MOTION CONTROL
ENGINEERING

Motion 2000
Hydro v9.x

USER GUIDE

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All for dreams

MCE
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Motion 2000 Hydraulic Controller
V9.xx software

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Important Precautions and Useful Information

This preface contains information that will help you understand and safely maintain MCE equipment. We strongly recommend you review this preface and read this manual before installing, adjusting, or maintaining Motion Control Engineering equipment. This preface discusses:

- Safety and Other Symbol Meanings
- Safety Precautions
- Environmental Considerations
- In this Manual

Safety and Other Symbol Meanings

Danger

This manual symbol is used to alert you to procedures, instructions, or situations which, if not done properly, might result in personal injury or substantial equipment damage.

Caution

This manual symbol is used to alert you to procedures, instructions, or situations which, if not done properly, might result in equipment damage.

Note

This manual symbol is used to alert you to instructions or other immediately helpful information.

Safety Precautions

Danger

This equipment is designed to comply with ASME A17.1, National Electrical Code, CE, and CAN/CSA-B44.1/ASME-A17.5 and must be installed by a qualified contractor. It is the responsibility of the contractor to make sure that the final installation complies with all local codes and is installed in a safe manner.

This equipment is suitable for use on a circuit capable of delivering not more than 10,000 rms symmetrical amperes, 600 volts maximum. The three-phase AC power supply to the Drive Isolation Transformer used with this equipment must originate from a fused disconnect switch or circuit breaker sized in conformance to all applicable national, state, and local electrical codes in order to provide the necessary motor branch circuit protection for the Drive Unit and motor. Incorrect motor branch circuit protection will void the warranty and may create a hazardous condition.

Proper grounding is vitally important to safe and successful operation. Bring your ground wire to the system subplate. You must choose the proper conductor size and minimize the resistance to ground by using the shortest possible routing. See National Electrical Code Article 250-95 or the applicable local electrical code.

Before applying power to the controller, physically check all the power resistors and other components located in the resistor cabinet and inside the controller. Components loosened during shipment may cause damage.

For proper operation of your controller, you must make sure that: 1) A direct solid ground is provided in the machine room to properly ground the controller and motor. Indirect grounds such as the building structure or a water pipe may not provide proper grounding and could act as an antenna to radiate RFI noise, thus disturbing sensitive equipment in the building. Improper grounding may also render any RFI filter ineffective. 2) The incoming power to the controller and the outgoing power wires to the motor are in their respective, separate, grounded conduits.

This equipment may contain voltages as high as 1000 volts. Use extreme caution. Do not touch any components, resistors, circuit boards, power devices, or electrical connections without ensuring that high voltage is not present.

Environmental Considerations

- Keep the machine room clean.
- Controllers are generally in NEMA 1 enclosures.
- Do not install the controller in a dusty area.
- Do not install the controller in a carpeted area.
- Keep room temperature between 32 and 104 degrees F (0 to 40 degrees C).
- Prevent condensation on the equipment.
- Do not install the controller in a hazardous location or where excessive amounts of vapors or chemical fumes may be present.
- Make certain that power line fluctuations are within plus or minus 10% of proper value.

Air Conditioned Equipment Cabinets

If your control or group enclosure is equipped with an air conditioning unit, it is very important to observe the following precautions. (Failure to do so can result in moisture damage to electrical components.)

- Maintain the integrity of the cabinet by using sealed knockouts and sealing any holes made during installation.
- Do not run the air conditioning while the cabinet doors are open.
- If you turn the air conditioner off while it is running, wait at least five minutes before restarting it. Otherwise, the compressor may be damaged.
- Observe the recommended thermostat setting (75 degrees) and follow recommended maintenance schedules.
- Make certain that the air conditioning drain tube remains clear to avoid water accumulation in the unit.

In This Manual:

This manual is the installation, adjustment, and troubleshooting guide for the HMC-2000 car control. When viewed online as a pdf file, hyperlinks (buttons or blue text) link to related topics and informational websites. The manual includes:

- Contents: Table of Contents. When viewed online as a pdf file, hyperlinks in the Contents link to the associated topic in the body of the manual.
- Section 1. Motion 2000 Description: A description of the Motion 2000 controller and circuit boards.
- Section 2. Installation: Installation and wiring guidelines.
- Section 3. Startup - Inspection Operation: Controller startup, operation on Inspection, installation of hoistway equipment and preparing the car to run on Test/Normal operation.
- Section 4. Final Adjustment: A description of absolute floor encoding and Test mode operation. Running the car on Test and Normal operation and making the final checks and adjustments prior to releasing the car to normal operation.
- Section 5. The Computer: How to use the MPU to program and troubleshoot the controller. Complete with parameter definitions where appropriate.
- Section 6. Troubleshooting: This section includes Status and Error Messages, PC Board Quick References and Data Trap instructions.
- Section 7. Appendix: Record of Parameter Values, Security Codes, LS-QUTE Landing System.
- Index: Alphabetical index to help you find information in the manual. When viewed online as a pdf file, index entry page references are hyperlinks to the associated information in the body of the manual.

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Section 2. Installation

Section 3. Startup - Inspection Operation

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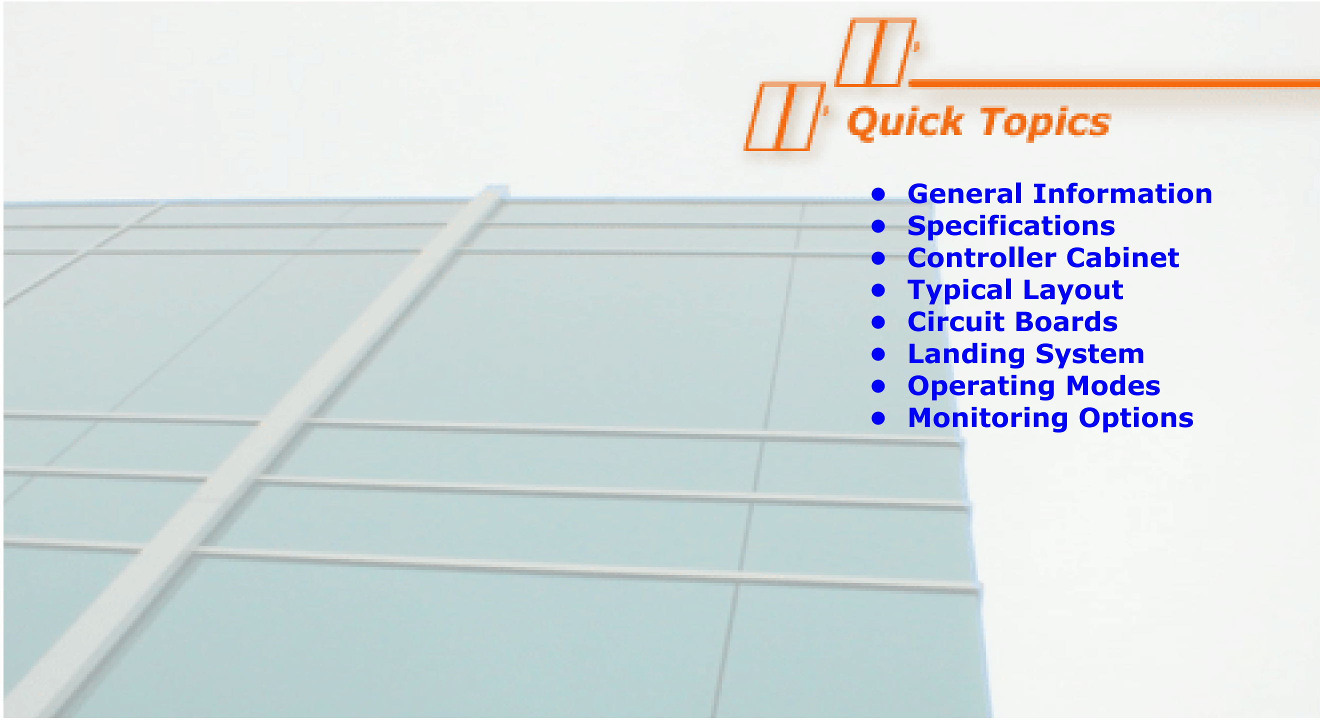
Section 7. Appendix



Quick Topics

1 Motion 2000 TSSA Description

General Information

Motion 2000 supports simplex, duplex, or group control. Motion 2000 design achieves simple inter-connectivity and easy field expansion through CAN BUS technology, phone-style connectors and optimized field connection locations.

Motion 2000 offers the same straight-forward user interface, switch programming, and LCD display as previous generation MCE programmable controllers; no learning curve required. Motion 2000 uses multiple, redundant, self-contained processors for reliable control and consistent safety monitoring. Through the CAN BUS, each processor is continuously aware of all system activity.

An optional ethernet port supports real time connection to the following MCE products:

- iMonitor for remote monitoring and control
- iReport for current and historical performance, activity reporting and archival
- iLobby for eye-pleasing, graphic display of elevator group activity.

Motion 2000 TSSA Description

The job prints accompanying your Motion 2000 controller are the primary document necessary to install the controller and additional equipment (if ordered from MCE). The job prints and this manual together provide the information necessary to install, adjust, and troubleshoot the Motion 2000 elevator controller. Study the job prints and read the manual before installing and adjusting the controller. Call Motion Control Engineering with any questions you may have before beginning installation or start-up.

Your Motion 2000 system may include:

- Car controller: Distributed-processor, elevator control configured according to a customer job survey.
- Car top station: Interface/interconnect/control box between car-mounted equipment and the car controller.
- Car top junction box: Some jurisdictions require that circuit boards normally mounted inside the Car top station be mounted in the car controller cabinet instead. In these instances, the less complex car top junction box is used in place of the car top station.
- Car station: Car operating panel interface.
- Dispatcher: If the car is part of a group, dispatching components and software may be provided.

Motion 2000 provides:

- Low-rise hydraulic building application
- Performance up to 200 feet per minute
- Up to 32 single or double-openings
- Simplex, duplex or group control
- Extensive field programmability

Motion 2000 Hydraulic Controller Specifications	
Maximum car speed	200 fpm, 1.0 mps
Configuration	Simplex, Duplex, Group
Landings	Up to 32
Motor control	Solid State, Y - Delta or Across the Line
Landing system	LS-QUTE (solid tape/magnets), LS-STAN (vanes), LS-EDGE
System access	LCD and switches, hand-held user interface or PS/2 keyboard
Dispatching	Groups to six cars
Environment	32-104°F, 0-40°C, humidity non-condensing up to 95%; harsh environment rugged service available (NEMA 4, 4X, 12)
Standard enclosure	34” w x 31.5” h x 11” d (864 x 800 x 380 mm) includes knock-outs
Optional enclosure (feature dependent)	36” w x 42” h x 9” d (914 x 1067 x 305 mm) includes knock-outs
Input	208-600 VAC, 50/60 Hz, single or 3-phase

Car Controller Description

Motion 2000 controllers are ASME A17.1-2000 compliant. A typical Motion 2000 controller is shown below. Typical board types are called out on the following page.

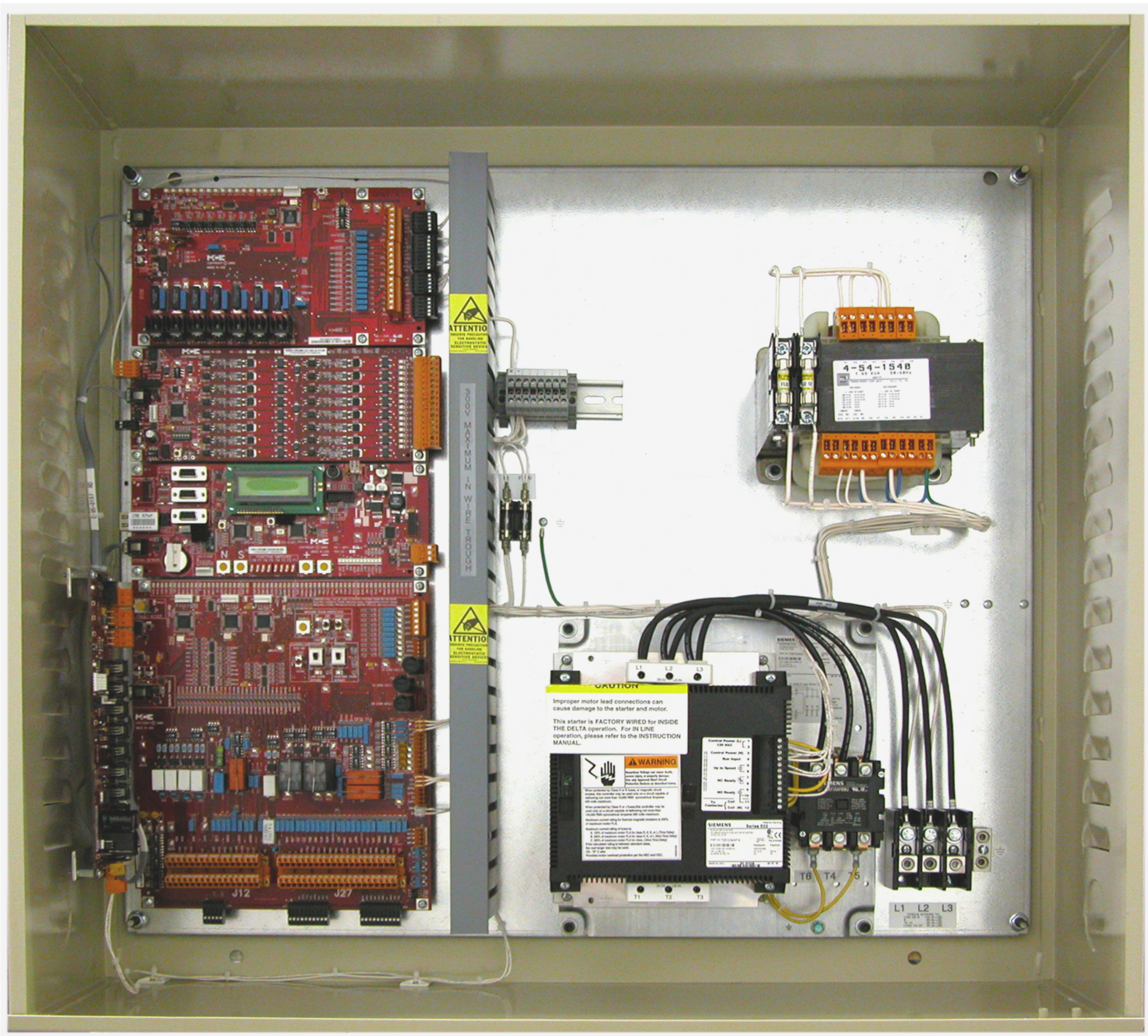
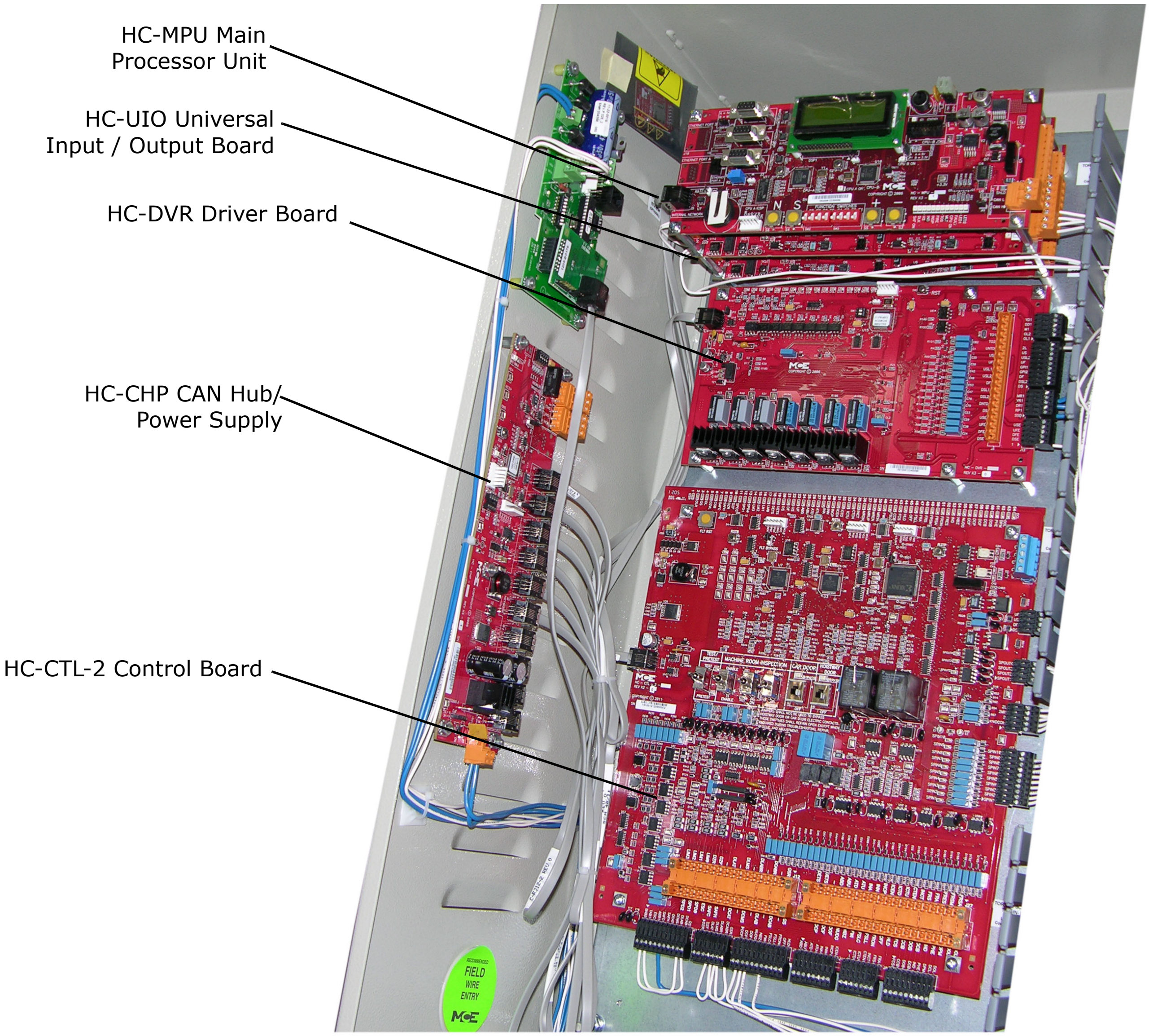
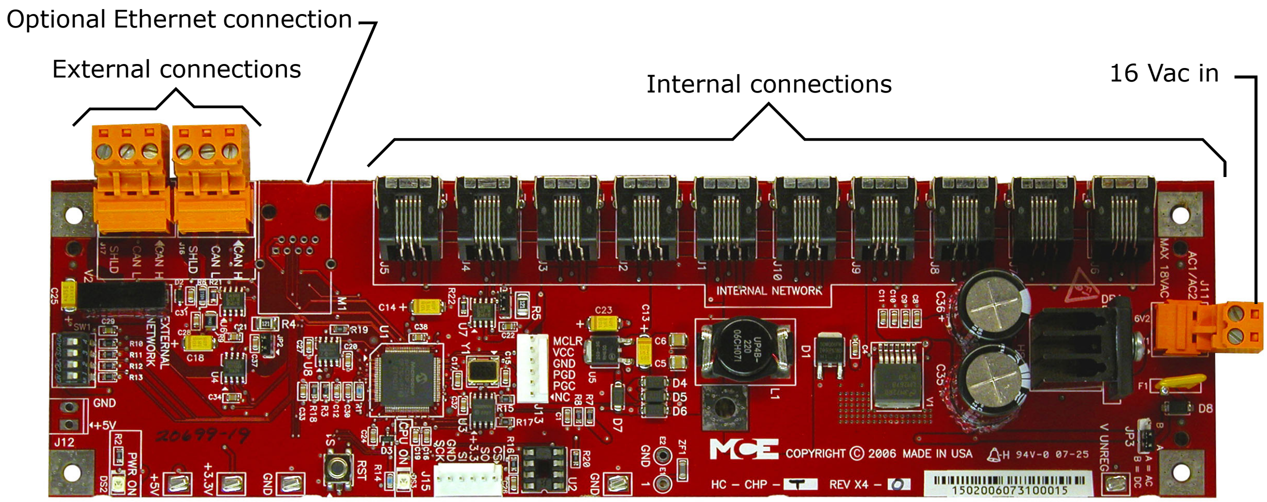


Figure 1.1 Typical Board Complement (Layout varies)

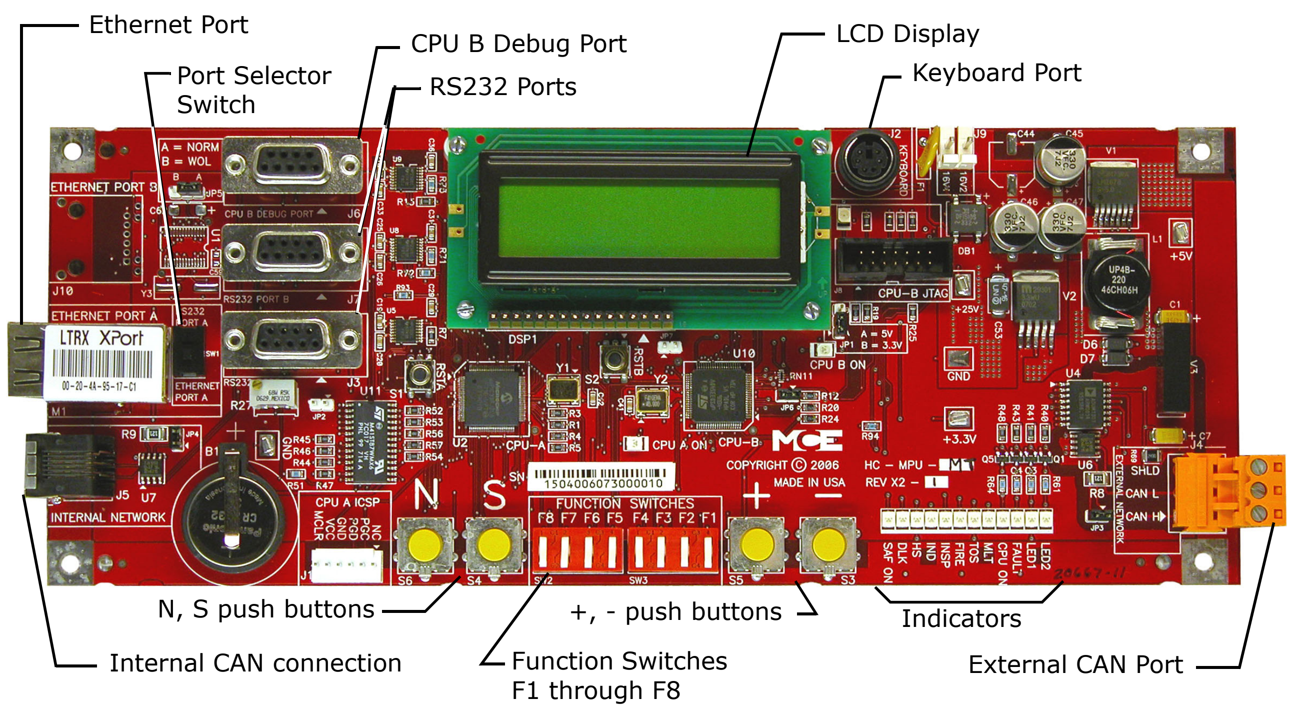


Controller Circuit Boards

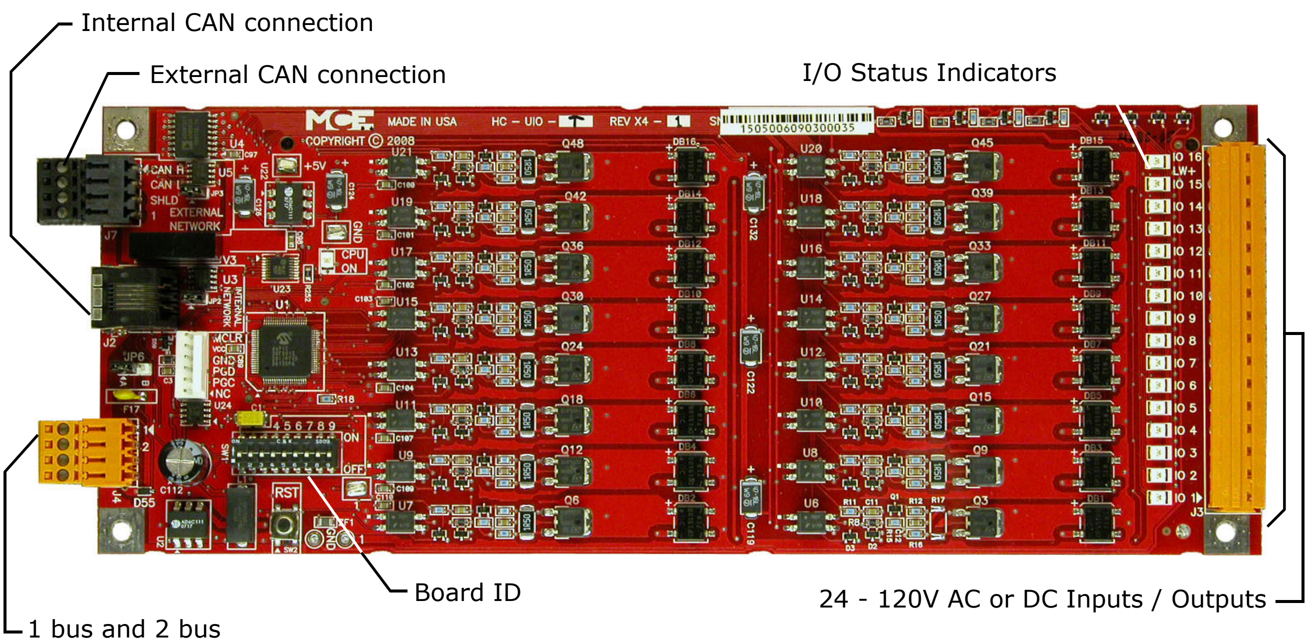
HC-CHP, CAN Hub and Power Supply: Provides a central connection point for the Controller Area Network (CAN). Also provides 16Vac power for digital integrated circuits throughout the controller. For more information see "HC-CHP CAN Hub and Power Supply Board" on page 6-40.



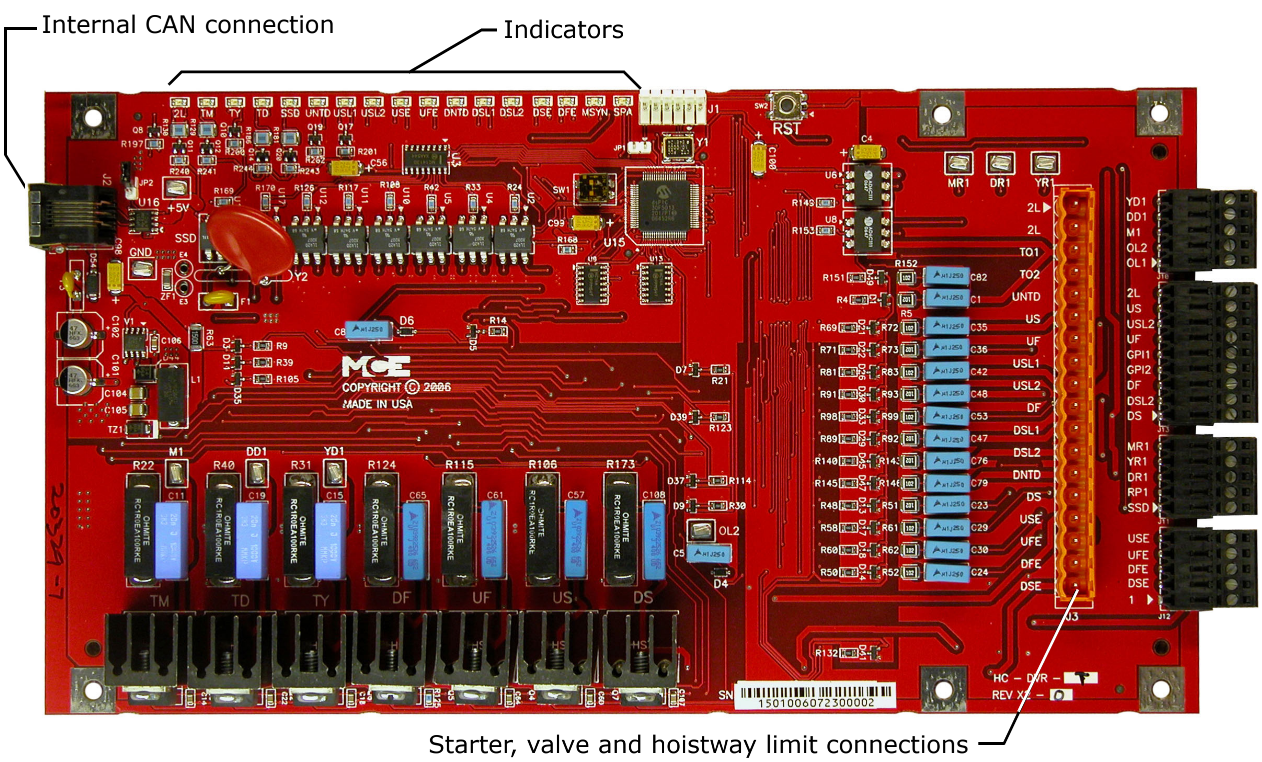
HC-MPU Main Processor Unit Performs control data processing. The HC-MPU is responsible for car operation, car communication, programming and diagnostics, redundancy monitoring, system software validation and duplexing. For more information see "HC-MPU Main Processor Board" on page 6-52.



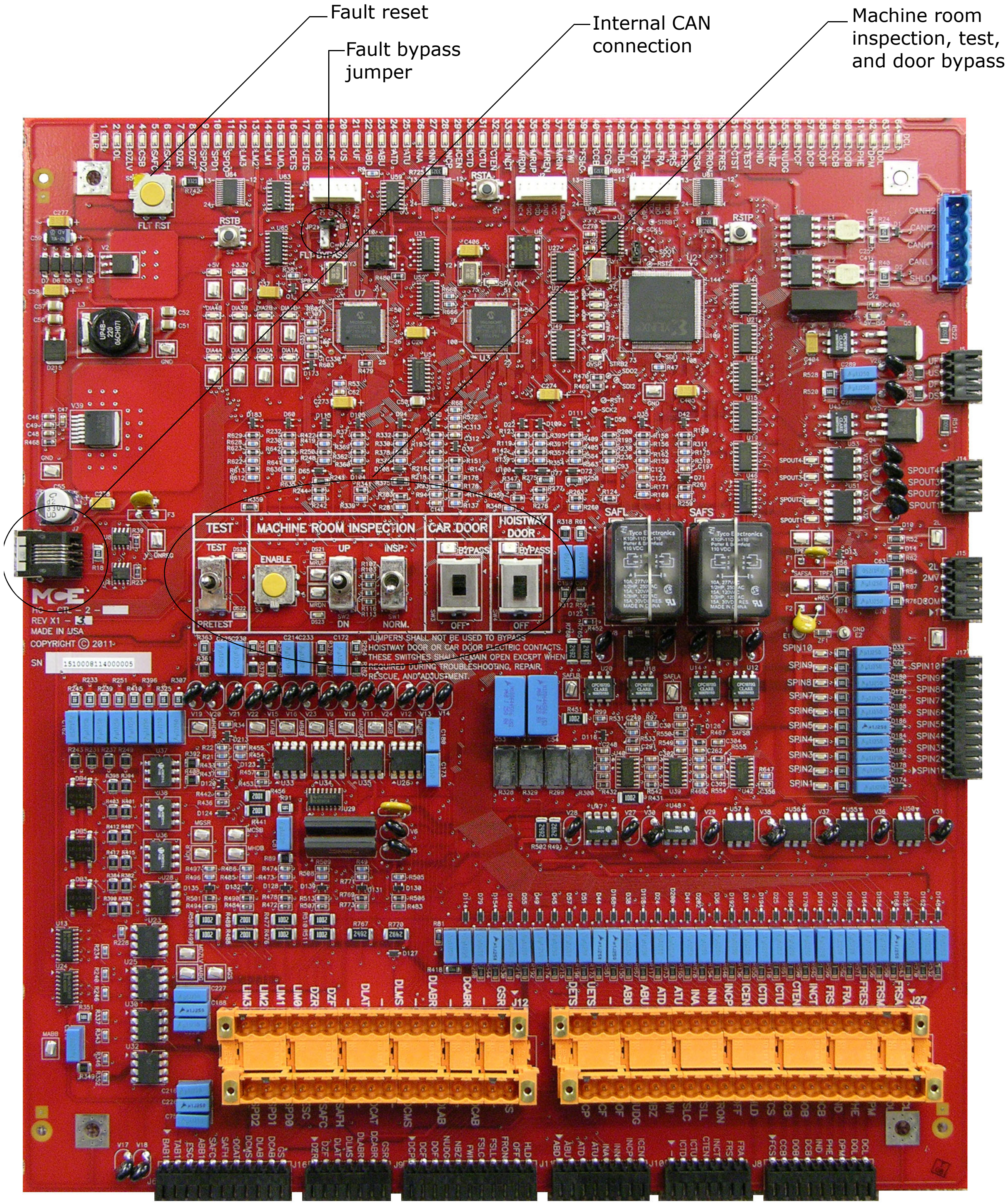
HC-UIO Universal Input/Output Board Depending upon the board configuration, HC-UIO boards may be used for programmable inputs and outputs (16 per board), car and hall calls, and dispatching. In all cases, the functionality of the HC-UIO board can be expanded by “plugging in” additional boards. For more information see “HC-UIO-2 Universal Input/Output Board” on page 6-55.



HC-DVR Driver Board The HC- DVR Driver board controls the starter and valves. For more information see “HC-DVR Driver Board” on page 6-49.



HC-CTL-2 Main Control Board



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HC-CTL-2 Main Control Board Monitors I/O, performs safety functions and front door operation. Please refer to “HC-CTL-2 Main Control Board” on page 1-7. The HC-CTL-2 board is responsible for inspection, fire service, landing system, door lock bypass and lanterns and gongs. For more information see “HC-CTL-2 Control Board” on page 6-42.

CE Fixture boards with LON interface (not shown) Used when extensive external fixtures are required.

MC-CPI or ICE-COP-2 Car Panel Interface Board (not shown) Converts the Discrete closures from car panel buttons and switches to CAN data and passes it through the Landing System Interface board (MC-LSI) to the car controller or dispatcher (see “ICE-COP-2 Car Panel Interface Board” on page 6-62).

MC-LSI Landing System Interface Board (not shown) Provides a connection point for the Car Panel Interface board (MC-CPI or ICE-COP-2). A shielded external CAN connection runs from the MC-LSI board, through the traveler, to the Motion 2000 controller (see “Example: MC-CPI Wiring” on page 6-69).

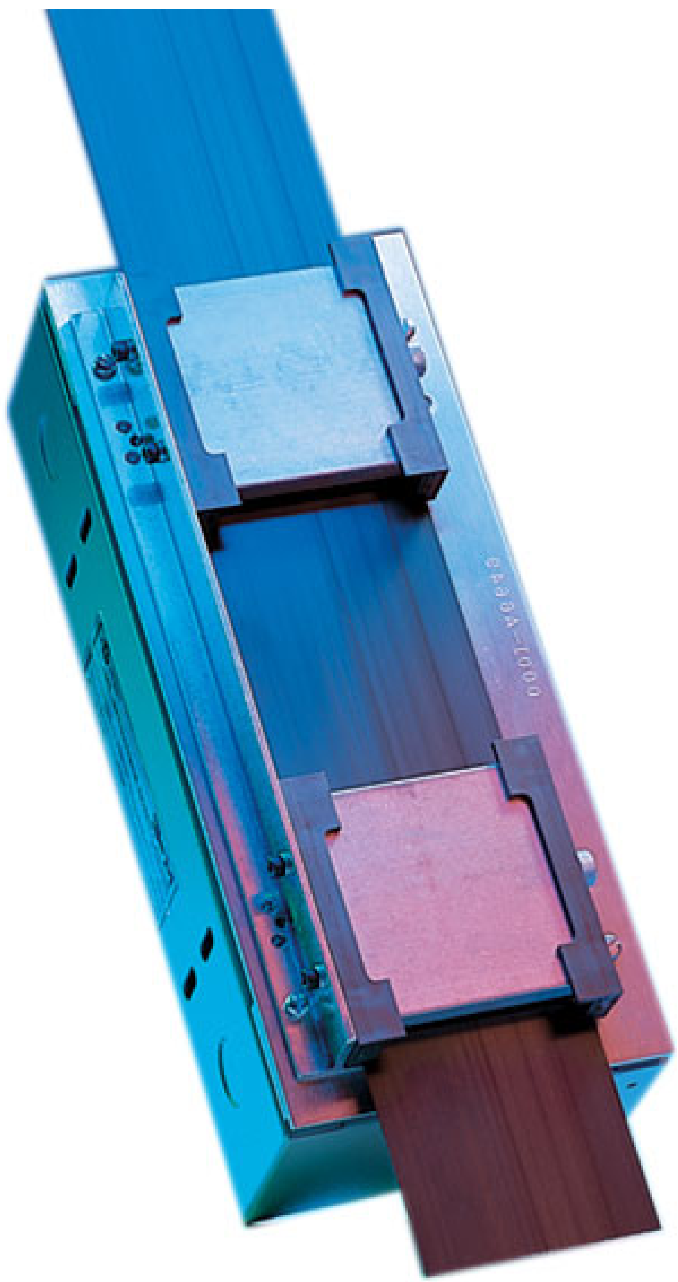
Landing System

The landing system is designed to be mounted on the car top. Landing systems used with the Motion 2000 controller include the LS-QUTE, LS-STAN, and LS-EDGE.

LS-QUTE Landing System

The LS-QUTE is a tape-and-magnet-operated landing system. A three inch wide steel tape is mounted in the hoistway. The cartop control box has a floating head that slides on the steel tape, and magnetic sensors for slowdown, STU, STD, ISTU, ISTD, ULM(LU), DLM(LD) and DZ. With LS-QUTE, the Motion 2000 is configured for absolute floor encoding.

Figure 1.2 LS-QUTE Landing System



LS-STAN Landing System

The LS-STAN landing system uses VS-1A infrared proximity switches to sense vanes that are mounted in the hoistway.

Figure 1.3 LS-STAN Landing System

LS-EDGE Landing System

The LS-EDGE positioning system uses hall-effect sensors and perforated steel tape to report position as the car moves through the hoistway. 5.5-inch magnets are used at each door zone.

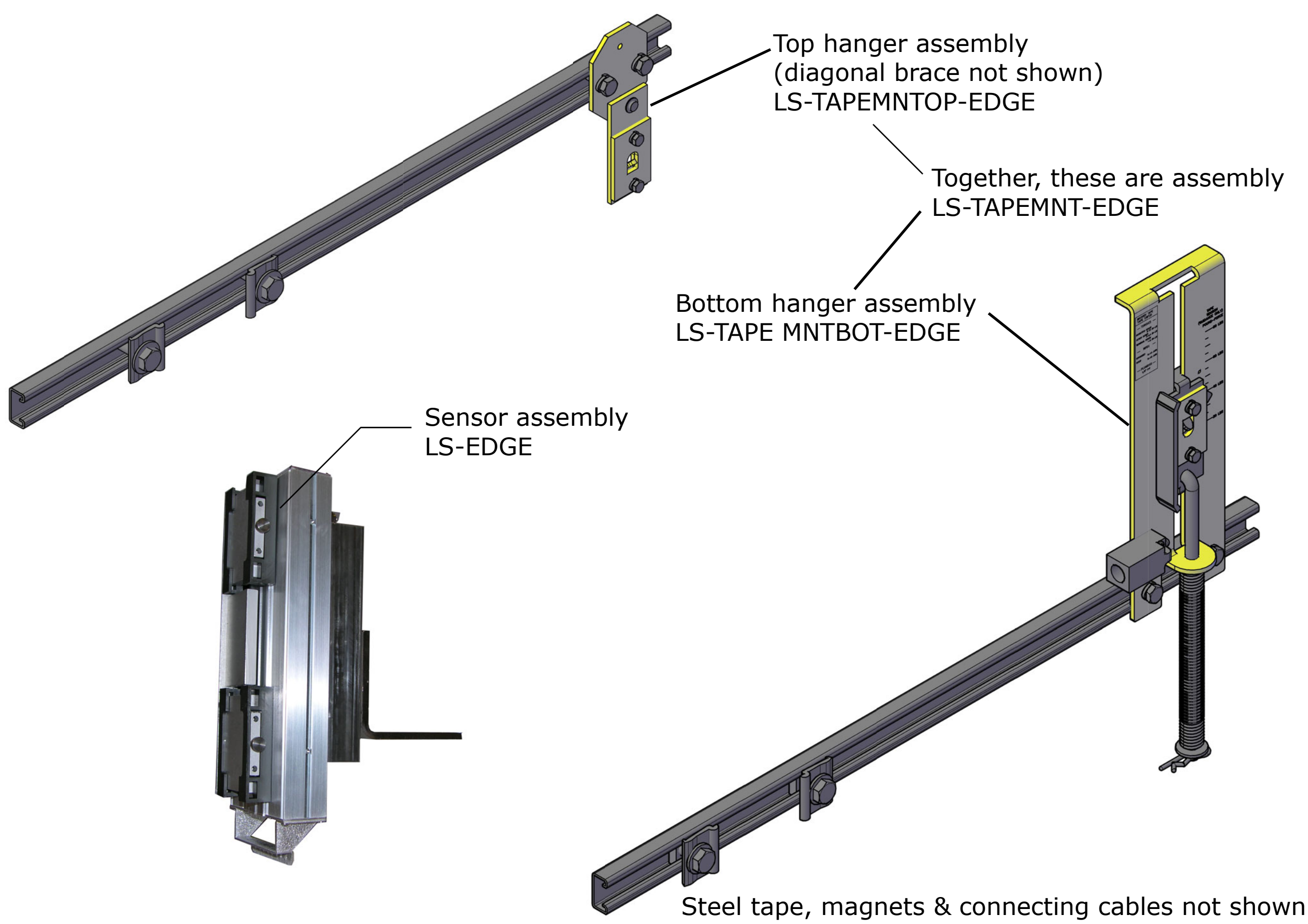
The system uses capacitor-stored power and non-volatile memory to retain position information in the event of a power failure, continuing to capture information for 10 seconds after power loss and storing the final reading for use after power restoration.

The LS-EDGE kit contains the sensor head assembly, an “L” bracket to mount the sensor assembly to a uni-strut that is in turn attached to the elevator cab (uni-strut to elevator cab not provided), steel tape, top and bottom steel tape hanger assemblies, the required number of door zone magnets and terminal magnets, and the CAT-5 electrical cables required to connect the sensor to the interface board.

Depending on applicable code, you may have to route electrical connections through conduit. If so, we recommend minimum 3/4-inch flex so that the modular connectors can slide through without binding. Perforations for cable tie wrap connection are provided on the RJ-45 plug-end of the sensor head.

LS-EDGE allows most hoistway switches to exist virtually, in software, greatly simplifying installation and adjustment.

Figure 1.4 LS-EDGE Components



Operating Mode Descriptions

Available operating modes are configured when the car is installed. Not all modes are available on all cars. This section describes controller operating modes, including:

- Automatic Operation
- Inspection Operation
- Attendant Service Operation
- Independent Service Operation
- Sabbath Operation
- Emergency Medical Operation
- Hospital Service Operation
- Fire Service Operation
- Emergency Power Operation
- Car Recall
- Capture for Test
- Test Mode

Automatic Operation

Automatic operation is the normal, default elevator operating mode. In this mode, cars are accepting hall calls and servicing car calls as determined by Basic Features Menu and other operating menu selections. Please refer to “Basic Feature Menu Options” on page 5-17.

Mode Entry

- Machine Room Inspection Mode Switch: Normal
- Test Switch: Normal
- Car Door Bypass: Off
- Hoistway Door Bypass: Off

Inspection Operation

In inspection, a car operates at the set inspection speed using up and down buttons or momentary switches. The car will stop as soon as the buttons are released. Inspection operation may be controlled from three locations. For safety purposes, locations have a priority:

- Top of car: When the cartop inspection switch input (INCT on the HC-CTL-2 board) is active, operation from the controller or from the car panel is disabled.
- In-Car: In car inspection may be from built-in COP switches or from the optional hand-held user interface. When the in-car inspection input (INCP on the HC-CTL-2 board) is active, operation from the controller inspection station is disabled.

Machine Room Inspection: Inspection operation using the switches in the elevator controller. Available only when cartop, in-car inspection, and/or hoistway access is not active.

Cartop Inspection

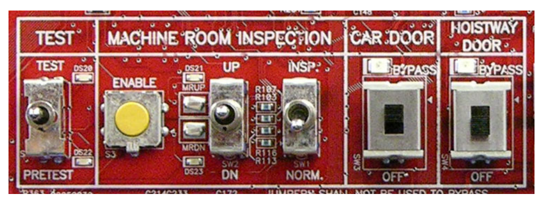
In this mode, the car is operated by pushing the cartop UP or DOWN and ENABLE buttons simultaneously. These buttons are generally provided through a third-party inspection station wired to inspection operation inputs in the elevator controller. There will also be a key switch that enables/disables inspection operation.

In Car Inspection

In this mode, the car is typically operated using a locked sub-panel in the COP that provides the inspection key switch and direction buttons.

Machine Room Inspection

In this mode, the car is operated using switches on the HC-CTL-2 (Control) board in the controller.



Mode Entry

- Place the car on Machine Room Inspection (Mode Switch to INSP).
- Ensure that car and hoistway doors are closed and locked.
- Run the car using the ENABLE and UP or DOWN Directional switch positions.

Hoistway Access Inspection

In the inspection hierarchy, hoistway access operation priority is the same as machine room inspection (in descending order: cartop, in-car, machine room/hoistway access). Hoistway access operation allows workers to access the top and bottom of the car from designated floors. In this mode, the car is brought to an access floor where a special key switch has been installed that allows a worker to move the car up or down the hoistway.

Mode Entry

- Bring the car to the access floor
- Place the car on Machine Room Inspection
- Place the appropriate Car and Hoistway door bypass switches in the Bypass position
- Enable hoistway access operation using the in-car switch
- Move the car up (bottom access) or down (top access) until the access limit is opened

- Top access must prevent the car from moving down beyond the point where the cross-head is even with the hoistway entrance sill.
- Bottom access must prevent the car from moving up beyond the point where the bottom of the toe guard is even with the hoistway entrance header.

Attendant Service Operation

Attendant operation allows an operator riding in the car to run the car, choosing run direction, and which hall calls to answer. In this mode:

- Doors open automatically when the car is stopped in a door zone.
- The attendant closes the door by pressing and holding the door close button, a car call button, or either car direction (UP/DOWN) button (UPI/DNI input: Please refer to “Spare Inputs Menu Options” on page 5-29.
- The attendant chooses the direction using run up (UNI) or down (DNI) buttons.
- The car will stop at the next car or hall call in the direction of travel. Holding the bypass button (NSI input) in will cause hall calls to be bypassed until the button is released.
- The elevator will level into the destination floor automatically, then open its doors.
- In-car position indicators will light for floors at which there are active hall calls so that they are visible to the attendant. The car will answer the calls unless the attendant is holding the bypass button (NSI).
- During Attendant operation, load weigher inputs are ignored.

Mode Entry

- Call the car to a floor.
- Enter the car and activate the Attendant mode key switch (enables the ATS, Attendant Service, controller input).

Independent Service Operation

In this mode:

- Doors open automatically when the car is stopped in a door zone
- The operator presses and holds the door close button to close doors
- The operator chooses direction and initiates the run by placing car calls (first placed determines direction of run).
- The elevator will level into destination floors automatically and open its doors.
- Hall arrival lanterns or jamb mounted arrival lanterns are inoperative.
- Bypassed by Fire Service Operation once doors are closed.

Mode Entry

- Call the car to a floor.
- Enter the car and activate the Independent mode key switch (IND input HC-CTL-2 board).

Sabbath Operation

Sabbath operation is a special mode that sets the car to consecutively service specified landings (and openings if the car has front and rear doors) during up and down travel with no hall or car call buttons being pressed. The car will begin from the bottom of the hoistway, travelling up and stopping at each designated stop and opening its doors to allow exit or entry. When the doors close, the car will travel to the next designated stop up the hoistway and repeat door operation. This will continue until the car reaches the top designated stop, at which point it will travel down the hoistway operating in the same manner.

- Initiate: Sabbath operation is initiated when the spare input SAB is activated.
- Operation: In accordance with the description above and servicing stops set through the Sabbath Operation parameter in the Extra Features menu. Please refer to “Extra Features Menu Options” on page 5-48.

Emergency Medical Operation

This mode complies to Massachusetts code. It allows a car to be recalled to a floor where it can be boarded by medical personnel and placed in restricted service, using an in-car switch, to respond to a medical emergency.

- Recall: Initiated using a key switch (EMSH input) at the floor assigned by the Massachusetts EMS Service/EMS Service Floor parameter in the Extra Features menu (single switch, single floor).
  - The car will immediately cancel all registered calls, return to the designated floor, and open its doors.
- In-Car Medical: Medical personnel board the car and place it in hospital service using the in-car switch (EMSC input).
  - If the hall switch has been shut off, the car will wait sixty seconds then return to normal service if the in-car switch has not been activated.
  - If the hall switch remains on, the car will wait without restriction until the in-car switch is activated.

Hospital Service Operation

Hospital service allows a car to be recalled to any of one or more assigned floors using a call button at the floor. Once at the floor, the car may be boarded by medical personnel and placed in restricted service, using an in-car switch, to respond to a medical emergency.

- Recall: Floors and openings (if the car has front and rear doors) are designated as hospital service through Hospital Emerg Operation parameters in the Extra Features Menu. Please refer to "Extra Features Menu Options" on page 5-48. When a designated call button is activated, the car will recall to the floor.
  - The car will immediately cancel all registered calls, move to the call floor, and open its doors.
  - A Timer Menu function, Hospital Emergency Timer, allows a timer to be set for a range of up to 10 minutes. After a car recalls to the designated floor, it will remain there until the timer expires, after which it will return itself to automatic passenger service if the in-car, hospital service switch has not been activated.
- Operation: Once the in-car switch (HOSP input assigned through the Spare Inputs Menu) is activated, the car is in restricted service and will accept only calls assigned through the car operating panel.
- When the in-car switch is deactivated, the car returns to normal service.

Fire Service Operation

There are many different fire codes that restrict or change elevator operation under fire conditions. Please refer to "Fire Service Menu Options " on page 5-20. In general, fire service proceeds in two stages; Phase I Emergency Recall and Phase II Emergency In-Car Operation. When a fire sensor or switch is activated:

- The elevator will recall to the designated main or alternate recall floor. (Main if fire detected on any floor other than the main floor; Alternate if fire detected on the main recall floor. Or, as directed by a manually activated Fire switch.)
- The elevator will open its doors to allow any passengers to exit, then remain at the recall floor until the in-car firefighter switch is activated. Once the in-car switch is activated the car will run on Fire Phase II operation as allowed by the selected fire code.

Emergency Power Operation

Emergency or standby power operation requires a backup power source. For large buildings, this is typically a diesel or gasoline powered generator. When this is not practical, backup power for a limited, rescue operation may be provided by a battery-powered system like the Reynolds & Reynolds Powervator EPS.

Generator Backup

When power is lost, the elevator will come to a full stop. When emergency/backup power comes on line, the elevator will be moved to a designated recall floor and the doors will open to allow passengers to exit. The elevator will remain at the recall floor unless it is designated to run under generator power. Please refer to “Extra Features Menu Options” on page 5-48.

EPS Backup

When power is lost, the elevator will come to a full stop. When battery power becomes available, the EXMLT input is activated and the elevator will be moved to the bottom floor. At the floor, the doors will cycle, allowing passengers to exit, and then close. The car will remain out of service until commercial power is again available.

Car Recall

Inputs may be provided to allow the car to be recalled to a specified floor.

- CTF: Car To Floor - This is a “spare” input that may be assigned to the HC-CTL-2 board or to a Universal I/O board as configured for the job. The floor to which the car is returned is set by the Car to Floor Return Floor parameter in the Extra Features menu. Please refer to “Extra Features Menu Options” on page 5-48.
  - When activated, causes the car to stop responding to hall calls. Existing car calls will be serviced. New car calls will not be registered.
  - When existing calls have been serviced, the car will move to the return floor, open then close its doors, and remove itself from service.
- CTL: Car to Lobby - This is a “spare” input that may be assigned to the HC-CTL-2 board or to a Universal I/O board as configured for the job. The floor to which the car is returned is set using the Lobby Floor parameter in the Basic Features menu. Please refer to “Basic Feature Menu Options” on page 5-17.
  - When activated, causes the car to stop responding to hall calls. Existing car calls will be serviced. New car calls will not be registered.
  - When existing calls have been serviced, the car will move to the return floor, open then close its doors, and remove itself from service.

Capture for Test (Pretest)

Pretest is used to capture the car in preparation to using Test mode.

- When this input is activated, the car will stop responding to hall calls and disable its gongs but continue to service car calls.
- The intent of the input is to allow maintenance personnel to capture the car while causing as little disruption to service as possible.
- Enter Pretest mode by placing the TEST/NORMAL/PRETEST switch on the HC-CTL-2 board in the PRETEST position. (The car will not enter Pretest if Inspection is active.)

Test Mode

Test mode allows the car to be run without operating the doors. When Test mode is active, door open circuitry is deactivated.

- Enter Test mode by placing the TEST/NORMAL switch on the HC-CTL-2 board in the TEST position. (The car will not enter Test mode if Inspection is active.)
- When Test mode is active, the controller LCD will display TEST MODE.

Monitoring and Control Options

Motion 2000 is Ethernet ready, allowing it to use iMonitor and iReport applications for local and/or distance monitoring and control (iMonitor) or report generation, archival, and automated alert (iReport). Motion 2000 can also be linked to Building Management System software through MCE BMS-Link, providing system visibility and limited control.

iMonitor

iMonitor is an elevator monitoring application that allows local or remote viewing and control of MCE elevator groups using a personal computer running the Windows XP operating system. Because Motion 2000 controls are Ethernet capable, you can connect to them though a local area network or remotely through internet/modem technology.

iMonitor provides a graphical representation of elevator groups, allowing their activity and status to be quickly and easily viewed. The user defines any number of “Connection Sets.” Each Connection Set consists of up to fifty connections to elevator group dispatchers selected by the user.

When working in iMonitor, the user simply clicks on a Connection Set which automatically establishes communication with all groups in the set and displays their associated hoistways and cars on the computer screen. Practical viewing limits are established by the speed of the connections and the size of the monitor viewing area.

When connected through iMonitor, the user may register car and general, auxiliary, or special hall calls as desired, control many group security functions, and enable or disable certain elevator operating modes.

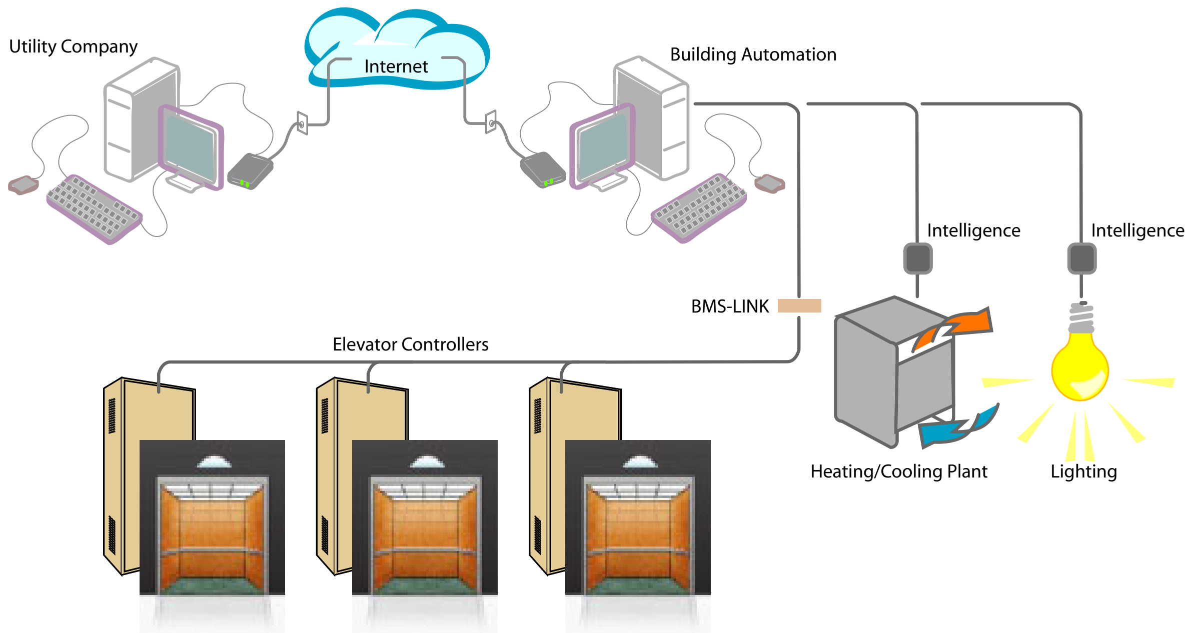
iReport

iReport is a system logging and report generating tool that allows local or remote analysis of MCE elevator groups from a personal computer running the Windows XP operating system and iReport client software. Because Motion 2000 controls are Ethernet capable, you can use iReport to connect to them through a local area network or remotely through Internet/modem technology.

iReport consists of the iReport server and iReport clients. Motion 2000 group dispatchers may be connected to iReport directly through a local area network or they may be connected remotely through a DSL or other high-speed connection and the Internet. The group dispatcher provides iReport with hall call and car operating mode information. The individual car controllers provide iReport with event and fault notifications.

BMS-Link

BMS-LINK uses the Niagara Framework developed by Tridium. The framework is a field-proven Java implementation that provides a reliable structure through which intelligent equipment may connect in a machine-to-machine environment. Motion Control Engineering and Gemini Integration Systems developed the software structure that integrates MCE iControl, Motion 2000, and Motion 4000 elevator controls and Motion 3000 escalator controls into this robust environment.



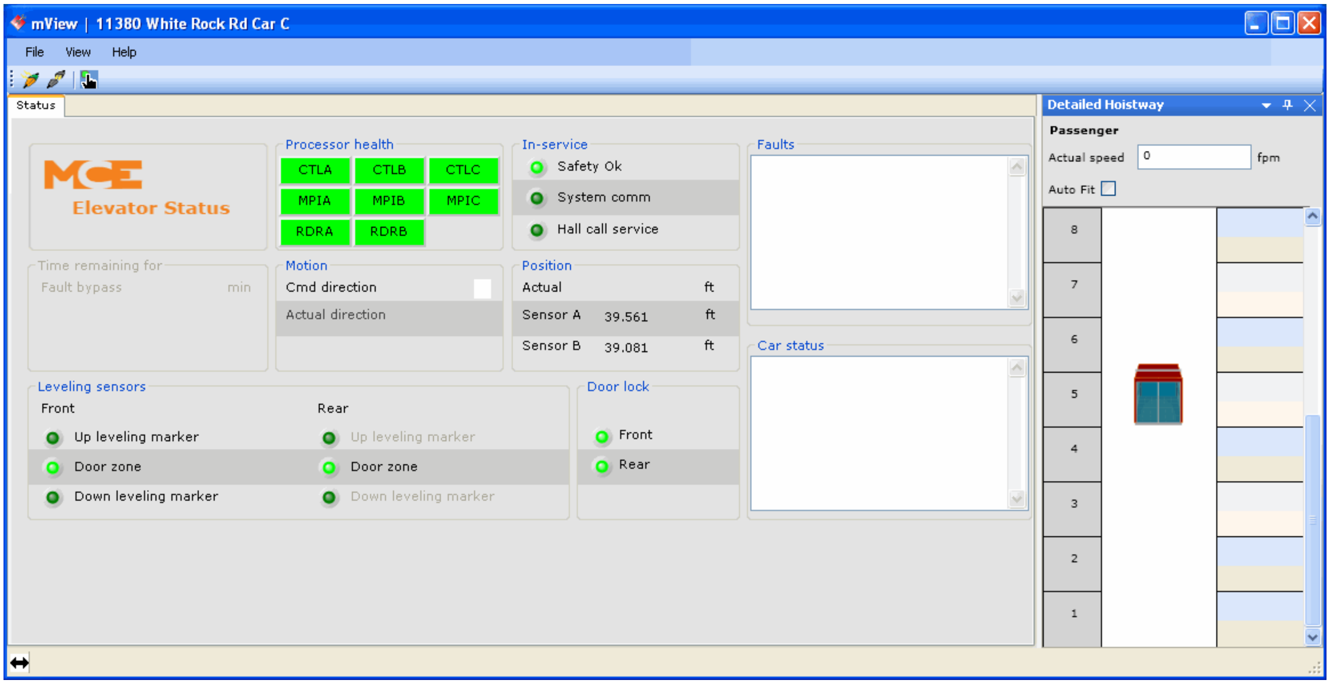
1

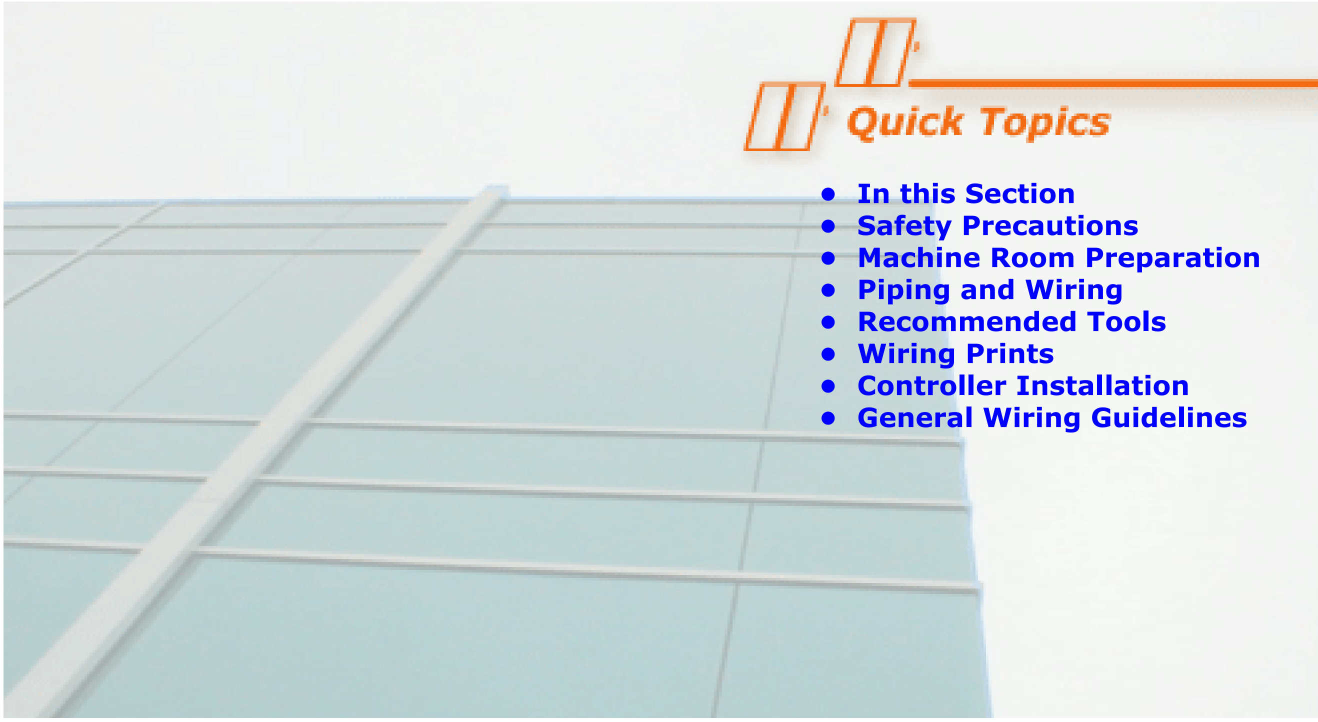
Motion Portable Adjustment Control (mPAC)

The hand-held user interface provides the same user functionality as does the HC-MPU board inside the controller. The mPAC can be plugged in to a CAN connection in the controller, on the cartop, or in the car (if one is wired). In addition, the mPAC can be used to transfer new firmware to Motion 2000 and Motion 4000 controllers.

mView

The mView application runs on a standard PC connected to the controller through an Ethernet hub or switch. mView provides local monitoring, status and event log viewing, diagnostics, and call registration for one or more Motion controllers.





2

Installation

In this Section

This section contains important recommendations and instructions for installing the Motion 2000 Hydraulic controller. If you are viewing this on a computer, click the page number to jump to the appropriate section.

- **Safety Precautions**: Precautions for personal and equipment safety (see page 2-2).
- **Machine Room Preparation**: Site selection and environmental considerations (see page 2-3).
- **Piping and Wiring**: Suggestions for avoiding electrical noise and EMI/RFI (see page 2-4).
- **Recommended Tools**: Tools and test equipment recommended for installation (see page 2-5).
- **Wiring Prints**: Job print and nomenclature conventions (see page 2-5).
- **Controller Installation**: Suggestions for proper controller wiring (see page 2-7).
- **General Wiring Guidelines**: Suggestions for proper grounding and wiring (see page 2-8).

Safety Precautions

Certain fundamental warnings must be kept in mind at all times to help avoid severe personal injury or equipment damage.

Personal Safety

- Motion 2000 Controllers should only be installed by qualified, licensed, trained elevator personnel familiar with the operation of microprocessor-based elevator controls.
- Verify that all safety devices (limits, hoistway locks, car gate, etc.) are fully functional before attempting to run the elevator. Never operate Motion 2000 controls with any safety device inoperative.
- The user is responsible for complying with the current National Electrical Code with respect to the overall installation of equipment and for proper sizing of electrical conductors connected to the controls.
- The user is responsible for understanding and applying all current local, state, provincial, and federal codes that govern practices such as controller placement, applicability, wiring protection, disconnections, over current protection, and grounding procedures.
- Controller equipment is at line voltage when AC power is connected.
- After AC power has been removed, internal capacitors can remain charged for up to 5 minutes. Wait at least 5 minutes after power down before touching any internal components.
- To prevent the risk of shock, all equipment should be securely grounded to earth ground with a minimum of #8 AWG wire as outlined in the National Electrical Code. Failure to obtain an actual earth ground may result in electrical shock to personnel and/or improper operation of the equipment.
- When using test equipment (oscilloscopes, etc.) with a power cord that electrically ties probe common to earth ground, an isolation transformer should be used to isolate the instrument common from earth ground.
- Remain clear of all rotating equipment while working on the controls.

Equipment Safety

- All equipment should be securely grounded to earth ground with a minimum of #8 AWG wire as outlined in the National Electrical Code. Failure to obtain a true earth ground may result in electrical shock. Improper grounding is the most common cause of electrical component failure and noise-induced problems.
- Replace components only with main line power off. Damage to equipment or unexpected operation of the elevator may occur if this precaution is not observed.
- Substitution of parts or unauthorized modifications should not be attempted before first contacting Motion Control Engineering to ensure all safety features are maintained. MCE will not be held responsible for circuit modifications made in the field unless they are approved in writing by MCE.
- Circuit boards believed to be defective must be sent to MCE for repair and testing. Field repair may leave the board with undetected problems.
- Care should be taken when using test leads and jumpers to avoid shorting high voltage or ground to low voltage microprocessor circuits.

Installation Considerations

1. Dust, carbon, or metallic particles should not be allowed to accumulate on any part of the control.
2. Avoid vibration and shock.
3. Avoid rapid temperature change, high humidities, high ambient temperatures.
4. Avoid caustic fumes.
5. Prevent electromagnetic interference. This may be caused by radio transmitters, high voltage inductive spikes from unsuppressed relay coils, improper grounding, and improper wiring practices. The following should be noted:
   - The outer door will protect against interference only if closed. When the door is open, do not run high wattage radios next to the microprocessor.
   - Noise from door operator reactors can cause a problem if mounted on the controller.
   - Standard arc suppressors (resistor/capacitor networks) are used on AC relays. Diode/resistor combinations work well for DC relays. Consult Motion Control Engineering for proper component sizing.

Machine Room Preparation

When choosing equipment location, consider:

- Adequate working space for comfort and efficiency and a good working space such as a workbench or table.
- Logical arrangement, taking into consideration other equipment in the machine room and electrical power.
- Do not install equipment in a hazardous location.
- A telephone in the machine room facilitates remote diagnostic and adjustment assistance.
- If any areas in the machine room are subject to vibration, they should be avoided or reinforced to prevent equipment damage.
- Provide adequate lighting to work with control cabinets and machines.
- Wiring is reduced if the drive isolation transformer (if used) is located near the controller.

Environmental conditions are important:

- Ambient temperature should remain within 32° to 104° Fahrenheit (0° to 40° Celsius). Temperatures outside these guidelines may be tolerated, but will shorten equipment life. Adequate ventilation is required. Air conditioning may be necessary.
- The air in the machine room should be free of excessive dust, corrosive elements, and excessive moisture. A NEMA 4 or NEMA 12 enclosure can help meet these requirements if machine room conditions are inadequate. If the machine room has open or unglazed windows or other direct outside openings, place equipment cabinets far enough from them so that severe weather does not damage the equipment.
- Very high levels of radio frequency (RF) radiation from nearby sources should be avoided. RFI may interfere with controller components, degrading elevator performance. Using hand-held communication devices close to the controller may also cause interference. Interference from permanently installed radio transmitting antennas is not common.
- Power line fluctuation should not be greater than ±10%.

Piping and Wiring

Proper routing of signal and power wires for the car and dispatcher is essential to trouble free installation of microprocessor based equipment. Low voltage and high voltage wiring cannot be run in the same conduit, duct, or tray.

How Electrical Noise Occurs

Electrical noise occurs in most cases when two wires run along side one another with one of them a high power conductor and the other a low signal level conductor. As current flows through the high power wire, magnetic lines of flux (voltage) expand outwards around the outside of the wire and voltage from the magnetic lines of flux is induced in the low level conductor.

The low level conductor, in the case of Motion 2000, may be a 24-volt input that really only needs to see 12 volts to turn on. If the voltage induced from the high power conductor is large enough to induce a 12-volt spike, the input can falsely turn on.

How to Avoid Electrical Noise Problems

The easiest way to avoid noise problems is to properly route high and low level signal wiring. Keep low level wiring in separate conduit from high power wiring. If high and low power wiring must be run in the same duct, separate them by a minimum of three to four inches. If one must cross the other, it should be at a ninety degree angle.

A second way to protect against electrical noise problems is to run low level wiring in shielded cable. The shield provides a conductor external to the actual signal wiring to collect any induced voltage from surrounding high power wiring. The shield or “drain”, as it is often referred to, must be connected to ground at one end. The shield or “drain” should never be connected to ground at both ends.

Possible EMI/RFI Interference

The main source of EMI/RFI problems is semiconductor devices that switch at high frequencies (such as variable frequency drives). The following wiring practices should be followed when piping and wiring high voltage lines to avoid EMI problems:

1. Run all motor leads in a separate conduit. All motor lead runs should be as short as possible. Control cabinet entry should be as close to the final termination point as possible.
2. Run main line supply leads in a separate conduit.
3. Run all primary isolation transformer wiring in separate conduit from the main line to the transformer.
4. Run all secondary isolation transformer wiring in a separate conduit from the transformer to the drive cabinet.
5. A single-point ground should be established inside the control cabinet and a #8 AWG ground wire run directly from each of the following devices to this single point:
   - Earth Ground from running water supply, Motion 2000-electric supplied ground, or a ground supplied via an earthing rod to the single ground stud.
   - Continuous wire from the main line disconnect to the single ground stud.
   - Continuous wire from the motor frame to the single ground stud.
   - Continuous wire from the isolation transformer frame to the single ground stud.
   - Continuous wire from the line filter frame to the single-point ground stud.

- Jumper the “N” stud on the line filter to the line filter frame.
- Continuous wire from the load reactor frame to the single-point ground stud.
- Continuous wire from the drive frame ground stud to the single-point ground stud.

Recommended Tools and Test Equipment

For proper installation, use the following tools and test equipment:

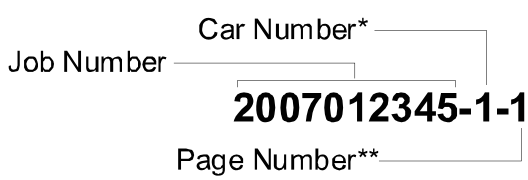
- A digital multimeter, Fluke series 75, 76, 77 or equivalent
- A hand-held tachometer
- A clamp-on AC ammeter
- Hand-held radios
- A telephone
- Test weights
- Pressure gauge
- Soldering tools, a flashlight and an MCE screwdriver (provided with controller).

Wiring Prints

Become familiar with the following information as well as the wiring prints provided with this control system.

Drawing Number Format

Each print has a drawing number indicated in the title block. The drawing number is comprised of the job number, car number and page number (see example). In this manual the drawings will often be referred to by the last digit of the drawing number (page number). The following is the drawing number format currently in use.



* Car Number “G” = Group Controller
** Page Number “S” = Starter page
** an “X” after the page number = auxiliary page

Note

Drawing Name: Some drawings have a drawing name directly above the title block or at the top of the drawing. The drawing name may be used to refer to a particular drawing.

Nomenclature

A listing of PC boards and their designator numbers plus other schematic symbols used in the wiring prints can be found at the beginning of the Job Prints and in the Component Nomenclature table below.

- Become familiar with the “Elevator Car Wiring Print” drawing number -1.
- Become familiar with the “Elevator Hoistway Wiring Print” drawing number -2.
- Become familiar with page -2DI of the job prints for duplex interconnect wiring if this application is duplexed.
- Review any additional wiring diagrams and details.
- The remainder of the job prints are detailed drawings of the Motion 2000 Hydraulic Control system.
- A specific part of a schematic may be referenced by the Area Number, which is found at the left-hand margin of the schematic.

The following table lists MCE part numbers and provides a brief description for each. Your installation may not use all boards listed.

Table 2.1 Component Nomenclature

Symbol	Component	Description
10	HC-DB-MOD	Front G. A. L. MOD Door Interface Board
11	HC-DB-MOD-R	Rear G. A. L. MOD Door Interface Board
32	HC-OA	Output Adaptor Board
44	HC-GB	Gong Board
45	HC-GB	Additional Gong Board
70	HC-CTL-2	Controller Board for Motion 2000/4000
72	HC-DVR	Hydraulic Driver board for Motion 2000
73	HC-UIO	Universal I/O Board for Motion 2000/4000
75	HC-CHP	CAN HUB and Power Board for Motion 2000/4000
76	HC-MPU	Main Processor Board for Motion 2000/4000
	ICE-COP-2	Car panel interface board
	MC-CPI	Car Panel Interface Board
	MC-LSI	Landing System Interface Board
	SC-3HN	Serial Hall Call Node Board
	SC-3HN-2	Serial Hall Call Node Board, Gen 2

Controller Installation

Mount the controller securely to the machine room wall or other appropriate location and knock out holes to install a raceway or conduit to permit the routing of wires into the cabinet. Note that the standard MCE control cabinet does not require rear access.

Caution

Do not allow any metal chips or drill shavings to fall into the electronics.

Controller Wiring Guidelines

Detailed instructions for connecting the Motion 2000 controller and accompanying components are contained in the drawings package for the job. During the job survey, site-specific information collected is used to engineer the drawings package. Contact Motion Control Engineering immediately if you have questions about the drawings or need additional assistance.

Note

Pay very close attention to the hierarchy of the inspection inputs. In order to maintain safe operation of the lift while on access, car top or in-car inspection, the inspection circuits must be wired as shown in the prints.

Caution

PC boards can be easily damaged by Electrostatic Discharge (ESD). Use a properly grounded wrist strap when touching the PC boards. **Do not touch PC Boards unless you are properly grounded.**

1. Bring wires in from a location that allows the use of the wiring duct inside the controller to route the wires. The terminals are found conveniently near wiring ducts.
2. When connecting wires to the controller, connect the wires according to the hoistway and car wiring diagrams.
3. If the car is part of a duplex or group system, there are a number of details relating to the wiring of the interconnects between the individual cars. They are as follows:
   - A separate conduit or wiring trough must be provided for the external CAN connections between the computers in each controller cabinet.
   - The wiring details for the communication link are fully detailed in the job prints.
   - Make sure to ground all of the cabinets according to the section titled *Ground Wiring*. Please refer to “Ground Wiring ” on page 2-9.

General Wiring Guidelines

Basic wiring practices and grounding requirements are discussed in this section.

Proper Grounding Procedures

A proper ground is essential to trouble free operation. Ground is defined as a direct connection to EARTH GROUND. This type of ground is not always available from the electrical supply panel.

The electrical conduit is not a sufficient ground for the system. Electrical ground should be obtained and certified from the electrical contractor. If this is not available, keep the following in mind when seeking an adequate connection to EARTH GROUND:

1. Building steel is not always earth ground. In most cases, building beams rest on concrete beam pockets, and the earth connection is inadequate.
2. Sprinkler system water pipe is **not** adequate because the sprinkler system is, in most cases, isolated from a free flowing earth water source.

If either of the two methods above are chosen for ground, and a true electrical ground is later introduced to the system, a difference in potential can occur between the assumed ground and the actual earth ground. This may lead to unsafe operating conditions and the possibility of electrical shock to passengers or personnel.

3. A water pipe is an adequate ground only if the water in the pipe is connected to a continuous city water source.

Wiring Connections for Properly Grounded Systems

1. An uninterrupted ground wire of at least #8 AWG should be run from each car controller cabinet chassis or back plate to earth ground. The connection at the car controller must be free of paint so the ground connection is made to the bare metal of the enclosure. The car controller should read less than 1-ohm to ground with the power off.
2. Ground straps, or short loops of ground wire, should be run from the controller ground connection to the primary duct connections.
3. An uninterrupted #8 AWG ground wire should be run from the hoist motor frame to the controller ground. The ground connection to the hoist motor must be free of paint.
4. An uninterrupted ground wire of minimum #14 AWG should be run from a termination point on the cab to the controller ground.
5. An uninterrupted ground wire should be run from the cab enclosure to the ground terminal on the cab to protect passengers and personnel from electrical shock.
6. An uninterrupted ground wire should be run from each car operating panel to the ground terminal on the cab to protect passengers and personnel from electrical shock.
7. An uninterrupted ground wire should be run from the dispatch cabinet chassis or back plate to earth ground. The connection at the dispatch cabinet must be free of paint so the ground connection is made to the bare metal of the enclosure.

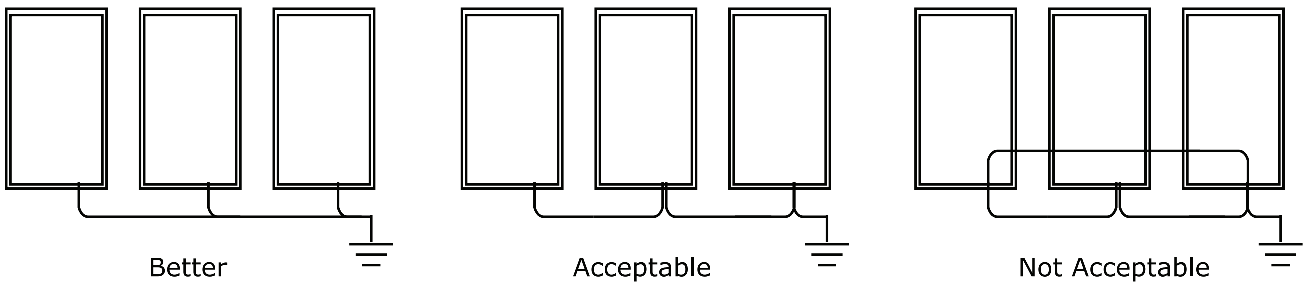
Ground Wiring

To obtain proper grounding, quality wiring materials and methods should be used.

All grounding in the elevator system must conform to all applicable codes. Proper grounding is essential for system safety and helps to reduce noise-induced problems. The following are some grounding guidelines:

- The grounding wire to the equipment cabinet should be as large as, or larger than, the primary AC power feeders for the controller and should be as short as possible.
- The grounding between equipment cabinets may be branching or a daisy chain, but the wire must terminate at the last controller and NOT loop back (see Figure 2.1).

Figure 2.1 Ground Wiring to Controller Cabinets



- Direct solid grounding must be provided in the machine room to properly ground the controller and the motor. Indirect grounding, such as the building structure or a water pipe, may not provide proper grounding and could act as an antenna radiating RFI noise, thus, disturbing sensitive equipment in the building. Improper grounding may also render an RFI filter ineffective.
- The conduit containing the AC power feeders must not be used for grounding.

Main AC Power

Main AC power supply wiring size must be determined by the electrical contractor. Proper motor branch circuit protection must be provided according to applicable electrical codes in the form of a fused disconnect or circuit breaker. Each disconnect or breaker must be clearly labeled with the elevator number.

Pump Motor Wiring

Connect the pump motor for the proper configuration shown on the wiring diagrams. Connect the pump motor leads to the proper terminals on the controller.

Low Voltage Signal Wiring

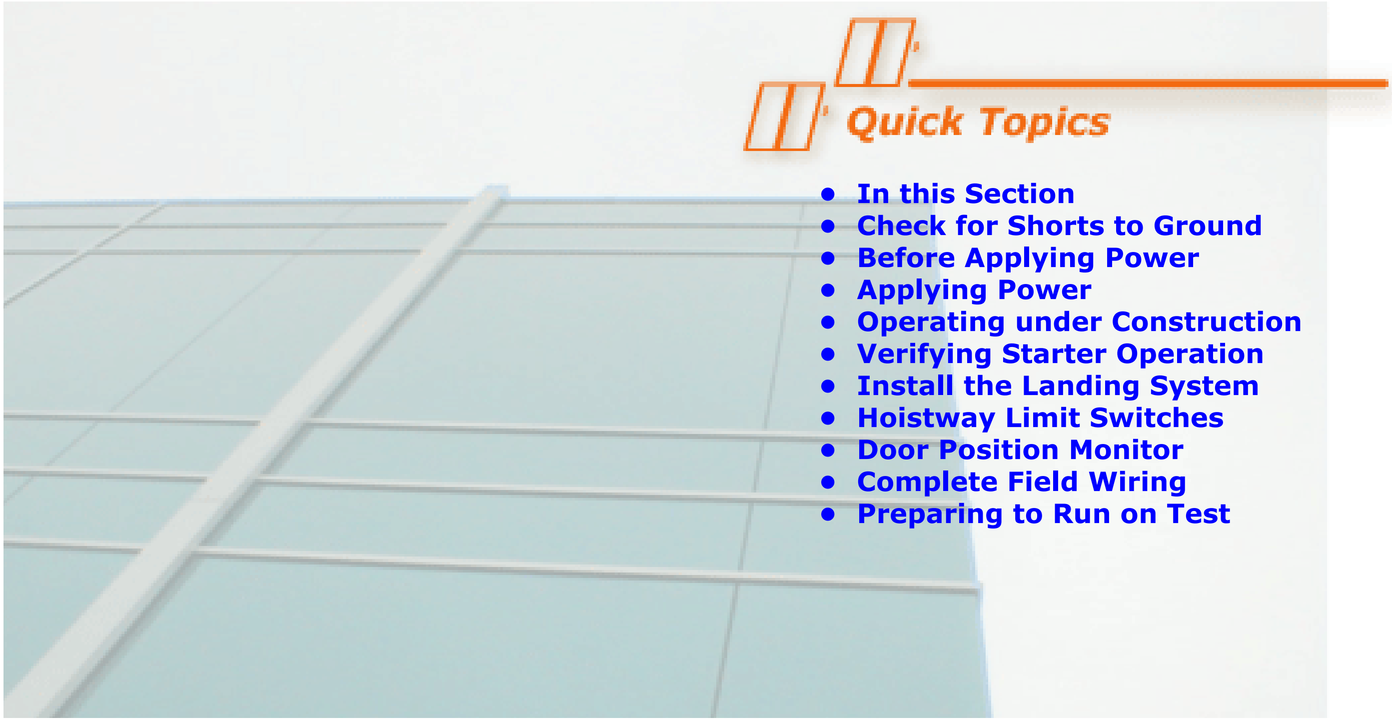
Low voltage signal wiring includes all 24-volt inputs. The inputs on the I/O boards can be turned on with as little as 12 Vac. If the signal wires are run along side the 240 Vdc door operator wiring, an induced 12-volt spike is very likely to occur. Keep low level signal wiring at least four inches from high power wiring to avoid false signal firing. If this is not possible, and the low level wiring must cross the high power wiring, the two should cross at a ninety-degree angle.

Traveling Cable Wiring

When laying out traveling cable wiring, it is always best to have the low voltage signal wiring multiple layers away from any 14-18 AWG power wires and high voltage signal wires.

The number of required wires and twisted pairs is documented in the job prints. The travelers are also identified by the use of yellow terminals in the top of the car junction box. Always allow 10% or more additional wires for spares.

On lower rise cars, it is often beneficial to run the traveling cable directly to the top of the car junction box. This avoids terminating traveler wires at the midway and at the under-car junction box.



3 Startup - Inspection Operation

In this Section

This section discusses preparing the car to run on Inspection operation. It covers the sequence of applying power to the controller and verifying proper motor rotation. It also covers completing the installation of hoistway equipment, initial adjustment of the system and preparing the car for normal operation and final adjustment.

- **Check for Shorts to Ground:** How to check for shorts to ground (see page 3-2).
- **Before Applying Power:** Things to do before applying power (see page 3-2).
- **Applying Power:** Steps to apply power and check for proper pump motor rotation (see page 3-3).
- **Set Up for Construction Operation**: Minimum requirements to allow the car to run while still under construction (see page 3-4).
- **Verifying Proper Starter Operation:** How to verify proper starter operation (see page 3-7).
- **Installing the Landing System:** Instructions for installing the landing system (see page 3-9).
- **Installing the Hoistway Limit Switches (LS-QUTE):** How to install the hoistway limit switches (see page 3-10).
- **Door Position Monitor Switch:** Installing the door position monitor switch, if used. (see page 3-23).
- **Complete the Installation and Field Wiring:** Finish the installation and wiring and check for shorts (see page 3-23).
- **Preparing the Car to Run on Test/Normal Mode:** How to prepare the car for running on automatic operation (see page 3-23).

Check for Shorts to Ground

Check for shorts to ground before powering up the system. Set the meter for resistance measurement (100 to 200 ohm range). Take all measurements with respect to the 1-bus, which is also referred to as the system common or common elsewhere in this manual.

Note

A short to ground is defined as having a resistance of less than 20 ohms between the 1-bus (common) and the terminal being checked.

1. Remove fuse F2 from the fuse holder in the individual car controller cabinet. If the system is a duplex controller, refer to the job prints and remove the fuse that powers terminals 2H (Hall Call Power Bus) and/or 2FS (Fire Service Bus). Check for shorts to ground on the 2H and/or 2FS terminals.
2. Check for shorts to the ground on all screw terminals on the bottom of the HC-CTL-2 Control board. Terminal 1 bus is the only terminal that should be grounded.
3. Check for shorts to ground on all terminals on the HC-UIO Universal I/O board.
4. Check for shorts to ground on the door operator terminals. Consult the job prints to determine which fuses to remove.

Before Applying Power

Note

These instructions assume adequate electrical troubleshooting experience. Follow the procedure carefully. If the elevator does not respond correctly, check the circuits according to your ability. Proceed cautiously. Read these instructions fully to become familiar with the procedure before starting the work.

1. Unplug the screw terminal blocks from the HC-UIO Universal I/O boards by moving the blocks toward the right. This is done to avoid damaging the boards through an accidental shorting of the output devices to a power buses (terminals 2, 2S, or 2L) during the initial power up of the system.
2. Verify that all circuits are wired to the controller properly.
3. On the HC-CTL-2 Control board, verify that the MACHINE ROOM INSPECTION - MODE switch is in the INSP position.
4. On the HC-CTL-2 Control board, verify that the Hoistway Door and Car Door Bypass switches are in the OFF position.
5. Verify that the Main Line Power Supply voltage matches the controller's designed voltage. Refer to the job prints provided with the controller and the silver label on the solid state starter (if used).

Applying Power

Initial Adjustments and Power Phasing

When performing the following steps please exercise extreme caution to prevent personal injury or damage to components and equipment. Have someone stand by the main power disconnect switch during the following phases of the start up procedure for added safety:

- First time power is applied to the controller
- First time an attempt is made to move the car

1. Check the line side of the Main Power Disconnect switch to verify that all three legs are at the correct voltage.
2. Reinstall fuse F2 to enable the primary controller relay voltage.

Verify Proper Pump Motor Rotation

1. Verify that the pump motor wiring has been installed per the job prints.
2. Turn ON power to the controller by closing the Main Power Disconnect switch.
3. Check the pump motor rotation using the method that is appropriate for the type of starter installed on the controller:
   - **Solid State Starter:** Take a jumper from 2 bus and briefly apply it to the "motor run" screw terminal on the solid state starter and observe the motor rotation.
   - **Y-Delta contactor:** Activate the Y contactor and observe motor rotation.
   - **Across the line (ATL) contactor:** Activate the A contactor and observe motor rotation.
4. Faults may occur while performing this operation. To clear latching faults, place the car on Machine Room Inspection and press the FAULT RESET button on the HC-CTL-2 Control board.
5. If the motor rotation is reversed, switch any two of the three leads at the Main Disconnect switch.
6. If an RP (Reverse Phase) sensor is provided and the sensor contact does not close when power is applied to the controller (indicated by a light on the sensor that comes on when phase rotation is correct), then 2 of the 3 AC wires that are connected to the RP sensor may need to be switched.
7. To provide an immediate stop once direction is released, set the SOFT STOP TIMER option on the ASME A17.1-2000 FEATURES menu to NONE (see "SOFT-STOP TIMER" on page 5-54).

Note

The HIGH SPEED INSPECTION option determines if the car will run at high or low speed on In-car, Cartop, or Machine Room Inspection or Hoistway Access (see "HIGH SPEED INSPECTION" on page 5-66. If the car contract speed is greater than 150 fpm, the HIGH SPEED INSPECTION option should be set to DISABLED.

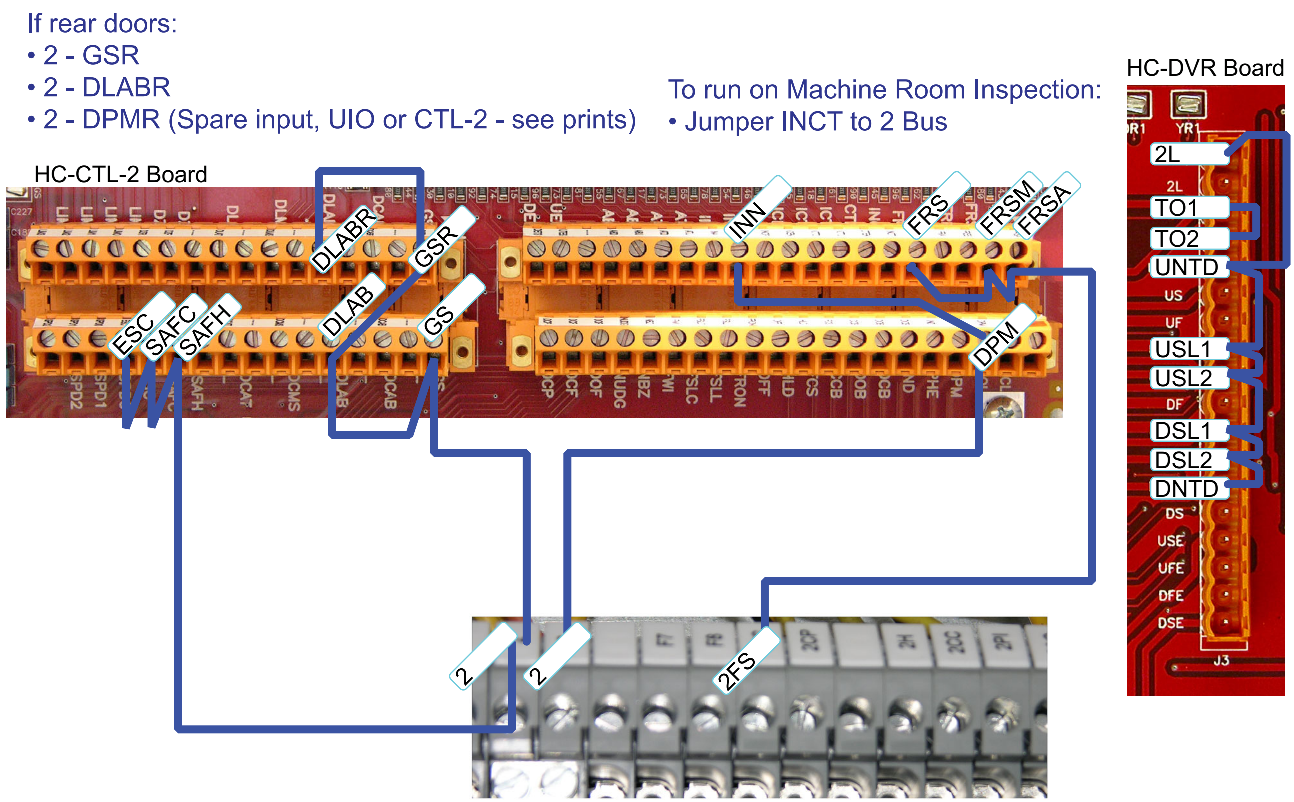
Set Up for Construction Operation

If required, it is possible to run the car during construction to help complete work in the hoistway. In this mode, the car runs at inspection speed. If they are in place, cartop controls may be used or the car may be run from the controller or a temporary run box. (Please refer to “Temporary Run Box Hookup” on page 3-6.)

Required Connections

Please refer to “Construction Mode Jumper Requirements” on page 3-5 and to the following illustration and text.

Figure 3.1 Jumpers Used Before Final Equipment Connected



Minimal equipment requirements are:

- Pump motor and valves.
- SAFH, SAFC, ESC: Hoistway and car safety devices. Connecting 2 bus to these terminals (as described in Table 3.1) will cause relay SAFS on the HC-CTL-2 board to pick and light the SAFS indicator (provided no safety-dropping faults are present).
- GS, DLAB: Door locks. (GSR, DLABR: Rear door logic and door locks.) Connecting 2 bus to these terminals will cause relay SAFL on the HC-CTL-2 board to pick and light the SAFL indicator (when direction has been established). The DLK indicator on the HC-MPU board will turn ON (provided that no safety-dropping faults are present).
- TO2: Thermal overload protection. Connecting TO1 to TO2, as specified on the job prints, will clear the OLM INPUT IS LOW fault (Overload monitor). When this fault is present the car can only move down.

- DNTD, UNTD: Up and down terminal limit switches. Connecting 2L bus to these terminals clears the faults caused by the final limit terminals being open.
- USL1, USL2, DSL1, DSL2: Slow down limits. Connecting 2L bus to these terminals clears the faults caused by having both sets of slow down terminals open.
- Custom Connections: Custom spare input connections that are active low and affect car motion, such as the Pressure Switch and Low Oil Switch, must be installed.

Temporary Jumpers

Temporary jumpers, as necessary, may be connected if needed to run the car on construction / inspection operation. For Temporary Run Box connections see page 3-6.

Table 3.1 Construction Mode Jumper Requirements

From	To
2 bus	SAFH on HC-CTL-2 board (Safety String, Hoistway)
SAFH on HC-CTL-2	SAFC on HC-CTL-2 board (Safety String, Car)
SAFC on HC-CTL-2	ESC on HC-CTL-2 board (In-car Emergency Switch)
2 bus (120VAC)	GS on HC-CTL-2 board (Gate Switch, car door locks)
2 bus (120VAC)	INN on HC-CTL-2 board
2 bus (120VAC)	GSR on HC-CTL-2 board (Rear Gate Switch, car door locks)
2 bus (120VAC)	DLAB on HC-CTL-2 board (Door Lock Access Bottom, hall doors)
2 bus (120VAC)	DLABR on HC-CTL-2 board (Rear Door Lock Access Bottom, hall doors)
2 bus (120VAC)	DPM on HC-CTL-2 board or HC-UIO board (Door Position Monitor)
2 bus (120VAC)	DPMR on HC-CTL-2 board or HC-UIO board (Door Position Monitor Rear)
TO1 on HC-DVR	TO2 on HC-DVR board or install thermal overload as specified on job prints
2L bus (120VAC)	DNTD and UNTD on HC-DVR board (Normal Terminal inputs)
2L bus (120VAC)	USL1, USL2, DSL1, DSL2 (Slow down limits) to clear faults. Must be installed to run the high speed valves while on Construction Mode. However. if the car's contract speed is greater than 150fpm, set HIGH SPEED INSPECTION option to DISABLED (see page 5-66).
2FS bus (120VAC)	FRS, FRSA, and FRSM on HC-CTL-2 board (Fire Service inputs) only required to clear faults. Car will run on Inspection without the jumpers.

Resolving Faults

If the car does not respond to a run command, check the HC-MPU board for error/fault codes. Please refer to "Status and Error Messages" on page 6-3. Error codes are displayed individually in the order of detection. It is possible that, after you correct a current error condition, another will be displayed. All errors must be resolved before the car will operate properly.

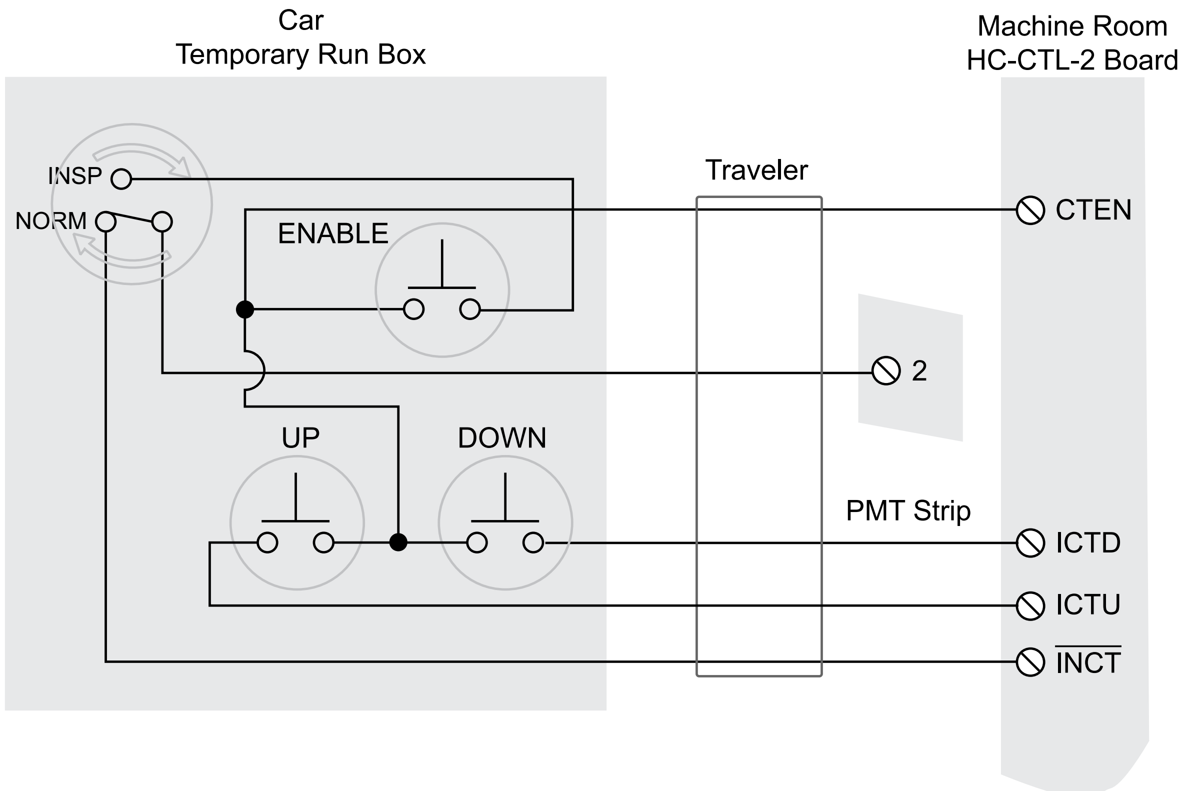
Temporary Run Box Hookup

The following illustration shows a temporary run box hookup. Disconnect controller power before attempting to wire the run box. The temporary run box must have an enable button, an up button, a down button, and a stop (Insp/Norm) switch (see Figure 3.1).

Caution

For safety, keep the controller Machine Room Inspection switch in the INSP position while the Temporary Run Box is in use.

Figure 3.2 Temporary Run Box



Verifying Proper Starter Operation

1. Verify that any fuses removed during the ground check have been reinstalled. If not, turn power OFF at the Main Power Disconnect switch, reinstall the fuses and then turn power back ON. Verify that the Machine Room Inspection Mode switch on HC-CTL-2 board is in the INSP position.
2. When power is turned ON, the LCD display on the HC-MPU Main Processor board will display the message MOTION CONTROL ENGINEERING, INC, then change to MOTION CONTROL M-2000, and then change to MACHINE ROOM INSPECTION or, if an error condition is present, will scroll the error message instead. If there is an error condition, it must be addressed or bypassed with a temporary jumper (see “Troubleshooting Tools” on page 6-2).
3. LEDs SAF ON, DLK, and INSP should be ON and relays SAFL and SAFS should pick as indicated by the SAFL and SAFS LEDs. Use the MACHINE ROOM INSPECTION switches on the HC-CTL-2 Control board to move the car up or down. Press and hold the ENABLE button and then hold the DIR switch in the UP or DN position.
4. Follow the appropriate instruction below for the type of starter (solid state, Y-Delta or ATL) installed on the controller.

3

Solid State Starter The Solid State starter will control the starting current to the motor (see the Solid State starter manual). Adjust the UP TO SPEED TIMER option, see “UP TO SPEED TIMER” on page 5-54) to provide a sufficient delay for the pump motor to get up to speed. Once the pump is at speed, the valves will be activated. If the motor does not spin when a demand up is present:

- Verify that there are no faults displayed on the HC-MPU board LCD display or the solid state starter display.
- Verify that relays SAFS and SAFL are picked (with Direction applied).
  - If neither relay is picked, check fuse F2 and then verify that the voltage measured between terminals 1 (1Bus) and 2 (2 Bus) is 120 VAC.
  - If relays SAFS and SAFL pick but the motor does not spin, check the thermal overload contact.
  - If relay SAFS does not pick, briefly place a jumper between 2 Bus and the SAFC screw terminal on the HC-CTL-2 board (bypasses the safety string). If direction is given and relay SAFS does not pick with the jumper, verify there are no faults.
  - If direction is given and relay SAFL does not pick, briefly place a jumper between 2 Bus and the DLAB screw terminal on the HC-CTL-2 board (DLABR on the HC-CTL-2 board). Jumper 2 Bus to relay GS on the HC-CTL-2 board and (GSR on the HC-CTL-2 board) to ensure they pick. If relay SAFL does not pick with the jumpers, verify there are no faults.
- Verify that the GS and GSR LEDs are ON. Otherwise, connect 2 bus to GS and GSR terminals.

Y-DELTA Starter The Y contactor picks first. Then, after a programmable delay, (dependent upon the “Y/D TRANSFER TIMER”,(see “Y-D OPEN TRANSN. TIMER” on page 5-54) the Y contactor should drop and the DEL contactor should pick.

1. If the Y and DEL contactors do not pick when a demand up is present:
   - Verify that there are no faults displayed on the HC-MPU board LCD display.
   - Verify that relays SAFS and SAFL are picked (with Direction applied).
     - If neither relay is picked, check fuse F2 and then verify that the voltage measured between terminals 1 (1Bus) and 2 (2 Bus) is 120 VAC.
     - If relays SAFS and SAFL pick but the motor does not spin, check the thermal overload contact.
     - If relay SAFS does not pick, briefly place a jumper between 2 Bus and the SAFC screw terminal on the HC-CTL-2 board (bypasses the safety string). If direction is given and relay SAFS does not pick with the jumper, verify there are no faults.
     - If direction is given and relay SAFL does not pick, briefly place a jumper between 2 Bus and the DLAB screw terminal on the HC-CTL-2 board (DLABR on the HC-CTL-2 board). Jumper 2 Bus to relay GS on the HC-CTL-2 board and (GSR on the HC-CTL-2 board) to ensure they pick. If relay SAFL does not pick with the jumpers, verify there are no faults.
   - Verify that the GS and GSR LEDs are ON. Otherwise, connect 2 bus to GS and GSR terminals.
2. Adjust the Y-D TRANSFER TIMER to transfer from Y to DELTA just as the pump motor reaches maximum RPM from a dead stop (see “Y-D OPEN TRANSN. TIMER” on page 5-54).

ATL Starter (Across The Line) Adjust UP TO SPEED TIMER to delay energizing valves until after pump motor is running at speed (see “UP TO SPEED TIMER” on page 5-54). If the A contactor does not pick when a demand up is present:

- Verify that there are no faults displayed on the HC-MPU board LCD display.
- Verify that relays SAFS and SAFL are picked (with Direction applied).
  - If neither relay is picked, check fuse F2 and then verify that the voltage measured between terminals 1 (1Bus) and 2 (2 Bus) is 120 VAC.
  - If relays SAFS and SAFL pick but the motor does not spin, check the thermal overload contact.
  - If relay SAFS does not pick, briefly place a jumper between 2 Bus and the SAFC screw terminal on the HC-CTL-2 board (bypasses the safety string). If direction is given and relay SAFS does not pick with the jumper, verify there are no faults.
  - If direction is given and relay SAFL does not pick, briefly place a jumper between 2 Bus and DLAB terminal on HC-CTL-2 board (DLABR on the HC-CTL-2 board). Jumper 2 Bus to relay GS on the HC-CTL-2 board and (GSR on the HC-CTL-2 board) to ensure they pick. If relay SAFL does not pick with the jumpers, verify there are no faults.
- Verify that the GS and GSR LEDs are ON. Otherwise, connect 2 bus to GS and GSR terminals.

Note

If the car needs to run at low speed to adjust the valves, set the HIGH SPEED INSPECTION option to DISABLED (see “HIGH SPEED INSPECTION” on page 5-66).

Hoistway Control Equipment Installation

This section covers the recommended procedures for installing the LS-QUTE or LS-EDGE landing systems.

Installing the LS-QUTE Landing System

Refer to the installation drawings for additional information.

Installing the LS-QUTE Landing System Control Box

Refer to the drawings in the job prints.

- The location for the landing system box should have already been selected.
- Holes are available on both sides and on the bottom of the landing system box for mounting to any support brackets or structural channels. The mounting of the box should be very firm and solid so that knocking it out of alignment would be difficult. Use 1/4-20 hardware.
- To install the tape into the tape guides on the LS-QUTE landing system box, remove the 2 thumbscrews on the 2 guide assemblies, insert the tape and reinstall the guides and thumbscrews (tighten firmly). If the installation has the LS-QUTE car top selector with the additional sensor bracket on the rear of the tape, first remove the three 8-32 screws holding the protective 1" wide channel. This channel covers the back of the Door Zone sensors on the upper tape guide bracket. Remove the single standoff that is in the way of the thumbscrew holding the tape guide. Remove the thumbscrews holding the upper and lower tape guides, insert the tape, and reinstall the guides with the thumbscrews (tighten firmly). Reinstall the standoff (do not over-tighten) and the protective channel.
- After inserting the steel tape into the tape guides, check the location of the landing system box. The car should be at the top of the hoistway to make it easier to see if the alignment is causing any stress or binding on the tape guides. Make sure that the box is vertical and plumb with the tape. This allows for easy tape movement and avoids excessive wear on the tape guides (using a level is helpful). Be careful so as to avoid premature failure of the tape guides.
- Move the elevator to the top and bottom of the hoistway to check for smooth tape movement and to make sure that there is no excessive pressure on the tape guides. Correct any problems immediately.

Installing the Magnetic Strips on LS-QUTE Steel Tape

Carefully, read and follow the Magnet Installation instructions in the job prints, but read the rest of these instructions before proceeding.

1. Before installing the magnets, clean the steel tape thoroughly with an appropriate solvent. No oil should be left on the tape as it will interfere with the adhesive backing on the magnets.
2. There are normally five lanes of magnets installed on the side of the tape facing the car. One lane consists of only the LU/DZ/DZX/LD and requires that a 6-inch magnet be installed at each floor. The other lanes have magnets which initiate slow downs or act as Absolute Floor Encoding (AFE) set points.
3. If the installation has rear doors, it may have an LS-QUTE landing system which has additional Door Zone sensors on the rear of the upper tape guide assembly. Follow the Magnet Installation instructions in the job prints and install the front and rear Door Zone magnets on the steel tape as shown.

Installing the LS-QUTE Hoistway Limit Switches

- The terminal landing slowdown switches should be installed and adjusted to open approximately one inch beyond the point where a normal slowdown (STU/STD) is initiated.
- The direction limit switches should be installed and adjusted to open approximately one inch beyond the terminal landings.
- The emergency terminal slowdown switch (if required) should open after the direction limit is open, but before striking the stop ring. Install and adjust the switch where it will not interfere with Inspection or Automatic operation while leveling or releveling. It must also be adjusted to achieve the required operation according to the applicable elevator code.
- Ensure that the cam that operates the slowdown and limit switches maintains the terminal slowdown switch open until the direction limit switch and emergency terminal slowdown switches (if required) are open.
- Ensure that the terminal slowdown, direction limit and emergency terminal slowdown switches are held open for the entire run-by or over-travel of the elevator.
- The hoistway access limit switch (if required) should be installed and adjusted to open and stop the elevator (in the down direction) when the top of the elevator is approximately level with the top landing (when the top hoistway access switch is activated while on Access or Inspection operation).

LS-EDGE Installation

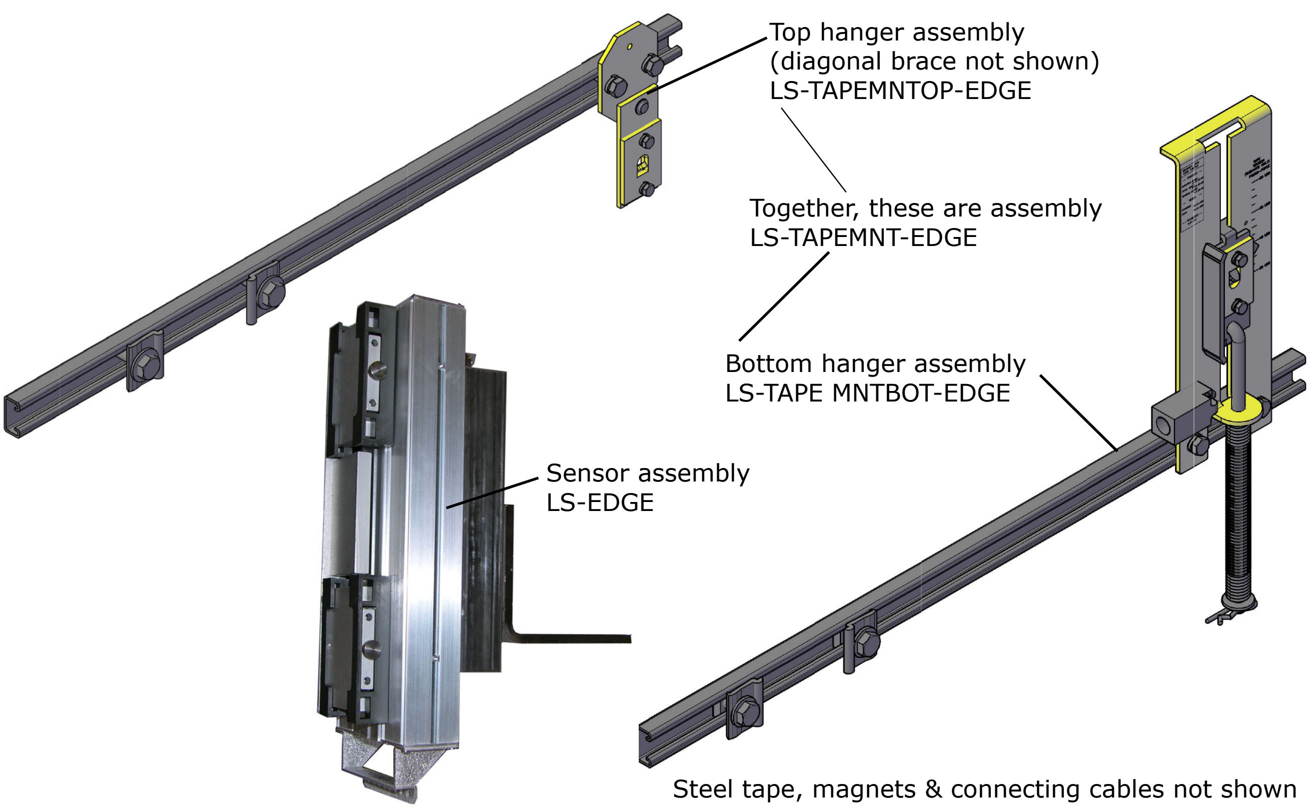
The LS-EDGE positioning system uses hall-effect sensors and perforated steel tape to report position as the car moves through the hoistway. 5.5-inch magnets are used at each door zone; one row for front openings, a second for rear openings. LS-EDGE is also available in a NEMA 4x/12 configuration that uses stainless steel hoistway materials and a sealed sensor head.

The system uses capacitor-stored power and non-volatile memory to retain position information in the event of a power failure, continuing to capture information for 10 seconds after power loss and storing the final reading for use after power restoration. The LS-EDGE system may be used with MCE iControl, Motion, or Element elevator controls.

The LS-EDGE kit contains the sensor head assembly, an “L” bracket to mount the sensor assembly to a uni-strut that is in turn attached to the elevator cab (uni-strut to elevator cab not provided), steel tape, top and bottom steel tape hanger assemblies, the required number of door zone magnets, and the CAT-5 electrical cables required to connect the sensor to the interface board.

Depending on applicable code, you may have to route electrical connections through conduit. If so, we recommend minimum 3/4-inch flex so that the modular connectors can slide through without binding. Perforations for cable tie wrap connection are provided on the RJ-45 plug-end of the sensor head.

Figure 3.3 LS-EDGE Components



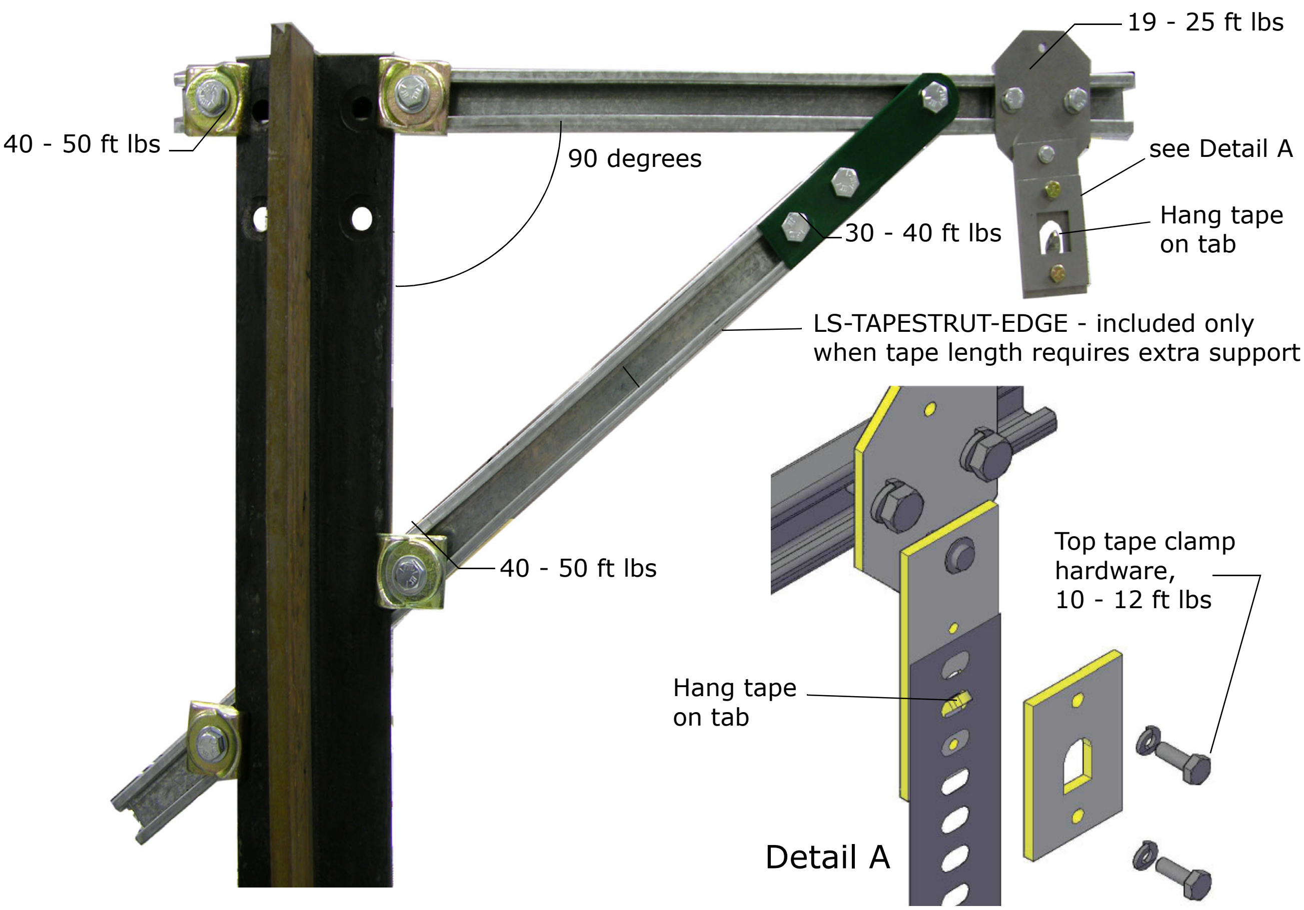
LS-EDGE Tape Installation

Before installing perforated tape, ensure adequate clearance from beams, walls, counterweight, cab, and terminal limit devices. Make sure the sensor is not placed so close to the governor lift arm that, when the car safeties are activated, the sensor is damaged or the car safeties cannot apply.

- Hang the tape high enough in the hoistway so that, when the counterweight is on a fully compressed buffer, the sensor assembly will not be damaged by overhead obstructions. Uni-struts are provided to attach the tape to the rails.
- Attach the tape in the pit low enough so that, when the car is on fully compressed buffer, the sensor assembly does not contact the bottom hanger assembly.
- Adjust tape spring tension so the tape does not make noise as the car travels up.
- During installation, the edges of the tape sometimes become gouged. After the tape is installed, use a fine file on the edges of the tape to remove any burrs or gouges. This will lead to much quieter operation of the encoder system as the car travels at contract speed.
- After smoothing the edges, wipe off all excess oil and dirt from the face of the tape before installing magnets. Do not use rags that will leave lint on the tape.

LS-EDGE Top Hanger Assembly

1. Attach the uni-strut for the top tape hanger across the back of the selected guide rail using the forged rail clips and hardware provided.
2. Attach the diagonal brace as shown below. (Used only when tape length exceeds 150 feet.)

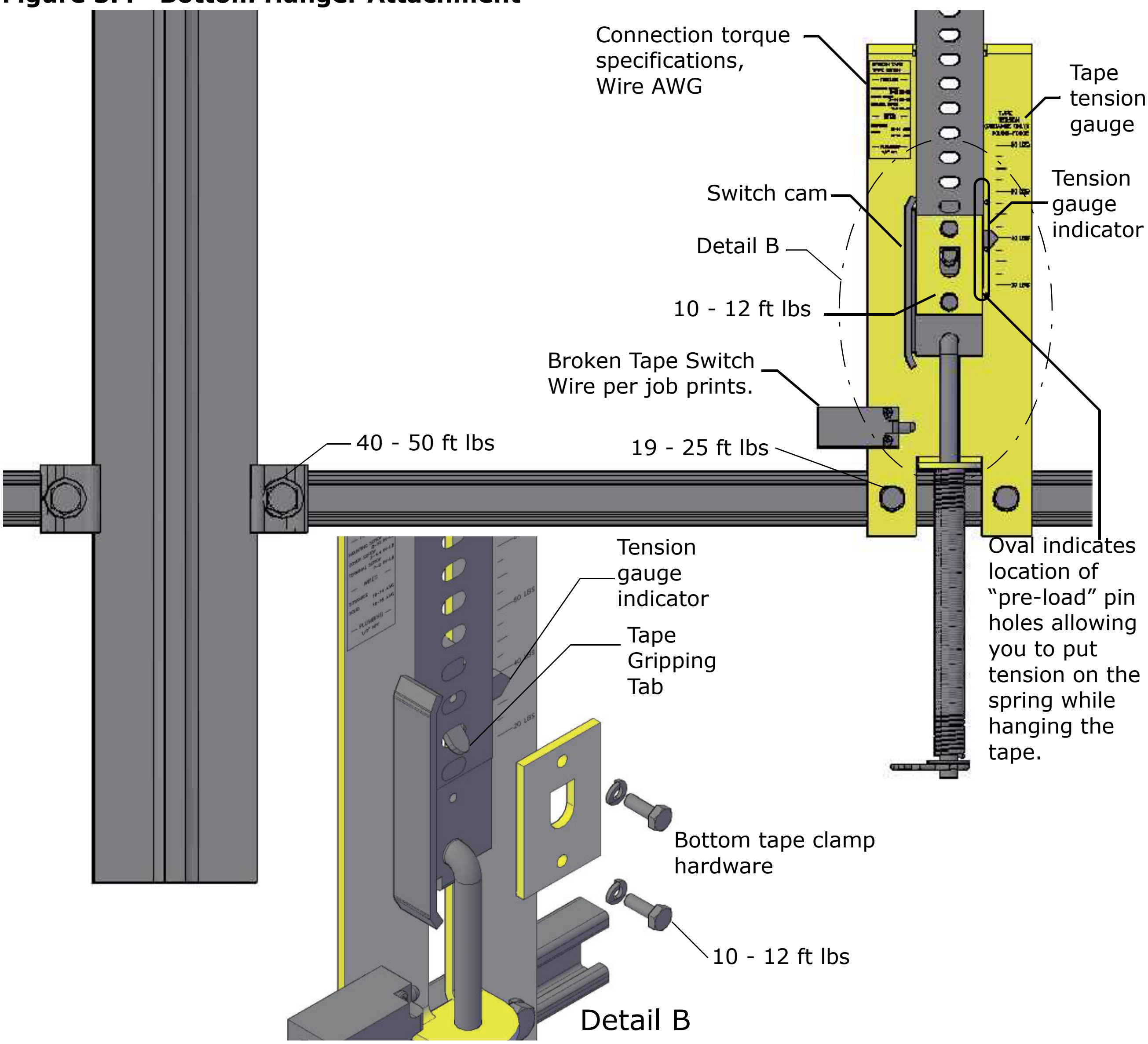


3. Adjust extended strut length as required (tape suspended as close to the guide rail as adequate clearances will allow to reduce loading on end of unistrut). Secure rail mounting hardware (40 - 50 ft lbs.). (The tape hanger slides in the strut for fine adjustment later.)
4. Hook the tape on the protruding tab. Secure the top tape clamp in place (10 - 12 ft lbs.).
5. Record the distance from the rail edge to the tape edge. _________ in/mm.

LS-EDGE Bottom Hanger Assembly

The bottom hanger provides tension to minimize vibration while allowing expansion/contraction across seasonal temperature ranges. Ensure that the tape to rail edge measurement matches that recorded for the top hanger so that the car tracks the tape accurately. Do not use a plumb in case the rail stack is not exactly aligned. The scale values are provided as a guideline only. They are not calibrated. Adjust to suit the installation.

Figure 3.4 Bottom Hanger Attachment



LS-EDGE Broken Tape Switch

The normally closed contacts on the Broken Tape Switch are used to detect a broken tape condition. The switch is mounted backwards for protection during shipment. Remove it and mount it as shown in page 3-13. Position the switch so that the cam on the tensioner activates (opens) the switch when the tensioner is at the bottom of its travel (no tension). Note that switch position should be adjusted so that the switch is activated by the cam but not so close that the switch is held against its mechanical stops. The switch closes at approximately 50% of travel.

Hanging the Tape

Work from the cartop to hang the tape from the top hanger and allow it to unroll slowly as you move the car down the hoistway. It is best to allow the tape to hang and straighten for at least 24-hours before attaching it to the bottom hanger.

Tape Tension The tape is tensioned according to compression of the bottom tape mount spring. The tension gauge provides visual indication of low, medium, and high tension positions. Short runs, up to five floors will generally be acceptable at the low tension position. Runs to 15 floors will generally be acceptable at the medium tension position. Longer runs may require the high tension position but you should start out with the medium setting first.

Tape tension is intended to reduce noise caused by tape vibration at contract speed. Generally, you want to use the lowest tension setting that maintains a quiet tape at contract speed.

LS-EDGE Sensor Installation

Tape guide side pieces easily detach so the sensor can be slipped onto the steel tape.

Figure 3.5 Sensor with Guide Sides Removed

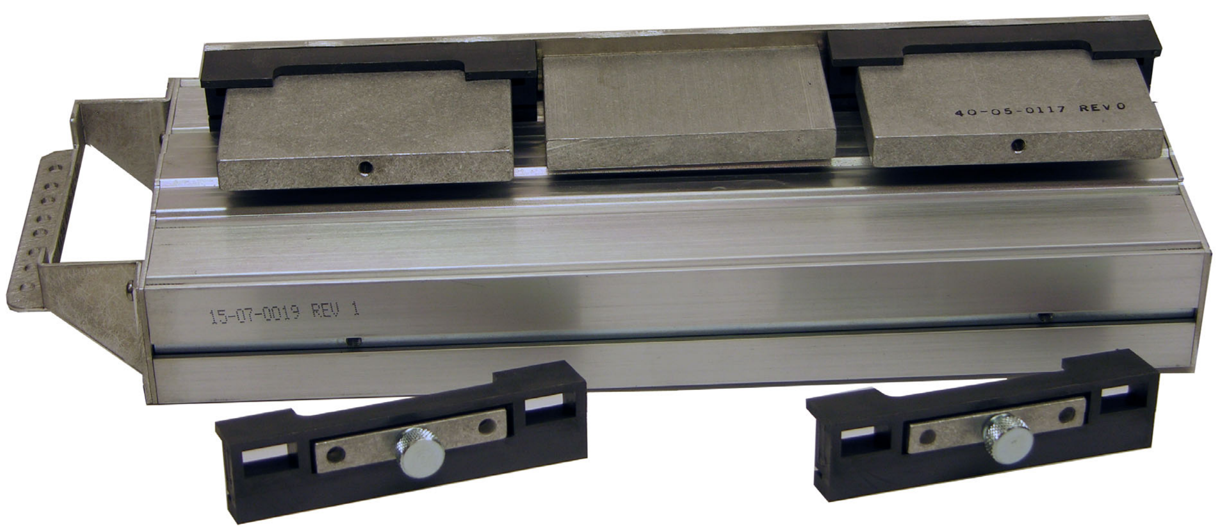


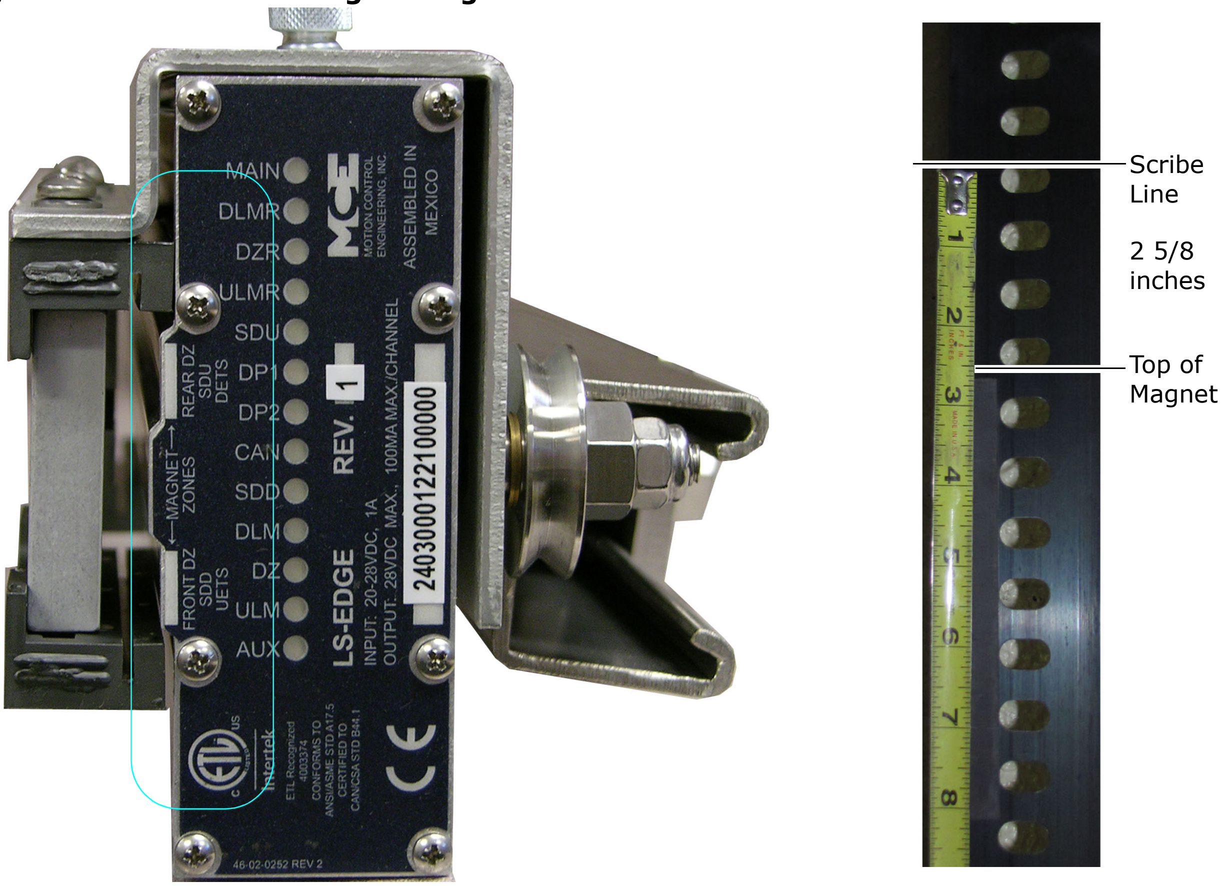
Figure 3.6 Sensor Mounting

Sensor Alignment After the tape has been installed, check the sensor alignment. The sensor should not ride hard on either side of the uni-strut bracket during any part of travel through the hoistway. In high-rise buildings, if rail alignment varies substantially, it may cause the encoder guides to wear prematurely. If such misalignment is noted, the installation should be inspected more regularly.

LS-EDGE Door Zone Magnets

5.5-inch strip magnets are used at each floor/opening position. Front and rear magnet alignment is shown on the sensor top label. Looking at the perforated tape from the elevator car, the magnets for the front door zone are mounted to the left of the perforated holes; magnets for the rear door zone are mounted to the right of the holes.

Figure 3.7 Door Zone Magnet Alignment



Caution

The magnets must be installed so that they face the front cover of the sensor assembly as indicated by the diagram on the LED indicator label.

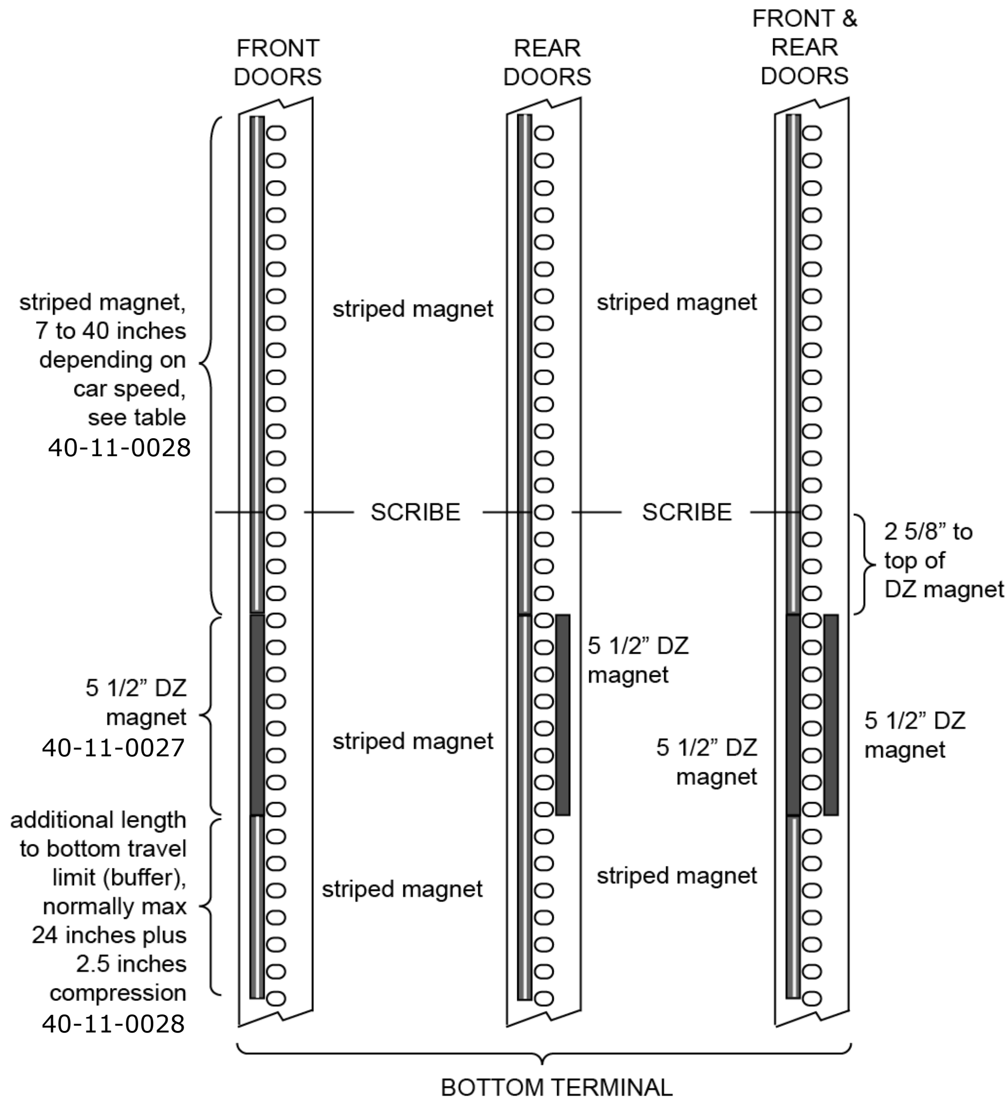
To mount the door zone magnets:

1. Move the elevator level to the highest floor on inspection.
2. Make a mark on the tape even with the top of the sensor assembly. Lower the car one foot.
3. Place the top of the door zone magnet 2 5/8 inches below the scribe mark and to the left (front door) or right (rear door) of the holes. For now, simply place the magnets. You can secure them permanently after final adjustments.
4. Continue mounting door zone magnets as described above for successive floors. Maximum floor height is 40.0 feet.

LS-EDGE Terminal Magnets

Special striped magnets are used to designate the top and bottom terminals. The length of the terminal magnets depends upon car speed, the aggressiveness of the slowdown, and the travel distance between level at floor and end of travel.

Figure 3.8 Motion 2000 Bottom Terminal Magnets



1. Refer to Table 4 on page 18 to determine the length of the magnet to be placed above the bottom terminal DZ magnet to the left of the tape holes (see "Motion 2000 Bottom Terminal Magnets" on page 3-17).
2. Place magnet(s) on the tape to the left of the holes, below the bottom terminal DZ magnet, sufficient to allow the car to reach bottom travel limit while still sensing the magnet.
3. Refer to Table 4 on page 18 to determine the length of the magnet to be placed below the top terminal DZ magnet to the right of the tape holes (see "Motion 2000 Top Terminal Magnets" on page 3-18).
4. Place magnet(s) on the tape to the right of the holes, above the top terminal DZ magnet sufficient to allow the car to reach stop ring while still sensing the magnet.

Figure 3.9 Motion 2000 Top Terminal Magnets

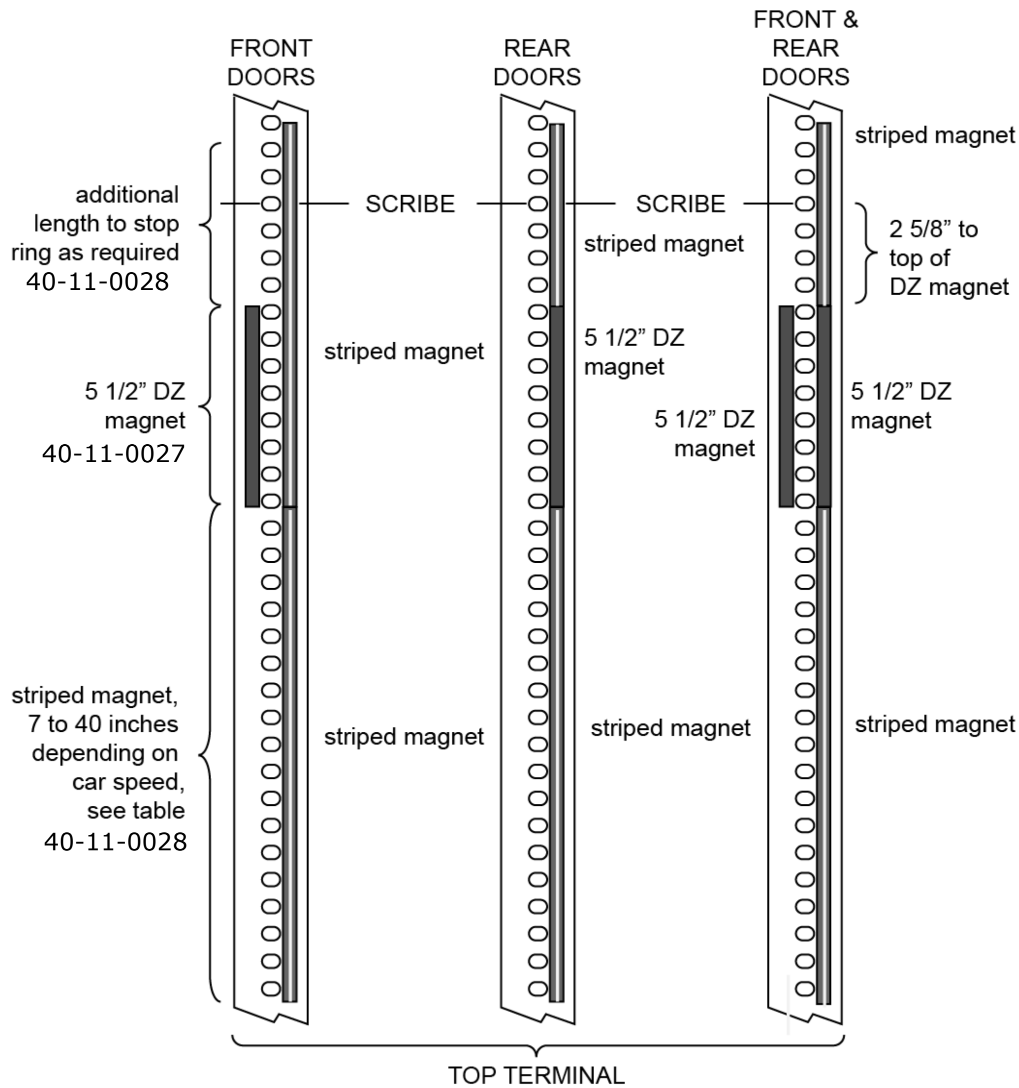


Table 4. Suggested Length of Terminal Magnet Before Leading Edge of DZ Magnet

Car Speed	Length of Terminal Magnet Preceding Floor Zone Magnet	Car Speed	Length of Terminal Magnet Preceding Floor Zone Magnet
		110 fpm	19 inches
<65 fpm	7 inches	125 fpm	22 inches
70 fpm	8 inches	140 fpm	25 inches
75 fpm	10 inches	150 fpm	28 inches
80 fpm	11 inches	160 fpm	30 inches
85 fpm	12 inches	170 fpm	32 inches
90 fpm	13 inches	180 fpm	35 inches
95 fpm	14 inches	190 fpm	37 inches
100 fpm	16 inches	200 fpm	40 inches

LS-EDGE Terminal Magnet Logic

The terminal limits from the LS-EDGE are positional back-up only. The controller uses serial counter data to adjust speed depending on the positions of the virtual limits. The LS-EDGE magnet logic provides a redundant means of terminal limits.

- L = LEVELING MAGNET (UNMARKED)
- T = TERMINAL MAGNET PRESENT (STRIPED OR WHITE)
- 0 = NO MAGNET PRESENT
- X = DON'T CARE

When the controller is powered up with no sensors present, **DSL1** and **USL1,** are closed.

- **DSL1** is open in the presence of terminal magnets at ULM, DZ, DLM, or SDD sensors.

ULM	DZ	DLM	SDD	ULMR	DZR	DLMR	SDU
T	T	T	T	X	X	X	X

- **USL1** is open in the presence of terminal magnets at ULMR, DZR, DLMR, or SDU sensors.

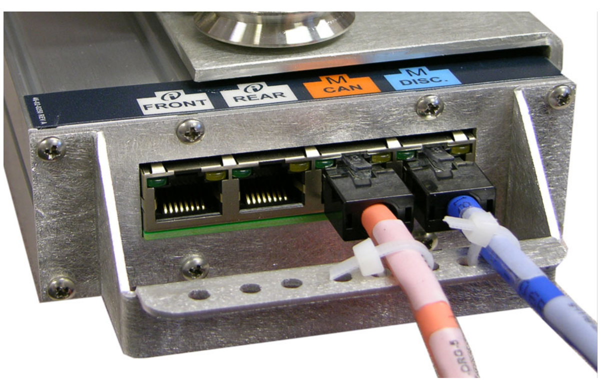
ULM	DZ	DLM	SDD	ULMR	DZR	DLMR	SDU
X	X	X	X	T	T	T	T

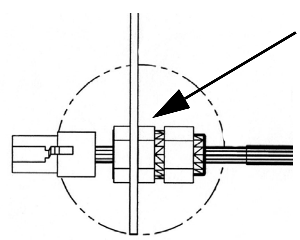
3

LS-EDGE Electrical Connection

Make electrical connections as shown in the job prints. Motion 2000 installations use the DISC (discrete) and M-CAN connections.
Caution: Secure cables with a nylon tie wrap through the holes provided. This is VERY IMPORTANT as it provides strain relief and prevents connector fatigue over time.

Figure 3.10 Sensor Connections





M CAN, Motion CAN, orange cable
DISC, Discrete, blue cable

Parameter Settings

Verify the following parameter settings:

- F1: Program Mode - Additional Car Option Menu - LS-EDGE Landing System? = Yes
- F7: Parameters Adjust - #191 Landing System = LS-EDGE
- F7 parameters 209 + Step Dn"x" and 210 + Step Up"x" = Factory settings (x = floor #)
- F7 parameters 241+ Sub Step Dn"x" and 242+ Sub Step Up"x" = Factory settings

PARAMETER FILL MENU is located after the PARAMETER RESTORE MENU, and can only be accessed if the controller is configured as M2000 HYDRO with an LS-EDGE landing system. The PARAMETER FILL MENU will set all step distances to a user-adjustable fill value which can ranged from 0 to 60 inches. All sub-step distances are set to 0 inches. Once the PARAMETER FILL MENU is selected, the S button will display the user-adjustable fill value. From the adjustment screen, the N button will return the user to the PARAMETER ADJUST MENU while the S button will modify and save the step and sub-step distances.

Hoistway Learn Operation

After installing the leveling and terminal magnets and setting step up/step down distances, you will need to perform a learn operation to learn floor and "switch" positions. If floor level magnets have not been positioned accurately enough, any offset can be adjusted in software (+/- 1 inch).

1. Place the car on Inspection operation.
2. Move the car to the bottom terminal.
3. Set the F6 function switch in the UP/ON position.
4. The LCD will display HOISTWAY LEARN, PRESS S.
5. Press S to initiate learn.
6. Place car on TEST mode. Shut off INSPECTION. Follow instructions on the LCD.

Synopsis As you follow the instructions on the LCD, the car will first travel down to the bottom terminal then move up to locate the center of the door zone magnet. From the bottom terminal, the car will move up the hoistway finding each door zone and indicating the height in inches of each door zone magnet center (Front and/or Rear as appropriate). Upon reaching the top terminal, the LCD will report hoistway information stored and offer the option to press N if you are Done or S if you want to restart the learn operation.

7. Press N when hoistway learn reports complete to exit the operation.
8. Place F6 in the Down position.

Adjusting Floor Heights

Motion 2000 allows the door zone heights to be individually adjusted in 0.10 inch increments to compensate for magnet placement irregularity up to a maximum +/- 0.9 inches for LS-EDGE. Stored floor heights may be accessed through the F7 menu (first 32 parameters) and the height of each floor individually adjusted at any time.

1. Place the car on Inspection, enter the F7 menu (F7 up, all other switches down).
2. Press N to advance to the desired parameter.
3. Use "+" or "-" buttons to adjust the height of the floor.
4. Place F7 in the down position.

Initial Stepping Distances

The initial settings for the run up and run down stepping distances were set at the factory. When running up to a floor, the floors Step Up position forces the elevator to drop high speed. When running down to a floor, the floors Step Dn position performs the same function. These settings can be verified or adjusted through the F7 parameters #209 + Step Dn"x" and 210 + Step Up"x".

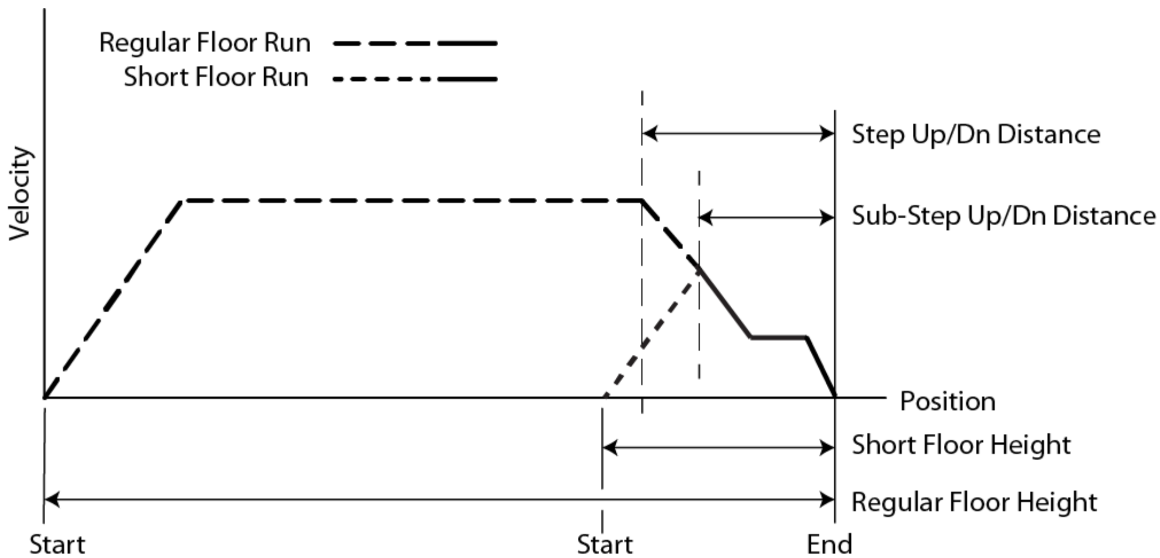
Door Position Monitor Switch (If used)

If you are in a jurisdiction where ASME A17.1 - 1996 or later is being enforced, Door Position Monitor switch(es) connected to the DPM and/or DPMR inputs must be added to monitor the position of the closed doors. This must be a separate physical limit switch that makes up approximately 1 to 2 inches before the doors lock. Please refer to the DOOR POSITION MONITOR and DOOR CLOSE LIMITS options on page 5-55.

LS-EDGE Short Floors

A landing that is too close to an adjacent landing such that, on a one-floor run, the car fails to reach contract speed before reaching the stepping (Step Up/Dn) distance for the destination floor is termed a “short floor” (see figure below). If the regular Step Up/Dn distance were used, the car would slow to leveling speed too soon and would be required to travel at leveling speed longer than desired. Therefore, an alternate stepping distance is provided (Sub-Step Up/Dn). When F7 parameter #208 (Stepping System) is set to “Dual”, the Sub-Step Up/Dn distance is used for a one floor run to any floor for which the Sub-Step Up/Dn parameters are not set to zero (0.0). When the destination floor is a terminal landing, an additional hardware cam operated switch (Short Floor Sw) is used as backup to ensure that stepping takes place.

Figure 3.11 Regular Floor Run vs. Short Floor Run



Note

The ideal Sub-Step Up/Dn distances must be determined by trial and error. The Short Floor switch should be positioned a little closer to the terminal landing than the Sub-Step Up/Dn distance.

Door Zone Verification

Following the hoistway learn process, starting at the top floor, move the car down on inspection and verify that the door zone indicators (e.g., LEDs, relays, diagnostic status, etc.) activate only at the appropriate locations at the landings (i.e., +/- 75 mm or 3”) and nowhere else. Be sure to check rear door zones as well, where applicable.

Permanently Attach Magnets

Once the hoistway has been successfully learned and door zone magnet placement is satisfactory, you may “lock” the magnets in place by placing a drop of silicone adhesive immediately above the top end and immediately below the bottom end of each magnet.

Complete the Installation and Field Wiring

Refer to the job prints and complete the installation of equipment and field wiring to the controller, including:

- Car Operating Panel (COP) switches and indicators
- Fire Service detectors and indicators
- Position indicators (A special interface board, MC-ZXFIX, allows Kinetek/ZXK position indicators to be used with MCE controllers. If used, connection instructions are provided in the prints for the job.)
- Hall switches and indicators

Check for shorts With the power turned OFF and prior to inserting the plug-in terminals into the boards:

- Check all of the call and PI terminals for shorts to ground (1 bus).
- Check all of the call and PI terminals for shorts to the 2 bus.

Check with power ON With power turned ON at the main power disconnect:

- Jumper each of the call terminals, one-by-one, to ground (1 bus). Verify that no fuses blow, especially F2, F2H and F2CC.

3

Plug in the terminal connectors With the power turned OFF at the main disconnect:

- Plug the call and PI terminal connectors into the PC boards.

Preparing the Car to Run on Test/Normal Mode

1. Verify that the Hoistway Door and Car Door Bypass switches work properly.
   - Turn the switches ON. Verify that the indicators on the HC-CTL-2 board turn on and that the car will run with doors open on Cartop Inspection only.
   - Turn the Hoistway Door and Car Door Bypass switches OFF. Verify that the car will not run with doors open.
2. Verify that the door operator is operating properly with all door equipment (clutches, rollers, etc.) properly adjusted with the correct running clearances and speeds.
3. Verify the door limits sequencing - DOL, DCL and DPM.
4. Make sure the car doors are closed and that all hoistway doors have been closed and locked.
5. Ensure that the car gate and door locks are made. If there is rear door functionality, then also ensure that the rear gate and door is made.
6. Run the car through the hoistway, on Cartop Inspection, to make sure that the hoistway is completely clear.
7. Verify that the landing system has been installed according to the installation instructions. Check PI stepping, floor encoding, leveling and door zone.
8. Verify that the limit switches are operating properly.
9. Verify that the Access limit switches operate properly (car stops in the proper location).
10. Proceed to Section 4 Final Adjustment.

4 Final Adjustment

In this Section

Before the car can be released to normal operation, final adjustments and code-mandated testing must be completed and approved. At this point, all of the steps in Section 3 should have been completed. Please read Section 5 before proceeding: it explains the adjustment and troubleshooting tools available. This section describes:

- **Diagnostics on the PC boards**: Information about diagnostic messages and status LEDs on the PC boards (see page 4-2).
- **Absolute Floor Encoding:** A description of car behavior with and without LS-QUTE absolute floor encoding (see page 4-2).
- **Registering Car Calls:** How to register car calls (see page 4-3).
- **Test Mode:** A description of car behavior on Text Mode (see page 4-4).
- **Running on Test/Normal:** Instructions for beginning operation on Test and Normal modes (see page 4-5).
- **Final Adjustments on Test Mode:** Instructions for making final adjustments (see page 4-6).
- **Final Adjustments on Independent Service:** Instructions for making final adjustments on Independent Service (see page 4-7).
- **Final Adjustments on Normal Operation:** Instructions for making final adjustments on Normal Operation (see page 4-8).
- **Release to Normal Operation:** Final checks before releasing the elevator to normal operation (see page 4-10).

Diagnostic Messages and Input/Output Signals

To speed up final adjustment and troubleshooting, become familiar with the Status and Error Messages (see “Status and Error Messages” on page 6-3) and Input/Output signals (see “Alphabetized Flags/Variables and Their Locations” on page 5-9).

Note

It will also be helpful to become familiar with the Motion 2000 Controller’s computer (see “The HC-MPU Main Processor Unit” on page 5-2) and Diagnostic Mode (see “Diagnostic Mode” on page 5-6).

Onboard Diagnostics

Status LEDs - The Motion 2000 controller boards (HC-CTL-2, HC-MPU, HC-DVR) are equipped with diagnostic LED's, which provide visual information regarding the computer's inputs and outputs. A listing of the indicators on each board can be found in PC Board Quick References (see “PC Board Quick References” on page 6-39).

LCD Display - When the Motion 2000 Hydraulic Controller’s computer (HC-MPU) is in the DIAGNOSTIC MODE, with switches F1 - F8 in the down position, the LCD display provides a description of normal and abnormal conditions. When the LCD displays NORMAL, in the car status field, the system is ready for normal operation. A complete listing of the status and error messages, their meaning, probable cause and needed response are found in the Status and Error Messages table (see “Status and Error Messages” on page 6-3).

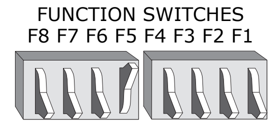
The computer displays abnormal conditions in the same priority that the computer evaluates them. For example, if the safety circuit is open and the system is also on Fire Service, the computer will first show that the safety circuit is open and will expect this problem to be corrected first. When the safety circuit problem has been corrected and the computer has recognized the safety input, the diagnostics will then show the Fire Service indication. After successfully bringing in the Fire Service input and Fire Service Reset, the computer will then show NORMAL on the LCD display, provided that the system is not on some other function such as Independent Service or Cartop Inspection operation. The display will show NORMAL only if everything is normal. If the LCD display is showing any other message, an abnormal condition exists.

Absolute Floor Encoding

Absolute floor encoding allows the controller to read encoding vanes or magnets at each landing and thereby identify the floor. Note: Absolute floor encoding does not apply to LS-EDGE. With absolute floor encoding, the behavior of the car when power is turned ON is as follows:

- If the car is not at a landing when power is turned ON, the controller will generate a Down/Up direction command and the car will move toward the closest landing, provided that all abnormal conditions have been corrected. When the car reaches a landing and is within the Door Zone (diagnostic LED DZF is On) with leveling completed (diagnostic LEDs ULM and DLM are Off) the controller reads the floor code vanes or magnets and corrects the Position Indicator. If the car is on Automatic Operation, and if a home floor has been designated, the car will move to the home landing at this time.
- If the car is at a landing, within the Door Zone (diagnostic LED DZF is On) with leveling completed (diagnostic LEDs ULM and DLM are Off) when AC power is turned ON, the controller will read the floor code vanes or magnets at the landing and correct the Position Indicator. Again, if the car is on Automatic Operation and if a home floor has been designated, the car will move to this landing to park.

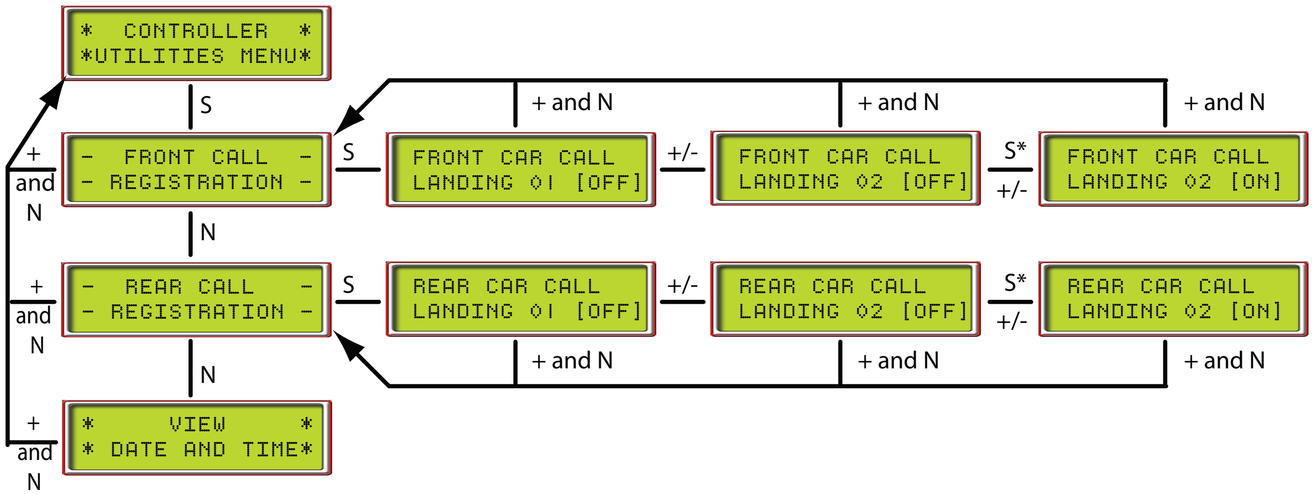
Registering Car Calls



Controller Utilities Menu

To place a call from the controller (or the hand-held):

1. Place the F5 function switch up (all others down).
2. If Controller Utilities Menu is not displayed, press N push button.
3. Press S push button. Front Call Registration is displayed. Refer to the illustration below.



4. Press +/- push buttons to increment or decrement floor numbers.
5. Press and momentarily hold S push button to register calls: displays [ON] while held.
6. Press + and N push buttons together to back out of the current display.

Continue placing calls to evaluate performance and accuracy and to ensure the car does not overshoot terminal landings.

Test Mode Operation

The purpose of TEST mode is to allow easy and convenient operation of the car so that the final adjustments can be made without cycling the doors. When the elevator is operated in the TEST mode, the elevator doors do not open. The door open functions are disabled during TEST mode operation.

The car is put into TEST mode by placing the TEST/NORMAL switch on the HC-CTL-2 Main Control board in the TEST position. Note that when the TEST/NORMAL switch is in the TEST position, it puts the car into Test Mode, provided that the Car Top Inspection and MACHINE ROOM INSPECTION switches are in the NORM or normal positions. In that case, the LCD should show “TEST MODE” and not “NORMAL.” If the expected indication is not displayed, check to see what message is being displayed and correct the problem. Operation while in TEST mode should be easy to understand by knowing the following:

1. Every time the car stops, a non-interference timer is started and the timer must elapse before the car can move again. Once the timer has elapsed, the car will move as soon as the next car call is registered. If a car call is placed right after the car stops, the non-interference timer must elapse.
2. In TEST mode, if multiple calls are registered, the car will not automatically move from call to call unless a jumper is placed continuously between 1 bus and terminal DCB on the HC-CTL-2 board (or 1 bus to the terminal of the last call placed). While using TEST mode, for convenience you may want to leave a jumper continuously between 1 bus and terminal DCB.
3. If a jumper from terminal 1 is touched to the car call input for the floor where the car is located, it will reestablish the non-interference timer and it must elapse before the car can move again.
4. If the elevator is trying to level, it will not pick high speed and leave the landing until it has completed the leveling process. If the car overshoots landings, the valves and/or direction limits at terminal landings may need to be adjusted.
5. If any of the inputs that open the door are active (Safety Edge On, Photo Eye On, Car Call input for the floor matching the Position Indicator jumpered to 1 bus, etc.) the car will not leave the landing.
6. Slowdown switch inputs (DSL1 and DSL2 for the bottom terminal and USL1 and USL2 for the top terminal) should never be inactive at the same time when the doors are closed and locked and the safety circuit is closed.

Running on Test/Normal Mode

Caution

If the door operator is not working, pull the door fuses and close the doors so that the door clutch will not hit any of the door lock rollers. Take whatever steps are necessary to keep the installation safe, but make sure that the car top is still accessible after closing all of the doors.

1. On Inspection, move the car to the bottom landing.
2. Verify that the car is in door zone (PI = 1) and indicators ULM and DLM are OFF and DZF is ON.
3. Place the Cartop Inspection, In-car Inspection and Access Enable switches in the Normal position.
4. On the HC-CTL-2 Control board, place the CONTROLLER TEST SW in the TEST position.
5. Place the MACHINE ROOM INSPECTION MODE switch in the NORM position. If the LCD display does not show Test Mode, see what message is being displayed and correct the problem.

NOTE: If the car is not completely wired (temporary), jumpers will be required. Check the following:

- wire removed from screw terminal DCL on HC-CTL-2 board.
- wire removed from screw terminal PHE on the HC-CTL-2 board.
- jumper from 2 bus to screw terminal DPM on HC-CTL-2 board.
- jumper from 2 bus to screw terminal DOL on the HC-CTL-2 board.
- jumper from 2 bus to screw terminal FRS, FRSA, FRSM on the HC-CTL-2 board.
- jumper from 2 bus to panel mount terminal EPI (if present).

6. If fire service is active, reset it.
7. If the car is not at a landing, it will move to a landing. If the car is at a landing but not in the door zone, either the ULM or DLM input (diagnostic LEDs ULM or DLM) is ON, the car should perform a relevel. If the relevel is not successful, check the following:
   - If the diagnostic LEDs ULM or DLM are ON, but the car does not move, verify that there are no faults displayed on the HC-MPU LCD screen. Also verify that relays SAFS and SAFL are picked and the up/down direction limit switches are in their proper states.
   - If the car is trying to level, it will not leave the landing for a call until the leveling is complete.

Automatic Mode Fault Bypass For the purpose of testing and adjustment, this option allows redundancy faults to be bypassed when the controller is on Automatic operation. In order to use this option, a jumper must be placed on JP2 (see “Controller System Menu ” on page 5-66).

1. Place the controller on System Mode (see “F3: System Mode” on page 5-60).
2. Press the ***N*** push button to display Controller System Menu and then press the ***S*** push button to select (see “Controller System Menu ” on page 5-66).
3. Press the ***N*** push button to display AUTOMATIC MODE FAULT BYPASS. JUMPER MUST BE INSTALLED TO ACTIVATE.
4. Press the ***S*** push button to select BYPASS ON.

Final Adjustments on Test Mode

The following final adjustments should be made with the elevator operating on Test mode (Controller Test Switch on the HC-CTL-2 board in the TEST position). The LCD display should indicate TEST MODE.

Hydraulic Valves

Adjust hydraulic valves for proper speed, acceleration, deceleration, etc. and check contract speed. A software controlled timer (SOFT-STOP TIMER option) automatically provides pump motor overrun for Soft-Stop operation. Ensure that the Soft-Stop Timer is set to the desired value for it to be on and to NONE for it to be off. If the car needs to run at low speed to adjust the valves, set the HIGH SPEED INSPECTION option to DISABLED (see “HIGH SPEED INSPECTION” on page 5-66).

Slowdown and Limit Switches

Disconnect the stepping switch inputs (terminals STU and STD on the HC-CTL-2 board) and verify proper operation of all slowdown and limit switches for slowing and stopping the car at both terminal landings.

Motor Limit Timer

A motor limit timer is provided to take the car to the bottom landing and open the doors if the motor is operating for too long.

Valve Limit Timer

The same is true for the valves with the down valves being turned off and the doors re-enabled if the car is at a floor.

Relevel Operation

If the car re-levels up after stopping at the floor, it will respond normally (instantly) the first time it re-levels up. Further re-leveling at that landing will be delayed by a computer-controlled timer (usually 3 seconds). This process will repeat every time the car runs to another floor (the first up relevel is always normal, not delayed). Down leveling is always normal and not affected by this timer.

Final Adjustments on Independent Service

The following final adjustments should be performed with the elevator operating on Independent Service.

- Place the CONTROLLER TEST SW on the HC-CTL-2 board in the NORM position.
- Place the Independent Service switch in the IND position.
- Verify that the IND indicator on the HC-MPU board is ON and the LCD display indicates INDEPENDENT SERVICE.

Door Operator Adjustments

Complete the final door operator adjustments. Verify smooth opening and closing. Doors can be opened at 3" before the floor or at the floor (see “PRE-OPENING?” on page 5-23). Hydraulic elevators are usually set up to open the doors only after the car stops, but pre-opening is available. Verify the operation of the photo eye and/or safety edge, door open and close buttons.

Door Open/Close Protection

Verify proper door open protection and door close protection operation.

- Door open protection: If the doors do not open (DOL goes low) after several seconds, the car will give up and continue to the next call (see “DOOR OPEN PROTECTION TIMER” on page 5-27).
- Door close protection: After the car starts to close the doors and the doors do not lock, it will recycle the doors open and attempt to close the doors three times before a DLK fail error is generated and DOOR CLOSE PROTECTION TIMER ELAPSED is displayed on the LCD.

Final Adjustments on Normal Operation

The following final adjustments should be performed with the elevator operating on Normal operation.

- Place the CONTROLLER TEST SW on the HC-CTL-2 board in the NORM position.
- MACHINE ROOM INSPECTION MODE switch on the HC-CTL-2 board in the NORM position.
- Place the Independent Service switch in the OFF position.
- Verify that the LCD display indicates NORMAL.

Hall Calls

Place hall calls for all of the landings and make sure that all hall calls function properly.

Ride and Performance

Run the car to all stops:

- Verify car call assignments
- Check for overshoot
- Verify door operation at all floors
- Check for proper ride quality.

Recheck

Recheck the operation of the following on Normal operation:

- Doors
- Car calls
- Hall calls
- PIs
- Gongs and Lanterns
- Photo eye
- Safety edge
- Door open button

Options

Verify the operation of the following options: Independent Service, Fire Return Phase 1 (Main Floor and Alternate Floor operation, if provided), Fire Phase II In-Car operation, and any other options provided.

Random Call Testing

Sabbath operation can be used to perform random call testing (refer to the SAB input, see “Spare Inputs Menu Options” on page 5-29).

Remote Governor Testing (Roped Hydro)

For a roped hydro installation, the following procedure describes the remote testing procedure for a Wittur Model OL35-NA governor.

Static Testing:

Refer to the Operating Instructions supplied with the governor. Section #4 of these instructions should be closely adhered to.

1. Locate the elevator controller slide switches labeled GOVERNOR TRIP #1, GOVERNOR TRIP #2, GOVERNOR RESET #1 and GOVERNOR RESET #2.
2. Slide both switches GOVERNOR TRIP #1, GOVERNOR TRIP #2 from the OFF position to TRIP position.
3. Observe that the safety circuit opens and the elevator will not move.
4. In order to return the system to normal operation, return both the GOVERNOR TRIP slide switches to the OFF position and then move the slide switches labeled GOVERNOR RESET #1 and GOVERNOR RESET #2 from the OFF position to the RESET position.
5. Finally move the slide switches GOVERNOR RESET #1 and GOVERNOR RESET #2 from the RESET position to the OFF position and observe that the safety circuit is now made and elevator can operate normally.

Dynamic Testing:

Refer to the Operating Instructions supplied with the governor. Section #4 of these instructions should be closely adhered to.

1. Locate the elevator controller slide switches labeled GOVERNOR TRIP #1, GOVERNOR TRIP #2, GOVERNOR RESET #1 and GOVERNOR RESET #2.
2. Move the elevator at contract speed in the down direction and simultaneously slide both switches GOVERNOR TRIP #1 and GOVERNOR TRIP #2 from the OFF position to TRIP position.
3. Observe that the safety circuit opens and the elevator stops and will not move.
4. In order to return the system to normal operation, return both the GOVERNOR TRIP slide switches to the OFF position and then move the slide switches labeled GOVERNOR RESET #1 and GOVERNOR RESET #2 from the OFF position to the RESET position.
5. Finally move the slide switches GOVERNOR RESET #1 and GOVERNOR RESET #2 from the RESET position to the OFF position and observe that the safety circuit is now made and elevator can operate normally.

This completes testing of remote governor activation circuitry.

Final Testing, LS-EDGE Only

This instruction provides a way to test the independent, hardware slowdown means at terminal stops when the normal stepping slowdown means have been disabled in a Motion 2000 hydraulic installation equipped with the MCE LS-EDGE landing system.

Bottom Terminal Test

1. Move car to an upper floor.
2. Place the car on Inspection mode.
3. Select F7 menu. After noting the current value, set STEP DN 1 to zero (0.0).
4. Save the setting. This effectively removes the step down.
5. Take the car off Inspection.
6. Through the F5 > CONTROLLER UTILITIES > FRONT CALL REGISTRATION/REAR CALL REGISTRATION menu, place a call to a floor one or two stops above the bottom terminal floor.
7. Once the car is stable at the floor, place a call to the first (bottom terminal) floor.
8. Monitor the car and note that it slows at the terminal due to the independent, built-in hardware slowdown means.

Top Terminal Test

1. Place the car on Inspection mode.
2. Select F7 menu. After noting the current value, set STEP UP x for the top (terminal) floor to zero (0.0).
3. Save the setting. This effectively removes the step up.
4. Take the car off Inspection.
5. Through the F5 > CONTROLLER UTILITIES > FRONT CALL REGISTRATION/REAR CALL REGISTRATION menu, place a call to a floor one or two stops below the top (terminal) floor.
6. Once the car is stable at the floor, place a call to the top (terminal) floor.
7. Monitor the car and note that it slows at the terminal due to the independent, built-in hardware slowdown means.

Restore Original Settings

1. Place the car on Inspection mode.
2. Select the F7 menu.
3. Return STEP DN 1 to its original setting.
4. Return STEP UP x for the top (terminal) floor to its original setting.
5. Save the changed settings.
6. Return the car to Normal operation.

Release to Normal Operation

Final testing must be successfully completed before the car may be released for passenger operation.

Danger

Before the Elevator can be turned over to normal use, it is very important to verify that no safety circuit is bypassed. The items to be checked, include, but are not limited to:

- Verify that the hierarchy of the inspection inputs is correct. Car top inspection must take priority over in-car, hoistway access and machine room inspection modes. In-car must take precedence over hoistway access and machine room inspection. Hoistway access must take priority over machine room inspection.
- The FAULT jumper on the HC-CTL-2 board is removed.
- No jumper between terminals 2 and SAFH (HC-CTL-2).
- No jumper between terminals 2 and DLAB (HC-CTL-2).
- No jumper between terminals 2 and DLAT or DLMS (HC-CTL-2).
- No jumper across any of the limits (HC-DVR).
- No jumper between terminals SAFH and SAFC (HC-CTL-2).
- The Automatic Mode Fault Bypass option is set to BYPASS OFF.
- The F3 switch on the HC-MPU board is down.

Quick Topics

5 The Computer

In this Section

The Computer is the primary programming and adjustment tool for the Motion 2000 system. This section provides the information you need to use the Computer, including:

- **HC-MPU Main Processor:** Describes the indicators, switches, buttons, connectors and display on the HC-MPU Main Processor board (see page 5-2).
- **Computer Security:** Describes the optional password protection system (see page 5-5).
- **Diagnostic Mode:** Using the onboard diagnostics for troubleshooting (see page 5-6).
- **Program Mode:** Describes how to program the many options available, including:
  - **Basic Features Menu Options** (see page 5-17)
  - **Fire Service Menu Options** (see page 5-20)
  - **Door Operation Menu Options** (see page 5-22)
  - **Timer Menu Options** (see page 5-26)
  - **Gongs/Lanterns Menu Options** (see page 5-28)
  - **Spare Inputs Menu Options** (see page 5-29)
  - **Spare Outputs Menu Options** (see page 5-39)
  - **Extra Features Menu Options** (see page 5-48)
  - **Additional Car Options Menu** (see page 5-54)
- **External Memory Mode:** How to view data stored in external memory (see page 5-56).
- **System Mode:** Describes system mode options, e.g., Building Security, Passcode Request, Load Weighing and ASME A17.1 2000 Fault Bypass (see page 5-60).
- **Duplexing:** Describes how to troubleshoot communication problems (see page 5-108).

The HC-MPU Main Processor Unit

The computer on the Motion 2000 Hydraulic Elevator Controller has been designed for easy communication between the mechanic and the controller and between the controller and other computers or data terminals. The computer is used for diagnostic troubleshooting and for programming the controller.

Figure 5.1 HC-MPU Main Processor Unit

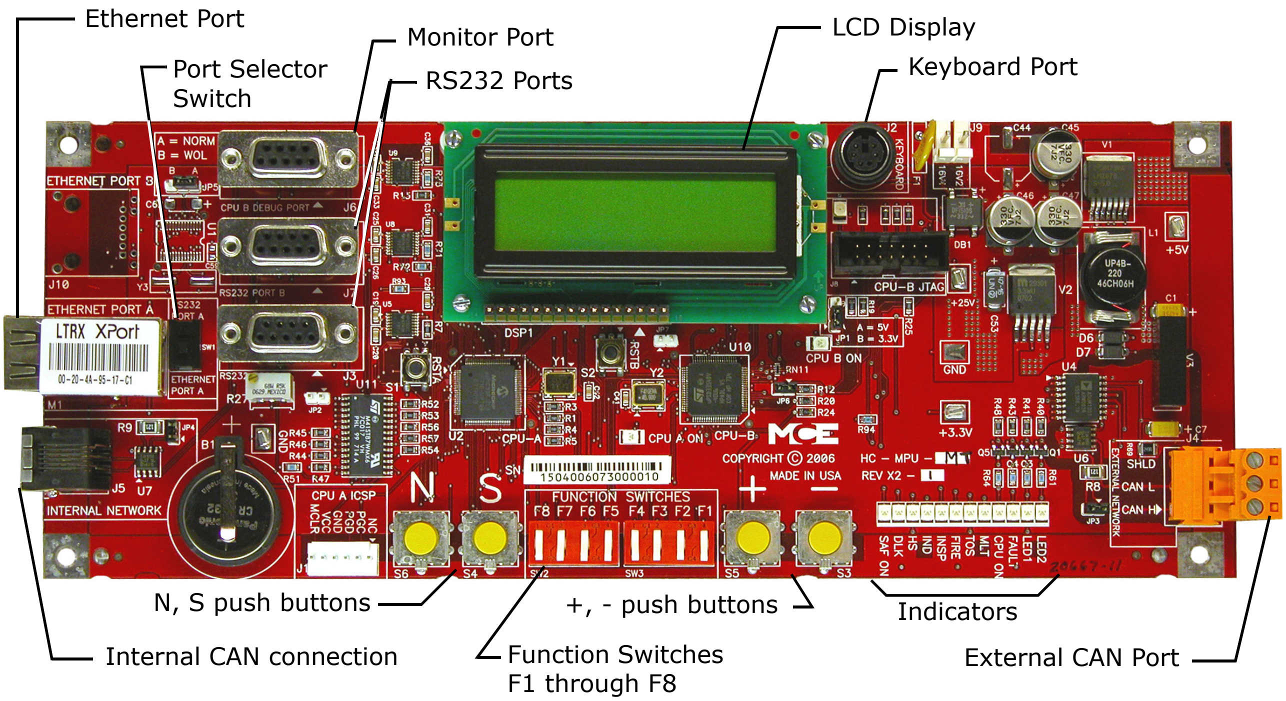


Figure 5.1 shows the indicators, push buttons and terminals on the main processor unit.

Indicators

CPU-A, CPU-B When steadily illuminated, this light shows that the computer is functioning normally and completing its program loop successfully. Pressing the COMPUTER RESET button will cause the COMPUTER ON light to turn *OFF* and the light will stay *OFF* while the RESET button is depressed. The computer is equipped with a watchdog feature that will shut down the controller if the program loop cannot be completed (software system failure). If the COMPUTER ON light is OFF or flashing continuously, it means that the computer board is malfunctioning.

Diagnostics LCD Display The 32-character LCD (Liquid Crystal Display) displays various information depending on the positions of the F1-F8 switches. Diagnostic mode is accessed when all of the switches are in the down position. The LCD display shows an elevator status message, the car position, the contents of the computer's internal memory and communication status.

Status Indicators These lights show the status of the elevator. Table 5.1 shows a list of these lights and their meanings.

Table 5.1 Status Indicators

Indicator	Description
SAF ON	Safety On - Safety circuit is made
DLK	Doors Locked - Door lock contacts are made
HS	High Speed - The elevator is running at high speed
IND	Independent Service - The elevator is on independent service
INSP	Inspection / Access - The elevator is on cartop inspection or hoistway access
FIRE	Fire Service - The elevator is on fire service operation
TOS	Timed Out of Service - The elevator has been timed out of service
MLT	Motor/Valve Limit Timer - The motor/valve limit timer has elapsed
CPU ON	Computer On - The MC-MPU processors are functioning properly
FAULT	Fault - A fault condition exists.
LED1	Reserved
LED2	Reserved

Switches, Buttons & Adjustments

Function Switches F1 - F8 The function switches are used to select the Main Computer's operating and programming modes as indicated in the following table.

Table 5.2 Function Switches

Description
All OFF = Diagnostic Mode: Use for diagnosing and troubleshooting system problems (see "Diagnostic Mode" on page 5-6).
F1 ON = Program Mode: Use to view and change the settings of parameters and programmable options (see "F1: Program Mode" on page 5-14).
F2 ON = External Memory Mode: Use to diagnose problems by viewing external memory flags (see "F2: External Memory Mode" on page 5-56).
F3 ON = System Mode: Use to program System functions, e.g. elevator security and load weigher settings (see "F3: System Mode" on page 5-60).
F4 ON = Messages and Floor Labels: Use to program the CE fixture displays (see "F4: Messages and Floor Labels" on page 5-67).
F5 ON = Controller Utilities Menu/Monitoring and Reporting Menu: Use to register front and/or rear car calls, set the controller's date and time, view the event log, CAN bus data and Monitoring and Reporting menu (see "F5: Controller Utilities/Monitoring and Reporting" on page 5-69).
F6 ON = Hoistway learn operation menu for LS-EDGE landing system (see "F6: Hoistway Learn Operations" on page 5-100).
F7 ON = Motion parameters adjustment (see "F7: Parameters Adjust" on page 5-101).
F8 ON = Status Display: Shows the software version, eligibility map and current load if applicable (see "Status Displays" on page 5-4).

RSTA - RSTB Pressing the *RESET* button will cause the computer to reset. If the elevator is running, the controller will drop the safety relay and bring the elevator to an immediate stop. The elevator will then go to the terminal landing (or to the next landing if the controller has the absolute floor encoding feature) to correct its position before it can respond to any calls. Existing calls and P.I. information will be lost each time the computer is reset.

N, S, +, - Push Buttons The push buttons allow the mechanic to view and change data in the computer memory. These push buttons have different functions depending on the current mode (Diagnostic mode [see “Diagnostic Mode” on page 5-6], Program mode [see “F1: Program Mode” on page 5-14], External Memory mode [see “F2: External Memory Mode” on page 5-56], or System mode [see “F3: System Mode” on page 5-60], CE Labels [see “F4: Messages and Floor Labels” on page 5-67]).

RS-232 Port B / Ethernet Port Selector Switch Selects between the RS-232 Port B and the Ethernet Port. Only one can be used.

Connectors

Internal CAN Port Controller Area Network port used for communication inside the controller cabinet.

External CAN Port Controller Area Network port used for communication outside the controller cabinet, e.g. to the cartop.

RS-232 Ports A and B RS-232 communication ports A and B.

Ethernet Port Ethernet port used for Local Area Network (LAN) and/or Internet communication.

Monitor Port Used to connect to a computer monitor (for diagnostics only).

Keyboard Port Used to connect to a standard computer keyboard.

Status Displays

To access the Status Displays, place function switch *F8* in the up position (F1 thorough F7 must be down). Press the ***N*** push button to cycle through the available status displays.

The following system status displays are available for viewing on the LCD display:

- **Software Version** - Main processor software version number.
- **Eligibility Map** - Door access for each floor (F = front, R = rear, B = both, ● = no access). Read left to right - floors 1 thorough 16 in the top row, floors 17 thorough 32 in the bottom row. Please see “CAR SERVES FRNT/FLR 1? (simplex)/THIS CAR SERVES FRNT/FLR 1? (duplex)” on page 5-18 and see “CAR SERVES REAR/FLR 1? (simplex) / THIS CAR SERVES REAR/FLR 1? (duplex)” on page 5-18 for programming instructions.
- **Current Load** - If an analog load weigher is used, the current load in the car as a percentage of full load is displayed (see “Load Weigher Thresholds” on page 5-63).

Computer Security

A computer security system is available for the Motion 2000 controllers. The system requires the user to enter a passcode before the controller's parameters can be adjusted.

The controllers are shipped without the security system. However, the security system can be purchased through MCE's Technical Support Department. Complete installation instructions are provided with the modification package. The next few paragraphs explain how the security system works after it is installed.

Note

```
PASSCODE REQUEST
PI 8 20:10001000
```

This message is not related to Computer Security. If this message is seen on the LCD screen, it means that the Passcode Request Option has been activated and that a passcode is required in order to run the elevator on any mode of operation other than Inspection. Please refer to “Passcode Request Menu” on page 5-62 for more information.

Password

There are two sections that are secured by an 8-digit, alpha-numeric code chosen by the customer, Program Mode and System Mode.

When either of these two sections is accessed, the LCD display will show:

```
ENTER PASSWORD:
00000000
```

The password is entered using the push buttons as follows:

N	Push button	Change the position of the cursor to select a digit to set.
+	Push button	Increment the selected digit by one.
-	Push button	Decrement the selected digit by one.
S	Push button	Check for a match (ENTER).

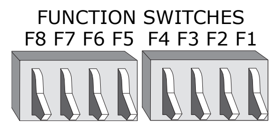
If an invalid code is entered, the operator will be prompted to re-enter the code. Once a valid code has been entered, access is granted to the programming options and the password will not have to be reentered until the Password Timer expires.

Diagnostic Mode

Onboard Diagnostics are designed to aid in evaluating the status of the control system. Onboard Diagnostics help to pinpoint the cause of elevator malfunctions.

Getting into Diagnostic Mode

Diagnostic mode is initiated by placing Function Switches F1 - F8 in the down position. A description of the LCD display format and the function of the *N*, *S*, +, and - push buttons during Diagnostic mode follows.



Diagnostic Mode

Function of N Push Button

```
NORMAL OPERATION
PI 8 20:10110011
```

The *N* push button selects the digit of the computer memory address, which is displayed on the second line of the LCD. For example, for the following display, pressing the *N* push button once will cause the 2 of the address 20 to begin blinking. By continuing to press the *N* push button, the 0 of address 20 will begin to blink. The cycle will continue while the N push button is being pressed. Once the digit to be changed is blinking, the address can then be modified using the + and – push buttons as described below.

The data (8 digits) that corresponds to the memory address, is displayed to the right of the address (see “Computer Internal Memory” on page 5-7). This display will change as the memory address changes.

Function of S Push Button

The S push button ends the ability to change the address by stopping the digit from blinking. If the S push button is not pressed, the selected digit will stop blinking automatically after a period of about 20 seconds.

Function of + Push Button

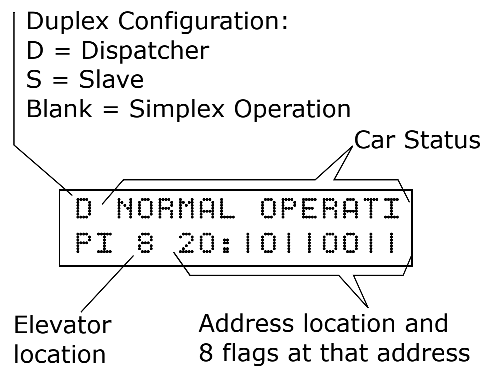
The + push button modifies the digit of the computer memory address selected by the *N* pushbutton. If the + push button is pressed, the selected digit is incremented by one. The data display will also change as the address changes. For example, if the 0 of the address 20 is blinking, pressing the + push button once will change the address from 20 to 21. Pressing the + push button several more times will change the address to 22, 23, 24, etc., up to 2F and then back to 20 again. If the 2 of address 20 is blinking, pressing the + push button once will change the address from 20 to 30. Pressing the + push button several more times will change the address to 40, 50, 60, etc., up to F0. Once the address has reached F0, pressing the + push button will cause the address to begin back at 00.

Function of - Push Button

The – push button also modifies the digit of the computer memory address selected by the *N* push button. If the – push button is pressed, the selected digit is decremented by one. The data display will also change as the address changes. For example: If the 0 of address 20 is blinking, pressing the – push button once will change the address from 20 to 2F. Pressing the – push button several more times will change the address to 2E, 2D, 2C, etc., back to 20 again. If the 2 in the address 20 is blinking, pressing the – push button once will change the address from 20 to 10. Pressing the – push button several more times will change the address to 00, F0, E0, etc., back to 00. Once the address has reached 00, pressing the – push button will cause the address to start over at F0.

Format of LCD Display

The multi-functional alphanumeric LCD display shows car status and can also be used for diagnostic purposes to display the contents of computer memory. The figure shows the various parts of the LCD in Diagnostic mode.



Normal Display For simplex controllers, the letter D in the drawing will not appear on the LCD and instead that part of the display will always be blank. For a duplex controller, this part of the display provides information about the communication between the controllers and about the dispatching. One of the following codes should appear:

S Indicates that this computer is acting as the slave to the dispatching computer. Hall call assignments are received from the dispatching computer through the communication cable.

D Indicates that this computer is acting as the dispatcher. It is responsible for assigning hall calls to itself and to the other controller.

Blank If this part of the display is blank, it denotes that communication has not been established between the two cars (see Section 6 for information on identifying and solving communication problems).

```
CAR IN TEST MODE
PI 8 20:10110011
```

Status / Error Message The top line of the LCD display shows the prevailing status of the elevator. The message is scrolled if it is larger than the space available. There is a status message for each special operation (e.g., Fire Service). There are also messages for most error conditions (e.g., open safety string). For a list of these status and error messages including a description and troubleshooting suggestions see “Status and Error Messages” on page 6-4.

```
D NORMAL OPERATI
PI 8 20:10110011
```

Elevator Position The underlined section in this display shows current elevator position relative to the bottom floor. The number 1 denotes the lowest landing in the elevator system.

```
D NORMAL OPERATI
PI 8 20:10110011
```

Computer Internal Memory The underlined section in this display shows the computer internal memory address (2 digits) and the data (8 digits) at that address. The colon character (:) separates the address from the data. The address is changed by first pressing the ***N*** push button, then the + and **-** pushbuttons.

Each of the 8 data digits (flags) corresponds to a particular elevator signal or condition. There are 8 pieces of information about the elevator at each memory address. Each data digit is either one or zero. One indicates the signal or condition is *ON* and zero indicates it is *OFF*.

The Computer Internal Memory Chart (Table 5.3) indicates the meaning of these data digits at different addresses.

For example, the internal memory display might look like this:

```
D NORMAL OPERATI
PI 8 29:11110000
```

The address on the display is 29; the data at that address is 11110000. To figure out what this means, simply match up the data digits with row 29 of the Computer Internal Memory Chart:

Display Data:	1	1	1	1	0	0	0	0
Row 29:	DNDO	LD	DPD	DDP	UPDO	LU	UPD	UDP

Notice that the DNDO, LD, DPD and DDP signals are *ON* and the UPDO, LU, UPD and UDP signals are *OFF*.

Table 5.3 Computer Internal Memory Chart

FLAGS AND VARIABLES								
ADD	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
10:	DOLMR	PHER	DZR	DOLR	DBCR	DOBR	GEUR	GEDR
11:	TFAR	DCR	UCR	CCR	NDSR	FDCR	DHOR	DOIR
12:	DCFR	DCPR	DOFR	LOTR	GHTR	HCTR	CCTR	SDTR
13:	DOCR	SER	DCLCR	CSBR	DCCR	NUDGR	NDGBPSR	DSHTR
20:	DOLM	PHE	DZ	DOL	DBC	DOB	GEU	GED
21:	TFA	DC	UC	CC	NDS	FDC	DHO	DOI
22:	DCF	DCP	DOF	LOT	GHT	HCT	CCT	SDT
23:	DOC	SE	DCLC	CSB	DCC	NUDG	NDGBPS	DSHT
24:	VCI	FRA	FCS	FRS	DNS	UPS	STD/R0	STU/R1
25:	SCE	FCCC	FCHLD	HLI	VCA	EXMLT	FWI	PIC
26:	LFP	UFP	NYDS	CCH	DIN	DPR	GTDE	GTUE
27:	HD	FCOFF	DHLD	IND	IN	DLKS	MLTP	MLTDO
28:	LLW	DLK	DDF	SUD	ISR	INCF	REAR	LLI
29:	DNDO	LD	DPD	DDP	UPDO	LU	UPD	UDP
2A:	DMD	DCB	UCB	CCB	DMU	DCA	UCA	CCA
2B:	TOS	MLT	VLT	SST	H	HSEL	DSH	RUN
2C:	DZP	STC	SAF	HCR	HCDX	CCD	ISV	ISRT
2D:	TEMPB	UFQ	DZORDZ	FCSM	FRM	FRSS	FRAS	FRC
2E:	SD	SDA	DSD	BFD	SU	SUA	USD	TFD
2F:	FRBYP	FRON	HYD1_TRC0	ECC	CD	ECRN	EPR	PFG
30:	R4	R2	R3	FREE	DEADZ	DHLDI	PH1	NDGF
31:	CTLDOT	CTLF	CTL	ALV	EPSTP	AUTO	EPRUN	EPI
33:	API	SAB	TEST	DHENDR	DHEND	CTST	HOSPH2	HOSP
38:	HML	SLV	CCC	CNFG	DLI	DLW	LWCE	HLW
42:	COMMUNICATION TIME-OUT ERROR COUNT							
43:	COMMUNICATION CHECKSUM ERROR COUNT							

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Troubleshooting Using the Computer's Internal Memory

Examining the computer memory (as in the example above) is a useful step in troubleshooting elevator problems. It is possible to find out if the controller is receiving input signals correctly and if it is sending out the proper output signals. It is also possible to look up each of the computer output and input signals shown in the Job Prints.

The following example illustrates how to use Table 5.3 on page 8 and Table 5.4 on page 9 to check a signal in the computer internal memory.

Example problem: the photo eye will not cause the doors to reopen.

1. Look at Table 5.4 on page 9. Find the abbreviation or mnemonic for Photo Eye input. The table shows that the mnemonic for Photo Eye input is PHE and provides an Address (20) and Position (7) for the signal. This will show where to look for the signal on Table 5.3 on page 8 and on the computer display.
2. Notice on Table 5.3 on page 8 that PHE is indeed in position 7 on row 20.
3. Now that the address and position have been determined, look up the PHE signal on the computer. First, change the address on the display to address 20. Then, look at data bit number 7 (from the right), which is underlined in the graphic:

```
D NORMAL OPERATI
PI 8 20:10110000
```


This digit represents the computer's interpretation of the PHE signal. If the digit is 1, the computer thinks that the PHE signal is *ON*. If the digit is 0 (as shown above), the computer thinks that the PHE signal is *OFF*.

This information can be used to find the source of the problem. The diagnostic display will show that the PHE input is *ON* when an obstruction is present which should interrupt the photo eye beam. If this is the case, checking the voltage present on the PHE terminal will show if the problem is inside or outside the controller.

Table 5.4 Alphabetized Flags/Variables and Their Locations

FLAG	Definition	Add	Position	FLAG	Definition	Add	Position
ALV	Other car alive output	31	5	FRS	Fire phase 1 input	24	5
API	Alternate Parking Input	33	8	FRSS	Fire phase 1 flag	2D	3
AUTO	Emergency power auto output	31	3	FWI	Fire warning indicator output	25	2
BFD	Bottom floor demand flag	2E	5	GED	Gong enable down output	20	1
CC	Car call flag	21	5	GEDR	Gong enable down output (rear)	10	1
CCA	Car call above flag	2A	1	GEU	Gong enable up output	20	2
CCB	Car call below flag	2A	5	GEUR	Gong enable up output (rear)	10	2
CCC	Car call cancel input	38	6	GHT	Gong hold timer flag	22	4
CCD	Car call disconnect flag	2C	3	GHTR	Gong hold timer flag (rear)	12	4
CCH	Car call hold	26	5	GTDE	Gong timer down enable	26	2
CCR	Car call flag (rear)	11	5	GTUE	Gong timer up enable	26	1
CCT	Car call time flag	22	2	H	High speed output	2B	4
CCTR	Car call time flag (rear)	12	2	HCDX	Hall call disconnect flag	2C	4
CD	Car done flag	2F	4	HCR	Hall call reject flag	2C	5
CNFG	Configuration error flag	38	5	HCT	Hall call door time flag	22	3
CSB	Car stop switch bypass	23	5	HCTR	Hall call door time flag (rear)	12	3
CSBR	Car stop switch bypass (rear)	13	5	HD	High speed delay flag	27	8

Table 5.4 Alphabetized Flags/Variables and Their Locations

FLAG	Definition	Add	Position	FLAG	Definition	Add	Position
CTL	Car to lobby input	31	6	HLI	Heavy load input	25	5
CTLDOT	Car to lobby door open timer	31	8	HLW	Heavy load weigher flag	38	1
CTLF	Car to lobby function	31	7	HML	Home landing input	38	8
CTST	Capture for test input	33	3	HOSP	In car hospital emergency input flag	33	1
DBC	Door close button input	20	4	HOSPH2	Hospital emergency phase 2 flag	33	2
DBCR	Door close button (rear)	10	4	HSEL	Hospital service select flag	2B	3
DC	Down call flag	21	7	HYD1-TR0	Hydro/Traction flag	2F	6
DCA	Down call above flag	2A	3	IN	Inspection or access input	27	4
DCB	Down call below flag	2A	7	INCF	Ind. service car call cancel flag	28	3
DCC	Door close complete flag	23	4	IND	Independent service input	27	5
DCCR	Door close complete flag (rear)	13	4	ISR	In service and ready	28	4
DCF	Door close function output	22	8	ISRT	In service truly flag	2C	1
DCFR	Door close function output (rear)	12	8	ISV	In service flag	2C	2
DCLC	Door close contact input	23	6	LD	Level down input	29	7
DCLCR	Door close contact input (rear)	13	6	LFP	Lower parking floor flag	26	8
DCP	Door close power output	22	7	LLI	Light load input	28	1
DCPR	Door close power output (rear)	12	7	LLW	Light load weighing funct. input flag	28	8
DCR	Down call flag (rear)	11	7	LOT	Lobby door time	22	5
DHENDR	Door hold end rear	33	5	LOTR	Lobby door time (rear)	12	5
DDF	Double ding function flag	28	6	LU	Level up input	29	3
DDP	Down direction preference flag	29	5	LWCE	Load weighing change enable flag	38	2
DEADZ	Dead zone flag	30	4	MLT	Motor limit timer flag	2B	7
DHEND	Door hold end	33	4	MLTDO	Motor limit timer door open	27	1
DHLD	Door hold input flag	27	6	MLTP	Motor limit timer pilot flag	27	2
DHLDI	Normal door hold input flag	30	3	NDGBPS	Nudging bypass flag	23	2
DHO	Door hold open flag	21	2	NDGBPSR	Nudging bypass flag (rear)	13	2
DHOR	Door hold open flag (rear)	11	2	NDGF	Nudging function flag	30	1
DIN	Door open inactive	26	4	NDS	Hall door timer non-shorten	21	4
DLI	Dispatch Load Input	38	4	NDSR	Hall door timer non-shorten (rear)	11	4
DLK	Door lock input	28	7	NUDG	Nudging output	23	3
DLKS	Door lock store bit	27	3	NUDGR	Nudging output (rear)	13	3
DLW	Dispatch load weighing function	38	3	NYDS	New York door shortening flag	26	6
DMD	Demand down flag	2A	8	PFG	Passing floor gong output	2F	1
DMU	Demand up flag	2A	4	PH1	Phase 1 return complete flag	30	2
DNDO	Down direction output	29	8	PHE	Photo eye input	20	7
DNS	Down direction sense input	24	4	PHER	Photo eye input (rear)	10	7
DOB	Door open button input	20	3	PIC	PI correction flag	25	1
DOBR	Door open button input (rear)	10	3	R2	Absolute floor encoding #2	30	7
DOC	Door open command	23	8	R3	Absolute floor encoding #3	30	6
DOCR	Door open command (rear)	13	8	R4	Absolute floor encoding #4	30	8
DOF	Door open function output	22	6	REAR	Rear door flag	28	2
DOFR	Door open function output (rear)	12	6	RUN	Run flag	2B	1
DOI	Door open intent flag	21	1	SAB	Sabbath input	33	7
DOIR	Door open intent flag (rear)	11	1	SAF	Safety string input	2C	6

Table 5.4 Alphabetized Flags/Variables and Their Locations

FLAG	Definition	Add	Position	FLAG	Definition	Add	Position
DOL	Door open limit input	20	5	SCE	Stepping correction enable	25	8
DOLM	Door open limit memory flag	20	8	SD	Supervisory down flag	2E	8
DOLMR	Door open limit memory flag (rear)	10	8	SDA	Down direction arrow	2E	7
DOLR	Door open limit (rear)	10	5	SDT	Short door time flag	22	1
DPD	Down previous direction	29	6	SDTR	Short door time flag (rear)	12	1
DPR	Door protection timer flag	26	3	SE	Safety edge input	23	7
DSD	Down slow down input	2E	6	SER	Safety edge input (rear)	13	7
DSH	Door shortening flag	2B	2	SLV	Stable slave flag	38	7
DSHT	Door shortening flag	23	1	SST	Soft stop timer flag	2B	5
DSHTR	Door shortening flag (rear)	13	1	STC	Stepping complete flag	2C	7
DZ	Door zone input	20	6	STD/R0	Step down input/absolute floor encoding #0	24	2
DZORDZ	Front or rear door zone input	2D	6	STU/R1	Step up input/absolute floor encoding #1	24	1
DZP	Door zone previous	2C	8	SU	Supervisory up flag	2E	4
DZR	Door zone input (rear)	10	6	SUA	Up direction arrow	2E	3
ECC	Excess car calls flag	2F	5	TEMPB	Temporary bit	2D	8
ECRN	Emergency car run flag	2F	3	TEST	Test switch input	33	6
EPI	Emergency power input flag	31	1	TFA	Timing function active	21	8
EPR	Emergency power return	2F	2	TFAR	Timing function active (rear)	11	8
EPRUN	Emergency power run input	31	2	TFD	Top floor demand flag	2E	1
EPSTP	Emergency power stop input	31	4	TOS	Timed out of service flag	2B	8
EXMLT	External Motor Limit Timer	25	3	UC	Up call flag	21	6
FCCC	Fire phase II car call cancel	25	7	UCA	Up call above flag	2A	2
FCHLD	Fire phase II hold	25	6	UCB	Up call below flag	2A	6
FCOFF	Fire phase II off	27	7	UCR	Up call flag (rear)	11	6
FCS	Fire phase II input	24	6	UDP	Up direction preference	29	1
FCSM	Fire service phase II input memory	2D	5	UFP	Upper parking floor flag	26	7
FDC	Door fully closed phase II	21	3	UFQ	Up first qualifier flag	2D	7
FDCR	Door fully closed phase II (rear)	11	3	UPD	Up previous direction	29	2
FRA	Alt. Fire service phase I input	24	7	UPDO	Up direction output	29	4
FRAS	Alternate fire flag	2D	2	UPS	Up direction sense input	24	3
FRBYP	Fire phase I bypass input flag	2F	8	USD	Up slow down input	2E	2
FRC	Fire phase II flag	2D	1	VCA	Viscosity active	25	4
FREE	No demand and in service	30	5	VCI	Viscosity Input	24	8
FRM	Fire service phase I flag	2D	4	VLT	Valve limit timer	2B	6
FRON	Fire phase I on input flag	2F	7				

Troubleshooting Specific Problems

This section will describe how to solve some specific problems by using the computer panel.

Problem: BOTTOM FLOOR OR TOP FLOOR DEMAND message. The BOTTOM FLOOR OR TOP FLOOR DEMAND message is scrolling on the top line of the LCD display. The Status and Error Messages list (page 6-4), indicates that the message means that there is either a Bottom Floor Demand or a Top Floor Demand. The controller is trying to establish the position of the car by sending it to either the bottom or top floor.

Note

If the controller has the Absolute Floor Encoding feature, then the controller can establish the position of the car as soon as the car reaches any door zone. The car does not have to travel to a terminal landing to establish the position of the car.

It is normal for the BOTTOM FLOOR OR TOP FLOOR DEMAND message to appear on the display right after power up, after the car is taken off Inspection, or after the RST B computer reset button is pressed. However, in all of these cases, the message should be cleared quickly and then it should not be seen again as the car runs on Normal service.

If the BOTTOM FLOOR OR TOP FLOOR DEMAND message is scrolling for no apparent reason, take the following steps:

The first step in troubleshooting is to decide which of the following scenarios applies:

Scenario A: The car is stuck at the bottom floor with the BOTTOM FLOOR OR TOP FLOOR DEMAND error message scrolling constantly.

Scenario B: The car runs normally until it reaches the top floor, then the BOTTOM FLOOR OR TOP FLOOR DEMAND error message scrolls and the car goes to the bottom floor. When it reaches the bottom, the message is cleared and the car functions normally until it again reaches the top floor.

Scenario C: The car runs normally until it reaches the bottom floor. Then the BOTTOM FLOOR OR TOP FLOOR DEMAND error message scrolls and the car goes to the top. After it gets there, the message is cleared and the car runs normally until it again reaches the bottom floor.

What to do for Scenario A: A Bottom Floor Demand should be cleared when all of the following conditions are met:

1. The car is at the bottom and the Down Slow Down (DSD) input to the controller is *OFF*.
2. The Door Zone (DZ) input to the controller is *ON*.
3. The Door Lock (DLK) input to the controller is *ON*.
4. The leveling signals ULM(LU), DLM(LD) are OFF.

Look up the DSD, DZ, ULM(LU), DLM(LD) and DLK signals in the computer memory (see "Troubleshooting Using the Computer's Internal Memory " on page 5-9). When the car is at the bottom floor with the doors locked, the correct values for these signals in the computer memory are as follows:

DSD= 0 (OFF)
DZ= 1 (ON)
ULM(LU) = 0 (OFF)
DLM(LD) = 0 (OFF)
DLK = 1 (ON)

If there is a different value for any of the 3 signals, check the wiring associated with that particular signal.

For example, if the DSD signal is equal to 1 (ON) in the computer memory, inspect the DSD input wiring, including the Down Slow Down limit switch. The Down Slow Down switch contacts should be open when the car is at the bottom.

What to do for Scenario B: In this situation, the USD input is usually the problem. Look at the USD signal in the computer memory (Address 2E, Position 2). USD should be *ON* except when the car is at the top; then it should be *OFF*. If the signal is not following this rule, then inspect the wiring associated with the USD input, including the Up Slow Down limit switch. The Up Slow Down switch contacts should be open when the car is at the top.

What to do for Scenario C: In this situation, the DSD input is usually the problem. Look at the DSD signal in the computer memory (Address 2E, Position 6). DSD should be *ON* except when the car is at the bottom; then it should be *OFF*. If the signal is not following this rule, then inspect the wiring associated with the DSD input, including the Down Slow Down limit switch. The Down Slow Down switch contacts should be open when the car is at the bottom.

Setting Parameters (Options) to Default Values

There are occasions when it is necessary to set the parameters (options) to their default values. Setting the parameters to their default values is usually required when:

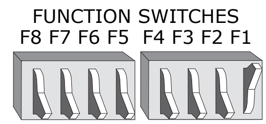
- The MC-MPU software is changed.
- RAM memory becomes corrupted. This sometimes happens due to lightening.

To set the MC-MPU parameters to their default values:

1. Place the car on Machine Room Inspection.
2. Place function switches **F1**, **F3**, **F5** and **F7** in the **On** (up) position.
3. Press all four push buttons (**N**, **S**, **+**, **-**) at the same time.
4. Using the settings shown in Appendix A, *Original Programmed Values and the Record of Changes*, reprogram the values that are different from the default values.

F1: Program Mode

This section will explain how to use Program mode. Enter Program mode by moving the ***F1*** switch on the computer board to the up position. Program mode can be used to program the controller to meet the requirements of the elevator such as, the selection of stops and fire floors, or changing timer values and selecting options such as nudging. The Motion 2000 controller has already been programmed at MCE. Usually, the controller does not have to be programmed during the initial installation. Program mode can be used later to modify the elevator operation.



Program Mode

Refer to the Programming Record in the Job Prints for a list of the options and values programmed into the controller at MCE. If you choose, you may copy these values into the space provided in Appendix A.

Note

If any changes are made using Program mode, record them in writing for future reference (use Appendix A).

General Description of Program Mode

The car must be on Inspection before Program mode can be used. Messages will appear on the LCD display. Use the ***N*** and ***S*** push buttons to find and select options and to change values. The next several subsections describe in detail how to use Program mode.

Viewing Menus on the LCD Display

All of the programmable options and features are divided into menus. The following is a list of the menus:

Basic Features Menu	Timer Menu	Spare Outputs Menu
Fire Service Menu	Gongs/Lanterns Menu	Extra Features Menu
Door Operation Menu	Spare Inputs Menu	Additional Car Options Menu

For each menu, there is a Menu Message on the display. To look at these Menu Messages, enter Program mode by moving the ***F1*** switch to the up position. The Start Message will appear:

```
  PROGRAM MODE
PRESS N TO BEGIN
```

Press the ***N*** push button, and release it. The first Menu Message will appear:

```
*BASIC FEATURES*
      MENU
```

Press the *N* push button again the next Menu message will appear:

```
* FIRE SERVICE *
```

Hold down the *N* push button, each Menu Message will appear, one at a time. Finally, the Start Message will appear again.

Viewing Options Within a Menu

The options can be viewed inside a particular menu by pressing the ***S*** push button when the Menu Message appears on the display. For example, to look at the options in the Door Operation Menu, first press the ***N*** push button until the Door Operation Menu Message appears:

```
*DOOR OPERATION*
      MENU
```

Press the ***S*** push button. The following display will appear:

```
  NUDGING? YES
```

To view the next option, press the *N* push button. Hold down the *N* push button to scroll through the options. Eventually the Menu Message will reappear, or to return directly to the Menu Message while the options are displayed, press the *N* and '+' push buttons at the same time. Press the *S* push button to see the options for that same menu again, or press the *N* push button to go on to the next menu.

Changing a Value

For each option that appears, the value can be changed by pressing the *S* push button. While in the Timer, Spare Inputs and Spare Outputs menus, pressing and holding the *S* push button for five seconds causes the display to scroll through the values at a faster rate. Also, in those same menus, pressing the *S* and '-' push buttons at the same time will cause the display to scroll backwards and pressing the *S* and '+' push buttons at the same will reset the option to NOT USED. To return directly to the Menu Message while the values or options are displayed, press the *N* and '+' push buttons at the same time.

5

Going back to the previous example in which the Nudging option was on the display:

```
  NUDGING? YES
```

Pressing the ***S*** push button to changes Nudging to NO:

```
  NUDGING? NO
```

Saving the New Values

Whenever options or values are changed in Program mode, this information must be saved in the computer's memory. When the changes are complete, press the ***N*** push button until the following message appears:

```
*SAVE CHANGES?*
* N=NO   S=YES *
```

Press the ***S*** push button to save the changes. The Start Message will appear again. When programming is complete, move the *F1* switch back to the down position**.**

Note

If the values have not been saved, they will be lost when *F1* is switched back to *OFF* (down) position. *Make sure* to keep an account of saved changes on the record provided in Appendix A.

Restoring Original Values

When using Program mode, if some values have been changed, but then you decide to go back to the old values, exit Program mode without saving the changes. Move the ***F1*** switch back to the down position and the original values will be restored.

Step-by-Step Example

The table provides a step-by-step example of using Program mode. In this example, the Fire Phase I Alternate floor will be changed. Similar steps can be taken to change any option.

Table 5.5 Using the Program Mode

Steps to take	Display menus and sub-menus	
Put the car on Inspection	D INSPECTION OPE PI 8 20:10110000	
Flip ***F1*** switch Up	PROGRAM MODE PRESS N TO BEGIN	
Press ***N*** button for Next	*BASIC FEATURES* * MENU *	
Press ***N*** button for Next	* FIRE SERVICE * * MENU *	
Press ***S*** button to Select		FIRE SERVICE OPERATION? YES
Press ***N*** button for Next		FIRE PHASE I MAIN FLOOR = 1
Press ***N*** button for Next		FIRE PHASE I ALT. FLOOR = 1
Press ***S*** button to select next available value. If you pass the desired value, press ***S*** until the desired value appears again.		FIRE SVCE. CODE ALT.FLOOR = 3
Press ***N*** button for Next		FIRE SVCE. CODE xxxx
Press ***N*** button for Next		BYPASS STOP SW. ON PHASE I? YES
Press ***N*** button to scroll through any remaining Fire Service sub-menus.		
Press ***N*** button for Next	* FIRE SERVICE * * MENU *	
Press ***N*** button for Next	*DOOR OPERATION* * MENU *	
Press ***N*** button for Next	* TIMER * * MENU *	
Press ***N*** button for Next	*GONGS/LANTERNS* * MENU *	
Press ***N*** button for Next	* SPARE INPUTS * * MENU *	
Press ***N*** button for Next	*SPARE OUTPUTS* * MENU *	
Press ***N*** button for Next	*EXTRA FEATURES* * MENU *	
Press ***N*** button for Next	*ADDITIONAL CAR* * OPTIONS *	
Press ***N*** button for Next	* SAVE CHANGES?* * N=NO S=YES *	
Press ***S*** button to Save	PROGRAM MODE PRESS N TO BEGIN	
Flip ***F1*** switch Down and take car off of Inspection	***The new options are stored and are now in effect.***	

Basic Feature Menu Options

CONTROLLER TYPE: (*HYDRO (M2000)/TRACTION (M4000)*) Determines the firmware that will be used for this controller. This parameter should have been factory set based on the type of controller in use, hydro or traction.

SIMPLEX / LOCAL OR DUPLEX? The controller has been programmed at the factory for either simplex, local or duplex capability.

If the controller has simplex capability, it can only operate a single car as a simplex.

This parameter should be set to LOCAL if the car is part of a group connected to a group dispatcher.

If the controller has duplex capability, then it can operate a single car as a simplex, or it can be connected to a second Motion 2000 controller and the 2 controllers can operate 2 cars as a duplex.

Both Motion 2000 controllers must have duplex capability for this arrangement to work. Also, the Simplex/Duplex option on each controller must be set to duplex.

In Duplex configuration, one of the controllers will assert itself as the dispatcher and will remain the dispatcher unless it is taken offline. The dispatching controller will show a “D” on its LCD; the other, an “S.” Hall calls are physically connected to both controllers

OPERATION: Dispatching operation - For simplex operation, there are 3 dispatching operations to choose from: Selective Collective, Single Button Collective, or Single Automatic Push button. Each operation is described below:

- **Selective Collective** - Choose this operation if there is an UP and DOWN button at each landing station except for the top floor (DOWN button only) and bottom floor (UP button only) and any number of calls can be registered at one time.
- **Single Button Collective** - Choose this operation if there is only 1 call button at each landing station and any number of calls can be registered at one time.
- **Single Automatic Push button** - Choose this operation if there is only 1 call button at each landing station and only 1 call can be registered and/or serviced at a time.

Note

If either Single Button Collective or Single Automatic Push button operation is selected, then one of the spare output terminals should be used for an INDFRC output. This output is used to disconnect the hall calls during Fire Service and Independent Service (see “Spare Outputs Menu Options” on page 5-39, INDFRC output for more details). Refer to the Job Prints for information on using the INDFRC output to disconnect hall calls.

For duplex operation, the dispatching scheme is always Selective Collective. Therefore, the Operation option message will not appear on the display if the duplex option has been selected.

Caution
The following BASIC FEATURE MENU OPTIONS affect the terminal assignments on the HC-UIO boards used for call related I/O (boards numbered 00 through 31). Please refer to "HC-UIO-2 Board Call Assignments" on page 6-60. It is recommended that the terminal connectors be unplugged from these HC-UIO boards when making changes to these settings. If parameters/terminal assignments are changed, the associated controller wiring must also be changed.

TOP LANDING SERVED? (simplex)**/TOP LANDING FOR THIS CAR?** (duplex) Set this option to the highest floor served by this car. This parameter determines the number of HC-UIO board terminals assigned for PIs, unless the "DISCRETE PI'S ON UIO" option is set to NO (see page 5-19).

WALK THRU DOORS THIS CAR? *YES/NO* - Set this to yes if this car has a second set of doors that can be controlled independently of the front doors.

CAR SERVES FRNT/FLR 1? (simplex)**/THIS CAR SERVES FRNT/FLR 1?** (duplex) *YES/NO* - Setting this option to YES indicates that this car is eligible to serve a front opening at this floor. This option will continue to be asked until the top landing is reached. Press the '+' push button to scroll through the available landings. Press the S push button to select Yes/No. Press the N push button for the next option. This parameter determines the number of HC-UIO board terminals assigned for front car calls, unless the "SERIAL COP BOARD HC-CPI?" option is set to YES (see page 5-19).

CAR SERVES REAR/FLR 1? (simplex) **/ THIS CAR SERVES REAR/FLR 1?** (duplex) *YES/NO* - Setting this option to YES indicates that this car is eligible to serve a rear opening at this floor. This option inquiry will continue until the top landing is reached. Press the '+' push button to scroll through the available landings. Press the S push button to select Yes/No. Press the N push button for the next option. This parameter determines the number of HC-IOU board terminals assigned for rear car calls, unless the "SERIAL COP BOARD HC-CPI?" option is set to YES (see page 5-19).

TOP LANDING FOR OTHER CAR? (duplex) Set this option to the highest floor served by the other car. This parameter determines the number of HC-UIO board terminals assigned for PIs, unless the "NO DISCRETE PI'S ON UIO" option is set to YES.

WALK THRU DOORS OTHER CAR? (duplex) *YES/NO* - Set this to yes if the other car has a second set of doors that can be controlled independently of the front doors.

OTHER CAR SERVES FRNT/FLR 1? (duplex) *YES/NO* - Setting this option to YES indicates that the other car of a duplex is eligible to serve a front opening at this floor. This option will continue to be asked until the top landing is reached.

OTHER CAR SERVES REAR/FLR 1? (duplex) *YES/NO* - Setting this option to YES indicates that the other car of a duplex is eligible to serve a rear opening at this floor. This option will continue to be asked until the top landing is reached.

Note: ***Both*** controllers in a duplex must be programmed with this information. These option inquiries must be answered for both cars.

PARKING FLOOR Any landing can be selected to be the parking floor. The car will go to the parking floor when it is free of call demand. In addition, there is a Parking Delay Timer that will cause a free car to wait for a short time before parking. The timer is adjustable, with a value between 0.0 minutes (no delay) and 6.0 minutes (see “PARKING DELAY TIMER” on page 5-27). If the parking feature is not needed, choose NONE when the Parking Floor option message is on the display. The car will stay at the last call answered.

ALT. PARKING FLOOR This option is available only when the API input is programmed and a parking floor is set. Any landing can be selected to be the alternate parking floor. This car will go to the alternate parking floor when it is free of call demand and the API input is active.

SECONDARY PARKING FLOOR This option is for duplex systems only. Any landing can be selected to be the secondary parking floor. The car will go to this floor when it becomes free of call demand and the other car is already parked at the first parking floor. It is acceptable to make the secondary parking floor the same as the first parking floor, if both cars are to park at the same floor. If a second parking floor is not needed, choose *NONE* when the Secondary Park Floor option message is on the display. Then, the first free car will go to the first parking floor, but the second car will stay at the last call answered.

LOBBY FLOOR Any landing can be selected to be the Lobby Floor. When the car answers either a hall or car call at this floor, the doors will stay open until the Lobby Door Timer elapses (the Lobby Door Timer is adjustable, see “LOBBY DOOR TIMER” on page 5-26). NOTE: The Lobby Floor is also used for CTL input.

CAR IDENTIFIER This option is for duplex systems only. Its purpose is to specify which controller is assigned to car A and which controller is assigned to car B. This is primarily used for controllers that use a peripheral device such as a CRT.

SERIAL COP BOARD HC-CPI? *YES/NO* - Yes indicates that the COP signals are being handled by an HC-CPI Serial COP board and therefore the car calls should not be assigned to HC-UIO board terminals.

SERIAL COP BOARD TYPE? Set to type of installed serial COP board (HC-CPI, ICE-COP-2, or NONE.

DISCRETE PI’s on UIO? Set to No if the car uses serial (CE) position indicator fixtures. See caution above.

- Set to Yes if PI’s are connected to HC-UIO boards.

DEDICATED PI BOARD? (Appears if “Discrete PI’s on UIO?” is set to Yes. Dedicates the first one or two HC-UIO boards to PI’s alone [no call connections]).

- If Yes: Position Indicators will be located on UIO Board 0 (zero) for 2 - 16 stops or boards 0 (zero) and 1 (one) for 2 - 32 stops (board 1 handles 17 - 32 [assuming that PI is one wire per floor]). Calls will begin on a new UIO Board immediately following Board 0 or 1.
- If No: PI’s are located on UIO boards but calls can begin immediately following the last PI rather than on the next UIO board.

SERIAL CARTOP DOOR CNTRL? *YES/NO* - Yes indicates that door control is being handled by an HC-UIO board that is installed on the car top.

DISABLE LOCAL HALL CALLS? Set to Yes if the car is dispatched by a group controller and should not respond to a local (connected to car) riser. If this car has swing operation, do not set this to Yes as it will prevent the car from responding to local riser calls.

Fire Service Menu Options

FIRE SERVICE OPERATION? If Fire Service operation is not required, then this option should be set to *NO*. Otherwise, if set to *YES*, the options below will appear on the LCD display.

FIRE PHASE 1 MAIN FLOOR Any landing can be selected to be the Main Fire Return Floor for Fire Service.

FIRE PHASE 1 ALT. FLOOR Any landing can be selected to be the Alternate Fire Return Floor for Fire Service.

FIRE SVCE. CODE The Fire Service Operation will conform to the selected fire service code. The fourteen different codes to choose from are:

1. CHICAGO (OLD)
2. VET ADMIN (Veterans' Administration)
3. NYC RS-18
4. ANSI A17.1 -89>
5. CALIF. TITLE 8
6. HAWAII
7. CSA B44-M90
8. 34 PA CODE, CH. 7
9. CITY OF HOUSTON
10. AUSTRALIA
11. CITY OF DETROIT
12. MASSACHUSETTS
13. ANSI A17.1 85 - 88
14. CITY OF DENVER
15. CHICAGO 2001
16. ANSI A17.1-2000

FIRE PHASE I 2ND ALT. FLOOR Detroit Fire Code only. Any landing may be the 2nd alternate fire return floor. Select None if there is no second alternate return floor.

WILL THIS CAR RUN ON PH2? This car is allowed to run on Fire Phase II if this option is set to YES.

BYPASS STOP SW. ON PHASE 1? This option was added to keep the stop switch from being bypassed on Fire Phase I. With this option set to *NO*, the CSB output will not come *ON* as the car is returning on Fire Phase I.

HONEYWELL FIRE OPERATION? This option is only available if the FIRE SVCE. CODE option is set to AUSTRALIA (see “FIRE SVCE. CODE” on page 5-20). If this option is set to *YES* then the Australia fire code will conform to Honeywell’s requirements. If this option is set to *NO* then the controller will conform to standard Australia code.

NYC FIRE PHASE 2 AND ANSI 89? This option is only available if the FIRE SVCE. CODE option is set to ANSI A17.1 89 (see “FIRE SVCE. CODE” on page 5-20). If this option is set to *YES* then the ANSI A17.1 89 Fire Code will conform to New York City Fire Code requirements when on Fire Phase 2. If this option is set to *NO* then the controller will conform to standard ANSI A17.1 89 Fire Code.

WHITE PLAINS, NY FIRE CODE? This option is only available if the FIRE SVCE. CODE option is set to ANSI17.1 89 (see “FIRE SVCE. CODE” on page 5-20). The city of White Plains requires that if fire phase one is still in effect, the car can exit fire phase two regardless of the position of the doors. Setting this option to YES will comply with this requirement.

MASS 524 CMR FIRE CODE? This option is only available if the “FIRE SVCE. CODE” option is set to “A17.1 - 2000." If this option is set to YES, the ASME A17.1-2000 fire code will conform to the Massachusetts 524 CMR requirements. If this option is set to *NO*, the controller will conform to the standard ASME A17.1-**2000 code.**

ASME A17.1A 2000 ADDENDA? Set to the appropriate addenda for your jurisdiction. (2005, 2007, NONE)

DISABLE DPM ON FIRE PH.2? If Yes, Door Position Monitoring is disabled when the car is on In-Car Firefighter operation (Fire Phase 2). If No, DPM is not disabled on Fire Phase 2.

LOW VOLTAGE FIRE SENSORS? If the fire sensors on this job use 24V signal levels, set this option to Yes. If set to No, the signal level is assumed to be 120 VAC.

FIRE HAT STATUS? [1]Dynamic/Latch Flashing/Latch Initial.

- Dynamic: Regardless of which fire alarm initiating device (FAID) initiated Fire Phase I operation, whenever the FAID in the elevator machine room or hoistway is activated, the fire hat in the associated car will flash. Otherwise, the fire hat will illuminate solidly unless required by code to flash in response to some other, non-FAID device actuation (for example, battery rescue device, low oil, etc.).
- Latch Flashing: Regardless of which fire alarm initiating device (FAID) initiated Fire Phase I operation, once the FAID in the elevator machine room or hoistway is activated, the fire hat in the associated car will flash and remain flashing throughout fire service.
- Latch Initial: If the fire alarm initiating device (FAID) that initiated Fire Phase I is located in the elevator machine room or hoistway, the fire hat in the associated car will flash and remain flashing throughout fire service. Otherwise, the fire hat will illuminate solidly and remain so throughout fire service unless required by code to flash in response to some other, non-FAID device actuation (for example, battery rescue device, low oil, etc.). This option should be selected for ASME A17.1-2004/CSA B44-04 and later.

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1. A17.1/B44 code edition/addenda or jurisdiction dependent: (A) for ASME A17.1-2004/CSA B44-04 and later, the machine room or hoistway sensor must be the sensor that initiated Fire Phase I for the hat to flash; or (B) for earlier editions of A17.1/B44, the fire hat will flash any time the machine room or hoistway sensor is active, regardless of which device initiated Fire Phase I. Also, some jurisdictions occasionally modify the A17.1/B44 requirements, so please consult with the jurisdictional authorities for additional requirements.

Door Operation Menu Options

NUDGING? Enables Nudging Operation when doors are prevented from closing. During Nudging Operation, controller will turn ON the NUDG output to signal the door operator to close the doors at reduced speed. The NUDG output will stay ON for the amount of time the Nudging Timer specifies and then cycle off for the same amount of time. This cycle will continue until the doors have fully closed.

The NUDG output can also be used to activate a buzzer. The PHE (Photo Eye) input will be ignored during nudging if the Stuck Photo Eye Protection option has been selected (see “STUCK PHOTO EYE PROTECTION?” on page 5-22). A Safety Edge or Door Open Button input will stop the doors from closing, but will not reopen the doors fully. Nudging Operation will begin when the Nudging Timer elapses. The Nudging Timer starts when the regular door timer elapses. The Nudging Timer is adjustable (see “NUDGING TIMER (Range: 10-240 Seconds)” on page 5-26).

STUCK PHOTO EYE PROTECTION? When enabled, causes controller to ignore PHE (Photo Eye) input and close the doors after the Nudging Timer elapses if the Nudging option is selected or when the Time Out of Service Timer elapses, whichever comes first. If the Nudging option is not selected, the PHE input will be ignored when the Time Out of Service Timer elapses. (see “TIME OUT OF SERVICE TIMER (Range: 15-240 Seconds, or None)” on page 5-26 for more details.)

If the Stuck Photo Eye Protection option is not selected, a PHE input that is stuck ON will keep the doors open indefinitely.

SEQUENTIAL DOOR OPER. (F/R)? This option is available only if independent rear doors are present. If this option is set to *YES* then the front and rear doors of the car do not open at the same time. Whenever the controller receives a front and rear call to the same landing, the car will, upon reaching that landing, first open the front doors and close them, then open the rear doors and close them. The default is to open the front doors first unless the rear doors have already started to open.

CAR CALL CANCELS DOOR TIME? If this option is selected, pressing a car call button when the doors are fully open will cause the doors to start closing. There is one exception. If the car is stopped at a floor, pressing the car call button *for that same floor* will not cause the doors to close, but will cause the doors to reopen if they are in the process of closing.

NUDGING DURING FIRE PH. 1? If selected, the controller will turn ON the NUDG output while the doors are closing during Fire Phase 1. The NUDG output signals the door operator to close the doors at reduced speed. This is useful for elevators that do not have mechanical safety edges. During Fire Phase 1, all smoke sensitive reopening devices must be disabled. This includes photo eyes and other devices that use infrared beams. If there are no other reopening devices active, the doors should close at reduced speed.

RETIRING CAM OPTION? This option should be selected for elevators with retiring cams. This option affects the car only when it is sitting at a floor. Without this option, the controller will wait until the doors are closed and locked before it turns *OFF* the door close signal. However, if the elevator has a retiring cam, the doors will not be locked until the retiring cam is activated.

If this option is selected, the controller will turn *OFF* the door close signal when the doors are *closed* instead of waiting for the doors to be locked. More precisely, the controller will turn *OFF* the door close output signal (DCF) when the DCLC (Doors Closed Contact) input is *ON* or when the DCL (Door Close Limit) input is *OFF*, instead of waiting for the DLK (Door Lock) input to turn *ON*.

PRE-OPENING? If this option is selected, the controller will begin to open the doors just before the car completely stops at a floor. More precisely, the controller will turn *ON* the DOF (Door Open Function) output signal when the DZ (Door Zone) input turns *ON*. Typically, the DZ input first turns *ON* when the car is about 3 inches away from the final stopping point. This option is not recommended for elevators that may spend an extended period of time in leveling.

MECHANICAL SAFETY EDGE? If this option is selected, the Nudging Operation will cycle until the doors are fully closed. Otherwise, the nudging function will operate continuously to comply with code requirements where a door reopening device is not used (see “NUDGING?” on page 5-22 for more details).

NUDGING OUTPUT/BUZZER ONLY? If selected with the Nudging option, NUDG output will be activated when Nudging Timer elapses. However, if either the Mechanical Safety Edge or the Door Open button is activated, the doors will stop and reopen fully. If this option is not selected, the doors will simply stop under these circumstances, but will not reopen fully. This option may be useful when only a nudging buzzer is required but actual Nudging Operation is not needed (see “NUDGING?” on page 5-22 for more details). With this option and the NUDGING option both set to YES, DOOR CLOSE PROTECTION TIMER ELAPSED faults are not generated.

D.C.B. CANCELS DOOR TIME? When the doors are fully open, this option will cancel any pre-existing door time and cause the doors to start closing when the Door Closed button is pressed.

LEAVE DOORS OPEN ON PTI/ESS? This option is displayed when either the PTI or ESS spare inputs have been programmed. With this option set and either the Power Transfer (PTI) input or the Elevator Shutdown Switch (ESS) input selected and active, once the car has stopped at a floor, the doors will remain open instead of cycling closed.

NUDGING DURING FIRE PHASE 2? If this option is selected, the controller will turn *ON* the NUDG output while the doors are closing during Fire Service Phase II. The NUDG output signals the door operator to close the doors at reduced speed.

DIR. PREFERENCE UNTIL DLK? This option causes the car to maintain its present direction preference until the doors are fully closed. Otherwise, the direction preference is maintained only until the door dwell time expires.

FULLY MANUAL DOORS? Set this option to *YES* when the doors are opened and closed manually versus automatically.

CONT. D.C.B. TO CLOSE DOORS? When this option is set to *YES*, the doors will remain open while the car is at a landing until the Door Close button is pressed. While the Door Close button is pressed, the doors will continue to close. If the Door Close button is released before the doors have closed fully, the door will re-open.

CONT. D.C.B. FOR FIRE PH 1? When set to *YES*, the doors will remain open when the car goes on Fire Service Phase I until constant DCB forces them closed.

MOMENT. D.O.B. DOOR OPENING? This option is used to require the momentary pressure on the Door Open Button (DOB) to open the doors. If set to *NO*, momentary pressure on the DOB is not required to open the doors when the car reaches a landing. The doors open automatically in response to a call.

MOMENT D.O.B. FOR: *(FRONT CALLS/ REAR CALLS/ BOTH CALLS)* - Choose whether front calls, rear calls or both calls need momentary D.O.B.

- *FRONT CALLS* - this option necessitates that DOB be pressed when the car responds to *front* door calls. Rear door calls are not affected.
- *REAR CALLS* - this option necessitates that DOB be pressed when the car responds to *rear* door calls. Front door calls are not affected.
- *BOTH CALLS* - this option necessitates that DOB be pressed when the car responds both *front* and *rear* door calls.

MOMENT D.O.B. FOR: *(HALL CALLS/ CAR CALLS/ ALL CALLS)* - Choose whether hall calls, car calls or all calls need momentary D.O.B.

- *HALL CALLS* - this option necessitates that DOB be pressed when the car responds to *hall calls*. Car calls are not affected.
- *CAR CALLS* - this option necessitates that DOB be pressed when the car responds to *car calls*. Hall calls are not affected.
- *ALL CALLS* - this option necessitates that DOB be pressed when the car responds to both *hall calls* and *car calls*.

DOORS TO OPEN IF PARKED: *(NONE/FRONT/REAR/BOTH)* - If set to NONE, the doors remain closed while the car is parked. When set to FRONT, REAR, or BOTH, the corresponding doors automatically open and remain open while the car is parked. This option is available only if a parking floor is programmed in the Basic Features menu. BOTH option is not available if the car is programmed for sequential door operation (see “SEQUENTIAL DOOR OPER. (F/R)?” on page 5-22 for more details.

DOORS TO OPEN ON MAIN FIRE? The choices for this option are FRONT, REAR and BOTH. This option determines which door(s) should open once the car has completed a Main Fire return (only if the CAR ARE WALK-THRU? option is set to *YES*).

DOORS TO OPEN ON ALT FIRE? The choices for this option are FRONT, REAR and BOTH. This option determines which door(s) should open once the car has completed an Alternate Fire return (only if the CAR ARE WALK-THRU? option is set to *YES*).

LEAVE DOORS OPEN ON CTL? This option is displayed when the CTL spare input is programmed. When set to *YES*, and the CTL (car to lobby) input is active, once the car has returned to the lobby, the doors will remain open instead of cycling closed.

LIMITED DOOR RE-OPEN OPTION Once the doors begin to close after a door dwell time has expired, if a re-opening device input (PHE or SE) is seen, this option will allow the doors to re-open as long as the re-opening device is active. Once the re-opening device is inactive, the doors will immediately begin to close again. Without this option set, in this same case, the doors will re-open fully for a short door time and then close.

REDUCE HCT WITH PHOTO EYE This option will cause a normal hall call time to be shortened to a short door time if a photo eye input is seen.

LEAVE DOORS OPEN ON EPI This option is displayed when the EPI spare input is programmed. When set to *YES*, and EPI (Emergency Power) input is active, once the car returns to the emergency power return floor, the doors are left open instead of cycling closed.

DOORS TO OPEN IF NO DEMAND: *(NONE/FRONT/REAR/BOTH)* - When set to NONE, the doors remain closed when the car is at a landing with no demand. When set to FRONT, REAR, or BOTH, the corresponding doors automatically open and remain open when the car is at a landing with no demand. BOTH option is not available if the car is programmed for sequential door operation (see “SEQUENTIAL DOOR OPER. (F/R)?” on page 5-22).

CONST. PRESS OP. BYPASS PHE? This option is used to indicate if Constant Pressure Operations, such as Independent Service, Attendant Service, or if the Constant Pressure Door Close option is set to YES, should bypass the Photo Eye when the Photo Eye is active and there is a demand to close the doors and move the car. When set to YES, the car will bypass the Photo Eye and nudge the doors closed. When set to NO, the car will not bypass the Photo Eye; the doors will remain open until the Photo Eye is cleared.

DOOR TYPE IS HORIZONTAL / VERTICAL This option is used to indicate if the doors open horizontally or vertically. When set to vertical, requires constant pressure on the door close button (DCB) to shut the doors when exiting Fire Phase 2 away from the recall floor with Fire Phase 1 active (ASME A17.1 requirement).

FRONT DOOR MECH. COUPLED? *YES/NO* - Set to YES if the front car gate is mechanically coupled to the hallway doors. To satisfy A17.1-2000 code requirements, this option is used to qualify the various door faults when the Retiring Cam Option (see “RETIRING CAM OPTION?” on page 5-22) is set to YES and this option is set to YES.

REAR DOOR MECH. COUPLED? *YES/NO* - Set to YES if the rear car gate is mechanically coupled to the hallway doors. To satisfy A17.1-2000 code requirements, this option is used to qualify the various door faults when the Retiring Cam Option (see “RETIRING CAM OPTION?” on page 5-22) is set to YES and this option is set to YES.

PREVENT DCP TIL DOORS CLOSE? This option is displayed when the Retiring Cam Option is set to YES. When this option is set to YES, the DCP output will not be generated until the doors close and a demand is present. Set this option to YES when it is required that the doors be fully closed before asserting DCP, e.g., when DCP is used to power the retiring cam RC relay, DCP should be asserted only after the doors have fully closed as indicated by the DCL input.

MOMENT. D.C.B TO CLOSE DOORS? *YES/NO* - When this option is set to “YES” a momentary push on the door close button is required to allow the doors to close while on normal operation.

DOORS TO LATCH DOF? *FRONT/REAR/BOTH/NONE* - This option would maintain the Door Open Function on the selected doors continuously as long as a door closing command is absent.

DOORS TO LATCH DCF? *FRONT/REAR/BOTH/NONE* - This option would maintain the Door Close Function on the selected doors continuously as long as a door opening command is absent.

INV. DOOR CLOSE LIMIT? *NONE/ FRONT/ REAR/ BOTH* - Set this option for doors that require inverted door close limit input logic (DCL and/or DCLR). When this option is set, the DCL and/or DCLR inputs must be active when the doors are closed and inactive when the doors are open.

FIRE PH2. WITH DOORS CLOSED? Yes/No FULLY MANUAL DOORS ONLY: If set to Yes, a car recalled on Fire Phase 1 is allowed to enter Fire Phase 2 with doors closed.

Timer Menu Options

SHORT DOOR TIMER (Range: 0.5-120.0 Seconds) - This is the length of time the doors will stay open after being reopened by the Photo Eye, Safety Edge or Door Open button.

CAR CALL DOOR TIMER (Range: 0.5-120.0 Seconds) - This is the length of time the doors will stay open when the car stops to answer a car call.

HALL CALL DOOR TIMER (Range: 0.5-120.0 Seconds) - This is the length of time the doors will stay open when the car stops to answer a hall call.

LOBBY DOOR TIMER (Range: 0.5-120.0 Seconds) - This is the length of time the doors will stay open when the car stops to answer either a hall call or a car call at the Lobby Floor. The location of the Lobby Floor is programmable (see “LOBBY FLOOR” on page 5-19).

NUDGING TIMER (Range: 10-240 Seconds) Used only if the Nudging option is selected. Door Nudging Operation will begin when Nudging Timer elapses. Nudging Timer will start when regular door timer elapses. This timer also determines the ON and OFF cycle time for the NUDG output. (see “NUDGING?” on page 5-22)

TIME OUT OF SERVICE TIMER (Range: 15-240 Seconds, or None) Used to take a car out of service when it is held at a floor excessively and calls are registered at other floors. Timer starts when a call is registered at another floor. If timer expires before the car closes its doors and begins to move, the car will be placed out of service. Typically, this occurs when doors are held open by continuous activation of photo eye, a call button, or another reopening device. When NONE is selected, no Time Out of Service timing is performed.

When the timer expires, the Timed Out of Service Indicator on the HC-MPU board will turn ON. The controller will ignore the PHE (Photo Eye) input if the Stuck Photo Eye Protection option is selected. In duplex or group installations, hall calls assigned to the car will be assigned to another car. When the car closes its doors and begins to move again, it will return to Normal service.

MOTOR LIMIT TIMER (Range: 1.0 - 6.0 Minutes) - This timer starts whenever the controller attempts to move the car in the up direction and is reset when the car reaches its destination floor. If the timer expires before the car reaches its destination, the controller stops trying to move the car up, to protect the motor. The car will then lower to the bottom floor and shutdown. The Motor/Valve Limit Timer Indicator on the HC-MPU board will turn *ON*.

VALVE LIMIT TIMER (Range: 1.0 - 6.0 Minutes) - This timer starts whenever the controller attempts to move the car down, and is reset when the car reaches its destination floor. If the timer expires before the car reaches its destination, the controller will stop trying to move the car, in order to protect the valves. The Motor/Valve Limit Timer Indicator on the HC-MPU board will turn *ON*.

DOOR HOLD INPUT TIMER (Range: 0-240 Seconds) - This timer will be used only if there is a DHLD (Door Hold) input on the controller (see “Spare Inputs Menu Options” on page 5-29). Usually, a Door Hold button will be connected to this input. This timer determines the amount of time that the doors will stay open when the door hold open button is pressed. The timer will be canceled and the doors will begin to close, if either the Door Close button or a Car Call button is pressed. If a Door Hold Key switch (instead of a button) is connected to the DHLD input, this timer value should be set to 0, so that the doors will close when the switch is turned to the *OFF* position.

PARKING DELAY TIMER (Range: 0.0-6.0 Minutes) - This timer is used only if a parking floor is selected (see “PARKING FLOOR” on page 5-19 and see “ALT. PARKING FLOOR” on page 5-19). The timer starts when the car is free of call demand. The car will not park until the timer elapses.

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FAN/LIGHT OUTPUT TIMER (Range: 5.0-20.0 Minutes) - Used with the FLO output. This timer sets the amount of time that will pass before the FLO output will be activated. The time will start when the car becomes inactive. The FLO output should be connected to a relay that when activated, will turn *OFF* the fan and light within the car. This output is also used for *PI Turned Off if No Demand* (see “PI TURNED OFF IF NO DEMAND?” on page 5-50).

HOSPITAL EMERG. TIMER (Range: 0.5-10.0 Minutes) - Used when the HOSPITAL EMERG. OPERATION option is set to YES. This timer sets the amount of time that the car will remain at the hospital emergency floor with the doors open before automatically returning to normal service (see “HOSPITAL EMERG. OPERATION?” on page 5-50).

DOOR OPEN PROTECTION TIMER (Range 8 - 30 Seconds) - This timer determines how long the door operator will attempt to open the doors. If DOL does not go low within this time, the doors will then begin to close.

CTL DOOR OPEN TIMER (Range: 2.0 - 60.0 seconds) - Used when either CTL or CTF spare inputs are programmed. This timer is used to indicate how long the doors should remain open after lowering to the lobby floor when the CTL or CTF spare input is activated.

DOOR BUZZER TIMER (Range: 0 - 30 Seconds) - This timer determines the length of time the door buzzer sounds before the doors are automatically closed.

OPN/CLS INTRLOCK TIMER *(Range: 050ms - 950ms, 50ms increments)* Introduces a delay when closing or opening doors are abruptly reversed (i.e., photo eye activation, door button press, etc.). This may be required if the door operator is sensitive to such reversal due to de-bounce capability. Set to NONE if unnecessary. Note: This timer is only invoked if either DOORS TO LATCH DOF? or DOORS TO LATCH DCF? option are enabled. These two options are set via the Door Operation Menu Options.

FIRE PH1 RECLOSE TIMER *(Range: None or 1 - 120 seconds)* - If set to a value other than NONE, the doors will close after the set number of seconds following a Fire Service Phase 1 recall. Doors may be opened using in-car or hall door open buttons.

SYNC. OP. DELAY TIMER *(Range: None or 1 - 120 seconds)* - If Synchronization Operation has been requested via the SYNCI input (see “SYNCI” on page 5-38) or the Sync. Op. Days timed feature (see “SYNC. OP. DAYS” on page 5-55), this timer will start when the car becomes idle (no demand) and the doors are closed and locked. If Retiring Cam = Yes, the doors would only need to be closed, not locked, before the timer starts. The timer must then expire before the car will respond to the request for Synchronization Operation. If the door opens or the car moves before the timer expires, the timer is reset and will begin again once the car is idle with doors closed and locked.

Gongs/Lanterns Menu Options

MOUNTED IN HALL OR CAR? This option determines when the lanterns and gongs will be activated, as the car slows into the floor for hall mounted fixtures or after the door lock opens for car mounted fixtures. If both types of lanterns will be used, then the Hall option is recommended.

DOUBLE STRIKE ON DOWN? This option causes a double strike of the lanterns and gongs, if the direction preference of the car is down.

PFG ENABLE BUTTON? (Passing Floor Gong Enable Button) If this option is selected, the Passing Floor Gong will only be operative when initiated by a momentary pressure pushbutton. Once initiated, the Passing Floor Gong will operate for the current direction of travel but will be rendered inoperative when the car reverses direction. The PFGE spare input (see “Spare Inputs Menu Options” on page 5-29) should also be selected if this option is turned *ON*.

EGRESS FLOOR ARRIVAL GONG? / MAIN EGRESS FLOOR # To program this option (Michigan Code), set one of the spare outputs to EFG. Then, set EGRESS FLOOR ARRIVAL GONG? to *NO* (no gong) or press *S* to select the floor number where the gong should activate (after the door lock opens). If *S* is pressed, the display will read MAIN EGRESS FLOOR #1. Press *S* until the desired floor number is displayed.

CAR LANTERN DOOR FULLY OPEN If NO, the car lantern turns on when the doors begin to open and remains on until the doors are fully closed. If YES, the car lantern turns on when the doors are fully open and turn off when the doors begin to close.

Spare Inputs Menu Options

The first 10 spare input terminals are located on the HC-CTL-2 board. Additional spare inputs are available on each HC-UIO Universal Input/Output board. Please refer to “HC-UIO-2 Universal Input/Output Board” on page 6-55. If your installation uses ICE-COP-2 or MC-CPI serial control panel boards in the car, spare inputs are also available on these boards and will show up in the Spare Inputs menu as inputs to COP-Fx, CPI-F, CPI-Fx or COP-Rx, CPI-R depending upon the car control panel and rear door board configuration. If the job has ICE-COP-2 or MC-CPI boards, unused spare inputs to these boards must be set to NOT USED. If controller software is upgraded in the field, it is very important to check programmable car panel interface board inputs and verify unused inputs are set to NOT USED.

“Spare” inputs are inputs that can be assigned to a physical board connection through software, allowing great flexibility in configuring a controller to meet specific requirements. Any of these spare inputs (SP1, SP2, ...) may be used for any of the input signals listed in Table 5.6 on page 30.

Viewing and Assigning Spare Inputs

Virtually every elevator installation requires some inputs or outputs that are not “standard.” Perhaps because one site has elevator security requirements while another does not, etc. To accommodate these features without requiring custom software, MCE defines many spare inputs and outputs in standard software that can be assigned to a physical connector and used as needed. Jobs are well defined and tested before shipment, allowing MCE, in most cases, to assign and label these non-standard inputs or outputs and show them in the job prints.

To view assigned spare inputs:

1. Put the car on Inspection and set Function switch F1 up (all others down).
2. Press the N button to cycle through menus until you see “Spare Inputs Menu,” then press the S button to select that menu.
3. The display will show the first “spare” (assignable) connector on the HC-CTL-2 board and the input assigned there.
4. Press the N button to cycle through available assignable connectors in your system and the input, if any assigned.
5. If you want to assign an input to an unused connector, cycle to the desired connector then begin pressing the S button to cycle through available input signals in the order they are shown in the table below. (You can press and hold S to continuously move through the inputs in their numeric/alphabetic order.)
6. When the desired input is shown, press N (it also may be held to cycle) until the Spare Inputs menu is completed and the display again shows the top level menus. Press N until the Save screen is displayed. Save your changes by pressing S when prompted.

After selecting an input, you can also press N and + buttons together to go immediately back to the top level menus, then continue to press N until the Save menu is displayed.

Table 5.6 Spare Inputs Menu Options

Spare Inputs Menu Options	
2AB	Monitoring input for the 2AB relay coil - If the 2AB relay is ON, the R2AB input will be OFF. R2AB should always be the opposite of 2AB otherwise, the 2AB redundancy fault is logged and the elevator shuts down.
ABI	Alarm Bell Input - This input monitors the car through remote monitoring software. There are three conditions that will display a warning on the screen. First, if the Alarm Button is pressed when the car is stopped outside of the door zone. Next, if the Alarm Button is pressed four times in 60 seconds without the car moving. And lastly, if the car fails to complete an LSA movement check after being idle for 10 minutes at a landing. All of these failures will alert the monitoring station.
ACI	Reserved for future use.
ALI	Alternate Lobby Input - The ALI input is used to substitute the Main Lobby floor value with an Alternate Lobby floor value. When the ALI input is activated, the lobby value is taken not from the LOBBY parameter, but from the ALTLBY parameter. The ALTLBY floor must be specified before using the ALI input.
ALV	Alive Input - This input is used in a duplex configuration and is received from the other car. If the input is on for this car, it states that the other car is powered. This input is used in emergency power applications.
API	Alternate Parking Input - This input is used to determine whether to park at the primary parking floor, or at the alternate parking floor. When API is low, the car will park at the primary floor. When API is high, the car will park at the alternate floor.
ARST	Alarm Reset input - When the ARST input is activated, the alarm outputs DISL and DISB are reset.
ATS	Attendant Service Input - When the ATS input is activated, the car is under the control of the attendant (starting, stopping, direction of travel). Doors open automatically when the car is stopped at a landing. Doors are closed only through constant pressure on the door close button, car call button, or either car direction button (UPI and DNI). The attendant may cause the car to bypass all hall calls by activating the “non-stop button” (NSI). The ATSOPT option must also be enabled. While the car is on Attendant Service, all of the Load Weigher Functions (LLW, HLW, OLW) are cleared.
AUTO	Emergency Power Auto Selection Input - This input is for duplexes only. When activated, one of the cars will be automatically chosen to run “normally” on emergency power. The dispatcher makes this decision, and will choose itself if able to run. The slave will be chosen if the dispatcher is unavailable to run. See also the ALV input.
AXR	Auxiliary Reset Input - Usually connected to a push button on a controller to reset redundancy error conditions.
BAB	Monitoring input for the BAB relay coil. If the BAB relay is ON, the RBAB input will be OFF. RBAB should always be the opposite of BAB otherwise, the BAB redundancy fault is logged and the elevator shuts down.
BSI	Building Security Input - This input is used to activate MCE Security when the BSI SECURITY KEY, in the Extra Features Menu (see “BSI SECURITY KEY” on page 5-50), is set to ENABLED.
CCC	Car Calls Cancel Input - Activation of this input will unconditionally cancel car calls. Because this input has no logical qualification in the software, it is highly suggested that necessary qualification be done in external circuitry (e.g., disable the signal feeding this input when on Fire Service Phase II).
CEPFG	When active, enables passing floor gong on CE fixture. Non-latching as opposed to PFGE which latches until direction reversal.
CEVA	When active, enables floor announcements on CE fixture. Always active if CEVA is not programmed. When CEVA is not active, floor announcement on CE fixture is disabled.

Table 5.6 Spare Inputs Menu Options

Spare Inputs Menu Options	
CNP	Contactor Proof Input - This input monitors the normal condition of motor/start contactors and will shut down the car if the contactor fails to make or break contact properly. Generates a Contactor Proofing Redundancy Failure message.
CR1 - CR8	Card Reader Front Landing 1-8 Inputs - These inputs are used to enable the registration of secured car calls for front landings.
CR1R - CR8R	Card Reader Rear Landing 1-8 Inputs - These inputs are used to enable the registration of secured car calls for rear landings.
CRO	Card Reader Override input - This input is used to override the Card Reader Security Inputs. Activating this input will allow car calls to be registered without restriction.
CTF	Car to floor Input - This input is used to return the car to a previously selected floor. The return floor is selected using the parameter CAR TO FLOOR RETURN FLOOR in the EXTRA FEATURES MENU. When activated, this input will cause the car to immediately become non-responsive to hall calls, and will prevent the registration of new car calls. The car will be allowed to answer all car calls registered prior to activation of the CTF input. Once all car calls have been answered, the car will travel to the return floor, perform a door operation, and will be removed from service.
CTL	Car-to-Lobby Input - When activated, this input will cause the car to immediately become non-responsive to hall calls, and will prevent the registration of new call calls. The car will be allowed to answer all car calls registered prior to activation of the CTL input. Once all car calls have been answered, the car will travel to the lobby landing, perform a door operation, and will be removed from service.
CTST	Capture for Test Input - This input will cause the car to bypass Hall Calls and disable the gongs. Car Calls, however, will still be answered and allowed to be entered.
DCL	Door Close Limit Input - Breaks when the car door is approximately 1 inch from being closed. DCL input will be low once the doors fully close. Moving the door approximately 1 inch will reapply power to the DCL input due to the switch making up.
DCLC	Doors Closed Contact Input - This input, when active (high), tells the computer the doors are closed on Retiring CAM (RETCAM) jobs. Since the doors don't lock until the car is ready to move, the computer needs to see this input to know when the doors are closed.
DCLR	Doors Closed Contact Rear input - When active (high) tells the computer the doors are closed on Retiring CAM (RETCAM) jobs. Since the doors do not lock until the car is ready to move, the computer needs to see this input to know when the doors are closed.
DHLD	Door Hold Input - This input will open and hold the doors open for as long as it is active and additionally for the DLHD timer value. Please refer to "DOOR HOLD INPUT TIMER" on page 5-27. DBC input and car call pressure will cancel DHLD timing. Fire Service disables the input.
DHLDR	DHLD input for Rear Doors - See description of DHLD.
DLI	Dispatch Load Input - A load weigher device can be connected to this input. When the input is activated, the door dwell time will be eliminated when the elevator has an up direction at the Lobby Floor.
DLS	Door Lock Sensor Input - Monitors the state of the contacts in the landing door lock string. Power will be present on the DLS input when all the landing doors are closed and locked. Needed for CSA code with Door lock bypass requirement. NOTE: It is mandatory to have the DCL spare input programmed whenever DLS is used.
DLSR	Door Lock Sensor Rear Input - See description for "DLS".
DNI	Down Input (Attendant Service) - This input is used by the attendant during Attendant Service operation to establish a direction preference. Pushing the "DOWN" button in the car will activate this input, which will cause the computer to generate SDA (down direction preference) and DSHT (door shortening) to close the doors.
DOL	Door Open Limit input - Active high input from door open limit switch.

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Table 5.6 Spare Inputs Menu Options

Spare Inputs Menu Options	
DOLR	Door Open Limit Rear input - Active high input from rear door open limit switch.
DPM	Front Door Position Monitoring - Makes when the car door is approximately 1 inch from being closed. DPM input is active once the door fully closes. Moving the door approximately 1 inch removes power from the DPM input due to the switch opening.
DPMR	Rear Door Position Monitoring - Makes when the car door is approximately 1 inch from being closed. DPMR input will be active once the door fully closes. Moving the door about 1 inch will remove power from the DPMR input due to the switch breaking.
DSTI	Door Stop Input - If the doors are opening or closing when this input is detected, the door operation will stop. DOF and DCF/DCP flags are cleared. If the DSTI input is momentary, the doors may then be opened or closed by the DOB or DBC inputs. If the DSTI input is constant, DOB or DCB will not override it. This operation will not function in Fire Service, Inspection or Independent service.
DSTIC	Door Stop Input Complement – Active low (see DSTI, Door Stop Input)
DSTICR	Door Stop Input Complement Rear - Active low (see DSTIR, Door Stop Input Rear)
DSTIR	DSTI for rear doors - See description under DSTI.
DZRX	Door Zone Rear Auxiliary input - This input may be used instead of the DZR (Door Zone Rear) input on the HC-CTL-2 board. It may be assigned to SPIN1 - SPIN6 on the HC-CTL-2 board or to an HC-UIO board input.
DZX	Door Zone Auxiliary input - This input may be used instead of the DZF (Door Zone Front) input on the HC-CTL-2 board. It may be assigned to SPIN1 - SPIN6 on the HC-CTL-2 board or to an HC-UIO board input.
ECRN	Emergency Car Freeze Input - This input is used with EMP-OVL product and will cause the car to freeze, allowing others cars to return on emergency power. Used with EPR input to select car to run (must be programmed).
ELFI	External Latching Fault. Multi-purpose input used to assert a fault that must be manually reset to clear. Once latched, input will cause the car to stop at the next possible floor and shut down. Input will persist over a power cycle. Place car on Machine Room Inspection and press the FAULT RESET button on the HC-CTL-2 board to restore operation. Event log will display "External Latching Fault Input."
EMSC	Emergency Medical Service (EMS) in car switch - When activated, this input will put the car on EMS phase two upon completion of the EMS phase one return.
EMSH	Emergency Medical Service (EMS) hallway switch - When activated, this input will initiate an emergency recall to the designated EMS floor.
EPI	Emergency Power Input - This input indicates loss of the commercial power when it is deactivated. Please refer to "EMERGENCY POWER OPERATION?/EMERGENCY POWER RETURN FLOOR" on page 5-48.
EPR	Emergency Power Return Input - This input is used with the EMP-OVL product. When activated, this input initiates lowering the car to the lobby on emergency power. The ECRN input must also be programmed.
EPRUN	Emergency Power Run Input - This input is wired to the "Run" switch for emergency power car selection. The "dispatcher" in a PTHC duplex system will reference this input when deciding which car should be allowed to run "normally" on emergency power. Each car should have its own EPRUN input. Whichever one is selected, will be the car chosen to run on Emergency Power Phase II.
EPSTP	Emergency Power Stop Input - When activated before the lowering sequence, this input will keep the cars in a frozen state preventing the emergency power transition timer from running. It is usually used for emergency power interface with other systems to delay the lowering sequence.

Table 5.6 Spare Inputs Menu Options

Spare Inputs Menu Options	
EQH	Earthquake Hydro input - This is a latching input. When activated the elevator will stop at the next available landing and shut down. Place car on Machine Room Inspection and press the FAULT RESET button on the HC-CTL-2 board to restore operation.
ERU	Emergency Return Unit Input - When activated, this input will initiate an emergency return to the bottom floor. Upon arrival, the car will be shut down and the doors will cycle for the predetermined time of the ERU timer. The doors will remain open if the ERU timer is set to zero. This input overrides fire service.
ESS	Elevator Shutdown Input - When this input is activated, the car stops at the next landing in the direction of travel, cycles the doors and shuts down. This input is bypassed by Fire, Inspection, Independent, Attendant and Hospital service.
EXMLT	External Motor Limit Timer Input - When activated, this input will initiate an emergency return to the bottom floor (all car calls immediately canceled). Upon arrival at the bottom floor, the car will be shut down and the doors will cycle for the field adjustable SDT time. Note: If it is required to cycle the doors for a predetermined time, then ERU should be used instead.
EXMLTC	Complimented EXMLT Input - This input provides reverse logic for the EXMLT function. EXMLT operation is initiated when this input goes low.
FCCC	Fire Phase II Call Cancel Button Input - When activated during Fire Phase II operation, all registered car calls will be canceled.
FCHLD	Fire Phase II Door Hold Input - When activated during Fire Phase II operation, fully open doors will not be allowed to close. The “HOLD” position of the In-car Fireman’s Service switch is wired to this input.
FCOFF	Fire Phase II OFF Input - Used to take the elevator out of Fire Phase II service. The “OFF” position of the In-car Fireman’s Service switch is wired to this input.
FRAA	Fire Phase I Second Alternate Input - Required by the Detroit fire code. When activated, this input will initiate an emergency return to the second designated alternate floor (FRA must also be active). The alternate fire return floor sensor should activate this input.
FRAON	Fire Phase I Alternate Switch ON Position Input - This fire service switch input will be seen as second priority to the main switch input (FRON) but will override the sensor inputs. When the input is seen as ON, the car will return to the alternate fire floor.
FRBYP	Fire Phase I Switch BYPASS Position Input - This input, when activated, will cause the system to ignore the fire sensors (restoring normal fire service status if the fire service switch is not active) and will unlatch the current fire sensor status.
FRHTW	Hoistway Fire Sensor - (Normally high) Deactivation of the input will initiate recall to the main fire floor and cause the FWL output to flash.
FRMR	Machine room fire sensor - (Normally high) Deactivation of the input will initiate recall to the main fire floor and cause the FWL output to flash.
FRON	Fire Phase I Switch ON Position Input - When activated, this input will place the system in Fire Service Phase I operation. The “ON” position of the fire recall switch is typically wired to this input.
FRON2	Fire Phase I Switch ON Position Input (additional input - same as FRON).
FRSA	Alternate Fire Service - normally active input. When this input goes low, Alternate Fire Service operation is initiated and the FWL output (Fire Warning Light) will flash.
FRSM	Main Fire Service - This is a normally active input. When this input goes low, Main Fire Service operation is initiated and the FWL output (Fire Warning Light) will flash.
GS	Gate Switch Input - Makes up when the car door is approximately 1 inch from fully closed. With the car door closed, there should be power on the GS input. This input is used for CSA door lock bypass and redundancy logic. NOTE: It is mandatory to have the DCL spare input programmed whenever GS is used.

Table 5.6 Spare Inputs Menu Options

Spare Inputs Menu Options	
GSR	Gate Switch Rear Input - When activated, this input indicates that the rear car gate is closed. This input is used for CSA door lock bypass and redundancy logic.
HBF	Hall Call Bus Failure input - This input from the group controller indicates that the serial hall bus has failed. Without hall call direction, local cars will begin "stop at each floor" operation to collect passengers and continue to provide service to the building.
HCC	Hall Call Cancel Input - When activated all registered hall calls are canceled.
HCR1 - HCR8	Hall Card Reader Front Landing 1-8 Inputs - These inputs are used to enable the registration of secured hall calls for front landings.
HCR1R - HCR8R	Hall Card Reader Rear Landing 1-8 Inputs - These inputs are used to enable the registration of secured hall calls for rear landings.
HCRO	Hall Card Reader Override input. When active, causes the car to bypass Per Floor Hall Card Reader security inputs. Hall Calls will be permitted without enabling the Hall Card Reader inputs.
HDCB	Front Hall Door Close Button Input - When activated, this input will initiate door closing for the front door. It is disabled during In-car Fireman's Operation (Fire Service Phase II).
HDCBR	Rear Hall Door Close Button Input - When activated, this input will initiate door closing for the rear door. This input is disabled during In-car Fireman's Operation (Fire Service Phase II).
HDOB	Front Hall Door Open Button Input - When activated, this input will initiate door opening for the front door. This input is disabled during In-car Fireman's Operation (Fire Service Phase II).
HDOBR	Rear Hall Door Open Button Input - When activated, this input will initiate door opening for the rear door. This input is disabled during n-car Fireman's Operation (Fire Service Phase II).
HDSTI	Front Hall Door Stop Input - This input will cause the front door to stop. Subsequently either the front door close or front door open buttons must be pressed to resume door operation. This input is disabled during In-car Fireman's Operation (Fire Service Phase II).
HDSTIR	Rear Hall Door Stop Input - This input will cause the rear door to stop. Subsequently either the rear door close or rear door open buttons must be pressed to resume door operation. This input is disabled during In-car Fireman's Operation (Fire Service Phase II).
HEATD	Heat Detector Input - This input is used for Detroit Fire Code jobs. It is connected to a heat detector located in the machine room and is used to stop the car at the next floor and open the doors (same as PTI). Once the doors are fully open, the HDSC spare output is turned off which indicates that it is okay to remove power from the controller and activate sprinklers in the machine room.
HIND	When active, the car will bypass all hall calls, answer existing car calls but not allow additional car calls to be registered. When calls are satisfied, the car will return to the lobby floor and enter Independent service automatically.
HLI	Heavy Load Input - This input indicates that the car is loaded to the point at which it should no longer accept hall call assignments (heavy load bypass). A "discrete" load weigher contact is typically wired to this input, usually indicating that the load is 75%-80% of full load.
HML	Home Landing Input - This input is used with the primary parking feature and will determine whether the car will park or not. The HLSOPT option must also be enabled to allow this feature to work.

Table 5.6 Spare Inputs Menu Options

Spare Inputs Menu Options	
HOSP	In-car Hospital Service Switch Input - This input is used to initiate Hospital Service Phase 2 operation. Typically, this input is wired to a keyed hospital service switch that is located inside the car. Upon activation, the car will accept a call for any floor, and proceed non-stop to that floor after the doors close. Deactivation of the input restores normal operation of the car.
ICPD	In Car Inspection Down Direction. Intended for a car panel inspection direction button input.
ICPU	In Car Inspection Up Direction. Intended for a car panel inspection direction button input.
INA	Monitoring input for the INAX relay coil.
INSDN	Inspection Down Input - This input is used to indicate that there is an intent to move in the down direction while on Inspection operation.
INSUP	Inspection Up Input - This input is used to indicate that there is an intent to move in the up direction while on Inspection operation.
IRCOF	Front Infrared Cutout. - This is a normally active input. When this input goes low, the infrared detector signal is ignored for the ***front*** door only and the door will always close at reduced torque and speed, i.e., nudge closed unless the door requires a constant door close button signal to close. In this case the door will close at full speed.
IRCOR	Rear Infrared Cutout - This is a normally active input. When this input goes low, the infrared detector signal is ignored for the ***rear*** door only and the door will always close at reduced torque and speed, i.e., nudge closed unless the door requires a constant door close button signal to close. In this case the door will close at full speed.
LD	Level Down.
LU	Level Up.
LLI	Light Load Input - When activated the elevator will only allow the number of car calls specified by the Light Load Car Call Limit parameter to be registered. If more are registered, all car calls are canceled. A discrete load weigher contact is typically wired to this input, indicating that a very minimal passenger load exists in the car. Please refer to “LIGHT LOAD WEIGHING? / LIGHT LOAD CAR CALL LIMIT” on page 5-48.
LOS	Low Oil Switch - (PHC controllers) - This input is connected to a level switch in the oil reservoir. Once activated, the car will immediately lower to the bottom landing and cycle the doors. To clear this condition, on the HC-CTL-2 board, place the car on Machine Room Inspection, press the FAULT RESET button, then return the car to Normal operation.
LSR	Landing System Redundancy Input - This input is used for redundancy checking. It monitors the door zone (DZ) level down (LD) circuits. On any run between floors, we expect the LSR input to go low at least once. If, however the DZ sensor has failed closed, power will be present continuously on the LSR input and the car will not be permitted to restart. “LANDING SYSTEM REDUNDANCY FAILURE” will be displayed on the LCD display. If either the LU or LD sensors failed closed, the controller will not permit the car to restart.
LWB	Load Weigher Bypass - This input is used to bypass the load weigher inputs (LLI, HLI, OVL and DLI).
MNO	Manual Override - When activated, automatic lowering is overridden. The car will recall to the next available landing and complete the recall process.
NSI	Non-Stop Input (Attendant Service) - Activation of this input will cause the car to bypass all hall calls. The input is enabled only when the car is in Attendant operation.
OTTS	Oil Tank Temperature Switch. When activated, the car will lower to the bottom landing, cycle the doors, and turn off power to the solid state starter by dropping the TM output. To clear the fault condition, on the HC-CTL-2 board, place the car on Machine Room Inspection, press the FAULT RESET button, then return the car to Normal operation.

Table 5.6 Spare Inputs Menu Options

Spare Inputs Menu Options	
OVL	Overload Input - While the car is stopped at a landing with the doors open, the activation of this input will hold the doors open until the overload condition is cleared by deactivating the input. Fire Service will bypass OVL.
OVL2	Overload 2 Input - While on Fire Phase II, when the car is stopped at a landing with the doors open, activation of this input will hold the doors open until the overload condition is cleared by deactivating the input (only used for the ANSI A17.1-2000 fire code).
PFGE	Passing Floor Gong Enable Input - Used mostly on New York City jobs. Normally there is not an output from the PFG. When this input is momentarily activated there will be a PFG output as the car passes a floor until the elevator reverses direction (also referred to as "S" button). Please refer to "PFG ENABLE BUTTON? (Passing Floor Gong Enable Button)" on page 5-28.
PHE2F	Second photo eye input for front doors. Same function as PHE. Required when two PHE inputs are required for cycle testing. PHE and PHE2F must activate simultaneously to pass the cycle test.
PHE2R	Second photo eye input for rear doors. Same function as PHE. Required when two PHE inputs are required for cycle testing. PHER and PHE2R must activate simultaneously to pass the cycle test.
PHER	Rear Photo Eye Auxiliary input - May be assigned to SPIN1 - SPIN6 on the HC-CTL-2 board or to an HC-UIO board input.
PHEX	Photo Eye Auxiliary input - This input may be used instead of the PHE (Photo Eye) input on the HC-CTL-2 board. It may be assigned to SPIN1 - SPIN6 on the HC-CTL-2 board or to an HC-UIO board input.
PITFLD	Pit Flood - Activated by pit flood sensor. When activated, the car recalls to the lowest landing above flood level, after which it returns to normal service without serving the inaccessible floors. Renders the floors set in the Extra Features menu "# of flrs below floor level" inaccessible. Fire, Parking, and Emergency floors, if below flood level, will be automatically set to the first available landing above floor level.
PSS	Pressure Switch Input - When activated (low), this input will cause the elevator to stop immediately.
PTI	Power Transfer Input - When this input is activated, it causes the car to stop at the next landing in the direction of travel, open the doors (in accordance with the "LEAVE DOORS OPEN ON PTI/ESS?" parameter) and shut down. This input is typically used with Emergency Power when transferring from normal power to emergency power (testing) or emergency power to normal power.
PTIC	Complimented PTI Input - Provides reverse logic for the PTI function. PTI operation is initiated when this input goes low.
R2AB	Redundancy monitoring input from the 2AB relay contact. (See description of 2AB input).
R5, R4, R3, R2	Floor Encoding Inputs - These inputs are required for jobs with absolute floor encoding. Please refer to "FLOOR ENCODING INPUTS?" on page 5-48.
R2L	Redundancy 2L bus. Used to monitor the normally closed contact of an additional 2L relay.
RBAB	Redundancy monitoring input for the BAB relay contact. (See description of BAB input).
RDLSR	Rear Door Lock Relay Redundancy input (CSA Redundancy) - This input is used to monitor the state of the DLSR relays (there are 2 relays). This input is activated if either one of the two relays is "picked" (a normally open contact from one relay is wired in parallel with a normally open contact from the other relay to feed this input). The logic compares the state of the RDLSR input with the state of the DLSR input (the DLSR input monitors the string of actual door lock contacts) to see if one of the two DLSR relays has failed in the "picked" mode (if DLSR=0 and RDLSR=1, a failure is declared).

Table 5.6 Spare Inputs Menu Options

Spare Inputs Menu Options	
REO	Re-Open Input - Only used on jobs with Houston fire code. This code requires that the doors close after completing a Fire Phase I return. There is a key switch in the hallway used by the fire person to reopen the doors at the main recall floor.
REOA	Re-Open Input Alternate - Houston fire code requires that doors close after completing a Fire Phase I return. A key switch in the hallway connected to this input is used by the fire person to reopen the doors at the Alternate recall floor.
RFV ASME A17.1-2000	Redundancy Fast Valve - Used to monitor the up/down fast valve relay when the VALVE TYPE option (see "VALVE TYPE:" on page 5-55) is set to PILOT RELAYS.
RGS	Redundancy Gate Switch (front) - This input is used to monitor the state of the GS relays (there are 2 relays). This input is activated if either one of the two relays is "picked" (a normally open contact from one relay is wired in parallel with a normally open contact from the other relay to feed this input). The logic compares the state of the RGS input with the state of the GS input (the GS input monitors the actual car gate contact) to check to see if one of the two GS relays has failed in the "picked" mode (if GS=0 and RGS=1, a failure is declared).
RGSR	Redundancy Gate Switch (rear) - This input is used to monitor the state of the GSR relays (there are 2 relays). This input is activated if either one of the two relays is "picked" (a normally open contact from one relay is wired in parallel with a normally open contact from the other relay to feed this input). The logic compares the state of the RGSR input with the state of the GSR input (the GSR input monitors the actual rear car gate contact) to check to see if one of the two GSR relays has failed in the "picked" mode (if GSR=0 and RGSR=1, a failure is declared).
RINAX	Redundancy monitoring input for the INAX relay contact.
RSV ASME A17.1-2000	Redundancy Slow Valve - Used to monitor the up/down slow valve relay when the VALVE TYPE option (see "VALVE TYPE:" on page 5-55) is set to PILOT RELAYS.
SAB	Sabbath Operation Input - This input is used to select Sabbath Operation. This mode will move the car through the hoistway, stopping at landings that are programmed in the Extra Features Menu.
SE	Safe Edge input. When active, doors may not close.
SER	Safe Edge input, rear. When active, rear doors may not close.
SIMP	Simplex Input - Activation of this input will cause a duplex car to behave as a simplex. As a simplex, the car will respond to hall calls registered on its own call circuitry (it will not accept hall calls assigned to it by another controller connected to it) and will perform its own parking function (independent of the other controller).
STARTIN	Start Input - The STARTIN input is used for the START position of the three position Fire Phase II switch for Australian jobs. When activated, it will cause the front and rear doors to close. The car will not proceed to answer car calls during Fire Phase II until the STARTIN input has been activated.
STDX	Programmable, auxiliary step down input. May be assigned to SPIN1 - SPIN6 on HC-CTL-2 board or to an HC-UIO board and used instead of STD input on HC-CTL-2 board.
STUX	Programmable, auxiliary step up input. May be assigned to SPIN1 - SPIN6 on HC-CTL-2 board or to an HC-UIO board and used instead of STU input on HC-CTL-2 board.
SWG	Swing Input. When active will disconnect from the group and act as a simplex, responding to calls from its independent riser. Disable Local Hall Calls, page 5-19, must be set to NO.

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Table 5.6 Spare Inputs Menu Options

Spare Inputs Menu Options	
SYNCI	Synchronization Input - (PHC controllers) - Momentary activation of this input will initiate the jack synchronization function once the Sync. Op Delay Timer has expired (see "SYNC. OP. DELAY TIMER" on page 5-28). This function is intended to equalize hydraulic pressure in systems that utilize more than one piston to move the car (generally two). When appropriate (the car is idle), the car will be taken to the bottom landing. The down normal limit switch is bypassed by activation of a relay connected to the SYNC output, and the car is moved at slow speed in the down direction. The down slow valve circuits are energized for 30 seconds to ensure that the car has been lowered all the way to the buffer. Once this timer elapses the car is moved back up to the bottom landing.
TEST	TEST Switch Input - This input monitors the TEST/NORM Switch located on the Relay Board to differentiate between Test and Independent Operation. This input is normally high and will go low when the switch is placed in the Test position.
TSLB	Bottom Terminal Slow Limit Input - This input will cause high speed to drop if deactivated while the elevator is traveling in the down direction at high speed.
TSLT	Top Terminal Slow Limit Input - This input will cause high speed to drop if deactivated while the elevator is traveling in the up direction at high speed.
UFL	Up Final Limit Input - This is a latching input that monitors the up final limit. Deactivation of this input will shut the elevator down and require a manual reset.
UPI	Up Input (Attendant Service) - This input is used by the attendant during attendant service operation to establish a direction preference. Pushing the "UP" button in the car will activate this input, which will cause the computer to generate SUA (up direction preference) and DSHT (door shortening) to close the doors.
VCI	Viscosity Control Input - Activation of this input will initiate the Viscosity Control Function. When appropriate (when the car is idle and "in service") the Viscosity Control Function will move the car to the bottom landing and activate the pump motor (without energizing the up direction valve circuits). The pump is run for 3 minutes, turned off for 9 minutes, turned on for 3 minutes, and so on and so forth (until the VCI input is deactivated). Registration of any call will preempt the Viscosity Control Function, as will any special operation (e.g., Fire Service, Independent Service, etc.).
WLD	Emergency Dispatch Input - Activation of this input will cause the Wild operation (emergency dispatching) to be disabled. This input was created to allow building personnel or elevator maintenance personnel to disable emergency dispatching on one or more cars in a multi-car system. As an example, if the dispatcher of an 8-car group were to fail, the building may only want 3 cars to run on "wild operation". The remaining 5 cars would be inhibited from running on "wild operation" by the activation of the WLD input.
WPIx (x = A thru H)	Wandering Patient Security (Bracelet Security) inputs - These inputs work in conjunction with the WPIx LANDING parameters in the Extra Features Menu. The landing and side (Front, Rear and Both) must be set for each WPIx input programmed. When a WPIx input is activated, hall calls to the landing and side associated with that input shall be disabled. If the elevator is already located at that landing with the doors open, it will be prevented from leaving that landing and shut down.

Spare Outputs Menu Options

The first four spare output terminals are located on the HC-CTL-2 board. Additional spare outputs are available on each HC-UIO Universal Input/Output board. Please refer to "HC-UIO-2 Universal Input/Output Board" on page 6-55. If your installation uses ICE-COP-2 or MC-CPI serial control panel boards in the car, spare outputs are also available on these boards and will show up in the Spare Outputs menu as outputs from COP-Fx, CPI-F, CPI-Fx or COP-Rx, CPI-R depending upon the car control panel and rear door board configuration. If the job has can panel interface boards, unused spare outputs from these boards must be set to NOT USED. If controller software is upgraded in the field, it is very important to check programmable CPI board outputs and verify unused outputs are set to NOT USED.

"Spare" outputs are outputs that can be assigned to a physical board connection through software, allowing great flexibility in configuring a controller to meet specific requirements. Any of these spare outputs may be used for any of the output signals listed in Table 5.7 on page 40.

Viewing and Assigning Spare Outputs

Virtually every elevator installation requires some inputs or outputs that are not "standard." Perhaps because one site has elevator security requirements while another does not or uses a switch to detect when the machine brake is picked, etc. To accommodate these features without requiring custom software, MCE defines many spare inputs and outputs in standard software that can be assigned to a physical connector and used at need. Jobs are well defined and tested before shipment, allowing MCE to assign, label, and show in the job prints these non-standard inputs or outputs in most cases.

To view assigned spare outputs:

1. Put the car on Inspection and set Function switch F1 up (all others down).
2. Press the N button to cycle through menus until you see "Spare Outputs Menu," then press the S button to select that menu.
3. The display will show the first "spare" (assignable) connector and the output assigned there.
4. Press the N button to cycle through available assignable connectors in your system and the output, if any assigned.
5. If you want to assign an output to an unused connector, cycle to the desired connector then begin pressing the S button to cycle through available output signals in the order they are shown in the table below. (You can press and hold S to continuously move through the outputs in their numeric/alphabetic order.)
6. When the desired output is shown, press N (it also may be held to cycle) until the Spare Outputs menu is completed and the display again shows the top level menus. Press N until the Save screen is displayed. Save your changes by pressing S when prompted.

Note

After selecting an output, you can also press N and + buttons together to go immediately back to the top level menus, then continue to press N until the Save menu is displayed.

Table 5.7 Spare Outputs Menu Options

Spare Outputs Menu Options	
702 - 709	Front Down Hall Call Indicator Outputs. These outputs are typically used to connect hall gongs or chimes. The appropriate output will activate as the elevator is slowing down to a landing. Do not use if a dedicated HC-UIO board is used for Hall Call Indicators.
702R - 709R	Rear Down Hall Call Indicator Outputs. These outputs are typically used to connect hall gongs or chimes. The appropriate output will activate as the elevator is slowing down to a landing. Do not use if a dedicated HC-UIO board is used for Hall Call Indicators.
801 - 808	Front Up Hall Call Indicator Outputs. These outputs are typically used to connect hall gongs or chimes. The appropriate output will activate as the elevator is slowing down to a landing. Do not use if a dedicated HC-UIO board is used for Hall Call Indicators.
801R - 808R	Rear Up Hall Call Indicator Outputs. These outputs are typically used to connect hall gongs or chimes. The appropriate output will activate as the elevator is slowing down to a landing. Do not use if a dedicated HC-UIO board is used for Hall Call Indicators.
900	Car Call Cancellation Output - This output is generated at the time of registration of a car call. This output is used to comply with specific handicap codes (*barrier-free* codes) that require an audible acknowledgment of car call registration
ABZ	Attendant Service Buzzer Output - This output is generated momentarily when a hall call button is pushed while the elevator is on attendant operation. It is used for an in-car buzzer to alert the attendant.
AFFS	Available For Fire Service output. Normally high, will go low if one of the below is true: Car out of service. Car is on Inspection. Car is on Test mode. Car on hospital service and fire does not bypass hospital. Car on EMS service and fire does not bypass EMS.
ATSFO	Active when car is on Attendant Service.
BOTTOM	Bottom landing output - Activates when the car reaches the bottom landing.
CARCOM	Active when car to car communications are good.
CCDE	Car Call Disconnect Enable Output - This output comes *ON* when the car calls are canceled during photo-eye anti-nuisance operation.
CCT	Car Call Time Flag Output - This output represents the state of the CCT flag. It is activated when a car call is canceled, and is deactivated when the door dwell time elapses (or is canceled by pressing a car call button or door close button).
CD	Car Done Returning on Emergency Power Output - This output is active when the car has finished returning on emergency power or when it has been determined that the car cannot lower.
CEPR	Completed Emergency Power Return. Generated when the car has completed emergency power return to the recall landing and is parked with doors open.
CFLT	CSA FAULT OUTPUT - This output turns on when there is a CSA Redundancy fault condition (CNP, ILO and UDF only). It is currently used for Canadian Standards Association (CSA) code only. If this is the applicable code for the installation, please refer to the Compliance Report included with the job.
CGED	Car Gong Enable Down Output - This output is generated to activate the in-car gong/lantern assembly (front doors). It is activated (usually a double ding: on-off-on) to announce the elevator's intention to go down after the doors start to open. This will happen when a down hall call front has been entered and the car has reached the floor for which that call originated from, or it the doors are open and a car call front is entered for a floor below.
CGEDR	CGED for rear doors Output - Same as CGED, but for the rear gong/lantern assembly.

Table 5.7 Spare Outputs Menu Options

Spare Outputs Menu Options	
CGEU	Car Gong Enable Up Output - This output is generated to activate the in-car gong/lantern assembly (front doors). It is activated (usually a single-ding) to announce the elevator's intention to go up after the doors start to open. This will happen when a up hall call front has been entered and the car has reached the floor for which that call originated from, or it the doors are open and a car call front is entered for a floor above.
CGEUR	CGEU for rear doors Output - Same as CGUE, but for the rear gong/lantern assembly.
CGF	Computer Generated Fault Output - This output will come on for any computer generated fault such as Motor/Valve Limit Timer elapsed.
CHBPO ASME A17.1-2000	Car and Hoistway Door Bypass Output - This output is active whenever a door is being bypassed (car gate or hoistway door for both the front and rear sides).
CRO1 - CRO8	Car Card Reader Front Landing Outputs - These outputs are used to indicate that the associated card reader input has been activated thereby allowing the registration of the car call. Once the call is registered the output will remain active until the call is extinguished. Inputs are available for front landings.
CRO1R - CRO8R	Car Card Reader Rear Landing Outputs - These outputs are used to indicate that the associated card reader input has been activated thereby allowing the registration of the car call. Once the call is registered the output will remain active until the call is extinguished. Inputs are available for rear landings.
CSB	Car Stop Switch Bypass Output - This output is used to provide redundancy for the in-car stop switch function. It is activated during Fire Service Phase I to bypass the in-car stop switch (a similar output is one of the standard outputs). By having this second output, the failure of one of these devices (stuck in the active mode) will not cause the stop switch to by bypassed improperly. Redundancy is required by CSA.
CSEO	Code Sequence Enable Output - This output comes on when car is on security and ready to accept the security code. This output goes off once the code has been accepted in the system, or once the code entry window of time has elapsed.
CSR	Car Selected to Run Output - This output is generated when the car is selected to run on Emergency Power phase 2 (via the AUTO or EPRUN input).
CTLDOT	Car-to-Lobby Door Open Timer Output - This output is generated upon completion of the car to lobby function (the car has returned to the lobby landing, the doors have opened, and the CTL door timer has expired).
DBZF	Front Door Buzzer Output - This output will be active, prior to automatic closing of the front doors, for the length of time determined by the Door Buzzer Timer.
DBZR	Rear Door Buzzer Output - This output will be active, prior to automatic closing of the rear doors, for the length of time determined by the Door Buzzer Timer.
DCFRX	Rear Door Close Function Auxiliary Output - Like DCFX but for rear doors.
DCFX	Door Close Function Auxiliary Output - The Door Close Function signals the controller to attempt to close the doors. .
DCPRX	Rear Door Close Power Auxiliary Output - Like DCPX but for rear doors.
DCPX	Door Close Power Auxiliary Output.
DHOF/R	Door Hold Output Front/Rear - Indicates doors are being held open by the door hold input function. (The DHLD input is active or the timer associated with the door hold function has not yet elapsed.) DHOF/R will be active if DHLDF/R is active.
DOFRX	Rear Door Open Function Auxiliary Output - Like DOFX but for rear doors.
DOFX	Door Open Function Auxiliary output - The Door Open Function signals the controller to attempt to open the doors.
DEIS	Front Door Enable Inspection Stop Switch Output - This output will be activated when front door operation is permitted. This output will deactivate if the elevator is on inspection or on TEST mode or the front door stop input has been activated.

Table 5.7 Spare Outputs Menu Options

Spare Outputs Menu Options	
DEISR	Rear Door Enable Inspection Stop Switch Output - This output will be activated when rear door operation is permitted. This output will deactivate if the elevator is on inspection or on TEST mode or the rear door stop input has been activated.
DHEND	Door Hold End Output - This output will turn *ON* five seconds prior to when the Door Hold Timer expires.
DHENDR	Rear Door Hold End Output - This output will turn *ON* five seconds prior to when the Rear-Door Hold Timer expires.
DHO	Door Hold Output - This output indicates that the doors are being held open by the *door hold input* function (the DHLDI input is active, or the timer associated with the door hold function has not yet elapsed).
DISB	Distress Buzzer output - When the ABI (Alarm Bell) input is activated, the DISB output turns on. When the ABI input is deactivated, the DISB output turns off. When the Stop switch is activated, the DISB output turns on. When the Stop switch is returned to normal, the DISB output turns off.
DISL	Distress Light output - When the ABI (Alarm Bell) input is activated, the DISL output turns on. DISL will latch and require momentary activation of the ARST input to clear the DISL output. When the safety string is lost, the DISL output turns on. DISL will latch and require the safety string be restored in addition to momentary activation of the ARST input to clear the DISL output.
DISLX	Auxiliary Distress Light output - When the ABI (Alarm Bell) input is activated, the DISLX output turns on. DISL will latch and require momentary activation of the ARST input to clear the DISLX output. When the safety string is lost, the DISLX output turns on. DISLX will latch and require the safety string be restored in addition to momentary activation of the ARST input to clear the DISLX output. When the elevator is shut down due to some other reason, such as PTI with car calls present, the DISLX output will turn on.
DLOB	Door Left Open Bell Output - Comes on when a call button is pressed and the door has been left open. Used on single button collective and single automatic push button when the hall and car call buttons are connected.
DNO	Down Output (Attendant Service) - This output is used for Attendant Service to indicate that a hall call has been registered below the car and the car has been assigned to answer it. It is normally used to turn on an indicator light to alert the attendant that such hall calls exist.
DNS	Down Sense output - Active while the car travels in the down direction.
DO1,	**DO2, DO4, DO8, DO16, D032** - Binary coded P.I. outputs for digital P.I. devices.
DOOR ENAB	Door Enable Output - This output will be activated when door operation is permitted. For example if the car is not on Inspection and not on TEST mode.
DSH	Door Time Shortening Output (intermediate) - This output is generated whenever a *destination car call* button is pressed (this action causes the shortening of the door dwell time if the doors are fully open).
DSHT	Door Time Shortening Front Output (final) - This output reflects the status of the DSHT flag and is generated if either a *destination car call* button is pressed or if the front door close button is pressed
DSHTR	Door Time Shortening Rear Output (final) - This output reflects the status of the DSHTR flag and is generated if either a *destination car call* button is pressed, or if the rear door close button is pressed.
ECRN	Emergency Power Car Run Output - This output is a reflection of the emergency car run flag associated with the emergency power logic. When activated, it indicates that the car is being prevented from running by the emergency power operation logic.

Table 5.7 Spare Outputs Menu Options

Spare Outputs Menu Options	
EFG	Egress Floor Gong Output - This output will activate for 300 msec. when the car arrives at the "egress" floor and opens the doors in response to a hall or car call (requires that the egress floor be programmed, see "EGRESS FLOOR ARRIVAL GONG? / MAIN EGRESS FLOOR #" on page 5-28). This output is used to activate an audible indicator to inform visually impaired passengers that the elevator has arrived a the main egress floor of the building.
EMSB	Emergency Medical Service Buzzer Output - This output comes on as soon as the EMS hall switch is activated (EMSIH) and extinguishes when the car reaches the EMS floor (Phase 1 return). EMSB is used to ring an audible signal in the car to alert passengers that the car is being commandeered on EMS service.
EMSIC	Emergency Medical Service Car Indicator Output - This output comes on as soon as the EMS hall switch is activated (EMSH) and will stay on until the car returns to normal service. EMSB is used to activate a visual indicator in the car to alert passengers that the car is on EMS service.
EMSIH	Emergency Medical Service Hall Indicator Output - This output comes on as soon as the EMS hall switch is activated (EMSH) and extinguishes when the in-car switch is activated (EMSC). This output is used for a visual indicator that informs that EMS personnel that the EMS signal has been recognized by the control system.
EP1	Emergency Power Phase 1 Output - This output is activated when Emergency Power is initiated via the EPI input and stays on until all cars have been recalled to the emergency power landing (sequential lowering, the first phase of emergency power).
EP2	Emergency Power Phase 2 Output- This output is activated when the system is in the second phase of emergency power (after recall, the *normal running* of a car on emergency power generators) and remains activated until commercial power is restored.
EQHL	Earthquake Hydro Latch output - On Hydro controllers this output provides a means to drive an earthquake status indicator.
EQIND	Earthquake Independent output. Generated when the CWI input is activated and the car is out of a door zone on Independent Service
EQL	Earthquake Light. Active during earthquake operation.
FCHLDO	Monitors the status of the Fire Phase II Door Hold Input.
FCOFFO	Monitors the status of the Fire Phase II OFF Input.
FIR1	Fire Service Phase I Output - This output is activated during Fire Service Phase I Main and Alternate operations.
FLASH	Flash Output - This output turns ON and OFF at 0.5 second intervals.
FLO	Fan/Light Operation Output - This output is used to turn *OFF* the fan and the light within the car. The output is usually *OFF.* It is turned *ON* after the Fan/Light Timer elapses. The timing starts when the car becomes inactive.
FRC	Fire Service Phase II Output - This output is activated when the car is on Fire Service Phase II. It will remain active until the elevator has completely transitioned out of Fire Service Phase II operation which, depending on the fire code programmed, may not be until the elevator has completed its return to the recall floor and the doors have fully opened after turning the In-car Firefighter's switch to the off position.
FRCT	True Fire Service Phase II Output - Like FRC, this output is activated when the car is on Fire Service Phase II. Unlike FRC, it may remain active after the car is taken off of In-car Firefighter's Service and until the car has recalled to the recall floor and the doors are preparing to open.
FRM	Fire Service Phase I Output - This output is activated when the car is on Main or Alternate Fire Service Phase I. It is deactivated when Fire Service Phase II begins.
FSA	Fire Service Alternate Output - This output is activated when the FRA input is activated by the main fire sensor. It remains activated while the car is on Fire Service Phase I.

Table 5.7 Spare Outputs Menu Options

Spare Outputs Menu Options	
FSLCX	Fire Service Light C.O.P. Auxiliary Output - When active, indicates in-car fire service light is active.
FSLLX	Fire Service Lobby Light Auxiliary Output - When active, indicates the lobby fire service light is active.
FSM	Fire Service Main Output - This output is activated by either the fire sensor or switch input for either Fire Service Main Phase I or II.
FSO	Fire Service On Output - This output is activated when the car is on Fire Service Phase I or II and is generally used to activate the visual fire service indicator in the cab.
FSVC	True Fire Service Output - This input is activated when the car is on Fire Service Phase I or II and is used to extinguish the hall position indicators as required by ANSI89 Fire Code.
FWIX	Fire Service Buzzer Auxiliary Output.
FWL	Fire Warning Light Output - This output is used to indicate when the car is on Fire Phase I or II. It will be ON solid except if the machine room or hoistway fire sensors have tripped (FRMR, FRHTW, FRSA, FRSM), in which case it will flash.
GDO1/	**2/4/8/16/32** Gray Code digital outputs for Gray Code Digital PI devices.
GEDRX	Gong Enable Down Rear Auxiliary Output - Same as GEDX, but for rear doors.
GEDX	Gong Enable Down Auxiliary Output - Unlike the standard GED output on the HC-CTL-2 board, this one is not active on inspection, Fire phase I, or Fire phase II operation.
GEURX	Gong Enable Up Rear Auxiliary Output - Same as GEUX, but for rear doors.
GEUX	Gong Enable Up Auxiliary Output - Unlike the standard GEU output on the HC-CTL-2 board, this one is not active on inspection, Fire phase I, or Fire phase II operation.
H	High Speed output - (informational) Active when the elevator is running at high speed.
HCP	Hall Call Button Pushed Output - This output is active whenever a hall call button is pressed. It is only activated for the amount of time that the button is being pressed.
HCR	Hall Call Reject Output - This output reflects the status of the HCR flag which indicates that a car is not in a position to respond to a hall call, e.g. the car is out of service or its heavy load status is active.
HCRO1 - HCRO8	Hall Card Reader Front Landing Outputs - These outputs are used to indicate that the associated card reader input has been activated thereby allowing the registration of the hall call. Once the call is registered the output will remain active until the call is extinguished. Inputs are available for front landings.
HCRO1R - HCRO8R	Hall Card Reader Rear Landing Outputs - These outputs are used to indicate that the associated card reader input has been activated thereby allowing the registration of the hall call. Once the call is registered the output will remain active until the call is extinguished. Inputs are available for rear landings.
HDNL	High speed down and not leveling. Informational output.
HDSC	Heat Detector Shutdown Complete Output - This output, used for jobs with Detroit Fire Code, is normally active. When the HEATD spare input is activated, the car stops at the next landing and open the doors. Once the doors are fully open (DOL=0), the HDSC output is turned off to indicate that it is okay to shutdown the controller and activate the machine room sprinklers.
HEO	Hospital Emergency Operation output - This output flashes when the car has been selected to respond to a hospital emergency call and will remain flashing until the in-car hospital switch is returned to normal or the time interval that the car must wait for the in-car switch to be turned ON expires (see "HOSPITAL EMERG. OPERATION?" on page 5-50, also see "HOSPITAL EMERG. TIMER" on page 5-27).
HLW	Heavy Load Weigher Output - This output reflects the heavy load status of the elevator. The output is activated when the load in the elevator exceeds the threshold setting (see "Load Weigher Thresholds" on page 5-63) or when the HLI input is activated.

Table 5.7 Spare Outputs Menu Options

Spare Outputs Menu Options	
HOSPH2	Hospital Emergency Phase 2 output - This output will remain ON, indicating that the car has arrived at the floor where the hospital call was registered, until the in-car hospital switch is returned to normal or the time interval that the car must wait for the in-car switch to be turned ON expires (see “HOSPITAL EMERG. OPERATION?” on page 5-50, also see “HOSPITAL EMERG. TIMER” on page 5-27).
HSEL	Hospital Emergency Select output - This output will remain steadily ON, indicating that the car has been selected to answer a hospital call, until the in-car hospital switch is turned ON or the time interval expires (see “HOSPITAL EMERG. TIMER” on page 5-27, also see “HOSPITAL EMERG. OPERATION?” on page 5-50).
HUNL	High speed up and not leveling. Informational output.
HWI	Hospital Emergency Warning Indicator output - This output will remain steadily ON for a car on Independent Service when a hospital emergency call is registered (see “HOSPITAL EMERG. OPERATION?” on page 5-50).
INDFRC	Independent Service/Fire Service Phase 2 Output - This output is used for elevators with either single button collective or single automatic push button operation (see “OPERATION:” on page 5-17). This output is used to disconnect hall calls during Fire Service and Independent Service.
INDO	Independent Service Output. Active when the elevator is running on Independent mode. Typically used to drive an indicator light.
INSP	Inspection. Active when the car is on Inspection operation (any inspection or access mode).
ISRT	In Service and Running Output - This output reflects the car’s ability to respond to hall calls (the ISRT status). ISRT is active when the car’s status is such that it can answer hall calls.
ISV	In Service Output - This output reflects the status of the in-service flag (ISV) which indicates that the car is in normal passenger mode of operation.
ISVF	Flashing In-Service output - This output functions similar to the standard ISV output, however the ISV output will flash whenever the car times out-of-service (see also ISV).
IUL	In Use Light Output - This output activates when the car is in use, e.g., the car is in motion or the doors are open.
LCTF	Front photo eye cycle test output. When this output and the 2PHEF input are programmed, the front doors will not close until the front photo eye cycle test passes. Prior to closing the front doors, the controller will generate the LCTF output so the door operator will cycle the front PHE inputs (Off to On, then On to Off). During this time, the front PHE is disabled for normal operation. Only fire service bypasses this operation.
LCTR	Rear photo eye cycle test output. When this output and the 2PHER input are programmed, the rear doors will not close until the rear photo eye cycle test passes. Prior to closing the rear doors, the controller will generate the LCTR output so the door operator will cycle the rear PHE inputs (Off to On, then On to Off). During this time, the rear PHE is disabled for normal operation. Only fire service bypasses this operation.
LLW	Light Load Weigher Output - This output reflects the light load status of the elevator. The output is activated when the load in the elevator is less than the threshold set for light load anti-nuisance (see “Load Weigher Thresholds” on page 5-63) or when the LLI input is activated (see “LIGHT LOAD WEIGHING? / LIGHT LOAD CAR CALL LIMIT” on page 5-48).
MISV	Mechanically In Service Output - This output is normally active when the car is running normally, but is turned off when the car appears to be mechanically out of service (as indicated by the Safety String (SAF) and Motor Limit Timer (MLT).
MLT	Motor Limit Timer Elapsed Output - This output is activated in two instances: when the Motor Limit Timer Elapses, and when the EXMLT input is active (Hydro controller).

Table 5.7 Spare Outputs Menu Options

Spare Outputs Menu Options	
MLTP	Motor Limit Timer Elapsed Output (not activated by EXMLT) - Activated when the Motor Limit Timer has elapsed. Not activated by EXMLT.
NBZX	Nudging Buzzer Auxiliary output. Unlike the standard NBZ output on the HC-CTL-2 board, this one is not active on inspection, Fire phase I, or Fire phase II operation.
NCD	Car Not Done with Emergency Power Return Output - This output is deactivated when the car has finished returning on emergency power or when it has been determined that the car cannot lower (see "EMERGENCY POWER OPERATION?/EMERGENCY POWER RETURN FLOOR" on page 5-48).
NDGRX	Rear Door Nudging Auxiliary Output - Same as NDGX, but for rear doors.
NDGX	Door Nudging Auxiliary Output - The Door Nudging output signals the controller to attempt to close the doors at reduced torque. Unlike the standard N1 output on the HC-CTL-2 board, this one is not active on inspection, Fire phase I, or Fire phase II operation.
OFR	One Floor Run Output - This output is generated when the car initiates a run and remains active until the car encounters the first door zone in its movement (the output is active while traversing the first floor height in its direction of travel).
OFRP ASME A17.1-2000	One Floor Run Programmable Output - This output will be active while making one-floor runs between adjacent floors designated in the Extra Features Menu (see "OFRP BETWEEN FLRS" on page 5-53).
OLW	Overloaded Car Threshold Output - This output is activated when the threshold value considered to be unsafe to move the elevator is reached (see "Load Weigher Thresholds" on page 5-63) or OVL input. When this threshold is exceeded, the car will remain at the floor with doors open. A typical application that requires such a feature will use some type of visual and/or audible indicator to alert elevator passengers that the car is overloaded (this is the typical reason for using this output). This operation is overridden by Fire Service Phase II operation.
PFGX	Passing Floor Gong Auxiliary Output. Unlike the standard PFG output on the HC-CTL-2 board, this one is not active on inspection, Fire phase I, or Fire phase II operation.
PH1	Fire Service Phase I Return Complete Output - The PH1 output indicates that the car has successfully completed the Fire Service Phase I recall function (the car is at the fire recall floor with its doors open). This output is most often used as a signal that it is okay to activate the machine room sprinklers.
PI1 - PI8	Position Indicator outputs (discrete). One wire per floor.
PRIFLG	Priority Service Output - This is to indicate, to the emergency power overlay, that this car is on emergency/priority service and should be selected to run. Priority operation includes: Hospital Service, EMT Service, Fire Service Phase II, Earthquake Service and Test Mode.
SAFO	Safety output - This output activates when the car safety string opens.
SEC	Security Code Incorrect Output - When the building's elevator security is on, this output will turn on for five seconds when an incorrect security code is entered.
SIMPO	Simplex Output - This output comes on when the SIMP input is activated or when Simplex Operation is chosen through KCE (if available). It is used to activate a relay(s) to separate the two hoistway risers.
SYNC	Synchronization Output - (PHC controllers) - This output is used to bypass the down normal limit switch to allow the car to be moved to the buffer at leveling speed. The computer generates the down direction output (DNDO) to move the car in the down direction. This output will be generated for 10 seconds to allow the car to move completely onto the buffer. Once this time elapses, the computer will generate the up direction output to move the car in the up direction at leveling speed, until the car reaches the bottom landing dead zone. At the time up direction travel is initiated, the SYNC output is turned *OFF*, removing the bypass around the down normal limit switch.
TESTSWO	Test switch output - activates when the car is put in Test mode.

Table 5.7 Spare Outputs Menu Options

Spare Outputs Menu Options	
TOS	Timed Out of Service Output - This output is a reflection of the Timed Out of Service flag. The TOS flag is set if the car does not move within a certain amount of time, with either SUA or SDA active.
UPO	Up Output (Attendant Service) - This output comes on to indicate that a hall call has been registered above the car and the car has been assigned to answer it. UPO is normally used to run an indicator light to alert the attendant that such hall calls exist.
PI1 - PI8	Position Indicator outputs (discrete). One wire per floor.
UPS	Up Sense output - Active while the car travels in the up direction.
WLDI	Wild Operation Indication Output - This output is generated when the car is in emergency dispatch mode of operation, e.g., if the hall call bus fuse is blown and *emergency dispatching* is activated.
XPI1 - XPI7	Auxiliary Position Indicators 1 through 7 Outputs - These outputs behave identically to the standard PI1 - PI7 outputs except that the XPI1 - XPI7 outputs are disabled on Inspection or during Fire Service Phase I and II.
XSDA	Auxiliary Supervisory Down Arrow Output - This output behaves identically to the standard SDA output.
XSUA	Auxiliary Supervisory Up Arrow Output - This output behaves identically to the standard SUA output.
ZADJ	Zero Adjust Output - This output is used to cause the analog load weigher to perform its zero adjust procedure. The output is generated once every 31 hours or whenever the car is idle at the bottom floor for 30 seconds.

Extra Features Menu Options

PI OUTPUT TYPE Choose either 1 WIRE PER FLOOR, BINARY BASE 1, BINARY BASE 0, GRAY CODE 1, or GRAY CODE 0 depending on the inputs required by the position indicator and whether the floor count begins with a zero value or a one value.

FLOOR ENCODING INPUTS? If this option is selected, whenever the car is in a door zone the computer checks the floor code inputs and corrects the P.I., if necessary. The code inputs are provided by the landing system (refer to the Job Prints). Refer to R4, R3, R2 (see "Spare Inputs Menu Options" on page 5-29).

ENCODE ALL FLOORS? This option is only available when the Floor Encoding option is programmed to YES. This option indicates at what landing the Absolute Floor Encoding values begin. When set to YES, then every landing must have AFE code values, including the terminal landings. When set to NO, then only intermediate landings must have AFE code values.

EMERGENCY POWER OPERATION?/EMERGENCY POWER RETURN FLOOR If this option is selected, the controller will put the elevator into Emergency Power Operation when the controller receives the Emergency Power Input (EPI) signal. During Phase 1 of Emergency Power Operation, the car will be moved to the emergency power return floor. In a duplex controller, each car will be moved to the emergency power return floor, one at a time.

During Phase 2 of Emergency Power Operation, if the car's Emergency Power Run (EPRUN) input is activated, the car will run normally. Otherwise, the car will remain at the emergency power return floor and will not respond to any calls.

For a simplex controller, the car's EPRUN input is sometimes connected to a switch, so that the input can be turned *ON* and *OFF*. For a duplex controller, both cars' EPRUN inputs are usually connected to a Run Selection switch. The position of this switch determines which car will run during Phase 2 of Emergency Power Operation.

Often there is an AUTO position on the Run Selection switch connected to the AUTO input on both controllers in a duplex. If the AUTO input is activated, then one car will be automatically selected to run during Phase 2 of Emergency Power Operation. For example: If one car happens to be out of service when the operation begins, the other car will be automatically selected to run. Car will not run on Swing Operation unless the swing input is toggled.

If the Emergency Power option is selected, then the appropriate spare inputs should be selected also (see "Spare Inputs Menu Options" on page 5-29).

LIGHT LOAD WEIGHING? / LIGHT LOAD CAR CALL LIMIT This option is only used when the Light Load Weigher Input is activated (see "Spare Inputs Menu Options" on page 5-29, LLI spare input). To program this option, activate the LLI input. Then, set LIGHT LOAD WEIGHING? to *NO* or press *S* to select the maximum number of car calls registered before all the car calls are canceled. If *S* is pressed, the display will read LIGHT LOAD CAR CALL LIMIT. Press *S* until the desired number is displayed.

PHOTO EYE ANTI-NUISANCE? / CONSEC STOPS W/O PHE LIMIT When this option is *ON*, the car calls will cancel if the Photo Eye input has not been activated after a programmed number of consecutive stops. The number of consecutive stops must be programmed before the car calls will cancel. To program this option, set PHOTO EYE ANTI-NUISANCE? to *NO* or press *S* to select the number of consecutive stops. If *S* is pressed, the display will read CONSEC STOPS W/O PHE LIMIT. Press *S* until the desired number is displayed.

DEDICATED CARD READER SECURITY? Enables card reader security through HC-UIO boards set aside (dedicated) for security I/O only. No non-security I/O may be connected to these boards.

UIO Board/Security Enforcement/Connection Order

The maximum number of security system signal connections for a single floor is four: One each for front and rear control panels and one each for front and rear hall stations. In reality, each floor may not require all four inputs; for example, some floors may not have rear doors while others do. In order to use UIO board connections most efficiently, the system uses the floor service "map" set up through Basic Features, page 5-18, and information from the following option set of four prompts, to set aside the actual number of security connections required for each floor. **THESE OPTIONS ARE FACTORY-SET**, if the information is available, before the system is shipped and you just follow the job prints to make connections.

CARD REDR INPUTS- STACKED C/H? If No, the system knows that each security UIO board's connections will be of one type (hall reader or car panel reader). Press S to set to NO. Press N to move to the next option. 5

- If yes, the system knows that car and hall security may be serviced by different connections on the same UIO board. It will then need clarification as to which calls must be accommodated:
  - After setting CARD REDR INPUTS - STACKED C/H to YES, use the + key to move to the next "clarification" prompt.
  - CARD REDR INPUTS - F CAR CALS? Y/N. Use the S key to respond. Yes if you have front car call readers; No if you do not. Use the + key to move to the next prompt.
  - CARD REDR INPUTS - F HAL CALS? Y/N. Use the S key to respond. Yes if you have front hall call readers; No if you do not. Use the + key to move to the next prompt.
  - CARD REDR INPUTS - R CAR CALS? Y/N. Use the S key to respond. Yes if you have rear car call readers; No if you do not. Use the + key to move to the next prompt.
  - CARD REDR INPUTS - R HAL CALS? Y/N. Use the S key to respond. Yes if you have rear hall call readers; No if you do not.
  - Press N to exit the prompt set.

IND. CNCL. CALLS ON STOP? If yes, on Independent service and if more than one car call is registered, when the first car call is answered all other registered car calls will be canceled.

WPIx LANDING? (x = A thru H) Wandering Patient Security (Bracelet Security) When a WPIx input is activated, hall calls to the landing and side associated with that input are disabled. If the elevator is already at that landing with doors open, it will be shut down and prevented from leaving that landing. Set the landing number and the side (Front, Rear or Both) to be disabled when the corresponding spare input (WPIA thru WPIH) is activated.

ALLOW CAR CALLS ON WP SEC.? *YES/NO* - Wandering Patient Security (Bracelet Security) If set to Yes, car calls to landings with active WPIx inputs are allowed, otherwise car calls to those landings shall be disabled.

CANCEL BOTH HALL (U/D) CALLS *YES/NO* - If set to NO, when servicing a hall call, only the call in the direction of travel is canceled. If set to YES, when servicing a hall call, calls in both up and down directions are canceled.

RETAIN CALLS ON CTL/CTF? *YES/NO* - If set to No, when a Car-to-Lobby or Car-to-Floor function is activated, latched car calls are serviced and then the car moves to the return or lobby floor. If set to Yes, when CTL or CTF is activated, the car moves to the return or lobby floor immediately, but any un-serviced car calls remain latched. When CTL/CTF is dropped, the retained calls are serviced.

AUTOMATIC FLOOR STOP OPTION? / AUTOMATIC STOP FLOOR #? When this option is set to a specific floor number, the car will automatically stop at that floor if its travel would cause it to pass that floor.

CC CANCEL W/DIR REVERSAL? This option will cause all of the previously registered car calls to be canceled whenever a direction reversal is detected.

CANCEL CAR CALLS BEHIND CAR? If this option is set to *YES* and the car has a direction arrow (SUA/SDA), no car calls can be registered behind the car's current position. For example: If a car is at the fifth floor moving down, no car calls can be registered from sixth floor and above.

CE ELECTRONICS BOARD? *REV 1/REV 2* - This option allows information such as position and arrival gong outputs to be provided for a CE electronics device. This option is to be used with the CE Electronics Interface board (Rev 1 and Rev 2) which provides a 3-wire serial interface to CE electronic fixtures.

MASSACHUSETTS EMS SERVICE? / EMS SERVICE FLOOR # This option is provided in the state of Massachusetts only. This option is key-operated and provides immediate car service for Massachusetts Emergency Medical Service personnel.

BSI SECURITY KEY This option is a board-level control of the security system. Standard Security is initiated by the BSI Security Key. There are three possible settings for the BSI Security Key: ACTIVATED, ENABLED or DEACTIVATED.

- If set to ACTIVATED, Security is initiated.
- If set to ENABLED, Security is initiated only if the Building Security Input (BSI) is turned *On*.
- If set to DEACTIVATED, Security is deactivated regardless of the status of the BSI input.

PI TURNED OFF IF NO DEMAND? Setting this option to *YES* will allow the PI outputs to turn *OFF* if the car has been inactive for an adjustable time (from 1 to 10 minutes) as determined by the fan/light timer. Please refer to “FAN/LIGHT OUTPUT TIMER” on page 5-27.

HOSPITAL EMERG. OPERATION? This option calls any eligible in-service elevator to any floor on an emergency basis. If this installation has Hospital Emergency Service Operation, a hospital emergency call switch will be installed at each floor where this service is desired.

When the hospital emergency momentary call switch is activated at any floor, the hospital emergency call registered light will illuminate at that floor only, and the nearest available elevator will respond to the hospital emergency call. All car calls within the selected car will be canceled and any landing calls which had previously been assigned to that car will be transferred to the other car. If the selected car is traveling away from the hospital emergency call, it will slow down and stop at the nearest floor without opening the doors, reverse direction, and proceed nonstop to the hospital emergency floor. If the selected car is traveling toward the hospital emergency floor, it shall proceed nonstop to that floor. At the time of selection, if the car happens to slow down for a stop, it will stop without opening the doors and then start immediately toward the hospital emergency floor.

When the car reaches the hospital emergency floor, it will remain with doors open for a predetermined time interval. After this interval has expired, if the car has not been placed on in-car Hospital Emergency Service Operation, the car will automatically return to normal service.

A hospital emergency key switch will be located in each car operating station for selecting in-car Hospital Emergency Service Operation. Upon activation of the key switch, the car will be ready to accept a call for any floor, and after the doors are closed, will proceed nonstop to that floor. Returning the key switch to the normal position will restore the car to normal service**.**

Either car selected to respond to a hospital emergency call will be removed from automatic service and will accept no additional calls, emergency or otherwise, until it completes the initial hospital emergency function. If both cars are out of service and unable to answer an emergency call, the hospital emergency call registered light will not illuminate.

Four outputs are available on the first HC-UIO board used for the hospital emergency service calls. Hospital Emergency Operation (HEO) will flash once the car has been selected to respond to a hospital emergency call and will remain flashing until the in-car hospital switch is returned to normal or the time interval that the car must wait for the in-car switch to be turned *ON* expires. Hospital Emergency Warning Indicator (HWI) will remain steadily *ON* for a car on Independent Service when the hospital call is registered. Hospital Emergency Select (HSEL) will remain steadily *ON*, indicating that the car has been selected to answer a hospital call, until the in-car hospital switch is turned *ON* or the time interval expires. Hospital Emergency Phase 2 (HOSPH2) will remain *ON*, indicating that the car has arrived at the floor where the hospital call was registered, until the in-car hospital switch is returned to normal or the time interval that the car must wait for the in-car switch to be turned *ON* expires.

If you do not have Hospital Emergency Service Operation, set this option to *NO* by pressing the *S* push button. Then, press the *N* push button to exit this option.

If you have Hospital Emergency Service Operation, set this option to *YES* by pressing the ***S*** push button. Press the ***N*** push button to continue. The following display will appear:

If you want Hospital Emergency Service to this landing, then set this option to *YES* by pressing the ***S*** push button (press ***S*** again to set the option to *NO*). Press the '+' push button to scroll through the available landings. Press the ***N*** push button to continue. If this car has rear doors, then the following will be displayed:

Press the '+' push button to scroll through the available landings. The computer will continue to present these options for each floor, up to the top floor. Press the ***N*** push button to exit the Hospital Emergency Service option.

FIRE BYPASSES HOSPITAL? Used if the HOSPITAL EMERG. OPERATION and FIRE SERVICE OPERATION options are set to YES. Set this option to YES if Hospital Service is used for VIP, Priority or Commandeering Service. Set this option to NO if Hospital Service is *truly* used for Hospital Service, also known as Code Blue.

HIGH SPEED DELAY AFTER RUN? Setting this option will insert a fixed delay (3 seconds) between the completion of a run and the initiation of the next run. This option should be used in applications in which an immediate "stop/start" is undesirable. Under most "normal" circumstances, the initiation of a run is delayed by the time required for the door operation. In some cases, however, the car may stop and start immediately in the absence of a door operation (example: a direction reversal upon being assigned a hall call while the car is parking).

SABBATH OPERATION If you do not have Sabbath Operation, set this option to *NO* by pressing the ***S*** Push button. Then, press the ***N*** push button to exit this option.

If you have [1]Sabbath Operation, set this option to *YES* by pressing the ***S*** push button. Press the ***N*** push button to continue. The following display will appear:

"FRONT UP STOP AT FLOOR 1?"

If you want to set the car to stop at this floor while traveling or initiating travel in the UP direction, press the *S* push button to select *YES* (press *S* again to set this option back to *NO*). Press the + push button to increment the floor value to the next landing. Continue until all of the desired front UP stops are set to *YES*.

Press the *N* push button to proceed to the next eligibility map. If there are no walk through doors on this controller, then the rear eligibility maps will not display. In order, the next eligibility maps are as follows:

"REAR UP STOP AT FLOOR 1?"
"FRONT DOWN STOP AT FLOOR 2?"
"REAR DOWN STOP AT FLOOR 2?"

Remember that the + push button increments the floor value to the next landing. And that the *N* push button will proceed to the next eligibility map.

LEVELING SENSOR ENABLED/DISABLED If this option is set to disabled, the LEVELING SENSOR FAILED - ON POSITION and DOOR ZONE SENSOR FAILURE - ON (OFF) POSITION errors will not be generated.

KCE ENABLE / DISABLE The KCE Enable is set to ON when ENABLE is selected or OFF when DISABLE is selected from the menu display.

ANALOG LOAD WEIGHER? This option enables the analog load weigher logic and selects the type of learn operation to be performed, depending on the type of load weigher installed.

1. For Sabbath operation, you must have a spare input assigned to activate Sabbath and a switch or other activation device properly connected to the input in addition to setting the Sabbath parameter.

IND. BYPASS SECURITY? YES / NO This option determines if Elevator Security is bypassed when the car is on Independent Service (available only when Security is enabled).

ATS BYPASS SECURITY? YES / NO This option determines if Elevator Security should be bypassed when the car is on Attendant Service (available only when Security and Attendant Service are enabled).

CAR TO FLOOR RETURN FLOOR This option determines the floor to which the car will be returned when the CAR TO FLOOR input is activated (see CTF in Spare Inputs Menu Options).

SCROLLING SPEED (NORMAL/FAST/SLOW) Menu options which are too long to be fully displayed on the LCD display are scrolled. This option determines the scrolling speed.

LOW OIL SWITCH CONTACT (N.O. / N.C.) This option should be set according to the type of low oil switch used (normally open or normally closed).

OVER TMP SWITCH CONTACT (N.O. / N.C.) This option should be set according to the type of oil tank temperature switch used for the OTTS input (normally open or normally closed). If an Over Temp Switch has been added as a spare input, this option will appear under EXTRA FEATURES. Use this option to select the type of switch contact used.

OFRP BETWEEN FLRS Sets the floors between which the OFRP output will be triggered. The One Floor Run Programmable output will then be on while making **one-floor runs** between designated floors.

ENABLE FRONT DOB ON SECURITY? *YES/NO* - YES = the front door open button will be enabled for all landings including secure landings. NO = the front door open button will be disabled at secure landings once the doors have closed.

ENABLE REAR DOB ON SECURITY? *YES/NO* - YES = the rear door open button will be enabled for all landings including secure landings. NO = the rear door open button will be disabled at secure landings once the doors have closed.

FLR COUNT BELOW FLOOD LEVEL? PITFLD spare input required. Indicates the number of floors below flood level and thereby sets the flood level. The set number of floors from the bottom of the hoistway will not be serviced when the PITFLD input is active.

DISABLE TOP FLRS ON PITFLD *YES/NO* - PITFLD spare input required. Prevents the elevator from servicing floors at the top of the hoistway (determined by FLR COUNT BELOW FLOOD LEVEL) when the PITFLD input is active, thereby preventing the counterweight from going into the water.

RETAIN CALLS ON CTL / CTF? *NO*: If Car To Lobby or Car To Floor are activated, the car will first service registered car calls then move to the recall floor. Hall calls are canceled.

YES: If Car To Lobby or Car To Floor are activated, the car will first service registered car calls then move to the recall floor. Hall calls are retained and served after the CTL input is deactivated.

FIRST LOWER/RUN ON EP PWR Allows selection of the Duplex car (A or B) that will be first to lower and run on emergency power.

Additional Car Options Menu

HOISTWAY ACCESS? (YES/NO) Set to YES if job has Hoistway Access operation.

TOP ACCESS? (F/R) Set to the riser in which the hall access switch is located.

BOTTOM ACCESS? (F/R) Set to the riser in which the hall access switch is located.

NUMBER OF MOTOR STARTERS (1-3) - Indicates the total number of starters for this car.

MIN. NUMBER OF MOTORS (1-3) - Set the minimum number of starters required to run. This option is only available for multi-starter controllers.

SOFT-STOP TIMER (NONE / 0.1-1.0 sec) - The soft-stop timer will cause the pump to continue to operate for the programmed amount of time after the elevator has stopped to allow the valves to fully close.

STARTER #1 TYPE: (WYE-DELTA / ACROSS THE LINE / SOLID STATE) - Select the appropriate type of starter. Applicable to starter #1.

STARTER #2 TYPE: (WYE-DELTA / ACROSS THE LINE / SOLID STATE / NONE) - Select the appropriate type of starter. Applicable to starter #2.

STARTER #3 TYPE: (WYE-DELTA / ACROSS THE LINE / SOLID STATE / NONE) - Select the appropriate type of starter. Applicable to starter #3.

Y-D TRANSFER TIMER (1.0-8.0 sec) - Represent the amount of time that the motor will run with a Wye contactor before switching to the Delta contactor. Set this option only for starters with WYE-DELTA configuration.

UP TO SPEED TIMER (1.0-8.0 sec) - Represent the amount of time that the controller will wait to allow the motor to accelerate to nominal speed. Set this option only for starters with ACROSS THE LINE or SOLID STATE configuration.

Y-D OPEN TRANSN. TIMER (50-500 msec) - Represent the time delay in picking the Delta contactor after the dropping of the Wye contactor. Set this option only for starters with WYE-DELTA configuration.

M CONTACTOR INSTALLED? (YES/NO) - Set this option to YES only for starters with M Contactors. Option not available for SOLID STATE starters.

STARTER CONFIG: (SEQUENTIAL / SIMULTANEOUS) - This option is only available for multi-starter Hydraulic systems. If the SEQUENTIAL option is set the starters will start in a sequential fashion to reduce inrush current. If the SIMULTANEOUS option is set then all starters in the system will start at the same time.

VALVE TYPE: (STANDARD / PILOT RELAYS / TKE / DOVER) - This option indicates the type of valve used for this installation.

SPEED > 150 FPM? (YES/NO) - This option must be set to YES on ASME A17.1-2000 code compliant hydraulic elevators with speeds exceeding 150 FPM. When on Inspection operation, running at high speed is prevented by disabling the UFE and DFE outputs.

DOOR POSITION MONITOR: (NONE/FRONT/REAR/BOTH) - This parameter indicates the use of a door position monitor on front, rear or both doors (DPM / DPMR inputs) in order to enable the door position monitor logic.

FRONT DOOR CLOSE LIMIT? (NONE/DCL/GS+DCAB) - Set to the front door close limit signals used by this car. (DCL for door close limit switch. GS and DCAB for gate switch and door closed bottom access. None.)

REAR DOOR CLOSE LIMIT? (NONE/DCL/GS+DCAB) - Set to the rear door close limit signals used by this car. (DCL for door close limit switch. GS and DCAB for gate switch and door closed bottom access. None.)

LS-EDGE LANDING SYSTEM? (YES/NO - Set to YES if you are using the LS-EDGE landing system.

Timed Features

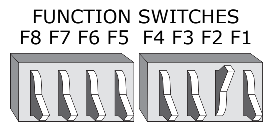
This menu allows you to select and program features that will be executed based on a time schedule.

SYNC. OP. DAYS (EVERYDAY, MON, TUE, WED, THUR, FRI, SAT, SUN) - Use ***S*** and + push buttons to select (YES/NO) the day(s) on which the Synchronization operation is to be performed (use in lieu of SYNCI input, see “SYNCI” on page 5-38).

SYNC. STARTING TIME (24 hour format / 30 minute increments) - Set the time at which the Synchronization operation is to begin (see “SYNC. OP. DELAY TIMER” on page 5-28).

F2: External Memory Mode

External Memory mode can be used to view memory addresses in the external RAM on the HC-MPU board. The external memory address is denoted by the letters DA (Data Address). The ability to view the external memory can also be helpful for diagnosing and troubleshooting the elevator system. The Computer External Memory Chart (page 5-58) shows the meaning of the data digits at different addresses.



External Memory Mode

Getting Into External Memory Mode

External Memory mode is initiated by placing the *F2* switch in the up position. The following is a description of the LCD display format and the function of the N, S, +, and - push buttons during External Memory mode.

```
EXTERNAL MEMORY
DA.1234:10001000
```

Function of N Push Button

The ***N*** push button allows for the advancement of the computer memory address, which is displayed on the second line of the LCD display. For example, for this display, pressing the ***N*** push button once (hold it for 1-2 seconds) will cause the 1 in the address 1234 to begin blinking. By continuing to press the ***N*** push button, the 2 in the address 1234 will begin to blink. The cycle will continue while the ***N*** push button is being pressed. Once the digit needed to be changed is blinking, the address can then be modified.

The data (8 digits) that correspond to the external memory address is displayed to the right of the address. This data display will change as the memory address changes.

Function of S Push Button

The ***S*** push button ends the ability to change the address by stopping the digit from blinking. If the ***S*** push button is not pressed, the selected digit will stop blinking automatically after 20 seconds.

Function of + Push Button

The + push button modifies the digit of the computer memory address selected by the ***N*** push button. If the + button is pressed, the selected digit is incremented by one. The data display will also change as the address changes. For example, if the 2 of the address 1234 is blinking, pressing the + push button once will change the address from 1234 to 1334. Pressing the + push button several more times will change the address to 1434, 1534, 1634, etc., up to 1F34 and then back to 1034.

Function of – Push Button

The – push button modifies the digit of the computer memory address selected by the N push button. If the – push button is pressed, the selected digit is decrement by one. The data display will also change as the address changes. For example: If the 2 in the address 1234 is blinking, pressing the – push button once will change the address from 1234 to 1134. Pressing the – push button several more times will change the address to 1034, 1F34, 1E34, etc.

Troubleshooting Using External Memory Mode

By using the computer's External Memory mode, it is possible to find out if the controller is receiving call signals correctly, as well as HC-UIO board input and output signals.

The following example illustrates how to use the Computer External Memory Chart to check a signal in the computer's external memory.

Example problem: The DHLD (Door Hold Open Switch) input will not cause the doors to stay open. DHLD is programmed for the Spare 5 input.

1. Find SP5 in the Computer External Memory Chart (page 5-58). Notice that the Address of SP5 is 02AF and the Position is 5.
2. Look up the signal on the computer. Change the address on the display to Address 02AF (see “F2: External Memory Mode” on page 5-56). Look at data bit number 5 (from the right), which is underlined in the following display:

```
EXTERNAL MEMORY
DA.02AF:10001000
```

This digit represents the computer's interpretation of the Spare 5 input signal. If the digit is 1, the computer thinks that the SP5 signal is *ON*. If the digit is 0, the computer thinks that the SP5 signal is off.

This information can be used to determine the source of the problem. If the Spare 5 input is programmed for the DHLD (Door Hold) input and the doors are not staying open, the diagnostic display will show that the SP5 input is off. If this is the case, checking the voltage on the SP5 terminal will show whether the problem is inside or outside the controller.

Table 5.8 Computer External Memory Chart

HALL CALLS							CAR CALLS	
ADD	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
0140:	601R/UC1R	601/UC1					101R/CC1R	101/CC1
0141:	602R/UC2R	602/UC2	502R/DC2R	502/DC2			102R/CC2R	102/CC2
0142:	603R/UC3R	603/UC3	503R/DC3R	503/DC3			103R/CC3R	103/CC3
0143:	604R/UC4R	604/UC4	504R/DC4R	504/DC4			104R/CC4R	104/CC4
0144:	605R/UC5R	605/UC5	505R/DC5R	505/DC5			105R/CC5R	105/CC5
0145:	606R/UC6R	606/UC6	506R/DC6R	506/DC6			106R/CC6R	106/CC6
0146:	607R/UC7R	607/UC7	507R/DC7R	507/DC7			107R/CC7R	107/CC7
0147:	608R/UC8R	608/UC8	508R/DC8R	508/DC8			108R/CC8R	108/CC8
0148:	609R/UC9R	609/UC9	509R/DC9R	509/DC9			109R/CC9R	109/CC9
0149:	610R/UC10R	610/UC10	510R/DC10R	510/DC10			110R/CC10R	110/CC10
014A:	611R/UC11R	611/UC11	511R/DC11R	511/DC11			111R/CC11R	111/CC11
014B:	612R/UC12R	612/UC12	512R/DC12R	512/DC12			112R/CC12R	112/CC12
014C:	613R/UC13R	613/UC13	513R/DC13R	513/DC13			113R/CC13R	113/CC13
014D:	614R/UC14R	614/UC14	514R/DC14R	514/DC14			114R/CC14R	114/CC14
014E:	615R/UC15R	615/UC15	515R/DC15R	515/DC15			115R/CC15R	115/CC15
014F:	616R/UC16R	616/UC16	516R/DC16R	516/DC16			116R/CC16R	116/CC16
0150:	617R/UC17R	617/UC17	517R/DC17R	517/DC17			117R/CC17R	117/CC17
0151:	618R/UC18R	618/UC18	518R/DC18R	518/DC18			118R/CC18R	118/CC18
0152:	619R/UC19R	619/UC19	519R/DC19R	519/DC19			119R/CC19R	119/CC19
0153:	620R/UC20R	620/UC20	520R/DC20R	520/DC20			120R/CC20R	120//CC20
0154:	621R/UC21R	621/UC21	521R/DC21R	521/DC21			121R/CC21R	121/CC21
0155:	622R/UC22R	622/UC22	522R/DC22R	522/DC22			122R/CC22R	122/CC22
0156:	623R/UC23R	623/UC23	523R/DC23R	523/DC23			123R/CC23R	123/CC23
0157:	624R/UC24R	624/UC24	524R/DC24R	524/DC24			124R/CC24R	124/CC24
0158:	625R/UC25R	625/UC25	525R/DC25R	525/DC25			125R/CC25R	125/CC25
0159:	626R/UC26R	626/UC26	526R/DC26R	526/DC26			126R/CC26R	126/CC26
015A:	627R/UC27R	627/UC27	527R/DC27R	527/DC27			127R/CC27R	127/CC27
015B:	628R/UC28R	628/UC28	528R/DC28R	528DC28			128R/CC28R	128/CC28
015C:	629R/UC29R	629/UC29	529R/DC29R	529/DC29			129R/CC29R	129/CC29
015D:	630R/UC30R	630/UC30	530R/DC30R	530/DC30			130R/CC30R	130/CC30
015E:	631R/UC31R	631/UC31	531R/DC31R	531/DC31			131R/CC31R	131/CC31
015F:			532R/DC32R	532/DC32			132R/CC32R	132/CC32

SPARE INPUTS*								
ADD	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
02AF:	SP8	SP7	SP6	SP5	SP4	SP3	SP2	SP1
02B0:	SP16	SP15	SP14	SP13	SP12	SP11	SP10	SP9
02B1	SP24	SP23	SP22	SP21	SP20	SP19	SP18	SP17
02B2	SP32	SP31	SP30	SP29	SP28	SP27	SP26	SP25
02B3	SP40	SP39	SP38	SP37	SP36	SP35	SP34	SP33
02B4	SP48	SP47	SP46	SP45	SP44	SP43	SP42	SP41
02B5							SP50	SP49

* The first 10 spare inputs are located on the HC-CTL-2 board. The remaining spare inputs are located on HC-UIO boards numbered 32 through 36 (8 per board).

SPARE OUTPUTS **								
ADD	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
02EF:	OUT4	OUT3	OUT2	OUT1				
02F0:	OUT12	OUT11	OUT10	OUT9	OUT8	OUT7	OUT6	OUT5
02F1:	OUT20	OUT19	OUT18	OUT17	OUT16	OUT15	OUT14	OUT13
02F2:	OUT28	OUT27	OUT26	OUT25	OUT24	OUT23	OUT22	OUT21
02F3:	OUT36	OUT35	OUT34	OUT33	OUT32	OUT31	OUT30	OUT29
02F4:	OUT44	OUT43	OUT42	OUT41	OUT40	OUT39	OUT38	OUT37

** The first four spare outputs are located on the HC-CTL-2 board. The remaining spare outputs are located on HC-UIO boards numbered 32 through 35 (8 per board).

Table 5.9 Hospital Call and Eligibility Memory Chart

	HOSPITAL CALL ELIGIBILITY				HOSPITAL CALLS				
	OTHER CAR		THIS CAR		ASSIGNED HOSPITAL CALLS		REGISTERED HOSPITAL CALLS		
	REAR	FRONT	REAR	FRONT	REAR	FRONT	REAR	FRONT	
ADD	8	7	6	5	4	3	2	1	
0240:							ECR1	EC1	Floor # 1
0241:							ECR2	EC2	Floor # 2
0242:							ECR3	EC3	Floor # 3
0243:							ECR4	EC4	Floor # 4
0244:							ECR5	EC5	Floor # 5
0245:							ECR6	EC6	Floor # 6
0246:							ECR7	EC7	Floor # 7
0247:							ECR8	EC8	Floor # 8
0248:							ECR9	EC9	Floor # 9
0249:							ECR10	EC10	Floor # 10
024A:							ECR11	EC11	Floor # 11
024B:							ECR12	EC12	Floor # 12
024C:							ECR13	EC13	Floor # 13
024D:							ECR14	EC14	Floor # 14
024E:							ECR15	EC15	Floor # 15
024F:							ECR16	EC16	Floor # 16
0250:							ECR17	EC17	Floor # 17
0251:							ECR18	EC18	Floor # 18
0252:							ECR19	EC19	Floor # 19
0253:							ECR20	EC20	Floor # 20
0254:							ECR21	EC21	Floor # 21
0255:							ECR22	EC22	Floor # 22
0256:							ECR23	EC23	Floor # 23
0257:							ECR24	EC24	Floor # 24
0258:							ECR25	EC25	Floor # 25
0259:							ECR26	EC26	Floor # 26
025A:							ECR27	EC27	Floor # 27
025B:							ECR28	EC28	Floor # 28
025C:							ECR29	EC29	Floor # 29
025D:							ECR30	EC30	Floor # 30
025E:							ECR31	EC31	Floor # 31
025F:							ECR32	EC32	Floor # 32

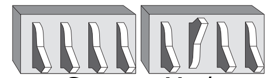
Legend for Table 5.8:

	Registered hospital calls for the floor opening. 1 = call is registered 0 = call is not registered
	Assigned hospital calls for the floor opening 1 = Call is assigned 0 = Call is not assigned
	The car is eligible for hospital Emergency Service Operation for the floor opening. 1 = Hospital emergency call can be entered for the floor opening 0 = Hospital emergency call cannot be entered for the floor opening

F3: System Mode

System mode allows the user to change certain system-wide options that do not require the car to be on Inspection. To enter System mode, move the ***F3*** switch to the up position. Press the ***N*** push button to select the desired System Mode item.

FUNCTION SWITCHES
F8 F7 F6 F5 F4 F3 F2 F1



System Mode

- Building Security Menu (see page 5-60)
- Passcode Request Menu (see page 5-62)
- Load Weigher Thresholds (see page 5-63)
- Analog Load Weigher Learn Function (see page 5-63)
- Controller System Menu (see page 5-66)
- Messages and Floor Labels (see page 5-67)

Building Security Menu

Elevator Security is typically used to prevent access to specific floors via the elevators, or to limit access to passengers with a valid security code. MCE's elevator security options include Basic Security and Basic Security with Remote Monitoring. Basic Security provides a means to prevent registration of unauthorized car calls. Basic Security with Remote Monitoring provides a means to prevent registration of unauthorized car calls and/or hall calls and additional programming options are available via the remote monitoring. Refer to MCE's iMonitor User's Guide, part # 42-02-S025 for additional information and instructions for using the remote monitoring software. The Appendix *Elevator Security Information and Operation* in this manual provides instructions for passengers who will be using the elevator while Security is ON. For both Basic Security and Basic Security with Remote Monitoring, the security codes for each floor are programmed as described below.

The Security code for each floor may consist of one to eight characters where each character is one of the floor buttons found in the elevator car. With Basic Security, any floor with a programmed security code is a secured floor when Security is ON. Basic Security is turned ON or OFF by the Building Security Input (BSI) (see “Spare Inputs Menu Options” on page 5-29) in combination with the BSI Security Key parameter in the Extra Features Menu (see “BSI SECURITY KEY” on page 5-50). There are 3 possible settings for the BSI Security Key: ACTIVATED, ENABLED, and DEACTIVATED:

- If set to ACTIVATED, Security is ON.
- If set to ENABLED, Security is ON when the BSI input is turned *ON*.
- If set to DEACTIVATED, Security is OFF regardless of the status of the BSI input.

To find the BSI input, refer to the job prints. When Security is ON, all car calls are screened by the computer and become registered only if 1) the call is not to a secured floor, or 2) the call is to a secured floor and its security code is correctly entered within 10 seconds.

Viewing the Building Security Menu

1. Place the ***F3*** switch in the up position (with all other switches in the down position).The following display appears:

```
  SYSTEM MODE
PRESS N TO BEGIN
```

2. Press the ***N*** pushbutton. The following display appears:

```
*   BUILDING   *
*SECURITY MENU *
```

Programming and Viewing the Security Codes

1. Press the ***S*** push button to start programming or changing the Security codes (or to view the codes).

   If no code has been programmed, the computer displays NO CODE PROGRAMMED for that particular floor. Press the ***S*** push button again to start programming the Security code.

   ```
   Flr 1f: NO
   CODE PROGRAMMED
   ```

   If a code has already been programmed, the computer displays the security code, with the floor number blinking.

   ```
   Flr 1f: 8r 3f 4f
     2r21f31r19f17r
   ```

2. Press the + and – push buttons to change the ***floor number***. The + push button increments the floor number to the next eligible value. The – push button decrements the value.
3. Press the ***S*** push button to move to the first character of the ***security code*** (COP button to be pressed)**.** Press the + and – push buttons to change the value of the first character.
4. Repeat these steps (pressing the ***S*** push button followed by the + and – push buttons) until the desired number of characters are programmed (maximum of 8 characters). The ***S*** push button moves the blinking cursor. If any character is left blank, or after all eight characters have been programmed, and the ***S*** push button is pressed, the cursor returns to the floor number.
5. Repeat these steps to program the Security codes for all the floors. You may exit the Building Security Menu at any time during programming by pressing the ***N*** push button. When the ***N*** push button is pressed, the LCD will display the following:

   ```
   Exit this menu?
     N=No  S=Yes
   ```

6. Press the ***S*** push button to exit or the ***N*** push button to return to the previous display. If ***S*** is pressed, the following will appear (only if changes have been made):

   ```
   Save Changes?
     N=No  S=Yes
   ```

7. Press ***S*** to save the changes or ***N*** to exit without saving (any original codes will remain in effect if the changes are not saved).

Passcode Request Menu

The Passcode Request Operation can be used to require a password to be entered in order to run the car on any mode of operation other than **Inspection.**

Note

If the passcode option has not been activated for this controller, the Passcode Request Menu will not appear.

If a passcode has been programmed, the LCD screen will flash the "PASSCODE REQUESTED" message when Passcode Request Operation is activated.

```
PASSCODE REQUEST
PI 8 20:10001000
```

In order to clear or set the Passcode Request Operation, the controller must first be placed into the System Mode (see "F3: System Mode" on page 5-60). By pressing the ***N*** push button when the display reads "BUILDING SECURITY MENU," the Passcode Request Menu will appear:

```
*   PASSCODE    *
  REQUEST MENU
```

Screen 1

Clearing the Passcode With Screen 1 displayed, press the ***S*** push button. If Passcode Request Operation is activated, the following screen appears:

```
REQUESTED PASS-
CODE: 00000000
```

Screen 2

The first character of the passcode to be entered will blink. The "+" and "-" push buttons will scroll through the numbers 0-9 and letters A-Z for each character of the passcode. The ***N*** push button will advance to the next character position of the passcode.

Pressing the ***S*** push button will cause the program to verify that the passcode entered was correct. If it was not correct, the following screen will appear:

```
* INVALID CODE *
S=CONT.   N=EXIT
```

Screen 3

Pressing the ***S*** push button will display Screen 2. Pressing the ***N*** push button from this screen will return the display back to Screen 1.

If the correct passcode was entered, the following screen appears:

```
*  VALID CODE   *
     N=EXIT
```

Screen 4

Pressing the ***N*** push button will return the display to Screen 1. The car may now be run on Normal operation mode.

Activating the Passcode With Screen 1 displayed, press the ***S*** push button. If Passcode Request Operation is not activated, the following display appears:

```
ACTIVATE
PASSCODE?  NO
```

Screen 5

Pressing the ***S*** push button will toggle the display from "NO" to "YES". Pressing the ***N*** push button while "NO" is displayed will return the display back to the Screen 1. Pressing the ***N*** push button while "YES" is displayed will activate the Passcode Request Operation and return the display back to Screen 1. With Passcode Request Operation *activated*, the passcode must be entered in order to run the car on any mode of operation other than Inspection.

Load Weigher Thresholds

This menu does not appear if the ANALOG LOAD WEIGHER option in the EXTRA FEATURES MENU is set to NONE. The load weigher (isolated platform, rope tension or crosshead deflection) provides a signal that corresponds to the perceived load in the car. This signal is brought to the control system where it is conditioned, sampled and digitized, and the value is used to calculate the actual load *inside* the elevator. This load value is then used for logical dispatching operations. The load thresholds are user-programmable and determine when each of these logical operations should be performed.

- **LIGHT LOAD WEIGHER (LLW):** This value is used to define the load at which a limited number of car calls is to be registered (anti-nuisance). If the programmed number of car calls is exceeded, all car calls will be canceled.

  Example: `LLW=20%`. If the measured load in the car is less than 20%, the computer will only allow a certain number of car calls to be registered, defined by the parameter `LIGHT LOAD WEIGHING?` / `LIGHT LOAD CAR CALL LIMIT` in the `EXTRA FEATURES MENU OPTIONS`. If the limit is set to a value of three, the computer will only allow three calls to be registered if the load is less than 20%. If a fourth call is registered, all car calls will be canceled.

- **DISPATCH LOAD WEIGHER (DLW):** This value is used to define the load at which the lobby landing door timer is reduced. This threshold should be set to a value (defined in many specifications as 60%) at which it is appropriate to initiate the process of moving the car out of the lobby.
- **HEAVY LOAD WEIGHER (HLW):** This value is used to define the load value at which hall calls should be bypassed.
- **OVERLOAD WEIGHER (OLW):** This value is used to define the load at which it is considered unsafe to move the elevator. When this threshold is exceeded, the car will remain at the floor with doors open. Typically an application that requires OLW will use some type of visual and/or audible indicator to alert elevator passengers that the car is overloaded.

5

Adjusting the Load Thresholds

The typical values for the load thresholds are shown below. However, these thresholds are user-adjustable and may be changed at any time.

To adjust these thresholds:

1. Enter the `SYSTEM` mode of operation by placing the *F3* switch in the up position.
2. Press the ***N*** push button until `LOAD WEIGHER THRESHOLDS` appears on the LCD display.
3. Press the **S** push button to display the load threshold you wish to set.
4. The value shown is the current threshold value expressed as a percentage of the full load value (see the table above). Press the '+' or '-' push button to adjust the value. If the value is set to 0%, the load weigher function is disabled.
5. Press the ***S*** push button to select another load threshold to adjust or press the ***N*** push button to exit this menu.
6. Place the ***F3*** switch in the down position to exit `SYSTEM` mode when finished.

Analog Load Weigher Learn Function

The Analog Load Weigher Learn Function must be performed before the load weigher system will perform properly. With the isolated platform load weigher (MCE), the system simply learns the reference values of the empty and fully loaded car weight. However, with the crosshead deflection load weigher (K-Tech) and the rope tension sensing load weigher (EMCO), the system must learn the reference values at each floor due to the dynamics of the elevator system. This is necessary because the perceived load at the crosshead varies with the position of the car in the hoistway due to the changing proportion of the traveling cable hanging beneath the car and the position of the compensation cables.

The Analog Load Weigher Learn Function is performed as follows:

1. Move the ***empty*** car to a convenient floor where the test weights are located. It is best to have one person in the machine room and another person at the floor to load the weights.
2. Place the car on Independent Service operation. Place the ***F3*** switch in the up position and press the ***N*** push button to select the Analog Load Weigher Learn Function (scrolling message is displayed)
   - ANALOG LOAD WEIGHER LEARN FUNCTION. PRESS S TO START
3. Press the ***S*** push button to start. The computer responds with one of two scrolling messages:
   - CAR NOT READY TO LEARN, MUST BE ON INDEPENDENT SERVICE
4. Verify that the car has been placed on Independent Service.
   - READY TO LEARN EMPTY CAR VALUES? PRESS S TO START
5. If the empty car values have already been learned and you want to be learn the full car values, press the ***N*** push button (go to step 9). To begin learning the empty car values, press the ***S*** push button. The computer displays the message:
   - LEARNING EMPTY CAR VALUES. PRESS N TO ABORT
6. If the Extra Features Menu Option “Analog Load Weigher?” is set to K-TECH, the car will move to the bottom floor, record the empty car value and then move up, stopping at each floor to record the empty car value. When the top floor has been reached, the car will move back to the floor at which the Analog Load Weigher Learn Function was begun and the computer will display the scrolling message:
   - EMPTY CAR LEARN PROCESS COMPLETED. PRESS S TO CONT.
7. If the Extra Features Menu Option “Analog Load Weigher?” is set to MCE, the car will learn the empty car value and then display the message:
   - EMPTY CAR LEARN PROCESS COMPLETED. PRESS S TO CONT.
8. Press the ***S*** push button. The computer displays the scrolling message:
   - READY TO LEARN FULL CAR VALUES? PRESS S TO START.
9. Place the full load test weights in the car and press the ***S*** push button to begin learning the full car values. The computer displays the message:
   - LEARNING FULL CAR VALUES. PRESS N TO ABORT.

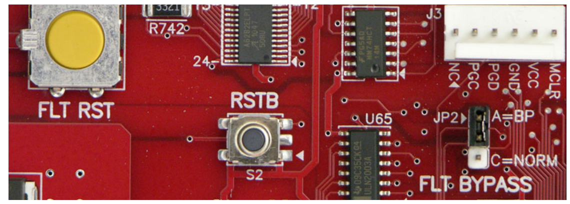
10. If the Extra Features Menu Option “Analog Load Weigher?” is set to K-TECH, the car will move to the bottom floor, record the full car value and then move up, stopping at each floor to record the full car value. When the top floor has been reached, the car will move back to the floor at which the Analog Load Weigher Learn Function was begun and the computer will display the scrolling message:
    - FULL CAR LEARN PROCESS COMPLETED. PRESS S TO CONT.
11. If the Extra Features Menu Option “Analog Load Weigher?” is set to MCE, the car will learn the full car value and then display the message:
    - FULL CAR LEARN PROCESS COMPLETED. PRESS S TO CONT.
12. Press the ***S*** push button, place the ***F3*** switch in the down position and take the car off of Independent service.
13. To verify that the Load Weigher Learn Function has been performed successfully, place the ***F8*** switch in the up position. With the test weights in the car, the following should be displayed:
    - CURRENT LOAD = 100%
14. If the Load Weigher Learn Function has not been performed successfully, the following will be displayed:
    - CURRENT LOAD = NOT LEARNED
15. The Load Weigher Learn Function (empty or full values) may be aborted at any time by pressing the ***N*** push button. The computer will display the message:
    - LEARN PROCESS ABORTED... PRESS S TO CONT.
16. When the ***S*** push button is pressed the computer displays the scrolling message:
    - ANALOG LOAD WEIGHER LEARN FUNCTION. PRESS S TO START
17. At this point you may exit System Mode by placing the ***F3*** switch in the down position, or you may re-start the learn function by moving the car back to the floor where the test weights are located and press ***S*** to start (go to step 4).
18. If the empty car values have been learned but the full load learn function was aborted, you need not re-learn the empty car values. When the message READY TO LEARN EMPTY CAR VALUES is displayed, press the ***N*** push button. The computer will display:
    - READY TO LEARN FULL CAR VALUES? PRESS S TO START.
19. Press the ***S*** push button to begin learning the full car values (go to step 10).

Controller System Menu

The following options are set using this menu:

AUTOMATIC MODE FAULT BYPASS. JUMPER MUST BE INSTALLED TO ACTIVATE. (BYPASS ON/BYPASS OFF)

For the purpose of testing and adjustment, this option allows redundancy faults to be bypassed when the controller is on Automatic operation. In order to use this option, a jumper must be placed on JP2 (center pin jumpered to A) near the FAULT RESET button on the HC-CTL-2 board).



Press the ***S*** push button to toggle the setting to BYPASS ON or BYPASS OFF. A timer will return the controller to BYPASS OFF automatically after two hours. In addition, if the jumper is removed from JP2 (center pin to A), the controller is removed from bypass mode.

```
AUTOMATIC MODE F
*  BYPASS OFF   *
```

INSPECTION MODE FAULT BYPASS. JUMPER MUST BE INSTALLED TO ACTIVATE. (BYPASS ON/BYPASS OFF)

```
INSPECTION MODE
*  BYPASS OFF   *
```

For the purpose of testing and adjustment, this option allows redundancy faults to be bypassed when the controller is on Inspection. In order to use this option, a jumper must be placed on JP2 (center pin jumpered to A) near the FAULT RESET button on the HC-CTL-2 board. Press the S push button to toggle the setting to BYPASS ON or BYPASS OFF. If the jumper is removed from JP2 (center pin to A), the controller is removed from bypass mode.

ANSI 2000 DATA TRAP MEMORY Not currently used on this product.

HIGH SPEED INSPECTION (ENABLED/DISABLED) - Determines if the car will run on high or low speed on Inspection. When set to Enabled, the car will run at high speed on Machine Room Inspection, Cartop Inspection or Hoistway Access. The car should not run at high speed on Inspection if contract speed is greater than 150 fpm (see “SPEED > 150 FPM?” on page 5-55).

```
HIGH SPEED INSPE
*   DISABLED    *
```

ELGO A / ELGO B Not currently used on this product.

POSITION / SPEED Not currently used on this product.

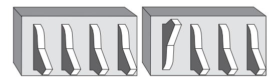
PLD ETS OVERSPEED BYPASS Not currently used on this product.

PLD ACCESS 75FPM OVERSPEED BYPASS Not currently used on this product.

PLD INSPECTION OVERSPEED BYPASS Not currently used on this product.

F4: Messages and Floor Labels

The Messages and Floor Labels menu is used to program the CE fixture displays. To access, move the ***F4*** switch to the up position.



Messages and Floor Labels

This display changes to:

```
* MESSAGES AND *
* FLOOR LABELS *
```

Modify Floor Labels Press the S push button. The display changes to:

```
- MODIFY FLOOR -
-    LABELS    -
```

Press the S push button again. The display changes to:

```
FLOOR LABEL FOR
LANDING 01: 001
```

Landing
Floor label 100's place
Floor label 10's place
Floor label 1's place

- Press + or - push buttons to change landing
- Press S push button to move to first label field
- Press + or - push buttons to change field value
- Press S push button to move to next field
- Repeat until entries completed
- Press N push button to exit.
- **Note:** Spaces for three characters (three character display) are provided. If the display has only two characters, use the two right most spaces (ones and tens place) and leave the left most space (hundreds place) blank.

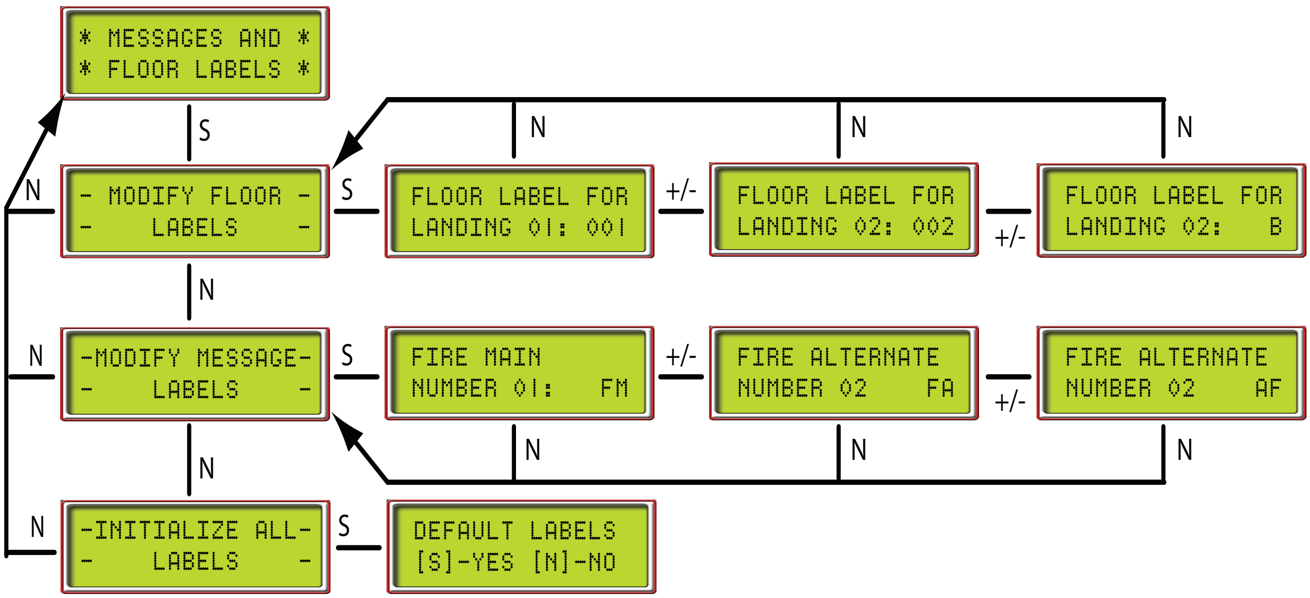
Modify Message Labels There are ten standard messages that will appear based on the operating status of the elevator. For example, if the car doors are in nudging mode, the "03" message will be displayed. The factory default for the 03 message is _ND but you may choose to set it to any three spaces or characters, for example, NUD. Factory defaults are listed below. The 10 "custom" labels are used by MCE when a customer requests a non-standard feature.

Table 5.10 Default Message Labels

Message #	Operation	Label
01	Fire Main	_FM
02	Fire Alternate	_FA
03	Nudging	_ND
04	Independent Service	_IN
05	Overload	_OL
06	Emergency Power	_EP
07	Inspection Service	_IS
08	Seismic Sensor	_SS
09	Door Hold	_DH
10	Hospital Phase I	_H1
11	Hospital Phase II	_H2
12	Out of Service	_OS
13	Stop Switch Active	_SA
14	Heavy Load	_HL
15-24	Custom Messages 01 - 10	_ _ _

Initialize all Labels DEFAULT LABELS [S] - Yes [N] - No. Use this function to initialize all labels to factory defaults.If you do not wish to complete the command, press and hold -, then press N to exit.

Figure 5.2 PI Entry Procedure



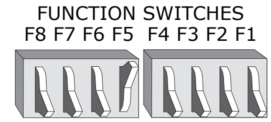
Custom Messages Message numbers 15 through 24 may be used for custom messages. Message labels can include numbers, letters and the following characters:

Table 5.11 Characters available for Custom Messages

Character Programmed	Character Displayed
:	*
;	space
<	<
=	-
>	>
?	?
@	*

F5: Controller Utilities/Monitoring and Reporting

Place the F5 switch in the Up position (all others down). This option provides access to the *Controller Utilities Menu* and the *Monitoring and Reporting Menu*.

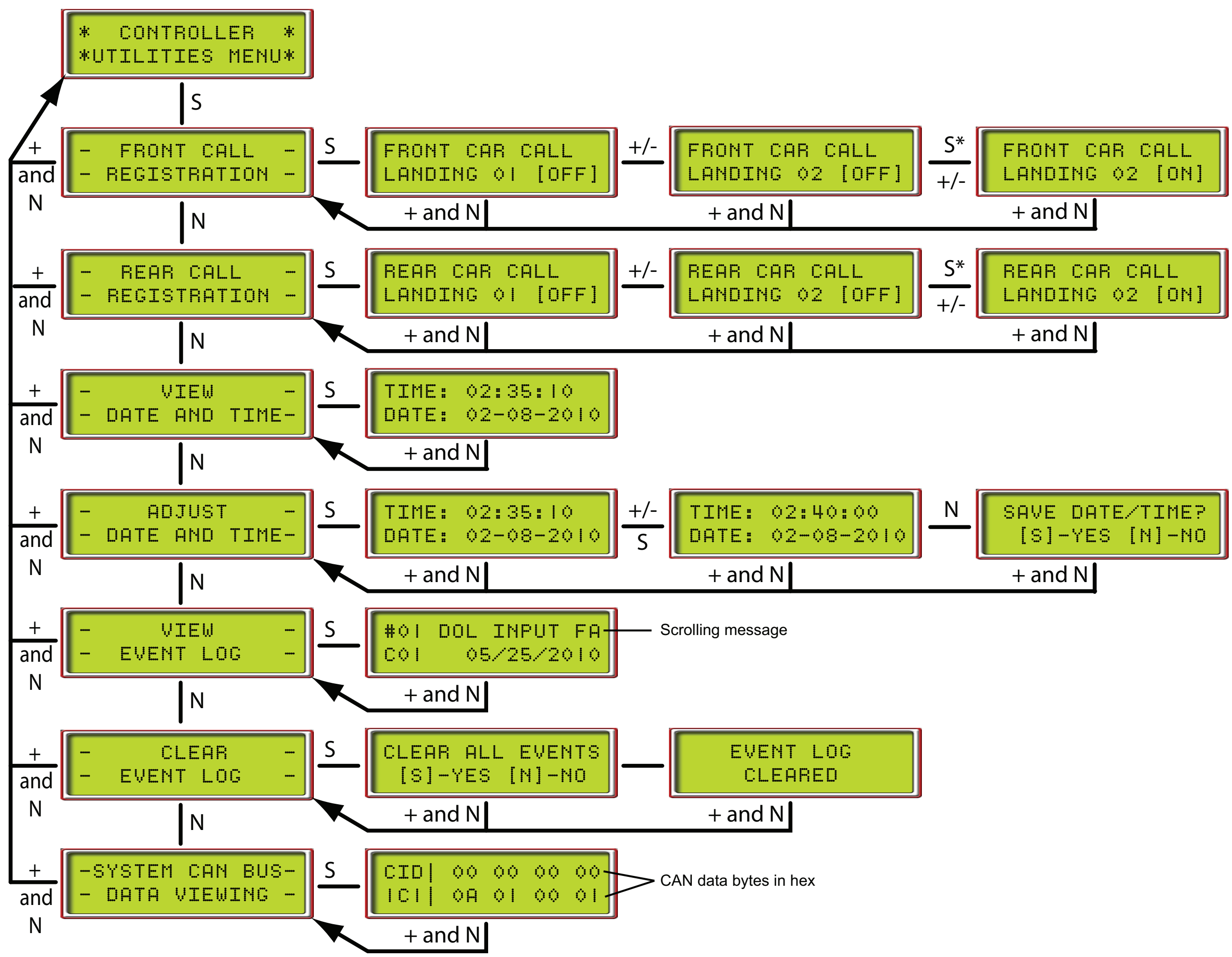


Controller Utilities Menu

Controller Utilities Menu

Use this menu to register front and/or rear car calls, set the controller's date and time, view and clear the event log, and view system CAN bus and CTL diagnostic data. If *Controller Utilities Menu* is not displayed, press N push button. Please refer to Figure 5.3.

Figure 5.3 Controller Utilities Menu



Registering Front or Rear Car Calls

1. Press S push button. Front Call Registration is displayed. Press S to select or press N until Rear Call Registration is displayed and press S to select. Refer to Figure 5.3.
2. Press +/- push buttons to increment or decrement floor numbers.
3. Press and momentarily hold S push button to register calls: displays [ON] while held.
4. Press + and N push buttons together to back out of the current display.

Date/Time

Use to display and/or set the date and time (see Figure 5.3).

```
-      VIEW        -
- DATE AND TIME-
```

To view the date and time:

1. Press N until View Date and Time is displayed, then press S. The current date and time is displayed.
2. Press + and N push buttons together to back out of the current display.

```
TIME:  02:35:10
DATE:  02-08-2008
```

To set the date and time:

```
-     ADJUST       -
- DATE AND TIME-
```

1. Press N until Adjust Date and Time is displayed, then press S.
2. The current date and time are displayed with the hour blinking. Press + or - to adjust the hour.
3. Continue pressing S to select the minutes, seconds, day, month and year. In each case, press + or - to adjust the setting. When you are finished adjusting the date and time, press N.

```
TIME:  02:35:10
DATE:  02-08-2008
```

4. Press S to save the setting or N to exit without saving.
5. Press + and N push buttons together to back out of the current display.

```
SAVE DATE/TIME?
 [S]-YES  [N]-NO
```

View Event Log

The event log tracks the most recent system events; each with date and time stamp. Event “01” is the most recent event, with older events numbered “02” through “99” respectively.

1. Press S to view the event log.

An event number and the associated event (usually scrolling due to message length) are displayed on the top line of the display. The time and date (alternating) are displayed on the bottom line.

2. Press + to increment to the next event. (Press - to decrement events.)
3. Press N to exit event viewing.

Additional Information Certain input and output conditions are important to almost all events. While displaying any event, the status of these inputs/outputs is viewable:

- With an event displayed, press S for additional information:

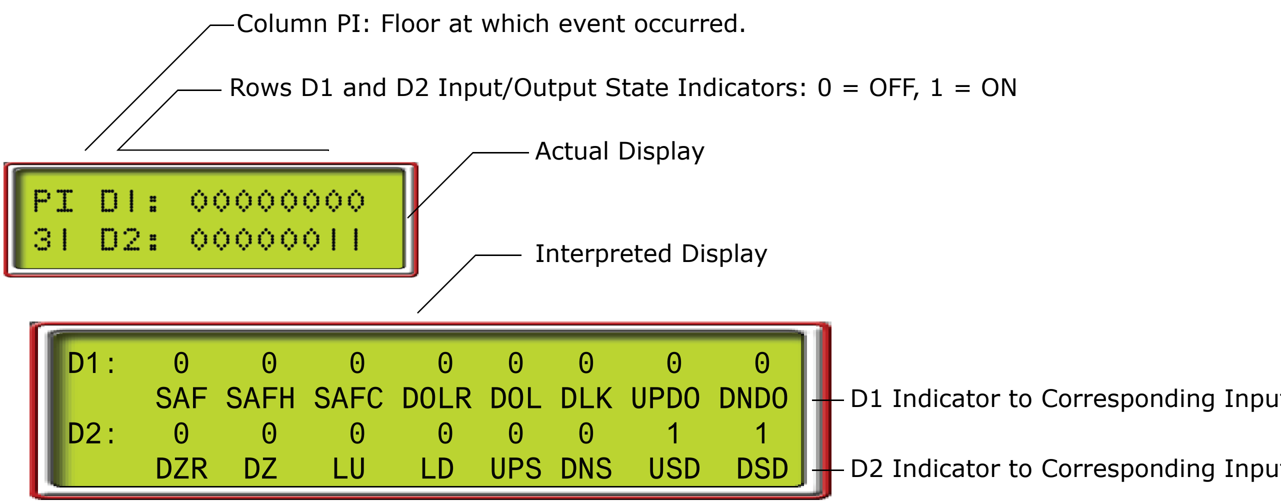


Table 5.12 Event Message Additional Information

D1	Definition	D2	Definition
SAF	Safety String, combined	DZR	Door Zone, Rear
SAFH	Safety String, hoistway	DZ	Door Zone, Front
SAFC	Safety String, car	LU	Level Up
DOLR	Door Open Limit, Rear	LD	Level Down
DOL	Door Open Limit, Front	UPS	Up Direction Sense Input
DLK	Door Lock Input	DNS	Down Direction Sense Input
UPDO	Up Direction Output	USD	Up Slowdown Input
DNDO	Down Direction Output	DSD	Down Slowdown Input

- Press S again to return to event log standard display.

Clear Event Log

This allows you to clear the events from the event log.

1. Press S push button to select Clear Event Log.

A prompt appears:

2. Press S push button to clear the event log.

A message appears notifying you that all events have been cleared.

3. Press + and N push buttons together to back out of the current display.

CTL Diagnostic Menu

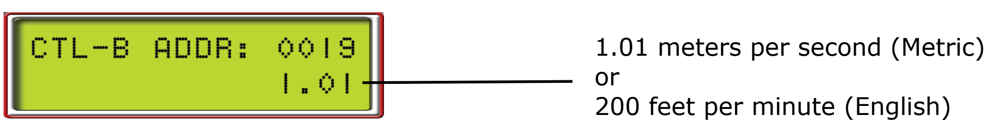
These diagnostics allow you to view car motion parameters (speed/distance) as the car moves through the hoistway. This information in turn will help you make ride adjustments or trouble-shoot ride issues.

The initial screen will show either METRIC or ENGLISH units.

1. To switch between Metric or English units, press N once. (Pressing N a second time will back you out of the menu.)

2. With the desired measuring units displayed, press S to begin diagnostics display. The initial display is for CTL-A (Processor A on the CTL board), address zero. This address displays the number of floors served — two in this example.
3. To select the parameter to display, use the S button to move between digits (processor A, or B, or address positions 0000 - 9999) — the selected digit will flash — and the Plus (+) or Minus (-) buttons to change the value of the selected digit.

For example, to display to speed recorded by CTL Processor B the last time the car passed the Down Normal Terminal switch S2, select CTL-B, address 0019.



- To find the address of the data you want to display, check the following tables.
  - CTL-A and CTL-B independently collect information from the landing system positioning sensors. The information they display per address should usually match.

EDG Diagnostics

Please see “CTL Diagnostic Menu” on page 5-72 for use instructions.

Table 5.13 LS-EDGE Diagnostics

Address	Floor number	Diagnostic
0		Sensor Flags
1		Encoder Pair 1
2		Encoder Pair 1
3		Encoder Pair 1
4		Encoder Pair 1
5		Main Encoder
6		Measured Correction in Counts
7		ETS Velocity
8		ETS Length
9		Loaded ETS counter
10	Front Floor 1	Floor height (inch or mm)
11		Measured magnet length in counts
12		Floor height in counts
13		DLM edge in counts
14		ULM_edge in counts
20	Front Floor 2	Floor height (inch or mm)
21		Measured magnet length in counts
22		Floor height in counts
23		DLM edge in counts
24		ULM edge in counts
30	Front Floor 3	Floor height (inch or mm)
31		Measured magnet length in counts
32		Floor height in counts
33		DLM edge in counts
34		ULM edge in counts
40	Front Floor 4	Floor height (inch or mm)
41		Measured magnet length in counts
42		Floor height in counts
43		DLM edge in counts
44		ULM edge in counts
50	Front Floor 5	Floor height (inch or mm)
51		Measured magnet length in counts
52		Floor height in counts
53		DLM edge in counts
54		ULM edge in counts
60	Front Floor 6	Floor height (inch or mm)

Table 5.13 LS-EDGE Diagnostics

Address	Floor number	Diagnostic
61		Measured magnet length in counts
62		Floor height in counts
63		DLM edge in counts
64		ULM_edge in counts
70	Front Floor 7	Floor height (inch or mm)
71		Measured magnet length in counts
72		Floor height in counts
73		DLM edge in counts
74		ULM_edge in counts
80	Front Floor 8	Floor height (inch or mm)
81		Measured magnet length in counts
82		Floor height in counts
83		DLM edge in counts
84		ULM_edge in counts
90	Front Floor 9	Floor height (inch or mm)
91		Measured magnet length in counts
92		Floor height in counts
93		DLM edge in counts
94		ULM_edge in counts
100	Front Floor 10	Floor height (inch or mm)
101		Measured magnet length in counts
102		Floor height in counts
103		DLM edge in counts
104		ULM_edge in counts
110	Front Floor 11	Floor height (inch or mm)
111		Measured magnet length in counts
112		Floor height in counts
113		DLM edge in counts
114		ULM_edge in counts
120	Front Floor 12	Floor height (inch or mm)
121		Measured magnet length in counts
122		Floor height in counts
123		DLM edge in counts
124		ULM_edge in counts
130	Front Floor 13	Floor height (inch or mm)
131		Measured magnet length in counts

Table 5.13 LS-EDGE Diagnostics

Address	Floor number	Diagnostic
132		Floor height in counts
133		DLM edge in counts
134		ULM_edge in counts
140	Front Floor 14	Floor height (inch or mm)
141		Measured magnet length in counts
142		Floor height in counts
143		DLM edge in counts
144		ULM_edge in counts
150	Front Floor 15	Floor height (inch or mm)
151		Measured magnet length in counts
152		Floor height in counts
153		DLM edge in counts
154		ULM_edge in counts
160	Front Floor 16	Floor height (inch or mm)
161		Measured magnet length in counts
162		Floor height in counts
163		DLM edge in counts
164		ULM_edge in counts
Addresses 170 through 644 are not applicable to a hydro controller.		
650	Rear Floor 1	Floor height (inch or mm)
651		Measured magnet length in counts
652		Floor height in counts
653		DLM edge in counts
654		ULM_edge in counts
660	Rear Floor 2	Floor height (inch or mm)
661		Measured magnet length in counts
662		Floor height in counts
663		DLM edge in counts
664		ULM_edge in counts
670	Rear Floor 3	Floor height (inch or mm)
671		Measured magnet length in counts
672		Floor height in counts
673		DLM edge in counts
674		ULM_edge in counts

Table 5.13 LS-EDGE Diagnostics

Address	Floor number	Diagnostic
680	Rear Floor 4	Floor height (inch or mm)
681		Measured magnet length in counts
682		Floor height in counts
683		DLM edge in counts
684		ULM_edge in counts
690	Rear Floor 5	Floor height (inch or mm)
691		Measured magnet length in counts
692		Floor height in counts
693		DLM edge in counts
694		ULM_edge in counts
700	Rear Floor 6	Floor height (inch or mm)
701		Measured magnet length in counts
702		Floor height in counts
703		DLM edge in counts
704		ULM_edge in counts
710	Rear Floor 7	Floor height (inch or mm)
711		Measured magnet length in counts
712		Floor height in counts
713		DLM edge in counts
714		ULM_edge in counts
720	Rear Floor 8	Floor height (inch or mm)
721		Measured magnet length in counts
722		Floor height in counts
723		DLM edge in counts
724		ULM_edge in counts
730	Rear Floor 9	Floor height (inch or mm)
731		Measured magnet length in counts
732		Floor height in counts
733		DLM edge in counts
734		ULM_edge in counts
740	Rear Floor 10	Floor height (inch or mm)
741		Measured magnet length in counts
742		Floor height in counts
743		DLM edge in counts
744		ULM_edge in counts
750	Rear Floor 11	Floor height (inch or mm)

Table 5.13 LS-EDGE Diagnostics

Address	Floor number	Diagnostic
751		Measured magnet length in counts
752		Floor height in counts
753		DLM edge in counts
754		ULM_edge in counts
760	Rear Floor 12	Floor height (inch or mm)
761		Measured magnet length in counts
762		Floor height in counts
763		DLM edge in counts
764		ULM_edge in counts
770	Rear Floor 13	Floor height (inch or mm)
771		Measured magnet length in counts
772		Floor height in counts
773		DLM edge in counts
774		ULM_edge in counts
780	Rear Floor 14	Floor height (inch or mm)
781		Measured magnet length in counts
782		Floor height in counts
783		DLM edge in counts
784		ULM_edge in counts
790	Rear Floor 15	Floor height (inch or mm)
791		Measured magnet length in counts
792		Floor height in counts
793		DLM edge in counts
794		ULM_edge in counts
800	Rear Floor 16	Floor height (inch or mm)
801		Measured magnet length in counts
802		Floor height in counts
803		DLM edge in counts
804		ULM_edge in counts
Addresses 810 through 1274 are not applicable to a hydro controller.		

CTL A Diagnostics

Please see “CTL Diagnostic Menu” on page 5-72 for use instructions.

Table 5.14 Controller Board CTL A Processor Diagnostics

Address	Item	Notes
0	Front openings	
1	Rear openings	
2	Floors	
3	Bottom floor	
4	Top floor	
5	Bottom landing	
6	Top landing	
7	Bottom position	
8	Top position	
9	Raw position	
10	Absolute position	
11	Relative position	
12	Delta Distance	
13	Offset distance	
14	Delta position errors	
15	Delta speed errors	
16	Processed speed feedback	
17	Raw speed feedback	
18	Speed @ leveling over-speed fault	
19	Speed @ inspection over-speed fault	
20	Speed @ contract over-speed fault	
21	Runtime speed @ DETS	
22	Runtime speed @ DNTS1	
23	Runtime speed @ DNTS2	
24	Runtime speed @ DNTS3	
25	Runtime speed @ DNTS4	
26	Runtime speed @ DNTS5	
27	Runtime speed @ UETS	
28	Runtime speed @ UNTS1	
29	Runtime speed @ UNTS2	
30	Runtime speed @ UNTS3	
31	Runtime speed @ UNTS4	
32	Runtime speed @ UNTS5	
33	Speed @ DETS over-speed fault	
34	Speed @ DNTS1 over-speed fault	
35	Speed @ DNTS2 over-speed fault	
36	Speed @ DNTS3 over-speed fault	
37	Speed @ DNTS4 over-speed fault	
38	Speed @ DNTS5 over-speed fault	
39	Speed @ UETS over-speed fault	
40	Speed @ UNTS1 over-speed fault	

Table 5.14 Controller Board CTL A Processor Diagnostics

Address	Item	Notes
41	Speed @ UNTS2 over-speed fault	
42	Speed @ UNTS3 over-speed fault	
43	Speed @ UNTS4 over-speed fault	
44	Speed @ UNTS5 over-speed fault	
45	Runtime distance @ DETS	
46	Runtime distance @ DNTS1	
47	Runtime distance @ DNTS2	
48	Runtime distance @ DNTS3	
94	Runtime distance @ DNTS4	
50	Runtime distance @ DNTS5	
51	Runtime distance @ UETS	
52	Runtime distance @ UNTS1	
53	Runtime distance @ UNTS2	
54	Runtime distance @ UNTS3	
55	Runtime distance @ UNTS4	
56	Runtime distance @ UNTS5	
57	Distance @ DETS position fault	
58	Distance @ DNTS1 position fault	
59	Distance @ DNTS2 position fault	
60	Distance @ DNTS3 position fault	
61	Distance @ DNTS4 position fault	
62	Distance @ DNTS5 position fault	
63	Distance @ UETS position fault	
64	Distance @ UNTS1 position fault	
65	Distance @ UNTS2 position fault	
66	Distance @ UNTS3 position fault	
67	Distance @ UNTS4 position fault	
68	Distance @ UNTS5 position fault	
69	DETS type	
70	DTS1 type	
71	DNTS2 type	
72	DNTS3 type	
73	DNTS4 type	
74	DNTS5 type	
75	UETS type	
76	UNTS1 type	
77	UNTS2 type	
78	UNTS3 type	
79	UNTS4 type	
80	UNTS5 type	
81	Successful runs	
82	Fault runs	

Table 5.14 Controller Board CTL A Processor Diagnostics

Address	Item	Notes
83	Floor zone	
84	Position bypass count	
85	Position pass count	
86	System position count	
87	Absolute position count	
88	Position lower sequence	
89	Position upper sequence	
90	Position lower value	
91	Position upper value	
92	Landing code	
93	At landing	
95	Near floor	
100	Port A inputs: 01 = (n/a) 02 = (n/a) 03 = (n/a) 04 = MHDBR 05 = (n/a) 06 = (n/a) 07 = FRA 08 = FRON 09 = (n/a) 10 = (n/a) 11 = (n/a) 12 = (n/a) 13 = FRSM 14 = FRS 15 = (n/a) 16 = (n/a)	
101	Port B inputs: 01 = HDBO 02 = M2MV 03 = FRES 04 = CDBO 05 = MGB 06 = INA 07 = INN 08 = INCP 09 = MGS 10 = ICTD 11 = ICTU 12 = INCT 13 = MREN 14 = MRIN 15 = MRUP 16 = MSAFS1	

Table 5.14 Controller Board CTL A Processor Diagnostics

Address	Item	Notes
102	Port C inputs: 01 = (n/a) 02 = PHE 03 = MCSB 04 = MGBR 05 = FRSA 06 = (n/a) 07 = (n/a) 08 = (n/a) 09 = (n/a) 10 = (n/a) 11 = (n/a) 12 = (n/a) 13 = (n/a) 14 = (n/a) 15 = (n/a) 16 = (n/a)	
103	Port D inputs: 01 = SAFSD 02 = CSBA 03 = SAFLD 04 = DZLV 05 = ABGA 06 = GBR 07 = MREN 08 = INCT 09 = INCTU 10 = INN 11 = HDB 12 = HDBR 13 = ABTA 14 = TAB 15 = BAB 16 = ABGRA	
104	Port E inputs: 01 = MABB 02 = DCAB 03 = MDLR 04 = MGSR 05 = FCCC 06 = FCS 07 = FCOFF 08 = HLD 09 = (n/a) 10 = (n/a) 11 = (n/a) 12 = (n/a) 13 = (n/a) 14 = (n/a) 15 = (n/a) 16 = (n/a)	

Table 5.14 Controller Board CTL A Processor Diagnostics

Address	Item	Notes
105	Port F inputs: 01 = (n/a) 02 = (n/a) 03 = SPD0A 04 = SPD1A 05 = SPD2A 06 = (n/a) 07 = (n/a) 08 = (n/a) 09 = (n/a) 10 = (n/a) 11 = (n/a) 12 = (n/a) 13 = FLT RESET 14 = (n/a) 15 = (n/a) 16 = (n/a)	
106	Port G inputs: 01 = (n/a) 02 = (n/a) 03 = (n/a) 04 = (n/a) 05 = (n/a) 06 = (n/a) 07 = (n/a) 08 = (n/a) 09 = (n/a) 10 = (n/a) 11 = (n/a) 12 = (n/a) 13 = DSLA 14 = USLA 15 = UETSA 16 = DETSA	
110	Port A outputs: 01 = (n/a) 02 = (n/a) 03 = ICTD 04 = (n/a) 05 = (n/a) 06 = (n/a) 07 = (n/a) 08 = (n/a) 09 = (n/a) 10 = SPOUT1 11 = SPOUT2 12 = (n/a) 13 = (n/a) 14 = (n/a) 15 = SPOUT3 16 = SPOUT4	
111	Port B outputs: (n/a)	

Table 5.14 Controller Board CTL A Processor Diagnostics

Address	Item	Notes
112	Port C outputs: 01 = (n/a) 02 = (n/a) 03 = (n/a) 04 = (n/a) 05 = (n/a) 06 = (n/a) 07 = (n/a) 08 = (n/a) 09 = (n/a) 10 = (n/a) 11 = (n/a) 12 = (n/a) 13 = (n/a) 14 = (n/a) 15 = (n/a) 16 = CTL-A ON LED	
113	Port D outputs: (n/a)	
114	Port E outputs: (n/a)	
115	Port F outputs: 01 = (n/a) 02 = (n/a) 03 = (n/a) 04 = (n/a) 05 = (n/a) 06 = DIA1 07 = DIA2 08 = DIA3 09 = DIA4 10 = (n/a) 11 = (n/a) 12 = (n/a) 13 = (n/a) 14 = (n/a) 15 = (n/a) 16 = (n/a)	
116	Port G outputs: (n/a)	

Table 5.14 Controller Board CTL A Processor Diagnostics

Address	Item	Notes
200	Faults (01 - 16): 01 = Maximum position offset fault 02 = Minimum position offset fault 03 = Landing system communication loss fault 04 = Excessive faults shutdown 05 = FCL-1 is offline 06 = FCL-2 is offline 07 = Landing system ETS fault 08 = MPU-A is offline 09 = Inspection over-speed 10 = Contract over-speed 11 = Leveling over-speed 12 = Up normal limit open 13 = Down normal limit open 14 = ETS shutdown 15 = UETS over-speed 16 = UETS position error	
201	Faults (17 - 32): 01 = DETS over-speed 02 = DETS position error 03 = Drive not ready 04 = Drive fault 05 = Drive on fault 06 = EEPROM error (CRC / device) 07 = Incorrect landing system channel detected 08 = Actual and requested direction mismatch 09 = UNTS-L over-speed 10 = UNTS-H over-speed 11 = UNTS position error 12 = DNTS-L over-speed 13 = DNTS-H over-speed 14 = DNTS position error 15 = Landing system floor checksum error 16 = landing system ETS checksum error	
202	Faults (33 - 48): 01 = (n/a) 02 = (n/a) 03 = (n/a) 04 = (n/a) 05 = (n/a) 06 = (n/a) 07 = (n/a) 08 = (n/a) 09 = (n/a) 10 = (n/a) 11 = (n/a) 12 = (n/a) 13 = (n/a) 14 = (n/a) 15 = (n/a) 16 = (n/a)	
203	Faults (49 - 64): (n/a)	

Table 5.14 Controller Board CTL A Processor Diagnostics

Address	Item	Notes
300	16 = BRE (MPI-A) 15 = DRE (MPI-A) 14 = PME (MPI-A) 13 = DRE (MPI-C) 12 = BRE (MPI-C) 11 = PME (MPI-C) 10 = (n/a) 09 = (n/a) 08 = (n/a) 07 = (n/a) 06 = (n/a) 05 = (n/a) 04 = (n/a) 03 = Danger 02 = Fault 01 = Ready	
301	16 = (n/a) 15 = (n/a) 14 = (n/a) 13 = Up slowdown 12 = Down slowdown 11 = Up direction limit 10 = Down direction limit 09 = Front level up 08 = Front door zone 07 = Front level down 06 = Rear level up 05 = Rear door zone 04 = Rear level down 03 = High speed 02 = Up 01 = Down	
302	16 = (n/a) 15 = (n/a) 14 = (n/a) 13 = (n/a) 12 = (n/a) 11 = (n/a) 10 = Up slowdown 09 = Down slowdown 08 = Near top 07 = Near bottom 06 = Up direction limit 05 = Down direction limit 04 = Front door zone 03 = Rear door zone 02 = Up 01 = Down	

Table 5.14 Controller Board CTL A Processor Diagnostics

Address	Item	Notes
303	16 = UETS status 15 = UTS1 status 14 = UNTS2 status 13 = UNTS3 status 12 = UNTS4 status 11 = UNTS5 status 10 = DETS status 09 = DTS1 status 08 = DNTS2 status 07 = DNTS3 status 06 = DNTS4 status 05 = DNTS5 status 04 = Front door zone 03 = Rear door zone 02 = Up 01 = Down	
304	16 = In rear floor zone 15 = In front floor zone 14 = Emergency brake: check relay fault 13 = Emergency brake: floor unintended motion 12 = Emergency brake: door unintended motion 11 = Emergency brake: governor over-speed 10 = Zone failure 09 = Rear gate failure 08 = Rear lock failure 07 = Front gate failure 06 = Front lock failure 05 = Emergency brake armed 04 = Rear door open 03 = Front door open 02 = In rear door zone 01 = In front door zone	
400	Down distance @ 100% of contract speed	
401	Down distance @ 90% of contract speed	
402	Down distance @ 80% of contract speed	
403	Down distance @ 70% of contract speed	
404	Down distance @ 60% of contract speed	
405	Down distance @ 50% of contract speed	
406	Down distance @ 40% of contract speed	
407	Down distance @ 30% of contract speed	
408	Down distance @ 20% of contract speed	
409	Down distance @ 10% of contract speed	
410	Up distance @ 100% of contract speed	
411	Up distance @ 90% of contract speed	
412	Up distance @ 80% of contract speed	
413	Up distance @ 70% of contract speed	
414	Up distance @ 60% of contract speed	
415	Up distance @ 50% of contract speed	
416	Up distance @ 40% of contract speed	

Table 5.14 Controller Board CTL A Processor Diagnostics

Address	Item	Notes
417	Up distance @ 30% of contract speed	
418	Up distance @ 20% of contract speed	
419	Up distance @ 10% of contract speed	
420	Upper position	
421	Lower position	
422	Median position	
423	Offset distance	
900	Software ID	
901	Software Revision	
902	Firmware Revision	
903	Hardware Revision	
904	CAN1 receiver - overflow counter	
905	CAN1 receiver - invalid message counter	
906	CAN1 transmitter - bus off counter	
907	CAN1 receiver - bus passive counter	
908	CAN1 transmitter - bus passive counter	
909	CAN1 receiver - bus warning counter	
910	CAN1 transmitter - bus warning counter	
911	CAN2 receiver - overflow counter	
912	CAN2 receiver - invalid message counter	
913	CAN2 transmitter - bus off counter	
914	CAN2 receiver - bus passive counter	
915	CAN2 transmitter - bus passive counter	
916	CAN2 receiver - bus warning counter	
917	CAN2 transmitter - bus warning counter	
1000	CTL-PLD port A	
1001	CTL-PLD port B	
1002	CTL-PLD port C	
1003	CTL-PLD port D	
1010	CTL-PLD mode	

CTL B Diagnostics

Please see “CTL Diagnostic Menu” on page 5-72 for use instructions.

Table 5.15 Controller Board CTL B Processor Diagnostics

Address	Item	Notes
0	Front openings	
1	Rear openings	
2	Floors	
3	Bottom floor	
4	Top floor	
5	Bottom landing	
6	Top landing	
7	Bottom position	
8	Top position	
9	Raw position	
10	Absolute position	
11	Relative position	
12	Delta Distance	
13	Offset distance	
14	Delta position errors	
15	Delta speed errors	
16	Processed speed feedback	
17	Raw speed feedback	
18	Speed @ leveling over-speed fault	
19	Speed @ inspection over-speed fault	
20	Speed @ contract over-speed fault	
21	Runtime speed @ DETS	
22	Runtime speed @ DNTS1	
23	Runtime speed @ DNTS2	
24	Runtime speed @ DNTS3	
25	Runtime speed @ DNTS4	
26	Runtime speed @ DNTS5	
27	Runtime speed @ UETS	
28	Runtime speed @ UNTS1	
29	Runtime speed @ UNTS2	
30	Runtime speed @ UNTS3	
31	Runtime speed @ UNTS4	
32	Runtime speed @ UNTS5	
33	Speed @ DETS over-speed fault	
34	Speed @ DNTS1 over-speed fault	
35	Speed @ DNTS2 over-speed fault	
36	Speed @ DNTS3 over-speed fault	
37	Speed @ DNTS4 over-speed fault	
38	Speed @ DNTS5 over-speed fault	
39	Speed @ UETS over-speed fault	
40	Speed @ UNTS1 over-speed fault	

Table 5.15 Controller Board CTL B Processor Diagnostics

Address	Item	Notes
41	Speed @ UNTS2 over-speed fault	
42	Speed @ UNTS3 over-speed fault	
43	Speed @ UNTS4 over-speed fault	
44	Speed @ UNTS5 over-speed fault	
45	Runtime distance @ DETS	
46	Runtime distance @ DNTS1	
47	Runtime distance @ DNTS2	
48	Runtime distance @ DNTS3	
94	Runtime distance @ DNTS4	
50	Runtime distance @ DNTS5	
51	Runtime distance @ UETS	
52	Runtime distance @ UNTS1	
53	Runtime distance @ UNTS2	
54	Runtime distance @ UNTS3	
55	Runtime distance @ UNTS4	
56	Runtime distance @ UNTS5	
57	Distance @ DETS position fault	
58	Distance @ DNTS1 position fault	
59	Distance @ DNTS2 position fault	
60	Distance @ DNTS3 position fault	
61	Distance @ DNTS4 position fault	
62	Distance @ DNTS5 position fault	
63	Distance @ UETS position fault	
64	Distance @ UNTS1 position fault	
65	Distance @ UNTS2 position fault	
66	Distance @ UNTS3 position fault	
67	Distance @ UNTS4 position fault	
68	Distance @ UNTS5 position fault	
69	DETS type	
70	DTS1 type	
71	DNTS2 type	
72	DNTS3 type	
73	DNTS4 type	
74	DNTS5 type	
75	UETS type	
76	UNTS1 type	
77	UNTS2 type	
78	UNTS3 type	
79	UNTS4 type	
80	UNTS5 type	
81	Successful runs	
82	Fault runs	

5

Table 5.15 Controller Board CTL B Processor Diagnostics

Address	Item	Notes
83	Floor zone	
84	Position bypass count	
85	Position pass count	
86	System position count	
87	Absolute position count	
88	Position lower sequence	
89	Position upper sequence	
90	Position lower value	
91	Position upper value	
92	Landing code	
93	At landing	
95	Near floor	
100	Port A inputs: 01 = SPD0 02 = SPD1 03 = SPD2 04 = UETS 05 = DETS 06 = SPIN7 07 = DZ 08 = DCL 09 = (n/a) 10 = SPIN8 11 = IND 12 = (n/a) 13 = MRDN 14 = DCABR 15 = DOB 16 = DCB	
101	Port B inputs: 01 = DZR 02 = MABGR 03 = GSR 04 = MBAB 05 = MTAB 06 = MABT 07 = DLR 08 = DL 09 = ABD 10 = ABU 11 = ATD 12 = ATU 13 = SPIN10 14 = SPIN9 15 = ICEN 16 = CTEN	

Table 5.15 Controller Board CTL B Processor Diagnostics

Address	Item	Notes
102	Port C inputs: 01 = (n/a) 02 = MSAFL1 03 = MDZLV 04 = MABGF 05 = GS 06 = (n/a) 07 = (n/a) 08 = (n/a) 09 = (n/a) 10 = (n/a) 11 = (n/a) 12 = (n/a) 13 = (n/a) 14 = (n/a) 15 = (n/a) 16 = (n/a)	
103	Port D inputs: (n/a)	
104	Port E inputs: 01 = DOL 02 = DPM 03 = SPIN1 04 = SPIN2 05 = SPIN3 06 = SPIN4 07 = SPIN5 08 = SPIN6 09 = (n/a) 10 = (n/a) 11 = (n/a) 12 = (n/a) 13 = (n/a) 14 = (n/a) 15 = (n/a) 16 = (n/a)	
105	Port F inputs: 01 = (n/a) 02 = (n/a) 03 = MHDB 04 = FLTBYPS 05 = (n/a) 06 = (n/a) 07 = (n/a) 08 = (n/a) 09 = (n/a) 10 = (n/a) 11 = (n/a) 12 = (n/a) 13 = (n/a) 14 = (n/a) 15 = (n/a) 16 = (n/a)	
106	Port G inputs: (n/a)	

Table 5.15 Controller Board CTL B Processor Diagnostics

Address	Item	Notes
110	Port A outputs: (n/a)	
111	Port B outputs: (n/a)	
112	Port C outputs: 01 = (n/a) 02 = (n/a) 03 = (n/a) 04 = (n/a) 05 = (n/a) 06 = (n/a) 07 = (n/a) 08 = (n/a) 09 = (n/a) 10 = (n/a) 11 = (n/a) 12 = (n/a) 13 = (n/a) 14 = (n/a) 15 = (n/a) 16 = CTL-B ON LED	
113	Port D outputs: 01 = SAFSD 02 = CSBB 03 = GB 04 = FWL 05 = FWI 06 = NBZ 07 = FBYP 08 = CTC 09 = FSLL 10 = ABBB 11 = ICPD 12 = ICPU 13 = DOF 14 = DCP/RCO 15 = DCF 16 = NUDG	
114	Port E outputs: (n/a)	
115	Port F outputs: 01 = (n/a) 02 = (n/a) 03 = (n/a) 04 = RST1 PLD 05 = (n/a) 06 = (n/a) 07 = (n/a) 08 = (n/a) 09 = (n/a) 10 = (n/a) 11 = (n/a) 12 = (n/a) 13 = (n/a) 14 = (n/a) 15 = (n/a) 16 = (n/a)	

Table 5.15 Controller Board CTL B Processor Diagnostics

Address	Item	Notes
116	Port G outputs: 01 = (n/a) 02 = (n/a) 03 = (n/a) 04 = (n/a) 05 = (n/a) 06 = (n/a) 07 = (n/a) 08 = (n/a) 09 = (n/a) 10 = (n/a) 11 = (n/a) 12 = (n/a) 13 = DIA1 14 = DIA2 15 = DIA3 16 = DIA4	
200	Faults (01 - 16): 01 = Maximum position offset fault 02 = Minimum position offset fault 03 = Landing system communication loss fault 04 = Excessive faults shutdown 05 = FCL-3 is offline 06 = FCL-4 is offline 07 = Landing system ETS fault 08 =LS-EDGE CPU-B is offline 09 = Inspection over-speed 10 = Contract over-speed 11 = Leveling over-speed 12 = Up normal limit open 13 = Down normal limit open 14 = ETS shutdown 15 = UETS over-speed 16 = UETS position error	
201	Faults (17 - 32): 01 = DETS over-speed 02 = DETS position error 03 = Drive not ready 04 = Drive fault 05 = Drive on fault 06 = EEPROM error (CRC / device) 07 = Incorrect landing system channel detected 08 = Actual and requested direction mismatch 09 = UNTS-L over-speed 10 = UNTS-H over-speed 11 = UNTS position error 12 = DNTS-L over-speed 13 = DNTS-H over-speed 14 = DNTS position error 15 = Landing system floor checksum error 16 = Landing system ETS checksum error	

Table 5.15 Controller Board CTL B Processor Diagnostics

Address	Item	Notes
202	Faults (33 - 48): 01 = (n/a) 02 = (n/a) 03 = (n/a) 04 = (n/a) 05 = (n/a) 06 = (n/a) 07 = (n/a) 08 = (n/a) 09 = (n/a) 10 = (n/a) 11 = (n/a) 12 = (n/a) 13 = (n/a) 14 = (n/a) 15 = (n/a) 16 = (n/a)	
203	Faults (49 - 64): (n/a)	
300	16 = BRE (MPI-B) 15 = DRE (MPI-B) 14 = PME (MPI-B) 13 = DRE (MPI-C) 12 = BRE (MPI-C) 11 = PME (MPI-C) 10 = (n/a) 09 = (n/a) 08 = (n/a) 07 = (n/a) 06 = (n/a) 05 = (n/a) 04 = (n/a) 03 = Danger 02 = Fault 01 = Ready	
301	16 = (n/a) 15 = (n/a) 14 = (n/a) 13 = Up slowdown 12 = Down slowdown 11 = Up direction limit 10 = Down direction limit 09 = Front level up 08 = Front door zone 07 = Front level down 06 = Rear level up 05 = Rear door zone 04 = Rear level down 03 = High speed 02 = Up 01 = Down	

Table 5.15 Controller Board CTL B Processor Diagnostics

Address	Item	Notes
302	16 = (n/a) 15 = (n/a) 14 = (n/a) 13 = (n/a) 12 = (n/a) 11 = (n/a) 10 = Up slowdown 09 = Down slowdown 08 = Near top 07 = Near bottom 06 = Up direction limit 05 = Down direction limit 04 = Front door zone 03 = Rear door zone 02 = Up 01 = Down	
303	16 = UETS status 15 = UTS1 status 14 = UNTS2 status 13 = UNTS3 status 12 = UNTS4 status 11 = UNTS5 status 10 = DETS status 09 = DNTS1 status 08 = DNTS2 status 07 = DNTS3 status 06 = DNTS4 status 05 = DNTS5 status 04 = Front door zone 03 = Rear door zone 02 = Up 01 = Down	
400	Down distance @ 100% of contract speed	
401	Down distance @ 90% of contract speed	
402	Down distance @ 80% of contract speed	
403	Down distance @ 70% of contract speed	
404	Down distance @ 60% of contract speed	
405	Down distance @ 50% of contract speed	
406	Down distance @ 40% of contract speed	
407	Down distance @ 30% of contract speed	
408	Down distance @ 20% of contract speed	
409	Down distance @ 10% of contract speed	
410	Up distance @ 100% of contract speed	
411	Up distance @ 90% of contract speed	
412	Up distance @ 80% of contract speed	
413	Up distance @ 70% of contract speed	
414	Up distance @ 60% of contract speed	
415	Up distance @ 50% of contract speed	
416	Up distance @ 40% of contract speed	

Table 5.15 Controller Board CTL B Processor Diagnostics

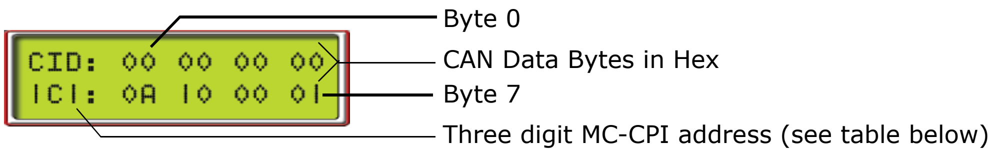
Address	Item	Notes
417	Up distance @ 30% of contract speed	
418	Up distance @ 20% of contract speed	
419	Up distance @ 10% of contract speed	
420	Upper position	
421	Lower position	
422	Median position	
423	Offset distance	
900	Software ID	
901	Software Revision	
902	Firmware Revision	
903	Hardware Revision	
904	CAN1 receiver - overflow counter	
905	CAN1 receiver - invalid message counter	
906	CAN1 transmitter - bus off counter	
907	CAN1 receiver - bus passive counter	
908	CAN1 transmitter - bus passive counter	
909	CAN1 receiver - bus warning counter	
910	CAN1 transmitter - bus warning counter	
911	CAN2 receiver - overflow counter	
912	CAN2 receiver - invalid message counter	
913	CAN2 transmitter - bus off counter	
914	CAN2 receiver - bus passive counter	
915	CAN2 transmitter - bus passive counter	
916	CAN2 receiver - bus warning counter	
917	CAN2 transmitter - bus warning counter	
1000	CTL-PLD port A	
1001	CTL-PLD port B	
1002	CTL-PLD port C	
1003	CTL-PLD port D	
1010	CTL-PLD mode	

Contents Index MCE Web

System CAN Bus

The System CAN Bus/Data Viewing screen allows you to check the working status of the inputs and outputs of any Car Panel Interface board in the system.

- Press S to enter the menu



- Use the + or - buttons to increment/decrement address digit value
- Use the S button to move from digit to digit
  - As soon as a valid ID is on the screen, the CAN data from that ID will be visible as the hex data for each CAN byte changes.
  - With the desired ID selected, you can place a call from the affected control panel, or press a Door Open button, etc. and view the data transfer on the CAN bus.

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Table 5.16 MC-CPI Board Addresses

ID	DATA
1C0	Output activity CPI board "0"
1C1	Input activity CPI board "0"
1C2	Output activity CPI board "1"
1C3	Input activity CPI board "1"
1C4	Output activity CPI board "2"
1C5	Input activity CPI board "2"
1C6	Output activity CPI board "3"
1C7	Input activity CPI board "3"
1C8	Output activity CPI board "4"
1C9	Input activity CPI board "4"
1CA	Output activity CPI board "5"
1CB	Input activity CPI board "5"
1CC	Output activity CPI board "6"
1CD	Input activity CPI board "6"
1CE	Output activity CPI board "7"
1CF	Input activity CPI board "7"

If CAN data is not appearing: Please refer to "Status and Error Messages" on page 5-2, entry "**CTL A or B LANDING SYSTEM COMM LOSS**" for relevant CAN connection car-to-controller troubleshooting information.

Monitoring and Reporting Menu

If the controller is configured for monitoring or reporting connections through Ethernet, this menu is used to set up the port and to view communication statistics for diagnostic purposes. If *Monitoring and Reporting Menu* is not displayed, press N push button.

```
*MONITORING AND*
*REPORTING MENU*
```

- With “Monitoring and Reporting Menu” displayed, press S to enter the menu. The first screen provides a way to exit the menu without making changes. Press N to continue.

```
MONITORING MENU
HOLD +&N TO EXIT
```

- The next screen provides the version number of the monitoring software in the controller. Press N to continue.

```
MONITORING VRSN:
001.000.006
```

- The monitored type screen displays the controller type being monitored. Press N to move on.

```
MONITORING TYPE:
M2000 SIMPLEX
```

- The IP address screen allows the IP address to be set (see note below):
  - Press S to move from digit to digit.
  - Press + or - to change value.
  - Press N to exit.

```
IP Address:
010.010.052.058
```

- The subnet mask screen allows the mask address to be set (see note below):

```
Subnet Mask:
255.255.000.000
```

- The gateway screen allows the gateway address to be set (see note below):

```
Gateway Address:
010.010.254.254
```

Note

Any time you make a change to an IP Address, Subnet Mask or Gateway Address, you must reset the HC-CHP board (Device) or the XPort. Refer to the information following.

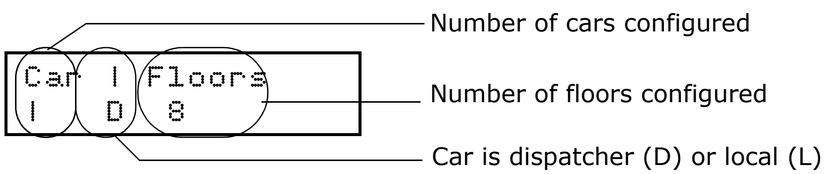
Diagnostics, Refresh, Reset

The following screens provide diagnostic information, and allow Device and XPort refresh (poll for current data) or reset.

- The connections screen indicates which client connections are active. The XPort has the ability to connect to up to six iMonitors. This screen tells you how many connections are currently active.

```
CONN 1 2 3 4 5 6
     - - - - - -
```

- The floors screen provides, left-to-right, the number of cars configured, if the car is a duplex dispatcher (D) or a local (L), and the number of floors configured.



- The XPort Comm Resets screen indicates the number of times the port has been reset since the last HC-CHP reset. If it exceeds three, you may have a network problem.

```
XPort<>PIC COMM:
COMM RESETS:1
```

- The Receive/Transmit screen monitors the current number of receive and transmit messages in the XPort queue, the peak number of messages in that queue, and the maximum acceptable number of messages in each queue.

```
RQ: 0 Peak 26/60
TQ: 0 Peak 11/35
```

- The error diagnostic displays those data points being checked for change.

```
E: 0 P:   0 M: 29
 /98  / 37  /165
```

E = Events
P = Parameters
M = Monitors

- The Device Data screen displays the data byte in a particular register.

```
Device Data:
00000=00000001
```

Data present
Register address

- The iReport screen shows the current status of iReport connections (None, Conn, Wait), and the last iReport Port and IP address that was connected.

```
IRprt:16189 NONE
101.101.011.176
```

Port
Status: None, Conn, Wait
IP address

- The Reset XPort screen allows you to reset the XPort and related counters. Resetting is required after changing IP address, Subnet mask, or Gateway address.

```
Reset XPort?
Press 'S'
```

- Refresh Device allows you to trigger an immediate data gathering cycle to ensure you are seeing the latest processor information.

```
Refresh Device?
Press 'S'
```

- Refresh XPort allows you to trigger an immediate data gathering cycle to ensure you are seeing the latest XPort information (IP address, Gateway address, Subnet Mask, and Type of controller).

```
Refresh XPort?
Press 'S'
```

- The TFTP Status screen allows you to provide permission for an FTP updater to update the monitoring software on this controller.

```
TFTP Status: NO
Press 'S'
```

- The Default XPort screen allows you to default the XPort to original factory programming.

```
Default XPort?
Press 'S'
```

F6: Hoistway Learn Operations

The F6 menu provides a process to learn the floor levels and counterweight position for the building. The process is different depending on the type of landing/positioning system for the job.

LS-EDGE Steel Tape

Please refer to “Hoistway Learn, LS-EDGE” on page 3-5.

Adjusting Floor Heights

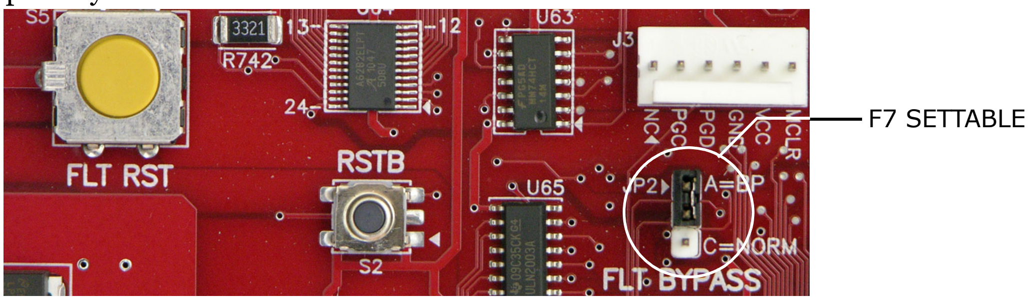
Stored floor heights may be accessed through the F7 menu (first 64 parameters) and the height of each floor individually adjusted at any time. F7 parameter 67 allows you to adjust the counterweight height.

1. Enter the F7 menu (F7 up, all other switches down).
2. Press N to advance to the desired parameter.
3. Use “+” or “-” buttons to adjust the height of the floor (or counterweight).
4. Place F7 in the down position.

F7: Parameters Adjust

Through the F7 menu, you can fill and/or adjust motion related parameters. With the car on Inspection and the F7 function switch in the UP position, the N button is used to cycle between the two (Fill or Adjust) menus.

Important Once set at the factory, F7 parameters are protected by positioning a jumper on the HC-CTL-2 board. Before you can access F7 parameters, you must set the jumper appropriately:



Changing Parameters

1. Place the car on Inspection operation.
2. Set the F7 function switch to the up position.
3. Press N until the LCD displays PARAMETER ADJUST MENU. Press S to select. The LCD will display ADJUST FROM N=LAST / S=START.
   - Press N to begin adjustment from the last viewed or edited parameter.
   - Press S to begin adjustment starting with the first F7 parameter.
4. Once viewing parameters:
   - Press N to move through the parameters listings.
   - Press + or - to change a displayed parameters value.
   - To move back to a previous parameter, press and hold N (Next) then press - (minus) as needed
   - Press S to save changed parameters.

Filling Parameters

Stepping parameters can be preset using this sub-menu.

1. Place the car on Inspection operation.
2. Set the F7 function switch to the up position.
3. Press N until the LCD displays PARAMETER FILL MENU. Press S to select. The LCD will display the stepping distance that will be used to preset all step parameters. The sub-step parameters will be preset to zero.
   - Press + or - to change the step fill value.
   - Press S to set all step parameters to the adjusted fill value and all sub-step parameters to zero.
   - Press N to cancel changes and return to the PARAMETER ADJUST MENU.

Using ID Numbers for Direct Parameter Access

All F7 parameters have a fixed ID number. When you are in the F7 menu, you can scroll to a particular ID by:

- Press and hold N (Next) to increment to the desired ID.
- Press and hold N, then press and hold - (minus) to decrement to the desired ID.

The table below lists the ID numbers and corresponding parameters.

Table 5.17 F7 Parameters

#	Item	Min	Default	Max	Notes
1	Floor 1	-12.0 in	0.0 in	+12000.0 in	
2	Floor 2	-12.0 in	+120.0 in	+12000.0 in	
3	Floor 3	-12.0 in	+240.0 in	+12000.0 in	
4	Floor 4	-12.0 in	+360.0 in	+12000.0 in	
5	Floor 5	-12.0 in	+480.0 in	+12000.0 in	
6	Floor 6	-12.0 in	+600.0 in	+12000.0 in	
7	Floor 7	-12.0 in	+720.0 in	+12000.0 in	
8	Floor 8	-12.0 in	+840.0 in	+12000.0 in	
9	Floor 9	-12.0 in	+960.0 in	+12000.0 in	
10	Floor 10	-12.0 in	+1080.0 in	+12000.0 in	
11	Floor 11	-12.0 in	+1200.0 in	+12000.0 in	
12	Floor 12	-12.0 in	+1320.0 in	+12000.0 in	
13	Floor 13	-12.0 in	+1440.0 in	+12000.0 in	
14	Floor 14	-12.0 in	+1560.0 in	+12000.0 in	
15	Floor 15	-12.0 in	+1680.0 in	+12000.0 in	
16	Floor 16	-12.0 in	+1800.0 in	+12000.0 in	
17	Floor 17	-12.0 in	+1920.0 in	+12000.0 in	
18	Floor 18	-12.0 in	+2040.0 in	+12000.0 in	
19	Floor 19	-12.0 in	+2160.0 in	+12000.0 in	
20	Floor 20	-12.0 in	+2280.0 in	+12000.0 in	
21	Floor 21	-12.0 in	+2400.0 in	+12000.0 in	
22	Floor 22	-12.0 in	+2520.0 in	+12000.0 in	
23	Floor 23	-12.0 in	+2640.0 in	+12000.0 in	
24	Floor 24	-12.0 in	+2760.0 in	+12000.0 in	
25	Floor 25	-12.0 in	+2880.0 in	+12000.0 in	
26	Floor 26	-12.0 in	+3000.0 in	+12000.0 in	
27	Floor 27	-12.0 in	+3120.0 in	+12000.0 in	
28	Floor 28	-12.0 in	+3240.0 in	+12000.0 in	
29	Floor 29	-12.0 in	+3360.0 in	+12000.0 in	
30	Floor 30	-12.0 in	+3480.0 in	+12000.0 in	
31	Floor 31	-12.0 in	+3600.0 in	+12000.0 in	
32	Floor 32	-12.0 in	+3720.0 in	+12000.0 in	
65	Bottom access distance	0.0 in	+120.0 in	+12000.0 in	
66	Top access distance	0.0 in	+120.0 in	+12000.0 in	
161	Re-leveling distance	0.0 in	+0.9 in	+9.0 in	
163	Leveling dead zone distance	0.0 in	+0.5 in	+3.0 in	

Table 5.17 F7 Parameters

#	Item	Min	Default	Max	Notes
191	Landing System		LS-EDGE		LS-EDGE should be selected.
208	Stepping System	Single	Dual	Dual	Single or dual stepping per floor.
209	Step Dn1	0.xx inches	20 inches	96 inches	Step down into floor when car is more than one floor away
210	Step Up1	0.xx inches	20 inches	96 inches	Step up into floor when car is more than one floor away.
Stepping settings continue to number of floors.					
241	Sub Step DN1	0.xx inches	20 inches	96 inches	Sub step down into floor when the car is one floor away. If slow-down distance from contract speed is more than a particular floor height, this distance will be less that the associated Step Dn distance.
242	Sub Step UP1	0.xx inches	20 inches	96 inches	Sub step up into floor when the car is one floor away. If slow-down distance from contract speed is more than a particular floor height, this distance will be less that the associated Step Up distance.
Sub stepping settings continue to number of floors.					

5

Parameters

Floor Heights Parameters 1 through 32 represent floor heights within the building. Floor heights are stored as absolute values referenced to the first floor, which is always initially displayed as 0.0 inches. You have already learned all floor heights in the building (F6), so they will be displayed as you progress. For all floors and openings, you should need only to view data and press Next to continue. They are here so that, should it be necessary later, you can adjust a floor height here without having to relearn all floors.

Figure 5.4 Adjust Floor Height, LCD Layout

1. Press Next. The display will update to show the next opening/floor.
2. Continue using Next to move through the floors and openings.

Bottom Access Distance, 65 This sets the distance above the bottom floor level at which the bottom access "switch" is placed. The value is entered in inches (1/10 inch increments). The Bottom Access Distance must be set such that it prevents the car from moving up beyond the point where the bottom of the toe guard is even with the hoistway entrance header.

Top Access Distance, 66 This sets the distance below the top floor level at which the top access "switch" is placed. The value is entered in inches (1/10 inch increments). The Top Access Distance must be set such that it prevents the car from moving down beyond the point where the crosshead is even with the hoistway entrance sill.

Note

Hoistway Access: Hoistway access allows the car to be moved to gain access to the car top or to the car bottom through hall and car doors. An enable switch in the car operating panel must be set to enable access, at which point switches at designated landings allow the car to be moved down to access the cartop or up to access the car bottom. Safety considerations will normally not allow the car to move with doors open, so Car Door Bypass and Hoistway Door Bypass switches on the HC-CTL-2 board in the controller must also be set to Bypass positions before access is possible.

Re-Leveling Distance, 161 If the car initially levels into the floor above or below this distance from accurate level, a re-leveling operation will proceed.

Leveling Dead Zone Distance, 163 This is the distance from floor level position at which the stop command is issued during initial leveling and the car "coasts" to a stop. Start with 0.7 inches.

Landing System, 191 The F7 screen is only available if LS-EDGE LANDING SYSTEM is selected in the Additional Car Options Menu. LS-EDGE should be selected.

Stepping System, 208 [SINGLE or DUAL]. Set to Dual if both stepping and sub-stepping are used. Set to single if only stepping is used.

- SINGLE - - If this option is selected, only STEP UP / STEP DN parameters will be visible and adjustable by the user. These parameters apply for both one-floor-runs and multi-floor-runs.
- DUAL - If this option is selected, both the STEP UP / STEP DN and SUB-STEP UP / SUB-STEP DN parameters will be visible. The STEP UP / STEP DN parameters are used for multi-floor-runs while SUB-STEP UP / SUB-STEP DN parameters are used for one-floor-runs.

Step Down x, 209, 211, 213, etc. This parameter is the down stepping distance for floor 1, 2, 3, etc. When the SINGLE stepping system is selected, this parameter represents the slowdown distance to floor “x” from above for both a one-floor-run and multi-floor-runs. If the “DUAL” stepping system is selected, this parameter represents the slowdown distance to floor “x” from above for multi-floor-runs.

Step Up x, 210, 212, 214, etc. This parameter is the up stepping distance for floor 1, 2, 3, etc. When the SINGLE stepping system is selected, this parameter represents the slowdown distance to floor “x” from below for both a one-floor-run and multi-floor-runs. If the “DUAL” stepping system is selected, this parameter represents the slowdown distance to floor “x” from below for multi-floor-runs.

Sub-Step Down x, 241, 243, 245, etc. Stepping distance when the car is one floor away. When the DUAL stepping system is selected, this parameter represents the slowdown distance to floor “x” from above for a one-floor-run. If the distance for this parameter is the same as the associated STEP DN x parameter, a zero distance or the STEP DN x distance should be entered.

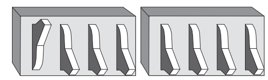
Sub-Step Up x, 242, 244, 246, etc. Stepping distance when the car is one floor away. When the DUAL stepping system is selected, this parameter represents the slowdown distance to the floor from below for a one-floor-run. If the distance for this parameter is the same as the associated STEP UP x parameter, a zero distance or the STEP UP x distance should be entered.

F8: Status Displays

Displays various system statuses. To view the Status Displays:

1. Place function switch F8 in the up position (all others down).
2. Press N to cycle through available status displays.

FUNCTION SWITCHES
F8 F7 F6 F5 F4 F3 F2 F1



Status Displays

The following status displays are available:

- **Software Version** - Main processor software version number.

```
PTHC D
Ver# H07.03.0001
```

  - **Firmware versions for all boards** - To view the listing of firmware versions for all of the boards in the controller, place function switches F8 and F1 in the up position. Then press N to cycle through the complete listing of firmware versions.

- **Eligibility Map** - Door access for each floor (F = front, R = rear, B = both). Read left to right - floors 1 through 16 in the top row, floors 17 through 32 in the bottom row. Please see “CAR SERVES FRNT/FLR 1? (simplex)/THIS CAR SERVES FRNT/FLR 1? (duplex)” on page 5-18 and see “CAR SERVES REAR/FLR 1? (simplex) / THIS CAR SERVES REAR/ FLR 1? (duplex)” on page 5-18 for programming instructions.

```
FFBBFBBR........
................
```

- **Current Load** - The current load in the car as a percentage of full load (analog load weigher required).

```
CURRENT LOAD
= NOT LEARNED
```

F1 & F8: Board Software Versions

When both F1 and F8 switches are up, board software version numbers are visible. This can be helpful when troubleshooting with an MCE technician.

- Press N button for versions:
  - MPUA: MPU board software
  - CTLA: Control board A processor software
  - CTLB: Control board B processor software
  - CTLC: Control board C processor software
  - UIO(0 - n): UIO board software
  - CHP: CHP board software

Duplexing

A great advantage of the Motion 2000 is how easily it can be duplexed. Because the duplexing logic is completely internal to the computers, it requires only a connecting cable and the selection of the Duplex option (see “SIMPLEX / LOCAL OR DUPLEX?” on page 5-17). The duplexing logic provides for proper assignment of hall calls to cars and increases efficiency and decreases waiting time.

Dispatching Algorithm

The dispatching algorithm for assigning hall calls will be real-time based on estimated time of arrival (ETA). In calculating the estimated time of arrival for each elevator, the dispatcher will consider, but not be limited to, the location of each elevator, the direction of travel, the existing hall call and car call demand, door time, flight time, lobby removal time penalty and coincidence call.

Hardware Connections

There are two critical items in duplexing hardware: Proper grounding between the two controller subplates and proper installation of the duplexing cable. The hall calls will be connected to both cars simultaneously. Once in a duplex configuration, either of the two controllers can become the dispatcher of hall calls. The controller that assumes the dispatching duty on power up remains the dispatching processor until it is taken out of service. If, for any reason, the communication link between the two controllers does not function, each car will respond to the registered hall calls independently.

Troubleshooting

In a duplexing configuration, the controller that assumes dispatching duty is identified by the letter *D* in the upper left corner of the LCD display. The other car is identified by the letter *S* (slave), in the upper left corner of the LCD. If the upper left-hand corner of the LCD is blank (neither the *D* nor the *S* is displayed), the cars are not communicating.

Power Phasing

When cars are paired for duplex operation, input power phasing to the two must match.

1. Connect a multimeter, set for AC voltage, between a 2 Bus terminal on one controller and a 2 Bus terminal on the second controller. If the meter reads close to zero (0) volts, the two are in phase. If not:
   - Swap two of the L1/L2/L3 inputs on one car and repeat step 1.

6 Troubleshooting

In This Section

This section contains general troubleshooting related information and tabled information to help you diagnose and correct problems. If you are viewing this on a computer, click the page number to jump to the appropriate section.

- **Troubleshooting Tools**: Lists the troubleshooting tools available (see page 6-2).
- **Status and Error Messages**: Table includes a description and troubleshooting tips for each message (see page 6-3).
- **Circuit Board Quick References**: Descriptions of circuit board connections, indicators, jumpers and test points (see page 6-39).
- **MLT/VLT Data Trap**: Troubleshooting using the Motor Limit Timer / Valve Limit Timer data trap (see page 6-80).

Troubleshooting Tools

The following troubleshooting tools are available on the Motion 2000 Hydraulic controller:

- **Status Indicators:** The status indicators on the HC-MPU board provide a quick look at the status of the safety circuit, door locks, and mode of operation, e.g., Independent service, Inspection and Fire service. Please refer to "Indicators" on page 5-2.
- **Scrolling Messages:** The Status and Error messages are scrolled on the LCD display on the HC-MPU board. This is one of the first places to look for an indication of a problem. A complete list of Status and Error Messages can be found in Section 6. This list includes a description of each message and suggestions for troubleshooting. Please refer to "Status and Error Messages" on page 6-3.
- **Diagnostic Mode:** A description of how to use the diagnostic mode for troubleshooting is provided in Section 5. Please refer to "Diagnostic Mode" on page 5-6 and see "Troubleshooting Using the Computer's Internal Memory " on page 5-9.
- **External Memory Mode:** External memory mode can be used to view memory address in external RAM and on the HC-MPU board. Using External Memory Mode for troubleshooting is described in Section 5. Please refer to "F2: External Memory Mode" on page 5-56.
- **PC Board Quick References:** This section contains information about the circuit boards and assemblies, including photographs with informational call outs, inputs/outputs, indicators, jumpers, test points and other information pertinent to troubleshooting. Please refer to "PC Board Quick References" on page 6-39.
- **MLT / VLT Data Trap:** The data trap records many of the controller's operational flags at the moment an MLT or VLT occurs. This allows you to see the status of the flags leading up to the fault. Please refer to "ICE-COP-2 Car Panel Interface Board" on page 6-62.
- **Motion 2000 Parameter Settings Record:** This table in the Appendix provides a record of the original parameter settings as well as a place to record changes made to the parameters. Please refer to "Motion 2000 Parameter Settings Record" on page 7-2.
- **Wiring Prints:** MCE job prints are technical drawings and instructions specifically generated for each installation. Use these drawings while tracing problems involving internal and external wiring to the controller. Please refer to "Wiring Prints " on page 2-5.
- **LS-QUTE Landing System Assembly Drawings:** Use these drawings if it becomes necessary to troubleshoot a problem or replace the HC-IPLS board in the LS-QUTE landing system. Please refer to "LS-QUTE Landing System Assembly Drawings" on page 7-16.

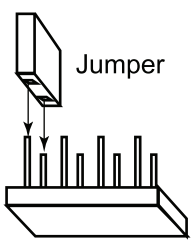
Status and Error Messages

While in Diagnostic Mode, the top line of the LCD display shows the prevailing status of the elevator. The message is scrolled. There is a status message for each special operation (e.g., FIRE SERVICE PHASE 1 - MAIN). There are also messages for most error conditions (e.g., SAFETY CIRCUIT IS OPEN). Table 6.1 provides a complete list of these status and error messages including a description and troubleshooting suggestions.

```
CAR IN TEST MODE
PI 8 2O:1O11OO11
```

The following table contains some terms that are unique to MCE or to electronics manufacturing:

- 2 or 2xx Bus: These are 120VAC buses originating in the controller.
- IDC: Insulation Displacement Connectors. These are connectors that allow an insulated wire to be pressed into place where narrow “jaws” cut the insulation to provide positive connection. When an instruction says to “check IDC,” it means to check signal presence at that connector/number, the integrity of the wire, the source connection, and the source signal.
- NYCHA: New York City Housing Authority.
- Data Trap: An electronic “capture” of the present status, off or on (0 or 1) of eight signals. Used when troubleshooting to see that signals are in the expected state during a particular point of controller operation.
- Jumper: A board-mounted connector with exposed, vertical pins that can be shorted together using a small “jumper” designed to slide on to two pins.



- PMT: Panel Mount Terminal. Gray screw-terminals arranged on a length of DIN rail. PMTs provide a convenient point of connection for field wiring.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
2 BUS IS LOW
Description: 2 bus (120VAC) monitoring input is low. **Troubleshooting:** 1. Check 2 bus fuses.
2FS BUS IS LOW
Description: 2FS bus (120VAC) monitoring input is low. **Troubleshooting:** 1. Check 2 bus fuses.
2HA BUS IS LOW
Description: 2HA (120VAC) bus monitoring input is low. **Troubleshooting:** 1. Check 2 bus fuses.
2MV BUS IS LOW
Description: 2MV (120VAC) bus monitoring input is low. **Troubleshooting:** 1. Check 2 bus fuses.
ABD INPUT FAILURE (CTLB)
Description: The Bottom Down Access (ABD) switch is high when 2HA bus is low. **Troubleshooting:** 1. Check for incorrect wiring or short on the HC-CTL-2 board ABD input and 2HA or 2 bus 2. Check the bottom access switch and associated wiring per the job prints.
ABU INPUT FAILURE (CTLB)
Description: The Hoistway Access Bottom Up (ABU) switch is high when 2HA bus is low. **Troubleshooting:** 1. Check for incorrect wiring or short on the HC-CTL-2 board ABU input and 2HA or 2 bus. 2. Check the bottom access switch and associated wiring per the job prints.
ACCESS ENABLED (CTLA)
Description: The controller is in Inspection Access mode, activated by either 120VAC at the Access Enable Switch input (screw terminal INA) on the HC-CTL-2 board or by placing the front or rear hoistway or car door bypass switches in the bypass position.
ATD INPUT FAILURE (CTLB)
Description: The Top Down Access (ATD) switch is high when 2HA bus is low. **Troubleshooting:** 1. Check for incorrect wiring or short on the HC-CTL-2 board ATD input and 2HA or 2 bus. 2. Check the top access switch and associated wiring per the job prints.
ATTENDANT SERVICE OPERATION
Description: The car is on attendant operation. The attendant service input (ATS) is activated. **Troubleshooting:** Go into Program Mode and check to see if any spare inputs are programmed as ATS. Then check to see if that particular input is activated.
ATU INPUT FAILURE (CTLB)
Description: The Top Up Access (ATU) switch is high when 2HA bus is low. **Troubleshooting:** 1. Check for incorrect wiring or short on the HC-CTL-2 board ATU input and 2HA or 2 bus. 2. Check the top access switch and associated wiring per the job prints.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
AUXILIARY STARTER TIMEOUT
Description: One of the auxiliary starters did not start properly. **Troubleshooting:** On a solid state starter, the DR1 input did not go high within the time programmed in the UP TO SPEED TIMER parameter (1.0 - 8.0 sec).
BATTERY BACKUP POWER SYSTEM FAULT
Description: The battery lowering system has fault. **Troubleshooting:** 1. Check proper operation of the battery lowering system.
BATTERY POWER CAR RECALL ACTIVATED
Description: The battery lowering system has been activated. **Troubleshooting:** 1. Normal operation during commercial power failure.
BOTTOM ACCESS SW. FAILURE (CTLB)
Description: The Up and Down Bottom Access inputs are active at the same time. **Troubleshooting:** Check the wiring and switches associated with the ABU and ABD inputs.
BOTTOM FLOOR OR TOP FLOOR DEMAND
Description: The controller is trying to establish the position of the car by sending it to either the top or the bottom. Usually associated with bottom floor demand. Bottom Floor Demand has four possible causes: 1. A change from Inspection to Automatic operation. 2. Pressing the COMPUTER RESET button. 3. Initial Power-up. 4. If the car is at the top floor, and the controller gets an up slow down signal (USD), the controller will create a Bottom Floor Demand. **Troubleshooting:** Bottom Floor Demand should be cleared when all of the following conditions are met: 1. The car is at the bottom and the down slow down (DSD) input to the controller is *OFF* (because the switch should be open). 2. The Door Zone (DZ) input to the controller is *ON*. 3. The Door Lock (DLK) input to the controller is *ON*. If the car is at the bottom, and the message still flashes, check the Down Slow Down switch & associated wiring. Also, inspect the door zone landing system vane or magnet at the bottom floor and the door lock circuit. Top Floor Demand should be cleared when all of the following conditions are met: 1. The car is at the top and the up slow down (USD) input to the controller is *OFF* (because the switch should be open). 2. The Door Zone (DZ) input to the controller is *ON*. 3. The Door Lock (DLK) input to the controller is *ON*. If the car is at the top, and the message still flashes, inspect the Up Slow Down Switch & associated wiring. Also, inspect the door zone landing system vane or magnet at the top floor and the door lock circuit. NOTE: If the controller has the absolute floor encoding feature, then the Bottom and Top Floor Demands should be cleared when the car stops in any door zone. The car does not have to travel to the top or bottom.
CAPTURE FOR TEST
Description: CTST input has been activated. **Troubleshooting:** Go into Program Mode. Check the spare inputs to see if any are programmed as CTST. Ensure that this input is NOT activated.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
CAR CALL BUS IS DISCONNECTED
Description: Usually indicates a problem in the wiring or fuses. There is no power to the Car Call circuits. **Troubleshooting:** Check the Car Call Bus fuse. Check the wires that go to the Car Call Power inputs in the controller.
CAR DOOR BYPASS SW. FAILURE (CTLA)
Description: Indicates that the CAR DOOR BYPASS switch has failed. **Troubleshooting:** 1. Cycle the HC-CTL-2 board car door bypass switch a few times to exercise it. Verify that it is fully in the ON or OFF position. 2. Verify 2S and GS connections and wiring.
CAR IN TEST MODE
Description: The spare input TEST has been activated. **Troubleshooting:** Check the TEST/NORM switch on the HC-CTL-2 Board.
CAR SAFETY DEVICE OPEN
Description: One of the car safety devices has activated, opening the safety circuit (e.g., emergency exit contact, safety clamp switch, car-top emergency stop switch). **Troubleshooting:** Check all car safety devices. Refer to controller wiring prints for applicable devices. Verify that the SAFC terminal on the HC-CTL-2-2 board is powered.
CAR TO FLOOR FUNCTION
Description: The CTF input has been activated. **Troubleshooting:** Go into Program Mode and see if any spare inputs are programmed as CTF. Then, check to see if that particular input is activated.
CAR TO LOBBY OPERATION
Description: The CTL input has been activated. **Troubleshooting:** Go into Program Mode and see if any spare inputs are programmed as CTL. Then, check to see if that particular input is activated.
CAR TOP INSPECTION (CTLA)
Description: The controller is currently in CAR TOP inspection. This indicates 120VAC at screw terminal INCT on the HC-CTL-2 board.
CAR TOP INSPECTION ENABLE STUCK
Description: The car top inspection enable button is stuck closed. **Troubleshooting: Check terminal CTEN on HC-CTL-2 pc board. With the car top inspection enable button released, there should be no voltage on CTEN.**
CONFIGURATION ERROR-CHANGE SETTINGS BEFORE INSTALLATION
Description: Incorrect Programmed value(s), e.g., a floor selected for the fire floor is not one at which the elevator stops. **Troubleshooting:** Go into Program Mode. Check all of the values associated with stops & special floors. Save the values. If this message reoccurs after cycling power to the controller, the memory backup battery on the HC-MPU board may have a low voltage. The voltage of the coin shaped CR2032 battery should about 3Vdc. If the battery was low, be sure to default the parameters before reprogramming the controller parameters (see "Setting Parameters (Options) to Default Values " on page 5-13).
CONTACTOR PROOFING REDUNDANCY FAILURE
Description: The main power contactors that provide power to the motor have not dropped out in their intended manner. **Troubleshooting:** Inspect the main power contactors to ensure that they are working as intended. Ensure that there is power on the CNP input when the car is not in motion.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
CTL A MPU A IS OFFLINE
Description: CPU-A on HC-MPU board is not responding. **Troubleshooting:** 1. Verify that CPU-A ON LED on the HC-MPU board is on solid and not flashing. 2. Check the CAN connection to the HC-MPU and HC-CHP board. 3. Check the CAN connection to the HC-CTL-2 and HC-CHP board. 4. Check power connections to the HC-MPU board.
CTL-A or B ACTUAL AND REQUESTED DIRECTION MISMATCH
Description: The processor has detected that the commanded run direction does not match the data reported by the positioning system. Power will be removed from brake and motor to bring the car to an immediate halt. **Troubleshooting:** 1. Check CAN bus connections from landing positioning sensor to cartop box MC-LSI board. 2. Check CAN bus connections from MC-LSI board to HC-CTL-2 board in controller. 3. Check 24V power to MC-LSI board in cartop box. 4. Check condition and proper installation of encoded tape for positioning system. 5. Check position sensor for excessive dirt or clogging.
CTL A or B EEPROM FAULT
Description: A device error has been detected during a cyclic redundancy check (code=1) or while reading from or writing to the device (code=2). **Troubleshooting:** 1. Reset the microprocessor. 2. Check for recently installed equipment that might be generating electrical noise. 3. If the error occurred while updating firmware, re-attempt the update procedure.
CTL A or B EXCESSIVE FAULTS SHUTDOWN
Description: The named processor has detected faults beyond an established limit in a circumscribed period of time. **Troubleshooting:** 1. Check the connections to and from the HC-CTL-2 board. 2. Reset the microprocessor. 3. Test elevator for proper operation.
CTL A or B INCORRECT LANDING SYSTEM CHANNEL DETECTED
Description: The named processor has detected that its associated CAN connection from the landing system is not reporting the correct channel identification. Usually, this means that the CAN 1 and CAN 2 connections from the hoistway position sensor to the HC-CTL-2 board have been “swapped” at the HC-CTL-2 board connector. **Troubleshooting:** 1. Exchange the CAN 1 and CAN 2 connections on the HC-CTL-2 board connector.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message

CTL A or B LANDING SYSTEM COMM LOSS

Description: The HC-CTL-2 board is not communicating with the landing system properly (A or B channel lost). Before beginning troubleshooting, check all related CAN connections and connectors carefully.

Troubleshooting:

1. On the controller HC-MPU board, place F3 in the UP position. Press “N” to access the system menu. Press “N” to advance to the Controller System Menu. Press “S” to select. Press “N” until CHNL A and CHNL B is displayed.If a channel has failed, the position information for that channel will be missing. LS-EDGE A uses CAN 2, along with the cartop HC-UIO, MC-CPI, and ICE-COP-2 boards. For example:

Connections Through Traveler

1. Check that the CAN connections on the HC-CTL-2 board are clean and tight.
2. On the cartop, temporarily disconnect the MACHINE ROOM / CANL2 and CANH2 wires from the MC-LSI board. Measure the resistance between them. (All resistance measurements must be performed with power off.) It should read about 120-ohms. Repeat for the CANL1 and CANH1 wires. They should also read about 120-ohms.
3. With power off and all CAN connections to the cartop terminated, resistance should be close to 60-ohms.

If a measured resistance is other than shown, you may have a damaged, broken, or shorted wire in the traveler. Resolve this issue before proceeding with additional troubleshooting.

CHANNEL A

1. If the lost channel is the A (CAN 2) channel, verify cartop mounted UIO board baud rate selection is correct. Next, unplug all HC-CPI (control panel interface) and HC-UIO (universal I/O) board CAN connections from the MC-LSI (landing system interface board) on the cartop (CAN 2 is a shared bus).Recheck the display to see if both channels are now back on line.
2. If the LS-EDGE channels are now OK, reconnect the UIO boards one at a time. If the channel is lost, check the CAN terminations on the UIO board. If the board is terminated, open the termination by moving the jumper so the header pins are not shorted. Repeat for additional UIO boards, checking LS-EDGE information as you go.
3. Check the car panel interface boards to see that only the last board in the string is terminated (CAN). Reconnect the CPI boards. Check LS-EDGE information. If the A channel is lost again as you reconnect boards, contact MCE support for help in isolating the bad board or termination.
4. If, after disconnecting the CPI and UIO boards, the A channel remained off line, temporarily connect CAN 1 connections to CAN 2 on the HC-CTL-2 board. Place the processor F3 switch down and check the error code on the display:
   - CTL-A INCORRECT LANDING SYSTEM CONNECTED - replace LS-EDGE.
   - CTLA-A LANDING SYSTEM COMM LOSS - continue numbered steps.
5. Temporarily connect CAN 2 connections to CAN 1 on the HC-CTL-2 board. If the message changes to CTL-B INCORRECT LANDING SYSTEM CONNECTED, replace the HC-CTL-2 board.

CHANNEL B

1. If the lost channel is the B (CAN 1) channel, temporarily connect CAN 2 to CAN 1 on the HC-CTL-2 board.
2. If the display changes to CTL-B INCORRECT LANDING SYSTEM CONNECTED, replace the HC-CTL-2 board.
3. If the message remains CTL-B LANDING SYSTEM COMM LOSS, replace the LS-EDGE reader head.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
CTL A or B LANDING SYSTEM FLOOR MISMATCH (FLOOR LEARN REQUIRED)
Description: The landing system floor heights were not learned with the current controller and landing system configuration.This fault can occur if the HC-CTL-2 board or landing system is replaced. **Troubleshooting:** 1. Relearn floor heights.
CTL A or B RELATIVE POSITION HIGH
Description: A or B channel from LS-EDGE (as specified in message) not being received. **Troubleshooting:** 1. Check connections between LS-EDGE, MC-LSI board, and HC-CTL-2 board. 2. Check F3 screen CHNL A/B position and verify that both increment when the car moves up or decrement when the car moves down on inspection. Verify that CHNL A is larger than CHNL B by 160 for the LS-EDGE system.
CTL A or B RELATIVE POSITION LOW
Description: A or B channel from LS-EDGE (as specified in message) not being received. **Troubleshooting:** 1. Check connections between LS-EDGE, MC-LSI board, and HC-CTL-2 board. 2. Check F3 screen CHNL A/B position and verify that both increment when the car moves up or decrement when the car moves down on inspection. Verify that CHNL A is larger than CHNL B by 160 for the LS-EDGE system.
CTL B LS-EDGE CPU-B IS OFFLINE
Description: CPU-B on LS-EDGE is not responding **Troubleshooting:** 1. Verify that AUX LED on the LS-EDGE is active. 2. Verify that CAN LED on the LS-EDGE is active. 3. Check the CAN connections to the LS-EDGE and MC-LSI board. 4. Check the CAN1 and CAN2 connections to the HC-CTL-2 and MC-LSI board.
CYCLE TEST WARNING
Description: Will keep the doors open in the event of a cycle test fault to provide sufficient time for further cycle test attempts. **Troubleshooting:** 1. View associated events in Table 6.1 Status nd Error Message.
DCAB INPUT FAILURE (CTLA)
Description: The Bottom Access Door Contact (DCAB) input monitors the bottom door closed contacts. DCAB should be 120VAC during bottom access operation and Bottom Access switch is toggled in the up or down position. **Troubleshooting**: 1. Verify 120VAC on the 2S bus. 2. Check that all hoistway doors are closed except for the bottom access hoistway door. 3. Check for 120VAC on the DCMS terminal.
DL INPUT FAILURE (CTLB)
Description: The Door Lock (DL) input has detected a failure of the Hoistway Door Bypass (HDBA) or Bottom Access Bypass (BABA) outputs or the Gate Switch (GS), Door Position Monitor (DPM) or Door Lock Access. **Troubleshooting:** 1. Check voltage on HC-CTL-2 board terminal DLAB. DPM should activate two inches before DLAB. 2. If DL is active, GS must also be active.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
DLR INPUT FAILURE (RDRB)
Description: The Rear Door Lock (DLR) input has detected a failure of the Rear Hoistway Door Bypass (HDBBR) or Rear Bottom Access Bypass (BABBR) outputs or the Rear Gate Switch (GSR), Rear Door Position Monitor (DPMR) or Rear Door Lock Access Bypass (DLABR) inputs. **Troubleshooting**: 1. Check voltage on HC-CTL-2 board terminal DLABR. DPMR should activate two inches before DLABR. 2. If DLR is active, GSR must also be active.
DOL INPUT FAILURE (CTLB)
Description: The Door Open Limit (DOL) input is not in the correct state for the position of the door as determined by the Door Position Monitor (DPM) input and the Gate Switch (GS) input. **Troubleshooting:** 1. If DPM is high, DOL must also be high. Check the wiring to terminal DOL on HC-CTL-2 or HC-UIO board. 2. If the GS input is high, DOL must also be high. Check the wiring to terminal GS.
DOLR INPUT FAILURE (RDRB)
Description: The Rear Door Open Limit (DOLR) input is not in the correct state for the position of the door as determined by the Rear Door Position Monitor (DPMR) input and the Rear Gate Switch (GSR) input. **Troubleshooting**: 1. If DPMR is high, DOLR must also be high. Check the wiring to terminal DOLR on HC-CTL-2 or HC-UIO board. 2. If the GSR input is high, DOLR must also be high. Check the wiring to terminal GSR.
DOOR CLOSE PROTECTION TIMER ELAPSED
Description: A failure to lock the doors is detected. This failure condition exists when the doors have closed (DCLC = 1 or DCL = 0/DPM=1) a demand exists for the car to move (DCP=1),but the doors are not locked (DLK = 0) within 60 seconds. **Troubleshooting:** If the Retiring Cam option is set, verify the Retiring Cam relay is activated (DCP=1, DCL=0/DPM=1 or DCLC=1) and the doors lock (DLK=1). If no Retiring Cam is used, verify the door lock circuitry contacts are closed to provide power to the door lock input (DLK=1). When a predetermined number of sequential failures is detected, default set to four, the car will shutdown. The failure will be reset once the doors are locked (DLK=1), if the car is placed on Inspection, or the Computer Reset Button is pressed.
DOOR ZONE SENSOR FAILURE - OFF POSITION
Description: Indicates that the car completed a run, but did not see door zone. **Troubleshooting:** Place car on Machine Room Inspection and press the FAULT RESET button on the HC-CTL-2 board to restore operation. Run the car to the same floor and verify that DZ=1 or DZR=1. Check placement of DZ magnets.
DOOR ZONE SENSOR FAILURE - ON POSITION
Description: The controller computer detected that one of the DZ inputs (front or rear) did not transition to the low state during the last elevator run. Probable cause may be: 1. A faulty door zone sensor or associated circuitry (within the landing system assembly); 2. Faulty wiring from the landing system to the controller; 3. Faulty computer input circuit (HC-CTL-2 Control board). **Troubleshooting:** Check operation of the door zone sensors and associated wiring (place car on inspection, move car away from the floor, noting the transitions in the door zone signal(s) coming from the landing system). Verify that the computer diagnostic display of DZ (or DZ rear) matches the state of the sensor signals at the HC-CTL-2 Control board. Verify voltage on DZ or DZ rear.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
DOWN NORMAL LIMIT OPEN (Hydro only)
Description: This message indicates that the car has traveled beyond the bottom terminal landing and has opened the down normal (directional) terminal switch. **Troubleshooting**: 1. Check the location of the car. 2. Check the voltage at terminal DNTD. 3. Check the limit switch connections.
DOWN TERMINAL LIMIT FAILURE (Hydro only)
Description: Both the Down Slow Limit and Down Emergency Limit switches have been detected to be in opposite states. These switches should open/close simultaneously, meaning that the voltage at these terminals should always be identical. **Troubleshooting**: 1. Check the connections to terminals DSL1 and DSL2. 2. Check the limit switches for proper operation. For LS-EDGE: 3. Check the connections to terminals LIM1 from the controller and SP2A from the Cartop. 4. Check the JRJ-45 connections on the cartop between J14 from the MC-LSI board and MDISC. from the LS-EDGE unit. 5. Confirm the terminal magnet matches the suggested length shown on Table 4 on page 3-18. 6. Verify DF and DSL2 terminals from the HC- DVR board and DF terminal from the HC-CTL-2 board are all connected together. 7. Verify DS terminal from the HC-DVR board is connected to DS terminal from the HC-CTL-2 board. For LS-EDGE and non-short floors at the bottom terminal: 8. Confirm LIM0 is connected to LIM1. For LS-EDGE and short floors at the bottom terminal: 9. Confirm LIM0 is ***not*** connected to LIM1. 10. Check connections between LIM0 from the controller and one end of the bottom short floor cam switch. 11. Check connections between 24V from the controller and the other end of the bottom short floor cam switch.
DPM REDUNDANCY FAULT
Description: A failure of a front door input, relay or associated circuitry has been detected. This logic detects failure of the input structure and hardware associated with the DPM (Door Position Monitor) input. **Troubleshooting**: Valid when SAF=1. 1. Verify that when DLK is ON (1) DPM is also ON (1). When DOL = 0, DPM = 0. 2. Verify that DPM makes (120Vac) 1” to 2” prior to door lock. 3. Check the associated input circuitry.
DPMR REDUNDANCY FAULT
Description: A failure of a rear door input, relay or associated circuitry has been detected. This logic detects failure of the input structure and hardware associated with the DPMR (Door Position Monitor Rear) input. **Troubleshooting**: 1. Verify that when DLK is ON (1) DPMR is also ON (1). When DOLR = 0, DPMR = 0. 2. Verify that DPMR makes (120Vac) 1” to 2” prior to door lock. 1. Check the associated input circuitry.

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Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
DRD (UP TO SPEED) FAILED TO ACTIVATE
Description: The DRD input that monitors the UP TO SPEED output from the solid state starter did not go high when expected. **Troubleshooting:** 1. Check the wiring associated with the solid state starter, especially terminal SSD. 2. This message may also be displayed if the UP TO SPEED timer duration is shorter than the amount of time it takes to ramp the motor up to operating speed. 3. If any faults are displayed on the solid state starter refer to the starter manual.
DRD INPUT FAILURE
Description: The Delta Redundancy (DRD) input monitors the normally closed auxiliary contact of the Delta contactor. **Troubleshooting**: 1. Verify that the STARTER #1 (2, 3) TYPE parameter setting is correct (see page 5-54). This fault is generated if the starter is solid-state but the starter type parameter is set to WYE-DELTA. 2. Verify that voltage of the coin shaped battery (CR2032) on the HC-MPU board is about 3Vdc. 3. The wiring or devices connected to DR1 input may not be terminated. 4. Check the Delta auxiliary contact wired to terminal DR1 and replace if necessary.
DVR 1 IS OFFLINE (CTLA) *(Hydro only)*
Description: Driver board HC-DVR #1 is offline. **Troubleshooting:** 1. Power to the HC-DVR board may not be connected. Check the CAN bus connection between the HC-DVR board and the HC-CHP CAN hub and power distribution board. 2. Make sure that the shunt has been removed from JP1 on the HC-DVR board. 3. Verify the SW1 settings on HC-DVR board #1: 1 = Off, 2 = Off. 4. If the DVR 1 indicator is not lit, reboot the processor by cycling the power to the controller or by removing the CAN bus connection to the HC-DVR board for a few seconds. 5. Place Function Switches F1 and F8 in the ON (up) position and press N. Inability to locate the version info for the HC-DVR board indicates that it is not communicating with the HC-MPU board. The HC-DVR board may need to be replaced.
DVR 2 IS OFFLINE (CTLB) *(Hydro only)*
Description: Driver board HC-DVR #2 is offline. See also, DVR 1 IS OFFLINE -car has two starters. **Troubleshooting:** 1. Power to the HC-DVR board may not be connected. Check the CAN bus connection between the HC-DVR board and the HC-CHP CAN hub and power distribution board. 2. Make sure that the shunt has been removed from JP1 on the HC-DVR board. 3. Verify the SW1 settings on HC-DVR board #1: 1 = Off, 2 = Off. 4. Verify the SW1 settings on HC-DVR board #2: 1 = On, 2 = Off. 5. Verify that the setting for NUMBER OF MOTOR STARTERS = 2. 6. Verify that the setting for STARTER #2 TYPE is correct. 7. If the DVR 2 indicator is not lit, reboot the processor by cycling the power to the controller or by removing the CAN bus connection to the HC-DVR board for a few seconds. 8. Place Function Switches F1 and F8 in the ON (up) position and press N. Inability to locate the version info for the HC-DVR board indicates that it is not communicating with the HC-MPU board. The HC-DVR board may need to be replaced.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
DVR 2 MSSD FAILED ACTIVE (CTLA) *(Hydro only)*
Description: When the controller is configured for a solid state starter, output terminal SSD on HC-DVR board #2 has 120 VAC while solid state device U1 is not in the On state. **Troubleshooting:** 1. Verify the SW1 settings on HC-DVR board #1: 1 = Off, 2 = Off. 2. Verify the SW1 settings on HC-DVR board #2: 1 = On, 2 = Off. 3. Verify that the setting for NUMBER OF MOTOR STARTERS = 2. 4. Verify that the setting for STARTER #2 TYPE is correct. 5. Verify that voltage is not being fed to terminal SSD on HC-DVR board #2 from another source. 6. Verify that solid-state device U1 has not been damaged by shorted wiring connected to terminal SSD (Call MCE Tech Support for details).
DVR 3 IS OFFLINE (CTLB) *(Hydro only)*
Description: Driver board HC-DVR #3 is offline. See also, DVR 1 IS OFFLINE and DVR 2 IS OFFLINE - car has three starters. **Troubleshooting:** 1. Power to the HC-DVR board may not be connected. Check the CAN bus connection between the HC-DVR board and the HC-CHP CAN hub and power distribution board. 2. Make sure that the shunt has been removed from JP1 on the HC-DVR board. 3. Verify the SW1 settings on HC-DVR board #1: 1 = Off, 2 = Off. 4. Verify the SW1 settings on HC-DVR board #2: 1 = On, 2 = Off. 5. Verify the SW1 settings on HC-DVR board #3: 1 = Off, 2 = On. 6. Verify that the setting for NUMBER OF MOTOR STARTERS = 3. 7. Verify that the setting for STARTER #3 TYPE is correct. 8. If the DVR 2 indicator is not lit, reboot the processor by cycling the power to the controller or by removing the CAN bus connection to the HC-DVR board for a few seconds.
DVR-'n' AUXILIARY STARTER TIMEOUT (n = 2 or 3) *(Hydro only)*
Description: One of the auxiliary starters did not start properly. **Troubleshooting:** On a solid state starter, the DR1 input did not go high within the time programmed in the UP TO SPEED TIMER parameter (1.0 - 8.0 sec).
DVR-'n' DOWN NORMAL LIMIT OPEN (n = 2 or 3) *(Hydro only)*
Description: This message indicates that the car has traveled beyond the bottom terminal landing and has opened the down normal (directional) terminal switch. **Troubleshooting**: 1. Check the location of the car. 2. Check the voltage at terminal DNTD. 3. Check the limit switch connections.
DVR-'n' DOWN TERMINAL LIMIT FAILURE (n = 2 or 3) *(Hydro only)*
Description: Both the Down Slow Limit and Down Emergency Limit switches have been detected to be in opposite states. These switches should open/close simultaneously, meaning that the voltage at these terminals should always be identical. **Troubleshooting**: 1. Check the connections to terminals DSL1 and DSL2. 2. Check the limit switches for proper operation.
DVR-'n' DRD (UP TO SPEED) FAILED TO ACTIVATE (n = 2 or 3) *(Hydro only)*
Description: The DRD input that monitors the UP TO SPEED output from the solid state starter did not go high when expected. **Troubleshooting:** 1. Check the wiring associated with the solid state starter, especially terminal SSD. 2. This message may also be displayed if the UP TO SPEED timer duration is shorter than the amount of time it takes to ramp the motor up to operating speed. 3. If any faults are displayed on the solid state starter refer to the starter manual.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
DVR-'n' DRD INPUT FAILURE (n = 2 or 3) *(Hydro only)*
Description: The Delta Redundancy (DRD) input monitors the normally closed auxiliary contact of the Delta contactor. **Troubleshooting**: 1. Verify that the STARTER #1 (2, 3) TYPE parameter setting is correct (see page 5-54). This fault is generated if the starter is solid-state but the starter type parameter is set to WYE-DELTA. 2. Verify that voltage of the coin shaped battery (CR2032) on the HC-MPU board is about 3Vdc. 3. The wiring or devices connected to DR1 input may not be terminated. 4. Check the Delta auxiliary contact wired to terminal DR1 and replace if necessary.
DVR-'n' EXCESSIVE NUMBER OF FAILED START ATTEMPTS (n = 2 or 3) *(Hydro only)*
Description: The starter failed to start after three consecutive attempts. **Troubleshooting:** Check the fault log to see what faults were generated when attempting to run the starter.
DVR-'n' M2L INPUT FAILURE (n = 2 or 3) *(Hydro only)*
Description: The M2L input monitors the status of the relay contacts of SAFL and SAFS against the circuits that drive these relay coils. Bus 2L should be 120VAC and relay SAFL should be picked only if the doors are locked. 2MV bus must also be active. **Troubleshooting:** 1. Check or replace relays SAFL and/or SAFS on the HC-CTL-2 board. 2. Verify that IDC terminal 2L on the HC-CTL-2 board connects to IDC terminal 2L on the HC-DVR board. 3. Check the thermal overload wiring between terminals TO1 and TO2 on the HC-DVR board. 4. Check the wiring of the starter overload between terminal OL1 and OL2 (if present).
DVR-'n' MDFE FAILED TO ACTIVATE (n = 2 or 3) *(Hydro only)*
Description: The MDFE input monitors the status of the DFE triac and the DFE triac driver. When either fails to activate when expected this fault is generated. When the doors are locked, the 2L bus is high, DSL1 and DSL2 limits are closed, the down normal limit (DNTD) is closed and the car is idle, terminals DF and DFE should 120VAC. **Troubleshooting:** 1. Check the associated wiring. 2. Check the down fast valve coil. 3. Run the car down on inspection and verify that terminal DFE goes low. 4. The DFE triac may have failed open. Replace the HC-DVR board.
DVR-'n' MDFE FAILED TO DEACTIVATE (n = 2 or 3) *(Hydro only)*
Description: The MDFE input monitors the status of the DFE triac and the DFE triac driver. When either fails to deactivate when expected this fault is generated. When the doors are locked, the 2L bus is high, DSL1 and DSL2 limits are closed, the down normal limit (DNTD) is closed and the car is idle, terminals DF and DFE should 120VAC. **Troubleshooting:** 1. Check the associated wiring. 2. Check the down fast valve coil. 3. The DFE triac may have shorted. Replace the HC-DVR board.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
DVR-'n' MDSE FAILED TO ACTIVATE (n = 2 or 3) *(Hydro only)*
Description: The MDSE input monitors the status of the DSE triac and the DSE triac driver. When either fails to activate when expected this fault is generated. When the doors are locked, the 2L bus is high, the down normal limit (DNTD) is closed and the car is idle, terminals DS and DSE should 120VAC. **Troubleshooting:** 1. Check the associated wiring. 2. Check the down slow valve coil. 3. Run the car down on inspection and verify that terminal DSE goes low. 4. The DSE triac may have failed open. Replace the HC-DVR board.
DVR-'n' MDSE FAILED TO DEACTIVATE (n = 2 or 3) *(Hydro only)*
Description: The MDSE input monitors the status of the DSE triac and the DSE triac driver. When either fails to deactivate when expected this fault is generated. When the doors are locked, the 2L bus is high, the down normal limit (DNTD) is closed and the car is idle, terminals DS and DSE should 120VAC. **Troubleshooting:** 1. Check the associated wiring. 2. Check the down slow valve coil. 3. The DSE triac may have shorted. Replace the HC-DVR board.
DVR-'n' MRD INPUT FAILURE (n = 2 or 3) *(Hydro only)*
Description: The M Contactor Redundancy (MRD) input monitors the normally closed auxiliary contact of the M contactor. **Troubleshooting**: 1. The wiring or devices connected to MR1 input may not be terminated. 2. Check the M auxiliary contact wired to terminal MR1 and replace if necessary. 3. Check the operation of the M contactor.
DVR-'n' MSSD FAILED TO ACTIVATE (n = 2 or 3) *(Hydro only)*
Description: MSSD monitors the solid state output of U1 and driver TY for proper operation. If either fail in the off position this fault is generated. When terminal OL2 is 120VAC and the car is commanded to run up, terminal SSD should be 120VAC. **Troubleshooting**: 1. Check the wiring at terminal SSD and OL2.
DVR-'n' MSSD FAILED TO DEACTIVATE (n = 2 or 3) *(Hydro only)*
Description: MSSD monitors the solid state output of U1 and driver TY for proper operation If either fail in the on position this fault is generated. When either fails to deactivate when expected this fault is generated. When the OL2 is 120VAC and the car is idle, terminal SSD should be low. **Troubleshooting**: 1. Check terminal SSD wiring. 2. Replace the HC-DVR board.
DVR-'n' MTD FAILED TO ACTIVATE (n = 2 or 3) *(Hydro only)*
Description: The MTD input monitors the status of the TD triac and the TD triac driver. When either fails to activate when expected this fault is generated. **Troubleshooting**: 1. Check the starter configuration and programming record. 2. Check motor contactor wiring and voltages at terminal DD1 on the HC-DVR board. 3. The TD triac may have failed open. Replace the HC-DVR board.

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Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
DVR-'n' MTD FAILED TO DEACTIVATE (n = 2 or 3) *(Hydro only)*
Description: The MTD input monitors the status of the TD triac and the TD triac driver. When either fails to deactivate when expected this fault is generated. **Troubleshooting**: 1. Check the starter configuration and programming record. 2. Check motor contactor wiring and voltages at terminal DD1 on the HC-DVR board. 3. The TD triac may have shorted. Replace the HC-DVR board.
DVR-'n' MTM FAILED TO ACTIVATE (n = 2 or 3) *(Hydro only)*
Description: The MTM input monitors the status of the TM triac and the TM triac driver. When either fails to activate when expected this fault is generated. **Troubleshooting**: 1. Check the starter configuration and programming record. 2. Check motor contactor wiring and voltages at terminal M1 on the HC-DVR board. 3. The TM triac may have failed open. Replace the HC-DVR board.
DVR-'n' MTM FAILED TO DEACTIVATE (n = 2 or 3) *(Hydro only)*
Description: The MTM input monitors the status of the TM triac and the TM triac driver. When either fails to deactivate when expected this fault is generated. **Troubleshooting**: 1. Check the starter configuration and programming record. 2. Check motor contactor wiring and voltages at terminal M1 on the HC-DVR board. 3. The TM triac may have shorted. Replace the HC-DVR board.
DVR-'n' MTY FAILED TO ACTIVATE (n = 2 or 3) *(Hydro only)*
Description: The MTY input monitors the status of the TY triac and the TY triac driver. When either fails to activate when expected this fault is generated. **Troubleshooting**: 1. Check the starter configuration and programming record. 2. Check motor contactor wiring and voltages at terminal YD1 on the HC-DVR board. 3. The TY triac may have failed open. Replace the HC-DVR board.
DVR-'n' MTY FAILED TO DEACTIVATE (n = 2 or 3) *(Hydro only)*
Description: The MTY input monitors the status of the TY triac and the TY triac driver. When either fails to deactivate when expected this fault is generated. **Troubleshooting**: 1. Check the starter configuration and programming record. 2. Check motor contactor wiring and voltages at terminal YD1 on the HC-DVR board. 3. The TY triac may have shorted. Replace the HC-DVR board.
DVR-'n' MUFE FAILED TO ACTIVATE (n = 2 or 3) *(Hydro only)*
Description: The MUFE input monitors the status of the UFE triac and the UFE triac driver. When either fails to activate when expected this fault is generated. When the doors are locked, the 2L bus is high, USL1 and USL2 limits are closed, the up normal limit (UNTD) is closed and the car is idle, terminals UF and UFE should be 120VAC. **Troubleshooting**: 1. Check the associated wiring. 2. Check the up fast valve coil. 3. Run the car up on inspection and verify that terminal UFE goes low. 4. The UFE triac may have failed open. Replace the HC-DVR board.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
DVR-'n' MUFE FAILED TO DEACTIVATE (n = 2 or 3) *(Hydro only)*
Description: The MUFE input monitors the status of the UFE triac and the UFE triac driver. When either fails to deactivate when expected this fault is generated. When the doors are locked, the 2L bus is high, USL1 and USL2 limits are closed, the up normal limit (UNTD) is closed and the car is idle, terminals UF and UFE should be 120VAC. **Troubleshooting**: 1. Check the associated wiring. 2. Check the up fast valve coil. 3. The UFE triac may have shorted. Replace the HC-DVR board.
DVR-'n' MUSE FAILED TO ACTIVATE (n = 2 or 3) *(Hydro only)*
Description: The MUSE input monitors the status of the USE triac and the USE triac driver. When either fails to activate when expected this fault is generated. When the doors are locked, the 2L bus is high, USL1 and USL2 limits are closed, the up normal limit (UNTD) is closed and the car is idle, terminals US and USE should be 120VAC. **Troubleshooting**: 1. Check the associated wiring. 2. Check the up fast valve coil. 3. Run the car up on inspection and verify that terminal USE goes low. 4. The USE triac may have failed open. Replace the HC-DVR board.
DVR-'n' MUSE FAILED TO DEACTIVATE (n = 2 or 3) *(Hydro only)*
Description: The MUSE input monitors the status of the USE triac and the USE triac driver. When either fails to deactivate when expected this fault is generated. When the doors are locked, the 2L bus is high, USL1 and USL2 limits are closed, the up normal limit (UNTD) is closed and the car is idle, terminals US and USE should be 120VAC. **Troubleshooting**: 1. Check the associated wiring. 2. Check the up fast valve coil. 3. The USE triac may have shorted. Replace the HC-DVR board.
DVR-'n' OLM INPUT FAILURE (n = 2 or 3) *(Hydro only)*
Description: The OLM input monitors the status of the both the thermal overload and the starter overload contacts. Bus 2L should be 120VAC and relay SAFL should be picked only if the doors are locked. 2MV bus must also be active. **Troubleshooting**: 1. Check that IDC terminal 2L on the HC-CTL-2 board connects to IDC terminal 2L on the HC-DVR board. 2. Check the wiring of the thermal overload between terminals TO1 and TO2 on the HC-DVR board. 3. Check the wiring of the starter overload between terminal OL1 and OL2 (if present).
DVR-'n' OLM INPUT IS LOW (n = 2 or 3) *(Hydro only)*
Description: The OLM input monitors the status of the both the thermal overload and the starter overload contacts. Bus 2L should be 120VAC and relay SAFL should be picked only if the doors are locked. 2MV bus must also be active. **Troubleshooting**: 1. Check the wiring of the thermal overload between terminals TO1 and TO2 on the HC-DVR board. 2. Check the wiring of the starter overload between terminal OL1 and OL2 (if present).

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Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
DVR-'n' RP SENSOR TRIPPED (n = 2 or 3) *(Hydro only)*
Description: The Reverse Phase sensor detected a problem with the incoming power and the RP sensor's N/C contacts activated HC-DVR board (2 or 3) RP1 input (active high - 120VAC). The car returns to the bottom landing, cycles the doors and shuts down. The DOB can cycle the doors. **Troubleshooting**: 1. Verify that HC-DVR board (2 or 3) terminal RP1 to ground = 120VAC. 2. Check the wiring (phase rotation) to the motor starter. 3. Check the wiring to the RP sensor (incorrect, loose or missing wires).
DVR-'n' STARTER FAULT CONTACT OPEN (n = 2 or 3) *(Hydro only)*
Description: The solid-state starter internal fault contact is open. **Troubleshooting**: 1. Check the solid-state starter fault display screen and refer to the starter manual for trouble-shooting instructions. 2. Verify that terminal YR1 has 120VAC.
DVR-'n' STARTER TYPE ERROR (n = 2 or 3) *(Hydro only)*
Description: The HC-DVR board has received an invalid starter type from the from the MPU board. **Troubleshooting:** May be caused by a communication error between the HC-MPU and HC-DVR boards, call MCE Tech Support.
DVR-'n' UP NORMAL LIMIT OPEN (n = 2 or 3) *(Hydro only)*
Description: This message indicates that the car has traveled beyond the top terminal landing and has opened the up normal (directional) terminal switch. **Troubleshooting**: 1. Check the location of the car. 2. Check the voltage at terminal UNTD. 3. Check the limit switch connections.
DVR-'n' UP TERMINAL LIMIT FAILURE (n = 2 or 3) *(Hydro only)*
Description: Both the Up Slow Limit and Up Emergency Limit switches have been detected to be in opposite states. These switches should open/close simultaneously, meaning that the voltage at these terminals should always be identical. **Troubleshooting**: 1. Check the connections to terminals USL1 and USL2. 2. Check the limit switches for proper operation.
DVR-'n' YRD INPUT FAILURE (n = 2 or 3) *(Hydro only)*
Description: The Y Contactor Redundancy (YRD) input monitors the normally closed auxiliary contact of the Y starter contactor. **Troubleshooting**: 1. The wiring or devices connected to YR1 input may not be terminated. 2. Check the Y auxiliary contact wired to terminal YR1 and replace if necessary. 3. Check the operation of the Y contactor.
EARTHQUAKE OPERATION
Description: The EQI and/or CWI input is/are active. The car is on earthquake operation. **Troubleshooting:** If there has been no seismic activity, check the status of the EQI and CWI inputs. Check the counterweight derailment detection sensor. Check the seismic activity sensor.
ELEVATOR SHUTDOWN SWITCH ACTIVE
Description: The ESS input has been activated. **Troubleshooting:** Go into Program Mode and see if any of the inputs are programmed as ESS. Then, check to see if that particular input is activated.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
EMERGENCY MEDICAL SERVICE
Description: Either the EMSH or the EMSC input has been activated. **Troubleshooting:** Ensure that the MASSACHUSETTS EMS SERVICE option is set correctly. If not required, set this option to NO and ensure that the EMSH and EMSC inputs are not programmed as spare inputs. If it is required, set this option to the floor that the car should return to when the EMSH input is activated.
EMERGENCY POWER OPERATION
Description: The car is on Emergency Power operation (EPI is low). **Troubleshooting:** Ensure that the Emergency Power operation option is set correctly. If emergency power is not required, set this option to NO and ensure that the EPI input is not programmed. If it is required, set this option to the floor that the car should return to on Emergency Power and program the EPI input.
ENTER SECURITY CODE
Description: MCE Security has been initiated. **Troubleshooting:** Enter floor pass code in the C.O.P. within 10 seconds. Please refer to “Building Security Menu” on page 5-60 for instructions on how to program or change security passcodes.
EXCESSIVE NUMBER OF FAILED START ATTEMPTS
Description: The starter failed to start after three consecutive attempts. **Troubleshooting:** Check the fault log to see what faults were generated when attempting to run the starter.
EXTERNAL LATCHING FAULT INPUT
Description: The External Latching Fault, ELF, Input is low. This active low input is normally used to detect slipping/damaged suspension means (ropes) on traction installations. This fault can only be reset by FAULT RESET button on HC-CTL-2 PC board. **Troubleshooting:** If in error, check to see that no input is programmed for this function.
EXMLT INPUT IS ACTIVATED *(Hydro only)*
Description: MLT shutdown with External Motor Limit Timer (EXMLT) **Troubleshooting:** Check the External Motor Limit Timer and the associated circuitry. Check the voltage at the EXMLT input. Verify that the wiring is correct. Check the MLT / VLT Data Trap to verify that EXMLT is active.
FAULT BYPASS IS ACTIVE (AUTOMATIC)
Description: The Automatic operation fault bypass function is set. **Troubleshooting:** The F3 Automatic operation fault bypass is on.
FAULT BYPASS IS ACTIVE (INSPECTION)
Description: The Inspection operation fault bypass function is set. **Troubleshooting:** The F3 Inspection operation fault bypass is on.
FIRE SERVICE PHASE 1 - ALTERNATE
Description: The car is returning to an alternate fire return landing. The FRA input is high or FRAON is active. **Troubleshooting:** Inspect the fire sensors (especially the main floor sensor) and the Fire Phase I switch wiring. For some fire codes including ASME, the Fire Phase I switch must be turned to the *BYPASS* position and then back to *OFF* to clear the fire service status once activated.
FIRE SERVICE PHASE 1 - MAIN
Description: The car is returning to the main fire return landing. The FRS input is low or the FRON or FRON2 inputs are high. **Troubleshooting:** Inspect the fire sensors and the Fire Phase I switch wiring. For some fire codes including ASME, the Fire Phase I switch must be turned to the *BYPASS* position and then back to *OFF* to clear the fire service status once activated.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
FIRE SERVICE PHASE 2
Description: The FCS controller input is *ON.* **Troubleshooting:** Inspect the phase 2 switch and wiring. In some cases, to exit Fire Service Phase 2, the car must be at the fire floor at which Fire Phase 2 was activated, the doors must be fully open, and the phase 2 switch must be off (the FCOFF input must be activated) to get out of phase 2.
FRONT DOL AND DLK ARE BOTH ACTIVE
Description: A critical failure has caused both the Door Open Limit and Door Lock inputs to both be active at the same time.(DOL=0 & DLK=1). A problem with DOL and/or DLK circuitry or wiring. **Troubleshooting:** Inspect the Door Open Limit and the Door Lock circuitry and wiring. When this error is generated, the car will shutdown with the doors open and will not answer any calls. The only way to reset this error condition is to put the car on Inspection operation.
FRONT DOOR FAILED TO CLOSE
Description: Doors Open (DCL = 1). There is a problem with DCL circuitry or wiring. **Troubleshooting:** Inspect the Door Closed Limit circuitry and wiring. When this error is generated, the car is not allowed to run.
FRONT DOOR IS LOCKED BUT NOT FULLY CLOSED
Description: Doors Open (DCL = 1) and Locked (DLK = 1). A problem with DCL and/or DLK circuitry or wiring. **Troubleshooting:** Inspect the Door Closed Limit and the Door Lock circuitry and wiring. When this error is generated, the car is not allowed to run.
FRONT DOOR LOCK SWITCH FAILURE *(NYCHA)*
Description: The front door lock contacts have failed closed. **Troubleshooting:** Ensure that with the front hoistway doors closed and locked, there is power on the DLS input and no power present on the DCL input.
FRONT DOOR OPEN LIMIT FAILURE
Description: The door open limit switch has failed open. **Troubleshooting:** Ensure that the car gate is open, there is no power on the DOL input and no power is present on the DL or GS inputs.
FRONT DZ RELAY DISCREPANCY
Description: HC-CTL-2 door zone input and door zone flag from MC-LSI board do not match. The elevator will stop at he next floor in the direction of travel and shut down until the fault is cleared (HC-CTL-2 fault reset or toggle Inspection switch). **Troubleshooting:** 1. Verify door zone (magnet if LS-EDGE) input. 2. Verify connection between MC-LSI board DZ_M and CTL-2 board DZF. 3. Relearn Hoistway via F6 operation.
FRONT GATE SWITCH FAILURE *(NYCHA)*
Description: The front car gate switch has failed closed. **Troubleshooting:** Ensure that with the front car gate closed, there is power on the GS input and no power present on the DCL input.
GROUP TO CAR COMMUNICATION LOSS
Description: The car controller has detected a loss of communication with the group controller. **Troubleshooting:** 1. Verify that the group controller's MC-MCP board is operating. 2. Verify that the SW1 DIP #4 is set to OFF on the group's HC-CHP board (sets baud rate). 3. Check the cable between the External Network connector (J4) on the car's HC-MPU board and the External Network connector (J17) on the group's HC-CHP board. Check wiring connections and polarity (CANH, CANL).

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
GS INPUT FAILURE (CTLB)
Description: The Gate Switch (GS) input has detected a failure of the ABGA or GBB outputs, DPM, DLAB or the gate switch. **Troubleshooting:** 1. Check the gate switch. DPM should activate two inches before the gate switch. 2. If GS is active, DLAB must also be active
GSR INPUT FAILURE (RDRB)
Description: The Rear Gate Switch (GSR) input has detected a failure of the ABGAR or RABA outputs, DPMR, DLABR or the rear gate switch. **Troubleshooting**: 1. Check the gate switch. DPMR should activate two inches before the gate switch. 2. If GSR is active, DLABR must also be active.
HALL AND CAR CALL BUSES DISCONNECTED
Description: A problem in the wiring or fuses. There is no power to the call circuits. **Troubleshooting:** Check the Call Bus fuses. Check the wires that go to the Call Power inputs in the controller.
HALL CALL BUS IS DISCONNECTED
Description: A problem in the wiring or fuses. There is no power to the Hall Call circuits. **Troubleshooting:** Check the Hall Call Bus fuse. Check the wires that go to the Hall Call Power inputs in the controller.
HEAVY LOAD WEIGHER CONDITION
Description: The HLI input has been activated. **Troubleshooting:** Go into Program Mode and see if any spare inputs are programmed as an HLI input. Then, check to see if that particular input is activated.
HOISTWAY DOOR BYPASS SW. FAILURE (CTLA)
Description: The expected input logic from the HOISTWAY DOOR BYPASS switch has failed. **Troubleshooting:** 1. Cycle the HC-CTL-2 board hoistway door bypass switch a few times to exercise it. Verify that it is fully in the ON or OFF position. 2. Verify 2S and DLAB connections and wiring.
HOISTWAY SAFETY DEVICE OPEN
Description: One of the hoistway safety devices has activated, opening the safety circuit (e.g., pit stop switch, car and counterweight buffer switches, up/down final limit switches). **Troubleshooting:** Check all hoistway safety devices. Refer to controller wiring prints for applicable devices. Verify that the SAFH terminal on the HC-CTL-2 board is powered.
HOSPITAL PHASE 1 OPERATION
Description: A hospital emergency momentary call switch is activated at any floor. **Troubleshooting:** Ensure that the hospital emergency operation option is set correctly. If hospital emergency operation is not required, set this option to no. If it is required, set the floors eligible to answer a hospital call to yes.
HOSPITAL PHASE 2 OPERATION
Description: The car has answered a hospital emergency call or the in car hospital emergency key switch has been activated (HOSP is high). **Troubleshooting:** Ensure that the hospital emergency operation option is set correctly. Then check to see if any spare inputs are programmed as HOSP and if it is activated.

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Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
ICPD INPUT FAILURE (CTLB)
Description: The Car Panel Inspection Down (ICPD) input is high while the 2 bus is low. **Troubleshooting:** 1. Check for incorrect wiring or short on the HC-CTL-2 board ICPD input and 2 bus.
ICPU INPUT FAILURE (CTLB)
Description: The Car Panel Inspection Up (ICPU) input is high while the 2 bus is low. **Troubleshooting:** 1. Check for incorrect wiring or short on the HC-CTL-2 board ICPU input and 2 bus.
ICTD INPUT FAILURE (CTLB)
Description: The Car Top Inspection Down (ICTD) input is high while the SAFH bus is low. **Troubleshooting:** 1. Check for incorrect wiring or short on the HC-CTL-2 board ICTD input.
ICTU INPUT FAILURE (CTLB)
Description: The Car Top Inspection Up (ICTU) input is high while the SAFH bus is low. **Troubleshooting:** 1. Check for incorrect wiring or short on the HC-CTL-2 board ICTU input.
INA INPUT FAILURE (CTLA)
Description: The INA input to the microcontroller did not receive a signal when expected. **Troubleshooting:** 1. Check for incorrect wiring or short on the HC-CTL-2 board INA input and 2 bus. 2. Check access enable switch in COP and connection through traveler.
IN-CAR INSPECTION (CTLA)
Description: The controller is currently on IN-CAR inspection, activated by 120VAC at screw terminal INCP on the HC-CTL-2 board.
IN-CAR INSPECTION BUTTON STUCK(CTLA)
Description: The in car inspection enable button is stuck closed. **Troubleshooting:** Check terminal ICEN on HC-CTL-2 PC board. With the in car inspection enable button released, there should be no voltage on ICEN.
IN CAR STOP SWITCH ACTIVATED
Description: The in-car stop switch has been pulled, opening the safety circuit. **Troubleshooting**: Check the status of the in-car emergency stop switch.
INCP INPUT FAILURE (CTLA)
Description: The Car Panel Inspection INSP/Auto Switch input (INCP) is high while the 2 bus is low. **Troubleshooting:** 1. Check for incorrect wiring or short on the HC-CTL-2 board INCP input and 2 bus.
INCT INPUT FAILURE (CTLA)
Description: The Car Top Inspection INSP/AUTO Switch input (INCT) is high while SAFH is low. **Troubleshooting:** 1. Check for incorrect wiring or short on the HC-CTL-2 board INCT input and SAFH or 2 bus.
INDEPENDENT SERVICE OPERATION
Description: The Independent Service switch inside the car has been turned on. **Troubleshooting:** Check the Independent Service switch inside the car.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
INSPECTION DIRECTION SW. FAILURE (CTLB)
Description: Both UP and DN Machine Room Inspection directions are activated at the same time. **Troubleshooting:** 1. Exercise the HT-CTL board Inspection direction switch. Verify that it remains in the middle when released. 2. Check status of UP and DOWN indicator LEDs.
INSPECTION OPERATION
Description: The car is on Inspection operation. **Troubleshooting:** Check all of the inspection switches and associated wiring.
LANDING SYSTEM REDUNDANCY FAILURE (*Non ASME-2000*)
Description: Either DZ, LU or LD has failed closed. **Troubleshooting:** Ensure that on any run between floors, the LSR input goes low at least once. If the DZ sensor has failed closed, power will be present continuously on the LSR input. If either the LU or LD sensor has failed closed, power will be present constantly on their respective inputs and this can also cause this error. This condition can be cleared by pressing the Redundancy Reset button.
LEVELING DOWN
Description: The Level Down computer input is *ON*. Comes *ON* normally when the car is just above a floor. If the car is level with the floor and a message appears, it is usually the result of a switch or sensor problem. **Troubleshooting:** Inspect the LD switch or sensor on the landing system and the placement of the landing system vane or magnet for that floor.
LEVELING SENSOR FAILED - OFF POSITION
Description: One of the leveling sensor inputs (LU or LD) appears to have failed (in the inactive state). The controller computer did not detect the appropriate leveling signal (LU or LD) during the last approach to the floor. Probable causes may be: 1. A faulty leveling sensor or associated circuitry (within the landing system assembly); 2. Faulty wiring from the landing system to the controller; 3. Faulty computer input circuit (HC-CTL-2 Control board). **Troubleshooting:** Check operation of the leveling sensors and associated wiring (place car on inspection, move above and below a landing, noting the transitions in the leveling signal(s) coming from the landing system). Verify that the computer diagnostic display of LU and LD matches the state of the sensor signals at the main relay board.
LEVELING SENSOR FAILED - ON POSITION
Description: One of the leveling sensor inputs (LU or LD) appears to have failed (in the active state). The controller computer detected that both the LU and LD inputs are active simultaneously. Probable causes may be: 1. A faulty leveling sensor or associated circuitry (within the landing system assembly); 2. Faulty wiring from the landing system to the controller; 3. Faulty computer input circuit (HC-CTL-2 Control board). **Troubleshooting:** Check operation of the leveling sensors and associated wiring (place car on inspection, move above and below a landing, noting the transitions in the leveling signal(s) coming from the landing system). Verify that the computer diagnostic display of LU and LD matches the state of the sensor signals at the main relay board. Check also the operation of any contacts that may be placed at the "low side" (the "1-bus" side) of the LU and LD relay coils (e.g., H, INT). Check that such contacts close properly when appropriate.

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Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
LEVELING SENSOR FAILURE
Description: One or both of the LU and LD sensors have failed closed. **Troubleshooting:** Ensure that power is not present on both the LU and LD inputs.
LEVELING UP
Description: The Level Up computer input is *ON*. Comes *ON* normally when the car is just below a floor. If the car is level with the floor and a message appears, it is usually the result of a switch or sensor problem. **Troubleshooting:** Inspect the LU switch or sensor on the landing system and the placement of the landing system vane or magnet for that floor.
LIGHT LOAD WEIGHER CONDITION
Description: The Light Load Weighing input is activated. **Troubleshooting:** Ensure that Light Load Weighing is required. If not, set the Light Load Weighing option to NO and ensure that the LLI input is not programmed. If Light Load Weighing is required, ensure that the Light Load Car Call Limit is set to the correct number of stops.
LOSS OF DOOR LOCK OUT OF DOOR ZONE
Description: Door lock lost with elevator outside of door zone (i.e., outside of door zone and leveling). May also be generated at speed if the door locks are clipped. **Troubleshooting:** Inspect door lock circuitry and wiring. Check for any mechanical contact with gate switch or door clutch (if restrictor used) and hoistway components.
LOW OIL SWITCH INPUT IS ACTIVATED *(Hydro only)*
Description: MLT shutdown with LOS. The car was unable to move at the expected speed due to insufficient oil. **Troubleshooting:** Check the MLT/VLT Data Trap (Addr 0495H bit 8). Ensure that there is sufficient oil in the reservoir. Check the Low Oil switch and LOS input. To clear the fault condition, on the HC-CTL-2 board, place the car on Machine Room Inspection, press the FAULT RESET button, then return the car to Normal operation.
M2L INPUT FAILURE
Description: The M2L input monitors the status of the relay contacts of SAFL and SAFS against the circuits that drive these relay coils. Bus 2L should be 120VAC and relay SAFL should be picked only if the doors are locked. 2MV bus must also be active. **Troubleshooting:** 1. Check or replace relays SAFL and/or SAFS on the HC-CTL-2 board. 2. Verify that IDC terminal 2L on the HC-CTL-2 board connects to IDC terminal 2L on the HC-DVR board. 3. Check the thermal overload wiring between terminals TO1 and TO2 on the HC-DVR board. 4. Check the wiring of the starter overload between terminal OL1 and OL2 (if present).
MABB INPUT FAILURE (CTLA)
Description: The Bottom Access Bypass Monitor (door close contacts) (MABB) input monitors proper operation of the solid state devices associated with bypassing the bottom hoistway door contacts during access operation. **Troubleshooting**: Remove the car from access operation and verify that test point TP41 (MABB) on the HC-CTL-2 board is low with respect to 1 bus.
MABBR INPUT FAILURE
Description: The Bottom Rear Access Monitor (door close contacts) (MABBR) input monitors proper operation of the solid state devices associated with bypassing the bottom rear hoistway door contacts during access operation. **Troubleshooting**: Remove the car from access operation and verify that test point TP43 (MABBR) on the HC-CTL-2 board is low with respect to 1 bus.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
MABGF INPUT FAILURE (CTLB)
Description: The Front Access Gate Bypass Monitor (MABGF) input has detected a failure of the Access Bypass Gate A (ABGA) or Front Access Bypass Bottom (FABB) outputs. **Troubleshooting**: 1. Temporarily disconnect then reconnect the CAN connection to the HC-CTL-2 board to reset the microprocessors. 2. Verify that SPA, SPB, and SPC LEDs are all lighted. 3. If this failure occurred while updating software, refer to the update instructions and repeat the process.
MABGR INPUT FAILURE (RDRB)
Description: The Rear Access Gate Bypass Monitor (MABGR) input has detected a failure of the Rear Access Bypass Gate A (ABGAR) or Rear Access Bypass (RABA) outputs. **Troubleshooting**: 1. Temporarily disconnect then reconnect the CAN connection to the HC-CTL-2 board to reset the microprocessors. 2. Verify that SPA and SPB LEDs are lighted. 3. If this failure occurred while updating software, refer to the update instructions and repeat the process.
MABT INPUT FAILURE (CTLB)
Description: The Top Access Bypass Monitor (door close contacts) (MABT) input monitors proper operation of the solid state devices associated with bypassing the top hoistway door contacts during access operation. **Troubleshooting**: Remove the car from access operation and verify that test point TP33 (MABT) on the HC-CTL-2 board is low with respect to 1 bus.
MABTR INPUT FAILURE
Description: The Top Rear Access Bypass Monitor (MABTR) input monitors proper operation of the solid state devices associated with bypassing the top rear hoistway door contacts during access operation. **Troubleshooting**: Remove the car from access operation and verify that test point (MABTR) on the HC-CTL-2 board is low with respect to 1 bus.
MACHINE ROOM INSPECTION (CTLA)
Description: The controller is currently in MACHINE ROOM inspection operation.
MBAB INPUT FAILURE (CTLB)
Description: The Bottom Access Bypass Monitor (door lock contacts) (MBAB) input has detected a failure of the Bottom Access Bypass (BAB) or (BABA) outputs or the BAB1 input. **Troubleshooting:** 1. Check the wiring at HC-CTL-2 board terminal BAB1.
MCSB INPUT FAILURE (CTLA)
Description: The Car Stop Bypass Monitor (MCSB) input on the HC-CTL-2 board is active while the car stop bypass circuit is not active. **Troubleshooting**: 1. Verify wiring and connections at ESC and SAFC. 2. Temporarily disconnect then reconnect the CAN connection to the HC-CTL-2 board to reset the microprocessors. 3. Verify that SPA, SPB, and SPC LEDs are all lighted. 4. If this failure occurred while updating software, refer to the update instructions and repeat the process.

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Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
MDFE FAILED TO ACTIVATE *(Hydro only)*
Description: The MDFE input monitors the status of the DFE triac and the DFE triac driver. When either fails to activate when expected this fault is generated. When the doors are locked, the 2L bus is high, DSL1 and DSL2 limits are closed, the down normal limit (DNTD) is closed and the car is idle, terminals DF and DFE should 120VAC. **Troubleshooting:** 1. Check the associated wiring. 2. Check the down fast valve coil. 3. Run the car down on inspection and verify that terminal DFE goes low. 4. The DFE triac may have failed open. Replace the HC-DVR board.
MDFE FAILED TO DEACTIVATE *(Hydro only)*
Description: The MDFE input monitors the status of the DFE triac and the DFE triac driver. When either fails to deactivate when expected this fault is generated. When the doors are locked, the 2L bus is high, DSL1 and DSL2 limits are closed, the down normal limit (DNTD) is closed and the car is idle, terminals DF and DFE should 120VAC. **Troubleshooting:** 1. Check the associated wiring. 2. Check the down fast valve coil. 3. The DFE triac may have shorted. Replace the HC-DVR board.
MDFE INPUT IS LOW (CTLB) *(Hydro only)*
Description: The input that monitors the continuity of the DN Fast Valve coil and also checks the off state of the (DFE) triac. **Troubleshooting:** 1. Check the termination of the valve coil at terminal DFE on the HC-DVR board. 2. Check terminal DF for 120VAC with respect to 1 bus.
MDSE FAILED TO ACTIVATE *(Hydro only)*
Description: The MDSE input monitors the status of the DSE triac and the DSE triac driver. When either fails to activate when expected this fault is generated. When the doors are locked, the 2L bus is high, the down normal limit (DNTD) is closed and the car is idle, terminals DS and DSE should 120VAC. **Troubleshooting:** 1. Check the associated wiring. 2. Check the down slow valve coil. 3. Run the car down on inspection and verify that terminal DSE goes low. 4. The DSE triac may have failed open. Replace the HC-DVR board.
MDSE FAILED TO DEACTIVATE *(Hydro only)*
Description: The MDSE input monitors the status of the DSE triac and the DSE triac driver. When either fails to deactivate when expected this fault is generated. When the doors are locked, the 2L bus is high, the down normal limit (DNTD) is closed and the car is idle, terminals DS and DSE should 120VAC. **Troubleshooting:** 1. Check the associated wiring. 2. Check the down slow valve coil. 3. The DSE triac may have shorted. Replace the HC-DVR board.
MDSE INPUT IS LOW (CTLA) *(Hydro only)*
Description: The MDSE input monitors the continuity of the DN Slow Valve coil and also checks the OFF state of the DSE triac. **Troubleshooting:** 1. Check the termination of the valve coil at terminal DSE on the HC-DVR board. 2. Check terminal DS for 120VAC with respect to 1 bus.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
MDZLV INPUT FAILURE (CTLB)
Description: The Door Zone/Leveling Monitor (MDZLV) input has detected a failure of the Door Zone/Leveling (DZLV) or (DZLVA) outputs or failure of the normally open DZ relay. **Troubleshooting:** 1. Replace relay DZ. 2. Replace HC-CTL-2 PC board.
MGB INPUT FAILURE (CTLA)
Description: A failure of the gate switch bypass circuit has been detected. **Troubleshooting**: 1. Toggle the gate bypass switch on the HC-CTL-2 board a few times, then make certain it is fully in the ON or OFF position. 2. Briefly disconnect then reconnect CAN connection to CTL board to reset processors.
MGBR INPUT FAILURE
Description: A failure of the rear gate switch bypass circuit has been detected. **Troubleshooting**: 1. Toggle the gate bypass switch on the HC-CTL-2 board a few times, then make certain it is fully in the ON or OFF position. 2. Briefly disconnect then reconnect CAN connection to RDR board to reset processors.
MGS INPUT FAILURE (CTLA)
Description: The Gate Switch Monitor (MGS) input has detected a failure of the gate switch or Door Zone/Door Zone Leveling (DZ/DZLVA) circuitry. **Troubleshooting:** 1. Check the condition of the gate switch. 2. If rear doors are present, check GSR. 3. Replace the HC-CTL-2 board.
MGSR INPUT FAILURE (CTLA)
Description: The Rear Gate Switch Monitor (MGSR) input (test point (GSR2) on the HC-CTL-2 board) has detected a failure of the rear gate switch or Door Zone/Door Zone Leveling (DZ/DZLVA) circuitry. **Condition 1**: MGSR should be low during automatic operation when either the rear gate or rear hoistway doors are open as indicated by the GSR and DLR relays, except during re-leveling. **Troubleshooting**: 1. If either relay GSR or DLR is not picked, verify that MGSR is low. 2. If front doors only, GSR and DLABR should be jumpered to the 2 Bus. **Condition 2**: If the car is re-leveling, and the front doors are closed, the MGSR input should have 120VAC. **Troubleshooting**: Check voltage at MGSR. **Condition 3**: This fault is also generated if relays GSR and DLR are picked indicating that the rear gate and hoistway doors are closed, but the MGSR input is low. **Troubleshooting**: 1. Verify that both DLR and GSR LEDs are on.
MHDB INPUT FAILURE (CTLB)
Description: The Hoistway Door Bypass Monitor (MHDB) input has detected a failure of the Hoist-way Door Bypass (HDB) or (HDBA) outputs. **Troubleshooting**: 1. Toggle the door bypass switch on the HC-CTL-2 board a few times, then make certain it is fully in the ON or OFF position. 2. Briefly disconnect then reconnect CAN connection to CTL board to reset processors.

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Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
MHDBR INPUT FAILURE (RDRB)
Description: The Rear Hoistway Door Bypass Monitor (MHDBR) input has detected a failure of the Rear Hoistway Door Bypass (HDBR) or (HDBBR) outputs. **Troubleshooting**: 1. Toggle the door bypass switch on the HC-CTL-2 board a few times, then make certain it is fully in the ON or OFF position. 2. Briefly disconnect then reconnect CAN connection to RDR board to reset processors.
MOTOR LIMIT TIMER (ANTI-STALL) ELAPSED
Description: The Starter Overload or the Thermal Overload has tripped, or there is a mechanical problem that prevents or slows the motion of the car. **Troubleshooting:** To clear the fault condition, on the HC-CTL-2 board, place the car on Machine Room Inspection, press the FAULT RESET button, then return the car to Normal operation. Immediately check the starter and thermal overloads and all circuitry associated with the motor.
MPI SPA IS OFFLINE, MPI SPB IS OFFLINE, MPI SPC IS OFF LINE
Description: These messages are Motion 4000 Traction related. **Troubleshooting**: Verify that CONTROLLER TYPE in the PROGRAM MODE (F1) BASIC FEATURES MENU is set to HYDRO (M2000).
MRD INPUT FAILURE
Description: The M Contactor Redundancy (MRD) input monitors the normally closed auxiliary contact of the M contactor. **Troubleshooting**: 1. The wiring or devices connected to MR1 input may not be terminated. 2. Check the M auxiliary contact wired to terminal MR1 and replace if necessary. 3. Check the operation of the M contactor.
MSAFL1 INPUT FAILURE (CTLB)
Description: The MSAFL1 input monitors the status of the relay contacts of SAFL and SAFS against the circuits that drive these relay coils. Bus 2L should be 120 Vac and relay SAFL should be picked only if the doors are locked. If on Inspection, direction must be established also. • This fault is generated if test point 2L, on the HC-CTL-2 board, measures 120VAC to ground while one of the following is true: 1. Test point SAFLA is 0VAC 2. Test point SAFLB is 120VAC 3. Test point MGS, on the HC-CTL-2 board, is 0VAC 4. Test point MSAFS1 is 0VAC 5. Safety bus terminal 2S, on the HC-CTL-2 board, is 0VAC. **Troubleshooting:** 1. Check or replace relays SAFL and/or SAFS on the HC-CTL-2 board. 2. Check that terminal 2L on the HC-CTL-2 board connects to IDC terminal 2L on the HC-DVR board. 3. Check the wiring of the thermal overload between terminals TO1 and TO2 on the HC-DVR board. 4. Check the wiring of the starter overload between terminal OL1 and OL2 (if present). 5. Replace the HC-CTL-2 board.
MSAFS1 INPUT FAILURE (CTLA)
Description: The MSAFS1 input monitors the status of the relay contacts of SAFL and SAFS against the circuits that drive these relay coils. Relay SAFS should be picked only if the safety string is made. **Troubleshooting:** 1. Check or replace relays SAFL and/or SAFS on the HC-CTL-2 board. 2. Check wiring associated with screw terminals SAFH, SAFC and ESC.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
MSSD FAILED ACTIVE (CTLB)
Description: MSSD monitors the solid state output of U1 and driver TY for proper operation If either fail in the on position this fault is generated. **Troubleshooting:** 1. Check terminal SSD wiring.
MSSD FAILED TO ACTIVATE
Description: MSSD monitors the solid state output of U1 and driver TY for proper operation. If either fail in the off position this fault is generated. When terminal OL2 is 120VAC and the car is commanded to run up, terminal SSD should be 120VAC. **Troubleshooting**: 1. Check the wiring at terminal SSD and OL2.
MSSD FAILED TO DEACTIVATE
Description: MSSD monitors the solid state output of U1 and driver TY for proper operation If either fail in the on position this fault is generated. When either fails to deactivate when expected this fault is generated. When the OL2 is 120VAC and the car is idle, terminal SSD should be low. **Troubleshooting**: 1. Check terminal SSD wiring.
MTAB INPUT FAILURE (CTLB)
Description: The Top Access Bypass Monitor (MTAB) input has detected a failure of the Top Access Bypass (TAB) or (TABA) outputs. **Troubleshooting**: 1. Verify wiring at HC-CTL-2 board terminals TAB1 and DLAT. 2. Check access switches and proper wiring of access terminals ATU, ATD.
MTABR INPUT FAILURE (RDRB)
Description: The Top Rear Access Monitor (MTABR) input has detected a failure of the Top Rear Access Bypass (TABR) or (TABAR) outputs or the TAB1 input. **Troubleshooting**: 1. Check the wiring at HC-CTL-2 board terminal TAB1. 2. Check Access switches and proper wiring of the access terminals (ATU, ATD).
MTD FAILED TO ACTIVATE *(Hydro only)*
Description: The MTD input monitors the status of the TD triac and the TD triac driver. When either fails to activate when expected this fault is generated. **Troubleshooting**: 1. Check the starter configuration and programming record. 2. Check motor contactor wiring and voltages at terminal DD1 on the HC-DVR board. 3. The TD triac may have failed open. Replace the HC-DVR board.
MTD FAILED TO DEACTIVATE *(Hydro only)*
Description: The MTD input monitors the status of the TD triac and the TD triac driver. When either fails to deactivate when expected this fault is generated. **Troubleshooting**: 1. Check the starter configuration and programming record. 2. Check motor contactor wiring and voltages at terminal DD1 on the HC-DVR board. 3. The TD triac may have shorted. Replace the HC-DVR board.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
MTD INPUT FAILURE (CTLA) *(Hydro only)*
Description: The input monitors the continuity of the DEL contactor coil and also checks the OFF state of the (TD) triac. **Troubleshooting**: 1. Verify that the STARTER #1 TYPE parameter is set to the correct type, WYE-DELTA or ACROSS THE LINE. 2. Check the termination of the left hand DEL contactor coil at terminal DD1 on the HC-DVR board. 3. Check the normally closed auxiliary contact of Y that feeds the right hand coil of DEL.
MTM FAILED TO ACTIVATE *(Hydro only)*
Description: The MTM input monitors the status of the TM triac and the TM triac driver. When either fails to activate when expected this fault is generated. **Troubleshooting**: 1. Check the starter configuration and programming record. 2. Check motor contactor wiring and voltages at terminal M1 on the HC-DVR board. 3. The TM triac may have failed open. Replace the HC-DVR board.
MTM FAILED TO DEACTIVATE *(Hydro only)*
Description: The MTM input monitors the status of the TM triac and the TM triac driver. When either fails to deactivate when expected this fault is generated. **Troubleshooting**: 1. Check the starter configuration and programming record. 2. Check motor contactor wiring and voltages at terminal M1 on the HC-DVR board. 3. The TM triac may have shorted. Replace the HC-DVR board.
MTM INPUT FAILURE (CTLA) *(Hydro only)*
Description: The input monitors the continuity of the M contactor coil and also checks the OFF state of the (TM) triac. **Troubleshooting**: 1. Verify that the M CONTACTOR INSTALLED parameter has been set to YES (if present). 2. Check the contactor coil. 3. Check the termination of the left hand M contactor coil at terminal M1 on the HC-DVR board.
MTY FAILED TO ACTIVATE *(Hydro only)*
Description: The MTY input monitors the status of the TY triac and the TY triac driver. When either fails to activate when expected this fault is generated. **Troubleshooting**: 1. Check the starter configuration and programming record. 2. Check motor contactor wiring and voltages at terminal YD1 on the HC-DVR board. 3. The TY triac may have failed open. Replace the HC-DVR board.
MTY FAILED TO DEACTIVATE *(Hydro only)*
Description: The MTY input monitors the status of the TY triac and the TY triac driver. When either fails to deactivate when expected this fault is generated. **Troubleshooting**: 1. Check the starter configuration and programming record. 2. Check motor contactor wiring and voltages at terminal YD1 on the HC-DVR board. 3. The TY triac may have shorted. Replace the HC-DVR board.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
MTY INPUT FAILURE *(Hydro only)*
Description: The input monitors the continuity of the Y Contactor coil and also checks the OFF state of the (TY) triac. **Troubleshooting**: 1. Verify that the STARTER #1 TYPE parameter is set to the correct type, WYE-DELTA. 2. Check the termination of the left hand Y contactor coil at terminal YD1 on the HC-DVR board. 3. Check the normally closed auxiliary contact of DEL that feeds the right hand coil of Y.
MUFE FAILED TO ACTIVATE *(Hydro only)*
Description: The MUFE input monitors the status of the UFE triac and the UFE triac driver. When either fails to activate when expected this fault is generated. When the doors are locked, the 2L bus is high, USL1 and USL2 limits are closed, the up normal limit (UNTD) is closed and the car is idle, terminals UF and UFE should be 120VAC. **Troubleshooting**: 1. Check the associated wiring. 2. Check the up fast valve coil. 3. Run the car up on inspection and verify that terminal UFE goes low. 4. The UFE triac may have failed open. Replace the HC-DVR board.
MUFE FAILED TO DEACTIVATE *(Hydro only)*
Description: The MUFE input monitors the status of the UFE triac and the UFE triac driver. When either fails to deactivate when expected this fault is generated. When the doors are locked, the 2L bus is high, USL1 and USL2 limits are closed, the up normal limit (UNTD) is closed and the car is idle, terminals UF and UFE should be 120VAC. **Troubleshooting**: 1. Check the associated wiring. 2. Check the up fast valve coil. 3. The UFE triac may have shorted. Replace the HC-DVR board.
MUFE INPUT IS LOW (CTLB) *(Hydro only)*
Description: The MUFE input monitors the continuity of the Up Fast Valve coil and also checks the OFF state of the UFE triac. **Troubleshooting**: 1. Check the termination of the valve coil at terminal UFE on the HC-DVR board. 2. Check terminal UF for 120VAC with respect to 1 bus.
MUSE FAILED TO ACTIVATE *(Hydro only)*
Description: The MUSE input monitors the status of the USE triac and the USE triac driver. When either fails to activate when expected this fault is generated. When the doors are locked, the 2L bus is high, USL1 and USL2 limits are closed, the up normal limit (UNTD) is closed and the car is idle, terminals US and USE should be 120VAC. **Troubleshooting**: 1. Check the associated wiring. 2. Check the up fast valve coil. 3. Run the car up on inspection and verify that terminal USE goes low. 4. The USE triac may have failed open. Replace the HC-DVR board.
MUSE FAILED TO DEACTIVATE *(Hydro only)*
Description: The MUSE input monitors the status of the USE triac and the USE triac software output. When USE fails to deactivate when expected this fault is generated. When the doors are locked, the 2L bus is high, USL1 and USL2 limits are closed, the up normal limit (UNTD) is closed and the car is idle, terminals US and USE should be 120VAC. **Troubleshooting**: 1. Check the associated wiring. 2. Check the up fast valve coil. 3. The USE triac may have shorted. Replace the HC-DVR board.

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Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
MUSE INPUT IS LOW (CTLA) *(Hydro only)*
Description: The MUSE input monitors the continuity of the Up Slow Valve coil and also checks the OFF state of the USE triac. **Troubleshooting**: 1. Check the termination of the valve coil at terminal USE on the HC-DVR board. 2. Check terminal US for 120VAC with respect to 1 bus.
NORMAL OPERATION
Description: The elevator is on "automatic" or Normal passenger operation.
NORMAL (PIT FLOOD) OPERATION
Description: The elevator is on "automatic" or Normal passenger operation with the pit flood input active. In this mode, the car will not serve floors beneath the flood level set. Please refer to "FLR COUNT BELOW FLOOD LEVEL?" on page 5-53. **Troubleshooting**: If pit flood operation is in error, refer to the drawings for the job and verify the PTFLD input is correctly configured (connected/disconnected/connected in error).
OIL TANK TEMPERATURE SHUTDOWN
Description: The input that monitors the Oil Tank Temperature Switch is activated. **Troubleshooting:** 1. Verify that the oil is overheated. If it is not, determine if the sensor is activated erroneously. 2. Check the OTTS Spare Input to determine if it is the proper state with regard to the Extra Features Menu Option OVER TMP SWITCH CONTACT parameter setting (normally open or normally closed). 3. To clear the fault condition, on the HC-CTL-2 board, place the car on Machine Room Inspection, press the FAULT RESET button, then return the car to Normal operation.
OLM INPUT IS LOW
Description: The OLM input monitors the status of the both the thermal overload and the starter overload contacts. Bus 2L should be 120VAC and relay SAFL should be picked only if the doors are locked. 2MV bus must also be active. **Troubleshooting**: 1. Check the wiring of the thermal overload between terminals TO1 and TO2 on the HC-DVR board. 2. Check the wiring of the starter overload between terminal OL1 and OL2 (if present).
OVERLOAD CONDITION
Description: The car appears to be overloaded, as indicated by the load weigher input OVL. **Troubleshooting:** Check the OVL input. If power is present on the OVL input, the load weigher contact associated with this input is closed. This contact being closed indicates to the elevator computer that the car is overloaded.
PASSCODE REQUEST
Description: The Passcode Request Option has been activated from the System Mode Menu. **Troubleshooting:** The system can be run on Inspection operation only. The pass code must be entered correctly in the System Mode Menu in order to deactivate this option and allow the controller to run normally. Please refer to "Passcode Request Menu" on page 5-62.
PLD IS OFFLINE
Description: The HC-CTL-2 PLD is not operating. **Troubleshooting:** Momentarily press RSTP push button on HC-CTL-2 PC board. If fault does not clear, then replace HC-CTL-2.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
POWER TRANSFER INPUT ACTIVE
Description: The PTI input has been activated. **Troubleshooting:** Go into Program Mode and see if any of the inputs are programmed as PTI. Then, check to see if that particular input is activated.
PRESSURE SWITCH ACTIVATED
Description: This message is displayed when the Pressure Switch Input (PSS) is programmed and activated (low). **Troubleshooting:** Check the associated hardware device and take appropriate action.
Profile Transition Stop
Description: This is when the car reaches the door zone at a speed higher than leveling. The LS-RAIL may be losing count, which can happen if it is improperly installed, slips on the rail, or the rail is uneven. **Troubleshooting:** IF the rail is uneven, the issue will occur at a specific location (not all landings). Observe the count in the F3 menu to see if the count is behaving properly.
R2L INPUT FAILURE (CTLA)
Description: The R2L input monitors the state of the 2L relay. The R2L input must be low when the 2L bus is active and high when the 2L bus is low. **Troubleshooting:** Check the circuitry associated with the 2L relay.
REAR CAR DOOR BYPASS SW FAILURE
Description: The rear car door bypass switch has failed. **Troubleshooting:** Check for proper function of the switch.
REAR DOL & DLK ARE BOTH ACTIVE
Description: The Door Open Limit Rear and the Door Lock inputs are both active, DOLR=0 and DLK=1. A problem with DOLR and/or DLK circuitry or wiring. **Troubleshooting:** Inspect the Door Open Limit Rear and the Door Lock circuitry and wiring. When this error is generated, the car will shutdown with the doors open and will not answer any calls. To reset this error condition, putt the car on Inspection operation.
REAR DOOR FAILED TO CLOSE
Description: Doors Open (DCLR = 1). There is a problem with DCLR circuitry or wiring. **Troubleshooting:** Inspect the Door Closed Limit Rear circuitry and wiring. When this error is generated, the car is not allowed to run.
REAR DOOR IS LOCKED BUT NOT FULLY CLOSED
Description: Rear Doors Open (DCLR = 1) and Locked (DLK = 1). Indicates a problem with DCLR and/or DLK circuitry or wiring. **Troubleshooting:** Inspect the Door Closed Limit Rear and the Door Lock circuitry and wiring. When this error is generated, the car is not allowed to run.
REAR DOOR LOCK SWITCH FAILURE
Description: The rear door lock contacts have failed closed. **Troubleshooting:** Ensure that with the rear hoistway doors closed and locked, there is power on the DLSR input an no power present on the DCLR input.
REAR DOOR OPEN LIMIT FAILURE
Description: The rear door open limit switch has failed open. **Troubleshooting:** Ensure that the rear car gate is open, there is no power on the DOLR input and no power is present on the DLR or GSR inputs.
REAR DOOR DZ RELAY DISCREPANCY

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Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
Description: The The HC-CTL-2 door zone input and door zone flag from MC-LSI board do not match. The elevator will stop at the next floor in the direction of travel and shut down until the fault is cleared (HC-CTL-2 fault reset or toggle Inspection switch). **Troubleshooting:** 1. Verify door zone (magnet if LS-EDGE) input. 2. Verify connection between MC-LSI board DZR_M and CTL-2 board DZR. 3. Relearn hoistway via F6 switch operation.
REAR GATE SWITCH FAILURE
Description: The rear car gate switch has failed closed. **Troubleshooting:** Ensure that with the rear car gate closed, there is power on the GSR input an no power present on the DCLR input.
REAR HOISTWAY DOOR BYPASS SW. FAILURE
Description: Indicates that the REAR HOISTWAY DOOR BYPASS switch has failed. **Troubleshooting**: 1. Cycle the HC-CTL-2 board hoistway door bypass switch a few times to exercise it. Verify that it is fully in the ON or OFF position. 2. Verify 2 bus and DLABR connections and wiring.
REDUNDANCY DOOR LOCK RELAY FAILURE
Description: The one or both of the front or rear door lock relays has failed closed. **Troubleshooting:** Ensure that with the hoistway doors open, there is no power present on the RDLS or RDLSR inputs. If power is present, one or more of the door lock relays has failed in the closed or picked position.
REDUNDANCY FRONT GATE SWITCH FAILURE (*Non ASME-2000*)
Description: The car gate switch relay has failed closed. **Troubleshooting:** Ensure that with the car gate open, there is no power present on the RGS input. If power is present, the car gate switch relay has failed closed.
REDUNDANCY REAR GATE SWITCH FAILURE
Description: The rear car gate switch relay has failed closed. **Troubleshooting:** Ensure that with the rear car gate open, there is no power on the RGSR input. If power is present, the rear car gate switch relay has failed closed.
RESTORING SAFETY (CTLA)
Description: This message will be displayed while the system checks the safety integrity of the controller when coming out of car top inspection.
RFV INPUT FAILED TO ACTIVATE (CTLA) (Hydro only)
Description: With the VALVE TYPE parameter set to PILOT RELAYS, the Redundancy Fast Valves (RFV) input did not go high when controller deactivated the associated pilot relays. **Troubleshooting**: 1. Check the wiring to the RFV spare input. 2. Verify that the RFV input is programmed in the correct spare input location. 3. Please refer to "Troubleshooting Using External Memory Mode" on page 5-57. Set the proper external memory address for the RFV spare input. Use a 120VAC jumper to toggle the RSV input and verify that the appropriate bit toggles. 4. Verify that the appropriate fast pilot relay (up or down) picks at the beginning of a high speed run and drops at the slow down point for the floor.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
RFV INPUT FAILED TO DEACTIVATE (CTLC) (Hydro only)
Description: With the VALVE TYPE parameter set to PILOT RELAYS, the Redundancy Fast Valves (RFV) input did not go low when controller activated the associated pilot relays. **Troubleshooting**: 1. Check the wiring to the RFV spare input. 2. Verify that the RFV input is programmed in the correct spare input location. 3. Please refer to "Troubleshooting Using External Memory Mode" on page 5-57. Set the proper external memory address for the RFV spare input. Use a 120VAC jumper to toggle the RSV input and verify that the appropriate bit toggles. 4. Verify that the appropriate fast pilot relay (up or down) picks at the beginning of a high speed run and drops at the slow down point for the floor.
RP SENSOR TRIPPED *(Hydro only)*
Description: The Reverse Phase sensor detected a problem with the incoming power and the RP sensor's N/C contacts activated HC-DVR board RP1 input (active high - 120VAC). The car returns to the bottom landing, cycles the doors and shuts down. The DOB can cycle the doors. **Troubleshooting**: 1. Verify that HC-DVR board terminal RP1 to ground = 120VAC. 2. Check the wiring (phase rotation) to the motor starter. 3. Check the wiring to the RP sensor (incorrect, loose or missing wires).
RSV INPUT FAILED TO ACTIVATE (CTLA) (Hydro only)
Description: With the VALVE TYPE parameter set to PILOT RELAYS, the Redundancy Slow Valves (RSV) input did not go high when controller deactivated the associated pilot relays. **Troubleshooting**: 1. Check the wiring to the RSV spare input. 2. Verify that the RSV input is programmed in the correct spare input location. 3. Please refer to "Troubleshooting Using External Memory Mode" on page 5-57. Set the proper external memory address for the RSV spare input. Use a 120VAC jumper to toggle the RSV input and verify that the appropriate bit toggles. 4. Verify that the appropriate slow pilot relay (up or down) remains picked throughout the run.
RSV INPUT FAILED TO DEACTIVATE (CTLC) (Hydro only)
Description: With the VALVE TYPE parameter set to PILOT RELAYS, the Redundancy Slow Valves (RSV) input did not go low when controller activated the associated pilot relays. **Troubleshooting**: 1. Check the wiring to the RSV spare input. 2. Verify that the RSV input is programmed in the correct spare input location. 3. Please refer to "Troubleshooting Using External Memory Mode" on page 5-57. Set the proper external memory address for the RSV spare input. Use a 120VAC jumper to toggle the RSV input and verify that the appropriate bit toggles. 4. Verify that the appropriate slow pilot relay (up or down) remains picked throughout the run.
SABBATH OPERATION ACTIVE
Description: The spare input SAB has been activated. **Troubleshooting:** Check spare input bit address for SAB. Verify that the spare input address matches the SAB flag. Check voltage level at the SAB input.
SAFC INPUT FAILURE (CTLA)
Description: The microcontroller has detected that the Car Safety String (SAFC) input on the HC-CTL-2 board is in an incorrect state. It should not have 120VAC unless the SAFH input also has 120VAC. **Troubleshooting**: Check the wiring or devices connected to the SAFC input. This could also be caused by a component failure on the HC-CTL-2 board.

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Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
SAFETY CIRCUIT IS OPEN
Description: The Car Operating Panel emergency stop switch has been pulled, or another contact switch in the safety circuit is in the open position. **Troubleshooting:** Check the C.O.P. stop switch. Check the other switches and contacts in the safety string. Check safety string wiring against the MCE wiring diagrams.
SAFETY DROPPED BY MPU-B
Description: Safety processor B on the HC-CTL-2 board has dropped the safety relay. **Troubleshooting**: 1. Cycle power. 2. Check the event log to see what events led up to the occurrence.
SPA IS OFFLINE (CTLB)
Description: Safety processor A on the HC-CTL-2 board is offline. **Troubleshooting**: 1. Power to the HC-CTL-2 board may not be connected. Check the CAN bus connection between the HC-CTL-2 board and the HC-CHP CAN hub and board. 2. If the SPA indicator is not lit, reboot the processor by cycling the power to the controller or by removing CAN bus connection to the HC-CTL-2 board for a few seconds. 3. If fault occurs while updating software, refer to update instructions and repeat process.
SPB IS OFFLINE (CTLA)
Description: Safety processor B on the HC-CTL-2 board is offline. **Troubleshooting**: 1. Power to the HC-CTL-2 board may not be connected. Check the CAN bus connection between the HC-CTL-2 board and the HC-CHP CAN hub and board. 2. If the SPB indicator is not lit, reboot the processor by cycling the power to the controller or by removing CAN bus connection to the HC-CTL-2 board for a few seconds. 3. If fault occurs while updating software, refer to update instructions and repeat process.
STARTER FAULT CONTACT OPEN (*Hydro only*
Description: The solid-state starter internal fault contact is open. **Troubleshooting**: 1. Check the solid-state starter fault display screen and refer to the starter manual for trouble-shooting instructions. 2. Verify that terminal YR1 has 120VAC.
STARTER TYPE ERROR (*Hydro only*
Description: The HC-DVR board has received an invalid starter type from the from the MPU board. **Troubleshooting:** May be caused by a communication error between the HC-MPU and HC-DVR boards, call MCE Tech Support.
SYNCHRONIZATION OPERATION (*Hydro only*)
Description: The SYNCI input has been activated **Troubleshooting:** Ensure that the synchronization function is required. This function is used on PHC controllers used on jobs with two jacks or telescopic jacks. If the SYNCI Input option is programmed and has been activated, the SYNC function will be performed as soon as all demand is serviced. Ensure that the circuit connected to SYNCI input is not activating the input inappropriately.
TIME OUT OF SERVICE
Description: The T.O.S. timer has expired. **Troubleshooting:** The elevator has been delayed, usually by a door being obstructed. The Time Out of Service timer has expired and the elevator has been taken out of service. Please refer to "TIME OUT OF SERVICE TIMER (Range: 15-240 Seconds, or None)" on page 5-26.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
TOP ACCESS SW. FAILURE (CTLB)
Description: The Up and Down Top Access inputs are active at the same time. **Troubleshooting**: Check the wiring and switches associated with the ATU and ATD inputs.
UP AND DOWN TERMINAL SPEED REDUCING LIMITS OPEN
Description: Usually indicates a problem with the up slow down or the down slow down switch. **Troubleshooting:** Inspect both switches and associated wiring. The down slow down switch should be closed, unless the car is at the bottom; then it should be open. The up slow down switch should be closed, unless the car is at the top; then it should be open.
UP NORMAL LIMIT OPEN
Description: This message indicates that the car has traveled beyond the top terminal landing and has opened the up normal (directional) terminal switch. **Troubleshooting**: 1. Check the location of the car. 2. Check the voltage at terminal UNTD. 3. Check the limit switch connections.
UP TERMINAL LIMIT FAILURE
Description: Both the Up Slow Limit and Up Emergency Limit switches have been detected to be in opposite states. These switches should open/close simultaneously, meaning that the voltage at these terminals should always be identical. **Troubleshooting**: 1. Check the connections to terminals USL1 and USL2. 2. Check the limit switches for proper operation. For LS-EDGE: 3. Check the connections to terminals LIM2 from the controller and SP3A from the cartop. 4. Check the RJ-45 connections on the cartop between J14 from the MC-LSI board and MDISC. from the LS-EDGE unit. 5. Confirm that the terminal magnet matches the suggested length shown on Table 4 on page 3-18. 6. Verify that the UF and USL2 terminals from the HC-DVR board and UF terminal from the HC-CTL-2 board are all connected together. 7. Verify that the US terminal from the HC-DVR board is connected to the US terminal from the HC-CTL-2 board. For LS-EDGE and non-short floors at the top terminal: 8. Confirm LIM2 is connected to LIM3. 9. Confirm U/DNT3 (F7 parameter 72) is set to Virtual. 10. Confirm U/DNT4 (F7 parameter 73 is set to Unused. 11. Confirm UNTS3 Distance (F7 parameter 90) is set to the suggested distance shown on Table 5.17 on page 5-101. For LS-EDGE and short floors at the top terminal: 12. Confirm LIM2 is ***not*** connected to LIM3. 13. Check connection between LIM3 from the controller and one end of the top short floor cam switch. 14. Check connections between 24V from the controller and the other end of the top short floor cam switch. 15. Confirm U/DNT3 is set to Virtual. 16. Confirm U/DNT4 is set to Virtual. 17. Using Table 7.2 on page 7-13, confirm UNTS3 Distance is set to the highest slowdown distance aligning with the minimum floor height that’s less than or equal to the top floor height. 18. Confirm UNTS4 Distance (F7 parameter 95) is set to the suggested distance shown on Table 7.2 on page 7-13, ignoring the minimum floor height distance. 19. Confirm that the position of the top short floor cam switch matches the UNTS3 Distance.

Table 6.1 Status and Error Messages

Scrolling Message - Special Event Message
VALVE LIMIT TIMER (ANTI-STALL) ELAPSED (*Hydro only*)
Description: Indicates a problem with the valve or valve solenoids. **Troubleshooting:** Inspect the valves & valve solenoids and associated wiring. To clear the fault condition, on the HC-CTL-2 board, place the car on Machine Room Inspection, press the FAULT RESET button, then return the car to Normal operation.
VISCOSITY CONTROL FUNCTION (*Hydro only*)
Description: The Viscosity Control Input (VCI) is *ON*. The computer is periodically running the motor to warm the oil in the system. **Troubleshooting:** Check the device that is wired to the input (usually an oil temperature sensor).
WP SECURITY ACTIVATED
Description: Wandering patient security has been activated. **Troubleshooting:** Wandering patient (abduction) security is active. If in error, check the status of the assigned input.
YRD INPUT FAILURE
Description: The Y Contactor Redundancy (YRD) input monitors the normally closed auxiliary contact of the Y starter contactor. **Troubleshooting**: 1. The wiring or devices connected to YR1 input may not be terminated. 2. Check the Y auxiliary contact wired to terminal YR1 and replace if necessary. 3. Check the operation of the Y contactor.
8-15-12

PC Board Quick References

This section contains information about Motion 2000 circuit boards including photographs with informational call outs, input/outputs, indicators, jumpers, test points and other information pertinent to troubleshooting.

The circuit boards are listed in the table below. If you are viewing this file on a computer, click the page number to jump to the appropriate section.

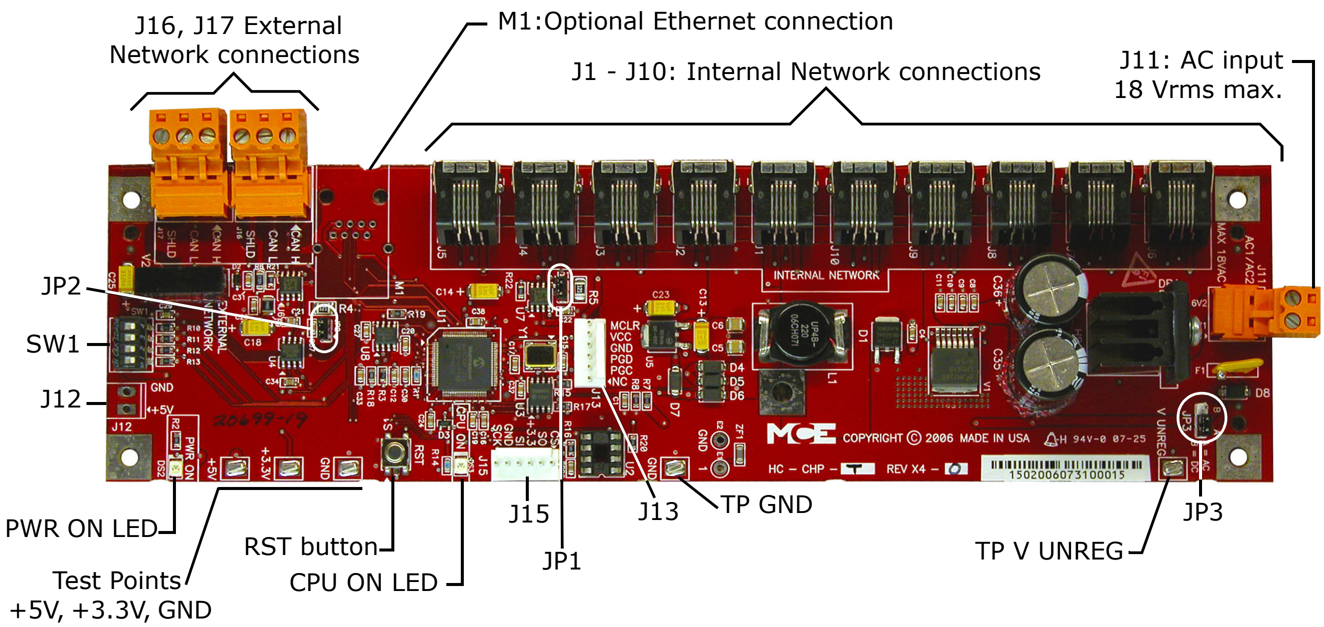
Table 6.2 Motion 2000 Circuit Boards

Board	Name	See
HC-**CHP**	CAN Hub and Power Supply Board	page 6-40
HC-**CTL-2**	Control Board	page 6-42
HC-**DVR**	Driver Board	page 6-49
HC-**MPU**	Main Processor Unit Board	page 6-52
HC-**UIO-2**	Universal Input/Output Board	page 6-55
ICE-**COP-2**	Car panel interface board	page 6-62
MC-**CPI**	Car Panel Interface Board	page 6-62
MC-**LSI**	Landing System Interface Board	page 6-69
SC-**3HN**	Serial Hall Call Node Board	page 6-72
SC-**3HN-2**	Serial Hall Call Node Board, Gen 2	page 6-72

HC-CHP CAN Hub and Power Supply Board

This board provides 5-volt, 4-amp DC power for digital integrated circuits throughout the controller. It also provides a central connection point for the Controller Area Network (CAN).i

Figure 6.1 HC-CHP CAN Hub and Power Supply Board



Connectors

- J1 - J10: Internal network connections - to boards inside the controller cabinet.
- J11: Low voltage AC input - 16V1/16V2, maximum 18Vrms.
- J12: optional +5Vdc output.
- J13: In-circuit serial programming port for microcontroller.
- J15: Connector used to interface with external serial flash memory.
- J16, J17: External network connections - to boards or equipment outside the controller cabinet.
- M1: Optional Ethernet connection.

Jumpers

- JP1: Internal CAN bus termination resistor - always closed.
- JP2: External CAN bus termination resistor - always closed.
- JP3: AC or DC voltage monitor. Always set to position A to monitor the loss of AC voltage.

Test Points

- +5V: +5Vdc measured between this test point and TP GND.
- +3.5V: +3.3Vdc measured between this test point and TP GND.
- GND: 0V.
- V UNREG: 24V A20% measured between this test point and TP GND.

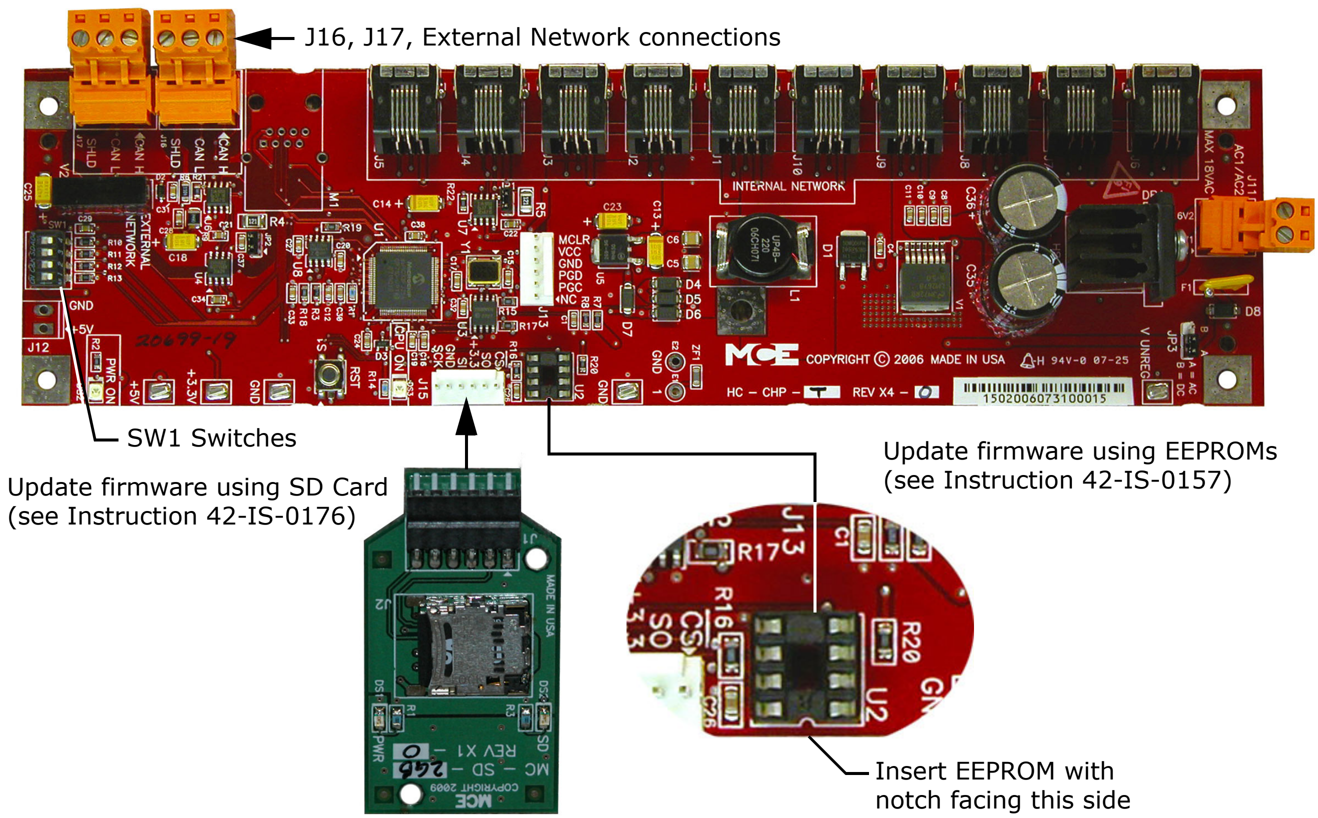
Indicators

- PWR ON: +5V indicator.
- CPU ON: LED on indicates that the on-board microcontroller is functional.

Switches

- SW1: DIP switches (see SW1 DIP Switch Settings below).
- RST: microcontroller reset button.

Figure 6.2 Upgrading Motion 2000 Firmware



SW1 DIP Switch Settings

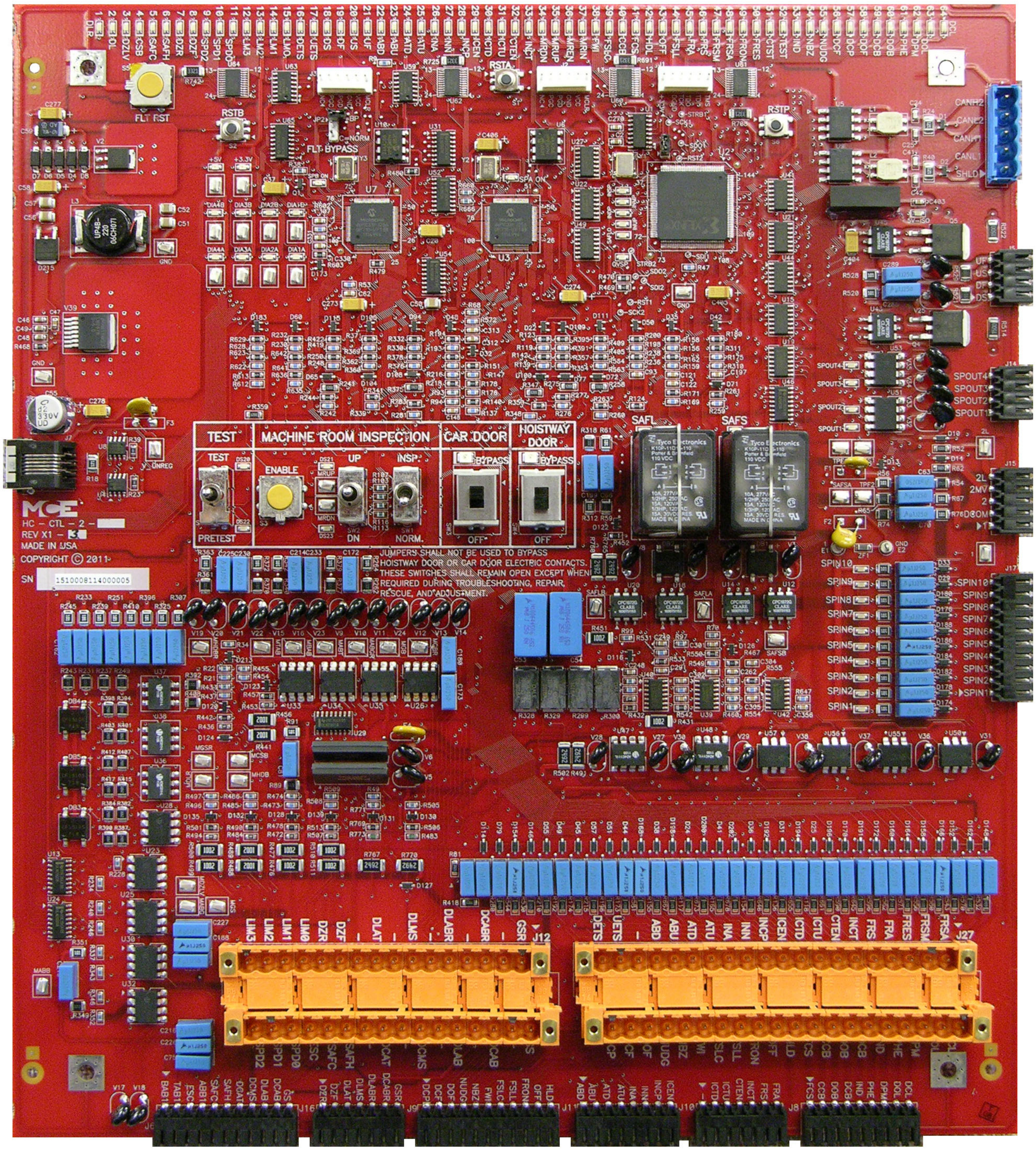
SW1 DIP Switch Settings			
DIP 1	**DIP 2**	**DIP 3**	**Description**
Off	Off	Off	Normal boot up (bypasses firmware update)
On	On	On	Updates firmware different from EEPROM or SD card
On	On	Off	Forced update (fixes corrupted software)
On = switch left, Off = switch right			

DIP 4 Sets the communication baud rate for the External CAN bus (Off = 125 kbs, On = 250 kbs).
DO NOT change this switch setting.

HC-CTL-2 Control Board

The HC-CTL-2 Control board monitors I/O, performs safety functions and provides front and rear door operation. The HC-CTL-2 board is responsible for Inspection, Fire Service, Landing System, door lock bypass, lanterns, and gongs.

Figure 6.3 HC-CTL-2 Control Board



HC-CTL-2 Terminal Definitions

Table 6.3 HC-CTL-2 Board Terminals

Connector	Terminal	Description
J1		Board programming, factory only
J2		Board programming, factory only
J3		Board programming, factory only
J4	CAN	CAN bus connection from HC-CHP board
J5	DS	Not used for traction control
	DF	Not used for traction control
	US	Not used for traction control
	UF	Not used for traction control
J6 MCE wired at factory. Not for field connection.	BAB1	Bottom access
	TAB1	Top access
	ESC	In-car stop switch bypass (completes SAFC safety string with switch open)
	ABB1	
	SAFC	Safety string, car
	SAFH	Safety string, hoistway
	DCAT	Door contact access top (top access floor door contact "made")
	DCMS	Door contact middle string (floors between access floors, contacts "made")
	DLAB	Door lock access bottom (bottom access floor door lock "made")
	DCAB	Door contact access bottom (bottom access floor door contact "made")
	GS	Gate switch (car gate switch "made")
J7	CAN	CAN bus connection, spare
J8 MCE wired at factory. Not for field connection.	FCS	See description, connector J27
	CCB	See description, connector J27
	DOB	See description, connector J27
	DCB	See description, connector J27
	IND	See description, connector J27
	PHE	See description, connector J27
	DPM	See description, connector J27
	DOL	See description, connector J27
	DCL	See description, connector J27
J9 MCE wired at factory. Not for field connection.	DCP	See description, connector J27
	DCF	See description, connector J27
	DOF	See description, connector J27
	NUDG	See description, connector J27
	NBZ	See description, connector J27
	FWI	See description, connector J27
	FSLC	See description, connector J27
	FSLL	See description, connector J27
	FRON	See description, connector J27
	OFF	See description, connector J27
	HLD	See description, connector J27

Table 6.3 HC-CTL-2 Board Terminals

Connector	Terminal	Description
J10 MCE wired at factory. Not for field connection.	ICTD	See description, connector J27
	ICTU	See description, connector J27
	CTEN	See description, connector J27
	INCT	See description, connector J27
	FRS	See description, connector J27
	FRA	See description, connector J27
J11 MCE wired at factory. Not for field connection.	ABD	See description, connector J27
	ABU	See description, connector J27
	ATD	See description, connector J27
	ATU	See description, connector J27
	INA	See description, connector J27
	INN	See description, connector J27
	INCP	See description, connector J27
	ICEN	See description, connector J27
J12	GSR	Gate switch rear (rear opening car gate switch "made" input)
	DCABR	Door contact access bottom rear (bottom access floor rear door contact "made" input)
	DLABR	Door lock access bottom rear (bottom access floor rear door lock "made" input)
	DLMS	Door lock middle string (floors between access floors, contacts "made" input)
	DLAT	Door lock access top (top access floor door lock "made" input)
	DZF	Front door zone input, discrete landing system connection
	DZR	Rear door zone input, discrete landing system connection
	LIM0	Used with hydro applications only
	LIM1	Used with hydro applications only
	LIM2	Used with hydro applications only
	LIM3	Used with hydro applications only
	GS	Gate switch (car gate switch "made" input)
	DCAB	Door contact access bottom (bottom access floor door contact "made" input)
	DLAB	Door lock access bottom (bottom access floor door lock "made" input)
	DCMS	Door contact middle string (floors between access floors, contacts "made" input)
	DCAT	Door contact access top (top access floor door contact "made" input)
	SAFH	Safety string, hoistway (input)
	SAFC	Safety string, car (input)
	ESC	In-car stop switch bypass (completes SAFC safety string with switch open)
	SPD0	Speed bit from LS-EDGE landing system sensor
	SPD1	Speed bit from LS-EDGE landing system sensor
	SPD2	Speed bit from LS-EDGE landing system sensor
J14	SPOUT1	Programmable spare output #1. Defined on job prints if used.
	SPOUT2	Programmable spare output #2. Defined on job prints if used.
	SPOUT3	Programmable spare output #3. Defined on job prints if used.
	SPOUT4	Programmable spare output #4. Defined on job prints if used.

Table 6.3 HC-CTL-2 Board Terminals

Connector	Terminal	Description
J15 MCE wired at factory. Not for field connection.	1	Ground
	DCOM	Digital Common
	2	120 VAC
	2MV	Provides 120VAC to 2L bus when SAFL and SAFS relays are picked (input).
	2L	Provides 120VAC to valves and motor signals when doors are locked and safety string is made up (Output).
J16 MCE wired at factory. Not for field connection.	DZR	See description, connector J12
	DZF	See description, connector J12
	DLAT	See description, connector J12
	DLMS	See description, connector J12
	DLABR	See description, connector J12
	DCABR	See description, connector J12
	GSR	See description, connector J12
J17	SPIN1	Programmable spare input #1. Defined on job prints if used.
	SPIN2	Programmable spare input #2. Defined on job prints if used.
	SPIN3	Programmable spare input #3. Defined on job prints if used.
	SPIN4	Programmable spare input #4. Defined on job prints if used.
	SPIN5	Programmable spare input #5. Defined on job prints if used.
	SPIN6	Programmable spare input #6. Defined on job prints if used.
	SPIN7	Programmable spare input #7. Defined on job prints if used.
	SPIN8	Programmable spare input #8. Defined on job prints if used.
	SPIN9	Programmable spare input #9. Defined on job prints if used.
	SPIN10	Programmable spare input #10. Defined on job prints if used.

Table 6.3 HC-CTL-2 Board Terminals

Connector	Terminal	Description
J27	FRSA	Fire Service Alternate Initiating Device, machine room (input)
	FRSM	Fire Service Main Initiating Device, all other hoistway fire service initiating devices (input)
	FRES	Fire Service Reset (input)
	FRA	Main Landing Smoke Sensor (input)
	FRS	Smoke/Fire Sensors for all landing that are not main (input)
	INCT	Car Top Inspection
	CTEN	Car top enable button input
	ICTU	Car top inspection Up button
	ICTD	Car top inspection Down button
	ICEN	In car inspection enable button input
	INCP	In car inspection switch input, INSP position
	INN	COP Access enable switch, NORM input
	INA	COP Access enable switch, ACC input
	ATU	Top access switch, Up position
	ATD	Top access switch, Down position
	ABU	Bottom access switch, Up position
	ABD	Bottom access switch, Down position
	UETS	Up emergency terminal switch input
	DETS	Down emergency terminal switch input
	DCL	Door close limit input
	DOL	Door open limit input
	DPM	Door position monitor switch input
	PHE	Photo eye, infrared detector input
	IND	Independent service switch input
	DCB	Door close button input
	DOB	Door open button input
	CCB	Fire service car call cancel button input
	FCS	Phase II Fire Service Operation On (On position, 3-position fire service switch)
	HLD	Phase II Fire Service Operation Hold (Hold position, 3-position fire service switch)
	OFF	Phase II Fire Service Operation Off (Off position, 3-position fire service switch)
	FRON	Fire Recall Operation On (input)
	FSLL	Fire Service Indicator for Lobby (output)
	FSLC	C.O.P. Fire Service Light (output)
	FWI	Fire Service Buzzer (output)
	NBZ	Nudging Buzzer (output)
	NUDG	Nudging enable output
	DOF	Door open function output, initiates door opening at landing
	DCF	Door close function output, initiates door closing at landing
	DCP	Door close power, enables door closing power application while car is running

HC-CTL-2 Board LED Indicators

Indicator LEDs for board connections light when the corresponding input or output is active.

HC-CTL-2 Board Jumpers, Fuses, Testpoints, and Switches

Table 6.4 HC-CTL-2 Board Jumpers

Jumper	Description
JP1	IC U2 program source, factory use only. Default is No Jumper.
JP2	Fault Bypass, 2 position. A = Bypass active; B = Bypass off. B position is default.

Table 6.5 HC-CTL-2 Board Fuses

Fuse	Description
F1	Fused 2 Bus (120VAC) testpoint TPF2
F2	Fused 1 Bus (ground) testpoint TPF1
F3	Fuse, unregulated voltage, connector J7, pin 2
F4	Fuse, ESC terminal (in-car stop switch bypass)

Table 6.6 HC-CTL-2 Board Test Points

Test Point	Description
TP1	DIA1A, SPA processor factory diagnostic
TP2	DIA2A, SPA processor factory diagnostic
TP3	DIA3A, SPA processor factory diagnostic
TP4	DIA4A, SPA processor factory diagnostic
TP5	DIA4B, SPB processor factory diagnostic
TP6	DIA1B, SPB processor factory diagnostic
TP7	DIA2B, SPB processor factory diagnostic
TP8	DIA3B, SPB processor factory diagnostic
TP9	+5V, on-board 5V regulator output for digital circuits, associated LED DS105, 5V
TP10, 11, 12	Ground
TP13	Ground
TP14	2L bus, 120VAC. 2L terminal voltage. PM, BR, FBS contactor logic.
TP15	MSAFS1, SAFS relay monitor.
TP16	SAFSB, output SAFS relay coil
TP17	SAFSA, input SAFS relay coil
TP18	MCSB, in-car stop switch bypass voltage monitor
TP19	SAFLA, input SAFL relay coil
TP20	SAFLB, output SAFL relay coil
TP21	MRUP, machine room inspection switch Up direction
TP22	MRDN, machine room inspection switch Down direction
TP23	MDZLV, monitors output of MDZLV (door zone level) solid state relay U23
TP24	MABG, monitors output of ABG (access bypass gate) solid state relay U25. MABG must always be in the opposite state of MABGR.
TP25	MGB, monitors status of car door bypass switch, front door, pole 4, high = bypass off

Table 6.6 HC-CTL-2 Board Test Points

Test Point	Description
TP26	MGBR, monitors status of car door bypass switch, rear door, pole 1, high = bypass off
TP27	MHDB, monitors status of hoistway door bypass switch, pole 4, high = bypass off
TP28	MHDBR, monitors status of hoistway door bypass switch, pole 1, high = bypass off
TP29	MABT, monitors status of access bypass top solid state relay ABTP U30
TP30	MABB, monitors status of access bypass bottom solid state relay ABB, U32
TP31	MTAB, monitoring for Top Access Bypass solid state relay U33. If the TAB relay is ON, the RTAB (Rear Top Access Bypass) input will be OFF. MTAB should always be the opposite of RTAB otherwise, the TAB redundancy fault is logged and the elevator shuts down.
TP32	MBAB, monitoring for BAB, Bottom Access Bypass, solid state relay U34.If the BAB relay is ON, the RBAB, Rear Bottom Access Bypass) input will be OFF. RBAB should always be the opposite of BAB otherwise, the BAB redundancy fault is logged and the elevator shuts down.
TP33	MABGR, monitoring for ABGR, Access Bypass Gate Rear, solid state relay U35. MABGR must always be in the opposite state from MABG.
TP34	MDLR, monitoring for DLR, door locks rear, solid state relay U36. High when rear door locks are made.
TP35	MGSR, monitoring for GSR, gate string rear, solid state relay U37. High when rear car gate string is made.
TP36	MGS, monitoring for GS, gate string, solid state relay U38. High when car gate string is made.
TP39	+3.3V logic voltage
TP40	V_unreg, pre-regulation board voltage supply. Nominally about 16 - 18 volts.

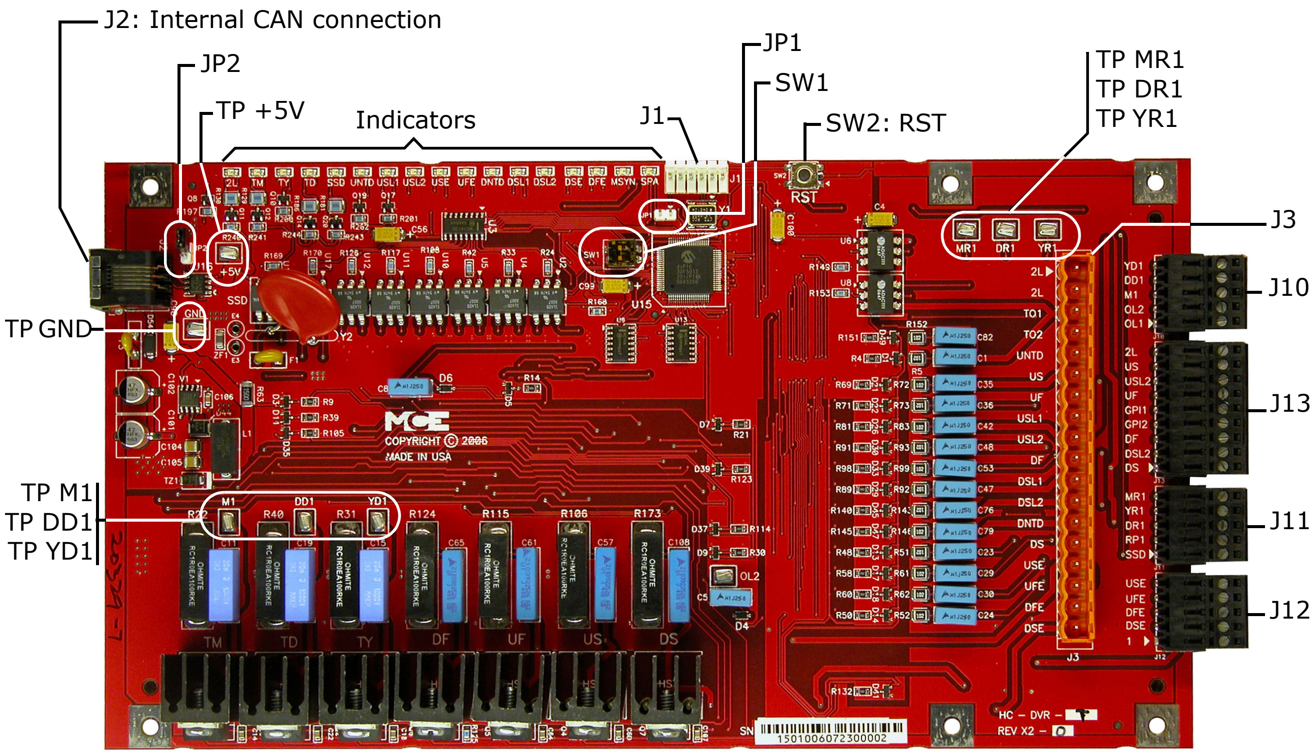
Table 6.7 HC-CTL-2 Board Switches

Switch	Description
S1	SPA U3 reset
S2	SPB processor U7 reset
S3	(Run) Enable button, Inspection operation
S4	Test/Pretest switch. Please refer to “Test Mode” on page 1-19.
S5	Board fault reset
S6	PLD U2 reset
SW1	Inspection/Normal operation switch
SW2	Up/Down Inspection direction
SW3	Car Door Bypass
SW4	Hoistway Door Bypass

HC-DVR Driver Board

The HC-DVR Driver board(s) control the pump(s) and valves.

Figure 6.4 HC-DVR Driver Board



Switches

- SW1: Board ID. DVR #1: 1 = Off, 2 = Off. DVR #2: 1 = On, 2 = Off. DVR #3: 1 = Off, 2 = On.
- SW2: RST - Processor reset.

Jumpers

- JP1: Processor hard reset - Open. Jumper required only to perform 2K compliance testing.
- JP2: Internal CAN network termination - Open.

Table 6.8 HC-DVR Board Test Points

Test Point	Description
+5V	+5 Vdc measured between this test point and TP GND.
DD1	TD triac output test point
DR1	Delta contactor monitor input test point
GND	0 volts
M1	TM triac output test point
MR1	Main contactor monitor input test point
YD1	TY triac output test point
YR1	Wye contactor monitor input test point

Table 6.9 HC-DVR Board Terminals

Connector	Terminal	Description
J1		Used to program the U15 microcontroller
J2		Internal CAN signal and power
J3	2L	2L bus output
	2L	2l bus output
	TO1	Connects to input of thermal overload (Also monitors 2L bus)
	TO2	Connects to output of thermal overload
	UNTD	Up normal limit (input)
	US	Up slow (Provides power to valve, output)
	UF	Up fast (Provides power to valve, output)
	USL1	Up slow terminal #1 (input)
	USL2	Up slow terminal #2 (input)
	DF	Down fast (Provides power to valve, output)
	DSL1	Down slow terminal #1 (input)
	DSL2	Down slow terminal #2 (input)
	DNTD	Down normal limit (input)
	DS	Down slow (Provides power to valve)
	USE	Up Slow Enable (Pulls to ground when valve is activated, output)
	UFE	Up Fast Enable (Pulls to ground when valve is activated, output)
	DFE	Down Fast Enable (Pulls to ground when valve is activated, output)
	DSE	Down Slow Enable (Pulls to ground when valve is activated, output)
J10	YD1	Wye contactor coil or solid state start (Pulls to ground when activated, output)
	DD1	Delta or A contactor coil (Pulls to ground when activated, output)
	M1	Main contactor coil (Pulls to ground when activated, output)
	OL2	Connects to overload monitor output
	OL1	Connects to overload monitor input
J11	MR1	Main contactor monitor input (Connects to 2 bus and normally closed auxiliary contacts)
	YR1	Wye contactor monitor input (Connects to 2 bus and normally closed auxiliary contacts)
	DR1	Delta contactor monitor input (Connects to 2 bus and normally closed auxiliary contacts)
	RP1	Reverse phase sensor input
	SSD	SSD monitor input

Table 6.9 HC-DVR Board Terminals

Connector	Terminal	Description
J12	USE	MCE valve connections (See J3)
	UFE	MCE valve connections (See J3)
	DFE	MCE valve connections (See J3)
	DSE	MCE valve connections (See J3)
	1	MCE valve connections (See J3)
J13	2L	MCE limits connections (See J3)
	US	MCE limits connections (See J3)
	USL2	MCE limits connections (See J3)
	UF	MCE limits connections (See J3)
	GPI1	MCE limits connections (See J3)
	GPI2	MCE limits connections (See J3)
	DF	MCE limits connections (See J3)
	DSL2	MCE limits connections (See J3)
	DS	MCE limits connections (See J3)

Table 6.10 HC-DVR Board Indicators

Indicator	Description
2L	2L bus is high
TM	TM triac is active
TY	TY triac is active
TD	TD triac is active
SSD	SSD input is active
UNTD	Up normal limit input is high
USL1	Up slow terminal #1 input is high
USL2	Up slow terminal #2 input is high
USE	Up Slow Enable output is active
UFE	Up Fast Enable output is active
DNTD	Down normal limit input is high
DSL1	Down slow terminal #1 input is high
DSL2	Down slow terminal #2 input is high
DSE	Down Slow Enable output is active
DFE	Down Fast Enable output is active
MSYN	Sync Operation Active
SPA	Safety Processor A is running

HC-MPU Main Processor Board

The HC-MPU board performs control data processing and is responsible for:

- Car operation
- Car communication
- Programming and diagnostics
- Redundancy cycle testing
- System software validation
- Duplexing

Figure 6.5 HC-MPU Main Processor Unit Board

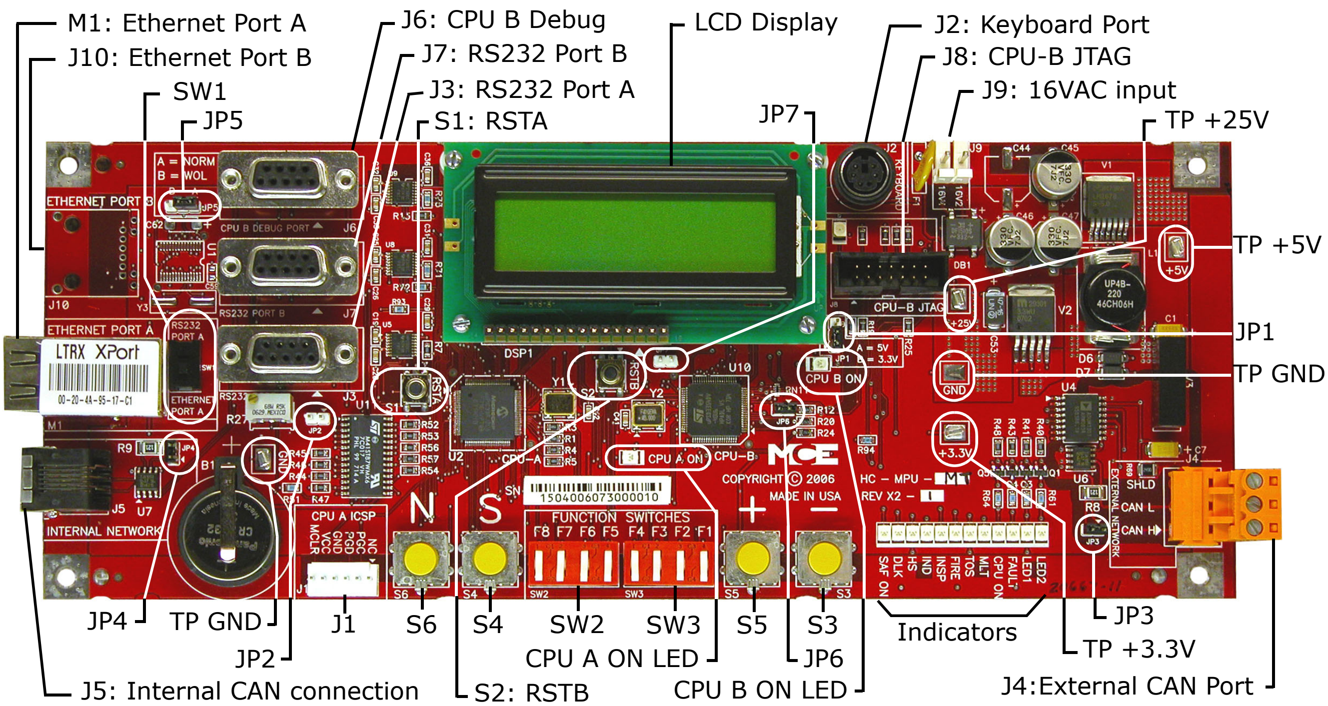


Table 6.11 HC-MPU Board Jumpers

Jumper	Setting	Description
JP1	A	Selects voltage for LCD. A = 5V, B = 3.3V
JP2	-	CPU A hard reset. No jumper provided, only required for 2K testing.
JP3	Closed	External CAN network termination.
JP4	Open	Internal CAN network termination
JP5	A	Ethernet Port B (not currently used)
JP6	Open	JTAG Debug Jumper. Closed = debug mode.
JP7	-	CPU B hard reset. No jumper provided, only required for 2K testing.

Table 6.12 HC-MPU Board Switches

Switches	Description
S1	RSTA: Reset CPU A
S2	RSTB: Reset CPU B
S3	"-" minus push button
S4	"S" push button
S5	"+" plus push button
S6	"N" push button
SW1	Port Selection: RS232 Port A / Ethernet Port A
SW2	DIP Function switches F5 through F8
SW3	DIP Function switches F1 though F4

Table 6.13 HC-MPU Board Indicators

Indicators	Description
CPU A ON	CPU A is executing its program
CPU B ON	CPU B is executing its program
LED2	Reserved
LED1	Reserved
FAULT	A fault has been detected.
CPU ON	All processors are fully functional.
MLT	Motor/Valve Limit Timer: The motor/valve limit timer has elapsed.
TOS	Timed Out of Service: The TOS timer has elapsed and the car is out of service.
FIRE	Fire Service: The car is on fire service operation.
INSP	Inspection: The car is on inspection operation.
IND	Independent Service: The car is on independent service.
HS	High Speed: The car is running at high speed.
DLK	Doors Locked: The door lock contacts are made.
SAF ON	Safety On: The safety circuit is made.

Table 6.14 HC-MPU Board Test Points

Test Points	Description
GND	0V
+3.3V	+3.3 Vdc measured between this test point and TP GND.
+5V	+5 Vdc measured between this test point and TP GND.
+25V	unregulated 25Vdc from the HC-CHP board

Table 6.15 HC-MPU Board Terminals

Connector	Description
J1	Used to program CPU A. IDC connector.
J2	Keyboard Port. Six pin DIN connector.
J3	RS-232 Port A. Nine pin D-sub connector.
J4	External CAN Port. Three pin Weidmuller connector (CAN H, CAN L, SHLD). Signal for CAN connections outside the controller cabinet.
J5	Internal CAN Port. RJ12 connector/cable to the HC-CHP CAN Hub / Power Supply board.
J6	CPU B Debug Port. Nine pin D-sub connector.
J7	RS-232 Port B. Nine pin D-sub connector.
J8	Used to program CPU B. Fourteen pin header connector.
J9	Low voltage AC input (16V). Two pin IDC connector.
J10	Optional Ethernet Port B. RJ45 connector.
M1	Ethernet Port A. Serial to ethernet conversion device.

HC-MPU Battery

The battery sustains volatile information when the power is off. Controller operating parameters are stored in battery backed memory and will not be affected by battery removal as long as power is applied to the controller. The battery provides 3.3 VDC. If battery voltage falls below 2.2 VDC, the battery should be replaced. If battery replacement is part of a regular maintenance schedule, we recommend it be replaced every two years.

Table 6.16 HC-MPU Battery

Type	Original Specification
Sanyo	CR2032, 3V, Mn D2-Li cell

Replacement:

1. Place the car on Inspection by placing the MODE switch on the HC-CTL-2 board in the INSP position. DO NOT remove power to the controller as this will cause the HC-MPU parameters to be reset to default values.
2. On the HC-MPU board, use a non-conductive flat tool to lift the battery tab and slide the old battery out of the battery holder.
3. Install a new battery on the HC-MPU board.
4. Return the car to service by placing the MODE switch on the HC-CTL-2 board in the NORM position.

HC-UIO-2 Universal Input/Output Board

Depending upon the software installed, HC-UIO boards may be used for programmable inputs and outputs (16 per board), car and hall calls, door operator interface, or dispatching. In addition to being backwards compatible with the HC-UIO board, the HC-UIO-2 also contains the following enhancements:

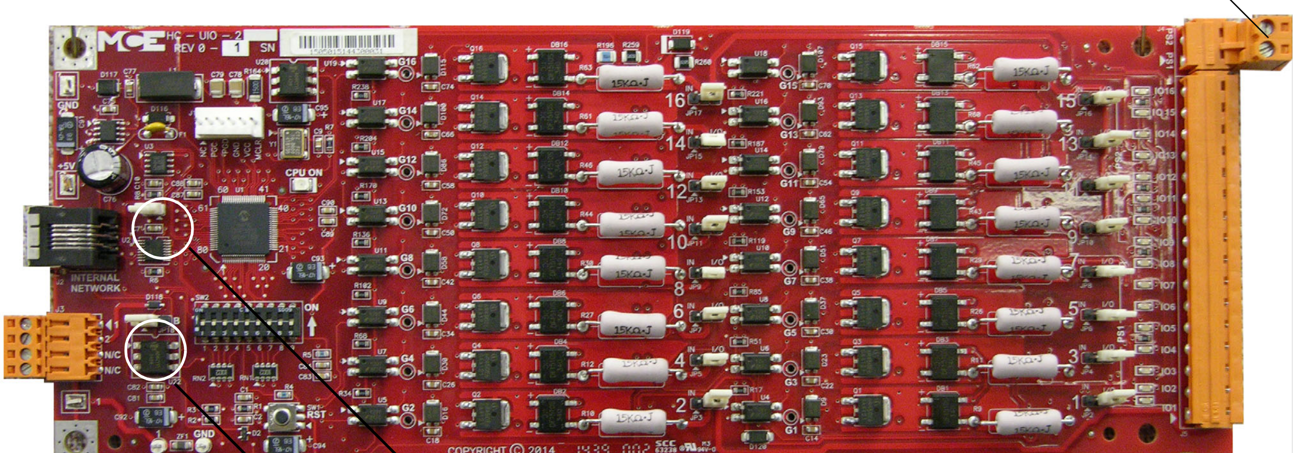
1. On-board pull-up resistors can be used by installing the jumpers JP2 through JP17 in the I/O position. This will eliminate glowing of some LED fixtures when they are off. The PS1 and PS2 terminals allow different voltages to be used.
2. Different circuitry allows button presses to be detected even when long wires or corroded button contacts are used.
3. Output short circuit protection is improved, reducing the need for board replacement.

Danger

If PS1 or PS2 is connected to 120V, 120V may also be present across the large resistors on the board and on jumpers JP2 through JP17! The resistors may also be physically hot. Use caution.

Figure 6.6 HC-UIO-2 Board

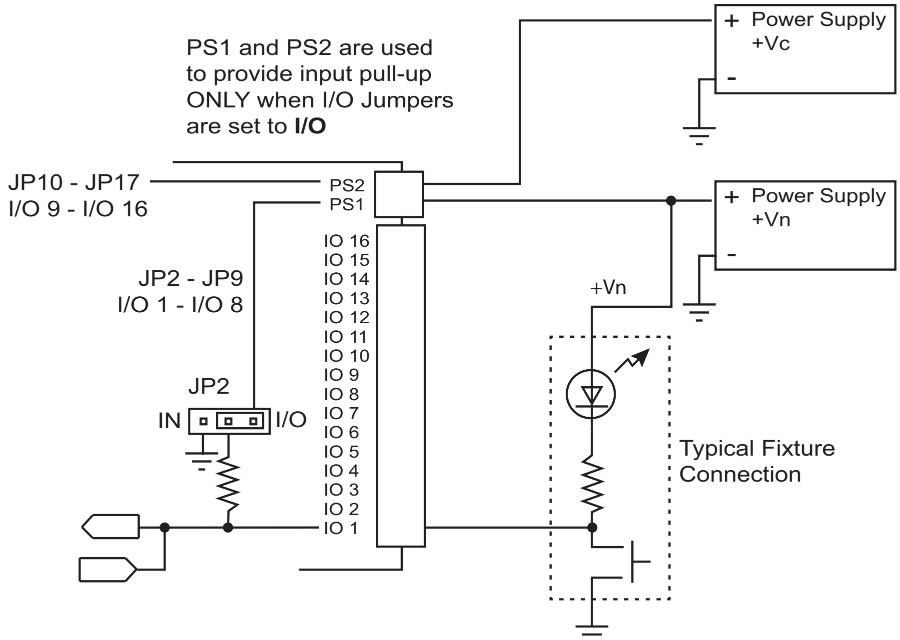
PS1 and PS2 are independent (hot lead only) supply inputs for the large pull-up resistors when the associated jumper (JP2 - JP17) is in the **I/O position**. PS1 supplies I/O 1 - I/O 8. PS2 supplies I/O 9 through I/O16.



JP1, CAN Termination

JP18, Voltage Reference. A=External, B=24VDC (Internal)

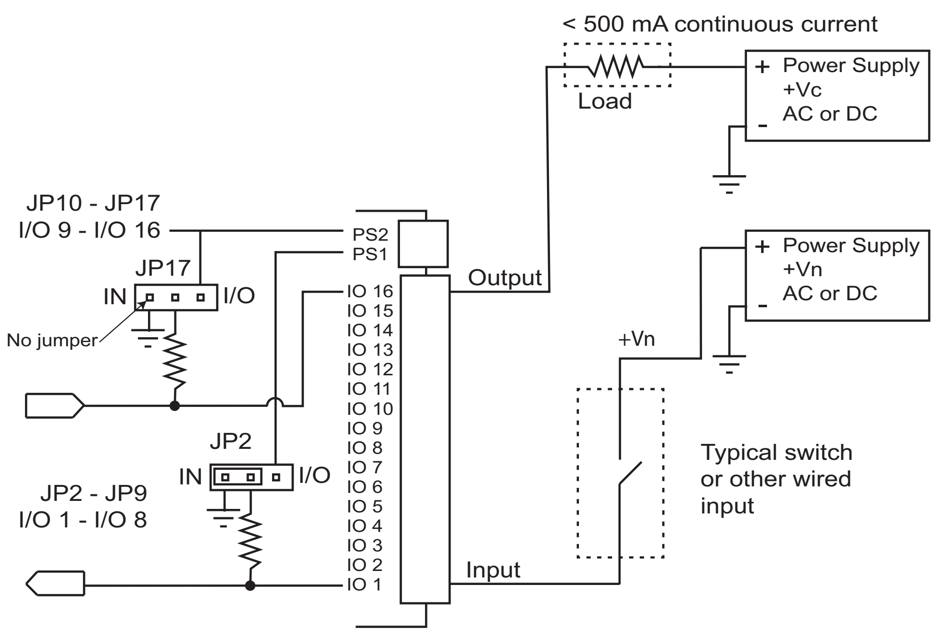
Figure 6.7 Typical Input and Output Connection (Board ID 0 to 15)



When using a board connection in IO mode, connect the associated PS input to the same voltage used to power the fixture.

PS1 and PS2 can be connected to separate voltages, depending on the job requirements.

Figure 6.8 Typical Input or Output Connection (Board ID 32 to 36)



Switches

Switches are ONLY checked by the board processor on start-up. Press the processor RESET button after any change to switches.

- DIP SW2:
  - Switches 1 through 6 = Board ID
  - Switches 7 & 8 = Baud rate
  - Switch 9 = Input levels
- Sw1: RST - Processor reset

Jumpers

- JP1: Internal CAN Network Termination
- JP2 - JP9: Pull Inputs 1 - 8 up to voltage at PS1 when set to I/O
- JP10 - JP17: Pull Inputs 9 - 16 up to voltage at PS2 when set to I/O
- JP18: Selects voltage reference
  - A = External power supplied by J3 (default)
  - B = 24Vdc power supplied by CAN bus

Danger

Line voltage can be present on jumpers. Move only with power off.

6

Test Points

- GND: Digital Ground - 0 V
- +5V: +5 Vdc measured between this test point and TP GND.
- 1: 1 Bus (common)

Indicators

- CPU ON: The micro controller is executing its program.
- IO1 - IO16: Indicates the state of the input or output, active or inactive. Blinking indicates overload condition (resets automatically after 5 seconds/processor reset/ or power cycle). See “Troubleshooting” on page 4.

Terminals

- J1: Used to program the micro controller (IDC connector).
- J2: Internal CAN signal and power (RJ12 connector).
- J3: 1 bus and 2 bus. Weidmuller connector.
- J4: Pull up voltages
- J5: IO1 - IO16

HC-UIO-2 Switches 7, 8 and 9 Settings

On the HC-UIO-2 Board switches 7 and 8 set the baud rate at which the CAN bus communicates with this board.

Table 6.17 HC-UIO-2 Board Switches 7 and 8

Sw 7	Sw 8	Baud Rate	Description
OFF	OFF	500 kbps	For boards inside the controller, RJ12 cable from J2 on HC-UIO board to HC-CHP board Internal Network J1 through J10.
ON	OFF	250 kbps	For boards on the cartop, RJ12 cable from J2 on HC-UIO board to MC-LSI board LAN connectors. **Caution:** Do not connect to J3 on the MC-LSI (Landing System) board.
OFF	ON	125 kbps	Future use

On the HC-UIO-2 Board switch 9 sets the activation threshold for inputs IO1 through IO16..

Table 6.18 HC-UIO-2 Board Switch 9 for I/O Boards

Sw 9	Description
OFF	Sets Input activation threshold to 18 Volts ac or dc
ON	Sets Input activation threshold to 55 to 65 Volts ac or dc

Table 6.19 HC-UIO-2 Board Switch 9 for Call Boards

Sw 9	Description
OFF	Sets Input activation threshold to 0.6 Volts ac or dc
ON	Sets Input activation threshold to 0.2 Volts ac or dc

HC-UIO-2 Used for Calls

When HC-UIO-2 boards are used for hall or car calls, the brightness of the LEDs associated with inputs and outputs has significance.

Level 0 - LED Off

- The input is not active and the output is not latched on.

Level 1 - LED medium brightness

- The input is not active and the output is latched on.

Level 2 - LED full brightness

- The input is active and the output may or may not be latched on.

LED flashing

- Maximum continuous current draw exceeded (overload or short detected).

Hospital Emergency Operation I/O

I/O 1 through I/O 4 on UIO-2 Board #16 are used for hospital emergency operation connections HEO, HWI, HSEL, and HOSPH2 respectively.

Troubleshooting

- I/O LED is Blinking:
  - Low impedance or largely reactive load (in-rush current surge >3A or steady state >300mA)
  - Output connected to line source with no series load
  - Input board addressed as output board (switches are only checked on boot up; reset processor after any switch change)
  - JP-18 not installed
  - 1 bus or 2 bus not connected at J3
  - 1 bus floating at J3
  - Output transistor damaged
- Car or Hall Call Fixture Glowing in OFF State:
  - I/O jumpers set to Input mode (pull down)
  - JP-18 set in B mode
  - Fixture voltages not connected to PS1 and PS2 (no voltage provided to pull up)
  - External resistors or RT-20 board not connected properly
  - Duplex Operation: 120VAC on controller 1 out of phase with controller 2.
- CPU ON Light Extinguished:
  - CAN/Power cable not connected
  - No software on board (repeat boot loading)
- Button press not seen by I/O call board:
  - Threshold recognition SW9 set for higher voltage
  - Voltage greater than 1VDC at I/O terminal during button press
  - Software version incorrect. Ensure HC-UIO-2 is running v21.8 or higher
  - Pull up voltage low (less than 20VAC, less than 20 VDC)
- I/O LED ON (when it should not be)
  - PS1 or PS2 terminal not connected (or floating)
  - Output transistor damaged
  - Duplex Operation: -2 board connected to Rev 2 or 4 board and DIP switch 9 not set. (Set switch 9 on -2 board.)
- Does not communicate with controller / does not bootload
  - Ensure correct Board ID is used
  - Verify CAN termination jumpers (JP1), refer to job prints
  - Ensure baud rate switches (SW7 and SW8) are set correctly

Call Inputs and Outputs

Table 6.20 HC-UIO-2 Board Call Assignments

Board ID	Switch Setting 1	2	3	4	5	6	IO 1 to IO 16
00	Off	Off	Off	Off	Off	Off	HC-UIO-2 boards numbered 00 through 31 are used for call related IO. The associated switch setting is shown to the left. Terminal assignments, beginning with terminal IO 1 through IO 16 on board 00, followed by terminal IO 1 through IO 16 on board 01, etc., are made in the following order: nn = TOP LANDING SERVED • PIs PI1 - PI(nn) • Front car calls 101 - 1(nn) • Rear car calls 101R - 1(nn)R • Front down hall calls 502 - 5(nn) • Front up hall calls 601 - 6(nn-1) • Rear down hall calls 502R - 5(nn)R • Rear up hall calls 601R - 6(nn-1)R HC-UIO-2board terminal assignments are determined by the settings of the following BASIC FEATURE MENU : • TOP LANDING SERVED? • HC-RDR BOARD ON THIS CAR? • CAR SERVES FRNT/FLR 1 (- 32)? • CAR SERVES REAR/FLR 1 (- 32)? And also: • DISCRETE PI'S ON UIO? • DEDICATED PI BOARD? (allows first one or two UIO boards to be dedicated to PI's alone) • SERIAL COP BOARD HC-CPI? The status of these terminals (On or Off) can be determined by observing the indicators on the HC-UIO-2 boards.
01	**On**	Off	Off	Off	Off	Off	
02	Off	**On**	Off	Off	Off	Off	
03	**On**	**On**	Off	Off	Off	Off	
04	Off	Off	**On**	Off	Off	Off	
05	**On**	Off	**On**	Off	Off	Off	
06	Off	**On**	**On**	Off	Off	Off	
07	**On**	**On**	**On**	Off	Off	Off	
08	Off	Off	Off	**On**	Off	Off	
09	**On**	Off	Off	**On**	Off	Off	
10	Off	**On**	Off	**On**	Off	Off	
11	**On**	**On**	Off	**On**	Off	Off	
12	Off	Off	**On**	**On**	Off	Off	
13	**On**	Off	**On**	**On**	Off	Off	
14	Off	**On**	**On**	**On**	Off	Off	
15	**On**	**On**	**On**	**On**	Off	Off	
16	Off	Off	Off	Off	**On**	Off	
17	**On**	Off	Off	Off	**On**	Off	
18	Off	**On**	Off	Off	**On**	Off	
19	**On**	**On**	Off	Off	**On**	Off	
20	Off	Off	**On**	Off	**On**	Off	
21	**On**	Off	**On**	Off	**On**	Off	
22	Off	**On**	**On**	Off	**On**	Off	
23	**On**	**On**	**On**	Off	**On**	Off	
24	Off	Off	Off	**On**	**On**	Off	
25	**On**	Off	Off	**On**	**On**	Off	
26	Off	**On**	Off	**On**	**On**	Off	
27	**On**	**On**	Off	**On**	**On**	Off	
28	Off	Off	**On**	**On**	**On**	Off	
29	**On**	Off	**On**	**On**	**On**	Off	
30	Off	**On**	**On**	**On**	**On**	Off	
31	**On**	**On**	**On**	**On**	**On**	Off	

Spare Inputs and Outputs

The first ten Spare Inputs (SP1 through SP10) are assigned to terminals SPIN1 through SPIN10 on the HC-CTL-2 board (connectors J6 and J10). The first four Spare Outputs (OUT1 through OUT4) are assigned to terminals 1 through 4 (J15) on the HC-CTL-2 board. The remainder of the Spare Inputs and Outputs are assigned to HC-UIO-2 boards numbered 32 through 36 as shown in the table below.

Table 6.21 HC-UIO-2 Spare Input / Output Assignments

Board	SW1 Setting						IO Terminals								IO Terminals							
ID	1	2	3	4	5	6	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
32	Off	Off	Off	Off	Off	On	SP11	SP12	SP13	SP14	SP15	SP16	SP17	SP18	OUT5	OUT6	OUT7	OUT8	OUT9	OUT10	OUT11	OUT12
33	On	Off	Off	Off	Off	On	SP19	SP20	SP21	SP22	SP23	SP24	SP25	SP26	OUT13	OUT14	OUT15	OUT16	OUT17	OUT18	OUT19	OUT20
*34	Off	On	Off	Off	Off	On	SP27	SP28	SP29	SP30	SP31	SP32	SP33	SP34	OUT21	OUT22	OUT23	OUT24	OUT25	OUT26	OUT27	OUT28
*35	On	On	Off	Off	Off	On	SP35	SP36	SP37	SP38	SP39	SP40	SP41	SP42	OUT29	OUT30	OUT31	OUT32	OUT33	OUT34	OUT35	OUT36
36	Off	Off	On	Off	Off	On	SP43	SP44	SP45	SP46	SP47	SP48	SP49	SP50	OUT37	OUT38	OUT39	OUT40	OUT41	OUT42	OUT43	OUT44
37	On	Off	On	Off	Off	On	Dedicated Card Reader Inputs								Dedicated Card Reader Inputs							
38	Off	On	On	Off	Off	On																
39	On	On	On	Off	Off	On																
40	Off	Off	Off	On	Off	On																
41	On	Off	Off	On	Off	On																
42	Off	On	Off	On	Off	On																
43	On	On	Off	On	Off	On																
44	Off	Off	On	On	Off	On																
45	On	Off	On	On	Off	On																
46	Off	On	On	On	Off	On																
47	On	On	On	On	Off	On																
48	Off	Off	Off	Off	On	On																
49	On	Off	Off	Off	On	On																
50	Off	On	Off	Off	On	On																
51	On	On	Off	Off	On	On																
52	Off	Off	On	Off	On	On																
53	On	Off	On	Off	On	On																
54	Off	On	On	Off	On	On																
55	On	On	On	Off	On	On																
56	Off	Off	Off	On	On	On																
57	On	Off	Off	On	On	On																
58	Off	On	Off	On	On	On																
59	On	On	Off	On	On	On																
60	Off	Off	On	On	On	On																
61	On	Off	On	On	On	On																
62	Off	On	On	On	On	On																
63	On	On	On	On	On	On																

* Addresses 34 and 35 are used on the car top, where the CAN baud rate must be 250k.
HC-UIO Rev 2 will automatically configure the CAN port to communicate at 250k baud.
HC-UIO Rev 4 - refer to Table 1 to set switches 7 and 8 to communicate at 250k baud.
HC-UIO-2 - refer to Table 1 to set switches 7 and 8 to communicate at 250k baud.

ICE-COP-2 Car Panel Interface Board

The ICE-COP-2 board, mounted in the car operating panel, converts the discrete closures from the panel buttons and switches to data on the CAN serial bus and passes it through the MC-LSI Landing System Interface board on the cartop, up the traveler to the car controller. Additional ICE-COP-2 boards are used to accommodate rear doors or installations with many floors, COP buttons, and lamps.

Spare assignable inputs to and outputs from ICE-COP-2 boards are available depending upon system configuration.

- F1 menu, Serial COP Board Type = ICE-COP-2: ICE-COP-2 board assignable inputs show up in the Spare Inputs menu as COP FX (front panel board) I1 - I7; COP Rx (rear panel board) I1 - I7. Spare outputs (Spare Outputs menu) will be prefaced with an ‘O’ for Output.

If the job has ICE-COP-2 boards, unused spare inputs to and outputs from these boards must be set to NOT USED. If controller software is upgraded in the field, it is very important to check programmable ICE-COP-2 board inputs and outputs and verify unused connections are set to NOTUSED. Please refer to “Spare Inputs Menu Options” on page 5-29.

Caution

Spare inputs and outputs used on the ICE-COP-2 boards must be 24VDC, not to exceed 6 Watts.

Installation Instructions

1. Turn the power off at the main disconnect.
2. Mount the ICE-COP-2 board(s) inside the COP using the supplied hardware and providing sufficient clearance for the components.

Caution

Do not replace C-RJ11-CAN-15 cables between the ICE-COP-2 and MC-LSI with RJ11 cables purchased locally. These cables MUST be replaced with C-RJ11-CAN-15 supplied by MCE. For a replacement cable, please contact MCE technical support.

3. Refer to the prints for the job to wire the ICE-COP-2 board.

Caution

This system is designed for 24 VDC circuits only! **Do not connect 120 VAC or DC to any terminal on the ICE-COP-2 board.** Connect only the 24V power from connector J34 (24V CUSTOMER LOAD SUPPLY) to the load.

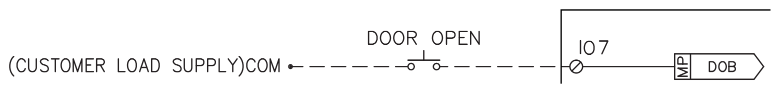
Normal Operation

During normal operation, I/O LEDs will be lighted when the associated I/O is active (dimmer when the output is active; brighter when the input is active). The SPA processor LED will be continuously lighted. If I/O LEDs remain in a static condition or the SPA processor LED is not continuously on:

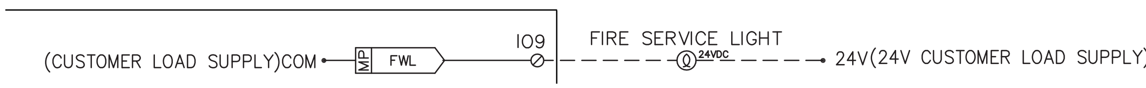
- Press the RST button on the board. The I/O LEDs will all cycle and the board will resume operation.

ICE-COP-2 Board Details

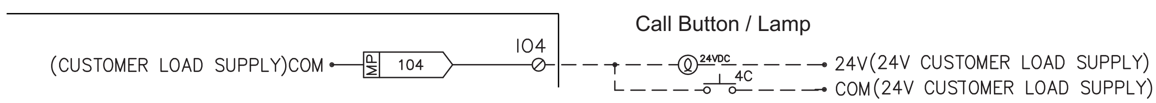
- **24V Inputs Only:** Typical circuit for terminals I1 through I16.



- **24V Outputs Only:** Typical circuit for terminals O1 through O16.



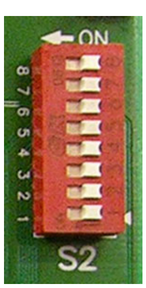
- **24V Inputs/Outputs Only:** Typical circuit for terminals IO1 through IO16.



6

S2 Switches Eight-position DIP switch S2 allows a unique address to be set for each COP board, places the board in CAN or iControl communication mode, sets the board input threshold, and determines the CAN baud rate (when CAN is enabled).

- RS485 or CAN Communication
  - For Motion controls, the board must be set to use CAN communication.
  - CAN Enable: Verify/set switch 8 to the ON position.
- Motion Input Threshold Detection
  On COP-2 boards with software version 1.1 or later, the input threshold level may be set to 900 or 700mV using DIP switch rocker 5.
  - Board revision X2-1 or greater: Recommended, rocker 5 OFF: 900mV (default)
  - Board revision X2-0: Recommended, rocker 5 ON: 700mV
- Motion Board Addressing
  For Motion controls, each COP-2 board used must have a unique address.
  - Addressing - switches 1, 2, and 3:



S2	Front COP Boards			Rear COP Boards		
Board	**SW1**	**SW2**	**SW3**	**SW1**	**SW2**	**SW3**
1	Off	Off	Off	Off	Off	On
2	On	Off	Off	On	Off	On
3	Off	On	Off	Off	On	On

- Motion CAN Baud Rate
  - Switch 7 OFF: 250k (default)
  - Switch 7 ON: 500k
- Motion Unused Switches
  - Switches 4 and 6 are unused and should be left in the OFF position.
- **24V Power**: The 24V power supply from the cartop box must be connected to the 24V IN connector J35 on the first ICE-COP-2 board. If additional boards are used, they are connected to 24V as shown in "ICE-COP-2 Board Interconnect" on page 6-64. Load connections (power source for buttons and switches in the car panel) can be made to any of the boards at the 24V CUSTOMER LOAD SUPPY connector as long as load current at any one board is not more than 4A.
- **CAN Bus termination**: Jumper JP1 terminates the CAN bus in the correct impedance for CAN signal transmission.
  - If more than one COP board is used, ONLY the last board in the CAN string should have jumper JP1 plugged in. (If there is only one COP board, it must have JP1 plugged in.)

Figure 6.9 ICE-COP-2 Board Interconnect

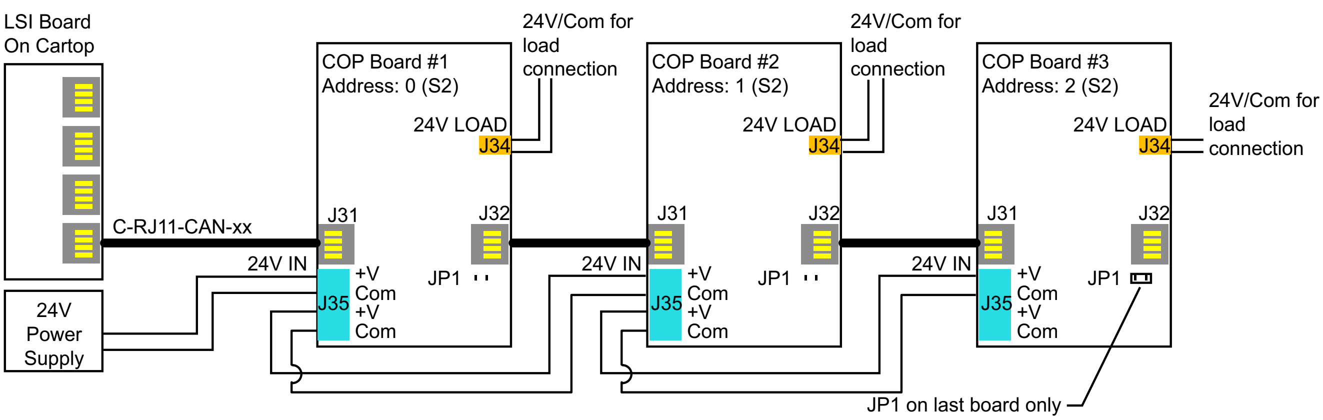
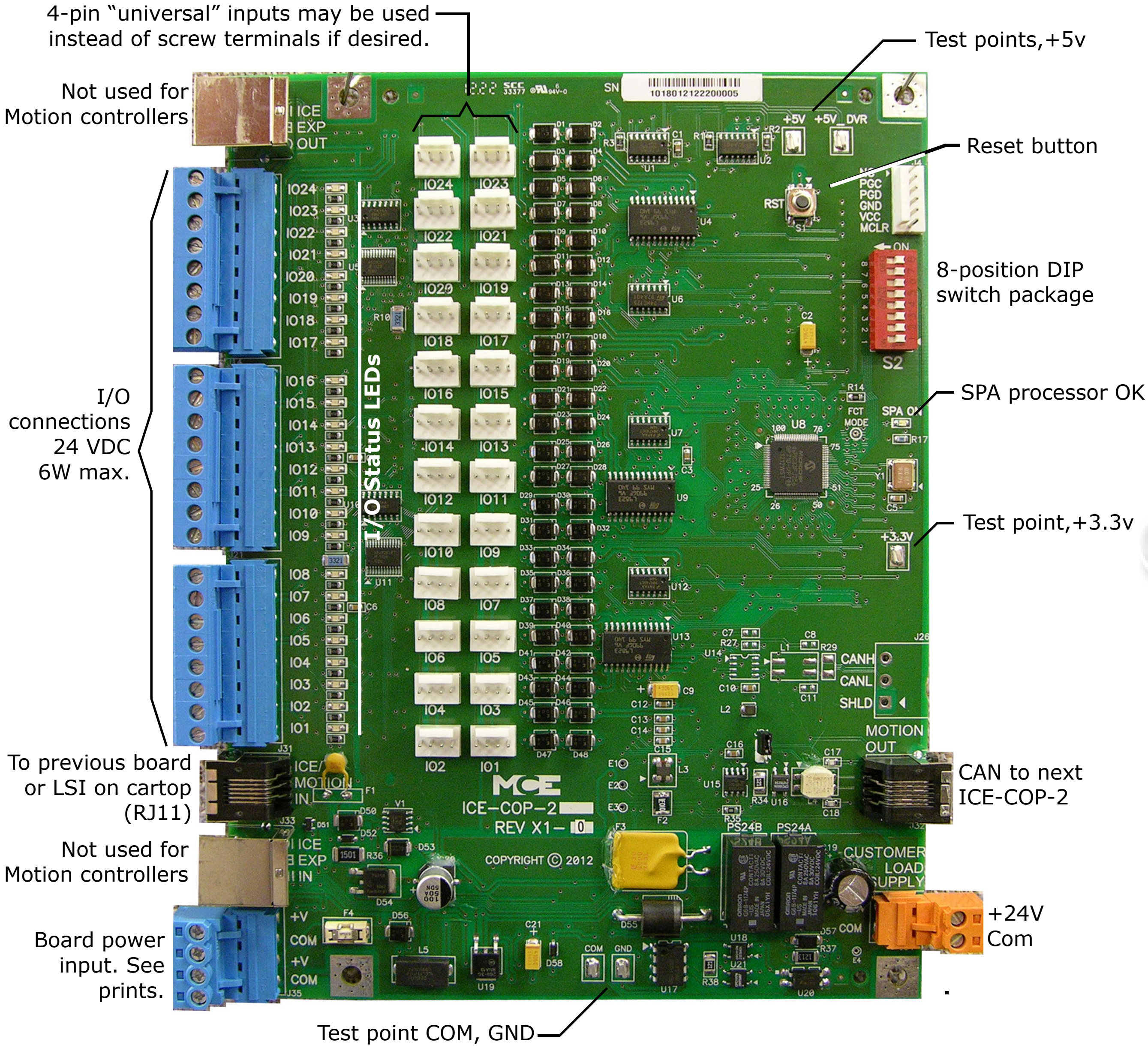
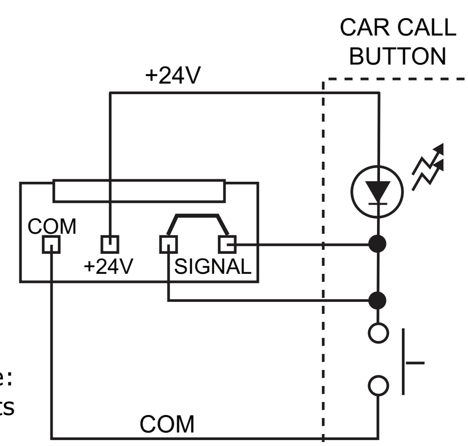


Figure 6.10 ICE-COP-2 Serial Car Operating Panel Board



Caution

This system is designed for 24 VDC circuits maximum. Connecting 120VAC or DC will open the input fuses.



Connection Example: Universal 4-pin inputs

MC-CPI Car Panel Interface Board

The MC-CPI board, mounted in the car operating panel, converts the discrete closures from the panel buttons and switches to data on the CAN serial bus and passes it through the MC-LSI Landing System Interface board on the cartop, up the traveler to the car controller. Additional MC-CPI boards are used to accommodate rear doors or installations with many floors, COP buttons, and lamps.

Spare assignable inputs to and outputs from CPI boards are available depending upon system configuration, front control panel only or front and rear control panels.

- F1 menu, Serial COP Board HC-CPI = YES and F1: CPI board assignable inputs show up in the Spare Inputs menu as CPI F (front panel board) I10 - I16; CPI FX (front panel extender board) I1 - I7. Spare outputs (Spare Outputs menu) will be prefaced with an 'O' for Output.
- F1 menu, Serial COP Board HC-CPI = YES and F1: CPI board assignable inputs show up in the Spare Inputs menu as CPI F (front panel board) I10 - I16 and CPI-R (rear panel board) I10 - I16. Spare outputs (Spare Outputs menu) will be prefaced with an 'O' for Output.

If the job has MC-CPI boards, unused spare inputs to and outputs from these boards must be set to NOT USED. If controller software is upgraded in the field, it is very important to check programmable CPI board inputs and outputs and verify unused connections are set to NOTUSED. Please refer to "Spare Inputs Menu Options" on page 5-29.

Caution

Spare inputs and outputs used on the CPI boards must be 24VDC, not to exceed 6 Watts.

Installation Instructions

1. Turn the power off at the main disconnect.
2. Mount the MC-CPI board(s) inside the COP using the supplied hardware and providing sufficient clearance for the components.

Caution

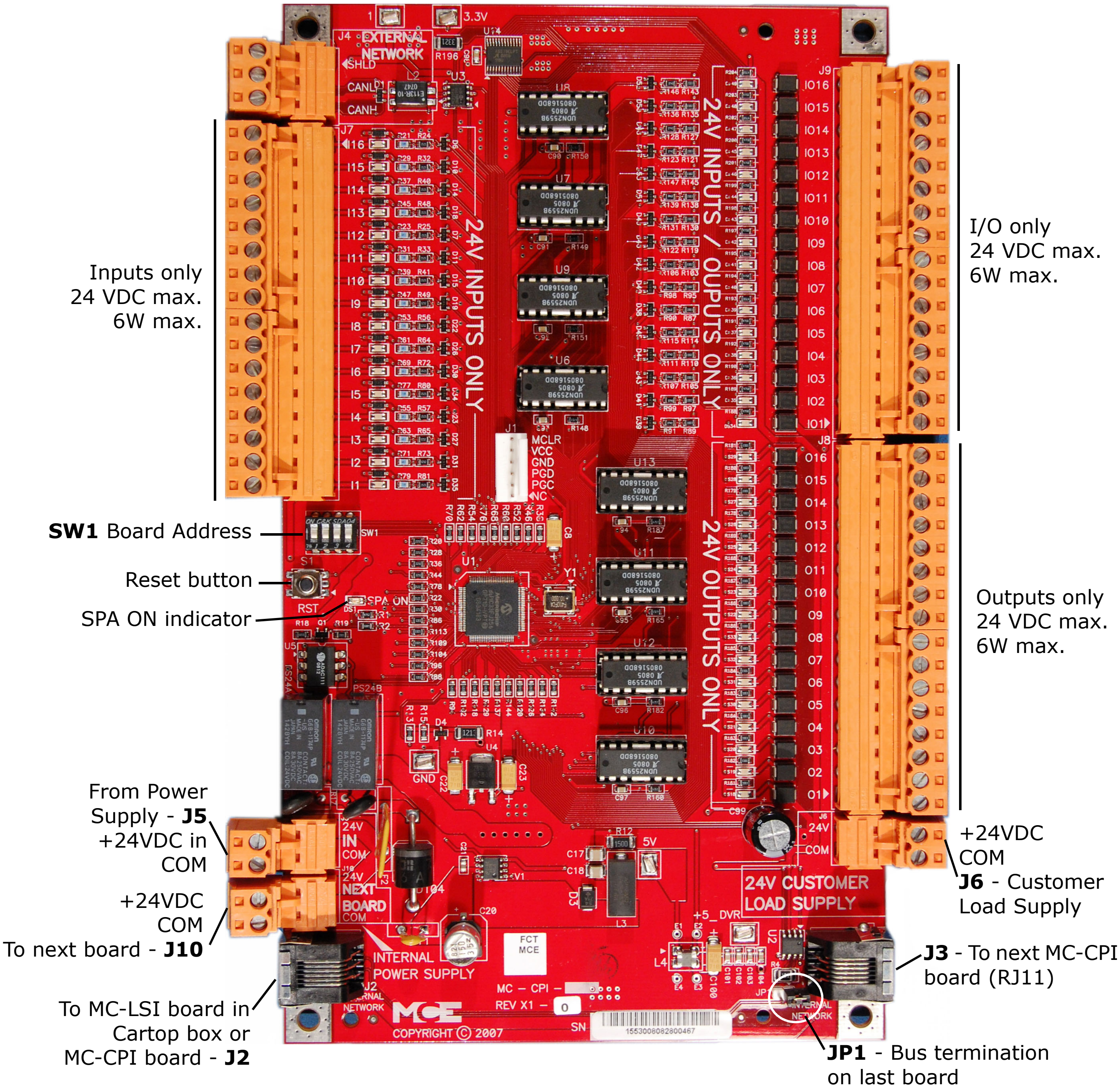
Do not replace C-RJ11-CAN-15 cables between the MC-CPI and MC-LSI with RJ11 cables purchased locally. These cables MUST be replaced with C-RJ11-CAN-15 supplied by MCE. For a replacement cable, please contact MCE technical support.

3. Refer to the prints for the job to wire the MC-CPI board. An example of a typical wiring print is included in this instruction (Please refer to "Example: MC-CPI Wiring" on page 6-69 and see "MC-CPI Serial Car Panel Interface Board" on page 6-67).

Caution

This system is designed for 24 VDC circuits only! **Do not connect 120 VAC or DC to any terminal on the MC-CPI board.** Connect only the 24V power from connector J6 (24V CUSTOMER LOAD SUPPLY) to the load. (Please refer to "MC-CPI Board Details" on page 6-68 and see "Example: MC-CPI Wiring" on page 6-69).

Figure 7. MC-CPI Serial Car Panel Interface Board

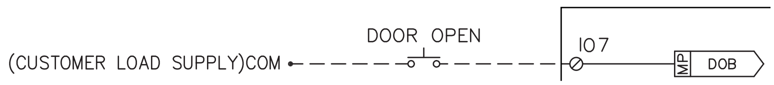


Caution

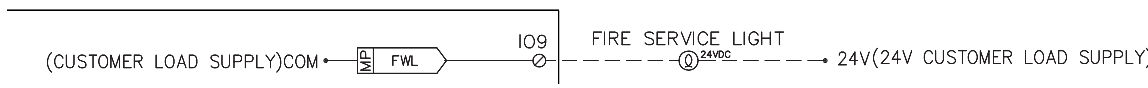
This system is designed for 24 VDC circuits maximum. Do not connect 120VAC or DC to any terminal on this board at any time.

MC-CPI Board Details

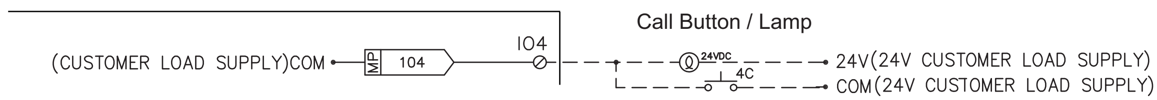
- **24V Inputs Only:** Typical circuit for terminals I1 through I16.



- **24V Outputs Only:** Typical circuit for terminals O1 through O16.



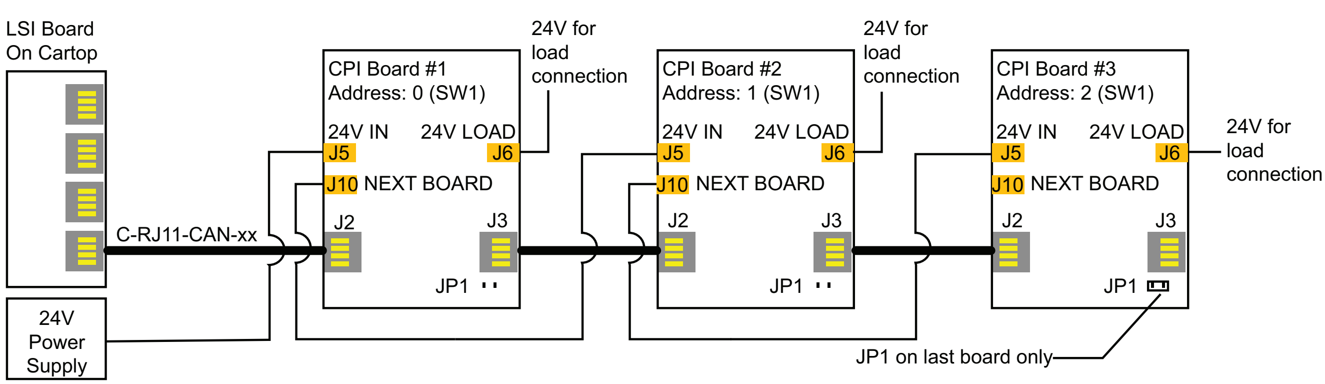
- **24V Inputs/Outputs Only:** Typical circuit for terminals IO1 through IO16.



- **Board address switches**: Four-position DIP switch SW1 provides a unique address for each CPI board (you should never have two CPI boards with the same SW1 setting).

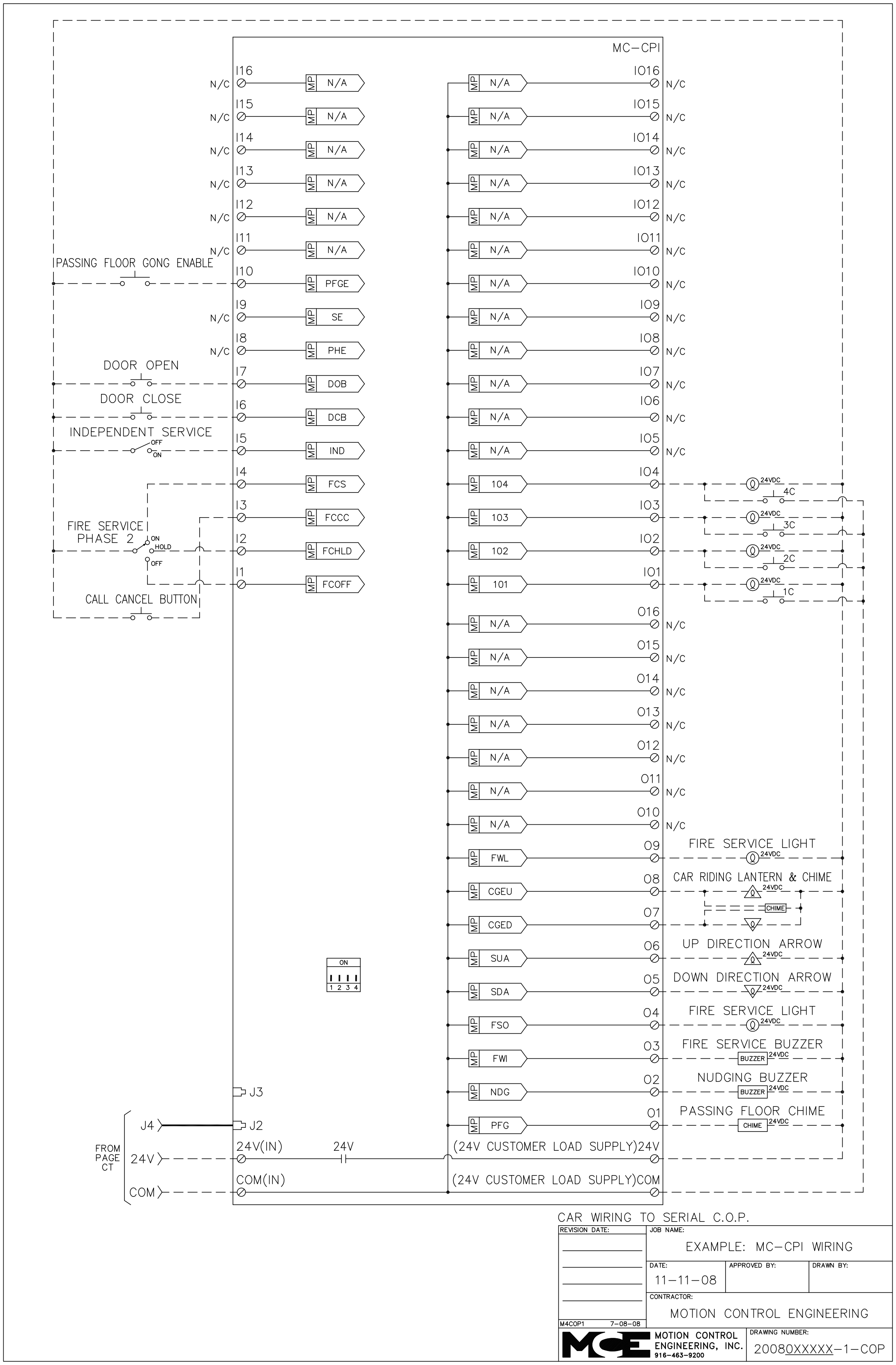
SW1	Front COP Boards				Rear COP Boards			
Board	**DIP1**	**DIP2**	**DIP3**	**DIP4**	**DIP1**	**DIP2**	**DIP3**	**DIP4**
1	Off	Off	Off	Off	Off	Off	On	Off
2	On	Off	Off	Off	On	Off	On	Off
3	Off	On	Off	Off	Off	On	On	Off
4	On	On	Off	Off	On	On	On	Off

- **24V Power**: The 24V power supply from the cartop box must be connected to the 24V IN connector on the first MC-CPI board. If additional boards are used, they are connected to 24V as shown below. Load connections (power source for buttons and switches in the car panel) can be made to any of the boards at the 24V CUSTOMER LOAD SUPPY connector as long as load current at any one board is not more than 4A.
- **CAN Bus termination**: Jumper JP1 terminates the CAN bus in the correct impedance for CAN signal transmission. (If there is only one CPI board, it must have JP1 plugged in.)



- **Verifying Cartop Communication**: Check for firmware versions for UIO 34 or UIO 35 (see “F8: Status Displays” on page 5-106). This usually indicates communication with the cartop.

Figure 6.1 Example: MC-CPI Wiring



Before Applying Power

Prior to applying power to the MC-CPI board(s):

1. Disconnect all terminal connectors from the MC-CPI boards (I/O connections, internal network and power connections (24V and COM terminals).
2. Apply power to the system.
3. Using a multimeter, check each of the wires to be connected to the MC-CPI boards as follows:
   - **Input circuits (switches, buttons, dry contacts)**: Using the VDC setting referenced to 1 bus (common), probe each input circuit. The reading should be either 24VDC or floating.
   - **Output circuits (indicators, buzzers, chimes)**: Using the VDC setting referenced to 1bus (common), probe each output circuit. The voltage reading should be approximately 24VDC.

Caution

This system is designed for 24 VDC circuits only! **Do not connect 120 VAC or DC to any terminal on the MC-CPI board.** Connect only the 24V power from connector J6 (24V CUSTOMER LOAD SUPPLY) to the load (Please refer to “MC-CPI Board Details” on page 6-68 and see “Example: MC-CPI Wiring” on page 6-69).

4. Power down the system.
5. Install the C-RJ11-CAN cable from J2 (Internal Network) on the MC-CPI board to the MC-LSI (Landing System Interface board) in the cartop box.
6. Install the MC-CPI board I/O connections (I/O terminals).
7. Install the MC-CPI board power connections (24V and COM terminals).

Caution

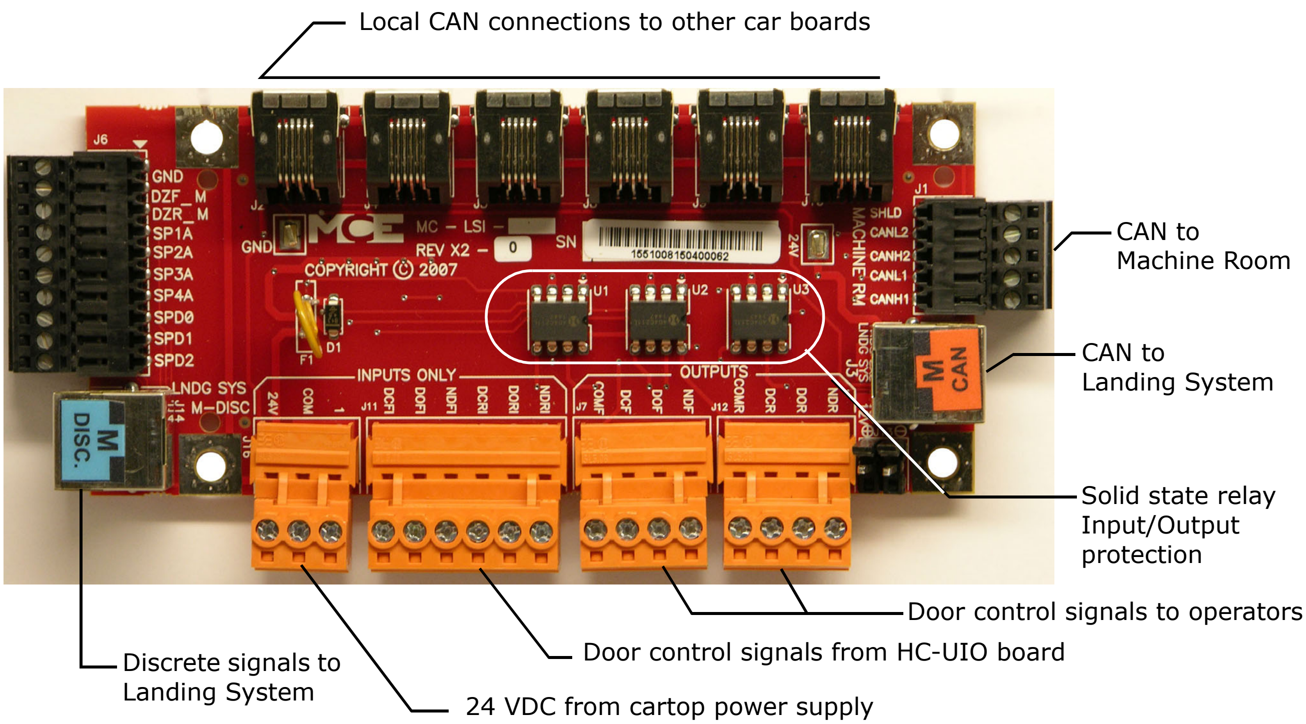
To avoid damage to the MC-CPI boards, the system must be powered down before connecting and disconnecting the MC-CPI board power connections (unplugging and plugging in the 24V and COM terminals).

8. Apply power to the system and verify that:
   - The MC-CPI board SPA indicator is ON (green).
   - The relay closes and supplies 24VDC to the 24V CUSTOMER LOAD SUPPLY terminals.

MC-LSI Landing System Interface Board

The MC-LSI mounts in the cartop box and provides a connection point for the landing system and for the Car Panel Interface board (MC-CPI) if one is used. The MC-LSI board receives 24 VAC power from an external transformer operating from the controller 2 Bus (120 VAC). In turn, the LSI board provides power to the landing system and to any Universal I/O boards that might be used on the cartop through the CAN connections to those components. A shielded, external CAN connection runs from the LSI board, through the traveler, to the Motion 2000 controller.

Figure 6.2 MC-LSI Landing System Interface Board



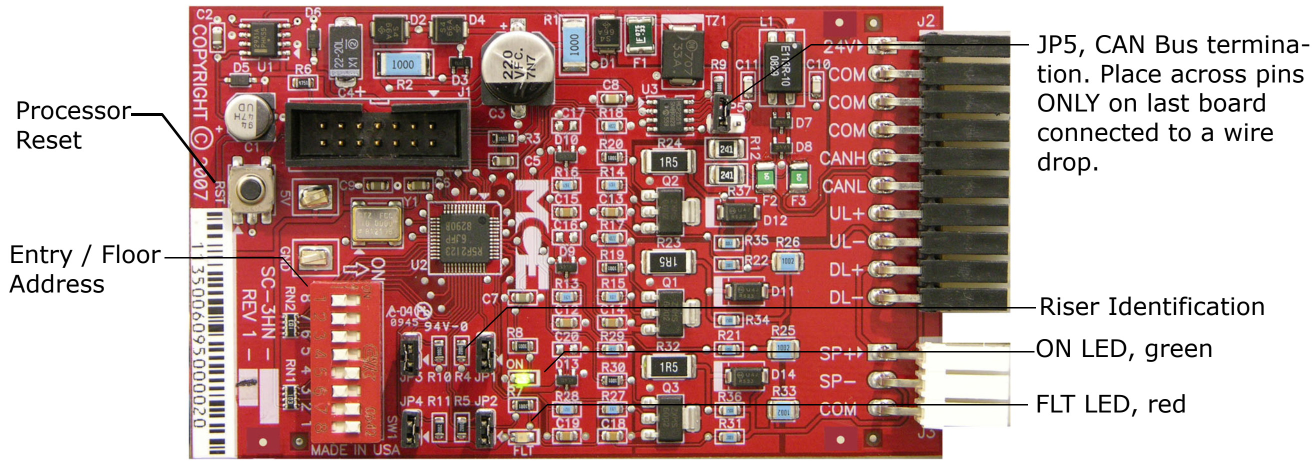
LSI Connections

- Local CAN: CAN signal and power to additional cartop box boards (HC-UIO, MC-CPI, etc.)
- CAN to Machine Room: Redundant CAN connections to/from machine room
- Landing System: CAN connections to/from landing system
- Door Signals from cartop HC-UIO:
  - NDRI: Nudging, rear — NDFI: Nudging, front
  - DORI: Door open, rear — DOFI: Door open, front
  - DCRI: Door close, rear — DCFI: Door close, front
- Door Signals to operators:
  - NDR: Nudging, rear — NDF: Nudging, front
  - DOR: Door open, rear — DOF: Door open, front
  - DCR: Door close, rear — DCF: Door close, front
  - COMR: Common — COMF: Common

SC-3HN Three Input Serial Hall Call Node Board

The SC-3HN board is used to provide serial hall calls for Motion systems. The SC-3HN provides analog inputs and outputs for the hall call buttons and LEDs and a CAN connection to the group or controller. Refer to the drawings package for connection instructions to your fixtures.

Figure 6.3 SC-3HN Three Input Serial Hall Call Node Board



Call Bus Conditions

Make connections as shown on the drawings for the particular job.

- Group: Eight risers are supported; four Main and four Auxiliary.
- Controller: Four main risers are supported.
- Each hoistway wire drop consists of a twisted pair for signals and one wire each for 24V power and common. A wire drop can support more than one riser.
- Settings on each SC-3HN board determine which riser it belongs to, its floor address, and whether it is associated with the Front or Rear car entry.
- SC-3HN boards with the same floor address and entry association will register the same call and light indicators. Each must have a different riser ID but within the same riser group (Main or Auxiliary).
- Main risers A - D use riser IDs 7 - 4. Auxiliary risers A - D use riser IDs 3 - 0.

General Installation

All SC-3HN connections are at one end of the board. One board is installed in each hall call panel electrical box. The board is shipped in an anti-static bag.

1. Make connections to the hall call buttons and indicators. (See following page.)
2. Make connections to the signal/power drop. (See following page.)
3. Set floor number and door (F/R) location, 6-78.
4. Set riser assignment, 6-78.
5. Last board on wire drop only: Place a jumper on JP5. All other boards: Ensure jumper NOT placed across JP5 pins, 6-78.
6. Insert board in anti-static sleeves and tape closed using supplied ESD sticker.
7. Tuck bag/board into electrical box and re-install hall call.

Figure 6.4 Hall Call Node Wiring

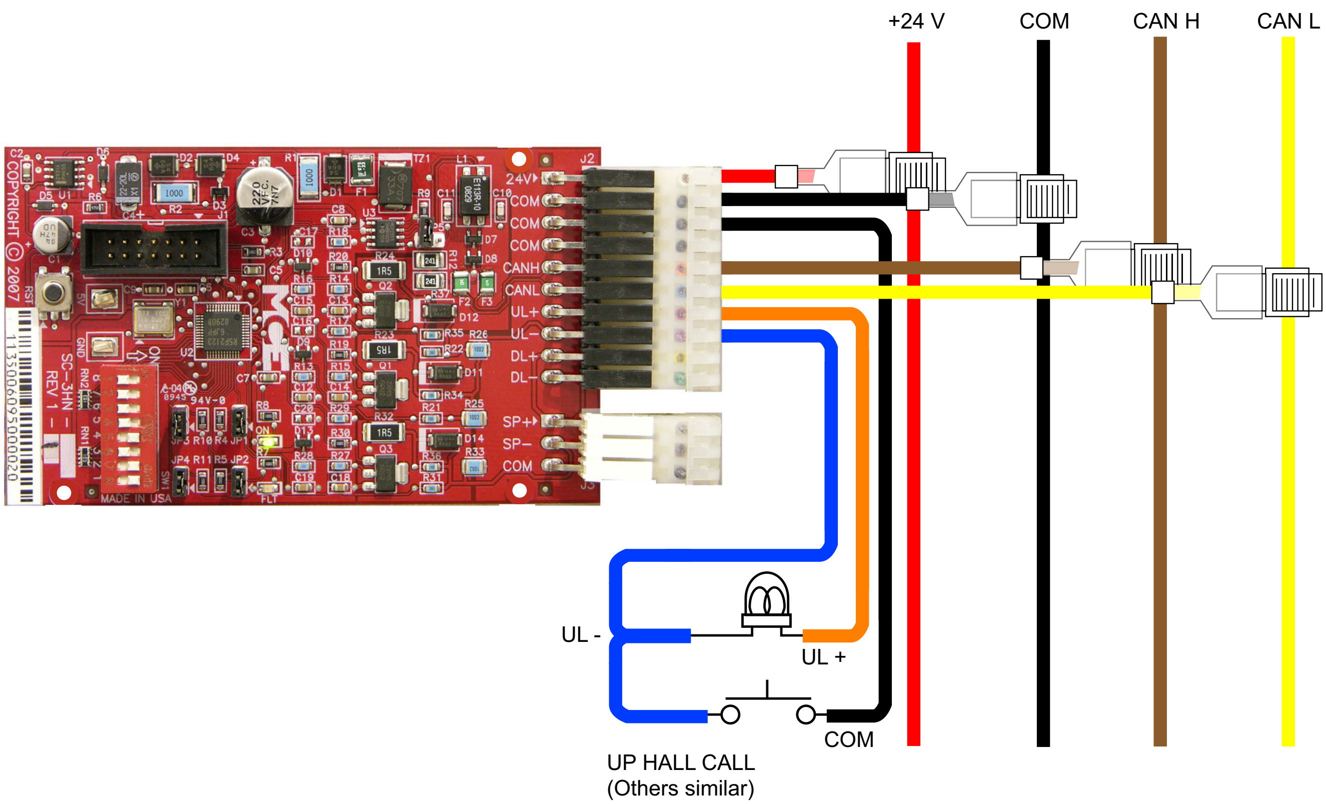


Table 6.22 Hall Wiring Colors

Color	Signal
red	+24V
black	common
brown	CAN H
yellow	CAN L
orange	UL+
blue	UL-
violet	DL+
green	DL-
gray	SP+
white	SP-

Addressing and CAN Bus Termination

Set SC-3HN addresses as shown in the job prints for the installation. Generic examples are provided below.

Riser Assignment

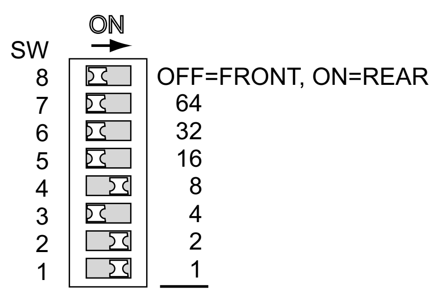
There may be up to four Main risers and four Auxiliary risers. Jumper locations JP3, JP2, and JP1 are used to assign the appropriate riser to the SC-3HN board. In the following table, a “1” indicates a jumper in place.

Table 6.23 Riser Assignment by Jumper Binary Representation

JP3	JP2	JP1	Riser
1	1	1	Main A (Binary value 7)
1	1	0	Main B (Binary value 6)
1	0	1	Main C (Binary value 5)
1	0	0	Main D (Binary value 4)
0	1	1	Auxiliary A (Binary value 3)
0	1	0	Auxiliary B (Binary value 2)
0	0	1	Auxiliary C (Binary value 1)
0	0	0	Auxiliary D (Binary value 0)

Floor Number and Front or Rear Opening

DIP switch SW1, switches 1 through 7 set the floor address for the board, beginning with Floor 1. Switch 8 selects Front or Rear opening.



Floor address example = 11

ON switch adds its value to floor address.

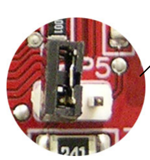
When setting addresses, use the values silk screened on the circuit board, not those shown on the DIP switch.

Baud Rate

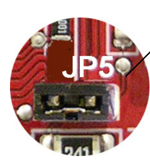
Jumper JP4 is reserved for future use to select a different CAN Bus baud rate should it become necessary. For now, the only option is to leave the JP4 jumper in place, setting baud rate to 125 kbps.

CAN Bus Termination

The CAN Bus must be terminated ONLY ON THE LAST SC-3HN connected to the wire drop (farthest board from Dispatcher).



JP5 OFF/Unterminated
All but last board



JP5 ON/Terminated
Last board on wire drop ONLY.

On Board Diagnostics

Two LEDs provide diagnostic information: The ON LED (green) and the FLT LED (red).

ON LED

The ON LED reflects power/communications status.

- ON: Serial hall call bus to Group/Car OK
- OFF: Board is not receiving power or has no software loaded.
- Blinking: Communications error - more than ten seconds have passed without a message from the dispatcher.

(FLT) FAULT LED

The FLT LED reflects the status of the analog outputs.

- ON steady: Internal fault -
  - Replace board if problem persists
- OFF: No Errors detected.
- Blinking: Output overload or disconnection. Pressing the Reset button on the SC-3HN board will clear a blinking Fault LED.
  - Overload: Excessive current draw. Resets when current draw is corrected and call button is pressed again.
  - Not Connected: The output is on (button pressed) but nothing is connected to the UL- or DL- output. Resets when the lamp is connected and the call button is pressed again.
  - Output Shorted: If short is very quick, the LED will flash. Pressing the call button for a few moments will cause the board to reboot. Resets when the short is removed and the call button is pressed again.

Please refer to the Motion Group Manual, 42-02-G006, for configuration information relating to group hall calls.

SC-3HN-2 Three Input Serial Hall Call Node Board

The SC-3HN-2 board is used to provide serial hall calls for Motion systems. The SC-3HN-2 provides analog inputs and outputs for the hall call buttons and LEDs and a CAN connection to the group or controller. Refer to the drawings package for connection instructions to your fixtures.

Figure 6.5 SC-3HN-2 Three Input Serial Hall Call Node Board, Gen.2

Call Bus Conditions

Make connections as shown on the drawings for the particular job.

- Group: Eight risers are supported; four Main and four Auxiliary.
- Controller: Four main risers are supported.
- Each hoistway wire drop consists of a twisted pair for signals and one wire each for 24V power and common. A wire drop can support more than one riser.
- Settings on each SC-3HN-2 board determine which riser it belongs to, its floor address, and whether it is associated with the Front or Rear car entry.
- SC-3HN-2 boards with the same floor address and entry association will register the same call and light indicators. Each must have a different riser ID but within the same riser group (Main or Auxiliary).
- Main risers A - D use riser IDs 7 - 4. Auxiliary risers A - D use riser IDs 3 - 0.

General Installation

The fixture SC-3HN-2 connections are at one end of the board. The power and communication connections are on the other end. One board is installed in each hall call panel electrical box. The board is shipped in an anti-static bag.

1. Make connections to the hall call buttons and indicators. (See following page.)
2. Make connections to the signal/power drop. (See following page.)
3. Set floor number and door (F/R) location, 6-78.
4. Set riser assignment, 6-78.
5. Last board on wire drop only: Place TERM Switch up in the direction of the arrow. All other boards: Ensure TERM switch is down, 6-78.
6. Insert board in anti-static sleeves and tape closed using supplied ESD sticker.
7. Tuck bag/board into electrical box and re-install hall call.

Figure 6.6 Hall Call Node Wiring

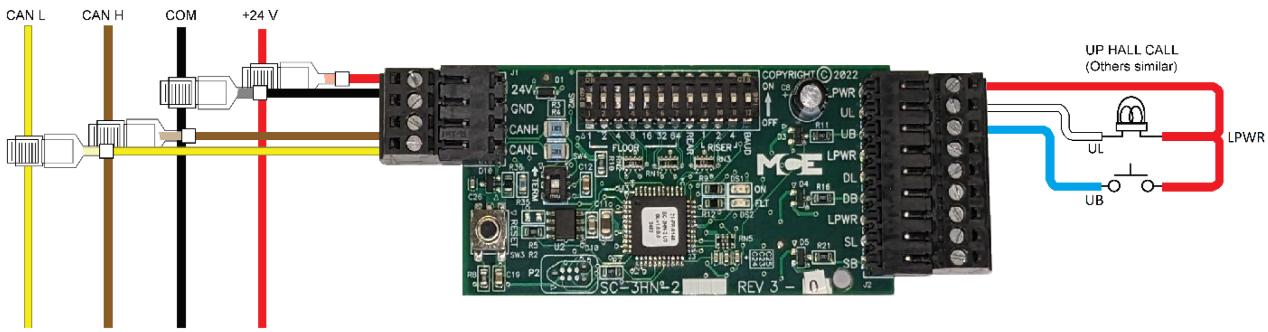


Table 6.24 Hall Wiring Colors

Color	Signal
red	+24V
black	common
brown	CAN H
yellow	CAN L

Addressing and CAN Bus Termination

Set SC-3HN-2 addresses as shown in the job prints for the installation. Generic examples are provided below.

Riser Assignment

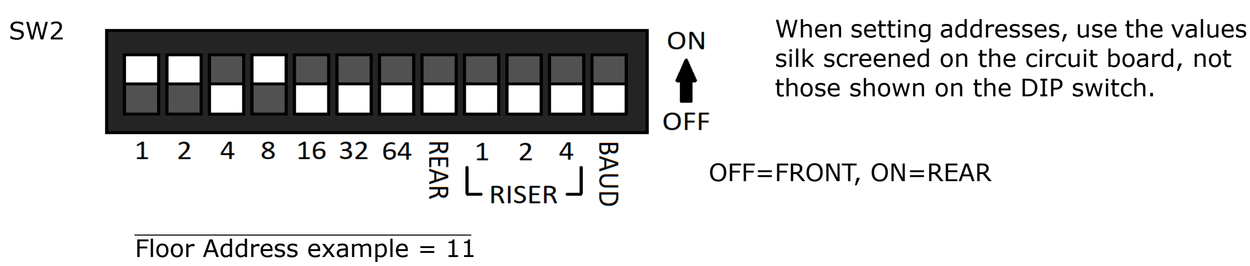
There may be up to four Main risers and four Auxiliary risers. Switches Riser 1, Riser 2, and Riser 4 are used to assign the appropriate riser to the SC-3HN-2 board. In the following table, a "1" indicates a switch in the ON position.

Table 6.25 Riser Assignment by Switch Binary Representation

Riser 1	Riser 2	Riser 4	Riser
0	0	0	Main A (Binary value 0)
1	0	0	Main B (Binary value 1)
0	1	0	Main C (Binary value 2)
1	1	0	Main D (Binary value 3)
0	0	1	Auxiliary A (Binary value 4)
1	0	1	Auxiliary B (Binary value 5)
0	1	1	Auxiliary C (Binary value 6)
1	1	1	Auxiliary D (Binary value 7)

Floor Number and Front or Rear Opening

DIP switch SW2, the first seven switches set the floor address for the board, beginning with Floor 1. Switch **REAR** selects Front or Rear opening.



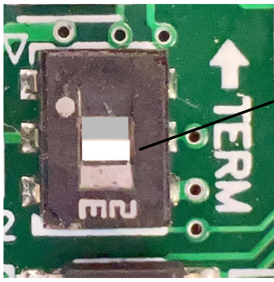
ON switch adds its value to floor address (binary format).

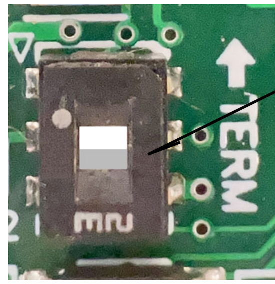
Baud Switch

The Baud Switch is reserved for future use to select a different CAN Bus baud rate should it become necessary. For now, the only option is to leave the baud switch off, setting baud rate to 125 kbps.

CAN Bus Termination

The CAN Bus must be terminated ONLY ON THE LAST SC-3HN-2 connected to the wire drop (farthest board from Dispatcher).





On Board Diagnostics

Two LEDs provide diagnostic information: The ON LED (green) and the FLT LED (red).

ON LED

The ON LED reflects power/communications status.

- ON: Serial hall call bus to Group/Car OK
- OFF: Board is not receiving power or has no software loaded.
- Blinking: Communications error - more than ten seconds have passed without a message from the dispatcher.

(FLT) FAULT LED

The FLT LED reflects the status of the analog outputs.

- **ON Steady**: Internal fault
  - Replace board if problem persists
- **OFF**: No Errors detected.
- **Blinking**: Output overload or disconnection. Pressing the Reset button on the SC-3HN-2 board will clear a blinking Fault LED.
  - Overload or Output Shorted: Excessive current draw. Resets when current draw is corrected and call button is pressed again.
  - Two or more SC-3HN-2 boards have the same floor address and riser ID.

Please refer to the Motion Group Manual, 42-02-G006, for configuration information relating to group hall calls.

Using the MLT / VLT Data Trap

The MLT / VLT "data trap" records many of the controller's operation "flags" at the moment the MLT or VLT occurs. This allows you to see what flags led up to the fault. Note: Direction must be on (input UPS) for the adjustable time set via parameter MOTOR LIMIT TIMER (1 - 6 minutes) before MLT will occur. Direction must be on (input DNS) for the adjustable time set via parameter VALVE LIMIT TIMER (1 - 6 minutes) before VLT will occur.

Once an MLT or VLT shuts down the car, use these steps to look at the stored flags.

1. Do not reset the computer as this will clear the data trap on software version 5.19.0001 or earlier. To return the car to service and not harm the data, simply toggle the relay panel inspection switch from OFF to ON and back to OFF, or press the FAULT RESET push button on the HC-CTL-2 PC board.

Note

The data is not cleared on power up or reset. The data is overwritten each time a new MLT occurs. However, the data may be cleared and the MLT counter reset by placing the F1, F2, F7 and F8 switches in the up position.

2. On the HC-MPU board place the F2 switch up (ON) to select External Memory. All other switches should be down (OFF). The LCD display shows the default address, DA.0100 (address 100 Hex) followed by the eight memory bits at that location.
3. Use the DATA TRAP MEMORY CHART to determine the addresses where the saved data is stored. The section in the Controller Installation Manual titled EXTERNAL MEMORY MODE provides a complete description of how to use the External Memory Mode. Briefly, use the **N** push button to select the digit to be changed (digit blinks on and off). Press + or **-** to change the digit.
4. Record the data displayed on the LCD for all rows shown on the chart. It helps if you have a few photocopies of the chart. Simply mark the positions in the chart that are shown as a "1" on the LCD display. Addresses 0480 through 0493 contain car status flags. Address 0494 contains the car's position indicator value at the instant the MLT or VLT condition occurred and address 0495 contains the MLT counter. Only the labeled positions are important to mark.
5. Use the recorded values and the timer logic flowcharts to help determine the cause of the problem. Then call MCE for assistance if any is needed.

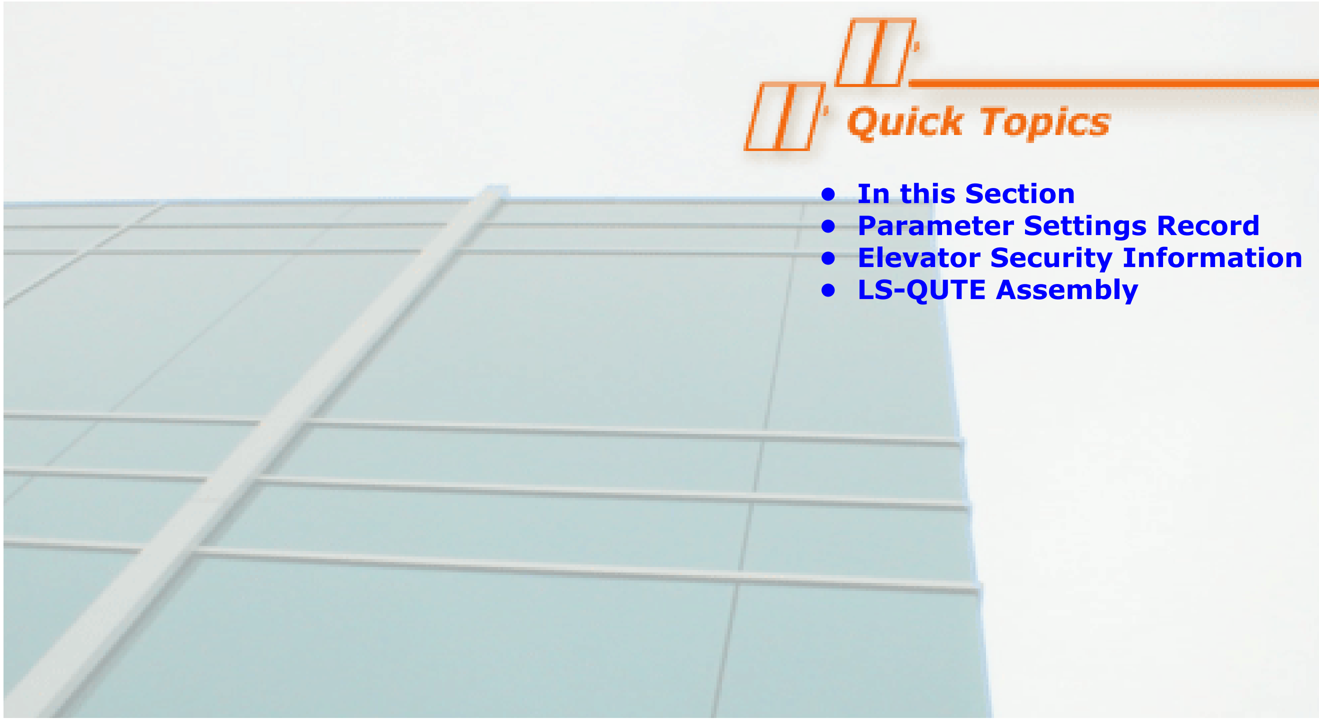
Note

* Note: To determine the software version, place switch F8 up (ON) with all other function switches down (OFF).

PHC Hydro Data Trap Memory Chart

Hex	Diagnostic Indicators							
Address	8	7	6	5	4	3	2	1
0480	DOLM On / Off	PHE On / Off	DZ On / Off	DOL On / Off	DBC On / Off	DOB On / Off	GEU On / Off	GED On / Off
0481	TFA On / Off	DC On / Off	UC On / Off	CC On / Off	NDS On / Off	FDC On / Off	DHO On / Off	DOI On / Off
0482	DCFN On / Off	DCP On / Off	DOF On / Off	LOT On / Off	GHT On / Off	HCT On / Off	CCT On / Off	SDT On / Off
0483	DOC On / Off	SE On / Off	DCLC On / Off	CSB On / Off	DCC On / Off	NUDG On / Off	NUGBPS On / Off	DSHT On / Off
0484	VCI On / Off	FRA On / Off	FCS On / Off	FRS On / Off	DNS On / Off	UPS On / Off	STD On / Off	STU On / Off
0485	SCE On / Off	FCCC On / Off	FCHLD On / Off	HLI On / Off	VCA On / Off	EXMLT On / Off	FWI On / Off	PIC On / Off
0486	LFP On / Off	UFP On / Off	NYDS On / Off	CCH On / Off	DIN On / Off	DPR On / Off	GTDE On / Off	GTUE On / Off
0487	HD On / Off	FCOFF On / Off	DHLD On / Off	IND On / Off	IN On / Off	DLKS On / Off	MLTP On / Off	MLTDO On / Off
0488	LLW On / Off	DLK On / Off	DDF On / Off	SUD On / Off	ISR On / Off	INCF On / Off	REAR On / Off	LLI On / Off
0489	DNDO On / Off	LD On / Off	DPD On / Off	DDP On / Off	UPDO On / Off	LU On / Off	UPD On / Off	UDP On / Off
048A	DMD On / Off	DCB On / Off	UCB On / Off	CCB On / Off	DMU On / Off	DCA On / Off	UCA On / Off	CCA On / Off
048B	TOS On / Off	MLT On / Off	VLT On / Off	SST On / Off	H On / Off	HSEL On / Off	DSH On / Off	RUN On / Off
048C	DZP On / Off	STC On / Off	SAF On / Off	HCR On / Off	HCDX On / Off	CCD On / Off	ISV On / Off	ISRT On / Off
048D	TEMPB On / Off	UFQ On / Off	DZORDZ On / Off	FCSM On / Off	FRM On / Off	FRSS On / Off	FRAS On / Off	FRC On / Off
048E	SD On / Off	SDA On / Off	DSD On / Off	BFD On / Off	SU On / Off	SUA On / Off	USD On / Off	TFD On / Off
048F	FRBYP On / Off	FRON On / Off	HYD1_TRC0 On / Off	ECC On / Off	CD On / Off	ECRN On / Off	EPR On / Off	PFG On / Off
0490	CODE4 On / Off	CODE2 On / Off	CODE3 On / Off	FREE On / Off	DEADZ On / Off	DHLD1 On / Off	PH1 On / Off	NDGF On / Off
0491	CTLDOT On / Off	CTLF On / Off	CTL On / Off	ALV On / Off	EPSTP On / Off	AUTO On / Off	EPRUN On / Off	EPI On / Off
0492	FRMM On / Off	OFR On / Off	WLDI On / Off	WLD On / Off	CCMEM On / Off	OLW On / Off	OVLM On / Off	OVL On / Off
0493	API On / Off	SAB On / Off	TEST On / Off	DHENDR On / Off	DHEND On / Off	CTST On / Off	HOSPH2 On / Off	HOSP On / Off
0494	PI On / Off	PI On / Off	PI On / Off	PI On / Off	PI On / Off	PI On / Off	PI On / Off	PI On / Off
0495	LOS On / Off	±	±	±	MLT Counter On / Off	MLT Counter On / Off	MLT Counter On / Off	MLT Counter On / Off

6



Quick Topics

7 Appendix

In this Section

- **Motion 2000 Parameter Settings Record:** Use this table to record the original parameter values and any changes made to these values (see page 7-2).
- **F7 Parameter Settings Record:** Use this table to record the original parameter values and any changes made to these values (see page 7-10)
- **Elevator Security Information and Operation:** Use this form to record information about building security and the programmed security codes. This form may given to building tenants (see page 7-14).
- **LS-QUTE landing System Assembly Drawings:** Assembly and wiring drawings for the LS-QUTE Landing System (see page 7-16).
- **ICE-COP-2 I/O Assignment**, Factory I/O Assignment, ICE-COP-2 Boards on page 7-18

Motion 2000 Parameter Settings Record

This form is provided for recording the current parameter settings on your Motion 2000 controller. If the firmware is upgraded or parameters are re-set to default values, you can then compare the parameter settings to this record to verify that they are correct.

Job Number: ____________________ **Date:** __________ **Bootrom Ver#**___________

Job Name: ____ **Car Number:** ______

Table 1. Firmware Versions (F8) and (F1 and F8)

Function Switch	Processor	Current Version	New Version
F8	MPU B	R____ Ver# H___.___.______	R____ Ver# H__.__.____
F1 & F8	MPU A		
F1 & F8	CTL A		
F1 & F8	CTL B		
F1 & F8	CTL C		
F1 & F8	RDR A		
F1 & F8	RDR B		
F1 & F8	UIO		
F1 & F8	CHP		
F1 & F8	DVR		

Table 2. Floor and Message Labels (F4)

Landing/ Msg #	Floor Label	Msg Label	Landing/ Msg #	Floor Label	Msg Label	Landing/ Msg #	Floor Label	Msg Label	Landing/ Msg #	Floor Label	Msg Label
01			11			21			31		
02			12			22			32		
03			13			23					
04			14			24					
05			15			25					
06			16			26					
07			17			27					
08			18			28					
09			19			29					
10			20			30					

Program Mode (F1) Parameter Settings Record

Program Mode (F1) Parameter Settings Record		
OPTIONS	**CURRENT VALUES**	**NEW VALUES**
BASIC FEATURES		
Controller Type:	___ Hydro (M2000) ___ Traction (M4000)	___ Hydro (M2000) ___ Traction (M4000)
Simplex / Local or Duplex?	___ Simplex ___ Local ___ Duplex	___ Simplex ___ Local ___ Duplex
Operation:	___ Sel. Coll. ___ Single Button ___ Single Auto PB	___ Sel. Coll. ___ Single Button ___ Single Auto PB
Top Landing Served (This car)?		
Car Serves Frnt/Flr (This car)?	1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32	1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
Car Serves Rear/Flr (This car)?	1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32	1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
Top Landing Served (Other car)?		
Other Car Serves Frnt/Flr?	1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32	1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
Other Car Serves Rear/Flr?	1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32	1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
Parking Floor		
Alt. Parking Floor		
Secondary Park Floor		
Lobby Floor		
Car Identifier	Set first car to A, next car to B, etc.	Set first car to A, next car to B, etc.
Serial COP Board HC-CPI?	_____ Yes ______ No	_____ Yes ______ No
Discrete PIs on UIO?	_____ Yes ______ No	_____ Yes ______ No
Dedicated PI Board?	_____ Yes ______ No	_____ Yes ______ No
Serial Cartop Door CNTRL?	_____ Yes ______ No	_____ Yes ______ No
Disable Local Hall Calls?	_____ Yes ______ No	_____ Yes ______ No
FIRE SERVICE		
Fire Service Operation?	_____ Yes ______ No	_____ Yes ______ No
Fire Phase 1 Main Floor		
Fire Phase 1 Alt. Floor		
Fire Service Code		
Fire Phase 1, 2nd Alt Landing		
Will This Car Run on PH2?	_____ Yes ______ No	_____ Yes ______ No
Bypass Stop Sw. on Phase 1?	_____ Yes ______ No	_____ Yes ______ No
Honeywell Fire Operation?	_____ Yes ______ No	_____ Yes ______ No
NYC Fire Phase 2 and ANSI 89?	_____ Yes ______ No	_____ Yes ______ No
White Plains, NY Fire Code?	_____ Yes ______ No	_____ Yes ______ No
Mass 524 CMR Fire Code?	_____ Yes ______ No	_____ Yes ______ No
ASME A17.1A 2000 Addenda?	_____ None ______ 2005 _____ 2007	_____ None ______ 2005 _____ 2007
Disable DPM on Fire PH.2?	_____ Yes ______ No	_____ Yes ______ No
Low Voltage Fire Sensor?	_____ Yes ______ No	_____ Yes ______ No
Fire Hat Status	Dynamic/Latch Flashing/Latch Initial	Dynamic/Latch Flashing/Latch Initial
DOOR OPERATION		
Nudging?	_____ Yes ______ No	_____ Yes ______ No
Stuck Photo Eye Protection?	_____ Yes ______ No	_____ Yes ______ No
Sequential Door Oper.(F/R)?	_____ Yes ______ No	_____ Yes ______ No
Car Call Cancels Door Time?	_____ Yes ______ No	_____ Yes ______ No
Nudging During Fire Phase 1?	_____ Yes ______ No	_____ Yes ______ No
Retiring Cam Option?	_____ Yes ______ No	_____ Yes ______ No
Pre-Opening?	_____ Yes ______ No	_____ Yes ______ No
Mechanical Safety Edge?	_____ Yes ______ No	_____ Yes ______ No
Nudging Output/Buzzer Only?	_____ Yes ______ No	_____ Yes ______ No
D.C.B. Cancels Door Time?	_____ Yes ______ No	_____ Yes ______ No
Leave Door Open on MGS (Traction only)	_____ Yes ______ No	_____ Yes ______ No

Program Mode (F1) Parameter Settings Record		
OPTIONS	**CURRENT VALUES**	**NEW VALUES**
Leave Door Open on PTI/ESS?	_____ Yes ______ No	_____ Yes ______ No
Nudging During Fire Phase 2?	_____ Yes ______ No	_____ Yes ______ No
Dir. Preference Until DLK?	_____ Yes ______ No	_____ Yes ______ No
Fully Manual Doors?	_____ Yes ______ No	_____ Yes ______ No
Cont. D.C.B. to Close Doors?	_____ Yes ______ No	_____ Yes ______ No
Cont. D.C.B. for Fire Phase 1?	_____ Yes ______ No	_____ Yes ______ No
Moment. D.O.B. door opening? Moment D.O.B. for: Moment D.O.B. for:	______ No ____Front ____Rear ____Both Doors ____Hall Calls ____Car Calls ____All Calls	______ No ____Front ____Rear ____Both Doors ____Hall Calls ____Car Calls ____All Calls
Doors to open if parked?	___None ___ Front ___ Rear ___ Both	___None ___ Front ___ Rear ___ Both
Doors to Open on Main Fire?	___ Front ___ Rear ___ Both	___ Front ___ Rear ___ Both
Doors to Open on Alt. Fire?	___ Front ___ Rear ___ Both	___ Front ___ Rear ___ Both
Leave Doors Open on CTL	_____ Yes ______ No	_____ Yes ______ No
Limited Door Re-Open Option	_____ Yes ______ No	_____ Yes ______ No
Reduce HCT with Photo Eye	_____ Yes ______ No	_____ Yes ______ No
Leave Doors Open on EPI	_____ Yes ______ No	_____ Yes ______ No
Doors to open if No demand?	___None ___ Front ___ Rear ___ Both	___None ___ Front ___ Rear ___ Both
Const. Press Op. Bypass PHE?	_____ Yes ______ No	_____ Yes ______ No
Door Type is?	_____ Horizontal ______ Vertical	_____ Horizontal ______ Vertical
Front Door Mech. Coupled?	_____ Yes ______ No	_____ Yes ______ No
Rear Door Mech. Coupled?	_____ Yes ______ No	_____ Yes ______ No
Prevent DCP Till Doors Close:	_____ Yes ______ No	_____ Yes ______ No
Moment D.C.B to Close Doors?	_____ Yes ______ No	_____ Yes ______ No
Doors to Latch DOF?	___None ___ Front ___ Rear ___ Both	___None ___ Front ___ Rear ___ Both
Doors to Latch DCF?	___None ___ Front ___ Rear ___ Both	___None ___ Front ___ Rear ___ Both
Inv. Door Closed Limit?	___None ___ Front ___ Rear ___ Both	___None ___ Front ___ Rear ___ Both
Fire PH2. with Doors Closed	_____ Yes ______ No	_____ Yes ______ No
TIMER		
Short Door Timer	_____ seconds	_____ seconds
Car Call Door Timer	_____ seconds	_____ seconds
Hall Call Door Timer	_____ seconds	_____ seconds
Lobby Door Timer	_____ seconds	_____ seconds
Nudging Timer	_____ seconds	_____ seconds
Time out of Service Timer	___None_____ seconds	___None_____ seconds
Motor Limit Timer	_____ minutes	_____ minutes
Valve Limit Timer (Hydro only)	_____ minutes	_____ minutes
MGR Output Timer (Traction only)	_____ minutes	_____ minutes
Door Hold Input Timer	_____ seconds	_____ seconds
Parking Delay Timer	_____ minutes	_____ minutes
Fan/Light Output Timer	_____ minutes	_____ minutes
Hospital Emerg. Timer	_____ minutes	_____ minutes
Door Open Protection Timer	_____ seconds	_____ seconds
CTL Door Cycle Timer	_____ seconds	_____ seconds
Door Buzzer Timer	_____ seconds	_____ seconds
Opn/Cls Interlock Timer	___None_____ seconds	___None_____ seconds
Fire PH1. Reclose Timer	___None_____ seconds	___None_____ seconds
Sync. Op. Delay Timer (Hydro only)	___None_____ seconds	___None_____ seconds
GONGS/LANTERNS		
Mounted in hall or car?	_____ Hall _____ Car	_____ Hall _____ Car
Double strike on Down?	_____ Yes _____ No	_____ Yes _____ No
PFG Enable Button?	_____ Yes _____ No	_____ Yes _____ No
Egress Floor Arrival Gong?	_____ No Main Egress Floor = _____	_____ No Main Egress Floor = _____
Car lantern Door Fully Open?	_____ Yes _____ No	_____ Yes _____ No

Contents Index MCE Web

Program Mode (F1) Parameter Settings Record		
OPTIONS	**CURRENT VALUES**	**NEW VALUES**
SPARE INPUTS		
(SP1) SPIN1 on HC-CTL-2 used for:		
(SP2) SPIN2 on HC-CTL-2 used for:		
(SP3) SPIN3 on HC-CTL-2 used for:		
(SP4) SPIN4 on HC-CTL-2 used for:		
(SP5) SPIN5 on HC-CTL-2 used for:		
(SP6) SPIN6 on HC-CTL-2 used for:		
(SP7) SPIN7 on HC-CTL-2 used for:		
(SP8) SPIN8 on HC-CTL-2 used for:		
(SP9) SPIN9 on HC-CTL-2 used for:		
(SP10) SPIN10 on HC-CTL-2 used for:		
(SP11) IO 1 on UIO 32 used for:		
(SP12) IO 2 on UIO 32 used for:		
(SP13) IO 3 on UIO 32 used for:		
(SP14) IO 4 on UIO 32 used for:		
(SP15) IO 5 on UIO 32 used for:		
(SP16) IO 6 on UIO 32 used for:		
(SP17) IO 7 on UIO 32 used for:		
(SP18) IO 8 on UIO 32 used for:		
(SP19) IO 1 on UIO 33 used for:		
(SP20) IO 2 on UIO 33 used for:		
(SP21) IO 3 on UIO 33 used for:		
(SP22) IO 4 on UIO 33 used for:		
(SP23) IO 5 on UIO 33 used for:		
(SP24) IO 6 on UIO 33 used for:		
(SP25) IO 7 on UIO 33 used for:		
(SP26) IO 8 on UIO 33 used for:		
(SP27) IO 1 on UIO 34 used for:		
(SP28) IO 2 on UIO 34 used for:		
(SP29) IO 3 on UIO 34 used for:		
(SP30) IO 4 on UIO 34 used for:		
(SP31) IO 5 on UIO 34 used for:		
(SP32) IO 6 on UIO 34 used for:		
(SP33) IO 7 on UIO 34 used for:		
(SP34) IO 8 on UIO 34 used for:		
(SP35) IO 1 on UIO 35 used for:		
(SP36) IO 2 on UIO 35 used for:		
(SP37) IO 3 on UIO 35 used for:		
(SP38) IO 4 on UIO 35 used for:		
(SP39) IO 5 on UIO 35 used for:		
(SP40) IO 6 on UIO 35 used for:		
(SP41) IO 7 on UIO 35 used for:		
(SP42) IO 8 on UIO 35 used for:		
(SP43) IO 1 on UIO 36 used for:		
(SP44) IO 2 on UIO 36 used for:		
(SP45) IO 3 on UIO 36 used for:		
(SP46) IO 4 on UIO 36 used for:		
(SP47) IO 5 on UIO 36 used for:		
(SP48) IO 6 on UIO 36 used for:		
(SP49) IO 7 on UIO 36 used for:		
(SP50) IO 8 on UIO 36 used for:		
I10 on CPI F used for:		
I11 on CPI F used for:		
I12 on CPI F used for:		
I13 on CPI F used for:		
I14 on CPI F used for:		

Program Mode (F1) Parameter Settings Record		
OPTIONS	**CURRENT VALUES**	**NEW VALUES**
I15 on CPI F used for:		
I16 on CPI F used for:		
I10 on CPI R used for:		
I11 on CPI R used for:		
I12 on CPI R used for:		
I13 on CPI R used for:		
I14 on CPI R used for:		
I15 on CPI R used for:		
I16 on CPI R used for:		
I1 on CPI FX used for:		
I2 on CPI FX used for:		
I3 on CPI FX used for:		
I4 on CPI FX used for:		
I5 on CPI FX used for:		
I6 on CPI FX used for:		
I7 on CPI FX used for:		
SPARE OUTPUTS		
(OUT1) SPOUT1 on CTL used for:		
(OUT2) SPOUT2 on CTL used for:		
(OUT3) SPOUT3 on CTL used for:		
(OUT4) SPOUT4 on CTL used for:		
(OUT5) IO 9 on UIO 32 used for:		
(OUT6) IO 10 on UIO 32 used for:		
(OUT7) IO 11 on UIO 32 used for:		
(OUT8) IO 12 on UIO 32 used for:		
(OUT9) IO 13 on UIO 32 used for:		
(OUT10) IO 14 on UIO 32 used for:		
(OUT11) IO 15 on UIO 32 used for:		
(OUT12) IO 16 on UIO 32 used for:		
(OUT13) IO 9 on UIO 33 used for:		
(OUT14) IO 10 on UIO 33 used for:		
(OUT15) IO 11 on UIO 33 used for:		
(OUT16) IO 12 on UIO 33 used for:		
(OUT17) IO 13 on UIO 33 used for:		
(OUT18) IO 14 on UIO 33 used for:		
(OUT19) IO 15 on UIO 33 used for:		
(OUT20) IO 16 on UIO 33 used for:		
(OUT21) IO 9 on UIO 34 used for:		
(OUT22) IO 10 on UIO 34 used for:		
(OUT23) IO 11 on UIO 34 used for:		
(OUT24) IO 12 on UIO 34 used for:		
(OUT25) IO 13 on UIO 34 used for:		
(OUT26) IO 14 on UIO 34 used for:		
(OUT27) IO 15 on UIO 34 used for:		
(OUT28) IO 16 on UIO 34 used for:		
(OUT29) IO 9 on UIO 35 used for:		
(OUT30) IO 10 on UIO 35 used for:		
(OUT31) IO 11 on UIO 35 used for:		
(OUT32) IO 12 on UIO 35 used for:		
(OUT33) IO 13 on UIO 35 used for:		
(OUT34) IO 14 on UIO 35 used for:		
(OUT35) IO 15 on UIO 35 used for:		
(OUT36) IO 16 on UIO 35 used for:		
(OUT37) IO 9 on UIO 36 used for:		
(OUT38) IO 10 on UIO 36 used for:		
(OUT39) IO 11 on UIO 36 used for:		

Program Mode (F1) Parameter Settings Record		
OPTIONS	**CURRENT VALUES**	**NEW VALUES**
(OUT40) IO 12 on UIO 36 used for:		
(OUT41) IO 13 on UIO 36 used for:		
(OUT42) IO 14 on UIO 36 used for:		
(OUT43) IO 15 on UIO 36 used for:		
(OUT44) IO 16 on UIO 36 used for:		
O10 on CPI F used for:		
O11 on CPI F used for:		
O12 on CPI F used for:		
O13 on CPI F used for:		
O14 on CPI F used for:		
O15 on CPI F used for:		
O16 on CPI F used for:		
O10 on CPI R used for:		
O11 on CPI R used for:		
O12 on CPI R used for:		
O13 on CPI R used for:		
O14 on CPI R used for:		
O15 on CPI R used for:		
O16 on CPI R used for:		
O1 on CPI FX used for:		
O2 on CPI FX used for:		
O3 on CPI FX used for:		
O4 on CPI FX used for:		
O5 on CPI FX used for:		
O6 on CPI FX used for:		
O7 on CPI FX used for:		
EXTRA FEATURES		
PI Output Type:	__ 1 wire per floor __ Binary 1 __ Binary 0 __ Gray code 1 __Gray code 0	__ 1 wire per floor __ Binary 1 __ Binary 0 __ Gray code 1 __Gray code 0
Floor Encoding Inputs? (Hydro only)	_____ Yes _____ No	_____ Yes _____ No
Encode All Floors? (Hydro only)	_____ Yes _____ No	_____ Yes _____ No
Intermediate Speed? (Traction only)	_____ Yes _____ No	_____ Yes _____ No
Emergency Power Operation?	__ No Emergency Power Return Floor = ___	__ No Emergency Power Return Floor = __
Light Load Weighing?	__ No Light Load Car Call Limit = ____	___ No Light Load Car Call Limit = ____
Photo Eye Anti-Nuisance?	__ No Consec Stops w/o PHE Limit = ___	___ No Consec Stops w/o PHE Limit = ___
Dedicated Card Reader Security?	_____ Yes _____ No	_____ Yes _____ No
Card Reader Inputs-Stacked C/H?	_____ Yes _____ No	_____ Yes _____ No
MG Shutdown Operation (Traction only)	_____ MGS Return Landing	_____ MGS Return Landing
IND. Cancel Calls on Stop?	_____ Yes _____ No	_____ Yes _____ No
WPIA Landing?	_____ Landing ___ Front ___ Rear ___Both	_____ Landing ___ Front ___ Rear ___Both
WPIB Landing?	_____ Landing ___ Front ___ Rear ___Both	_____ Landing ___ Front ___ Rear ___Both
WPIC Landing?	_____ Landing ___ Front ___ Rear ___Both	_____ Landing ___ Front ___ Rear ___Both
WPID Landing?	_____ Landing ___ Front ___ Rear ___Both	_____ Landing ___ Front ___ Rear ___Both
WPIE Landing?	_____ Landing ___ Front ___ Rear ___Both	_____ Landing ___ Front ___ Rear ___Both
WPIF Landing?	_____ Landing ___ Front ___ Rear ___Both	_____ Landing ___ Front ___ Rear ___Both
WPIG Landing?	_____ Landing ___ Front ___ Rear ___Both	_____ Landing ___ Front ___ Rear ___Both
WPIH Landing?	_____ Landing ___ Front ___ Rear ___Both	_____ Landing ___ Front ___ Rear ___Both
Allow Car Calls on WP Sec?	_____ Yes _____ No	_____ Yes _____ No
Cancel Both Hall (U/D) Calls?	_____ Yes _____ No	_____ Yes _____ No
Retain Calls On CTL/CTF?	_____ Yes _____ No	_____ Yes _____ No
Automatic Floor Stop Option?	___ No Floor # for Car to Stop at:_____	____No Floor # for Car to Stop at:_____
Car Call Cancel with Direction Reversal?	_____ Yes _____ No	_____ Yes _____ No
Cancel Car Calls Behind Car?	_____ Yes _____ No	_____ Yes _____ No
CE Electronics Board?	_____ Rev 1 _____ Rev 2	_____ Rev 1 _____ Rev 2
Massachusetts EMS Service?	_____No EMS Service Floor #:_____	_____No EMS Service Floor #:_____
BSI Security Key	___ Activated ___ Deactivated ___ Enabled	___ Activated ___ Deactivated ___ Enabled

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Program Mode (F1) Parameter Settings Record		
OPTIONS	**CURRENT VALUES**	**NEW VALUES**
PI Turned off if No Demand?	_____ Yes _____ No	_____ Yes _____ No
Hospital Emerg. Operation (This car)	_____ Yes _____ No	_____ Yes _____ No
Hospital Calls Frnt/Flr (This car)?	1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32	1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
Hospital Calls Rear/Flr (This car)?	1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32	1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
Hospital Emerg. Operation (Other car)	_____ Yes _____ No	_____ Yes _____ No
Other Car Hospital Calls Frnt/Flr?	1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32	1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
Other Car Hospital Calls Rear/Flr?	1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32	1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
Fire Bypasses Hospital?	_____ Yes _____ No	_____ Yes _____ No
High Speed Delay After Run?	_____ Yes _____ No	_____ Yes _____ No
Single Speed AC Option? (Traction only)	_____ Yes _____ No	_____ Yes _____ No
Sabbath Operation?	_____ Yes _____ No	_____ Yes _____ No
Sabbath Up Calls Front Floor?	1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
Sabbath Up Calls Rear Floor?	1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
Sabbath Down Calls Front Floor?	2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32	2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
Sabbath Down Calls Rear Floor?	2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32	2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
Intermediate Speed between Floors?	1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32	1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
Leveling Sensors	___Enabled ____ Disabled	___ Enabled ____Disabled
KCE	___Enabled ____ Disabled	___ Enabled ____Disabled
Analog Load Weigher?	___None ____ MCE____K-Tech	___None ____ MCE____K-Tech
Ind. Bypass Security?	_____ Yes _____ No	_____ Yes _____ No
Ats. Bypass Security?	_____ Yes _____ No	_____ Yes _____ No
Car to Floor Return Floor	_____ Floor	_____ Floor
Scrolling Speed	___Slow ____ Normal____Fast	___Slow ____ Normal____Fast
Low Oil Switch Contact (Hydro only)	_____N.O. _____N.C.	_____N.O. _____N.C.
Over Temp Switch Contact	_____N.O. _____N.C.	_____N.O. _____N.C.
OFRP Between Flrs	_____ Floor _____ Floor	_____ Floor _____ Floor
Enable Front DOB on Security?	_____ Yes _____ No	_____ Yes _____ No
Enable Rear DOB on Security?	_____ Yes _____ No	_____ Yes _____ No
Flr Count Below Flood Level?	__________	__________
Disable Top Flrs on PITFLD?	_____ Yes _____ No	_____ Yes _____ No
Earthquake Operation? (Traction only)	_____ Yes _____ No	_____ Yes _____ No
Calif/ANSI Earthquake Operation	___ANSI ___ Calif. (Traction only)	___ANSI ___ Calif. (Traction only)
Counterweighted Drum Machine	_____ Yes _____ No (Traction only)	_____ Yes _____ No (Traction only)
Earthquake Shutdown at a Landing	_____ Yes _____ No (Traction only)	_____ Yes _____ No (Traction only)
Correction Away from Counter Weight	_____ Yes _____ No (Traction only)	_____ Yes _____ No (Traction only)
Earthquake Shutdown PH1 Fire Service	_____ Yes _____ No (Traction only)	_____ Yes _____ No (Traction only)
Earthquake Shutdown PH2 Fire/Hospital	_____ Yes _____ No (Traction only)	_____ Yes _____ No (Traction only)
First Lower/Run on EP Power	_____ A _____ B	_____ A _____ B
ADDITIONAL CAR OPTIONS (Hydro only) (was ASME A17.1 - 2000 Features)		
Hoistway Access?	_____ Yes _____ No	_____ Yes _____ No
Top Access?	_____ Front _____ Rear	_____ Front _____ Rear
Bottom Access?	_____ Front _____ Rear	_____ Front _____ Rear
Number of Motor Starters	____1 _____2 _____3	____1 _____2 _____3
Minimum Number of Motors	____1 _____2 _____3	____1 _____2 _____3
Soft-Stop Timer	_____ Seconds	______ Seconds
Starter #1 Type	____ Wye-Delta _____ Across the Line ____ Solid State _____ None	____ Wye-Delta _____ Across the Line ____ Solid State _____ None
Y-D Transfer Timer	____ Seconds _____N/A	____ Seconds _____N/A
Y-D Open Transn. Timer	____ mSeconds _____N/A	____mSeconds _____N/A

Program Mode (F1) Parameter Settings Record		
OPTIONS	**CURRENT VALUES**	**NEW VALUES**
Up To Speed Timer	____ Seconds _____N/A	_____Seconds _____N/A
M Contactor Installed?	____ Yes _____No	____Yes _____No
Starter #2 Type	____ Wye-Delta _____Across the Line ____ Solid State _____None	____ Wye-Delta _____Across the Line ____Solid State _____None
Y-D Transfer Timer	____ Seconds _____N/A	____ Seconds _____N/A
Y-D Open Transn. Timer	____ mSeconds _____N/A	____mSeconds _____N/A
Up To Speed Timer	____ Seconds _____N/A	_____Seconds _____N/A
M Contactor Installed?	____ Yes _____No	____Yes _____No
Starter #3 Type	____ Wye-Delta ____Across the Line ____ Solid State ____None	____ Wye-Delta ____Across the Line ____ Solid State ____None
Y-D Transfer Timer	____ Seconds _____N/A	____ Seconds _____N/A
Y-D Open Transn. Timer	____ mSeconds _____N/A	____mSeconds _____N/A
Up To Speed Timer	____ Seconds _____N/A	_____Seconds _____N/A
M Contactor Installed?	____ Yes _____No	____Yes _____No
Starter Configuration	____ Sequential ___Simultaneous ___ N/A	____Sequential ___Simultaneous ___ N/A
Valve Type	____ Standard _____ Pilot Relays ____ TKE _____ Dover	____ Standard _____ Pilot Relays ____ TKE _____ Dover
Speed > 150 FPM?	_____ Yes _____ No	_____ Yes _____ No
ADDITIONAL CAR OPTIONS (Traction only) (was ASME A17.1 - 2000 Features)		
ETS Switches Required?	_____ Yes _____ No	_____ Yes _____ No
Hoistway Access?	_____ Yes _____ No	_____ Yes _____ No
Top Access?	_____ Front _____ Rear	_____ Front _____ Rear
Bottom Access?	_____ Front _____ Rear	_____ Front _____ Rear
ADDITIONAL CAR OPTIONS (Hydro & Traction) (was ASME A17.1 - 2000 Features)		
Door Position Monitor	____ None ____Front ____ Rear ____Both	____ None ____Front ____ Rear _____Both
Front Door Close Limit?	____ None _____DCL____ GS+DCAB	____ None _____DCL____ GS+DCAB
Rear Door Close Limit?	____ None _____DCLR____ GS+DCABR	____ None _____DCLR____ GS+DCABR
LS-EDGE Landing System?	_____ Yes _____ No	_____ Yes _____ No
TIMED FEATURES		
Sync Op. Days: (Hydro only)	__Evdy __Mo __Tu__We__Th__Fr__Sa__Su	__Evdy __Mo __Tu__We__Th__Fr__Sa__S
Sync Starting Time	_____ 24 Hr format/ 30 min increments	_____ 24 Hr format/ 30 min increments
Motion 2000/4000 Version 00.08.0047		

7

F7 Parameter Settings Record

Please use the following table to record yourF7 menu settings. If the HC-CTL-2 board is replaced in the future, this will provide you a quick way to re-enter proper settings. Also, if you place a support call to MCE, these values are information you will need to speed problems solving.

Table 7.1 F7 Parameter Log

ID#	Description	Unit	Setting Min	Setting Max
1	Floor 1 (bottom floor served)	Inches	Learned Floor Height - .9	Learned Floor Height + .9
2	Floor 2 (next floor ascending)	Inches	Learned Floor Height - .9	Learned Floor Height + .9
3-16	Floors in ascending order	Inches	Learned Floor Height - .9	Learned Floor Height + .9
65	Bottom Access Distance: Distance in Inches from bottom floor to virtual bottom access up-travel limit switch position.	Inches	0.0	12000.0
66	Top Access Distance: Distance in Inches from top floor to virtual top access down-travel limit switch position.	Inches	0.0	12000.0
72	U/DNT3: Set to Virtual if an LS-EDGE landing system is used. It is associated with the physical switch connected to LIM2 on HC-CTL-2 board when contract speed can be reached on a one-floor-run to the top terminal landing. When contract speed cannot be reached on a one-floor-run to the top terminal landing, it is associated with the physical switch connected to LIM3 on HC-CTL-2 board. For a LS-EDGE landing system, LIM2 will be shorted to LIM3 if contract speed can be reached on a one-floor-run to the top terminal landing. If an LS-EDGE landing system is not used, set to Unused.	N/A	Virtual, Physical, Unused	
73	U/DNT4: Set to Virtual if an LS-EDGE landing system is used and a one-floor-run to the top terminal landing cannot reach contract speed. It is associated with the physical switch connected to LIM2 on HC-CTL-2 board. If set to Virtual, the U/DNT3 option must also be set to Virtual. If an LS-EDGE landing system is not used or contract speed cannot be reached on a one-floor-run to the top terminal landing, set to Unused.	N/A	Virtual, Physical, Unused	
90	UNTS3 Distance: If contract speed can be reached on a one-floor-run to the top terminal landing, set value to the distance that the physical switch attached to the LIM2 on the HC-CTL-2 board is located from the top terminal landing. If the contract speed cannot be reached on a one-floor-run to the top terminal landing, set value to the distance to the physical switch attached to LIM3 on the HC-CTL-2 board is located from the top terminal landing.	Inches	-1200.0	1200.0
95	UNTS4 Distance: Set value to the distance that the physical switch attached to LIM2 on the HC-CRL-2 board is located from the top terminal landing. If U/DNT4 option is set to Unused, then set value distance to N/A.	Inches	-1200.0	1200.0
161	Releveling distance: If the car initially levels into the floor above or below this distance from accurate level, a releveling operation will proceed.	Inches	0.0	+9.0

Table 7.1 F7 Parameter Log

ID#	Description	Unit	Setting Min	Setting Max
163	Leveling dead zone distance: This is the distance from floor level position at which the stop command is issued during initial leveling and the car **coasts** to a stop.	Inches	0.0	+3.0
191	Landing System (LS-EDGE): Select the landing system used for this job.	N/A	ELGO-160 ELGO-240 LS-EDGE	
208	Stepping System (Single/Dual) **Single:** If this option is selected, only **STEP UP / STEP DN** parameters will be visible and adjustable by the user. These parameters apply for one-floor-run movement and multi-floor-run movement. **Dual:** If this option is selected, both the S**TEP UP / STEP DN** and **SUB-STEP UP / SUB-STEP DN** parameters will be visible and adjustable by the user. The **STEP UP / STEP DN** parameters are used for multi-floor-run movement, while **SUB-STEP UP / SUB-STEP DN** parameters are used for one-floor-run movement.	N/A	Single Dual	
209	STEP DN1 (For 1st landing): This parameter determines the slowdown distance down to a floor for one-floor-run and multi-floor-run movement when the **STEPPING OPTION** is selected as **SINGLE**. If **DUAL** is selected for the **STEPPING OPTION**, this parameter determines the slowdown distance down to a floor for multi-floor-run movement.	Inches	0.0	96.0
210	STEP UP1 (For 1st landing): This parameter determines the slowdown distance up to a floor for one-floor-run and multi-floor-run movement when the **STEPPING OPTION** is selected as **SINGLE**. If **DUAL** is selected for the **STEPPING OPTION**, this parameter determines the slowdown distance up to a floor for multi-floor-run movement.	Inches	0.0	96.0
211	STEP DN2 (FOR 2ND LANDING): SEE PARAMETER 209	Inches	0.0	96.0
212	STEP UP2 (FOR 2ND LANDING): SEE PARAMETER 210	Inches	0.0	96.0
213	STEP DN3 (FOR 3RD LANDING): SEE PARAMETER 209	Inches	0.0	96.0
214	STEP UP3 (FOR 3RD LANDING): SEE PARAMETER 210	Inches	0.0	96.0
215	STEP DN4 (FOR 4TH LANDING): SEE PARAMETER 209	Inches	0.0	96.0
216	STEP UP4 (FOR 4TH LANDING): SEE PARAMETER 210	Inches	0.0	96.0
217	STEP DN5 (FOR 5TH LANDING): SEE PARMETER 209	Inches	0.0	96.0
218	STEP UP5 (FOR 5TH LANDING): SEE PARAMETER 210	Inches	0.0	96.0
219	STEP DN6 (FOR 6TH LANDING): SEE PARAMETER 209	Inches	0.0	96.0
220	STEP UP6 (FOR 6TH LANDING): SEE PARAMETER 210	Inches	0.0	96.0
221	STEP DN7 (FOR 7TH LANDING): SEE PARAMETER 209	Inches	0.0	96.0
222	STEP UP7 (FOR 7TH LANDING): SEE PARAMETER 210	Inches	0.0	96.0
223	STEP DN8 (FOR 8TH LANDING): SEE PARAMETER 209	Inches	0.0	96.0
224	STEP UP8 (FOR 8TH LANDING): SEE PARAMETER 210	Inches	0.0	96.0
225	STEP DN9 (FOR 9TH LANDING): SEE PARAMETER 209	Inches	0.0	96.0
226	STEP UP9 (FOR 9TH LANDING): SEE PARAMETER 210	Inches	0.0	96.0
227	STEP DN10 (FOR 10TH LANDING): SEE PARAMETER 209	Inches	0.0	96.0
228	STEP UP10 (FOR 10TH LANDING): SEE PARAMETER 210	Inches	0.0	96.0
229	STEP DN11 (FOR 11TH LANDING): SEE PARAMETER 209	Inches	0.0	96.0

Table 7.1 F7 Parameter Log

ID#	Description	Unit	Setting Min	Setting Max
230	STEP UP11 (FOR 11TH LANDING): SEE PARAMETER 210	Inches	0.0	96.0
231	STEP DN12 (FOR 12TH LANDING): SEE PARAMETER 209	Inches	0.0	96.0
232	STEP UP12 (FOR 12TH LANDING): SEE PARAMETER 210	Inches	0.0	96.0
233	STEP DN13 (FOR 13TH LANDING): SEE PARAMETER 209	Inches	0.0	96.0
234	STEP UP13 (FOR 13TH LANDING): SEE PARAMETER 210	Inches	0.0	96.0
235	STEP DN14 (FOR 14TH LANDING): SEE PARAMETER 209	Inches	0.0	96.0
236	STEP UP14 (FOR 14TH LANDING): SEE PARAMETER 210	Inches	0.0	96.0
237	STEP DN15 (FOR 15TH LANDING): SEE PARAMETER 209	Inches	0.0	96.0
238	STEP UP15 (FOR 15TH LANDING): SEE PARAMETER 210	Inches	0.0	96.0
239	STEP DN16 (FOR 16TH LANDING): SEE PARAMETER 209	Inches	0.0	96.0
240	STEP UP16 (FOR 16TH LANDING): SEE PARAMETER 210	Inches	0.0	96.0
241	SUB-STEP DN1 (For 1st landing): This parameter determines the slowdown distance down to a floor for one-floor-run movement when STEPPING OPTION is selected as DUAL. If the slowdown distance for this parameter is the same as the associated STEP DN parameter, enter zero.	Inches	0.0	96.0
242	SUB-STEP UP1 (For 1st landing): This parameter determines the slowdown up to a floor for one-floor-run movement when STEPPING OPTION is selected as DUAL. If the slowdown distance for this parameter is the same as the associated STEP UP parameter, enter zero.	Inches	0.0	96.0
243	SUB-STEP DN2 (FOR 2ND LANDING): SEE PARAMETER 241	Inches	0.0	96.0
244	SUB-STEP UP2 (FOR 2ND LANDING): SEE PARAMETER 242	Inches	0.0	96.0
245	SUB-STEP DN3 (FOR 3RD LANDING): SEE PARAMETER 241	Inches	0.0	96.0
246	SUB-STEP UP3 (FOR 3RD LANDING): SEE PARAMETER 242	Inches	0.0	96.0
247	SUB-STEP DN4(FOR 4TH LANDING): SEE PARAMETER 241	Inches	0.0	96.0
248	SUB-STEP UP4 (FOR 4TH LANDING): SEE PARAMETER 242	Inches	0.0	96.0
249	SUB-STEP DN5 (FOR 5TH LANDING): SEE PARAMETER 241	Inches	0.0	96.0
250	SUB-STEP UP5 (FOR 5TH LANDING): SEE PARAMETER 242	Inches	0.0	96.0
251	SUB-STEP DP6 (FOR 6TH LANDING): SEE PARAMETER 241	Inches	0.0	96.0
252	SUB-STEP UP6 (FOR 6TH LANDING): SEE PARAMETER 242	Inches	0.0	96.0
253	SUB-STEP DN7 (FOR 7TH LANDING): SEE PARAMETER 241	Inches	0.0	96.0
254	SUB-STEP UP7 (FOR 7TH LANDING): SEE PARAMETER 242	Inches	0.0	96.0
255	SUB-STEP DN8 (FOR 8TH LANDING): SEE PARAMETER 241	Inches	0.0	96.0
256	SUB-STEP UP8 (FOR 8TH LANDING): SEE PARAMETER 242	Inches	0.0	96.0
257	SUB-STEP DN9 (FOR 9TH LANDING): SEE PARAMETER 241	Inches	0.0	96.0
258	SUB-STEP UP9 (FOR 9TH LANDING): SEE PARAMETER 242	Inches	0.0	96.0
259	SUB-STEP DN10 (FOR 10TH LANDING): SEE PARAMETER 241	Inches	0.0	96.0
260	SUB-STEP UP10 (FOR 10TH LANDING): SEE PARAMETER 242	Inches	0.0	96.0
261	SUB-STEP DN11 (FOR 11TH LANDING): SEE PARAMETER 241	Inches	0.0	96.0
262	SUB-STEP UP11 (FOR 11TH LANDING): SEE PARAMETER 242	Inches	0.0	96.0
263	SUB-STEP DN12 (FOR 12TH LANDING): SEE PARAMETER 241	Inches	0.0	96.0
264	SUB-STEP UP12 (FOR 12TH LANDING): SEE PARAMETER 242	Inches	0.0	96.0
265	SUB-STEP DN13 (FOR 13TH LANDING): SEE PARAMETER 241	Inches	0.0	96.0
266	SUB-STEP UP13 (FOR 13TH LANDING): SEE PARAMETER 242	Inches	0.0	96.0

Table 7.1 F7 Parameter Log

ID#	Description	Unit	Setting Min	Setting Max
267	SUB-STEP DN14 (FOR 14TH LANDING): SEE PARAMETER 241	Inches	0.0	96.0
268	SUB-STEP UP14 (FOR 14TH LANDING): SEE PARAMETER 242	Inches	0.0	96.0
269	SUB-STEP DN15 (FOR 15TH LANDING): SEE PARAMETER 241	Inches	0.0	96.0
270	SUB-STEP UP15 (FOR 15TH LANDING): SEE PARAMETER 242	Inches	0.0	96.0
271	SUB-STEP DN16 (FOR 16TH LANDING): SEE PARAMETER 241	Inches	0.0	96.0
272	SUB-STEP UP16 (FOR 16TH LANDING): SEE PARAMETER 242	Inches	0.0	96.0
273	TOP/BOTTOM Access Margin	Inches	6.0	36.0

Table 7.2 Hydraulic Elevator Slowdown Distance Table

MCE Recommended setting for STEP DNx/ STEP UPx and SUB-STEP DNx/SUB-STEP UPx (Parameters 209-240). Here x stands for floor#.

Car Speed (frm)	Slowdown Distance (in.)	Min. Floor Height (in.)
50	12	24
55	13	26
60	14	28
65	15	30
70	16	32
75	18	36
80	19	38
85	20	40
90	21	42
95	22	44
100	24	48
110	27	54
125	30	60
140	33	66
150	36	72
160	39	78
175	42	84
200	48	96

Elevator Security Information and Operation

Building name:

Building location:

Security activation:	Key switch	Mon:	from	to
	or	Tue:	from	to
	Time clock	Wed:	from	to
		Thu:	from	to
		Fri:	from	to
		Sat:	from	to
		Sun:	from	to

Instructions: To gain access to secured floors, follow the steps below while in the elevator car. The steps may be taken while the car is moving or standing still. Requests for a car from a hallway or corridor are answered without restriction.

1. While in the car, press the button for the desired floor. If the destination floor is secured, the button for that floor will flash on/off.
   If the button for that floor stays solidly illuminated, that floor is unsecured.

2. While the destination floor button is flashing, enter the security code for that floor within 10 seconds. Enter the security code by pressing the corresponding buttons on the panel.
   If the code was entered correctly and within the required time limit, the car will immediately go to that floor. If the code was not entered within the10-second time limit or was entered incorrectly, the destination floor button light will turn off after 10 seconds and the entire sequence must be repeated.

   If a mistake is made while entering the security code, simply wait until the destination floor button light stops flashing and then start the entire sequence again.

Security Codes

Maintain a record of the security codes by noting the floor name as found in the elevator cab and each floor's code. Any floor with a security code is a secured floor.

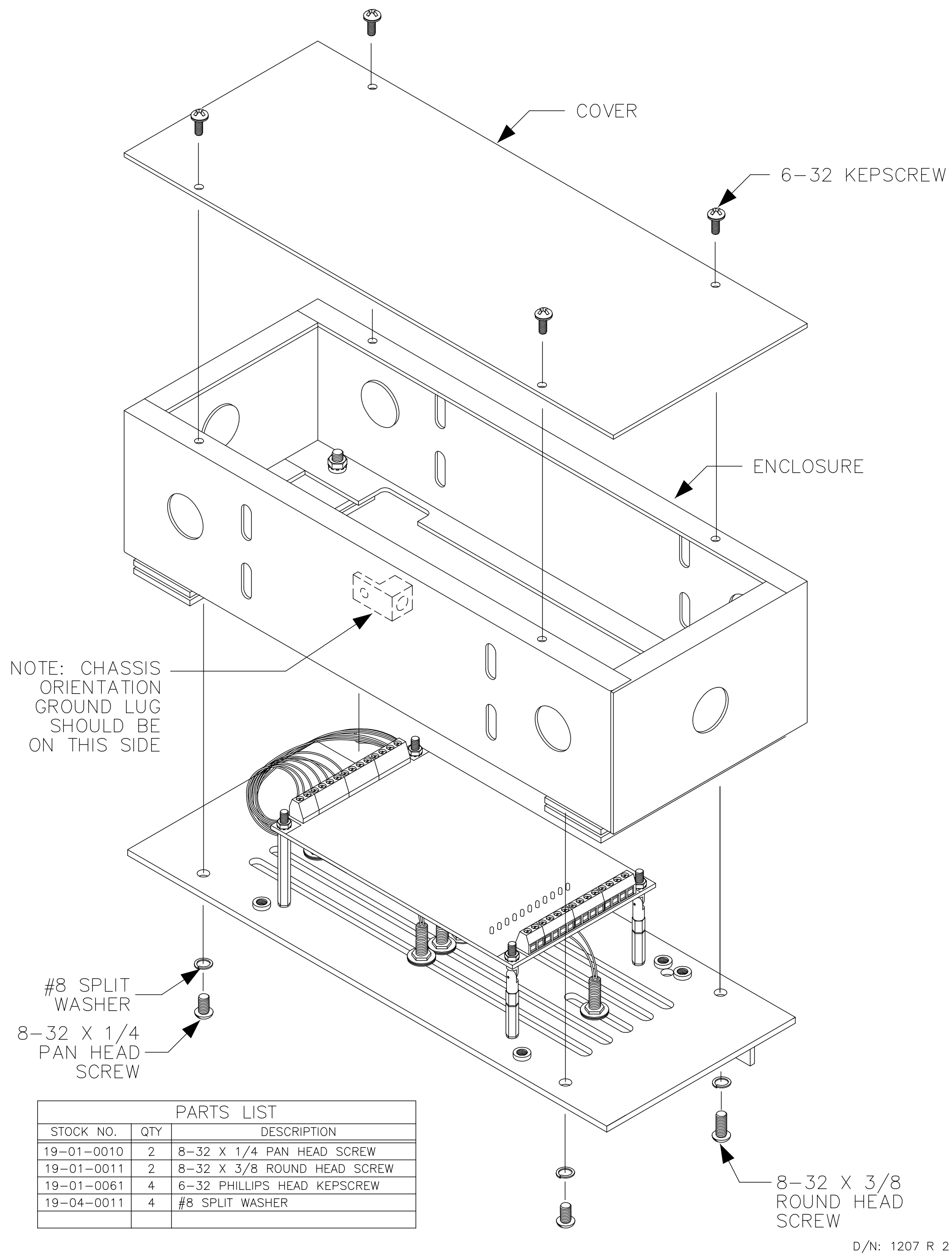
1. Floor	**security code**	**=**	__ __ __ __ __ __ __ __
2. Floor	**security code**	**=**	__ __ __ __ __ __ __ __
3. Floor	**security code**	**=**	__ __ __ __ __ __ __ __
4. Floor	**security code**	**=**	__ __ __ __ __ __ __ __
5. Floor	**security code**	**=**	__ __ __ __ __ __ __ __
6. Floor	**security code**	**=**	__ __ __ __ __ __ __ __
7. Floor	**security code**	**=**	__ __ __ __ __ __ __ __
8. Floor	**security code**	**=**	__ __ __ __ __ __ __ __
9. Floor	**security code**	**=**	__ __ __ __ __ __ __ __
10.Floor	**security code**	**=**	__ __ __ __ __ __ __ __
11.Floor	**security code**	**=**	__ __ __ __ __ __ __ __
12.Floor	**security code**	**=**	__ __ __ __ __ __ __ __
13.Floor	**security code**	**=**	__ __ __ __ __ __ __ __
14.Floor	**security code**	**=**	__ __ __ __ __ __ __ __
15.Floor	**security code**	**=**	__ __ __ __ __ __ __ __
16.Floor	**security code**	**=**	__ __ __ __ __ __ __ __
17.Floor	**security code**	**=**	__ __ __ __ __ __ __ __
18.Floor	**security code**	**=**	__ __ __ __ __ __ __ __
19.Floor	**security code**	**=**	__ __ __ __ __ __ __ __
20.Floor	**security code**	**=**	__ __ __ __ __ __ __ __
21.Floor	**security code**	**=**	__ __ __ __ __ __ __ __
22.Floor	**security code**	**=**	__ __ __ __ __ __ __ __
23.Floor	**security code**	**=**	__ __ __ __ __ __ __ __
24.Floor	**security code**	**=**	__ __ __ __ __ __ __ __
25.Floor	**security code**	**=**	__ __ __ __ __ __ __ __
26.Floor	**security code**	**=**	__ __ __ __ __ __ __ __
27.Floor	**security code**	**=**	__ __ __ __ __ __ __ __
28.Floor	**security code**	**=**	__ __ __ __ __ __ __ __
29.Floor	**security code**	**=**	__ __ __ __ __ __ __ __
30.Floor	**security code**	**=**	__ __ __ __ __ __ __ __
31.Floor	**security code**	**=**	__ __ __ __ __ __ __ __
32.Floor	**security code**	**=**	__ __ __ __ __ __ __ __

LS-QUTE Landing System Assembly Drawings

Note

If a sensor or the HC-IPLS board is replaced, make sure the **orientation of the HC-IPLS** board is correct. Use the chassis ground and the LEDs shown in the figure below for an orientation reference.

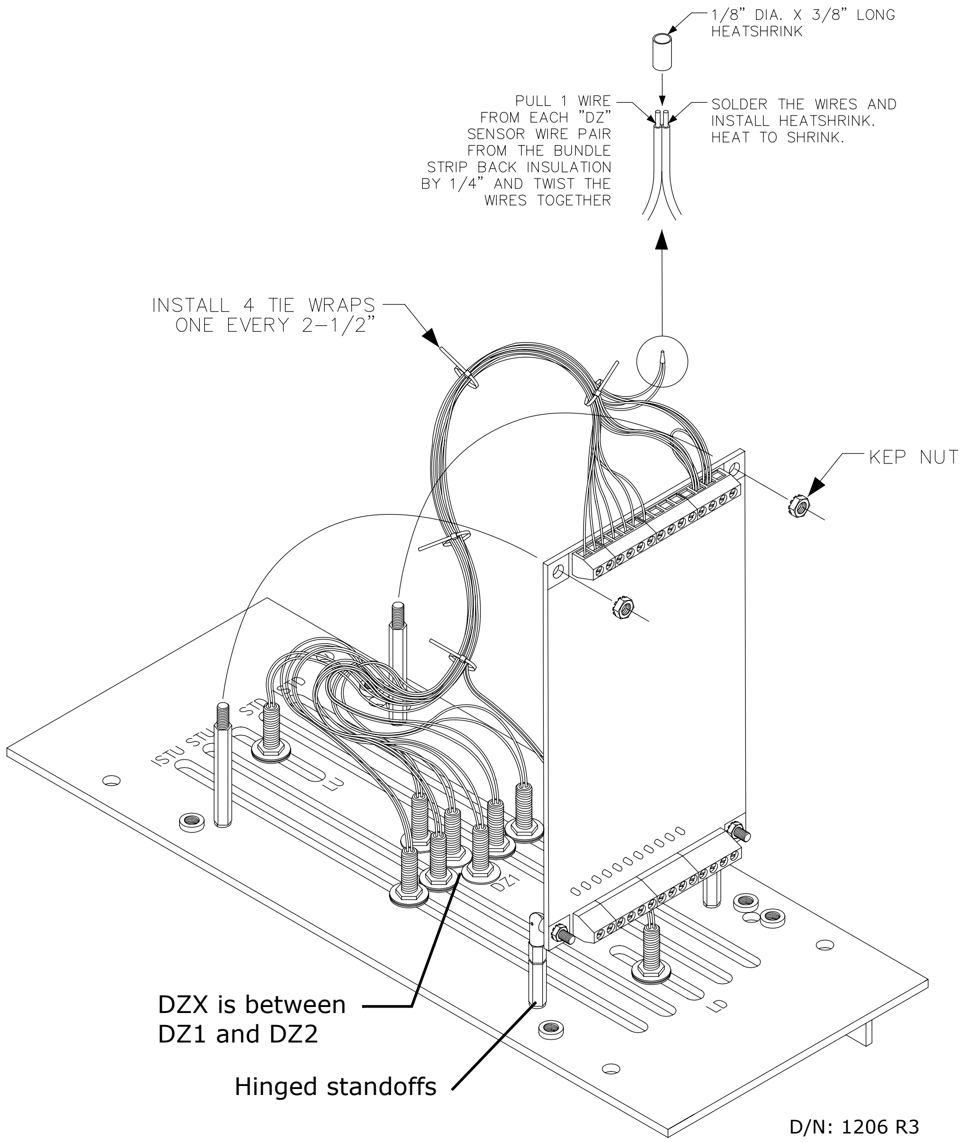
Figure 7.1 LS-QUTE Enclosure Assembly



PARTS LIST

STOCK NO.	QTY	DESCRIPTION
19–01–0010	2	8–32 X 1/4 PAN HEAD SCREW
19–01–0011	2	8–32 X 3/8 ROUND HEAD SCREW
19–01–0061	4	6–32 PHILLIPS HEAD KEPSCREW
19–04–0011	4	#8 SPLIT WASHER

Figure 7.2 LS-QUTE Wiring Diagram



SENSOR	HC-IPLS BOARD TERMINALS	
DZ1	DZ2 SENSOR	S18
DZX	SDZX	S18
DZ2	DZ1 SENSOR	S27
DZF	SDZF	S18
DZR	SDZR	S18
LD	SLD	S18
LU	SLU	S18
STD	STD	S2
STU	STU	S2
ISTD	ISTD	S2
ISTU	ISTU	S2
One 2 inch jumper	S18	S2

Factory I/O Assignment, ICE-COP-2 Boards

COP-2 Board #1 - ID: 0

The first COP-2 board contains standard dedicated inputs as follows:

IO8	IO7	IO6	IO5	IO4	IO3	IO2	IO1
CRO	DOB	DCB	IND	FCCC	FCS	FCHLD	FCOFF

The first COP-2 board contains standard dedicated outputs as follows:

IO16	IO15	IO14	IO13	IO12	IO11	IO10	IO9
CGEU	CGED	SUA	SDA	FWL	FWI	NDG	PFG

The first COP-2 board contains standard dedicated car calls (see note) as follows:

IO24	IO23	IO22	IO21	IO20	IO19	IO18	IO17
108	107	106	105	104	103	102	101

COP-2 Board #2 - ID: 1

The second COP-2 board contains standard dedicated car calls (see note) as follows:

IO8	IO7	IO6	IO5	IO4	IO3	IO2	IO1
116	115	114	113	112	111	110	109

IO16	IO15	IO14	IO13	IO12	IO11	IO10	IO9
124	123	122	121	120	119	118	117

IO24	IO23	IO22	IO21	IO20	IO19	IO18	IO17
132	131	130	129	128	127	126	125

Note

Note that the front car calls stack on each other. For example, if a car serves floors 1 through 3, does not serve floor 4, but does serve floors above 4, floors above floor 4 will move down one connection rather than leave an I/O open.

COP-2 Board #3 - ID: 2

The third COP-2 board contains spare inputs as follows:

IO8	IO7	IO6	IO5	IO4	IO3	IO2	IO1
-	SPIN	SPIN	SPIN	SPIN	SPIN	SPIN	SPIN

The third COP-2 board contains spare outputs as follows:

IO16	IO15	IO14	IO13	IO12	IO11	IO10	IO9
SPOUT	SPOUT	SPOUT	SPOUT	-	-	-	-

IO24	IO23	IO22	IO21	IO20	IO19	IO18	IO17
-	-	-	-	-	SPOUT	SPOUT	SPOUT

COP-2 Board #4 - ID: 4

The fourth COP-2 board contains standard dedicated inputs as follows:

IO8	IO7	IO6	IO5	IO4	IO3	IO2	IO1
CRO	DOBR	DCBR	IND	FCCC	FCS	FCHLD	FCOFF

The fourth COP-2 board contains standard dedicated outputs as follows:

IO16	IO15	IO14	IO13	IO12	IO11	IO10	IO9
CGEUR	CGEDR	SUA	SDA	FWL	FWI	NDGR	PFG

The fourth COP-2 board contains standard dedicated car calls (see note) as follows:

IO24	IO23	IO22	IO21	IO20	IO19	IO18	IO17
108R	107R	106R	105R	104R	103R	102R	101R

Note

Note that the rear car calls stack on each other. For example, if a car serves floors 1 through 3, does not serve floor 4, but does serve floors above 4, floors above floor 4 will move down one connection rather than leave an I/O open.

COP-2 Board #5 - ID: 5

The fifth COP-2 board contains standard dedicated car calls (see note) as follows:

IO8	IO7	IO6	IO5	IO4	IO3	IO2	IO1
116R	115R	114R	113R	112R	111R	110R	109R

IO16	IO15	IO14	IO13	IO12	IO11	IO10	IO9
124R	123R	122R	121R	120R	119R	118R	117R

IO24	IO23	IO22	IO21	IO20	IO19	IO18	IO17
132R	131R	130R	129R	128R	127R	126R	125R

COP-2 Board #6 - ID: 6

The sixth COP-2 board contains spare inputs as follows:

IO8	IO7	IO6	IO5	IO4	IO3	IO2	IO1
-	SPIN	SPIN	SPIN	SPIN	SPIN	SPIN	SPIN

The sixth COP-2 board contains spare outputs as follows:

IO16	IO15	IO14	IO13	IO12	IO11	IO10	IO9
SPOUT	SPOUT	SPOUT	SPOUT	-	-	-	-

IO24	IO23	IO22	IO21	IO20	IO19	IO18	IO17
-	-	-	-	-	SPOUT	SPOUT	SPOUT

Note

Note that the rear car calls stack on each other. For example, if a car serves floors 1 through 3, does not serve floor 4, but does serve floors above 4, floors above floor 4 will move down one connection rather than leave an I/O open.

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