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Motion 2000 Touch Screen User Guide
V20 software

Manual 42-02-1P28, Rev A3 May 2023

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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.

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 TS Description: A description of the Motion 2000 TS controller and circuit boards.
- Section 2. Installation: Safety precautions, 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-2 to program and troubleshoot the controller. Complete with parameter definitions where appropriate. Includes Status and Event Messages.
- Section 6. Troubleshooting: This section includes PC Board Quick References, General Installation, and On Board Diagnostics.
- Index: Alphabetical index to help 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.

Contents

Section 1. M2000 TS Description

Section 2. Installation

Section 3. Startup - Inspection Operation

Section 4. Final Adjustment

Section 5. The Computer

Section 6. Troubleshooting

M2000 TS Description

General Information

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

Motion TS (Touchscreen) offers an improved user interface with a 3.5” color touch screen for status display, configuration, and diagnostics. A micro SD card has been added to easily save and restore the controller configuration.

Motion 2000 TS 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.
- BMS-LINK to send elevator information to non-MCE building management systems

The job prints accompanying your Motion 2000 TS 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 TS 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 TS 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 TS provides:

- Low-rise hydraulic building application
- Performance up to 200 feet per minute
- Up to 16 single or double-openings
- Simplex, duplex, or group control
- Extensive field programmability

Motion 2000 TS Hydraulic Controller Specifications	
Maximum car speed	200 fpm, 1.0 mps
Configuration	Simplex, Duplex, Group
Landings	Up to 16
Motor control	Solid State, Y - Delta or Across the Line
Landing system	LS-EDGE
System access	LCD Touchscreen
Dispatching	Simplex, Duplex, and Groups up to four 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 280 mm) includes knock-outs
Optional enclosure (feature dependent)	36” w x 42” h x 12” 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 TS controllers comply with the latest A17.1/B44 Elevator Safety Code. A typical Motion 2000 TS controller is shown below. Typical board types are called out on the following page.

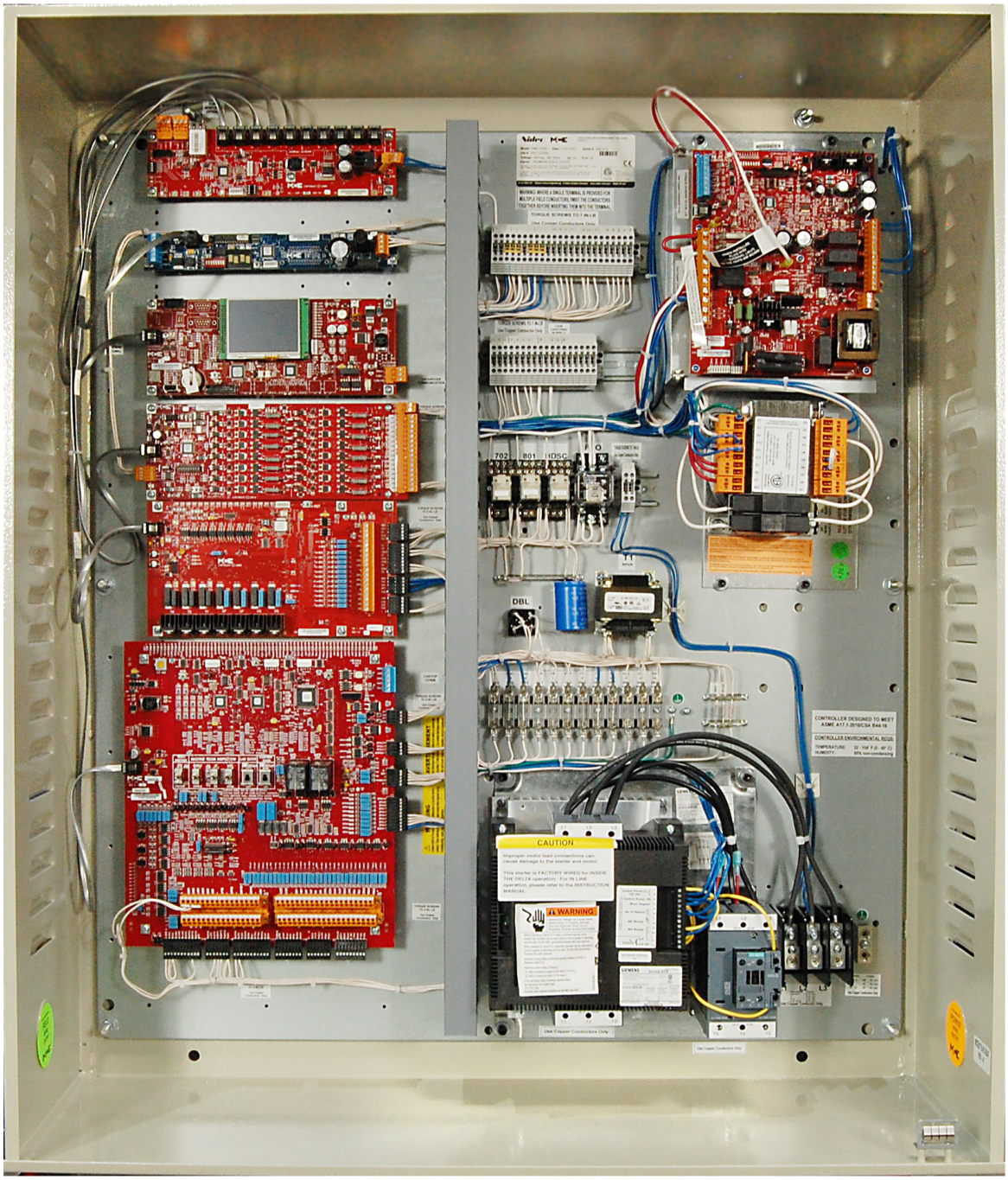
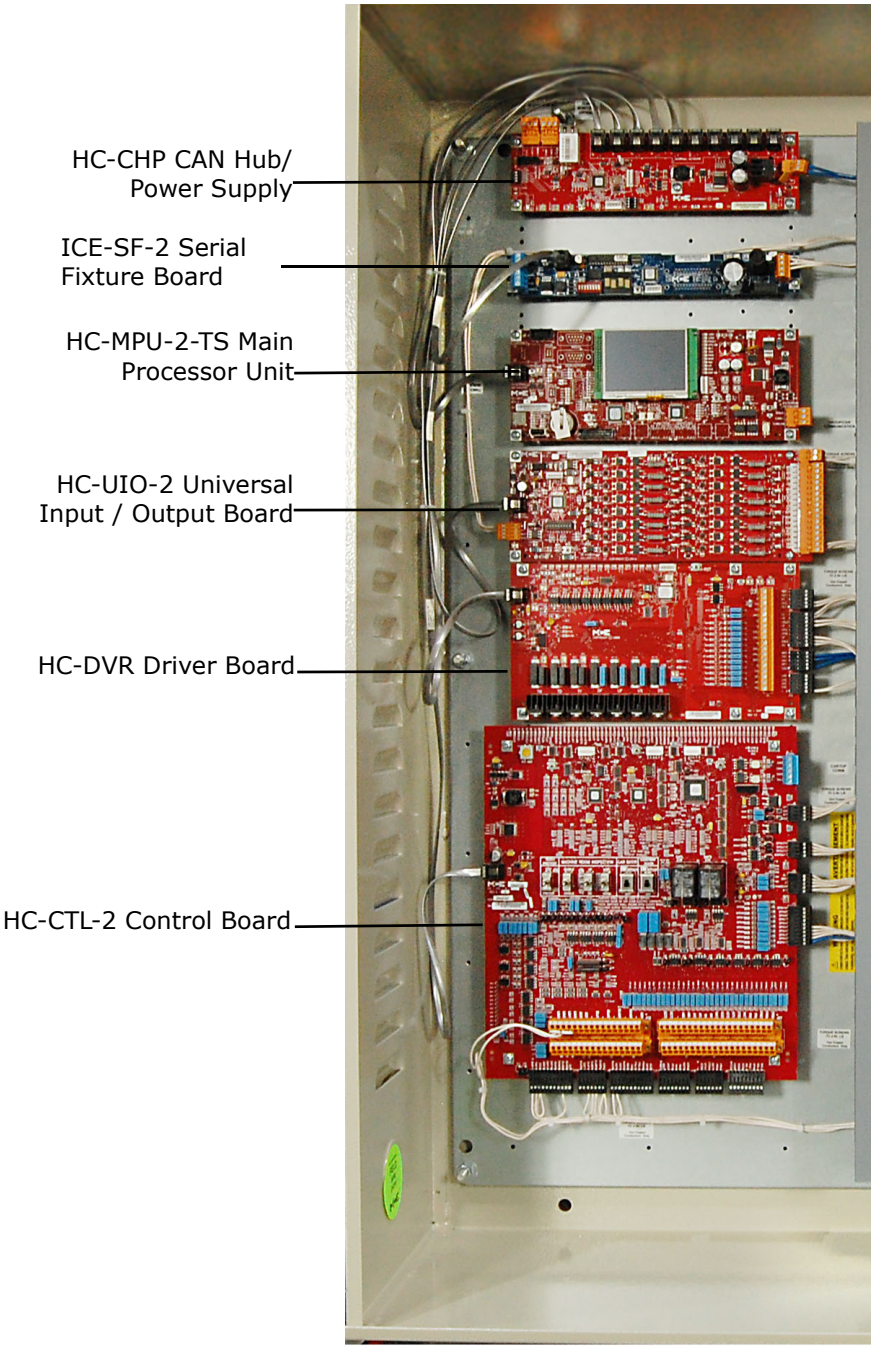


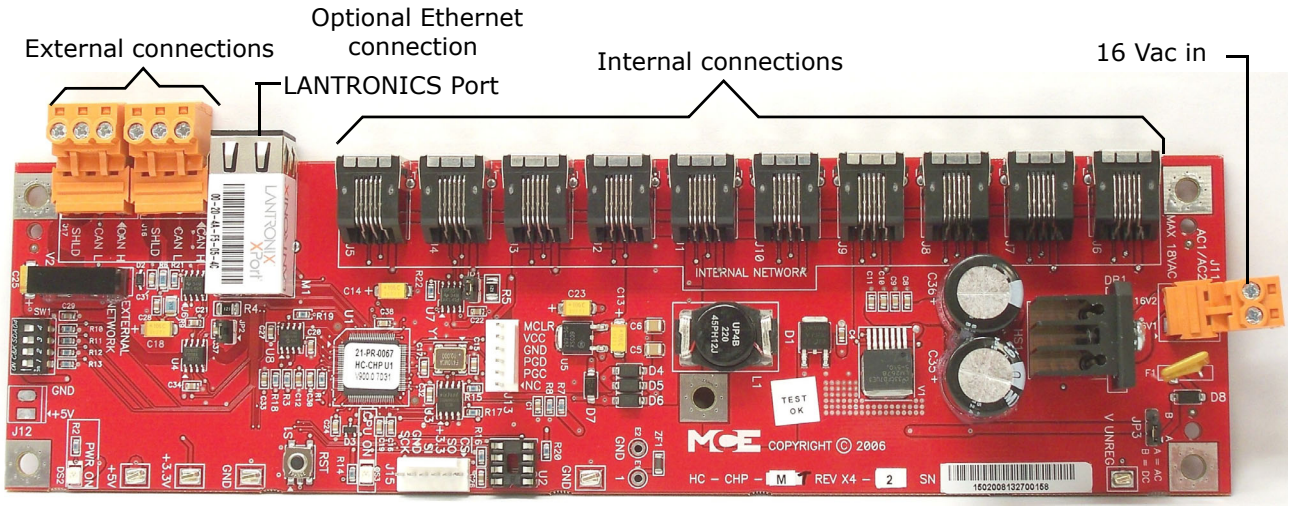
Figure 1.1 Typical Board Complement (Layout varies)



Controller Circuit Boards

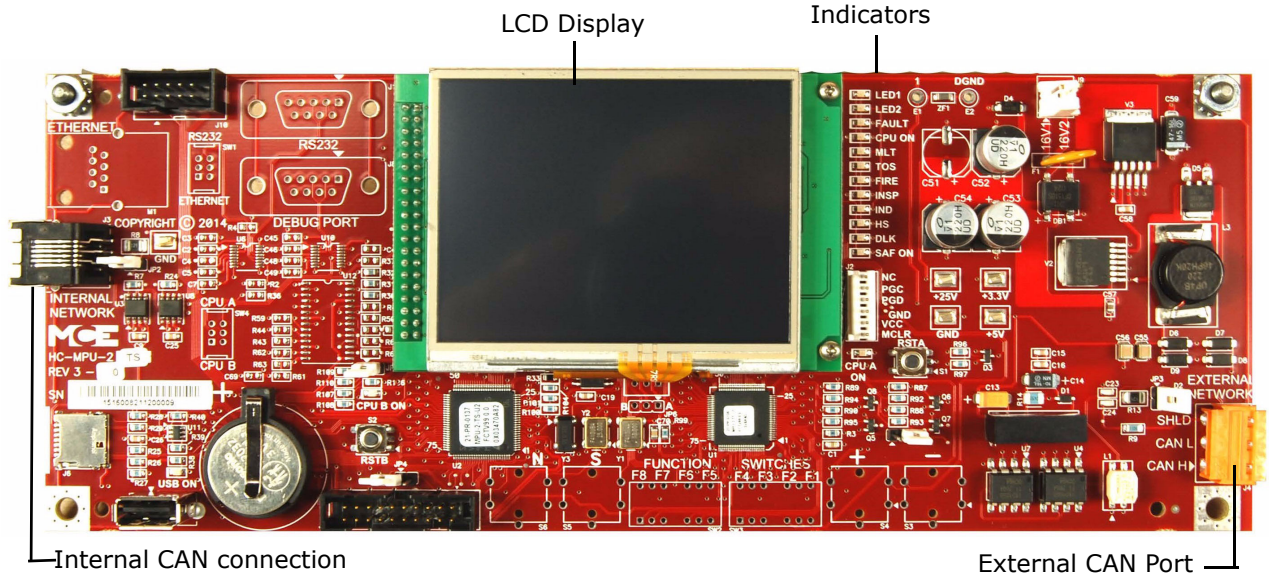
HC-CHP, CAN Hub and Power Supply: Provides a central connection point for the Controller Area Network (CAN). Also provides 16Vac power for digital integrated circuits throughout the controller. For more information see “HC-CHP CAN Hub and Power Supply Board” on page 6-3.

Figure 1.2 HC-CHP-M



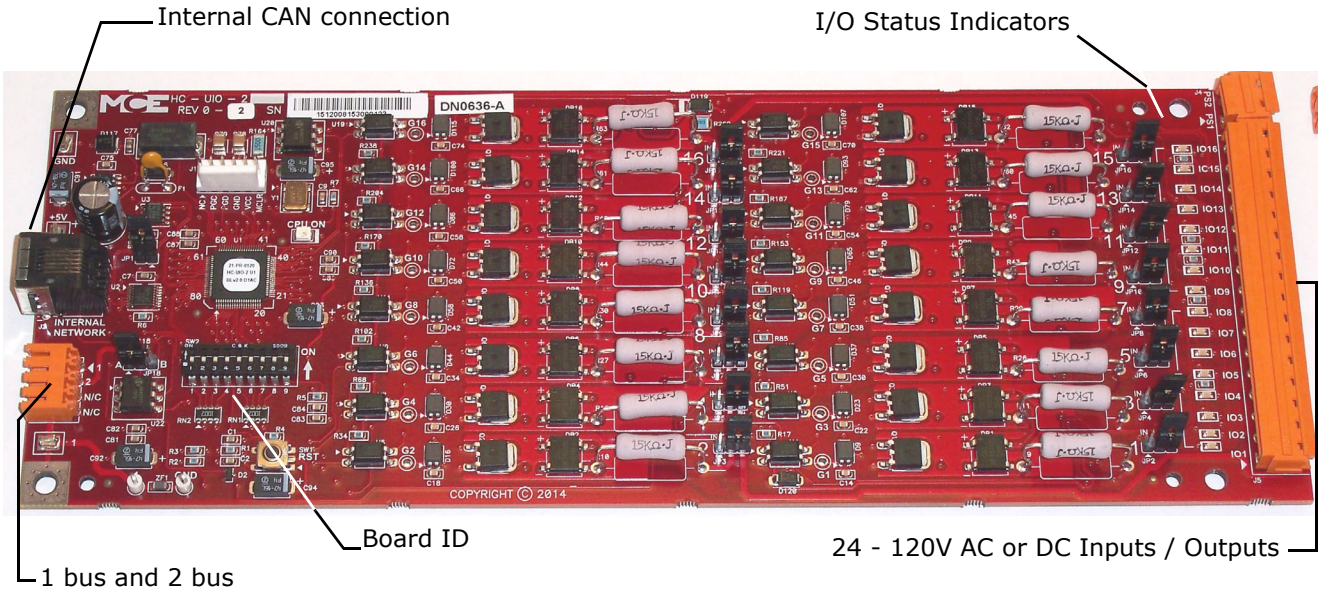
HC-MPU-2-TS Main Processor Unit Performs control data processing. The HC-MPU-2-TS is responsible for car operation, car communication, programming and diagnostics, redundancy monitoring, system software validation and duplexing. For more information see “HC-MPU-2-TS Main Processor Board” on page 6-15.

Figure 1.3 HC-MPU-2-TS Main Processor Unit



1

HC-UIO-2 Universal Input/Output Board Depending upon the board configuration, HC-UIO-2 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-2 board can be expanded by plugging in additional boards. For more information see "HC-UIO-2 Universal Input/Output Board" on page 6-18.



HC-DVR Driver Board The HC- DVR Driver board controls the starter and valves. For more information see "HC-DVR Driver Board" on page 6-12.

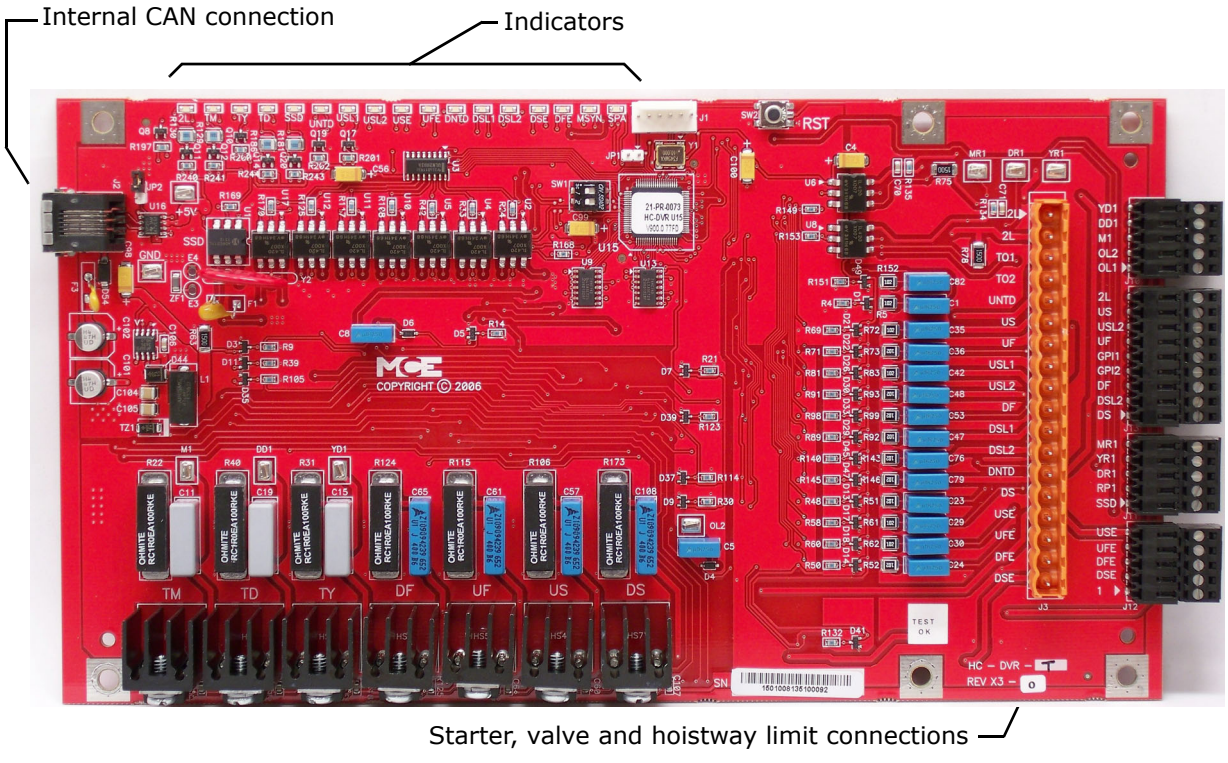
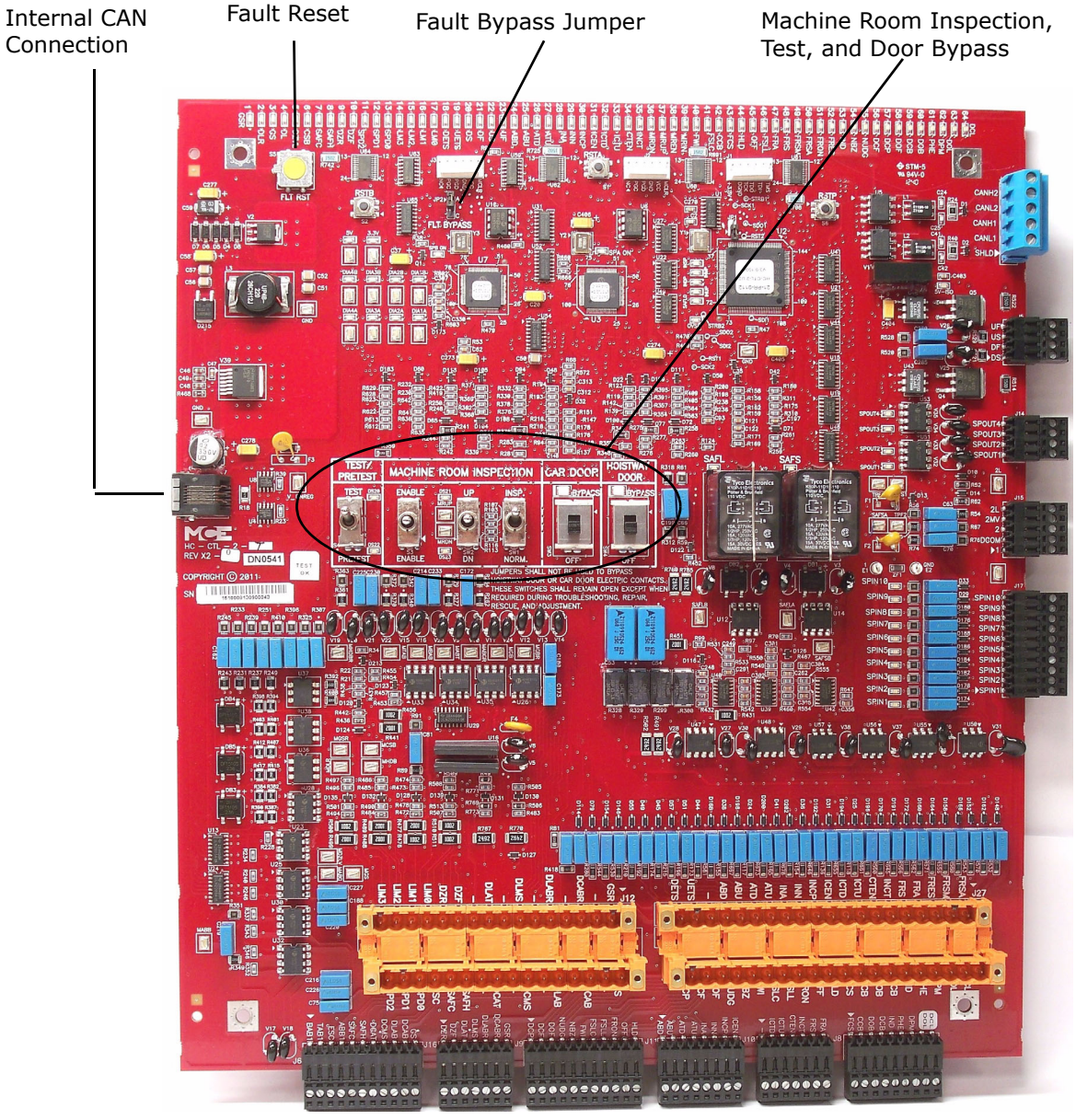
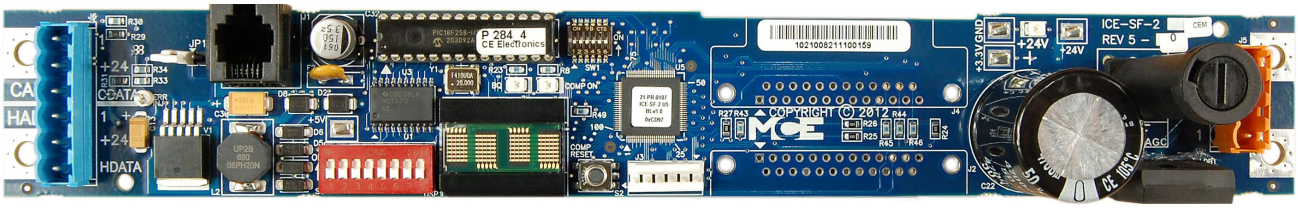


Figure 1.4 HC-CTL-2 Main Control Board

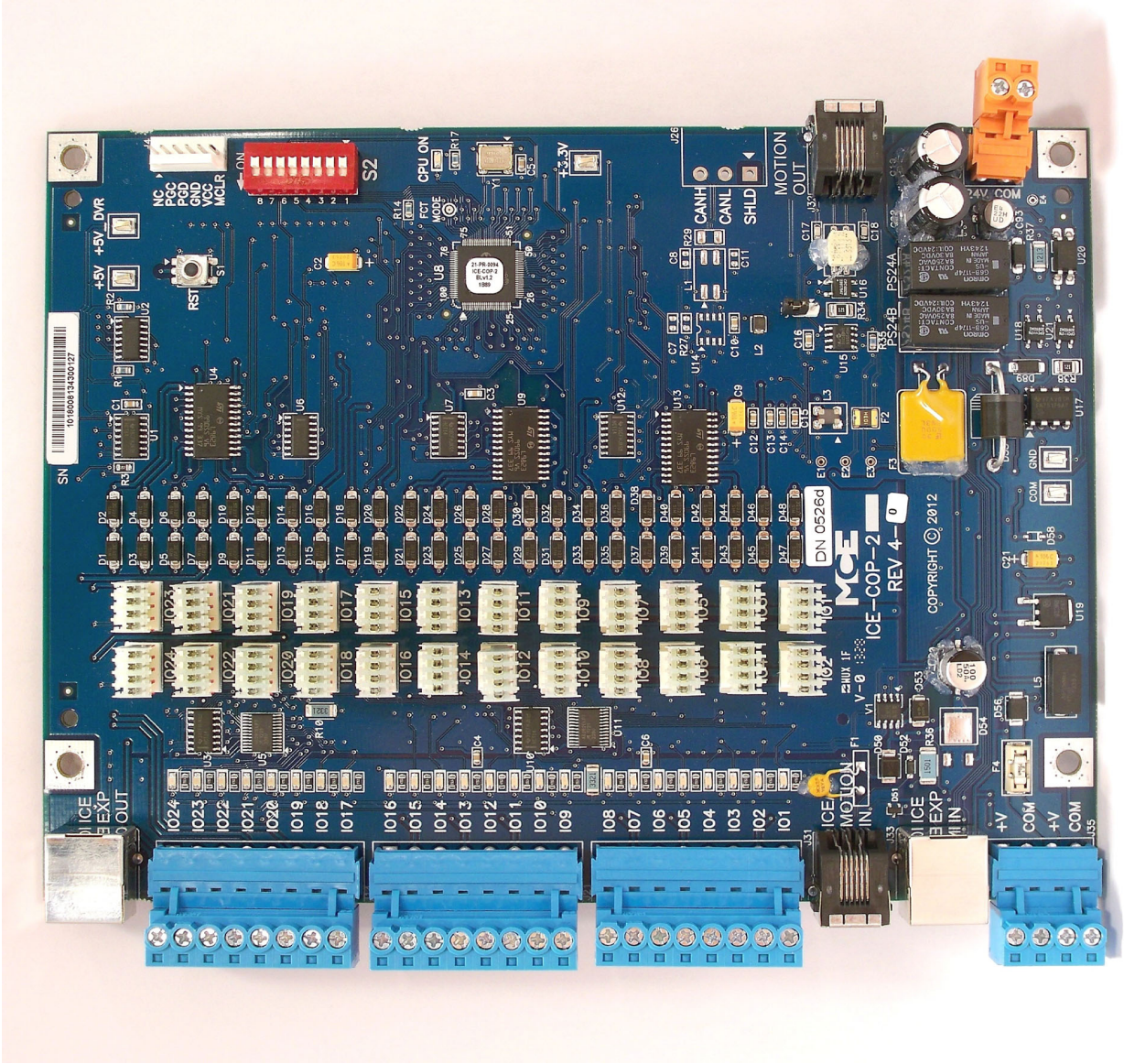
HC-CTL-2 Main Control Board HC-CTL-2 Main Control Board monitors I/O, performs safety functions and door operation. The HC-CTL-2 board is responsible for inspection, fire service, landing system, door lock bypass and lanterns and gongs. For more information see “HC-CTL-2 Control Board” on page 6-5



ICE-SF-2 Serial Fixture Board Interfaces with serial fixtures.



ICE-COP-2 Low Voltage I/O Board Converts programmable I/O (24 per board) to CAN bus to be read/written by the controller



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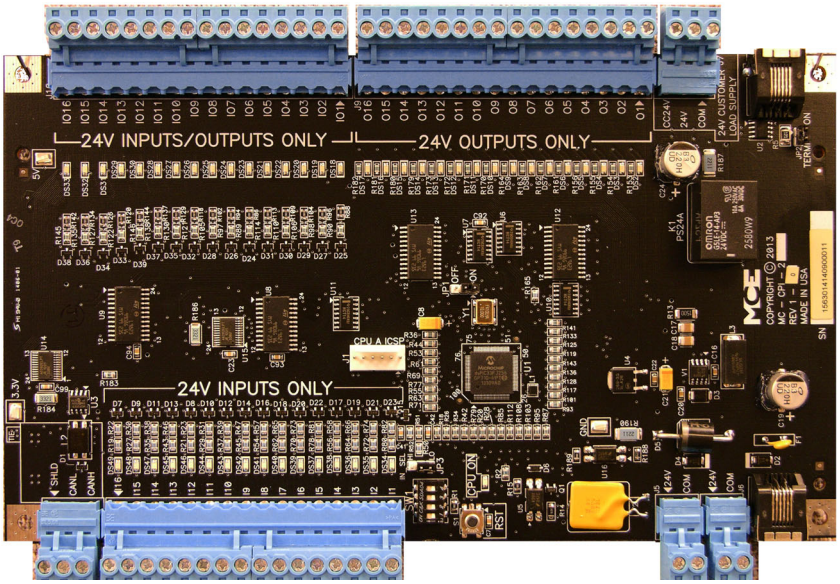
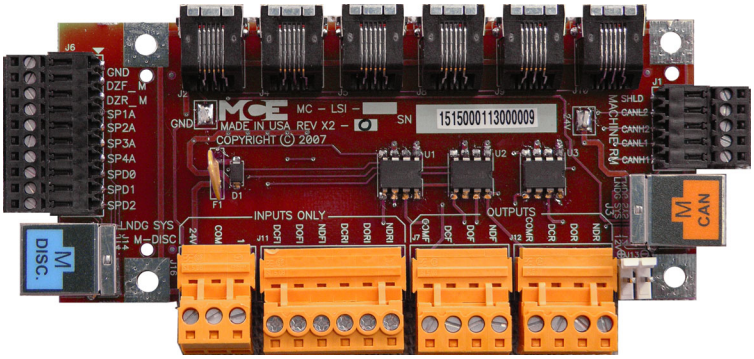
MC-CPI-2 Car Panel Interface Board Converts the Discrete closures from car panel buttons and switches to CAN data and passes it through the Landing System Interface board (MC-LSI) to the car controller or dispatcher.



MC-LSI Landing System Interface Board Provides a connection point for the Car Panel Interface board (MC-CPI-2). A shielded external CAN connection runs from the MC-LSI board, through the traveler, to the Motion 2000 TS controller (see “Example: MC-CPI-2 Wiring” on page 6-32).



Specifications

This section lists specification and feature set information for hydraulic installations.

- Environmental and Power Input
- Standardization and Code Compliance
- Operating Modes
- Operating Mode Definitions

Table 1.1 Environmental and Power Input

Topic	Description
Enclosures	NEMA 1 standard, others available
Temperature	32 to 104° F, 0 to 40° C
Humidity	To 95% non-condensing
Altitude	To 10,000 feet (3000 meters) starter derating per manufacturer
Power Input	Power Input: 208 - 480 VAC, 50/60 Hz, 3 phase

Table 1.2 Standardization and Code Compliance

Topic	Description
Safety Codes (Fire Codes)	- ASME A17.1/CSA B44 2016 - ASME A17.1/CSA B44 (2007 to 2013) - ASME A17.1a/CSA B44S1 2005 - ASME A17.1/CSA B44 2004 - ASME A17.1/CSA B44 2000 W/Add - ASME A17.1-1996 with addenda - Massachusetts - New York City
Special Needs	2010 ADA Standards
Electrical	NEC, U.S., CSA B44.1/ASME A17.5
Pollution	UL508C
Emissions	EN12016

Table 1.3 Operating Modes

Topic	Description
Simplex	Single car, integrated dispatching
Duplex	Two cars, both with integrated dispatching capability but with one car assuming dispatching control for both
Call Response	Selective Collective automatic service
Automatic Operation	Passenger/normal Test (contract speed operation without door opening) Pretest (no hall call response, car recalls to capture floor after servicing car calls)
Attended Operation	Independent service, Attendant service, In-car fire service (Fire Phase 2)
Sabbath Operation	In areas with large populations of observant Jews, there may be a requirement for a **Sabbath Elevator.** In this mode, an elevator will stop automatically at every floor, allowing people to step in and out the elevator without having to press any buttons. This prevents violation of the Sabbath prohibition against doing useful work.

Table 1.3 Operating Modes

Topic	Description
Inspection Operation	Cartop inspection Car panel inspection Hoistway access inspection Machine room inspection
Construction Fault Bypass	Faults bypassed operation using run box or inspection controls. See Faults Bypass note.
Inspection Fault Bypass	Faults bypassed operation using inspection controls. See Faults Bypass note.
Automatic Fault Bypass	Faults bypassed operation in Automatic mode. See Faults Bypass note.
Emergency Operation	Fire service (ASME A17.1/CSA B44) NYC Appendix K Massachusetts (2004 or 2013)
Earthquake Operation	ASME A17.1/CSA B44 Seismic detection
Hall Call Loss (Emergency Dispatch)	See page 1-20. May be initiated by input if programmed.
Flood	Pit Flood (access blocking to one or more lower floors only)
Emergency Power	MCE HAPS battery lowering option, building generator I/O standard
Load Response (discrete load weigher only)	Light load Heavy load/Lobby departure Standard overload Fire Phase 2 overload (ANSI A17.1/CSA B44)
Anti-Nuisance	Car call cancel on direction reversal Cancel car calls behind car Photo eye/designated number of stops car call cancellation Load weigher/designated number of stops car call cancellation
Oil pressure, oil viscosity, thermal overload	Condition must be corrected before car can return to service.

FAULTS BYPASS: Each fault or event lists which fault bypass operating modes will prevent that fault. Construction blocks the greatest number of faults, Inspection next, then Automatic. Automatic mode fault bypass is on a two hour timer.

Operating Mode Descriptions

Controller Operating Modes are mutually exclusive, meaning the elevator controller may only be in one mode at any time. Available operating modes are configured when the car is installed. Not all modes are available on all cars. This section describes controller operating modes. Modes are listed by priority below:, including:

- Non-Automatic Modes
  - Cartop Inspection
  - In Car Inspection
  - Hoistway Access Inspection
  - Machine Room Inspection
  - Construction Mode
- Automatic Modes
  - Test Mode
  - Fire Phase II Mode
  - Fire Phase I Mode
  - Emergency Medical Service Mode
  - CFSS Phase I Mode (Configurable Priority)
  - CFSS Phase II Mode (Configurable Priority)
  - Recall Mode (Configurable Priority)
  - Independent Service Mode
  - Attendant Service Mode
  - Sabbath Mode
  - Capture for Test Mode
  - Passenger Mode
- Operational States
  - Earthquake Operation
  - Emergency Power Operation
  - Emergency Dispatch Operation
  - Pit Flood Operation

Non-Automatic Modes

Non-automatic modes include:

- Cartop Inspection 1-13
- In Car Inspection 1-13
- Hoistway Access Inspection 1-14
- Machine Room Inspection 1-14
- Construction Operation 1-15

In any of these modes, the car is manually operated and will not respond to building demand of any type. Position indicators and passenger annunciators will be disabled. If fire service is activated during a non-automatic mode, audible and visible annunciators will activate to alert the elevator personnel but the car will not automatically exit the non-automatic mode.

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. When the in-car inspection input (INCP on the HC-CTL-2 board) is active, operation from the controller inspection station is disabled.Hoistway Access: Used to move the car up at the bottom floor to gain access to the PIT or down at the top floor to gain access to the cartop.
- Machine Room Inspection: Inspection operation using the switches in the elevator controller. Available only when cartop and in-car inspection are not active.

Cartop Inspection

Cartop Inspection has the highest priority of the inspection modes. When it is active, the car will not operate from any other inspection station.

A switch located in the cartop inspection station places the car on cartop inspection. When this switch is activated, automatic car and door operation are immediately terminated. Doors in transit when cartop inspection is activated will immediately stop. Additional constant-pressure switches on the cartop allow the car to be moved at inspection speed (not to exceed 150 fpm).

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.

Mode Entry

- Bring the car to the access floor.
- Enable Hoistway Access operation using the in car switch.
- Move the car down until the access limit is opened.
- Top access must prevent the car from moving down beyond the point where the crosshead is even with the hoistway entrance sill.
- Set the cartop switch to Inspection before stepping onto the cartop.
- Use ENABLE and UP or DOWN buttons to run from the cartop.

In Car Inspection

In Car or Car Panel Inspection has the second highest priority of the inspection modes. When it is active, the car will not operate in Hoistway Access or Machine Room Inspection.

A switch located in the car operating panel places the car on Car Panel Inspection. When this switch is activated, automatic operation is immediately terminated. Doors in transit when Car Panel Inspection is activated will immediately stop. While on Car Panel Inspection, door operation requires constant pressure operation of door open/close buttons. Additional constant-pressure switches allow the car to be moved at inspection speed (not to exceed 150 fpm).

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.

Mode Entry

- Bring the car to the desired floor.
- Place the car on in-car inspection.
- Use UP or DOWN buttons to run the car.

Hoistway Access Inspection

At both top and bottom access hall stations, a three-position, key operated switch allows the car to be moved to gain top or bottom access. The car will move with car and hall doors open at the affected landing. If doors are in transit when hoistway access is initiated, they will stop immediately.

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 crosshead 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

Machine Room Inspection

Machine room inspection has the lowest priority of the inspection modes.

A switch located in the elevator controller cabinet places the car on machine room inspection. When this switch is activated, automatic car and hall door operation are immediately terminated. Doors in transit when inspection is activated will immediately stop. Additional constant-pressure switches allow the car to be moved at inspection speed (not to exceed 150 fpm).

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.

Construction Operation

Construction operation is for use when all hoistway equipment may not yet be installed. On Construction operation, the car is moved using cartop or machine room inspection inputs.

Mode Entry

- The INSP/NORM switch on the HC-CTL-2 board must be in INSP position.
- The FLT BYPASS jumper just below the HC-CTL-2 board MACHINE RM INSPECTION switches must be in the BYPASS position.
- On the Utils (Utilities) tab > Construct and Bypass Faults Menu, enable Construction Fault Bypass.

To bypass door faults on Construction operation: Set the HC-CTL-2 board Car and Hoistway Door Bypass switches to BYPASS.

Automatic Modes of Operation

Automatic modes include Passenger Mode, Capture for Test (pretest), and Test Modes. In these modes, the mechanic does not have control of the car, it may move automatically.

Test Mode

Test mode allows the car to be run without operating the doors. When Test mode is active, door open circuitry is deactivated. It is the responsibility of maintenance personnel to be certain that the elevator is empty before entering test mode. In test mode, the elevator doors will remain closed. The car runs at contract speed, responding to car calls placed through the controller touchscreen. Use Capture Mode to empty the elevator before going into Test Mode.

- 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.

Fire Service Operation

There are many different fire codes that restrict or change elevator operation under fire conditions. 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.

Fire Service Phase II (In-Car) Mode

When the car is placed on Fire Service Phase II (in-car fire- fighter) operation, the elevator will operate according to the applicable local fire code. For example, A17.1 code:

- Constant pressure on the door close button initiates door closing.
- When exiting Fire Phase II and the car arrives at the fire recall floor, doors open automatically.

Fire Recall Mode

Fire recall operation (Fire Phase I) recalls the elevator to a designated fire recall floor (main or alternate) and removes it from passenger operation. Fire recall can be initiated by smoke detectors or by a fire recall switch.

At the recall floor, the car will wait with doors closed or open (as configured). The car may enter fire phase II operation automatically or by activation of a key switch inside the car

Emergency Medical Service Mode

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 SW input) at the floor assigned by the Massachusetts EMS Floor parameter in the CONFIG 1 >BUILDING SETUP (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 SW 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.

CFSS Recall Mode

Commandeer for Special Service - This mode can either be configured for Hospital Service or VIP operation (See CONFIG 3 > CFSS for a full list of options). If the CFSS Medical Emergency Option is set to YES, the car will be given a higher priority during Emergency Power Operation. Each floor/side can be configured to call the elevator for a CFSS call. These calls will either be on the 3rd IO of the serial HC-3HN hall call node board or stacked after the hall calls on an HC-UIO board. CFSS Recall will take the car out of hall call service. The logic will read the user configured CFSS Car Call Disposition to handle any existing car calls.

- **Cancel Calls:** All car calls will be canceled, and car will immediately be sent to the recall floor.
- **Answer Calls:** The car will answer all car calls, but now allow new car calls. After all car calls have been answered, the car will be sent to the recall floor.
- **Allow New Calls:** The car will answer all car calls and allow new car calls. After all car calls have been answered, the car will be sent to the recall floor.
- **Cancel at Next Stop:** The car will stop at the next floor in the direction of travel and open the doors. At this point all car calls will be canceled and a voice announcement can tell passengers to exit the elevator. Once the doors close, the car will be sent to the recall floor.

CFSS Phase II (In-Car) Mode

CFSS Phase II should initiate after the elevator has arrived at the recall floor. The hospital staff, or VIP can then take control of the car and go non-stop to their desired floor. The car can go into CFSS Phase II automatically or be configured to wait for a momentary or constant pressure key switch (CFSS II SW input). (See CONFIG 3 > CFSS for a full list of options).

Recall Switch Mode

- Motion 2000 TS provides four car recall inputs, Recall S1-S4.
- Each of the four recall switches can be configured to determine the car behavior when the switch is activated. (See CONFIG 3 > RECALL SWITCHES for a full list of options).

Independent Service Mode

When independent service is initiated, all existing car calls are immediately canceled, and the elevator is removed from hall call service. With the car stopped in a door zone, if car doors are open, they will remain open; if closed, they will remain closed. During independent service the car is controlled by car calls placed while independent service is active.

Upon arriving at a call, the elevator doors open and will remain open until the attendant closes the doors using constant pressure on the door close button or on a car call button. Hall and jamb mounted arrival fixtures are inoperative.

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.

Mode Entry

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

Attendant Mode

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 (ATS UP/ATS DOWN) input. The attendant chooses the direction using run up (ATS UP) or down (ATS DOWN) buttons.
- The car will stop at the next car or hall call in the direction of travel. Holding the bypass button (ATS 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 ON, Attendant Service, controller input).

Sabbath Mode

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, travel up and stop at each designated landing and open 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.

- Go to CONFIG 01 > BUILDING SETUP > FLOOR ELIGIBILITIES to specify the floors (1-16) to be automatically serviced during Sabbath operation. Specify Front/Rear openings and Up/Down directions, via this parameter.
- Go to CONFIG 3 > ADDITIONAL FEATURES to configure the following Sabbath options:
  - Enable
  - Start Floor
  - Return Floor Preferred
  - Start Direction
  - Number of Trips
  - Pause Time
  - Door Open Time
  - Door Close Warning Buzzer
  - Nudging
  - Allow Hall Calls
  - Allow Car Calls

- Finish Car Calls
- Car Call Lights
- Door Buttons
- Arrival Lanterns
- PI Outputs
- Override Security

- 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 Additional Features menu (page 5-18).

Capture for Test (Pretest) Mode

When placed in Pretest mode, the car is taken out of hall call service and arrival annunciators disabled. Remaining car calls will be served and new car calls may be placed but, when the car completes servicing car calls, it will recall to the designated Capture floor or remain at the last floor served; door action as programmed.

Capture operation is overridden by all modes except passenger operation.

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.)
- A programmable recall floor for Capture mode is also provided.

Passenger (Automatic) Mode of Operation

Automatic operation is the normal, default elevator operating mode of operation and is active so long as no other mode is selected. In this mode, cars accept hall calls and service car calls as determined by several defined options. Please refer to User Interface starting on page 1-15.

Mode Entry

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

Operational States

Unlike Operational Modes, the following operations are not mutually exclusive. The controller may be in any one or more of these states. These states are only available during Automatic Modes of Operation.

Earthquake Operational State

Earthquake operation affects all automatic modes of operation. When a seismic input becomes active, the car will stop at the next available floor and shut down.

Emergency Power Operational State

Emergency Power Operation, if provided, is activated when normal power loss is detected. Emergency power may be provided by a building generator or by a battery powered lowering device.

Generator Backup When power is lost, the elevator will come to a full stop. When emergency/backup power comes online, 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. Emergency Power menu options are located at CONFIG 3 > EMERGENCY POWER.

APS (Auxiliary Power Supply) Backup When an EP generator is not practical, backup power for a limited rescue operation may be provided by a battery-powered system like HAPS (Hydraulic Auxiliary Power Supply). See HAPS User Manual 42-02-U002 pages 1-14. When power is lost, the elevator will come to a full stop. When battery power becomes available, the APS 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.

Emergency Dispatch Operational State

If a communications failure prevents hall calls from being registered, the car will enter emergency dispatch operation. In this mode, the controller generates car calls, sequentially dispatching the car to floors and allowing any passengers at those floors to enter and place a car call. This operation allows the elevator to continue service to the building in the absence of normal hall call registration. When the hall calls are again able to communicate, the elevator will resume normal passenger operation.

Pit Flood Operational State

If a flooded pit is detected and pit flood is activated, the car will be prevented from servicing one or more lower floors (depending on job site configuration of the controller).

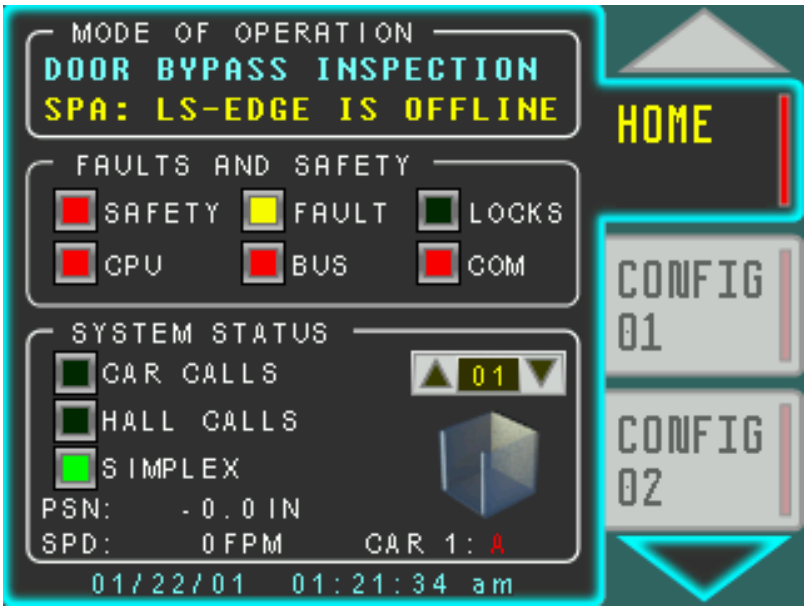
User Interface

System status display, configuration, and diagnostics are through the on-board, color, touch-screen (OBD, On Board Display). [1]No external programming tools are required. You must be on Inspection mode to change and save parameters. The interface provides:

1

Home Screen

Figure 1.5 Home Screen



Mode of Operation

This screen section lets you know immediately what mode of operation the elevator is currently using. Typically, this will be Passenger (normal automatic) mode but it may be any of several

1. Web browser access is supported. Parameters may be transferred from controller to controller using a USB drive.

different modes. In our example illustration, the car is on MR (machine room) INSPECTION operation. Please see Operating Modes on page 1-12.

The second line of the display shows any events or faults that may be active in yellow text. Usually, this line will be blank. In our example illustration, EP SHUTDOWN indicates that the car has been shut down on emergency power.

Faults and Safety

These **LED** indicators provide immediate information about factors affecting elevator operation.

- SAFETY:
  - Green = Safety string OK.
  - Red = Safety string open.
- FAULT:
  - Blank = No Faults
  - Yellow = One or more self-resetting faults are active.
  - Flash Yellow = One or more latching faults (requiring fault reset) are active.
- LOCKS:
  - Green = Door lock string is made up.
  - Blank = Door lock string is open.
- CPU:
  - Green = All CPUs (CAR, MOTION, GROUP, PLD, LS-EDGE-EL) are online and communicating.
  - Red = One or more CPUs are offline or not communicating.
- BUS:
  - Green = All buses (2LS, 3HN, M2MV ...) hardware status okay.
  - Red = One or more buses are not detected.
  - Yellow = One or more buses are not detected due to normal operation (the 2LS bus is temporarily interrupted when the doors are open).
- COM:
  - Green = All CPUs are communicating with all buses (3HN, CAN, COP, ...).
  - Red = One or more CPUs are not communicating with one or more buses.

System Status

This section describes how the system is operating right now.

- CAR CALLS:
  - Green = Car is in service for car calls.
  - Blank = Car is not in service for car calls.
- HALL CALLS:
  - Green = Car is in service for hall calls.
  - Blank = Car is not in service for hall calls.

- DISPATCHER/DISP ID: nn / M-GROUP / SIMPLEX
  - The designated dispatcher car will show **DISPATCHER** for this LED.
  - The designated non-dispatcher car will show **DISP: 01** or **DISP: 02**, telling the viewer which car ID is the dispatcher (when cars are communicating).
  - This LED will show **M-GROUP** text for local cars in a group system.
  - Dispatcher - indicates the car is assigning its own hall calls or, if in a Duplex installation, is assigning hall calls for itself and for the second car of the Duplex.
  - Disp ID: nn - indicates that this car is accepting hall call assignments from the other car in a Duplex installation.
  - Simplex: Single, self-dispatching car.
  - M-Group - indicates the car is accepting hall call assignments from the group.

Note

In all cases, the LED lights up when car-to-car or group-to-car communication is established.

Additional information provided in this screen section includes:

Table 1.4 General Status Information

Topic	Description
Intended Direction	Intended direction of travel (preferred direction)
Actual Direction	Actual direction of travel (direction command activated)
Position	Logical position, user defined floor label
Destination	Next destination, user defined floor label
Door Status	Door state display (closed, opening, open, closing, stalled)
Door Lock Status	Door locks/Car safety string
Car Label	Label assigned to this car (A in our example)
Car Motion Animation	Arrows scroll rapidly if fast valve enabled; slow if slow valve enabled.
Date and Time	mm/dd/yy and 00.00.00 am/pm

Menu Overview

Table 1.5 Config 01, 02, and 03

Topic	Description
Config 01	
Building Setup	Controller type, floor information, Fire code and recall floors, landing system type.
Job Info and Labels	Job information, car and floor labels
Elevator Features	Capture and recall floors, car behavior, anti-nuisance
Configure Spare Inputs	Configure spare inputs.
Configure Spare Outputs	Configure spare outputs.
System Timers	Motor delays, door timers, car delay timers
Config 02	
Hoistway Setup	LS-EDGE landing system only.
Door Operation	Door opening and closing
NTS Switches	NA for hydraulic elevators
ETS Switches	NA for hydraulic elevators
S-Curve	NA for hydraulic elevators
System Control Parameters	Car speed, valve, and starter settings
Config 03	
Building Security	Security settings
Emergency Power	Power type, recall and run selections
Recall Switches	Recall switch settings
Network Settings	IP address information
CFSS	Medical Emergency
Additional Features	Sabbath Enable, etc.

Table 1.6 Utilities

Topic	Description
File Transfer	Allows you to selectively transfer controller parameters: - Backup Current Settings - Restore Backup Settings - Restore Factory Settings
Register Calls	Car and hall call registration
Construct and Bypass Faults	Enable Construction mode/fault bypass. Set fault bypass for Inspection and Automatic modes.
Safety Tests	Commissioning tests
Date and Time	Set date and time
Landing System Utilities	Hoistway learn and landing system leveling data.

Table 1.7 System I/O

Topic	Description
System Inputs	View system input status
System Outputs	View system output status
Programmed Inputs	View programmed input status
Programmed Outputs	View programmed output status
Front CPI I/O Status	View main CPI board I/O status
Rear CPI I/O Status	View aux CPI board I/O status

Table 1.8 System Diagnostics

Topic	Description
Event Log	Time-based logging of system events
Door Control	View door control signal status
Diagnostics Tree	Safety related signal activity flags
Landing System	View landing system signal status
Active Events	View currently active system events

Table 1.9 Car Diagnostics

Topic	Description
Car Op. Flags	Registers and active flags
Car Op. Numeric	Register data pertaining to general I/O
Emerg Pwr & Earthquake	View emergency power and earthquake related flags.
Door Dwell Times	Conditions affecting door dwell time with activity indicators
Itinerary Manager	Conditions affecting car travel with activity indicators
Features Diag	Sabbath status, etc.

Table 1.10 Motion Diagnostics

Topic	Description
Motion Flags	Registers and active flags
Motion Numeric	Register data
Motion Inputs	MOTION input flags
Motion Outputs	MOTION output flags

Table 1.11 Group Diagnostics

Topic	Description
Group to Car Data	Group to car data monitoring
Car to Group Data	Car to group data monitoring

Table 1.12 PLD Diagnostics

Topic	Description
PLD Flags	Flags for PLD related system operations.
PLD Numeric	PLD register data
PLD Inputs	Activity on inputs related to the PLD.
PLD Outputs	Activity on outputs related to the PLD.

Table 1.13 Action Information

Topic	Description
Car call canceled due to	Cancellation conditions with activity indicators
Hall call canceled due to	Cancellation conditions with activity indicators
Door open due to	Conditions affecting door opening with activity indicators
Door close due to	Conditions affecting door closing with activity indicators
Prohibit run/start due to	Conditions affecting car starting and running

Table 1.14 Status Information

Topic	Description
CPU-Bus-Com Status	Conditions affecting microprocessor communication with activity indicator
Monitoring Tools	Reset Xport, Default Password, TFTP Status
Can Bus Viewer	View CAN bus device IDs and related messaging activity.
Version Information	Software version information
Other Car Settings	Second car settings display for duplex operation, Sabbath Mode, etc.
Address Diagnostics	Access selected processor register contents via address entry. Technician assisted troubleshooting.

Table 1.15 Statistics

Topic	Description
Maintenance Statistics	Statistics pertinent to system maintenance
Hourly Statistics	Statistics for the last 24 hours of operation, per hour (car and hall calls)
Hall Bus Inventory	Inventory and test hall call nodes and indicators

Table 1.16 Scope

Topic	Description
View Scope	Select and track four system signals in near real time, from:
Landing System	Switches, slowdowns, door zones
System Inputs	Dedicated inputs
Programmed Inputs	Assignable inputs
System Outputs	Dedicated outputs
Programmed Outputs	Assignable outputs

Landing System

The landing system is designed to be mounted on the car top. Landing systems used with the Motion 2000 TS controller includes the LS-EDGE.

LS-EDGE Landing System

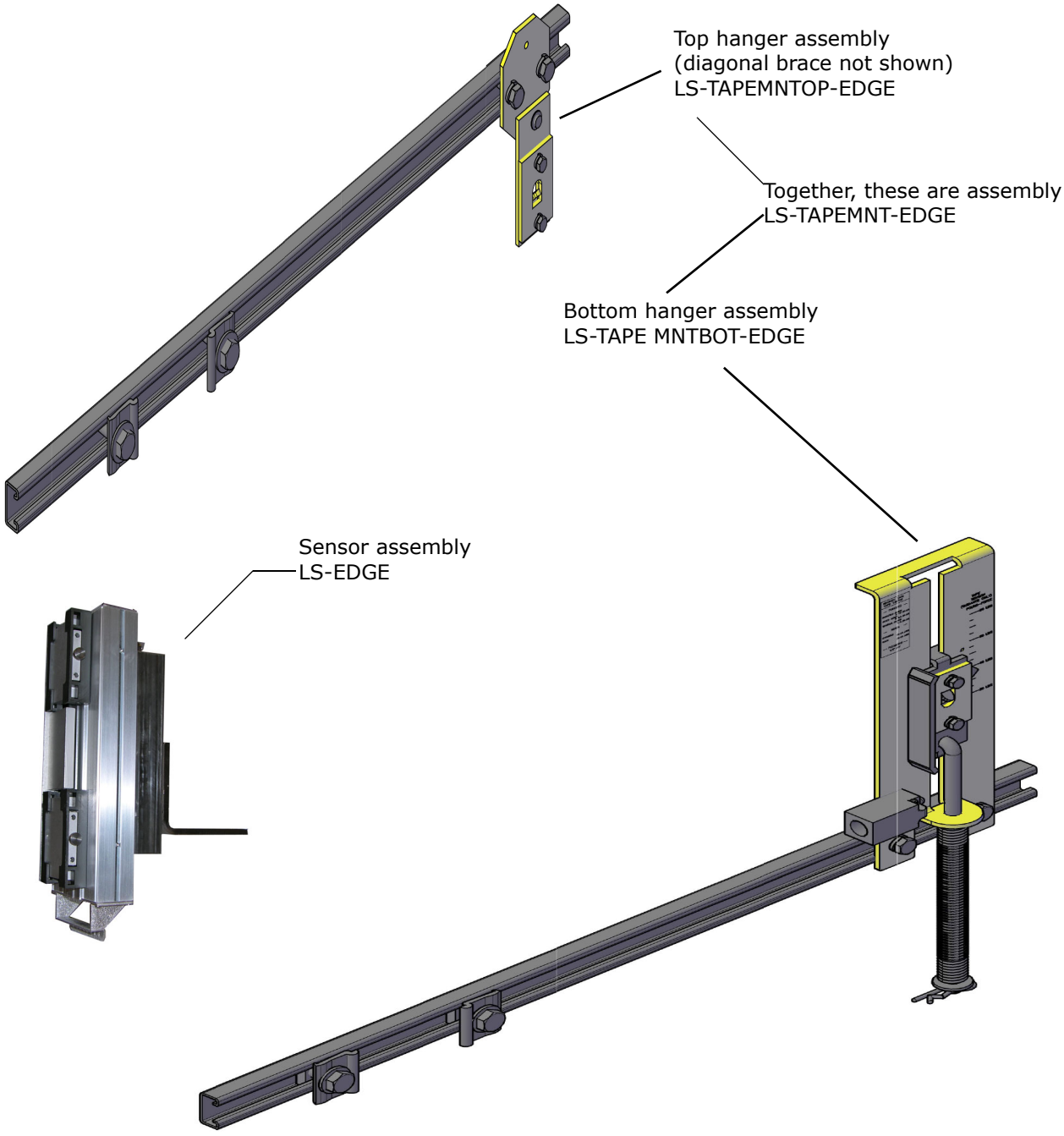
The LS-EDGE positioning system uses hall-effect sensors and perforated steel tape to report position as the car moves through the hoistway. 5.5-inch magnets are used at each door zone.

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.

Figure 1.6 LS-EDGE Components



Steel tape, magnets & connecting cables not shown

Contents Index MCE Web

In this Section

This section contains important recommendations and instructions for installing the Motion 2000 TS 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 TS 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 TS 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.

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 TS, 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. 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 TS-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.

Recommended Tools and Test Equipment

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

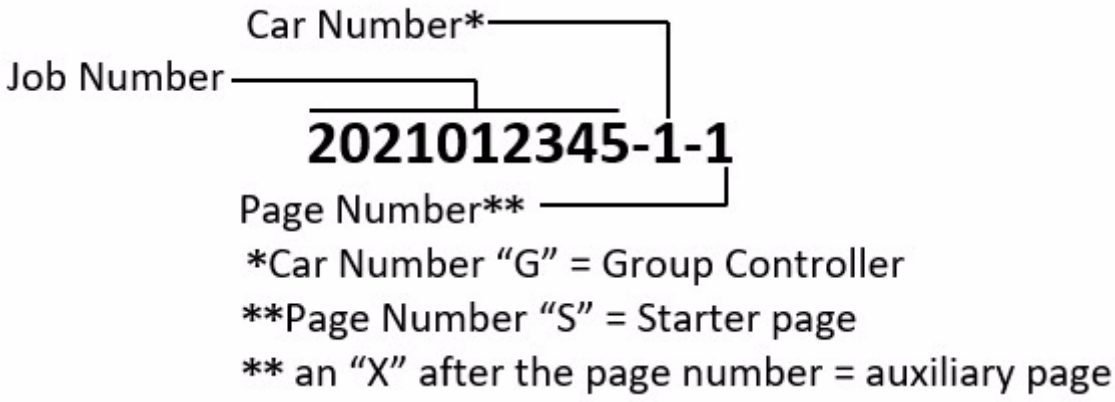
- A digital multimeter, Fluke series 75, 76, 77 or equivalent
- A clamp-on AC ammeter
- Hand-held radios or cell phone
- Test weights
- Pressure gauge
- Soldering tools, a flashlight and a screwdriver

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.



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 TS Hydraulic Control system.

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

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 TS 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 2-8.

General Wiring Guidelines

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

Proper Grounding Procedures

MCE cannot provide specific advice regarding equipment grounding (or bonding), as each building is unique in its construction, and local codes may differ significantly from national codes. For example, building steel is not always earth ground. In some cases, building beams rest on concrete beam pockets, and the earth connection is inadequate. Paint and inadequate metal material in any intermediary junction points can also cause poor ground connections. Please consult with the building engineer or electrical contractor to determine the best source for a low impedance connection to earth ground

Wiring Connections for Properly Grounded Systems

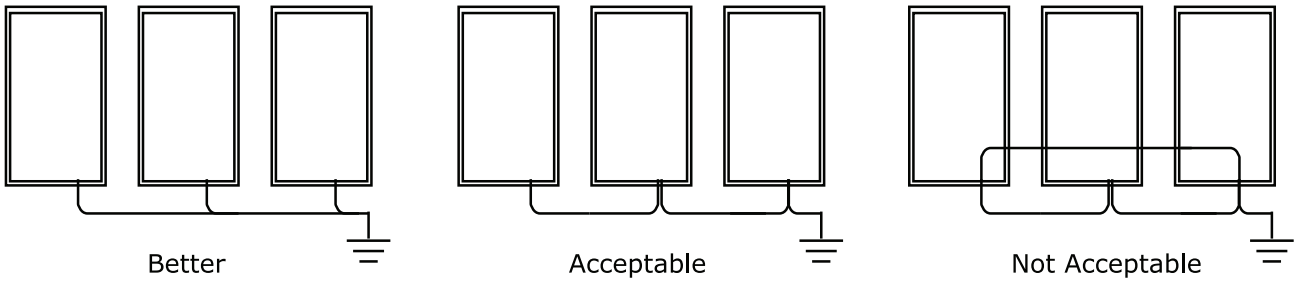
1. An uninterrupted ground wire of at least #8 AWG should be run from each car controller cabinet chassis or back plate to earth ground. The connection at the car controller must be free of paint so the ground connection is made to the bare metal of the enclosure. The car controller should read less 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.

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.

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).
- **Door Position Monitor Switch:** Installing the door position monitor switch, if used. (see page 3-19).
- **Complete the Installation and Field Wiring:** Finish the installation and wiring and check for shorts (see page 3-21).
- **Preparing the Car to Run on Test/Normal Mode:** How to prepare the car for running on automatic operation (see page 3-21).

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.

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-2 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

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-2 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 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 FLT RST 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 DELAY TIMER in System Control Parameters menu options to 0 (zero).

The SLOW INSPECTION SPEED option determines if the car will run at high or low speed on In-car, Cartop, or Machine Room Inspection or Hoistway Access. If the car contract speed is greater than 150 fpm, the SLOW INSPECTION SPEED should be set to YES. (CONFIG 02 > SYSTEM CONTROL PARAMETERS)

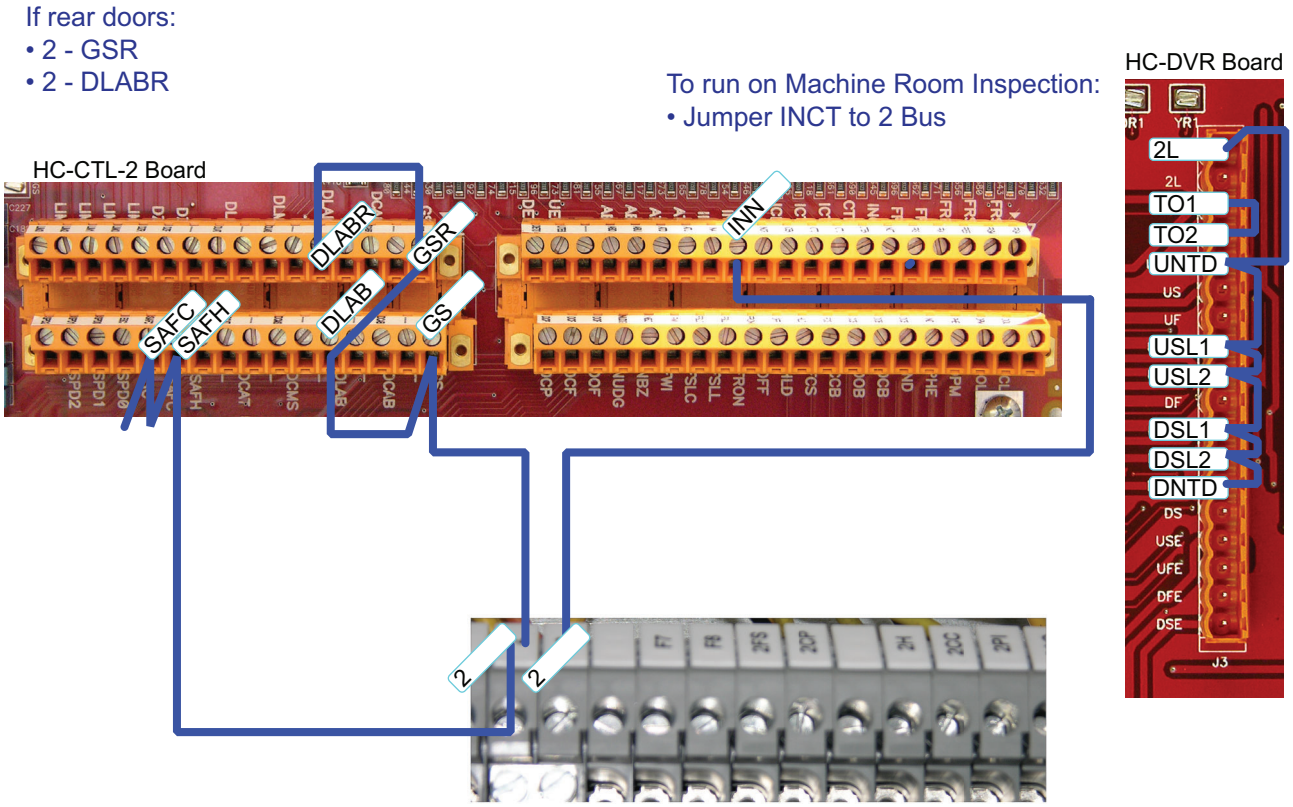
Set Up for Construction Operation

If required, it is possible to run the car during construction to help complete work in the hoistway. 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.)

Settings and Jumpers

1. Power down the controller.
2. Please refer to “Construction Mode Jumper Requirements” on page 3-5 and to the following illustration and text.
3. Set FLT BYPASS jumper to A position(JP2, upper left area of HC-CTL-2 board).
4. Set Machine Rm Inspection INSP/NORM to INSP.
5. Power up the controller.
6. Set UTLS screen, CONSTRUCT AND BYPASS FAULTS menu, CONSTRUCTION/FAULT BYPASS to ENABLED.

Figure 3.1 Jumpers Used Before Final Equipment Connected



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Minimal equipment requirements are:

- Pump motor and valves.
- SAFH, SAFC: 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-2-TS 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. See your job prints and/or the SYSTEM IO > PROGRAMMED INPUTS menu to verify additional inputs.

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 (120VAC)	SAFH on HC-CTL-2 board (Safety String, Hoistway)
SAFH on HC-CTL-2	SAFC on HC-CTL-2 board (Safety String, Car)
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)	INCT on HC-CTL-2 board (Cartop Inspection) only required to run on Machine Room Inspection.
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 150 fpm, set SLOW INSPECTION SPEED option to YES.

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, an inspection switch, and a stop switch.

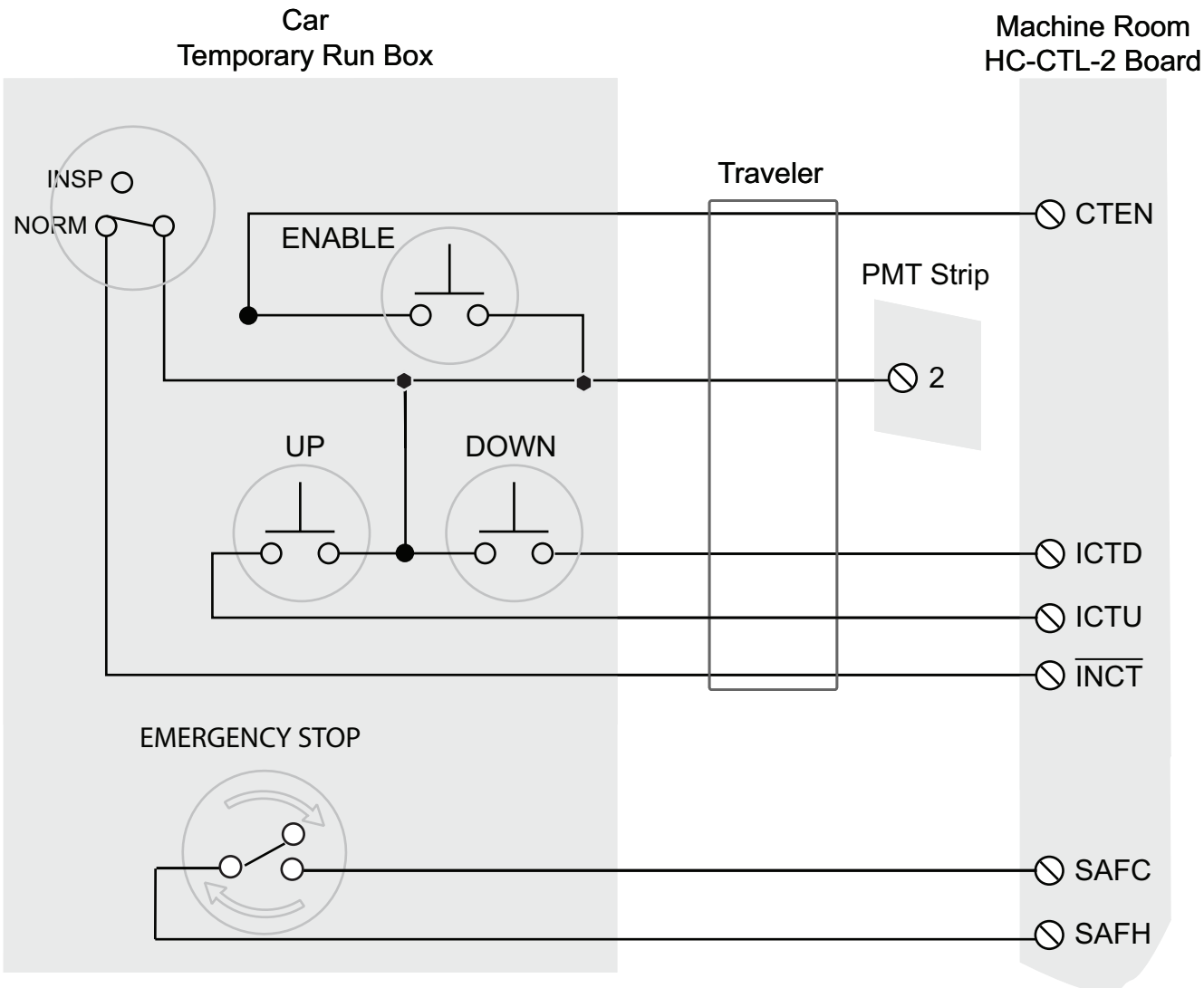
Caution

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

Caution 2

If a jumper was installed between HC-CTL-2 board terminals SAFH and SAFC as described in Table 3.1 *Construction Mode Jumper Requirements,* that jumper must be removed when a temporary run box is connected.

Figure 3.2 Temporary Run Box



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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 controller touchscreen will display the Home page. If there is an error condition, it must be addressed or bypassed with a temporary jumper.
3. LEDs SAF ON, DLK, and INSP should be ON and relay SAFS should pick as indicated by the 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.

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 DELAY TIMER option 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-2-TS 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 for rear doors). Jumper 2 Bus to relay GS on the HC-CTL-2 board and (GSR on the HC-CTL-2 board for rear doors) 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 UP TO SPEED DELAY (CONFIG 02>SYSTEM CONTROL PARAMETERS>UP TO SPEED) timer, the Y contactor should drop then after another programmable delay, dependent on the STARTER W-D TRANSITION (CONFIG 02 >SYSTEM CONTROL PARAMETERS> STARTER W-D TRANSITION) timer, the DEL contactor should pick. 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-2-TS 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 for rear doors). Jumper 2 Bus to relay GS on the HC-CTL-2 board (GSR on the HC-CTL-2 board for rear doors) 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.

5. Adjust the timer to transfer from Y to DELTA just as the pump motor reaches maximum RPM from a dead stop.

ATL Starter (Across The Line) Adjust UP TO SPEED DELAY timer to delay energizing valves until after pump motor is running at speed. If the A contactor does not pick when a demand up is present:

- Verify that there are no faults displayed on the HC-MPU-2-TS 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 for rear doors). Jumper 2 Bus to relay GS on the HC-CTL-2 board (GSR on the HC-CTL-2 board for rear doors) 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 SLOW INPECTION SPEED option to YES.

Hoistway Control Equipment Installation

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

LS-EDGE Installation

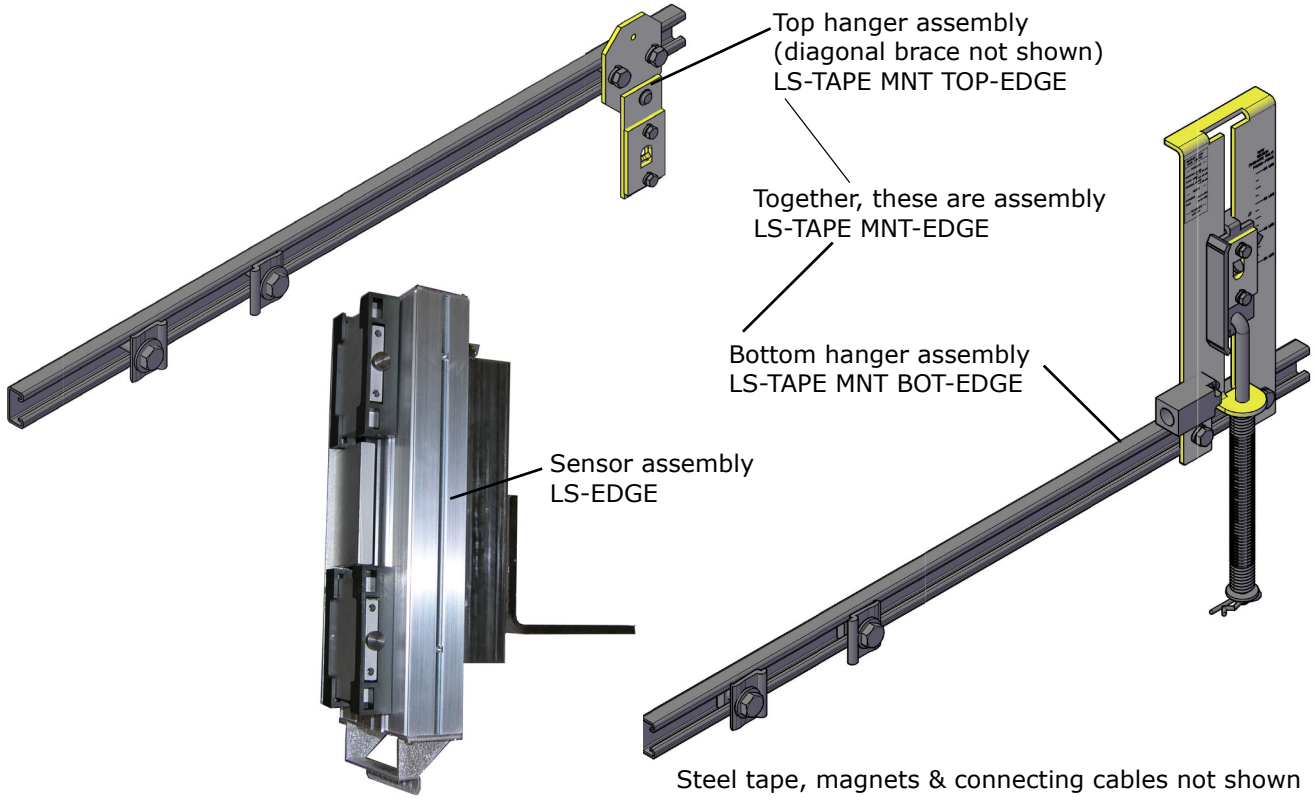
The LS-EDGE positioning system uses hall-effect sensors and perforated steel tape to report position as the car moves through the hoistway. 5.5-inch magnets are used at each door zone; one row for front openings, a second for rear openings. LS-EDGE is also available in a NEMA 4x/12 configuration that 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 Motion 2000 TS elevator controls.

The LS-EDGE kit contains the sensor head assembly, an L-bracket to mount the sensor assembly to a Unistrut channel that is in turn attached to the elevator cab (Unistrut channel 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



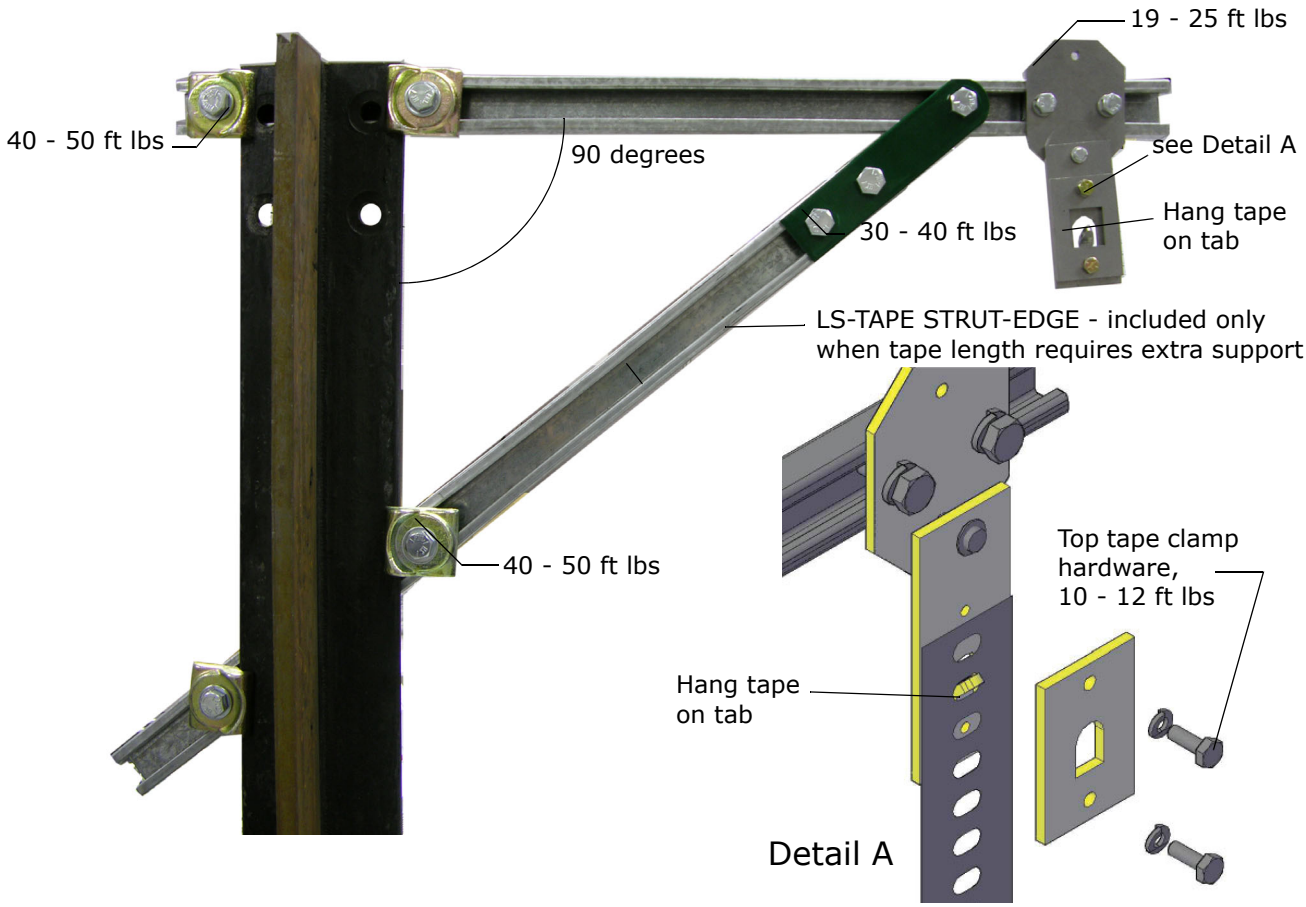
LS-EDGE Tape Installation

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. Unistrut channels 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 Unistrut channel 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.)

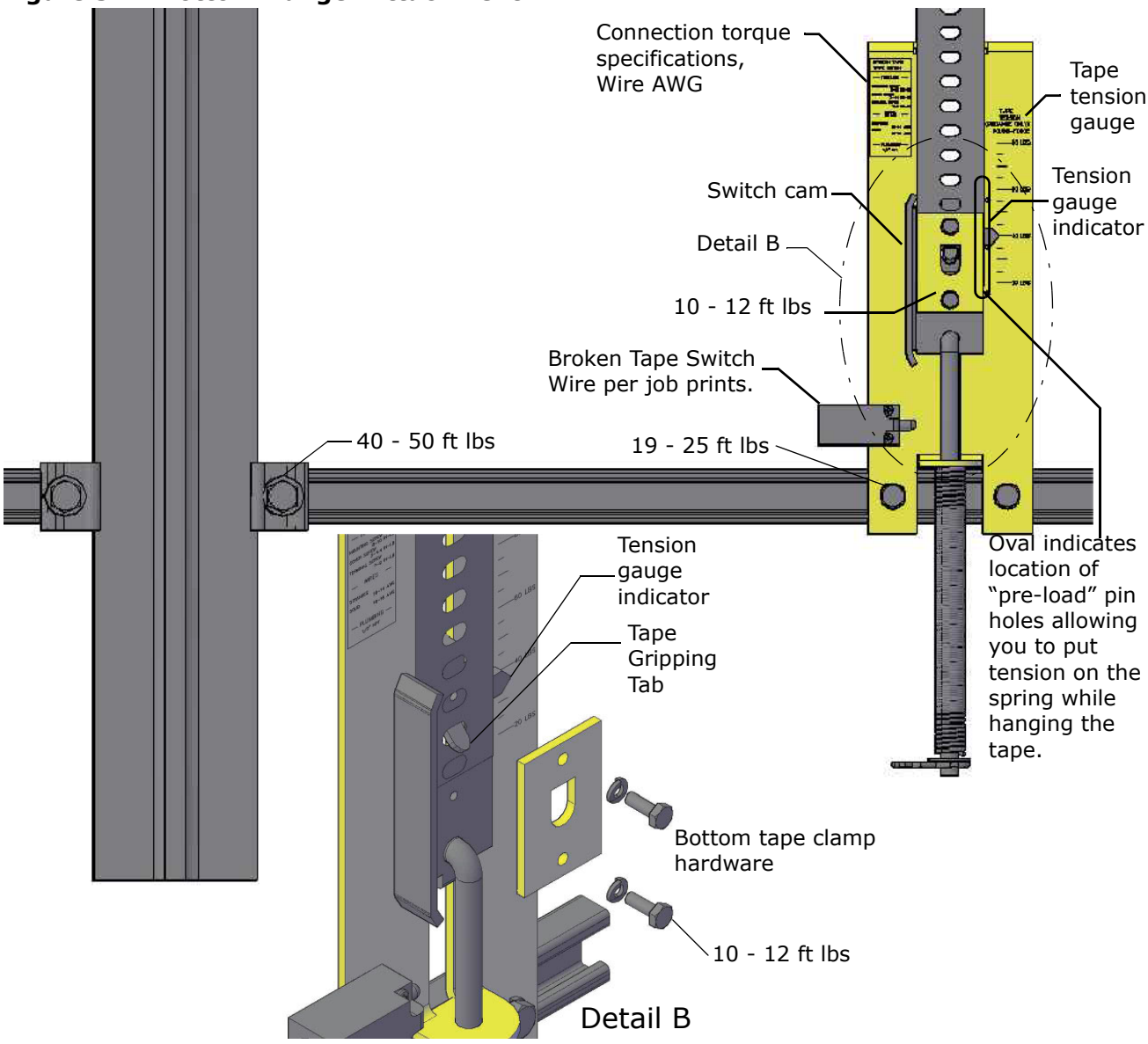


3. Adjust extended strut length as required (tape suspended as close to the guide rail as adequate clearances will allow to reduce loading on end of Unistrut channel). Secure rail mounting hardware (40 - 50 ft lbs.). (The tape hanger slides in the strut for fine adjustment later.)
4. Hook the tape on 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. 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

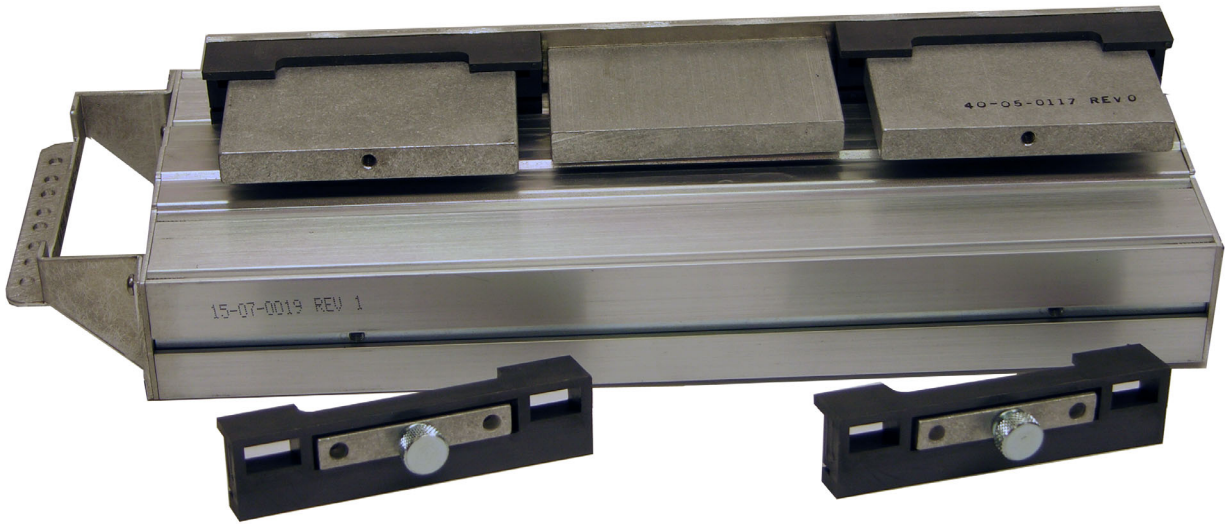
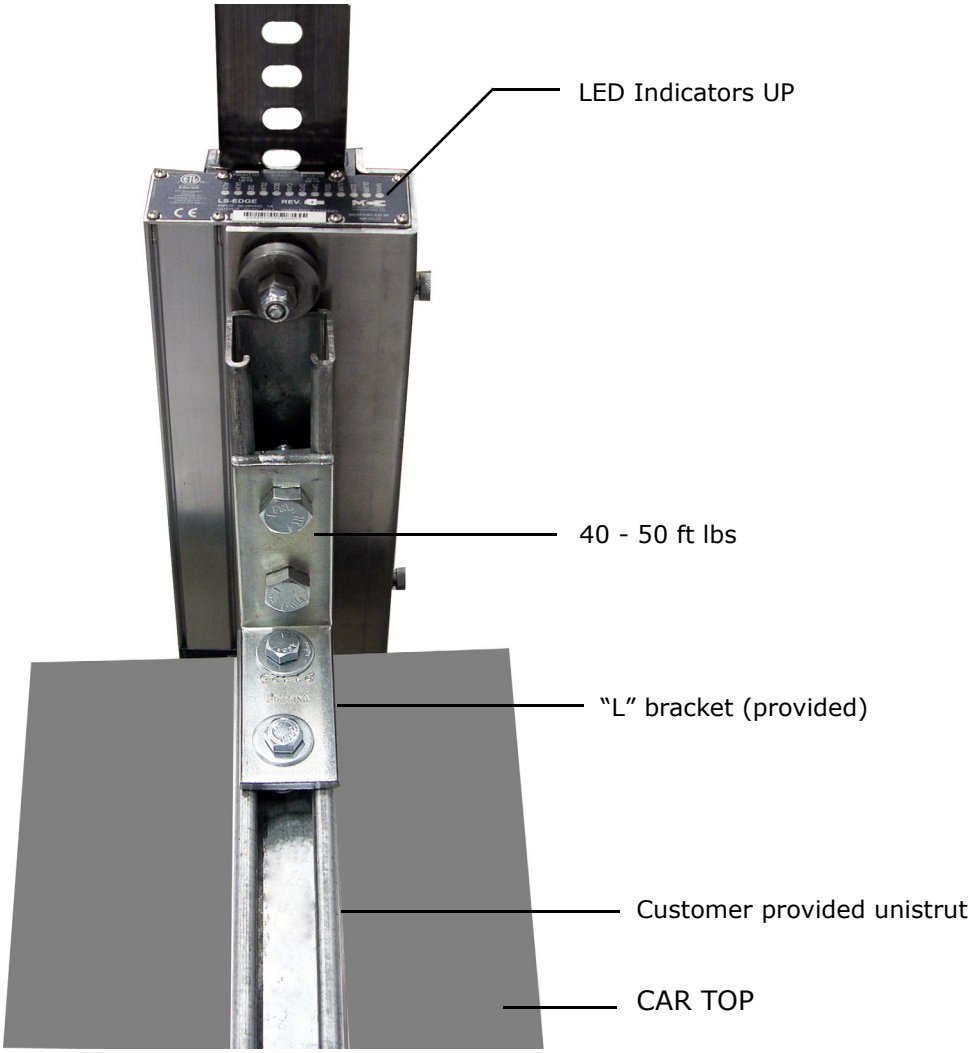


Figure 3.6 Sensor Mounting

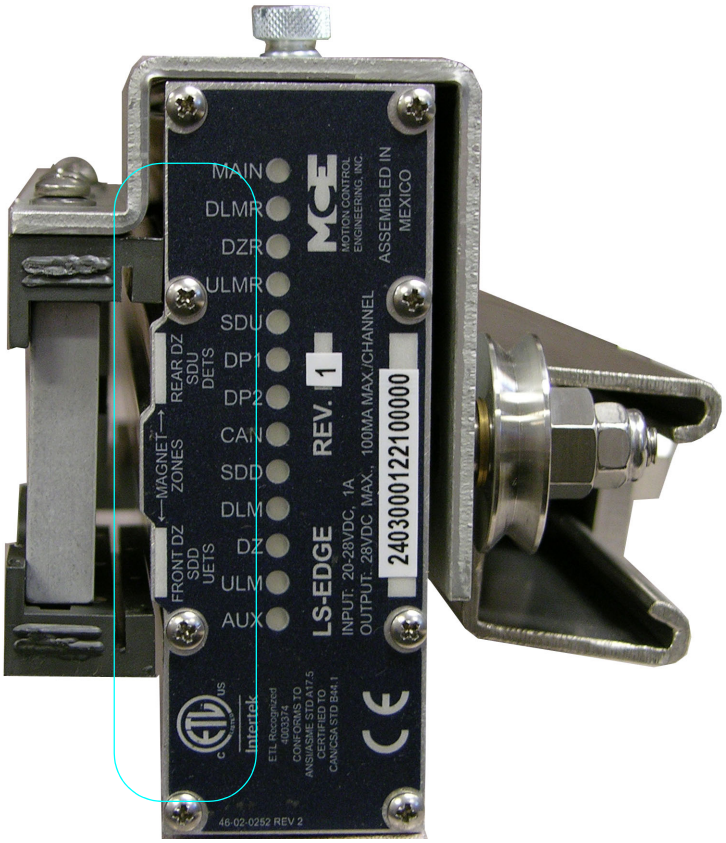


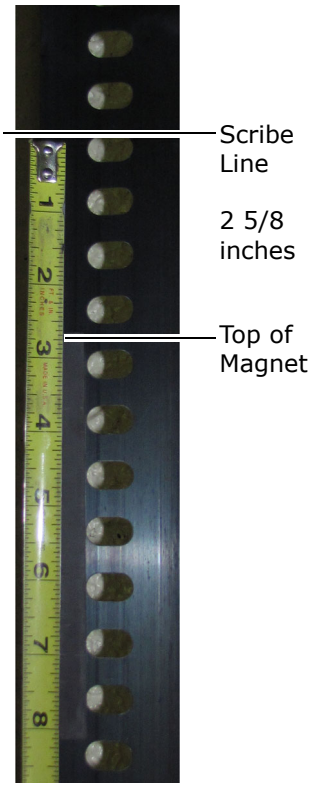
Sensor Alignment After the tape has been installed, check the sensor alignment. The sensor should not ride hard on either side of the Unistrut bracket during any part of travel through the hoistway. In high-rise buildings, if rail alignment varies substantially, it may cause the encoder guides to wear 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.

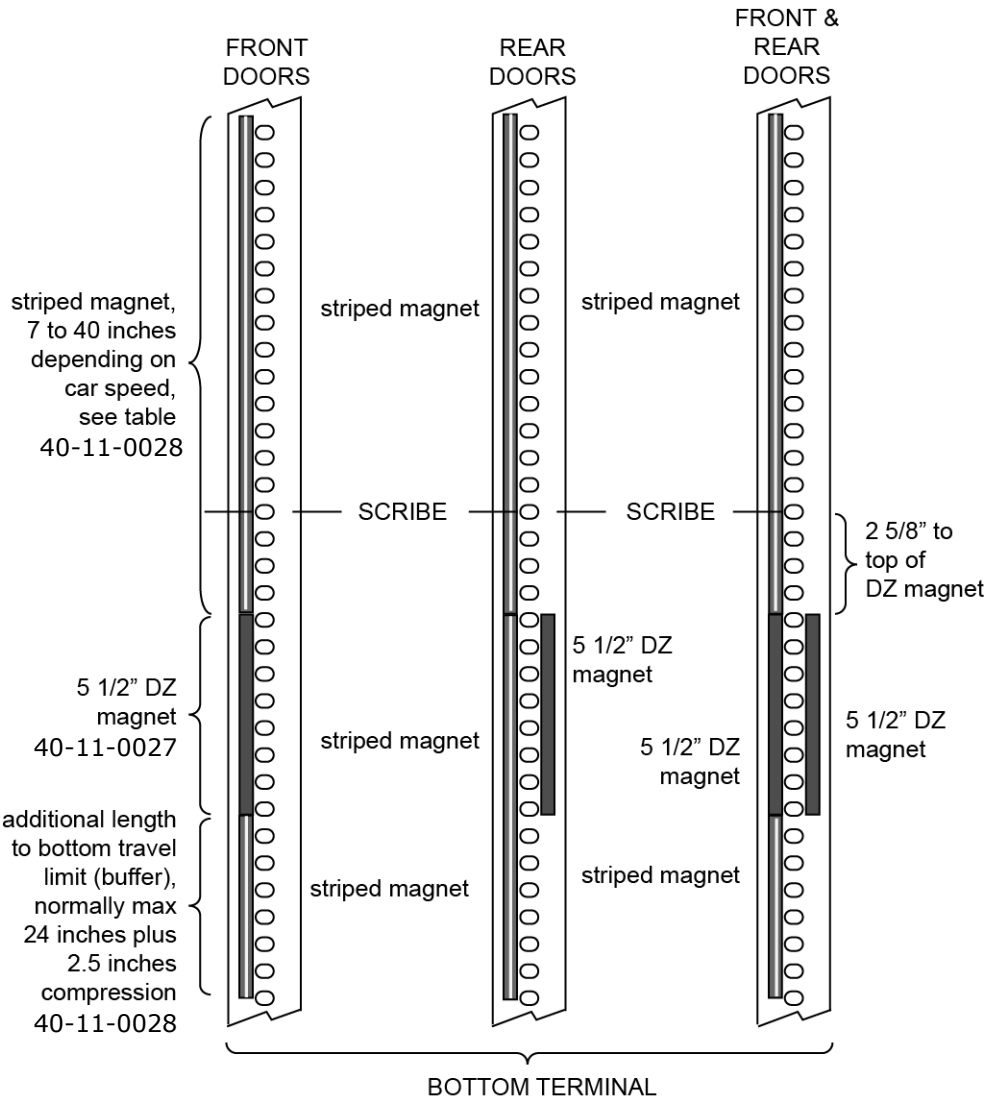
To mount the door zone magnets:

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 TS Bottom Terminal Magnets



1. Refer to Table 4 on page 16 to determine the length of the magnet to be placed above the bottom terminal DZ magnet to the left of the tape holes.
2. Place magnets 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 16 to determine the length of the magnet to be placed below the top terminal DZ magnet to the right of the tape holes (see Top Terminal Magnets Table 3.9 on page 16).
4. Place magnets 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 TS Top Terminal Magnets

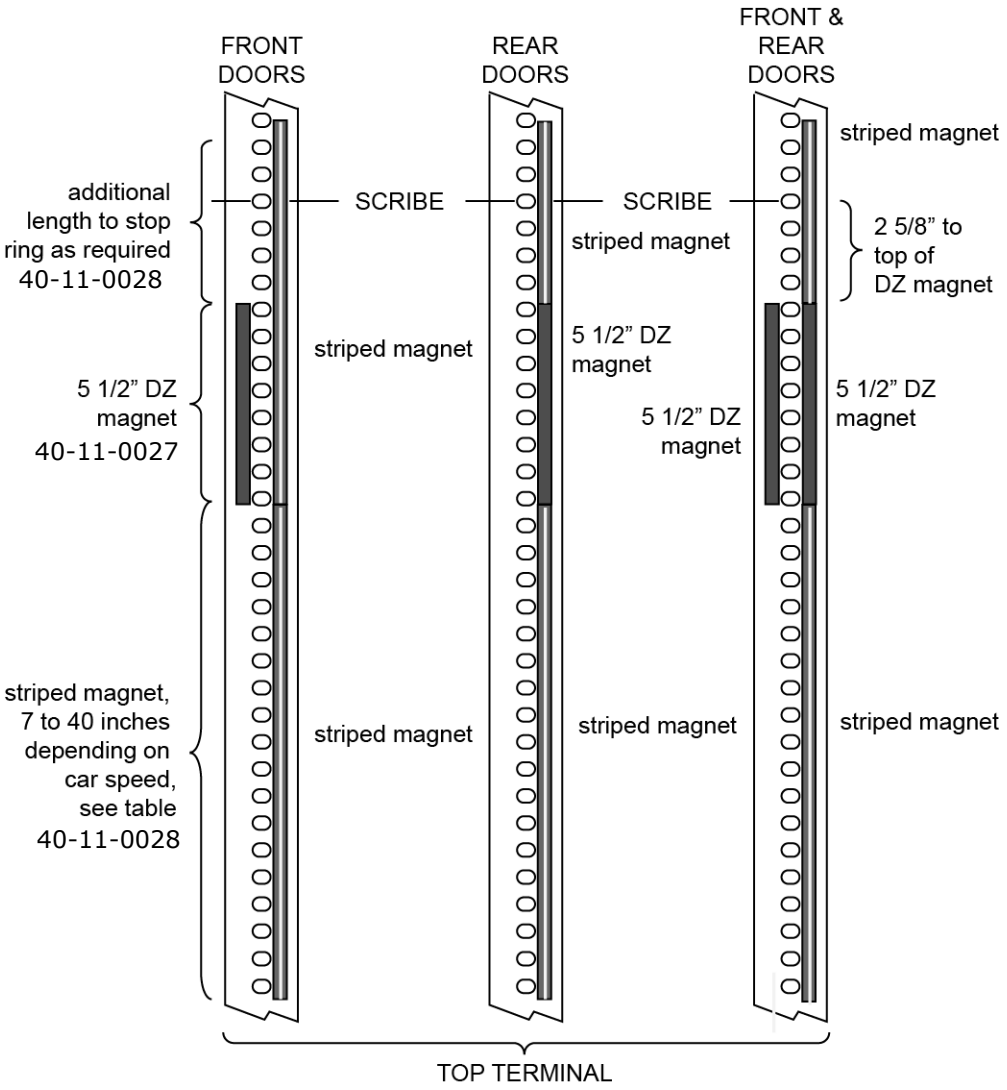


Table 4. Suggested Length of Terminal Magnet Before Leading Edge of DZ Magnet

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

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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.

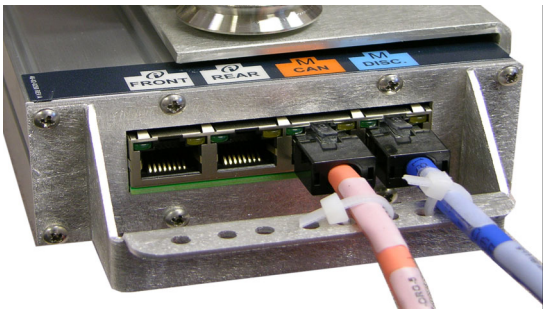
ULM	DZ	DLM	SDD	ULMR	DZR	DLMR	SDU
X	X	X	X	T	T	T	T

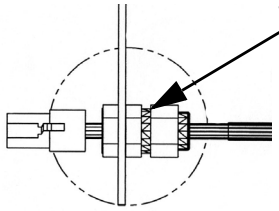
LS-EDGE Electrical Connection

Make electrical connections as shown in the job prints. Motion 2000 TS 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





The NEMA 4X / 12 version provides strain relief and sealed entry using a gasketed cover and special hardware as shown

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

Parameter Settings

Verify the following parameter settings:

- Set the LANDING SYSTEM TYPE to LS-EDGE. (CONFIG 01 > BUILDING SETUP)
- The FLOOR STEP DOWN **x** and FLOOR STEP UP **x** (**x** = floor #) are already set at the factory. (CONFIG 02 > HOISTWAY SETUP)
- The FLOOR SUB STEP DOWN **x** and FLOOR SUB STEP Up **x (x** = floor #) are already set at the factory. (CONFIG 02 > HOISTWAY SETUP)

Hoistway Learn Operation

Hoistway Learn (Landing System Learn)

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 car on Test and Machine Room Inspection using switches on HC-CTL-2.
2. Set the FLT BYPASS jumper in the A position.
3. Select the UTILS menu. Select CONSTRUCT AND BYPASS FAULTS.
4. Select CONSTRUCTION FAULT BYPASS DISABLED; press OK to ENABLE. Press EXIT. Faults are now bypassed.
5. Move car on inspection to about **six or more** inches above bottom terminal landing.
6. Select CONSTRUCT AND BYPASS FAULTS. Press CONSTRUCTION FAULT BYPASS ENABLED. Press OK to disable fault bypass.
7. Move the FLT BYPASS jumper to the C position. Faults are no longer bypassed.
8. Select LANDING SYSTEM UTILITIES. Select HOISTWAY LEARN (LANDING SYSTEM LEARN). Press LEARN.
9. Set Machine Room Inspection switch to NORM. The screen will display FINDING BOTTOM, followed by BOTTOM FOUND. The car will then begin to run up the hoistway.

During the run, the screen will display LEARNING. Once the top floor is learned the screen will display FINALIZING, followed by STORING HOISTWAY, and finally DONE STORING HOISTWAY.

10. Press DONE. Press EXIT. Press EXIT on the following screens until the UTILS home menu appears.

Construction Learn

The hoistway can be learned while on Construction using the MACHINE ROOM INSPECTION switches if a problem is encountered using the **normal** learn procedure. When you select LEARN, you are directed to move the car down to the bottom landing. Use the DN + ENABLE switches. A message indicates when the bottom landing position is found. You are then instructed to move the car up the hoistway as each landing is learned. Release UP + ENABLE when CAR REACHED TOP is displayed. STORING HOISTWAY and finally DONE STORING HOISTWAY are displayed.

Motion 2000 TS Hydro Adjustment

Perform a series of runs to various floors while observing the UTILS, Landing System View display to see that the car is stepping and leveling into each floor appropriately.

Adjusting Floor Heights

For the LS-EDGE landing system, floor heights are set during the hoistway learn operation, but may be adjusted to compensate for floor level magnet position imperfections in CONFIG 02 > HOISTWAY SETUP.

Initial Stepping Positions The initial settings for the run up and run down stepping positions were set at the factory using the following table (Gray area applicable to Motion 2000 TS). 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 down position performs the same function. If this is a terminal floor, either the step up/down position, the physical position of the terminal magnets, or the USL3 position will force high speed to drop. These settings can be verified or adjusted through the CONFIG 02, Hoistway Setup and NTS Switches menu 3.

Table 5. Hydro Initial Stepping Distances

Car Speed	Factory Set Stepping Distance From Floor Level	Car Speed	Factory Set Stepping Distance From Floor Level
Gray area = Motion 2000 TS Hydro		85 fpm	20 inches
<35 fpm	8 inches	90 fpm	21 inches
40 fpm	9 inches	95 fpm	22 inches
45 fpm	10 inches	100 fpm	24 inches
50 fpm	12 inches	110 fpm	27 inches
55 fpm	13 inches	125 fpm	30 inches
60 fpm	14 inches	140 fpm	33 inches
65 fpm	15 inches	150 fpm	36 inches
70 fpm	16 inches	160 fpm	38 inches
75 fpm	18 inches	175 fpm	42 inches
80 fpm	19 inches	200 fpm	48 inches

With valves adjusted for speeds and slowdown characteristics desired, adjust floor height and stepping offsets (CONFIG 02, Hoistway Setup) until the car levels properly at each floor without releveling.

Dead Zone (releveling limits) may be adjusted through CONFIG 02, System Control Parameters, Dead Zone Distance if required.

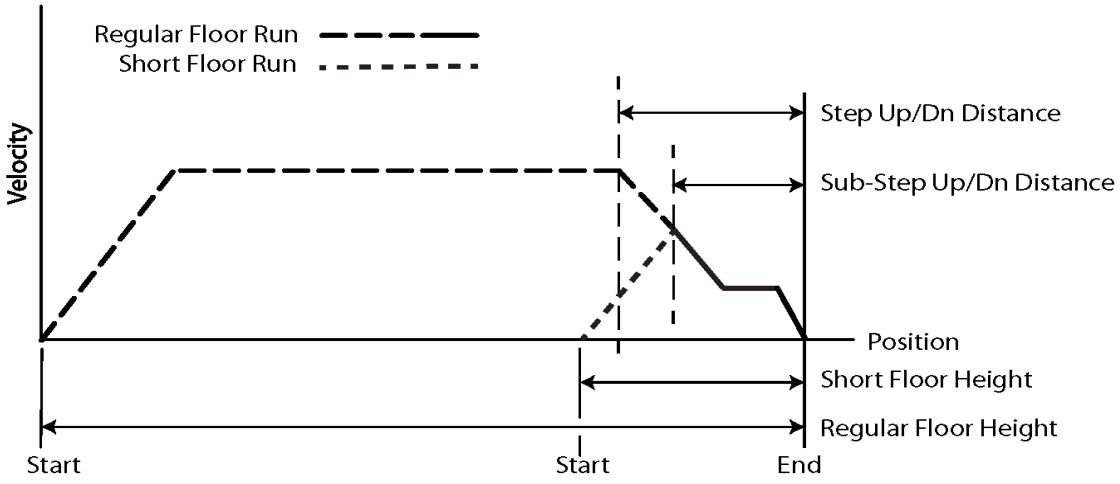
Door Position Monitor Switch (If used)

If you are in a jurisdiction where ASME A17.1 - 1996 or later is being enforced, Door Position Monitor switches 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 option (CONFIG 01 > ELEVATOR FEATURES).

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 the Hoistway Setup Stepping Type option 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. When the destination floor is the top terminal landing, USL4 can be used as a third means of slowing down the car. The settings for USL4 can be found at CONFIG 02 > NTS SWITCHES.

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 and USL4 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.

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 and In-Car Inspections 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, DPM, DOLR, DCLR, and DPMR.
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 are 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.

Quick Topics

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).
- **Troubleshooting Reference** (see page 4-3)
- **Test Mode:** A description of car behavior on Test Mode (see page 4-7).
- **Running on Test/Normal:** Instructions for beginning operation on Test and Normal modes (see page 4-7).
- **Final Adjustments on Test Mode:** Instructions for making final adjustments (see page 4-8).
- **Final Adjustments on Independent Service:** Instructions for making final adjustments on Independent Service (see page 4-9).
- **Final Adjustments on Normal Operation:** Instructions for making final adjustments on Normal Operation (see page 4-10).
- **Final Testing on LS-Edge** (see page 4-12)
- **Passcode (Restricted Mode)** (see page 4-15)
- **Release to Normal Operation:** Final checks before releasing the elevator to normal operation (see page 4-16).

Diagnostic Messages and Input/Output Signals

To speed up final adjustment and troubleshooting, become familiar with the Status and Error Messages and Input/Output signals.

It will also be helpful to become familiar with the Motion 2000 TS Controller's computer. See The HC-MPU-2-TS Main Processor Unit on page 5-2 and Screen Descriptions on page 5-7.

On Board Diagnostics On all boards an ON LED provides the following diagnostic information.

ON LED The ON LED reflects power/communications status.

- ON: Communications OK
- OFF: Board is not receiving power or has no software loaded.
- Blinking: Communications error - more than ten seconds have passed without a message

Troubleshooting Reference

Danger

Always observe safety precautions when troubleshooting. Lethal voltages are present.

This section includes:

- Bus voltage testpoints and fuse locations
- Touch screen tools
- Circuit board descriptions
- Fault Message Descriptions

System I/O

At this level, inputs and outputs are grouped separately and alphabetically with no deference to their function.

- Inputs and Outputs: Indicators reflect activation of that physical input or output. When the board LED is lighted, the indicator will also be lighted.
  - System Inputs: Dedicated (non-programmable) input status indicators
  - System Outputs: Dedicated (non-programmable) output status indicators
  - Programmed Inputs: Programmable input status indicators
  - Programmed Outputs: Programmable output status indicators
  - Front CPI I/O status: CPI board's I/O flags
  - Rear CPI I/O status: CPI board's I/O flags

1. If an input is not in the proper state, troubleshoot the connection and the source.
2. If an output is in the proper state but the system is not reacting accordingly, troubleshoot the connection and the destination equipment.
3. If an output is not in the proper state, check the job prints to see what inputs or internal flags must be asserted in order to enable the output.
   - Troubleshoot associated inputs in System I/O or System Diagnostics
   - Troubleshoot internal flags according to their origination (i.e., Car diagnostics, Motion diagnostics, Group diagnostics, PLD diagnostics)

System Diagnostics

At this level, inputs and outputs are gathered into sets according to the system they affect; i.e., their collective function. (See troubleshooting steps above.)

- Door Control: Indicators for door related inputs and outputs.
- Landing System: Indicators for landing system related inputs and outputs.
- Event Log: Time stamped entries for system events and faults.
- Diagnostics Tree: Indicators on this screen must be ON in order for the related function to succeed. Some indicators are single; some (+) expand to a list when selected. If the system is not doing what it is supposed to, an unlighted indicator points you to the problem.
- Active Events: Displays currently active faults and events.

Note

This screen can also be accessed by touching Mode of Operation box on the Home screen.

CAR, MOTION, GROUP, PLD Diagnostics

These screens provide useful in depth diagnostics for the car and system control operations (Car Operation, Car Motion Control Controller System, Group Control, and PLD). Flags are visible indicators of active signals, descriptively labeled so you can understand what they represent. Numerics are register data bit information and are intended for factory diagnostics. They are also useful when MCE Technical Support is assisting in diagnosing a system.

The job prints will indicate what flags/functions are required to enable an output. The output (or an input) can be viewed through the System I/O or System Diagnostics screen. Associated flags/functions can be viewed through the screen for the appropriate safety processor or PLD.

CAR Diag Car Operation Control related indicators.

MOTION Diag Car Motion Control related indicators (valve enables, pump information, limits, etc.).

GROUP Diag Communication and System Control related indicators.

PLD Diag System-wide PLD indicators.

Action Info

This display provides indicators that can help to discover why an unexpected action is occurring.

- Car Call Canceled Due To: Inputs or states that can cause car calls to be canceled.
- Hall Call Canceled Due To: Inputs or states that can cause hall calls to be canceled.
- Door Open Due To: Inputs or states that can cause doors to open or remain open.
- Prohibit Run/Start Due to: Inputs or states that can cause starting or running to be disabled.
- Door Close Due To: Inputs or states that can cause doors to close or remain closed.

Status Info

View:

- CPU, BUS, COM Status
- CAN BUS Viewer: Internal CAN BUS diagnostics per CAN ID
- Other Car Settings: See the other car's parameters related to duplexing and Sabbath Operation
- Monitoring Tools: Xport management for CHP board
- Version Information: All software/firmware versions listed
- Address Diagnostics: Processor diagnostics by address

Stats

Collected statistics for maintenance and system activity.

- Maintenance Statistics: Collected run-related statistics. Compiled until manually cleared.
- Hourly Statistics: Car and hall call statistics per hour for the preceding 24 hours.
- Hall BUS Inventory: Monitor/check each node board's I/O and load status. When all hall calls are installed and functioning properly use the INVTRY control on this screen to add them to system memory. When troubleshooting hall calls at a future date, use the TEST control to automatically poll and test all switches and lamps.

Scope

The virtual oscilloscope allows you to select up to four signals from an elevator subsystem and display them in near real-time.

1. Select the subsystem:
   - System Inputs
   - System Outputs
   - Landing System
   - Programmed Inputs
   - Programmed Outputs
2. Use the scroll arrows to move through signals.
3. For each desired signal, tap on one of the four boxes on the right of the screen. The signal will appear in the box.
4. Tap on OK to return to the selection screen, then on View Scope.
5. Touch the scope arrows to adjust trace speed (amount of time represented by screen graticules).
6. The selected signals will remain on the scope until you replace them with others.

Test Mode Operation

The purpose of TEST mode is to allow easy and convenient full-speed 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-2-TS 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. Refer to the UTILS section in Touchscreen Organization and Content for details on how to use this option.

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 SLOW INSPECTION SPEED to YES.

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/Valve 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.

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-2-TS 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. 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 fail to open on the first attempt, they will make two more attempts. Each attempt will generate a fault message, **Door open fail 1 (2/3)**. If the doors are still unable to open, a door open fault will be declared. The door open fault is cleared by a successful door opening cycle or by pressing the Fault Reset button.
- Door close protection: If the doors fail to close on the first attempt, they will make two more attempts. Each attempt will generate a fault message, **Door close fail 1 (2/3)**. If the doors are still unable to close, a door close fault will be declared. The door close fault is cleared by a successful door closing cycle or by pressing the Fault Reset Button. If the door close fault continues, a door close fault shutdown will occur. The car doors will fully reopen, all calls will be canceled, and the car will shut down.

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.

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

Bottom Terminal Slowdown Limit Tests

To test the Normal Stopping Means

1. Remove the wires from terminals LIM0 and LIM1 on the HC-CTL2 board.
2. Apply 24VDC to the LIM0 and LIM1 terminals.
3. Under CONFIG 2 > HOISTWAY SETUP, note the **Floor Step Down XX** distance (XX represents the bottom landing).
4. Move the car up and then make a call to the bottom landing.
5. Verify that the Fast Valves are disabled at the **Floor Step Down XX** distance and car slows down.

To test the Terminal Speed Reducing Device

1. Make sure wires are placed back into terminals LIM0 and LIM1, and 24VDC is removed.
2. Under CONFIG 2 > HOISTWAY SETUP, note the **Floor Step Up XX** distance. Set it to 0 (zero) to disable it.
3. Move the car up and then make a call to the bottom landing.
4. Verify that the Fast Valves are disabled and car slows down near the bottom terminal floor.
5. Restore original settings.

Top Terminal Slowdown Limit Tests

To test the Normal Terminal Stopping Means

1. Remove the wires from terminals LIM2 and LIM3 on the HC-CTL2 board.
2. Apply 24VDC to the LIM2 and LIM3 terminals.
3. Make sure under CONFIG 2 > NTS SWITCHES, the USL/DSL 3 option is disabled.
4. Under CONFIG 2 > HOISTWAY SETUP, note the **Floor Step Up YY** distance (YY represents the top landing).
5. Move the car down and then make a call to the top landing.
6. Verify that the Fast Valves are disabled at the **Floor Step Up YY** distance and car slows down.

To test the Terminal Speed Reducing Device

1. Make sure wires are placed back into terminals LIM2 and LIM3, and 24VDC is removed.
2. Under CONFIG 2 > HOISTWAY SETUP, note the **Floor Step Up YY** distance. Set it to 0 (zero) to disable it.
3. Make sure under CONFIG 2 > NTS SWITCHES, the USL/DSL 3 option is disabled. Move the car down and then make a call to the top landing. Verify that the Fast Valves are disabled and car slows down near the top terminal floor.
4. Restore original settings.

To test the Normal Terminal Stopping Device

1. Remove the wires from terminals LIM2 and LIM3 on the HC-CTL2 board.
2. Apply 24VDC to the LIM2 and LIM3 terminals.
3. Under CONFIG 2 > HOISTWAY SETUP, note the **Floor Step Up YY** distance. Set it to 0 (zero) to disable it.
4. Make sure under CONFIG2 > NTS SWITCHES the USL/DSL 3 option is set to Virtual. Move the car down and then make a call to the top landing.
5. Verify that the Fast Valves are disabled and car slows down near the top terminal floor.
6. Fault **Up Terminal Limit Failure** will be generated. Press **Fault Reset** button on the HC-CTL-2 board to clear the fault.
7. Restore original settings.

Stop Ring Test

This procedure allows the car to be moved up against the stop ring for testing purposes.

1. Place the controller on Test Mode (TEST/PRETEST switch in the TEST position).
2. Register a car call to the top landing using the touchscreen.
3. Once the car arrives at the top landing, place the controller on Machine Room Inspection (MACHINE ROOM INSPECTION INSP/NORM switch in the INSP position).
4. Turn off test mode (TEST/PRETEST switch in the centered position).
5. Remove power to the controller at the main disconnect.
6. Disconnect the wire connected to the UNTD terminal on the HC-DVR board.
7. Place a jumper wire between the DNTD and UNTD terminals on the HC-DVR board.
8. Place a jumper wire between LIM0 and LIM3 terminals on the HC-CTL-2 board WITHOUT removing any preexisting wires on those terminals.
9. Restore Power to the controller at the main disconnect.
10. On the touchscreen, select **CONFIG 02 > HOISTWAY SETUP > U/DTL LIMIT OPT**. If the value is not PHYSICAL, record the value and change it to **PHYSICAL**. Press **SAVE** on the touchscreen.
11. On the touchscreen, select **CONFIG 02 > NTS SWITCHES > U/DSL OPTION**. If the value is not DISABLED, record the value and change it to **DISABLED**. Press **SAVE** on the touchscreen.
12. At this point the car may be moved up against the stop ring using the MACHINE ROOM INSPECTION UP/DN switch for testing purposes.
13. Once the testing is completed, move the car back down to the top floor.
14. On the touchscreen, select **CONFIG 02 > HOISTWAY SETUP > U/DTL LIMIT OPT** and change the value to the original setting.
15. Press **SAVE** on the touchscreen.
16. On the touchscreen, select **CONFIG 02 > NTS SWITCHES > U/DSL OPTION** and change the value to the original setting. Press SAVE on the touchscreen.
17. Remove power to the controller at the main disconnect.
18. Remove the wire jumper between DNTD and UNTD and reconnect the disconnected UNTD wire on the HC-DVR board.
19. Remove the wire jumper between LIM0 and LIM3 terminals on the HC-CTL-2 board.

20. Restore power to the controller at the main disconnect.
21. Take the controller off of Machine Room Inspection (MACHINE ROOM INSPECTION INSP/NORM switch in the NORM position).

Low Oil Condition Testing

These procedures simulate a low oil condition for testing purposes.

Low Oil Switch in use

If there is a low oil switch being used, perform the following:

1. Check the job prints to verify the polarity of the switch and the input to which it is wired.
2. For an active low switch, remove the wire to the input.
3. For an active high switch, wire a jumper from the switch common to the input terminal.
4. Observe that the car will lower to the bottom (or recall) floor and cycle its doors

No Low Oil Switch in use

If there is no low oil switch in use, perform the following:

1. On the touch screen select CONFIG 01 > SYSTEM TIMERS > MOTOR/VALVE TIME LIMIT. After recording the current setting, set the time for 1 minute and press SAVE.
2. With the car at any floor other than the top terminal landing, power down the controller.
3. Remove the UP FAST valve coil wire from the controller terminals UFE and UF (HC-DVR board) and cap the wires.
4. Wire a test light bulb as a dummy load between terminals UFE and UF (HC-DVR board) that would provide a similar load as the UP FAST valve coil (e.g., a 120VAC, 100W bulb).
5. Restore power to the controller.
6. Enter a call for an upper floor. Observe that the car will only move in the up direction at leveling speed, and that after 1 minute has elapsed, the car will lower to the bottom (or recall) floor and cycle its doors.
7. Power down the controller; remove the light bulb from the circuit and restore the UP FAST valve coil wires to controller terminals UFE and UF (HC-DVR board), as originally wired.
8. Restore power to the controller and, restore the MOTOR/VALVE TIME LIMIT parameter to the time recorded in step 1, if necessary.

Passcode (Restricted Mode)

(If applicable.) Until a valid pass code is entered and saved, the controller will not answer hall calls. If a valid pass code has not been obtained and entered for the job:

1. Contact MCE Customer Service to obtain a pass code.
2. In the touch screen CONFIG 01 > JOB INFO AND LABELS, you will see:
   - **PASSCODE: PASSCODE ACTIVE**
3. Press PASSCODE ACTIVE to open an entry screen.
4. Key in the pass code. Press ENTER.
5. The CONFIG 01 screen will display **PASSCODE VALID**. Press SAVE.
6. The display will change to:
   - **PASSCODE: PASSCODE CLEAR**
7. The controller will now respond to hall calls. Until the pass code is cleared, a status message: RESTRICTED MODE on the HOME screen will alert you to the need.

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 (FLT bypass in C position).
- 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.

In this Section

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

- **HC-MPU-2-TS Main Processor:** Describes the indicators, switches, buttons, connectors and display on the HC-MPU-2-TS Main Processor board (see page 5-2).
- **Using the Touchscreen**
  - **Screen Descriptions**
  - **Menu Tree**
  - **Spare Inputs and Spare Outputs** (see page 5-25)
  - **Acronym Descriptions** (see page 5-32)
- **Touchscreen Organization and Content** (see page 5-7)
- **Troubleshooting Reference**
  - **Touch Screen** Event and Fault Message Descriptions on (see page 5-48)
- **Event Log**
- **Duplexing:** Describes how to troubleshoot communication problems (see page 5-107).

The HC-MPU-2-TS Main Processor Unit

The computer on the Motion 2000 TS 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-2-TS Main Processor Unit

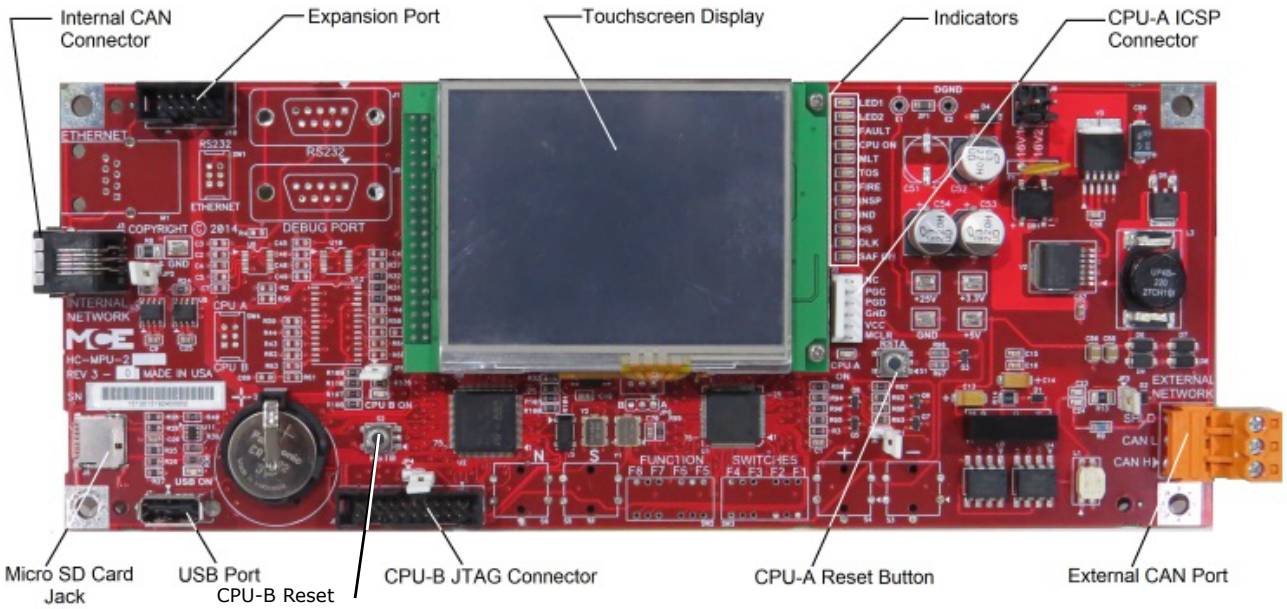


Figure 5.1 shows the indicators, push buttons and terminals on the main processor unit.

Indicators

CPU-A, CPU-B When steadily illuminated, these LEDs show that the computer is functioning normally and completing its program loop successfully. Pressing the **RSTA** button will cause the CPU A **ON** LED to turn off and stay off while the RSTA button is depressed. Pressing the **RSTB** button will cause the CPU B **ON** LED to turn off and stay off while the RSTB 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.

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

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Table 5.1 Status Indicators

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

Buttons and Adjustment 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.

Buttons

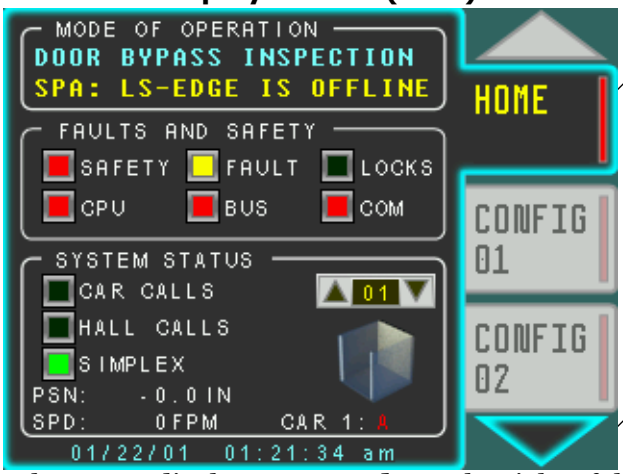
- RSTA Button - Resets CPU-A Processor
- RSTB Button - Resets CPU-B processor

Using the Touch Screen

Motion 2000 TS controls use a touchscreen user interface (OBD). The initial (and default) display is the Home Display. Screens are arranged in **order of use** with the Home screen first, followed by configuration screens, utility screens, and then diagnostics oriented screens.

Home

Figure 5.2 Home Display Screen (OBD)



On the Home display screen, **tabs** to the right of the window show what additional adjustment, control, and diagnostic screens are available. Up and Down arrows scroll through the tabs. To access a screen, simply touch the associated tab.

- When activated, main screens with many selections open to a sub-screen selection menu.
- To select/set a particular feature, simply touch it.
  - If Yes/No, it will change from one state to the other.
  - If there are more than two possible settings, a list will appear.
  - If a time or value may be set, a numeric entry screen will open.
- The Save button allows you to save changes. (Save and Exit.)
- The Exit button allows you to exit the screen. Any unsaved changes will be ignored.
- Undo: Undo action but remain in menu.

We recommend you take a few minutes to become familiar with the touch screen interface. You will find that operation is simple and predictable. See additional screen representations on the next page.

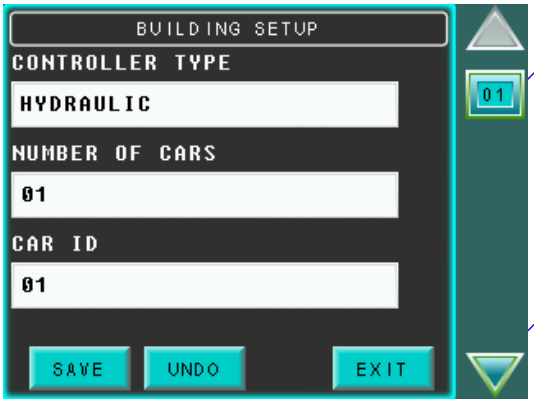
Note

Screen freeze: If the screen should ever freeze or lock up, press RSTA on the HC-MPU-2-TS board.

Note

The controller must be on Inspection to modify and save parameters.

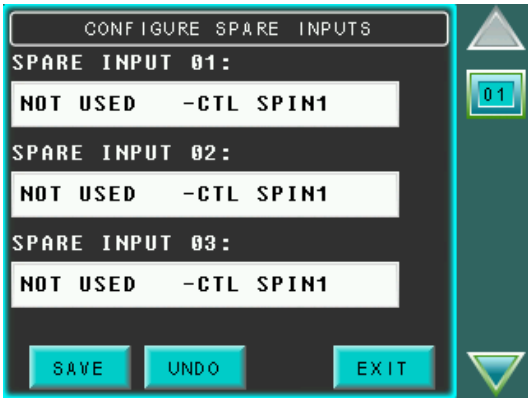
Figure 5.3 Parameter Selection Screen



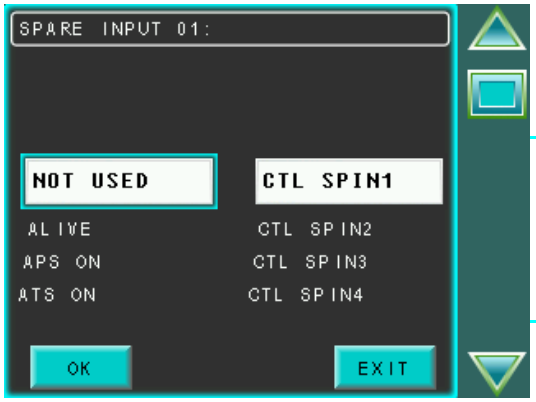
Press and slide to move through multiple screens.

Tap the arrows to move one screen at a time. Press and hold to move continuously.

Figure 5.4 Input/Output Assignment



Tap on the input or output to be configured.



Tap on the input/output name and use scroll arrows or slider to move through potential input/output assignments. Note blue outline when item is selected.

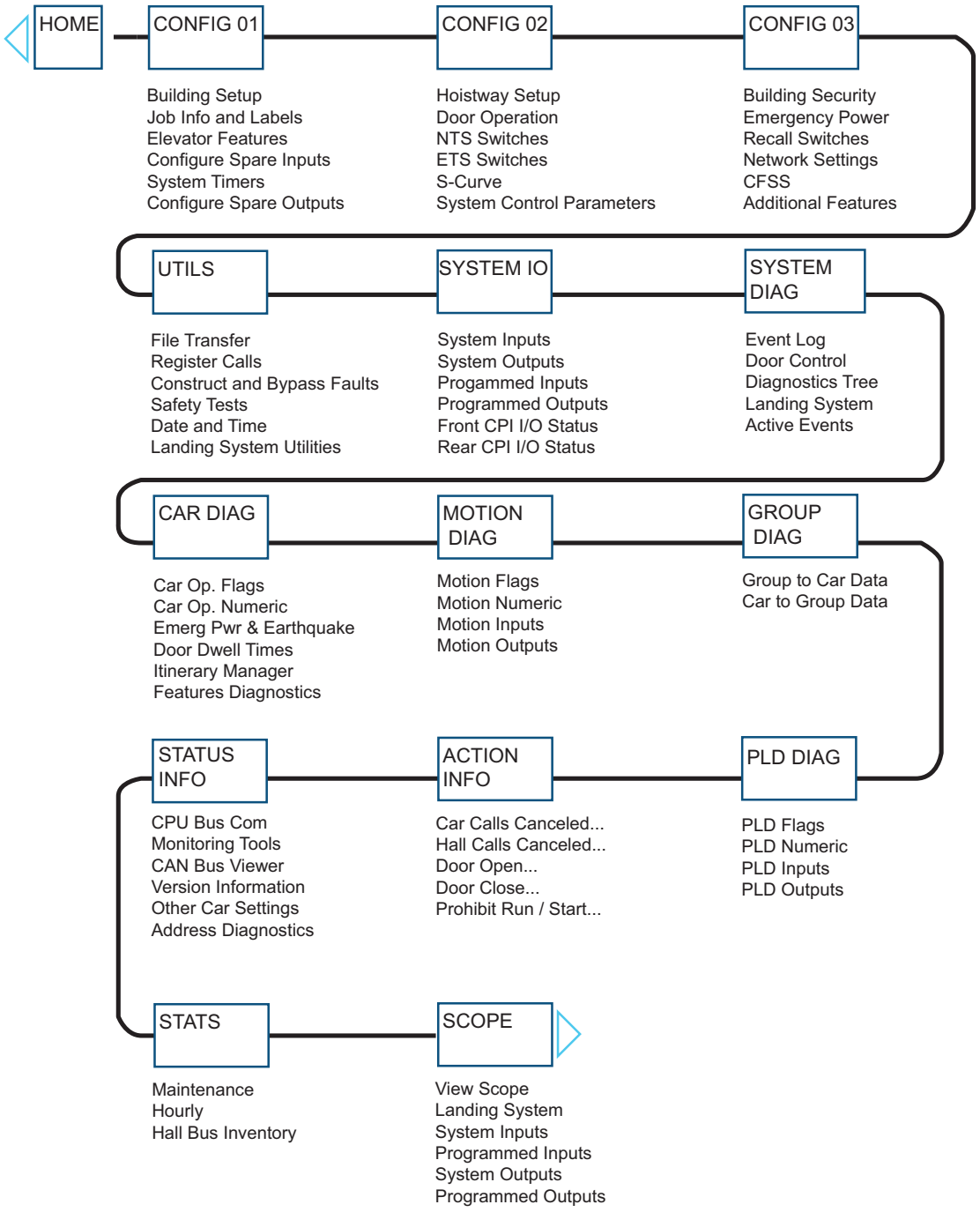
Tap on the input/output location and use scroll arrows or slider to move through potential location assignments. Note blue outline when item is selected.

To reassign an already used input:

- Reassign input to NOT USED.
- Assign the new function, press OK.
- Press Save.

5

Figure 5.5 Menu Tree



Shortcuts

- Touch the elevator on the Home screen to go to Call Registration.
- Touch the upper left corner on the Register Calls screen to return to the Home screen.
- Touch inside the Mode of Operation, Faults & Safety, or System Status areas of the Home screen to go to a screen relevant to obtaining additional information.
- Touch the home icon in upper left corner to return to the Home screen.

Screen Descriptions

Experiment with the touch screen to familiarize yourself with navigation and content. If an abbreviation is not clear, please see Acronym Descriptions and Memory Locations on page 5-32.

Table 5.2 Touchscreen Organization and Content

Tab	Subtab	Description
HOME	N/A see Home on page 5-4	**Displays critical status information for operation** - **Operating Mode** - **Fault text** if a fault is active - **Safety string complete indicator** - **Active fault indicator** - **Locks string complete indicator** - **CPU health indicator** - **Bus status** - **System communication** - **Clock and date display** - **Car and Hall call in service status** - **Dispatcher** (on dispatched duplex car **Disp ID: nn** will appear where **nn** is the ID of the dispatching car, Duplex only) Simplex will appear for a single self-dispatching car - **M-GROUP** will appear for a local car in a group system - **Car doors position** - **Current floor** - **Intended and current direction of travel** - **Destination floor** - **Actual position** - **Actual speed** - **Car # / Label**

Table 5.2 Touchscreen Organization and Content

Tab	Subtab	Description
CONFIG 01	**Building Setup**	- **Controller Type,** Hydraulic - **Supervisor Source** (Other car, This car, M-Group) - **Number of Cars** (1 Simplex, 2 Duplex) - **Car ID** - **Call Config Type**: Up/Down Collect, Single Collect (Simplex Only), Single Button (Simplex Only) **NOTE: Duplex can only be Up/Down Collect** - **Bottom Floor** (served) - **Top Floor** (served) - **Floor Eligibilities: (1-16)** Opening, CFSS, Sabbath Up, Sabbath Down (Front and Rear) - **Lobby Floor** - **Egress Floor** (building exit floor) - **Safety Code** (Elevator Safety Code) (page 1-10) - **Flash Fire Hat** (MR/HSTWY) - **Fire II with Door Closed** (Yes/No) Set on fully manual doors to allow fire phase II when the in-car firefighters' switch is activated even when the doors are closed or not fully open. - **Main Fire Floor** - **Main Fire Side** - **Alt Fire Floor** - **Alt Fire Side** - **Low Voltage Fire Sensor** - **Flood Floor** (lowest served if Flood input active) - **Landing System Type**, LS-EDGE - **Primary Parking Floor** (Applies to Simplex/Duplex) - **Primary Parking Door Operation (Front and Rear)** - **Secondary Parking Floor** (Applies to Duplex only) - **Secondary Parking Door Operation (Front and Rear)** - **Car Panel Inspection:** When present (Yes), HC-CTL-2-TS inputs ICEN/IN1, ICPU/IN2, and ICPD/IN3 may only be used as Car Panel Inspection inputs - **Hoistway Access**: Top, Bottom, None, or Both. - **Bottom Access Side** - **Top Access Side** - **EMS Floor**: Set the floor number at which the EMS call to floor input is located - **EMS Side**
CONFIG 01	**Job Info and Labels**	- **Screen Type** - **Passcode.** See Passcode (Restricted) on page 4-15. - **HC-MPU-2 Serial Number** (Read Only) - **Job Department and Year** - **Job Number** - **Job Name** - **Car Label** - **Floor Label,** per floor (1-16)

Table 5.2 Touchscreen Organization and Content

Tab	Subtab	Description
CONFIG 01	**Elevator Features**	*- **DEDICATED UIO CALL ENABLE:** (NONE, CAR, HALL, CAR, HALL) Used when the security hall call enable inputs are dedicated on the UIO board. - **Calls on UIO-2 Board** (None, car, hall, or car and hall) - **DEDICATED PI ON UIO:** (None, stacked, dedicated) - **DEDICATED PI TYPE:** (0 OFFSET BINARY, 1 OFFSET BINARY, 0 OFFSET GRAY-CODE, 1 OFFSET GRAYCODE -ONE PER FLOOR) Use to configure the dedicated PI outputs on the UIO board(s) and specify the type and offset. - **DEDICATED PI DISABLED:** (NO DEMAND☐ INSPECTION☐ FIRE ☐ MEDI-CAL☐) Used to specify when to disable the dedicated position indicators outputs on the UIO board(s). - **SPARE PI OUPUTS TYPE:** (0 OFFSET BINARY, 1 OFFSET BINARY, 0 OFFSET GRAYCODE, 1 OFFSET GRAYCODE -ONE PER FLOOR) Use to configure the spare PI outputs and specify the type and offset. - **SPARE PI DISABLED:** (NO DEMAND ☐ INSPECTION ☐ FIRE ☐ MEDICAL ☐) Used to specify when to disable the spare position indicators outputs. - **Serial Hall Calls** (Yes/No) Set to **NO** in a group system - **Capture Floor** (Pretest Operation calls car to this floor). See Capture for Test (pretest), page 1-10. - **Capture Front/Rear Door Operation** (Doors Closed/Open Doors/Cycle Doors): Door action behavior at capture floor. - **Bypass Stuck PHE** (Yes/No): When enabled, causes controller to ignore PHE (Photo Eye) input and close the doors after the Stuck PHE Timer elapses - **Bypass Stuck SE** (Yes/No): When enabled, causes controller to ignore SE (Safety Edge) input and close the doors after the Stuck SE elapses - **Bypass Stuck DOB** (Yes/No): When enabled, causes controller to ignore DOB (Door Open Button) input and close doors after the Stuck DOB or TOS timer elapses - **PHE Anti-nuisance** (Photo Eye Anti-nuisance - 00 - 16) Maximum number of car calls served without photo eye interruption before all car calls are canceled - **LLI Anti-nuisance** (Light Load Anti-nuisance - 00 - 16) Maximum number of car calls registered with load light input active - **CCC Reversal** (Yes/No) If Yes, cancel any car calls in the previous direction when the car reverses direction - **CCC Behind Car** (Yes/No) If Yes, cancel all car calls entered in the opposite direction of current or upcoming direction of travel - **DLK Direction Preference** (Yes/No) If Yes, car maintains present direction preference until doors closed and locked. If No, car maintains direction preference only until door dwell time expires - **Double Ding Down** (Yes/No) Causes lanterns and gongs to double-strike if car direction preference is down - **DCB Cancels CCT** (Yes/No) If Yes, pressing the Door Close Button cancels the active car call door timer and begins closing doors immediately - **DCB Cancels HCT** (Yes/No) If Yes, pressing the Door Close button cancels the active hall call door timer and begins closing doors immediately - **DCB Cancels LOT** (Yes/No) If Yes, pressing the Door Close button cancels the lobby dwell timer and begins closing the doors immediately.

* This option moved to the **Building Security** screen in MPU-3 Software Version 20.02.01 and higher.

Table 5.2 Touchscreen Organization and Content

Tab	Subtab	Description
CONFIG 01	**Elevator Features**	- **PHE Cancels CCT** (Yes/No) If Yes, photo eye activation cancels the active car call dwell timer - **PHE Cancels HCT** (Yes/No) If Yes, photo eye activation cancels the active hall call dwell timer - **PHE Cancels LOT** (Yes/No) If Yes, photo eye activation will cancel the lobby door dwell timer - **CCB Cancels CCT** (Yes/No) If Yes, pressing a car call button while the doors are open will cancel normal car call door dwell time and cause the doors to begin closing - **CCB Cancels HCT** (Yes/No) If Yes, pressing a car call button cancels the active hall call dwell timer and begin closing doors immediately - **CCB Cancels LOT** (Yes/No) If Yes, pressing a car call button will cancel the lobby door dwell timer and begin closing doors immediately - **DCB Cancels All Dwells** (NONE, FRONT, REAR, BOTH) When set to any setting other than NONE, all configured side(s) Dwell times are canceled when the Door Close Button is pressed, and the related side doors shall immediately close if there are no other door open intents. - **PHE Cancels All Dwells** (NONE, FRONT, REAR, BOTH) When set to any setting other than NONE, all configured side(s) Dwell times are canceled, and a new Short Dwell time activated when the Photo Eye is interrupted. The related side doors shall close when the Short Dwell time has expired and there are no other door open intents. - **CCB Cancels All Dwells** (NONE, FRONT, REAR, BOTH) When set to any setting other than NONE, all configured side(s) Dwell times are canceled when a Car Call Button is pressed, and the related side doors shall immediately close if there are no other door open intents. - **Stuck Insp Input** (TSSA) (Yes/No): If Yes, and if any inspection direction or enable inputs remain high for more than one second during passenger operation, or during inspection operation, if any combination of inspection inputs remain high for more than five seconds, except for Enable plus Up (e.g., ICEN + ICPU) and Enable plus Down (e.g., ICEN + ICPD), a stuck inspection button fault will be generated. - **CP Close Bypass PHE** (Yes/No): Set to Yes for the photo eye to be bypassed during constant pressure close operation. (This option does not apply to Fire Phase II.) - **Resynchronization Days** (Sunday through Saturday): Day(s) on which jack resynchronization is to be performed **Note:** Set day of the week (UTILS > DATE AND TIME) - **Resynchronization Time** (Hour: Minute AM/PM): Time at which resynchronization is to be performed - **IND Open Side** (none, front, rear, both) Which doors to open when Independent Service switch is initially turned on - **IND Stop Cancels CC** (Yes/No): If Yes, cancels remaining car calls at first car call stop

Table 5.2 Touchscreen Organization and Content

Tab	Subtab	Description
CONFIG 01	**Elevator Features**	- **ATS Open Side** (None, front, rear, both): Which doors to open when Attendant Service switch is initially turned on - **ATS Stop Cancels CC** (Yes/No): If Yes, cancels remaining car call at first car call stop. - **Autostop Floor** (1-16): The floor the car will stop at when Autostop function is enabled - **Autostop Direction** (Up, down, both): The specified direction that the car will stop at the Autostop floor - **Autostop Open Side** (Front, rear, both): Which doors will open at the Autostop floor - **Autostop Dwell Time**: Door Dwell timing at Autostop floor - **Exercise Timer** (0-24 hours): How often to initiate exercise operation - **Exercise Cycles** (1-5): How many exercise runs to complete for each exercise interval - **EMERGDISP Cycles** (1-10): The number of emergency dispatch trips the car will make between the timed HOLD cycles - **PI Outputs Type**: Defines the usage for PI BIN 0 through PI BIN 3 outputs (**Only on MPU-B 20.01.xx or lower.)**
	Configure Spare Inputs	Allows input signals to be assigned to available spare inputs. Maximum 70. See Spare Inputs on page 5-25
	Configure Spare Outputs	Allows output signals to be assigned to available spare outputs. Maximum 40. See Spare Outputs on page 5-28
	Input/Output Assignment 1. Touch the input you want to configure. An assignment screen will appear. 2. Touch and highlight either the input/output you want to assign or the physical connection you want to assign to. 2. Change selection by scrolling up or down (scroll bar on the right). 3. When desired Inputs/Outputs and desired physical connections are aligned, press OK to return to the configure screen. Press Save to save changes. **NOTE: An input assigned to a terminal must be cleared and saved as "Not Used" before it can be reallocated.**	

Table 5.2 Touchscreen Organization and Content

Tab	Subtab	Description
CONFIG 01	**System Timers**	- **Motor/Valve Time Limit** (Default 3 minutes) Starts when the controller attempts to move the car in the up direction and resets 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 shut down - **Open Limit Time** (Default 10 seconds) Determines how long the door operator should attempt to open the doors before declaring an unsuccessful attempt (Door Open Fail 1 - 3). After 3 unsuccessful attempts, a Door Open Fault will be declared. This action protects the door motor - **Close Limit Time** (Default 10 seconds) Determines how long the door operator should attempt to close the doors before declaring an unsuccessful attempt (Door Close Fail 1-3) After 3 unsuccessful attempts, a Door Close Fault will be generated, followed by a Door Fault Shutdown. This actions protects the door motor - **Door Interlock Timer** (Default 100 ms) Introduces a delay when closing or opening doors that are abruptly reversed. This may be required if the door operator is sensitive to such reversal due to debounce capability. Set to 0.0 if not required - **Short Door Timer** (Default 1 second) Length of time doors will remain open after being reopened by photo eye, safety edge, or door open button - **Car Call Timer** (Default 2 seconds) Length of time doors will remain open to service a car call - **Hall Call Timer** (Default 4 seconds) Length of time doors will remain open to open to service a hall call - **Lobby Call Timer** (Default 6 seconds) Length of time doors will remain open to service a lobby call - **ADA Car Timer** (Default 3 seconds Length of time doors will remain open to service an ADA car call - **ADA Hall Timer** (Default 5 seconds) Length of time doors will remain open to service an ADA hall call - **Stuck PHE Timer** (Default 10 seconds) Length of time the photo eye is allowed to delay closing before it is bypassed and the doors begin to close - **Stuck SE Timer** (Default 20 seconds) Length of time the safety edge is allowed to delay closing before it is bypassed and the doors begin to close - **Stuck DOB Timer** (Default 10 seconds) Length of time the door open button is allowed to delay closing before it is bypassed and the doors begin to close. - **Car Delayed Timer** (Default 30 seconds) Removes the car from hall call demand if delayed beyond the timer setting
CONFIG 01	**System Timers**	- **COS Timer** (Default 5 minutes) If the car delayed condition persists for the amount of time set here, the car will be removed from service for all calls (COS = Car Out of Service) - **FLO Timer** (Default 5 minutes) When a car is inactive for this amount of time, the fan and light in the cab will automatically be turned off. (Disabled on Inspection) - **Door Hold Timer** (Default 20 seconds) Time to hold the doors open for a momentary activation of the Door Hold input (button). - **Parking Timer** (Default 2 seconds) If a car is idle in excess of the time set here, it will move to its designated parking floor - **Sleep Mode Timer** (Default 10 minutes) The touch screen will enter sleep mode when this timer expires if there has been no activity - **EMERG DISP. Hold Timer**: The amount of time between EMERGDISP run trip cycles

Table 5.2 Touchscreen Organization and Content

Tab	Subtab	Description
CONFIG 02	**Hoistway Setup**	- **LS-EDGE Landing system only**. Floor heights are set during hoistway learn operation but may be adjusted here to compensate for floor level magnet position imperfections - **Floor Height** (n): Level at floor height in inches for each landing - **Floor Offset** (n): **Moves** the floor up or down (negative entries) to adjust the elevator level position. - **Stepping Type:** Single Step or Dual Step - **Floor Step Up** (n): Sets the distance from floor level at which the virtual stepping magnets will force high speed to drop when the elevator is running up to that floor - **Floor Step Down** (n): Sets the distance from floor level at which the virtual stepping magnets will force high speed to drop when the elevator is running down to that floor. Please refer to "Initial Stepping Positions" on page 3-19. - **Floor Sub-Step Up (n)** Set for Dual Step - **Floor Sub-Step Down (n)** Set for Dual Step - **Landing System ID**: Automatically entered during hoistway learn operation. Forces a new learn if the landing system software or hardware is changed - **Top Access Distance**: Sets the location of the "top access switch" that limits downward travel to a point at which the crosshead is level with the sill when accessing the car top - **Bottom Access Distance**: Sets the location of the "bottom access switch" that limits upward travel to a point at which the bottom of the apron is even with the hoistway entrance header - **Top/Bottom Access Margin** - **U/DTL Limit Opt:** Virtual, Physical, or Disable - **U/DTL Distance:** MIN: 0.0, MAX: 1200.0, VAL: 2.0
	ETS Switches	- N/A for Hydraulic Elevator
	NTS Switches	- **U/DSL (1,3,4) Option** - **USL (1,3,4) Distance**: Programmed distance at which the virtual USL2 switch is positioned from terminal floor level. Distance should be set to the same value as Floor Step Up (top floor) distance. - **DSL (1,3,4) Distance:** Programmed distance at which the virtual DSL2 switch is positioned from terminal floor level. Distance should be set to the same value as Floor Step Down 1 distance.

Table 5.2 Touchscreen Organization and Content

Tab	Subtab	Description
CONFIG 02	**Door Operation**	- **Manual Doors**: (None, Front, Rear, Both) Set for fully manual freight doors - **Mechanically Coupled**: (None, Front, Rear, Both) Set for the mechanically coupled doors - **Vertically Sliding** (None, Front, Rear, Both) Set for the vertically sliding doors. - **DOOR POSITION MONITOR:** (Front, Rear, Both, None) Used to specify the side where the door position monitor switch is installed. - **Use GS+DCAB for DCL**: (None, Front, Rear, Both) Used when the door close limit switch is not used. Instead, the DCL status is internally set by looking at the GS/GSR and DCAB/DCABR statuses - **Pre-Open Doors**: (Yes/No) If yes, doors will begin preopening when car is within three inches of the destination door zone - **NUDGING:** (Yes/No) Enable or Disable for both sides - **DOOR CLOSE WARNING FRONT:** (NONE , ALWAYS – IF CLOSED WITH HALL DCB) Set if it is required to delay the front door closing of power operated automatic doors and if a door closing warning buzzer and/or light are required before the doors start to close. - **DOOR CLOSE WARNING REAR:** (NONE , ALWAYS – IF CLOSED WITH HALL DCB) Set if it is required to delay the front door closing of power operated automatic doors and if a door closing warning buzzer and/or light are required before the doors start to close. - **DC WARNING LIGHT TIMER:** (OFF 0 - 1 sec. to 30 min.) Default: 5 sec. Set for the time the door close warning light is to come ON before the doors start to close. - **DC WARNING BUZZER TIMER**: (OFF 0 - 1 sec. to 30 min.) Default: 2 sec. - **Open Gate If Hoistway Open**: (None, Front, Rear, Both) Set when it is required to keep the car gate open if the hoistway doors are open. - **Sequential Door Open** (None, front, rear): If set to front/rear, that side will open/close first when demand exists for both sides to open at a walk-through floor. Only one side will open and close at a time for this feature - **Idle Door Open:** (None, Front, Rear, Both) Used to specify which doors are to open or remain open when idle or parked at a floor - **Latch Door Open**: (None, Front, Rear, Both) Used to keep the Door Open Function (DOF) on, even when the specified side doors are fully open. - **Latch Door Close**: (None, Front, Rear, Both) Used to keep the Door Close Function (DCF) on, even when the specified side doors are fully closed. - **Passenger Front/Rear Opening**: Auto, Constant on DOB, Momentary on DOB, Not controlled by MCE - **Passenger Front/Rear Closing**: Auto, Constant on DCB, Constant on DCB **OR** CC, Constant on DCB **IF** CC, Constant on Car Call, Momentary on DCB, Momentary on DCB **IF** CC, Not controlled by MCE - **Passenger Front/Rear Autoclose CC**: Yes/No - **IND Front/Rear Opening**: Auto, Constant on DOB, Momentary on DOB, Not controlled by MCE - **IND Front/Rear Closing**: Constant on DCB, Constant on DCB **OR** CC, Constant on DCB **IF** CC, Constant on Car Call, Momentary on DCB Not controlled by MCE - **IND Front/Rear Autoclose CC**: Yes/No - **ATS Front/Rear Opening**: Auto, Constant on DOB, Momentary on DOB, Not controlled by MCE - **ATS Front/Rear Closing:** Constant on DCB, Constant on DCB **OR** CC, Constant on DCB **IF** CC, Constant on Car Call, Momentary on DCB Not controlled by MCE - **ATS Front/Rear Autoclose CC:** Yes/No - **EMSI Front/Rear Opening:** Automatic, Constant on DOB, Momentary on DOB, Not Controlled by MCE - **EMSTI Front/Rear Closing:** Automatic, Constant on DCB, Constant on DCB **OR** CC, Constant on DCB **IF** CC, Constant on Car Call, Momentary on DCB, Momen-

Table 5.2 Touchscreen Organization and Content

Tab	Subtab	Description
	NTS Switches	- **U/DSL (1,3,4) Option**: Virtual, Physical, or Disabled - **USL (1,3,4) Distance**: Programmed distance at which the virtual USL2 switch is positioned from terminal floor level. Distance should be set to the same value as Floor Step Up (top floor) distance. - **DSL (1,3,4) Distance:** Programmed distance at which the virtual DSL2 switch is positioned from terminal floor level. Distance should be set to the same value as Floor Step Down 1 distance.
CONFIG 02	**System Control Parameters**	- **Number of Starters**: (1-3) - **Min. Number of Starters**: (1-3) - **Starting Control Type**: Sequential / Simultaneous - **Soft Stop Delay**: When set, if the start contact signal is removed, the starter will continue to operate normally for this additional time to allow a hydraulic valve to close before motor shutdown. After timer expires, the starter will shut down normally. Set to 0.0 to disable - **Starter Type:** (1-3) Across the Line, WYE-Delta, Siemens, or Sprecher and Schuh - **Starter M Contactor:** (1-3) (Yes/No) - **Starter Up to Speed**: (1-3) (Min . 50 Max 6.50 Default 1.) - **Up to Speed Delay**: (1-3) Set the amount of time that the controller will wait to allow the motor to accelerate to nominal speed. Set to 0.0 to disable. Max is 15 seconds - **Starter W-D Transition:** (1-3) (0.05 to 0.50 seconds timer) - **Valve Type**: Standard, TKE/Dover, Pilot Relays, or Bucher - **Contract Speed:** Set to contract speed for car - **Relevel Distance**: After initial leveling into the floor, defines the distance on either side of level which the car can drift before releveling is activated. Must always be greater than Dead Zone Distance - **Level Dead Zone Distance**: When moving normally between floors or correcting to a floor from beyond 6 inches, it defines the distance on either side of exact level at which the stop command is issued to coast into the floor. Start with 0.5 inches - **Relevel Dead Zone Distance:** When correcting to a floor from within 6 inches (releveling to a floor), it defines the distance on either side of exact level at which the stop command is issued to coast into the floor. - **Slow Inspection Speed:** (Yes/No)

Table 5.2 Touchscreen Organization and Content

Tab	Subtab	Description
CONFIG 03	**Building Security**	- **Security Enabled**: (Yes/No) If Yes, enables car call security. Valid credential must be recognized by security system and Car Call Enable signal issued to controller before call may be registered - **DEDICATED UIO CALL ENABLE:** (NONE, CAR, HALL, CAR, HALL) Used when the security hall call enable inputs are dedicated on the UIO board. - **CC Enable Inputs Polarity:** (ACTIVE HIGH, ACTIVE LOW) If ACTIVE HIGH, a high state of the car call enable signal is required to register car calls. If ACTIVE LOW, a low state of the car call enable signal is required to register car calls. - **HC Enable Inputs Polarity:** (ACTIVE HIGH, ACTIVE LOW) If ACTIVE HIGH, a high state of the hall call enable signal is required to register hall calls. If ACTIVE LOW, a low state of the hall call enable signal is required to register hall calls. - **Enable DOB on Security**: (Yes/No) If yes, the Door Open Button is functional at a secured floor. (Prior access required) - **IND Overrides Security**: (Yes/No) If yes, Independent operation overrides security. - **ATS Overrides Security:** (Yes/No) If yes, Attendant Service overrides security. - **Remote CC. Override CCSEC**: If YES, remote calls override security (includes call registration panel in OBD) - **Park at CC Secured Floor:** (Yes, No) If **YES**, the car is allowed to park at a secured car call floor.- SEC. Bracelet (A-H) Floor: (None, 1-16) - **SEC. Bracelet** (**A-H**) **Side:** (None, Front, Rear, Both) - **Allow CC at SECBRAC Floor**: (Yes/No) **NOTE: Security Bracelet inputs are used for wandering patients and child abduction features.**
	Emergency Power	- **Emergency Power Type:** None (No emergency power available), Dispatcher (Emergency recall and run determined by dispatcher), Overlay (Emergency recall and run determined through discrete I/O by emergency power overlay system) - **Cars to Recall/Run on EP:*** Number of cars able to run on emergency power - **EP Delay Timer:*** (2-600 Sec.) delay before running EP logic on generator power - **Pref. Car to Recall First:*** (Car ID1 or Car ID2) - **Pref Car to Run on EP2:*** (EP AUTO) Select car to run on emergency power (Last recalled, Car ID1, Car ID2) - **Bypass EP Sequencing:*** When set to Yes, emergency power recall and select to run phases are bypassed and the maximum number of cars are selected to run on generator power without need of an EP selection switch - **EP Recall Floor**: Floor to which cars will recall on emergency power - **EP Door Operation (Front/Rear)**: Open Doors (DEFAULT) (Doors open at recall floor), Close Doors (Doors remain closed at recall floor), Cycle Doors (Doors will cycle open and then close at recall floor) -**EP Recall Timeout**: Seconds dispatcher should attempt to recall non-responsive car before passing it by ***These parameters are controller by the dispatcher.**

Table 5.2 Touchscreen Organization and Content

Tab	Subtab	Description
CONFIG 03	**Recall Switches**	**Motion 2000 TS provides four car recall inputs, Recall S1 - S4.** For momentary input activation, set latch timer - **Latch Switch(1-4):** (Seconds) At recall floor, car will wait for this period of time for an initiating action to be taken (i.e., independent control initiated, access operation initiated, etc.) before automatically returning to normal passenger service (0 sec. for continuous input) - **Recall Floor (1-4)**: Set to desired recall floor - **RECALL Sn: INDEPENDENT(1-4):** (Yes/No) When set to YES, the car will go into independent service when recall is complete. - **Override Security (1-4):** (Yes/No) If Yes, the recall operation will override security settings for the floor - **Car Calls Disposition (1-4):** How should registered car calls be handled before the car recalls? (Cancel Calls/Answer Calls/Allow New Calls/Cancel Calls at Next Stop) - **Door Operation (1-4):** (Cycle Doors/Doors Closed/Doors Open) Determines door action on arrival at recall floor - **Override IND (1-4):** (Yes/No) If Yes, recall operation will override Independent service - **Override ATS (1-4):** (Yes/No) If Yes, recall operation will override Attendant Service
	Network Settings	- **IP Address**: IP address of car on LAN - **Subnet Mask**: Subnet mask of car on LAN - **Default Gateway**: Default gateway of car on LAN
	CFSS	**Commandeer for Special Service- CFSS Medical Emergency:** (Yes/No) - **CFSS Light Flash:** (No flash, CFSS I, CFSS II **OR** CFSS I **AND** CFSS II) - **CFSS Car Call Disposition:** (Cancel calls, answer calls, allow new calls, or cancel at next stop) - **CFSS Recall Timer:** (0-1800 sec.) - **CFSS BYPASS IND TIMER:** Cars on Independent Service are eligible for CFSS calls if this timer is set to a non-zero value and may be assigned a CFSS call. Independent Service is bypassed and CFSS recall initiated once this timer has expired. Until then, the car remains on Independent Service. (0-1800 sec.)(0=off and 1800 sec.=30 min.) - **CFSS BYPASS ATS TIMER:** Cars on Attendant Service are eligible for CFSS calls if this timer is set to a non-zero value and may be assigned a CFSS call. Attendant Service is bypassed and CFSS recall initiated once this timer has expired. Until then, the car remains on Attendant Service. (0-1800 sec.)(0=off and 1800 sec.=30 min.) - **CFSS I Front/Rear Opening:** (Door settings) - **CFSS I Front/Rear Closing:** (Door settings) - **CFSS II Front/Rear Opening:** (Door settings) - **CFSS II Front/Rear Closing:** (Door settings) - **CFSS II Switch Type:** (Constant, momentary, none) - **CFSS II Without Recall First:** (Yes/No) - **CFSS II Front/Rear Autoclose CC:** (Yes/No) - **CFSS In-Car On Timer:** (0-1800 sec.) - **CFSS In-Car Off Timer:** (0-1800 sec.) - **CFSS II Front/Rear Autoclose CC:** (Yes/No)

Table 5.2 Touchscreen Organization and Content

Tab	Subtab	Description
	Additional Features	- **Sabbath: Enable** (Yes/No) Configures the controller to allow Sabbath Operation. Sabbath is triggered by spare input SABBATH IN. By default, the car will travel to the highest unsecured Sabbath Floor and then work its way down stopping at every unsecured Sabbath Floor. Sabbath Floors are defined in Config 1 > Building Setup > Floor Eligibilities. - **Sabbath: Start Floor** (0-16) (0=None) This floor specifies where a Sabbath trip shall start. If a Start floor is selected, the car will proceed to this floor before it starts servicing the building. - **Sabbath: Return Floor** (0-16) (0=None) This floor specifies where a Sabbath trip shall end, after servicing all Sabbath floors. The user can select to end a Sabbath trip at the last Sabbath floor served or any other floor. - **Sabbath: Pref. Start Dir.** (Up, Down, None) Specifies the preferred Sabbath Operation start direction when Sabbath is activated. Used only if there was no direction when Sabbath was activated and if a Start Floor was not programmed. Otherwise, Sabbath will start in the current direction. - **Sabbath: # of trips** (0-10) (0=Off) Number of trips before the car returns to normal group operation between trips. (all floors are served at least once in configured directions) - **Sabbath: Pause Time** (0-120 minutes) (0=Off) Specifies the time between each Sabbath trip during Sabbath operation. - **Sabbath: Door Open Time** (0.50-120.00 seconds) Specifies the time to keep the doors open after answering a Sabbath call. - **Sabbath: DC Warn. Buzr.** (0.50-120.00 seconds) Specifies the amount of time between sounding the door close warning buzzer and closing the doors after answering a Sabbath call. - **Sabbath: Nudging** (Yes/No) Used to close the doors at reduced speed and torque during Sabbath Operation (needed when the PHE is bypassed via hardware). - **Sabbath: Allow Hall Calls** (Yes/No) Used to specify whether a car remains in service for hall calls during Sabbath trips. - **Sabbath: Allow Car Calls** (Yes/No) Specifies whether car calls can be registered via the COP or other sources during Sabbath trips - **Sabbath: Finish Car Calls** (Yes/No) Specifies if all existing car calls should be answered before a Sabbath trip can be initiated. - **Sabbath: Car Call Lights** (Enable/Disable) Specifies whether to disable the car call buttons light for the during Sabbath trips. - **Sabbath: Door Buttons** (Enable/Disable) Specifies whether to disable all COP door buttons (DCB, DOB, DHOLD) during Sabbath trips. - **Sabbath: Arrival Lanterns** (Enable/Disable) Specifies whether to disable the all car and hall arrival lanterns and gongs during Sabbath trips. - **Sabbath: PI Outputs** (Enable/Disable) Specifies whether to disable non-serial position and direction arrow indicators during Sabbath trips (serial fixtures shall always remain enabled). - **Sabbath: Override Security** (Yes/No) Used to allow secured floors to be serviced during Sabbath trips. - **KEYBOARD CONTROL (KCE):** (Yes/No) Set to enable commands from iMonitor (Recall Command, …).

Table 5.2 Touchscreen Organization and Content

Tab	Subtab	Description
UTILS	**File Transfer**	Allows parameters to be backed up and restored: - **Backup Current Settings** (to SD) - **Restore Backup Settings** (from SD) - **Restore Factory Settings** (from SD) When option is selected, you are prompted to press OK to continue or EXIT to abort without changing defaults
	Register Calls	On-board Car and Hall call registration controls. (Per car only)
	Construc-tion and Bypass Faults	- **Construction/Fault Bypass** When active, enables Construction operation, bypasses faults. Also requires that the Fault Bypass jumper on the HC-CTL-2 board be set to BYPASS and the car be placed on Inspection mode - **Inspection Fault Bypass** When active, bypasses faults on Inspection operation. Also requires that the Fault Bypass jumper on the HC-MPU-2-TS board be set to BYPASS - **Automatic Fault Bypass** Bypasses faults on Passenger operation. Also requires that the Fault Bypass jumper on the HC-CTL-2 board be set to BYPASS. A countdown timer will appear on the Home screen, counting down from 2 hours. When the timer expires, the car will automatically exit fault bypass operation. If more time is required, must be re-enabled
	Safety Tests	Compliance Testing (Future)
	Date and Time	Date, time and day of the week setting controls
	Landing System Utilities	**Hoistway Learn** (Landing System Learn) - Allows you to learn the hoistway, page 3-18. LS-EDGE only. **Landing System View** - Displays position and speed information at upper and lower leveling markers during floor leveling. Displays ON/OFF status for SDU (Slow Down Up), ULMF (Up Level Marker, Front), ULMR (Up Level Marker, Rear) DZF (Door Zone, Front), DZR (Door Zone, Rear), DLMF (Down Level Marker, Front), DLMR (Down Level Marker, Rear), SDD (Slow Down Down). LS EDGE only
SYSTEM IO	**System Inputs**	On/Off status of dedicated inputs
	System Outputs	On/Off status of dedicated outputs
	Pro-grammed Inputs	On/Off status of programmable inputs
	Pro-grammed Outputs	On/Off status of programmable outputs
	Front CPI I/Os	On/Off status of CPI inputs/outputs
	Rear CPI I/Os	On/Off status of CPI inputs/outputs

Table 5.2 Touchscreen Organization and Content

Tab	Subtab	Description
SYSTEM DIAG	**Event Log**	First In, First Out record of the last 100 events, time and date stamped. Colors: Blue = informational; Yellow = fault; Red = Error; Gray = No longer active
	Door Control	On/Off status of door control inputs/outputs.
	Diagnostics Tree	Indicators for selected PLD functions. See page 5-38
	Landing System	On/Off status of landing system inputs/outputs
	Active Events	Displays currently active system events
CAR DIAG	**CAR Op. Flags**	Indicators for car operation activity
	CAR Op. Numeric	Data register information for factory assisted diagnosis
	Emergency Pwr & EQ	Indicators related to emergency power and earthquake operation
	Door Dwell Times	Indicators for active dwell timers
	Itinerary Manager	Indicators for active car operation signals
	Features Diag	Diagnostics for Sabbath Status, etc.
MOTION DIAG	**MOTION Flags**	Indicators for motion activity
	MOTION Numeric	Data register information for factory assisted diagnosis
	MOTION Inputs	Indicators for motion related inputs
	MOTION Outputs	Indicators for motion related outputs
GROUP DIAG	**Group to Car Data**	Group to car data monitoring
	Car to Group Data	Car to group data monitoring

Table 5.2 Touchscreen Organization and Content

Tab	Subtab	Description
PLD DIAG	**PLD Flags**	Indicators for PLD related I/O
	PLD Numeric	Data register info for PLD
	PLD Inputs	Indicators for PLD related inputs
	PLD Outputs	Indicators for PLD related outputs
ACTION INFO	**Car Call Canceled Due To**	Conditions affecting car call cancellation and their status
	Hall Call Canceled Due To	Conditions affecting hall call cancellation and their status
	Door Open Due To	Conditions affecting door opening and their status
	Door Close Due To	Conditions affecting door closing and their status
	Prohibit Run/Start Due To	Conditions affecting car running and their status

Table 5.2 Touchscreen Organization and Content

Tab	Subtab	Description
STATUS INFO	**CPU Bus Com Status**	Conditions affecting processor communication and their status
	Monitoring Tools	**-Reset XPORT:** Resets LAN port on SCHP board **-Default Password** **-TFTP Status**
	CAN Bus Viewer	Allows viewing CAN bus data for HC-MPU-2-TS board. Each string provides the ID of the device and eight packets of Hex data bytes. This tool is intended to be used in conjunction with MCE technical support
	Version Information	Software version information
	Other Car Settings (display only; reflects duplex-related settings)	- **Emergency Power Type 2**: As selected. - **Car 2 Floor (nn) Opening**: Front/Rear/None per floor served by non-dispatching car of Duplex. - **Car 2 Floor Heights**: Height in inches per floor served by non-dispatching car of Duplex. Used by the Dispatching car to calculate ETA when making decisions **- Car 2 Contract Speed**: **- Car 2 Top Floor**: **- Car 2 Floor Eligibilities** - Opening - CFSS - Sabbath Up (Front/Rear) - Sabbath Down (Front/Rear)
	Address Diagnostics	- Allows you to request selected processor register data via address entry. Technician assisted troubleshooting
STATS	**Maintenance Statistics**	Power cycles, Resets, Starts, etc.
	Hourly Statistics	Last 24 hours, per hour statistics for car calls, hall calls, up runs, down runs
	Hall Bus Inventory	With all hall calls installed and working, press INVTRY to inventory switches and indicators. After Inventory is run, press TEST to test for switch or indicator problems

Table 5.2 Touchscreen Organization and Content

Tab	Subtab	Description
SCOPE	**View Scope**	Near real time scope with four trace capacity
	Landing System Signals	Select trace signals from landing system
	System Inputs	Select trace signals from among dedicated inputs
	Pro-grammed Inputs	Select trace signals from among programmable inputs
	System Outputs	Select trace signals from among dedicated outputs
	Pro-grammed Outputs	Select trace signals from among programmable outputs

Note

CAR Diagnostics / Motion Numeric

The Motion Flags that reference floor numbers are directly readable and require no code reference (as do the flags intended for use with MCE technical support). Numbers are zero-based; zero = one, 1 = 2, etc.

- Target Floor: Displays the floor number of the next intended stop.
- New Target Floor: If new registration assignment changes the Target floor, the new target floor number will appear here momentarily before Target data is updated.
- Next Target Floor: Displays the floor number of the intended stop after the Target floor.
- Start Position: Displays the floor number at which the current run began.
- Current Position: Displays the floor number at which the car is currently stopped.

Spare Input and Spare Output Tables

Table 5.3 Spare Inputs

Input	Description
NOT USED	Input is not used
ALIVE	Input used in Duplex operation to inform the car that the other car is powered
APS ON	Auxiliary power supply is on (HAPS)
ATS ON	Attendant Service ON activation
ATS UP	ATS UP direction
ATS DOWN	ATS DOWN direction
ATS NSI	ATS NON-STOP input (Ignores hall calls)
AUTOSTOP	Enables the Autostop feature
CC ENABL1-16	Car Call Enable Inputs from security system (1-16)
CC ENABL1-16R	Car Call Enable Inputs from security system (1-16R)
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.
CFSS II SW	In-Car CFSS switch
CFSS II CNCL	In-Car CFSS Cancel Input (For momentary CFSS II Operation)
DCB/DCBR	Activate this input to close doors
DCB HALL/ DCBR HALL	Front/Rear Hall Door Close buttons. Activate this input to close doors
DCL/DCLR	This limit switch opens when doors reach closed position
DCL-C	Door close limit DCL complement
DCLR-C	Rear Door close limit DCLR complement
DLMF	Front Down level marker. Used to locate floor for preopening and for final approach. Inner leveling zone is set by DLM and DZ
DLMR	Rear Down level marker. Used to locate floor for pre-opening and for final approach. Inner leveling zone is set by DLM and DZ
DOB/DOBR	Activate this input to open the doors
DOB HALL/ DOBR HALL	Front/Rear Hall Door Open buttons. Activate this input to open the doors.
DOL/DOLR	This limit switch opens when the doors are fully open
DHOLDR	Rear Door Hold button. Activate this input to hold the doors open
DHOLD HALL DHOLDR HALL	Front/Rear Hall Door Hold buttons
DOOR HOLD	Activate this input to hold the doors open
DPM	Door Position Monitor. Code Mandated limit switch that tells us doors are truly closed
DPMR	Rear Door Position Monitor
DSTOP/DSTOPR	Front/Rear Door Stop buttons. Deactivate this input to stop partially open doors
DSTOP-C	Front Door Stop Button Complement. Activate this input to stop partially open doors
DSTOPR-C	Rear Door Stop Button Complement. Activate this input to stop partially open door
DSTOP HALL/ DSTOPR HALL	Front/Rear Hall Door Stop buttons. Deactivate this input to stop partially open doors
DSTOP HALL-C	Front Hall Door Stop Button Complement. Activate this input to stop partially open doors
DSTOPR HALL-C	Rear Hall Door Stop Button Complement. Activate this input to stop partially open doors

Table 5.3 Spare Inputs

Input	Description
EMDISP	Emergency Dispatch. Sometimes referred to as Wild Operation, takes over in the event of dispatch failure. This input forces this operation
EMDISP OV	Emergency Dispatch Override. Input that bypasses Wild Operation; when active, car will stay at last call entered, in the event of a dispatcher failure
EMSC SW	In-car Emergency Medical Service input that transfers car to Phase 2 of emergency medical service
EMSH SW	Hallway key switch that activates Phase 1 of emergency medical service
EPI	Emergency Power Input: A normally closed contact that opens to alert controller to presence of Emergency Power
EPI-C	Inverted Emergency Power Input: A normally open contact that closes to alert controller to presence of Emergency Power
EP AUTO	When input is active, car to run on emergency power is automatically selected
EP MANUAL	Emergency Power Manual Select Input: Use this input to manually select car to run on Emergency power operation
EPOVL ECRN	Emergency Power Overlay Freeze Car Input. Used to freeze, recall, shutdown, and run the car
EPOVL EPR	Emergency Power Overlay Recall Input used to freeze, recall, shutdown, and run the car
EPOVL EP2	Emergency Power Phase II Input. Used to indicate that the supervisor/dispatcher is on emergency power phase II (selection phase).
EQ SS	Earthquake Seismic Switch: Input from **Shaker Box** that tells the controller that an earthquake has occurred
FR1 OFF	OFF position of the primary fire recall switch. When in OFF position, system looks to smokes to determine status of Fire Service. (Optional, not required)
FR1 ON	ON position of the primary fire recall switch. When in ON position, system is on fire recall to main fire recall floor
FR1 ON2	ON position of additional fire recall switch. Similar to FR1 ON; However, both switches must be off to reset fire service
FR1 RESET	RESET position of the primary fire recall switch. Used to reset or bypass Fire Service Phase I
FR2 CANCEL	Firefighter's CALL CANCEL Switch: When on Phase 2 Fire, used to cancel any existing car calls
FR2 HOLD	HOLD position of the firefighter's in car switch. Used to hold doors open when on Phase 2 Fire Service
FR2 OFF	OFF position of the firefighter's in car switch. When turned to OFF position, car returns to fire recall floor and reverts to Phase 1 Fire Service
FR2 ON	ON position of firefighter's in car switch. Places car on Phase 2 Fire Service
FRSA	When OFF (active low) car returns to alternate recall level on Phase 1 Fire and flashes fire hat.
FRSA OTHER	(Duplex only) Other cars MAIN recall input (From MR or Hoistway). Will not cause fire hat to flash for this car
FRSM	When this input goes low, car returns to fire recall floor on Phase 1 Fire and flashes fire hat
FRSM OTHER	(Duplex only) Other cars ALT recall input (From MR or Hoistway). Will not cause fire hat to flash for this car
HC CANCEL	Hall Call Reject. When active, cancels any remaining hall calls
HC ENABL (1 - 8)	Front Hall Call Enable inputs from the security system for Floors 1 to 8. Used to enable registration of secured front hall calls for Floors 1 to 8. Use the dedicated UIO board for building with more than 8 floors.

Table 5.3 Spare Inputs

Input	Description
HC ENABL (1R - 8R)	Rear Hall Call Enable inputs from the security system for Floors 1 to 8. Used to enable registration of secured front hall calls for Floors 1 to 8. Use dedicated UIO board(s) for building with more than 8 floors.
IND SERV	When active, places car on Independent service
LOAD DISP	Load weigher input that shortens door dwell time at the lobby when activated
LOAD HEAVY	Heavy Load. When active, causes car to bypass hall calls until load in car decreases
LOAD LIGHT	Light Load. Used for anti-nuisance. If activated, only programmed number of car calls can be latched. Placing more than this number will cancel all car calls.
LOAD OVER	Overload. When active, doors will be held open until load diminishes. Bypassed by Fire Phase II
LOAD OVER2	Overload 2. When active, doors will be held open until load diminishes. Not bypassed by Fire Phase 2
OIL LOW	Oil Low Switch. When active, indicates that the tank is low on oil and shuts down the car
OIL LOW-C	Inverted Low Oil Switch. When low indicates that the tank is low on oil and shuts down car. Complement of Oil Low
OIL PRESS	Oil Pressure Switch. When low, causes the car to stop
OIL VISC	Oil Viscosity. When active, Causes pump to run in order to warm up oil
OIL VISC-C	Inverted Oil Viscosity. Complement of Oil Viscosity
OIL TEMP	Oil Temp Switch. When high, causes oil tank temperature shutdown
OIL TEMP-C	Inverted Oil Temp Switch. Complement of Oil Temp
PARK ENABLE	Park Enable input. This input is used to determine whether the car will park or not. The car will park if the input is active, otherwise, it is not available for parking.
PFG ENABLE	Passing floor gong enable button. When assigned, passing floor chime will only sound after this button is pressed.
PHE/PHER	Photo Eye. Optical reopening means for doors connects here. When active causes doors to reopen
PHE-C/PHER-C	Inverted photo eye. Optical reopening means for doors connects here. When low, causes doors to reopen
PHE CUT/ PHER CUT	Photo eye cut out switch. When active, disables Photo eye input
PHE2	Auxiliary Photo Eye Front input. Signal from the front side auxiliary light curtain. It is normally low and shall be high when the front light curtain detects an object.
PHE2R	Auxiliary Photo Eye Rear input. Signal from the rear side auxiliary light curtain. It is normally low and shall be high when the rear light curtain detects an object.
PHE2-C	Auxiliary Photo Eye Complement Front input. Signal from the front side auxiliary light curtain. It is normally high and shall be low when the front light curtain detects an object.
PHE2R-C	Auxiliary Photo Eye Complement Rear input. Signal from the rear side auxiliary light curtain. It is normally high and shall be low when the rear light curtain detects an object.
PHE2 CUT	Auxiliary Photo Eye Cut Front input. Signal from a switch to disable the Front Auxiliary Photo Eye.
PHE2R CUT	Auxiliary Photo Eye Cut Rear input. Signal from a switch to disable the Rear Auxiliary Photo Eye
PIT FLOOD	Flood Level Switch. When active, prevents car from servicing floors at or below programmed flood level. (Car will move above the flood level.)
PTI	Power Transfer Switch. When active, causes car to stop at nearest floor and cycle doors. Car is then taken out of service
PTI-C	Inverted Power Transfer Switch. When low, causes car to stop at nearest floor and cycle doors. Car is then taken out of service

Table 5.3 Spare Inputs

Input	Description
R2L	Redundancy 2L bus. Used to monitor the normally closed contact of an additional 2L relay.
RECALL S1	When active, recalls car to programmed floor. See CONFIG 03 Recall Switches
RECALL S2	When active, recalls car to programmed floor. See CONFIG 03 Recall Switches
RECALL S3	When active, recalls car to programmed floor. See CONFIG 03 Recall Switches
RECALL S4	When active, recalls car to programmed floor. See CONFIG 03 Recall Switches
RESYNC	When active, forces jack resynchronization operation
RFV	Redundancy Fast Valve - Used to monitor the up/down fast valve relay when the VALVE TYPE option is set to PILOT RELAYS.
RSV	Redundancy Slow Valve - Used to monitor the up/down slow valve relay when the VALVE TYPE option is set to PILOT RELAYS.
SABBATH IN	Sabbath Operation Input
SAF EDGE/SAF EDGER	Safety Edge. When active, reopens doors
SAF EDGE-C/ SAF EDGER-C	Inverted Safety Edge. When low, reopens doors
SECBRAC_(A-H)	Security bracelet inputs used for wandering patient (Floors 1-8)
SECBRAC_OV	Security bracelet override
SEC CCEN OV	Car Call Security Enable Security Override Input. When active, car call security is disabled
SEC HCEN OV	Hall Call Security Enable Security Override Input. When active, hall call security is disabled
SECRTY OV	Security Override input. When active, both car and hall call security are disabled.
SLOW INSP	Slow Inspection Speed. Slows car to reduced inspection speed when active
STD	Step down vane or magnet for down direction of travel. Also used for floor encoding.
STU	Step up vane or magnet for up direction of travel. Also used for floor encoding.
ULMF/ULMR	Up level marker. Used to locate floor for preopening and for final approach. Inner leveling zone is set by ULM and DZ

Table 5.4 Spare Outputs

Output	Description
NOT USED	Input is not used
APS DONE	Auxiliary Power Supply complete. HAPS asserts this output when return is complete
ARROW DN	Turns ON when preferred direction of travel is below the car's present location.
ARROW UP	Turns ON when preferred direction of travel is above the car's present location.
ARROW DN 2	Turns ON when preferred direction of travel is below the car's present location. Will turn OFF during certain modes of operation and/or conditions per the configured options for disabling the spare and/or the dedicated UIO PI outputs (Inspection, Fire, Medical, etc.)
ARROW UP 2	Turns ON when preferred direction of travel is above the car's present location. Will turn OFF during certain modes of operation and/or conditions per the configured options for disabling the spare and/or the dedicated UIO PI outputs (Inspection, Fire, Medical, etc.)
ATS ON	Attendant Service Light
ATS BUZZER	Attendant Service Buzzer
ATS HCBABOVE	Attendant hall call assigned above the car
ATS HCBELOW	Attendant hall call assigned below the car

Table 5.4 Spare Outputs

Output	Description
BACKUP PWR	Battery lowering has been activated by the APS ON input (HAPS/TAPS)
CAR DELAY	Car has not been able to move. Typically due to doors being held open
CAR GONG/R	Car gongs
CAR LANTDN/R	Down car lanterns
CAR LANTUP/R	Up car lanterns
CC REGSTRD	Car call Registered. Activates for 1/2 second when a car call is registered
CC SECURED	Car Call Secured. Activates for 1/2 second if a secured car call button is pressed
CFSS BUZZER	Turns on when car begins to recall to CFSS floor. Turns off when car arrives or car is reassigned.
CFSS LIGHT	This car is on CFSS operation
CFSS IN_CAR	This output turns **ON** when the doors are fully open after answering a CFSS call. It remains ON during CFSS In-Car operation. Turns OFF when the car goes back to Passenger.
CFSS IN_USE	This car is in use for CFSS and is not available
CLOSING F/R	The doors are closing or attempting to close. See output DCF.
DCF/DCFR	Activates to close the doors. Turns off after door lock is established. Door Close Function
DCW LIGHT_F	Description: Door Close Warning Light Front output. Used for power operated vertically sliding doors whenever they are closed automatically or with momentary pressure by MCE. It comes on for a predetermined time prior to the start of closing and stays on until the front doors are closed. Note: The closing delay may be omitted when momentary pressure closing type doors are closed using the in-car door close button.
DCW LIGHT_R	Door Close Warning Light Rear output. Used for power operated vertically sliding doors whenever they are closed automatically or with momentary pressure by MCE. It comes on for a predetermined time prior to the start of closing and stays on until the rear doors are closed. Note: The closing delay may be omitted when momentary pressure closing type doors are closed using the in-car door close button.
DCW BUZZR_F	Door Close Warning Buzzer Front output. Used for power operated vertically sliding doors whenever they are closed automatically or with momentary pressure by MCE. It comes on for a predetermined time prior to the start of closing and stays on until the front doors are closed (usually after the closing warning light). Note: The closing delay may be omitted when momentary pressure closing type doors are closed using the in-car door close button.
DCW BUZZR_R	Door Close Warning Buzzer Rear output. Used for power operated vertically sliding doors whenever they are closed automatically or with momentary pressure by MCE. It comes on for a predetermined time prior to the start of closing and stays on until the rear doors are closed (usually after the closing warning light). Note: The closing delay may be omitted when momentary pressure closing type doors are closed using the in-car door close button.
DHOLD ON	Door Hold Function Front
DHOLDR	Door Hold Function Rear
DHOLD END/R	Door hold function ending warning buzzer
DISABLE PI	Disable PI outputs
DISAUTOCLSF	Disable Auto Close Front. Used on freight doors that are not controlled by MCE, this output comes when front door auto closing is not allowed (Fire recall complete, Fire Phase II, IND, ATS, Door Hold...).

Table 5.4 Spare Outputs

Output	Description
DISAUTOCLSR	Disable Auto Close Rear. Used on freight doors that are not controlled by MCE, this output comes when front door auto closing is not allowed (Fire recall complete, Fire Phase II, IND, ATS, Door Hold...).
DISHALBTNSF	Disable Hall Door Buttons Front. Used on freight doors that are not controlled by MCE, this output comes on when all front hall door buttons (DOB, DCB, DHOLD…) need to be disabled (Fire Phase II, IND, ATS...).
DISHALBTNSR	Disable Hall Door Buttons Rear. Used on freight doors that are not controlled by MCE, this output comes on when all front hall door buttons (DOB, DCB, DHOLD…) need to be disabled (Fire Phase II, IND, ATS...).
DLEFT OPENF	Door Left Open Bell Front output. Used for non-automatic doors. It comes on if the front doors are open, while a front/rear hall call button is pressed.
DLEFT OPENR	Door Left Open Bell Rear output. Used for non-automatic doors. It comes on if the rear doors are open, while a front/rear hall call button is pressed.
DOF/DOFR	Turns ON to open the doors. Door Open Function
DOOR CAM F	Door Cam Front output. Used on jobs with a retiring cam mechanism to lock the hoistway doors. It comes on when there is a demand to move and both front/rear car gates are closed. This output shall not be ON if the car is stopped in between floors.
DOOR CAM R	Door Cam Rear output. Used on jobs with a retiring cam mechanism to lock the hoistway doors. It comes on when there is a demand to move and both front/rear car gates are closed. This output shall not be ON if the car is stopped in between floors.
DOOR ENAB F	Door Enable Front. Used on freight doors that are not controlled by MCE, this output comes on to enable the front door operation. It is turned off during whenever door operation is disabled (Inspection, Test, door stop, in-car stop switch…).
DOOR ENAB R	Door Enable Rear. Used on freight doors that are not controlled by MCE, this output comes on to enable the front door operation. It is turned off during whenever door operation is disabled (Inspection, Test, door stop, in-car stop switch…).
EF GONG	Egress floor arrival gong
EMSC BUZZR	Emergency Medical Service car buzzer output
EMSC LIGHT	Emergency Medical Service car light output
EMSH LIGHT	Emergency Medical Service hall light output
EP CAR DONE	Emergency power recall done output. This output comes ON 4 sec after the doors are fully open to allow for releveling.
EP LIGHT	Emergency power light. Flashes when car is selected to recall on emergency power. Solid when car is selected to run.
EP LOBBY	Intended to drive a light at the designated emergency power return floor after the car is at the floor with doors open on emergency power
EP ON	Emergency power ON output
EP SELECT	Emergency power car selected to recall or run output
EP1 ON	Emergency power lowering phase output
EP1 RECALL	Emergency power car selected to recall output
EP2 ON	Emergency power Phase 2 run output active
EP2 RUN	Emergency power car selected to run output
EPOVL R. FAIL	Emergency Power Overlay Recall Fail output. Activated by the car that is commanded to recall if it fails to complete the recall within the user defined time (needed for EP 2008 and later).
EPOVL INIT R	Emergency Power Overlay re-Initiate Recall output. Activated by the car when emergency power recall needs to be re-initiated. Used when the car has recalled to a floor that is no longer safe due to Flood of Fire (needed of EP 2008 and later).

Table 5.4 Spare Outputs

Output	Description
EPOVL BYP R	Emergency Power Overlay Bypass Recall output. Activated by the car when the is in service. Used during the automatic selection during the emergency power phase 2).
EPOVL ISV	Emergency Power Overlay In Service output. Activated by the car when the car is in service. Used during the automatic selection during the emergency power phase 2 (needed for EP 2008 and later)
EPOVL PRI1 through PRI3	Emergency power overlay priority outputs
EQ BUZZER	Turns ON after an earthquake has been detected
EQ LIGHT	Turns ON after an earthquake has been detected
FAN LIGHT	Controlled by FLO Timer (Default 5 minutes) located in System Timers
FLASH	Flashing output (generic)
FLR GONG	Output activates when a car passes a floor
FR HAT	Illuminates when on Fire Phase 1 / Flashes for certain conditions
FR ISV	In service for fire service light
FR RECALL	Fire recall light
FR1 BUZR	Fire I buzzer
FR1 DONE	Fire recall complete
FR1 LIGHT	Fire phase one in effect light
FR1 SYSTEM	Turns on solid or flashes based on either car's fire status
FR2 STATUS	In car fire Phase 2 service status
FSO	Fire service light output
GATE RELEAS	Gate Release Solenoid output. Typically used on horizontally sliding fully manual doors to release the car gate and allow it to close. This output shall be ON when the hoistway doors are closed and there is a demand to move the car. It shall be turned OFF when both car gates are fully closed
GLANTF UP (1-4)	Gongs/Lanterns Outputs UP FRONT output Floor (1-4)
GLANTF DN (2-5)	Gongs/Lanterns Outputs DOWN FRONT output Floor (2 -5)
GLANTR UP (1-4)	Gongs/Lanterns Outputs UP REAR output Floor (1-4)
GLANTR DN (2-5)	Gongs/Lanterns Outputs DOWN REAR output Floor (2-5)
IND SERV	Independent Service has been activated by IND SERV Input
INSPECTION	Inspection has been activated by one of the controller inspections inputs (INCT, INCP, INA OR MRIN)
IN USE	Common In Use light used for freight elevators
LCTO FRONT	Light Curtain Test Output Front output. Used on freight doors when an auxiliary photo eye device is required/installed for the door operator (Peelle) to perform the Photo Eye safety integrity check required for A17.1a-2008/CSA B44a-08 and later.
LCTO REAR	Light Curtain Test Output Rear output. Used on freight doors when an auxiliary photo eye device is required/installed for the door operator (Peelle) to perform the Photo Eye safety integrity check required for A17.1a-2008/CSA B44a-08 and later.
MISV	**Mechanically In Service** This output is usually **ON** when the car is running normally. It turns **OFF** when the car appears to be mechanically out of service due to a fault (Safety String Open, Oil Operation, Motor/Valve Timeouts, etc.). The event log and/or the active faults screens should indicate which faults triggered MISV output to OFF.
NUDG/NUDGR	Usually occurs due to a blocking of photo eye input. Results in reduced closing speed and torque
NUDG BUZER/ NUDGR BUZER	Active when nudging operation is invoked

Table 5.4 Spare Outputs

Output	Description
OPENING F/R	The doors are opening or attempting to open. See output DOF/DOFR
OVERLOAD	Car is in Overload Status
OVERLOAD2	Car is in Overload 2 Status
PI OUTPUT (1-8)	Position Indicators outputs. Fully configurable for standard binary, gray code or one line per floor. Use dedicated UIO board (s) if more than 8 outputs are needed
PIT FLOOD	Pit Flood operation has been activated by the Pit Flood input, which prevents access to certain floors
SAB ENDED	Sabbath Mode has Ended
SAB ON	Sabbath Mode is On
SERV IN	Car in service on Passenger Mode
SERV OUT	Car not in service for hall calls
SHUTDOWN	Car shutdown

Table 5.5 Acronym Descriptions and Memory Locations

Acronym	Description and Memory Location
NOT USED	An available spare input, or output, that has yet to be assigned @ CONFIG 01
2 BUS	Primary 110 VAC bus with respect to 1 bus (GND), View status @ MOTION DIAG > MOTION Inputs 2BUS.B, or MOTION Flags 2 BUS
2 STOP FLG	Car is configured for 2 stop operation. When a car is set to be a two stop installation, CONFIG 01 > Building Setup parameters must be properly set and DLMS (Door Lock Middle String) connection on SCE-HVI board must not be connected. View Status @ PLD DIAG > PLD Flags 2 STOP FLG
2LS BUS	110 VAC bus, when active, means that both locks and safeties are active. View @ PLD DIAG > PLD Inputs, scroll to M2L, or MOTION DIAG > MOTION Inputs, M2L.B > M2L.P
2MV BUS	110 VAC bus supply from Fuse F2MV, monitoring source @ MOTION DIAG > MOTION Inputs M2MV.B
SC-3HN	The serial node board connected to hall call push button fixtures (hall call boxes). Use Status Info Tab and then Hall Bus Inventory to inventory and test node boards used in hall call boxes
ABD	Access Bottom Down input from access key switch at bottom floor, view @ MOTION DIAG > MOTION Inputs ABD.B, ABD.P, also view @ PLD DIAG > PLD Inputs ABD
ABU	Access Bottom Up input from access key switch at bottom floor, view @ PLD DIAG > PLD Inputs ABU
ADA	American with Disabilities Act. Denotes special signals, timers, devices, etc. to accommodate disabled access
APS	Auxiliary Power Supply: Typically supplied by a HAPS unit
ATD	Access Top Down @ PLD DIAG > PLD Inputs ATD
ATU	Access Top Up. Key switch access @ PLD DIAG > PLD Inputs ATU
CC	Car Call @ CAR DIAG> CAR FLAGS, view flags starting with CCF (Car Call Front)
CC ENBLx	Car Call Enable, input used to enable a secured car call. View status @ SYSTEM I/O > PROGRAMMED INPUTS
CCF	Please see various CCF flags @ CAR DIAG > CAR FLAGS
CCT	Car Call Dwell Time. Time for doors to remain open after a call has been answered. @ CAR DIAG > Door Dwell Times > Car Call
CDB	Car Door Bypass input from switch @ MOTION DIAG > MOTION Inputs and also PLD DIAG > PLD Inputs

Table 5.5 Acronym Descriptions and Memory Locations

Acronym	Description and Memory Location
CDBO	From OFF position of switch used to bypass car doors. Used for monitoring switch. Car Door Bypass Off @ MOTION DIAG > MOTION Inputs Car Door Bypass OFF input from switch on CPU
CDBOB	From OFF position of switch used to bypass car doors. Used for monitoring switch. Car Door Bypass OFF B input from switch on CPU, NOT Output. Car Door Bypass Output B @ MOTION DIAG > MOTION Inputs and also PLD DIAG > PLD Inputs
CGED	Car Gong Enable Down output. Where digital PIs are missing, used to enable gongs
CGEU	Car Gong Enable Up output. Where digital PIs are missing, used to enable gongs
COS-Timer	Car Out of Service timer @ CONFIG 01 > SYSTEM TIMERS
CP	Car Operating Panel in cab of elevator
CT	Top of elevator cab that includes car top inspection station, door operator, selector. etc.
CTEN	Part of car top inspection station that enables car top direction buttons (button > signal) @ PLD DIAG > PLD Flags, Flag label CTEN.P
CTPR	Cartop power control output located on SC-UPD J3
CTST	Capture for Test (pretest) switch input on HC-MPU-2-TS board, waits for existing car calls to empty out. When activated, hall calls are no longer dispatched. Once car calls have been serviced, the car waits with doors closed expecting TEST operation to be initiated
CYCTST	Cycle Test @ MOTION DIAG > MOTION Inputs and MOTION outputs, indicates end of run cycle test active. Certain critical circuits must be exercised after every operating cycle. We call this logic cycle testing
DCB	When programed to do so, activating this input should close doors that are open. Door Close Button @ System IO > Programmed Inputs
DCF	The DCF output is asserted to pick up the Door Close relay and close the doors. Down Call Front @ CAR DIAG > CAR Flags, various, DCF AT PRESS DCF BELW PRESS, etc. Door Close Function @ SYSTEM DIAG > Door Control
DCL	When doors are fully closed this input should be at zero volts. (low) Door Close Limit @ SYSTEM DIAG > Door Control
DETS	This limit switch is required to slow down the elevator in a manner that will prevent the car/counterweight from striking the reduced-stroke buffer at or below rated buffer speed. Down Emergency Terminal Switch @ SYSTEM DIAG > Landing System
DFLT	A signal that informs the controller that the drive has failed. Drive Fault input to controller @ System IO > System Inputs
DLAB	Bottom door lock that will be bypassed during bottom floor hoistway access operation. Door Lock Access Bottom @ System IO > System Inputs
DLAT	Top floor door lock that will be bypassed during top floor hoistway access operation. Door Lock Access Top @ System IO > System Inputs
DLK	DLK will be active when both car and hoistway door locks are made. Door Lock @ PLD DIAG/PLD Flags, see HDLK (Hall), GDLK(GATE) and on OBD - LOCKS
DLM	Engaged when the car enters the leveling zone 6” above floor level. Down Level Marker @ System IO > System Inputs
DLMS	When intermediate door locks are made, DLMS will be active (high). Door Lock Middle String @ PLD DIAG > PLD Inputs
DOB	Activating DOB when the car is floor level will cause the doors to open when on normal automatic operation. Door Open Button @ System IO > Programmed Inputs
DOF	This output is asserted to activate the door open relay that will cause the doors to open. Door Open Function (signal) @ System IO > System Outputs
DOL	When the doors are fully open, the DOL limit will go low (0 volts). It is high otherwise. Door Open Limit @ System IO > Programmed Inputs
DPM	Door Position Monitor limit switch input activates approximately 2” before door lock and is used to monitor the lock condition of the doors. @ System IO > Programmed Inputs

Table 5.5 Acronym Descriptions and Memory Locations

Acronym	Description and Memory Location
DRDY	DRDY is a signal from the drive that it is ready to operate. Drive Ready (input to controller) @ System IO > System Inputs
DRE	The drive tells the controller that it has control of the motor so it is safe to move the car. Drive Enable (output from controller) @ System IO > System Outputs
DRO	DRO tells the controller that it is outputting current to the motor. Car should be moving. Drive On (input to controller) @ System IO > System Inputs
DSL	As a backup to the normal slow down means, the slow down limit switches remove power from the high speed circuits to slow down car. Down Slow Limit @ System IO > System Inputs, see flags DSL1/DSL2
DTL	Normally assigned as the Down Normal Terminal Limit that prevents the car from going on to the final limit switch. Down Terminal Limit @ System IO > System Inputs
DZ	The DZ/DZF/DZR signal that we are within 3” of floor level. Doors will not open unless this signal is active. Door Zone @ CAR DIAG > CAR Flags and SYSTEM DIAG > Landing System and MOTION DIAG > Flags
EQ	Earthquake. A **ring and string** or seismic switch (or both) will be used to activate earth-quake operation. Earthquake view @ SYSTEM I/O > PROGRAMMED INPUTS, EQ SS or EQ CWT
EQR	Earthquake operation is a latching function that requires a manual reset which this switch provides. @ MOTION DIAG > MOTION Inputs, see EQR.B
ESC	Fed by Firefighters Stop Switch. Car top stop switch emergency exit contact and SOS switch. Emergency Stop Car @ System IO > System Inputs
ESCTO.B	Emergency Switch Cutout enable, Safety Processor B @ MOTION DIAG > MOTION Outputs
ETH	Ethernet
FB	Fed by fault bypass jumper on HC-MPU-2-TS. Fault Bypass @ MOTION DIAG > MOTION Inputs, see FBYP.P Flag
FLO	Fan Light Output @ CAR DIAG > CAR Flags also in CONFIG 01 > System Timers
FLT Bypass	Bypass input on HC-MPU-2-TS board, view @ PDL DIAG > PLD INPUTS, FLT BYP JPR and also @ SYST 1/O, System Inputs, FLT BYP
FLPWR	Car fan and light power control @ MOTION DIAG > MOTION Outputs, FLPWR.B
FR	Fault Reset @ PLD DIAG > PLD Inputs, FLT RST BTN
FR HAT	Fire service light enable output @ System IO > Programmed Outputs
FR1 BUZZER	Fire service buzzer enable output @ System IO > Programmed Outputs
FR1 LIGHT	Fire service light, lobby, enable @ System IO > Programmed Outputs
FR1 OFF	Fire recall switch off input @ System IO > Programmed Inputs
FR1 ON	Fire recall switch on input @ System IO > Programmed Inputs
FR1 RESET	Fire Recall reset input @ System IO > Programmed Inputs
FR2 CANCL	In-Car Fire Service Car Call Cancel @ SYSTEM IO > PROGRAMMED INPUTS, FR2 Cancel
FR2 HOLD	In-Car Fire Switch Hold System IO > PROGRAMMED Inputs, FR2 Hold
FR2 OFF	In-Car Fire Switch OFF @ System IO > PROGRAMMED Inputs, FR2 OFF
FR2 ON	In-Car Fire Switch ON @ System IO > PROGRAMMED Inputs, FR2 ON
FRA	Fire Recall Alternate @ System IO > Programmed Inputs
FRS	Fire Recall Main @ System IO > Programmed Inputs
FRSA	Fire Recall Switch, this car Alternate @ System IO > Programmed Inputs
GOV	Governor input that opens if car over speeds. Drops safety string and activates rope gripper.
GP	General Purpose. Cycle Test I/O if used
GS	PLD gate switch monitor @ PLD DIAG > PLD Inputs
HAPS	Hydraulic Auxiliary Power Supply (MCE APS product for hydraulic elevators)

Table 5.5 Acronym Descriptions and Memory Locations

Acronym	Description and Memory Location
HC	Hall Call
HCF	Hall Call Front
HCT	Hall Call Time. Defined time for doors to remain open @ CAR DIAG > Door Dwell Timers
HDB	From ON position of switch used to bypass hoistway doors. Also places car on inspection simultaneously. Hoistway Door Bypass signal to Safety Processor B @ MOTION DIAG > MOTION Inputs
HDBO	From OFF position of switch used to bypass hoistway doors. Used for monitoring switch Hoistway Door Bypass Off @ MOTION DIAG > MOTION Inputs
HDBOB	From OFF position of switch used to bypass hoistway doors. Used for monitoring switch Hoistway Door Bypass OFF B @ MOTION DIAG > MOTION Inputs
ICEN	In Car Inspection Enable @ System IO > System Inputs
ICPD	In Car Inspection push button down @ System IO > System Inputs
ICPU	In Car Inspection push button up @ System IO > System Inputs
ICTD	Inspection Cartop down button @ System IO > System Inputs
ICTU	Inspection Cartop up button @ System IO > System Inputs
IN1H	Programmable 24VDC active high input. Seismic (SS) or Counterweight (EQH) input. See Job prints @ GROUP DIAG > GROUP inputs
IN2H	Programmable 24VDC active high input. Seismic (SS) or Counterweight (EQH) input. See Job prints @ GROUP DIAG > GROUP inputs.
INA	Inspection, Access. Hoistway access enable switch input @ System IO > System Inputs
INCP	Inspection Car Panel @ System IO > System Inputs
INCT	Inspection, Car Top @ System IO > System Inputs
IND	Independent service input, @ SYSTEM IO > PROGRAMMED Inputs
LLI	Light Load Input. Input from load weigher @ System IO > Programmable Inputs
LOT	Lobby Open Dwell Time. Defined time for doors to remain @ CAR DIAG > Door Dwell Times
MC-CPI-2	The serial car panel interface board normally used to convert car panel signals to serial
MEB3 4	Monitor of solid state driver for EB3/4 @ MOTION DIAG > MOTION Inputs (Car Stop Bypass)
MLT	Motor Limit Timer (Anti-Stall) @ ACTION INFO > Prohibit Run/Start Due to
MAIN CLOCK	Main Clock @ PLDDIAG > PLD Inputs
MPME	Monitor for PME solid state driver for UP Fast valve @ PLD DIAG > PLD Inputs
MPSBR	MPSBR is used by HAPS to signal the controller to lower the car. MPSBR can be found on page 3 of System Inputs
MRDN	Machine Room DOWN (inspection direction button) @ PLD DIAG > PLD Inputs
MREN	Machine Room Enable (inspection enable button) @ PLD DIAG > PLD Inputs
MRIN	Machine Room Inspection @ PLD DIAG > PLD Inputs
MRUP	Machine Room UP (inspection direction button) @ PLD DIAG > PLD Inputs
NDF	Nudging Function (signal) @GROUP DIAG > GROUP Outputs
NUDG	Nudging (door closing) @ SYSTEM DIAG > Door control
PFG	Passing Floor Gong @ System IO > Programmable Outputs, see FLR GONG flag
PHE	Photo eye protection device for elevator car doors @ SYSTEM DIAG > Door Control
PLD	Programmable Logic Device
PME.B	Primary Output to pick Up Fast valve by MOTION @ MOTION DIAG > MOTION Outputs
PME.P	Primary Output to pick Up Fast valve by PLD @ PLD DIAG > PLD Outputs
PMP	Primary Motor Contactor Proving @ PLD DIAG > PLD Inputs - not used on Hydro controllers
PTI	Power Transfer Input. Use to shut down the elevator @ System IO > Programmable Inputs

Table 5.5 Acronym Descriptions and Memory Locations

Acronym	Description and Memory Location
SAFC.P	Safety String Car @ MOTION DIAG > MOTION Inputs
SAFH.B	Safety String Hoistway @ MOTION DIAG > MOTION Inputs
SAFP	Safety PLD @ PLD DIAG > PLD Outputs
SANE(x)	Processing device verification @ PLD DIAG > PLD Flags
SCE-CON	Small interface board for LS-EDGE-EL landing system. Generally installed in COP or cartop.
SE	Safe Edge protection device for elevator car doors @ SYSTEM DIAG > Door Control
SPD(n)	Landing System speed input @ MOTION DIAG > MOTION Numeric, see Profile List and Pos
UCF	Up Call Front @ CAR DIAG > CAR Flags CAR DIAG > CAR Flags
UETS	Up Emergency Terminal Switch @ SYSTEM DIAG > Landing System
UIM	Car has left the landing zone with both doors open. Unintended Motion
UIMRST	Manual reset for UIM. Unintended Motion Reset @ System IO > System Inputs
ULM	Up Level Marker @ System IO > System Inputs
USB	Universal Serial Bus
USD	Micro SD RAM
USLx	Up Slow Limit @ System IO > System Inputs see USL1 and USL2 flags
UTL	Up Terminal Limit @ System IO > System Inputs

Troubleshooting Reference

Danger

Always observe safety precautions when troubleshooting. Lethal voltages are present.

This section includes:

- Bus Voltage Testpoints and Fuse Locations
- Touch Screen Tools, page 5-38
- Circuit Board Descriptions, page 5-40
- Fault Message Descriptions, page 5-48

Bus Voltage Testpoints and Fuse Locations

Required operating voltages are distributed through fused buses.

Table 5.6 Bus Voltages

Bus	Description	Testpoints
1	Ground	Controller ground is critical. Poor ground introduces potential danger, electrical noise, and can prevent system inputs, outputs, and assemblies from working correctly. System must be grounded to a point certified by an Electrician. NEC 250.
2	110 VAC	110VAC, 2 Bus for high voltage connections throughout system
24	24 VDC	24VDC, +24, 24CTP, 24HWY buses.

Table 5.7 Backplane Fuses

Bus	Description	Type
FL1 - FL3	Line Voltage	See labeling in controller.
FOC1-FOC3	Oil Cooler Power	See labeling in controller.
FM1-FM6	Line Voltage to Starter	See labeling in controller.
FAC1 & FAC2	Line Voltage to A/C	See labeling in controller.
FAC	Voltage to A/C	See labeling in controller.
FPI-FP3	Line Voltage	See labeling in controller.
FPWR	Power Bus delay	See labeling in controller.
FTD1 & FTD2	Line voltage	See labeling in controller.
F7 & F8	Voltage to door operator	See labeling in controller.
F2MV	Voltage for motor and valve logic	AGC/312
F2EP	Voltage for emergency power	See labeling in controller.
F2H	Voltage for Hall Calls	AGC/312
F2CC	Voltage for Car Calls	AGC/312
F2PI	Voltage for Fixtures	MDQ/313
F2CP	Voltage for COP	MDQ/313
F2	Voltage for 2 Bus	AGC/312
F2FS	Voltage for 2FS Bus	AGC/312

Table 5.7 Backplane Fuses

Bus	Description	Type
FCE1 & FCE2	Voltage for CE Driver Board	MDQ/313
FT(X)	Voltage for Transformer	See labeling in controller.
F24V	Voltage for Serial Calls	AGC/312
FCR	Voltage for Card Readers	AGC/312
F2CE	Voltage to FCE Transformer	MDQ/313
F2V	Voltage to Valves	MDQ/313

Touch Screen Tools

System I/O

At this level, inputs and outputs are grouped separately and alphabetically with no reference to their function.

- Inputs and Outputs: Indicators reflect activation of that physical input or output. When the board LED is lighted, the indicator will also be lighted.
  - System Inputs: Dedicated (non-programmable) inputs status indicators.
  - System Outputs: Dedicated (non-programmable) outputs status indicators.
  - Programmed Inputs: Programmable inputs status indicators.
  - Programmed Outputs: Programmable outputs status indicators.
  - Front CPI I/O Status
  - Rear CPI I/O Status

1. If an input is not in the proper state, troubleshoot the connection and the source.
2. If an output is in the proper state but the system is not reacting accordingly, troubleshoot the connection and the destination equipment.
3. If an output is not in the proper state, check the job prints to see what inputs or internal flags must be asserted in order to enable the output.
   - Troubleshoot associated inputs in System I/O or System Diagnostics.
   - Troubleshoot internal flags according to their origination (i.e., safety processors CAR, MOTION, GROUP, or PLD).

System Diagnostics

At this level, inputs and outputs are gathered into sets according to the system they affect (their collective function). (See troubleshooting steps above.)

- Door Control: Indicators for door related inputs and outputs.
- Landing System: Indicators for landing system related inputs and outputs.
- Event Log: Time stamped entries for system events and faults.
- Diagnostics Tree: Indicators on this screen must be ON in order for the related function to succeed. Some indicators are single; some (+) expand to a list when selected. If the system is not doing what it is supposed to, an unlighted indicator points you to the problem.
- Active Events: Displays currently active events.

CAR, MOTION, GROUP, PLD Diagnostics

These screens provide useful in-depth diagnostics for the car and system controls operations (Car Operation Control, Car Motion Control, Group Controller, System Control, and PLD).For each system processor and for the PLD, these screens can provide information useful for in-depth diagnostics. Flags are visible indicators of active signals, descriptively labeled so you can understand what they represent. Numerics are register data bit information and are intended for factory diagnostics. They are also useful when MCE Technical Support is assisting in diagnosing a system.

The job prints will indicate what flags/functions are required to enable an output. The output (or an input) can be viewed through the System I/O or System Diagnostics screen. Associated flags/functions can be viewed through the screen for the appropriate safety processor or PLD.

CAR Diag Car operation control related indicators.

MOTION Diag Car motion control related indicators (valve enables, pump information, limits, etc.).

GROUP Diag Communication and system control related indicators.

PLD Diag System-wide indicators.

Action Info

This display provides indicators that help to determine why any of the following actions have occurred.

- Car Call Canceled Due To: Inputs or states that can cause car calls to be canceled.
- Hall Call Canceled Due To: Inputs or states that can cause hall calls to be canceled.
- Door Open Due To: Inputs or states that can cause doors to open or remain open.
- Door Close Due To: Inputs or states that can cause doors to close or remain closed.
- Prohibit Run/Start Due to: Inputs or states that can cause starting or running to be disabled.

Status Info

View:

- CPU, BUS, COM Status
- Monitoring Tools
- CAN Bus Viewer
- Version Information
- Other Car Settings
- Address Diagnostics

Stats

Collected statistics for maintenance and system activity.

- Hall Bus Inventory: When all hall calls are installed and functioning properly use the INVTRY control on this screen to add them to system memory. When troubleshooting hall calls at a future date, use the TEST control to automatically poll and test all switches and lamps.
- Maintenance Statistics: Collected run-related statistics. Compiled until manually cleared.
- Hourly Statistics: Car and hall call statistics per hour for the preceding 24 hours.

Scope

The virtual oscilloscope allows you to select up to four signals from an elevator subsystem and display them in near real-time.

1. Select the subsystem:
   - System Inputs
   - System Outputs
   - Landing System
   - Programmed Inputs
   - Programmed Outputs
2. Use the scroll arrows to move through signals.
3. For each desired signal, tap on one of the four boxes on the right of the screen. The signal will appear in the box.
4. Tap on OK to return to the selection screen, then on View Scope.
5. Touch the scope arrows to adjust trace speed (amount of time represented by screen graticules).
6. The selected signals will remain on the scope until you replace them with others.

Circuit Board Descriptions

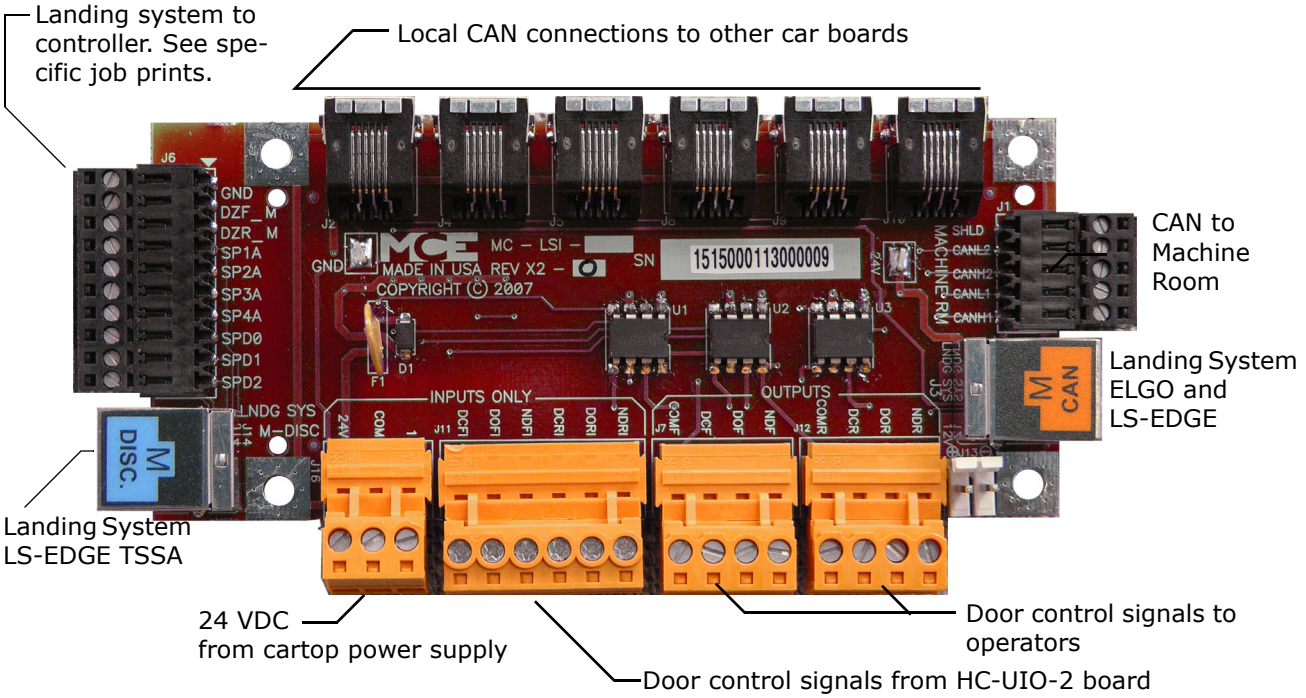
Motion 2000 TS hydraulic controller circuit boards and Solid State Starters:

- MC-CPI-2: COP serialization, landing system interface, added I/O, page 5-44
- SC-3HN: Serial Hall Call Node Board, page 6-35
- LS-LSI: Interface Board, page 5-41
- HC-MPU-2-TS: Controller processor, page 5-2
- HC-DVR: Driver Board, page 6-12
- HC-UIO-2: Universal Input/Output, page 6-18
- HC-CTL-2: Control Board, page 6-5
- HAPS-600: Hydraulic Auxiliary Power Supply, (See HAPS User Manual 42-02-U002)
- Solid State Starter, page 5-48

MC-LSI Landing System Interface Board

The MC-LSI provides a connection point for the landing system and for the Car Panel Interface board (MC-CPI-2) if one is used. The board receives 24 VDC power from an external power supply operating off 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. There are additional, discrete connections through the traveler if the system is TSSA compliant and uses the LS-EDGE landing system.

Figure 5.6 MC-LSI Landing System Interface Board



LSI Connections

- Local CAN: CAN and power to additional cartop box boards (HC-UIO-2, MC-CPI-2, etc.)
- CAN to Machine Room: CAN connections to/from machine room
- Landing System: CAN and DISC connections to/from landing system
- Door Signals from cartop HC-UIO-2:
  - 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
- Landing System to Controller, Additional: See Job Prints

LS-LSI Connector Assignments

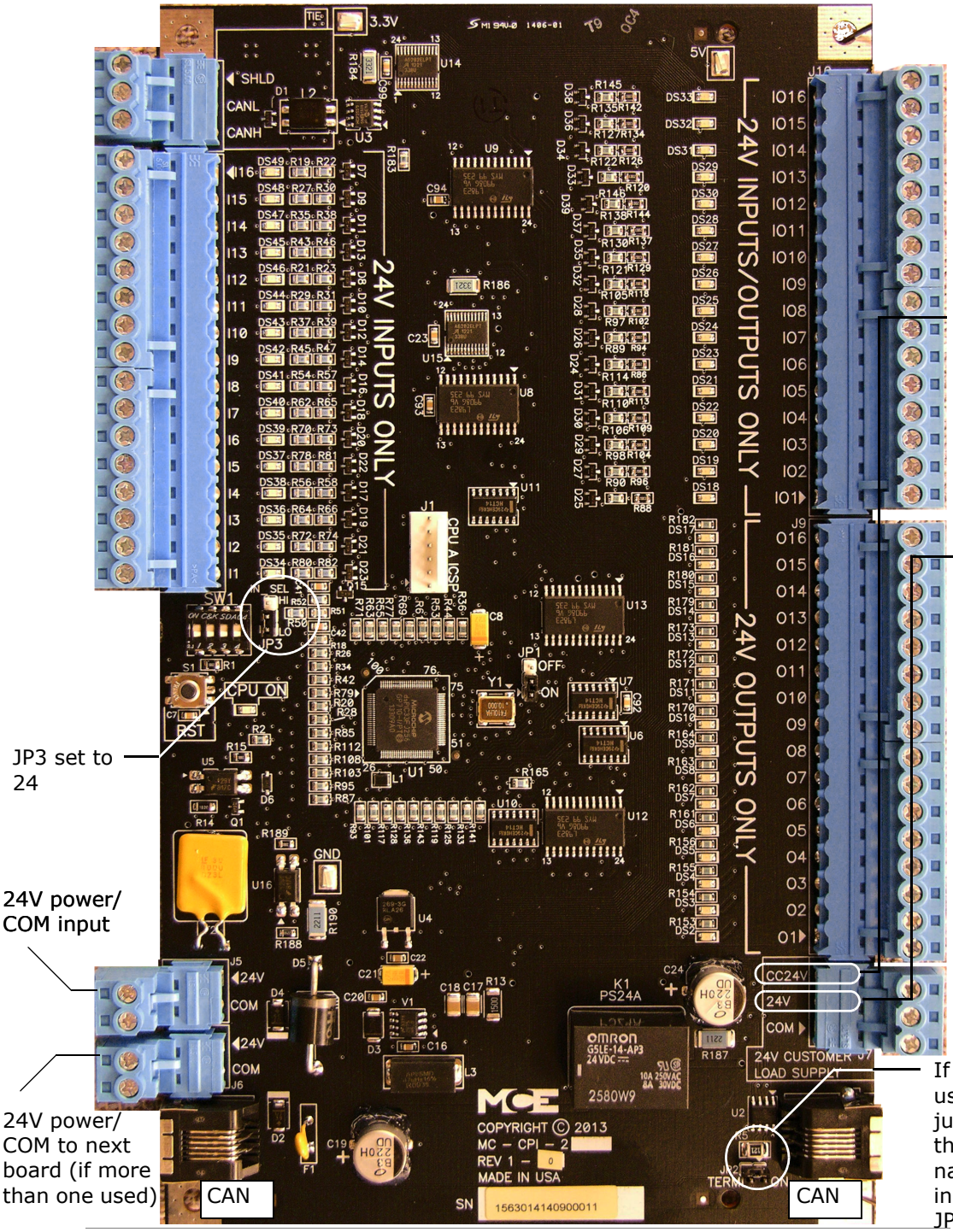
Table 5.8 LS-LSI Connector Assignments

Connector	Assignment	Description
J1	SPD0	Speed bit 0 from the LS-EDGE landing system
J1	SPD1	Speed bit 1 from the LS-EDGE landing system
J1	DZF	Front Door Zone signal from the LS-EDGE landing system
J1	24CTP	24VDC fused power out (F1 is 72V, 1100mA)
J2	CANH1	CAN port 1, H
J2	CANL1	CAN port 1, L
J2	CANH2	CAN port 2, H
J2	CANL2	CAN port 2, L
J2	SHLD	CAN shield
J3, Pin 1	2	120VRMS from machine room
J3, Pin 2	1	Ground
J3, Pin 3	2	120VRMS to load weigher
J3, Pin 4	1	Ground
J4	24V	24V to first MC-CPI-2 board
J4	COM	Common for 24V
J5	SPD0	Speed bit 0 from LS-EDGE sensor
J5	SPD1	Speed bit 1 from LS-EDGE sensor
J5	SPD2	Speed bit 2 from LS-EDGE sensor
J5	SP1A	DTL
J5	SP2A	DSL1
J5	SP3A	USL1
J5	DZR M	Door Zone Rear
J5	SP4A	UTL
J5	CGND	Pins 9 and 10. Chassis ground.
J6	CANH2	CAN port 2, H
J6	CANL2	CAN port 2, L
J6	DZF M	Door Zone Front
J6	CANH1	CAN port 1, H
J6	12V BAT	12V, Battery output
J6	CANL1	CAN port 1, L
J6	DGND	Ground
J6	V UNREG	Unregulated ~24V
J6	CGND	Pins 9 and 10. Chassis ground.
J7	SNN1	Unused
J7	V UNREG	Unregulated ~24V from machine room
J7	CANH2	CAN port 2, H
J7	CANL2	CAN port 2, L
J7	Pins 4, 6	Ground
J7	M1, M2	Chassis ground
J8	SNN 2	Unused
J8	V UNREG	Unregulated ~24V from machine room
J8	CANH2	CAN port 2, H
J8	CANL2	CAN port 2, L
J8	Pins 4, 6	Ground
J8	M1, M2	Chassis ground

MC-CPI-2

MC-CPI-2 boards provide serialization of control panel inputs and assignable I/O for interface to landing systems and/or door operators. CPI-2 boards are installed in the car control panel enclosure or, when used to expand system I/O, in the controller enclosure as well.

Figure 5.7 MC-CPI-2 Board



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CPI-2 Configuration

The CPI-2 boards in your controller are factory-configured to match the job requirements.

- Jumpers:
  - JP1: Factory
  - JP2: Used to terminate the CAN communication bus. If you have just one CPI-2 board, this jumper should always be in the ON position. If you have more than one CPI-2 board, use this jumper on the last board in the string only.
  - JP3: Sets the inactive level (OV or 24V) for the 24V INPUTS ONLY connections.
    - 24V: OFF state is 24V. ON state is 0V. (**USE FOR MOTION 2000 TS APPLICATIONS**.)
    - 0V: Off state is 0V. ON state is 24V.

24V is the maximum input that may be applied. For outputs, 24V, 6W is the maximum load supported.

- DIP Switch SW1, **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).

DIP 1	CPI Boards		
Board	**SW1**	**SW2**	**SW3**
0	Off	Off	Off
1	On	Off	Off
2	Off	On	Off
3	On	On	Off

- SW1, switch 3, must remain OFF at all times.
- SW1, switch 4, determines CAN baud rate:
  - ON: 500k - used if board is mounted INSIDE the Motion 2000 TS controller cabinet
  - OFF: 250k - default setting; use with boards mounted in COP

Installation and Connections Please refer to “Settings and Jumpers” on page 3-4.

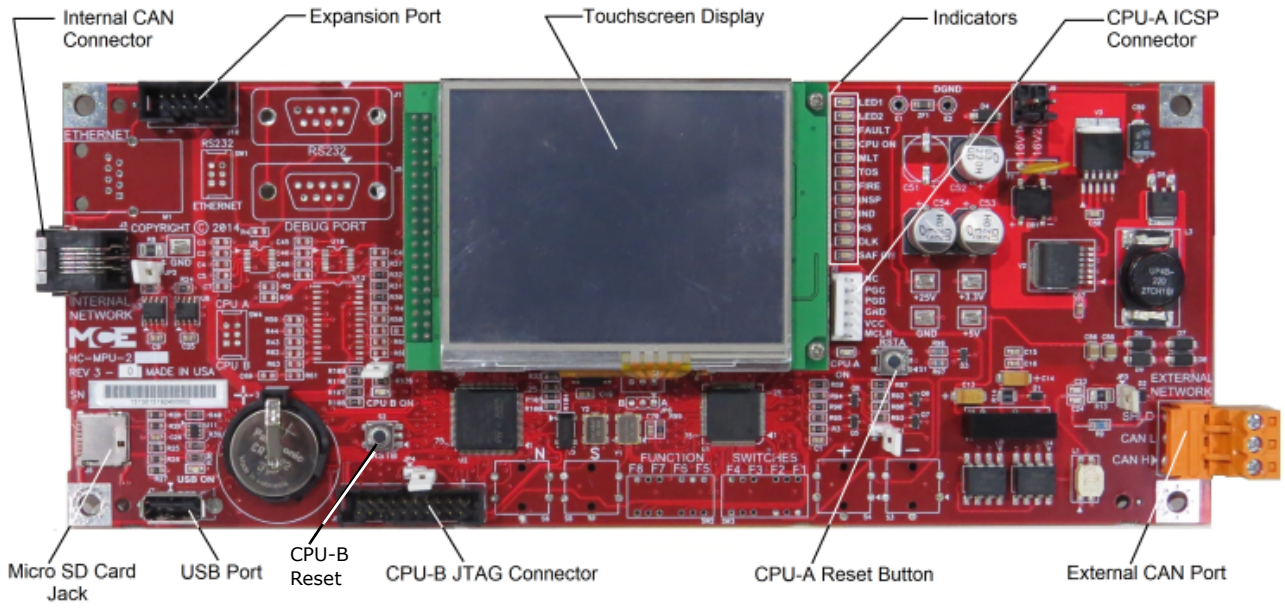
SC-3HN Serial Hall Call Node Board

Please refer to “Hall Calls” on page 4-10 for a detailed description.

HC-MPU-2-TS

The HC-MPU-2-TS board provides system logic and control. The touchscreen is mounted on this board

Figure 5.8 HC-HPU-2-TS



Solid State Starter

The solid state starter is the interface between the controller and the pump motor. The starter is compatible with 3/6 or 9/12 lead motors. The connections between the starter and the motor are shown in the prints for the particular job.

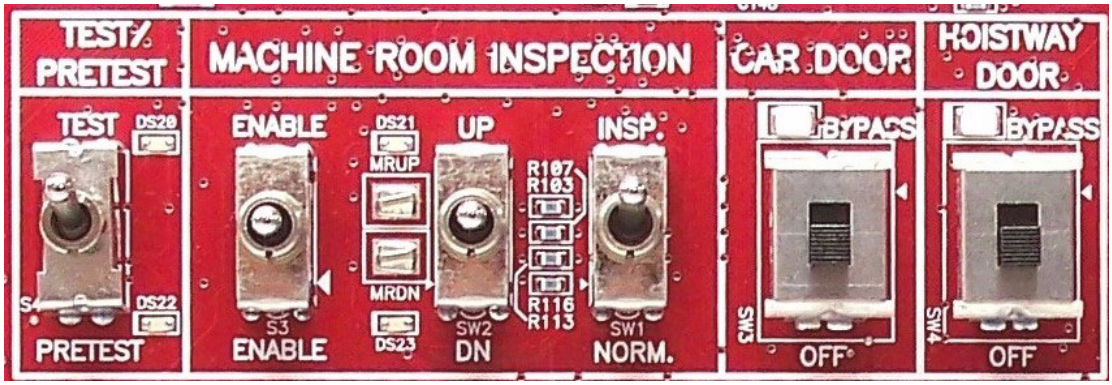
The Motion 2000 TS controller will display fault conditions related to the starter. When a starter-related fault is displayed on the controller, the related fault condition is probably displayed on the starter LCD as well.

Danger

Always observe safety precautions when working with starter wiring. Lethal voltages are present.

HC-MPU-2-TS Switches, Interface

HC-MPU-2-TS board controls are shown below.



Many times, starter faults are caused by loose connections. As a general rule, when one of these faults occurs, make it a habit to check connections first.

Both this manual and the manual for the starter provide troubleshooting information for faults displayed by that device (controller/starter). See Touch Screen Event Listings on page 5-48 for controller faults. See the starter manufacturer manual for detailed starter troubleshooting information.

Table 5.9 HC-MPU-2-TS Connector Assignments

Connector	Assignment	Description
J6	SD MICRO	Port for SD card storage.
J3	CAN, Modular	Typically connects to HC-CHP. See Job Prints
M1	Ethernet	Ethernet port. Web App configuration/per job use. Only available on -M. See Job Prints
J7	USB	USB Drive port
J5	CPU B TJAG	MCE use only
J4	CAN H	CAN external network connection, High
J4	CAN L	CAN external network connection, Low
J4	SHLD	CAN external network connection, Shield
J9, MCE	16V1	Power input, Not needed for most applications. See Job Prints.
J9, MCE	16V2	Power input, Not needed for most applications. See Job Prints
J10	Expansion	MCE use only
J2	CPU A PROG	MCE use only

Event and Fault Message Descriptions

The following is a list of Events and Status Messages that can be displayed on the second line of the Mode of Operation box on the Home screen, and in the Event Log screen.

Table 5.10 Touch Screen Event Listings

Event	Description
2 BUS IS LOW (119) 2 BUS IS LOW (496)	**Description:** 2 Bus (120VAC) monitoring input is low. Cannot be bypassed. Check fuse F2 on SCE-UPD board. Verify 120VAC across terminals X1B and X2B on the SCE-UPD.
2FS BUS IS LOW (497)	**Description:** 2FS bus (120CVAC) monitoring input is low. **Troubleshooting:** Check 2 bus fuses.
2HA BUS IS LOW (498)	**Description:** 2HA bus (120CVAC) monitoring input is low. **Troubleshooting:** Check 2 bus fuses
2MV BUS IS LOW (499)	**Description:** 2MV bus (120CVAC) monitoring input is low. **Troubleshooting:** Check 2 bus fuses
3HN COMM LOSS (160)	Communication to the serial hall call bus is lost
ABD INPUT FAILURE (482)	**Description:** The Bottom Down Access (ABD) switch is high when 2HA bus is low. 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.
ABU INPUT FAILURE(481)	**Description:** The Hoistway Access Bottom Up (ABU) switch is high when 2HA bus is low. 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.
ATD INPUT FAILURE (480)	**Description:** The Top Down Access (ATD) switch is high when 2HA bus is low. 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.
ATU INPUT FAILURE (479)	**Description:** The Top Up Access (ATU) switch is high when 2HA bus is low. 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.
ATTENDANT SERVICE (770)	**Description:** The car is on attendant operation. The attendant service input (ATS) is activated.
AUTOSTOP (774)	**Description:** Autostop is enabled. The car will stop and cycle the doors and the specified floor/direction whenever the car passes that floor.
AUX POWER: COMPLETE (51)	**Description:** The car has completed lowering/recall under auxiliary power (HAPS). Cannot be bypassed. System Verifies: - Aux Power Data = APS Recall Done - APS Done output true **Troubleshooting:** If in error, verify the status of the spare input programmed for APS.
AUX POWER: FAIL (52)	**Description:** The car has failed to recall under auxiliary power. Fault-bypassed in Construction/Inspection. System Verifies: - Aux Power Data = APS Recall Fail **Troubleshooting:** Verify car is not obstructed. Verify doors closed. Check function of HAPS or TAPS unit.

Table 5.10 Touch Screen Event Listings

Event	Description
AUX POWER: FIRE I (49)	**Description:** The car is in fire recall mode and on auxiliary power. Cannot be bypassed. System Verifies: - State of fire recall input - Aux Power Data = APS Fire Recall On - Mode of operation is not OpModeFireII **Troubleshooting:** If in error, verify the status of the fire recall related inputs.
AUX POWER: FIRE II (50)	**Description:** The car is on in-car firefighter mode and is recalling on auxiliary power. Cannot be bypassed. System Verifies: - Aux Power Data = APS Fire Recall On - Mode of operation = Fire II **Troubleshooting:** If in error, verify the in-car firefighter switch wiring.
AUX POWER: RECALL (48)	**Description:** The car is recalling under auxiliary power, i.e., a battery powered lowering device. Cannot be bypassed. System Verifies: - State of input - Aux Power data = APS Recall On **Troubleshooting:** If in error, verify no input programmed for this function. Otherwise, verify status of input and input device. Verify input wiring.
AUX STARTER TIMEOUT (597)	**Description:** One of the auxiliary starters did not start properly. 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).
BBRAM READ ERROR (184)	**Description:** System has detected a Battery Backed RAM read error. Cannot be bypassed. **Troubleshooting:** Cycle power and recheck.
BBRAM WRITE ERROR (183)	**Description:** System has detected a Battery Backed RAM write error. Cannot be bypassed. **Troubleshooting:** Cycle power and recheck.
BOTTOM ACC SW FAILURE (484)	**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 DEVIATION (EDGE) (155)	**Description:** LS-EDGE-EL encountered terminal magnets that do not match learned positions. Fault bypassed in Construction/Inspection. System Verifies: - Learned versus current-read magnet locations do not match within an acceptable tolerance. **Troubleshooting:** Verify magnets for terminals have not been changed. Relearn terminal magnets location by performing a hoistway learn.
CAPTURE MODE (4)	**Description:** The controller is in Capture Mode. In this mode the elevator will not accept hall calls but will answer car calls. The intent is to service existing passengers until the car is idled at a floor and is available for maintenance or test. Fault bypassed in Construction/Inspection. System Verifies: - Mode of operation = Capture **Troubleshooting:** Check that the Test switch is not in the Pretest position.

Table 5.10 Touch Screen Event Listings

Event	Description
CAR CALLS DISABLED (252)	**Description:** Car calls have been disabled. Typically caused by car operation in a mode or during a fault condition in which car calls are not active. **Troubleshooting:** If in error, check Home screen to see what mode of operation is displayed and if any faults are displayed. Troubleshoot the active mode and/or fault condition.
CAR DELAYED DOOR CLOSED (218)	**Description:** The car has been delayed in answering a registered call while the doors are closed. Informational. Fault-bypassed in Construction. **Troubleshooting:** Check the Car Delayed Timer setting. It might be too short. Check for any faults that might be preventing the car from moving in a timely manner.
CAR DELAYED F DOOR OPEN (38) CAR DELAYED R DOOR OPEN (785)	**Description:** The car has been delayed in answering a registered call while the doors are open. Informational. Fault-bypassed in Construction. **Troubleshooting:** Check the Car Delayed Timer setting. It might be too short. Check for any faults that might be preventing the car from moving in a timely manner.
CAR HOLD (338)	**Description:** The car is on hold and not allowed to move. Used for the EMS Hold function initiated when the car is on in-car EMS mode and the in-car EMS switch is deactivated while the car is away from the EMS floor.
CAR STOP SW BYPASSED (211)	The car stop switch is being bypassed. Normally due to PH1 Fire.
CAR STOP SW ON (2)	**Description:** Car stop switch input active. If moving, the car will perform an emergency stop. Doors will not be allowed to move. The event will end when the switch is returned to the off position. **Troubleshooting:** If in error, troubleshoot the SAFC input and the switch.
CAR STOP SW ON RE-LEVEL (217)	**Description:** Car stop switch activated during releveling. Car will complete releveling. Doors remain operational. Informational event. Resets when switch returned to Off position.
CARTOP CONSTRUCT/BYPASS (215)	**Description:** Car Panel inspection is active and one or both of the Car/Hoistway Door Bypass switches is in the Bypass position. Cannot be bypassed. System Verifies: - ModeofOperation = OpModeInspectionBPCP **Troubleshooting:** Turn off one or both of the Car/Hoistway Door Bypass switches.
CARTOP CONSTRUCTION (53)	**Description:** The car is on construction operation and is being operated from the cartop inspection station. Cannot be bypassed. System Verifies: - Mode of Operation = Construction CT **Troubleshooting:** Exit construction operation (Please see Set Up for Construction Operation on page 3-4).
CARTOP INSP./BYPASS (115)	**Description:** Cartop inspection is active and one or both of the Car/Hoistway Door Bypass switches is in the Bypass position. Cannot be bypassed. System Verifies: - ModeofOperation = OpModeInspectionBPCT **Troubleshooting:** Turn off one or both of the Car/Hoistway Door Bypass switches.

Table 5.10 Touch Screen Event Listings

Event	Description
CARTOP INSP ENABLE FAULT (490)	**Description:** The Cartop Inspection Enable input is being seen active while the car is not on Cartop Inspection. The controller determined this input to be failed closed. **Troubleshooting:** Check Cartop enable switch. Check Cartop enable input.
CARTOP INSPECTION (57)	**Description:** The car is on Cartop Inspection mode. Cannot be bypassed. System Verifies: - Mode of Operation = Inspection CT **Troubleshooting:** If in error, verify cartop inspection inputs. 24VDC at INCT disables car top inspection.
CC SECURITY DISABLED (270)	**Description:** Car call security has been disabled. Informational.
CDB SWITCH FAULT (227)	**Description:** Generated when the CDB and CDBO inputs are in the same state indicating a possible failure of the car door bypass switch. **Troubleshooting:** Toggle the car door bypass switch and verify that the diagnostic LEDs for the switch also toggle (CDB, CDBO). PLD Inputs, screen 1. Verify that the CDBTST jumper is inserted in the OFF position.
CELL BATTERY VOLTS LOW (272)	**Description:** Low HC-MPU-2-TS battery voltage. Battery backs-up run time parameters. Informational. Replace battery.
CFG ERR: 2-STOP CONFIG (189)	**Description:** Generated when a car is set to be a two stop installation and the CONFIG terminal is low (0V). Alternatively, when the car is set to be more than two stops and the CONFIG terminal is high (+24V). Also generated if both the CONFIG terminal and the DLMS terminal are high (+24V).Cannot be bypassed. **Troubleshooting:** Verify top and bottom floor settings in the Building Setup menu. Check voltage at the CONFIG terminal matches the settings. Check voltage at the DLMS terminal matches settings.
CFG ERR: CAR PANEL INSP (190)	**Description:** User defined car panel inspection settings and car panel inspection hardware configuration do not match. Cannot be bypassed. **Troubleshooting:** Verify touch screen settings against job prints. Verify actual installation against job prints.
CFG ERR: CONTROLLER TYPE (188)	**Description:** The user defined controller type (Hydraulic) does not match the hard wired default at HC-MPU-2-TS input TR_HY. (TR_HY at 24VDC for hydraulic applications.) Cannot be bypassed. **Troubleshooting:** Verify correct controller type on touch screen (CONFIG 01 > Building Setup > Controller Type). Verify state of HC-MPU-2-TS board TR_HY input (IDC, upper right edge of HC-MPU-2-TS board). If not in accordance with description above, contact MCE.
CFG ERR: HOIST. ACCESS (191)	**Description:** User defined hoistway access settings and the access hardware configuration do not match. Cannot be bypassed. **Troubleshooting:** Hoistway access option set to disabled and one of the access inputs (INA, ATU, ATD, ABU, ABD) is active. Hoistway access option set to bottom and one of the top access inputs (ATU, ATD) is active. Hoistway access option set to top and one of the bottom access inputs (ABU, ABD) is active.

Table 5.10 Touch Screen Event Listings

Event	Description
CFG ERR: INVALID FLOOR (323)	**Description:** An invalid floor has been programmed.
CFG ERR: LAND SYS (324)	**Description:** Configured and actual landing system do not match.
CFSS BYPASS TIMING (848)	**Description:** The car has been assigned a CFSS call but CFSS operation is currently bypassed due to the car being on Attendant or Independent service. The car will answer the CFSS call when the current mode of operation (ATS/IND) related timer(s) has expired or if the car is returned to normal operation prior to the timer expiring. **Car actions:** If the car is on Attendant or Independent service when it is assigned a CFSS call, it shall remain under the current mode of operation and start the mode's related timer. The CFSS light indicator shall come on to indicate to the attendant that the car is needed for a medical emergency. The car will proceed to answer the CSS call upon expiration of the timer. **Troubleshooting:** 1. Check and set the related **CFSS BYPASS IND TIMER** and **CFSS BYPASS ATS TIMER** options. 2. Set the timer(s) to **0** if a car on IND or ATS is not eligible to take CFSS calls.
CFSS RECALL (772)	Commandeer for Special Service (Hospital Service) – Car has been selected to answer a hospital call and is recalling to the floor the call was made.
CFSS IN-CAR (773)	Commandeer for Special Service (Hospital Service) - Car has picked up special passengers and is now under control of the passenger. Car will not answer hall calls during this mode.
COMMERCIAL POWER LOSS (279)	**Description:** Appears in the event log if commercial power is lost. Informational.
COMM & ALIVE INPUT LOW (284)	Duplex Operation – Dispatching car has communication with the duplexed car, but it is showing that is not powered. **Troubleshooting:** Check that the Alive inputs on both cars are wired to print and have voltage.
COMPLIANCE TEST ACTIVE (316)	**Description:** A compliance/safety test has been initiated but is not yet completed. **Troubleshooting:** 1. Complete or abort the test.
CONSTRUCTION INVALID (96)	**Description:** The car is in construction operation but controller switches or inputs are in states not valid in construction operation. If stopped, the car will not leave the floor. If in motion, the car will stop at the next floor and shut down. The fault must be manually cleared before operation resumes. Cannot be bypassed. System Verifies: - Mode of Operation = Construction Invalid **Troubleshooting:** To exit construction operation see Set Up for Construction Operation on page 3-4.

Table 5.10 Touch Screen Event Listings

Event	Description
CONTRACT OVERSPD (164)	**Description:** The processor has detected a contract overspeed (F7 menu, parameter 150). Power will be removed from brake and motor to bring the car to an immediate halt. **Troubleshooting:** 1. Check the integrity of the landing/positioning system encoded tape. Use a hand tach to check the speed at which the overspeed is triggered. If this is occurring on a job that is just being set up or adjusted or has had this problem sporadically, Check F7 menu Contract Speed setting (parameter 153). 2. Check F7 menu Contract Overspeed setting (parameter 150 should be set to about 108% of Contract Speed). 3. Check F7 menu Contract Rotation setting (parameter 154). Check correct gear ratio, drive parameter LF.22. 4. Check drive Contract Speed, High Speed, Sheave Diameter, Gear and Roping Ratio, Integral Gain, and Encoder settings.
CP INS STUCK INPUT (90)	**Description:** Car Panel Inspection Enable, Up, and Down inputs are monitored in all modes of operation. This fault is asserted if any of the three is high when the car is on Automatic mode or is detected as stuck during Inspection mode. This fault does not affect car behavior on Inspection mode. On Automatic modes, the car is allowed to answer its first call. The CP Ins Stuck Input Flt is then asserted if the car is already at a floor or has reached a floor. See description below. Fault-bypassed in Construction. **Troubleshooting:** Check all car panel inspection related inputs, switches, and wiring (HC-MPU-2-TS ICEN, ICPU, and ICPD).
CP INS STUCK INPUT FLT (91)	**Description:** A stuck Car Panel Inspection input has been asserted (see description above) and the car is already at a floor or has reached a floor. The doors open to release passengers and the car removes itself from service. Fault bypassed in Construction mode. **Troubleshooting:** Check all car panel inspection related inputs, switches, and wiring (HC-MPU-2-TS ICEN, ICPU, and ICPD).
CT INS STUCK INPUT (88)	**Description:** Cartop inspection Enable, Up, and Down inputs are monitored in all modes. This fault is asserted if any of the three is high when the car is on Automatic mode or is detected as stuck during inspection mode. This fault does not affect car behavior on inspection mode. On automatic modes, the car is allowed to answer its first call. The CT Ins Stuck Input Flt is then asserted if the car is already at a floor or has reached a floor. (See description below.) Fault-bypassed in Construction. **Troubleshooting:** Check all Car Top Inspection related inputs, switches, and related wiring (HC-MPU-2-TS CTEN, ICTU, and ICTD).
CT INS STUCK INPUT FLT (89)	**Description:** A stuck Cartop Inspection input has been asserted (see above) and the car is already at a floor or has reached a floor. The doors open to release passengers and the car removes itself from service. Fault bypassed in Construction mode. **Troubleshooting:** Verify switches and wiring on HC-MPU-2-TS inputs CTEN, ICTU, and ICTD.
CTLA CAR BYP SW FAIL (399) CTLA R CAR BYP SW FAIL (429)	**Description:** Indicates that the CAR DOOR BYPASS switch has failed. **Troubleshooting:** Replace the HC-CTL-2 board.

Table 5.10 Touch Screen Event Listings

Event	Description
CTLA CARTOP IN BTN FAIL (416)	**Description:** The CTL-2 board sees the cartop inspection up or down button is being activated while the car is not on cartop inspection. It is declaring that the button is stuck closed. **Troubleshooting:** Check Cartop Inspection up and down buttons. Check wiring to Cartop Inspection up and down buttons.
CTLA: CTLB IS OFFLINE (404)	**Description:** CTLA processor does not see communication from CTLB processor. **Troubleshooting:** Verify all shunt jumpers on the HC-CTL-2 board are correct.
CTLA CYCLE TEST FAILURE (426)	**Description:** A cycle test (exercise operation) of the brake and motor contactors is conducted before the car is allowed to move from a landing. This message will be displayed if the cycle test fails. **Troubleshooting:** Check brake and motor contactors (refer to job prints for guidance).
CTLA DCAB INPUT FAILURE (395)	**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.
CTLA DIRECTION MISMATCH (380) CTLB DIRECTION MISMATCH (455)	**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 MCLSI 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 the positioning system. 5. Check position sensor for excessive dirt or clogging.
CTLA DN NORMAL LIM OPEN (369) CTLB DN NORMAL LIM OPEN (444)	**Description:** The indicated processor has detected that the down directional limit switch is open. The car will run no further in the down direction. **Troubleshooting:** 1. Review car adjustment and landing settings. 2. Adjust as required to prevent the car from overshooting the terminal and activating the directional limit. 3. Review terminal switch programming in the CONFIG 2 menu
CTLA DPM RED. FAULT (423)	**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:** 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 while doors are closing. 3. Check the associated input circuitry.

Table 5.10 Touch Screen Event Listings

Event	Description
CTLA DPMR RED. FAULT (424)	**Description:** Rear door input, relay, or associated circuitry failure detected. Valid when SAF is on. DLK and DPMR must always be in the same state. If your door operator connects to a UIO board on the car top (rather than up the traveler to the controller), check that the "spare" inputs used for door operation are correctly configured. Verify communication to the UIO board associated with the door spare inputs. **Troubleshooting**: 1. Check that DPMR makes (120VAC) 1 to 2 inches prior to door lock. 2. If so, check associated circuitry.
CTLA DRIVE FAULT (376) CTLB DRIVE FAULT (451)	**Description:** This fault indicates that the drive has detected a DFLT output The car will perform an emergency stop with the motor contactor and brake contactor immediately dropped. **Troubleshooting:** Verify the detected message via drive parameter LF.98. The last ten faults are saved at 0.LF.98 through 9.LF.98. Refer to Error Messages and Their Causes in the TorqMax manual.
CTLA DRIVE ON FAULT (377) CTLB DRIVE ON FAULT (452)	**Description:** The drive failed to activate the DRO signal when it was sent the command to run. The car will perform an emergency stop with the motor contactor and brake contactor immediately dropped. **Troubleshooting:** 1. Check for fault messages on the F5 drive display and refer to Error Messages and Their Causes in the TORQMAX manual for suggested solutions. 2. Check the state of the F5 drive inputs by displaying diagnostic parameter LF.82. Refer to the LF.82 input state table in the TORQMAX F5 drive manual. 3. Check for proper operation of the PM contactor main contacts. 4. Verify that Brake Pick Delay is set correctly to allow the motor to build up torque. 5. Verify that F5 drive parameter LF.70 = 0.3. 6. Referring to the job prints, verify terminal X2A.24, X2A.26, X2A.27, and X2A.29 on the drive. With the drive generating a DRO signal, terminal X2A.27 should be at the same potential as terminal X2A.26. **Additional Troubleshooting:** 1. On M4000 controllers with Rev 8 software, verify F7 parameter 184 for proper drive type. 2. Verify LF.83 to see if the drive is getting the correct inputs 3. Verify LF.82 to see if the drive is turning on the relay 4. Verify RU.82 to see if the drive is putting out magnetizing current 5. Verify LF.93 to see if the drive is applying phase current 6. Try changing US.25 from 3 to 0 to ignore checks and see what check is preventing the drive from being ready. 7. Before swapping the drive, try swapping the operator.
CTLA DZF RELAY DISCR (421) CTLA DZR RELAY DISCR (422)	**Description:** This fault indicates that the DZF/DZR HC-CTL-2 door zone input and the associated learn door zone position do not match. The elevator will stop at the next floor in the direction of travel and shut down until the fault is cleared by pressing the fault reset button on the HC-CTL-2 board. **Troubleshooting:** 1. Verify the voltage at the DZF/DZR terminals on the HC-CTL-2 board, voltage would indicate the presence of a door zone magnet. 2. Verify door zone magnet placement when using the LS-EDGE landing system. 3. Re-learn the hoistway through the UTILS->LANDING SYSTEM UTILITIES->HOISTWAY LEARN screen.

Table 5.10 Touch Screen Event Listings

Event	Description
CTLA EEPROM FAULT (378) CTLB EEPROM FAULT (453)	**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.
CTLA EXCESSIVE FAULTS (360) CTLB EXCESSIVE FAULTS (435)	**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.
CTLA FLOOR LRN REQUIRED (387) CTLB FLOOR LRN REQUIRED (462)	**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.
CTLA HOIST BYP SW FAIL (398) CTLA R. HOIST BYP SW FAIL (428)	**Description:** The expected input logic from the HOISTWAY DOOR BYPASS switch has failed. **Troubleshooting:** Replace the HC-CTL-2 board.
CTLA INA INPUT FAILURE (402)	**Description:** The INA input to the micro controller did not receive a signal when expected. **Troubleshooting:** 1. Check for incorrect wiring or short on the HC-CTL-2-TS board INA input and 2 bus. 2. Replace the HC-CTL-2 board.
CTLA INCAR IN BTN FAIL (405)	**Description:** The CTL-2 board sees the In-Car inspection up or down button is being activated while the car is not on In-Car inspection. It is declaring that the button is stuck closed. **Troubleshooting:** Check In-Car Inspection up and down buttons. Check wiring to In-Car Inspection up and down buttons.
CTLA INCP INPUT FAILURE (401)	**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-TS board INCP input and 2 bus. 2. Replace the HC-CTL-2 board.
CTLA INCT INPUT FAILURE (403)	**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. 2. Replace the HC-CTL-2 board.

Table 5.10 Touch Screen Event Listings

Event	Description
CTLA LAND SYS COMM LOSS (359) CTLB LAND SYS COMM LOSS (434)	**Description:** The HC-CTL2 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**: **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.
CTLA MABB INPUT FAILURE (393)	**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. If not, contact MCE for assistance.
CTLA MCSB INPUT FAILURE (397)	**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:** This fault indicates a failure of the HC-CTL-2 board.
CTLA MDSE INPUT IS LOW (412)	**Description:** The MDSE input monitors the continuity of the DN Slow Valve coil and also checks the OFF state of the DSE solid state device. **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 5.10 Touch Screen Event Listings

Event	Description
CTLA MGB INPUT FAILURE (400) CTLA MGBR INPUT FAILURE (404) (430)	**Description:** A failure of the gate switch bypass circuit has been detected. **Troubleshooting:** Replace the HC-RDR board.
CTLA MGS INPUT FAILURE (392)	**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. Replace relay GS. 3. Replace relay DZ. 4. Check continuity between IDC terminals GS1 and GS2 on the HC-CTL-2 board. 5. If rear doors are present, check GSR. 6. Replace the HC-CTL-2 board.
CTLA MGSR INPUT FAILURE (425)	**Description:** The Rear Gate Switch Monitor (MGSR) input (test point TP48 (GSR2) on the HC-RDR board) has detected a failure of the rear gate switch or Door Zone/Door Zone Leveling (DZ/DZLVA) circuitry. **Troubleshooting:** **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. If either relay GSR or DLR is not picked, verify that TP48 is low. Check continuity between terminals GS1 on the HC-CTL-2 and GSR1 on the HC-RDR board and between terminals GS2 on the HC-CTL-2 and GSR2 on the HC-RDR board. **Condition 2:** If the car is re-leveling, and the front doors are closed, the MGSR input should have 120VAC. Check continuity between terminals GS2 on the HC-CTL-2 and GSR2 on the HC-RDR board. **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. 1. Verify that both relays DLR and GSR are picked. 2. Verify 120VAC on terminals GSR1 and GSR2. 3. Verify 120VAC on TP49 (MDLR) on the HC-RDR board. 4. Verify 120VAC on TP48 (GSR2) on the HC-RDR board.
CTLA: MPU IS OFFLINE (364)	**Description:** CPU-A on HC-MPU-2-TS board is not responding. **Troubleshooting:** 1. Verify that CPU-A ON LED on the HC-MPU-2-TS board is on solid and not flashing. 2. Check the CAN connection to the HC-MPU-2-TS 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.
CTLA MTD INPUT FAILURE (409)	**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. 4. Replace the HC-DVR board.

Table 5.10 Touch Screen Event Listings

Event	Description
CTLA MTM INPUT FAILURE (407)	**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. 4. Replace the HC-DVR board.
CTLA MTY INPUT FAILURE (408)	**Description:** The input monitors the continuity of the Y Contactor coil and also checks the OFF state of the (TY) solid state device. **Troubleshooting**: 1. Verify that the STARTER 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.
CTLA MUSE INPUT IS LOW (411)	**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. 3. Replace the HC-DVR board.
CTLA RFV FAIL TO ACTIV (414)	**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. 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.
CTLA RFV FAIL TO DEACT (420)	**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. 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 5.10 Touch Screen Event Listings

Event	Description
CTLA RSV FAIL TO ACTIV (413)	**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. 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.
CTLA RSV FAIL TO DEACT (419)	**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. 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.
CTLA SAFC INPUT FAILURE (396)	**Description:** The processor 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.
CTLA UP NORMAL LIM OPEN (368) CTLB UP NORMAL LIM OPEN (433)	**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. 4. Replace the HC-DVR board. 5. Verify integrity of the landing system.
CTLA: PLD IS OFFLINE (427)	**Description:** HC-CTL-2 board safety processor C is offline. **Troubleshooting:** 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. If the GROUP indicator is not lighted, reboot the processor by cycling power to the controller or by removing the CAN bus connection to the HC-CTL-2 board for a few seconds. If fault occurs while updating software, refer to update instructions and repeat process.

Table 5.10 Touch Screen Event Listings

Event	Description
CTLA RELATIVE POS. HIGH (357) CTLB RELATIVE POS. HIGH (432)	**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 the UTILS->LANDING SYSTEM UTILITIES->LANDING SYSTEM VIEW screen and verify that both the upper and lower positions increment when the car moves up or decrement when the car moves down on inspection. Verify that upper position value is larger than the lower position value by 160mm when using an LS-EDGE landing system.
CTLA RELATIVE POS. LOW (358) CTLB RELATIVE POS. LOW (433)	**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 the UTILS->LANDING SYSTEM UTILITIES->LANDING SYSTEM VIEW screen and verify that both the upper and lower positions increment when the car moves up or decrement when the car moves down on inspection. Verify that upper position value is larger than the lower position value by 160mm when using an LS-EDGE landing system.
CTLA RESTORING SAFFETY (410)	**Description:** The CTL-2 board has a 5 second debounce between detecting any faults and restoring the Safety String. This message is displayed during that time.
CTLA WRONG LAND SYS CH (329) CTLB WRONG LAND SYS CH (454)	**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.
CTLB: CTLA IS OFFLINE (486)	**Description:** The CTL-2 B processor does not see any communication from the CTLA processor. **Troubleshooting:** Check all shunt jumpers are set correctly on the CTL-2 board.
CTLB LS CHECKSUM FAIL (463)	**Description:** The CTLB stores a checksum identifier for the LS-EDGE and LS-RAIL landing systems. It has detected that the landing system identifier does not match, possibly due to swapping out a landing system or CTL board. **Troubleshooting:** Re-learn the hoistway.
CYCLE TEST WARNING (507)	**Description:** nnn = ESC (293), INA (296), INCP (297), INCT (295), M2L (300), MRIN (298), MASF HIGH (299), MASF LOW (309), PLD COMM (308), PLD ESC (301), PLD INA (304), PLD INCP (305), PLD INCT (303), PLD MRIN (306), PLD SAFC (302), SAFC (294), MOTION COMM (307) Before departing a floor, code requires that safety related inputs be tested to ensure they are in the proper state. If an error is found, a Cycle Test fault specific to the problem input will be displayed. Fault-bypassed in Construction/Inspection. **Troubleshooting:** Verify installation, condition, and connections for the specified equipment.

Table 5.10 Touch Screen Event Listings

Event	Description
DEFAULTED PARAMETERS (815)	**Description:** The controller found that the parameter memory had been corrupted or not set up properly. It has defaulted the parameters to reformat the memory.
DFE/EB1 STUCK OFF (126)	**Description:** Down Fast Enable or emergency brake outputs remain off when commanded to be active. No bypass in any mode. **Troubleshooting:** Verify down fast output is correctly connected. Verify function of down fast valve.
DFE/EB1 STUCK ON (125)	**Description:** DFE/EB1 reset issued but outputs remain on. No bypass in any mode. **Troubleshooting:** Verify down fast output is correctly connected. Verify function of down fast valve.
DFLT IS ON (314)	**Description:** Starter has faulted. Not generated in construction operation. Fault bypassed in Construction/Inspection. Verify status of DFLT input. Check starter for fault indication and troubleshoot.
DISPATCH LOAD (47)	**Description:** The car load has surpassed the designated load point for lobby departure and will automatically prepare to leave the lobby floor. This is not a normally supported input and should not appear unless the installer has configured a spare input to support it and the load weigher used supports this function. Fault-bypassed in Construction. System Verifies: - Status of input. - Load Data = Load Dispatch **Troubleshooting:** If in error, verify no input is programmed for this function. Otherwise, verify state of input and input device. Calibrate load weigher. Verify input wiring.
DISPATCHER COMM LOSS (281)	**Description:** The dispatching controller has lost CAN communication with the other controller.
DL INPUT FAILURE (474)	**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.
DLR INPUT FAILURE (504)	**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.
Door Faults Information: **Flag Definitions** - DOL Door Open Limit, DPM Door Position Monitor, GS Gate Switch (car door lock), DLAB Door Lock Access Bottom, DLAT Door Lock Access Top, DLMS Door Lock Mid String, DCL Door Close Limit. **Normal Open State:** DOL=0=DPM=GS=(DLAB/DLAT/DLS depending on car location), DCL=1. **Normal Closed State**: DOL=1=DPM=GS=DLAB=DLAT=DLMS, DCL=0.	
DLAB OPEN-RUNNING (236) REAR DLAB OPEN-RUNNING (791)	**Description:** The bottom door lock string was not made during a run. The car will make an emergency stop. **Troubleshooting:** Verify DLAB/R input electrically and mechanically. Trouble shoot door lock string.

Table 5.10 Touch Screen Event Listings

Event	Description
DLAT OPEN-RUNNING (238) REAR DLAT OPEN_RUNNING (793)	**Description:** Asserted if the top floor door lock string is not made during a run. The car will make an emergency stop. **Troubleshooting:** Verify DLAT/R input electrically and mechanically. Trouble shoot lock string.
DLMS OPEN-RUNNING (237) REAR DLMS OPEN-RUNNING (792)	**Description:** Asserted if the middle door lock string is not made during a run. The car will make an emergency stop. **Troubleshooting:** Verify DLMS/R input electrically and mechanically. Trouble shoot lock string.
DOB BYPASSED FRONT (35) DOB BYPASSED REAR (780)	**Description:** The Door Open Button is stuck. Fault-bypassed in Construction/Inspection. System Verifies: - Door Flags, Stuck DOB Timer = Elapsed - Door Flags, DOB Bypassed and DOB Failed are not true. **Troubleshooting:** Verify input and switch. See if continuously active on System IO > Programmed Inputs, DOB.
DOB FAIL (Not Used) (36)	**Description:** The door open button has failed. Fault-bypassed in Construction. System Verifies: - Door Flags = DOB Failed **Troubleshooting:** Verify DOB switch and wiring. Verify door operator functioning properly.
DOL INPUT FAILURE (469) DOLR INPUT FAILURE (500)	**Description:** The Door Open Limit (DOL/R) input is not in the correct state for the position of the door as determined by the Door Position Monitor (DPM/R) input and the Gate Switch (GS/R) input. 1. If DPM/R is high, DOL/R must also be high. Check the wiring to terminal HC-CTL board DOL/R. 2. If the GS/R input is high, DOL must also be high. Check the wiring to terminal DOL/R. 3. Replace the HC-CTL-2 board.
DOL LOW - DCL LOW (224) DOL LOW - DCL LOW REAR (225)	**Description:** The door open and close limits are not made (DOL and DCL = 0). If the DOOR CONTACT FLT ENABLED option = YES, the car is shut down and the door close button is rendered inoperative as long as the fault is present (per applicable elevator safety code). If the option = NO, the fault is logged but otherwise ignored. **Troubleshooting:** Check door open and close limit inputs and contacts.
DOL LOW - DLAB HIGH (233) DOLR LOW - DLABR HIGH (234)	**Description:** Car is at the bottom floor with doors open but the bottom door lock string is made (DOL = 0, DLAB = 1). If the DOOR CONTACT FLT ENABLED option = YES, the car is shut down and the door close button is rendered inoperative as long as the fault is present (per applicable elevator safety code). If the option = NO, the fault is logged but otherwise ignored. **Troubleshooting:** Check door open limit and bottom door lock string inputs and contacts.

Table 5.10 Touch Screen Event Listings

Event	Description
DOL LOW - DLAT HIGH (229) DOLR LOW - DLATR HIGH (230)	**Description:** Car is at the top floor with doors open but the top door lock string is made (DOL = 0, DLAT = 1). If the DOOR CONTACT FLT ENABLED option = YES, the car is shut down and the door close button is rendered inoperative as long as the fault is present (per applicable elevator safety code). If the option = NO, the fault is logged but otherwise ignored. **Troubleshooting:** Check door open limit and top door lock string inputs and contacts.
DOL LOW - DLMS HIGH (231) DOLR LOW - DLMSR HIGH (232)	**Description:** Car is at a floor other than the top or bottom with doors open but the door lock string is made (DOL = 0, DLMS = 1). If the DOOR CONTACT FLT ENABLED option = YES, the car is shut down and the door close button is rendered inoperative as long as the fault is present (per applicable elevator safety code). If the option = NO, the fault is logged but otherwise ignored. **Troubleshooting:** Check door open limit and middle door lock string inputs and contacts.
DOL LOW - DPM HIGH (205) DOLR LOW - DPMR HIGH (206)	**Description:** Doors are open but DPM limit is made (DOL = 0, DPM = 1). If the DOOR CONTACT FLT ENABLED option = YES, the car is shut down and the door close button is rendered inoperative as long as the fault is present (per applicable elevator safety code). If the option = NO, the fault is logged but otherwise ignored. **Troubleshooting:** Check door open and position monitoring limit inputs and contacts.
DOL LOW - GS HIGH (203) DOLR LOW - GSR HIGH (204)	**Description:** The door open limit and car gate switch positions are conflicting (DOL = 0, GS = 1). If the DOOR CONTACT FLT ENABLED option = YES, the car is shut down and the door close button is rendered inoperative as long as the fault is present (per applicable elevator safety code). If the option = NO, the fault is logged but otherwise ignored. **Troubleshooting:** Check the door open limit and car gate switch inputs and contacts.
DOOR BYPASS CONSTRUCT (214)	**Description:** Machine room inspection and construction operation are active and one or both of the Car/Hoistway Door Bypass switches is in the Bypass position. Cannot be bypassed. System Verifies: - ModeOfOperation = OpModeConstructionBP **Troubleshooting:** Exit construction operation (See Construction Operation on page 3-4)
DOOR BYPASS INSPECTION (114)	**Description:** Machine Room inspection is active and one or both of the Car/Hoistway Door Bypass switches is in the Bypass position. Cannot be bypassed. System Verifies: - ModeofOperation = OpModeInspectionBP **Troubleshooting:** Turn off one or both of the Car/Hoistway Door Bypass switches.
DOOR FLT SHUTDOWN (104) REAR DOOR FLT SHUTDOWN (105)	**Description:** The door has failed to close after three closing cycles have been attempted. Doors will fully open and the car will shut down. Fault bypassed in Construction/Inspection.
DOOR HOLD FRONT (106) DOOR HOLD REAR (107)	**Description:** The Door Hold input is active. Fault bypassed in Construction/Inspection. System Verifies: - Door Flags, Door Hold Data, Door Hold Function active. **Troubleshooting:** If in error, check wiring (be sure that door hold timer has expired)

Table 5.10 Touch Screen Event Listings

Event	Description
DOOR HOLD HALL FRONT (832) DOOR HOLD HALL REAR (833)	**Description:** The hall door hold button has been activated or latched for a user-defined time. **Car actions:** The doors are held open until the input is deactivated and related timer elapsed (if enabled). **Troubleshooting:** 1. Check the door hold button input and related circuitry. 2. Check the related door hold timer.
DOOR STOP HALL FRONT (834) DOOR STOP HALL REAR (835)	**Description:** The hall door stop button has been activated. **Car actions:** The doors are stopped or stalled. **Troubleshooting:** 1. Check the door stop input and related circuitry.
F **DOOR** OPEN FAIL 1 (71) F DOOR OPEN FAIL 2 (72) F DOOR OPEN FAIL 3 (73) F DOOR OPEN FAIL 4 (74) R DOOR OPEN FAIL 1 (79) R DOOR OPEN FAIL 2 (80) R DOOR OPEN FAIL 3 (81) R DOOR OPEN FAIL 4 (82)	**Description:** Detected for each failed attempt to open the doors at a destination floor. Cleared if the doors successfully open. Cannot be bypassed. System Verifies: - Door Flags, Door Command Data, Door Open Fail = 1 (2, 3) **Troubleshooting:** Check all door contacts. Check the user defined Open Time Limit. Check for correct door operation and speed. Check fuses FDLN1, FDLN2.
F **DOOR** CLOSE FAIL 1 (75) F DOOR CLOSE FAIL 2 (76) F DOOR CLOSE FAIL 3 (77) F DOOR CLOSE FAIL 4 (78) R DOOR CLOSE FAIL 1 (83) R DOOR CLOSE FAIL 2 (84) R DOOR CLOSE FAIL 3 (85) R DOOR CLOSE FAIL 4 (86)	**Description:** Detected for each failed attempt to close the doors at a destination floor. Cleared if the doors successfully close. Cannot be bypassed. System Verifies: - Door Flags, Door Command Data, Door Close Fail = 1 (2, 3) **Troubleshooting:** Check all door contacts. Check the user defined Open Time Limit. Check for correct door operation and speed. Check fuses FDLN1, FDLN2.
DOOR STOP FRONT (786) DOOR STOP REAR (787)	**Description:** The front and/or rear door stop input is active and the respective doors are stopped and prevented from moving. **Troubleshooting:** Check the status of the front/rear door stop input and related devices and circuitry. Verify that the correct input polarity has been programmed. Door operation can be restored by activating the door open or close buttons, provided the door stop input is deactivated.
FRONT **DOORS** NOT LOCKED (248) REAR **DOORS** NOT LOCKED (822)	**Description:** Car is at a floor with doors fully closed but locks are not made. The car is prevented from starting a new run. **Troubleshooting:** Check car gate switch and all door lock strings.
FRONT **DOOR** OPEN FAULT (12) REAR **DOOR** OPEN FAULT (13)	**Description:** Car is shut down after 4 failed attempts to open the doors. **Troubleshooting** Check the front door open limit (DOL/R)) and door open command (DOF/R) related circuitry.

Table 5.10 Touch Screen Event Listings

Event	Description
FRONT **DOOR** CLOSE FAULT (14) REAR **DOOR** CLOSE FAULT (15)	**Description:** Car is shut down after 4 failed attempts to close the front doors. **Troubleshooting:** Check the front door close limit (DCL/R) and door close command (DCF/R) related circuitry.
FRONT **DOOR** CLOSE DELAY (836) REAR **DOOR** CLOSE DELAY (837)	**Description:** The doors are about to close after a user defined delay. The total closing delay time is the sum of both the door close warning light and buzzer timers. **Car actions:** The doors remain open until the user defined timer has elapsed. If configured, the door close warning light and/or buzzer outputs are activated. **Troubleshooting:** 1. Check the door close warning option. 2. Check the door close warning light timer. 3. Check the door close warning buzzer timer.
DOWN NORMAL LIMIT OPEN (615)	**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. 4. Replace the HC-DVR board.
DOWN TERM LIMIT FAILURE (613)	**Description:** Both the Down Slow Limit 1 and Down Slow Limit 2 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. 3. Replace the HC-DVR board.
DPM LOW - DLK HIGH (207) DPMR LOW - DLK HIGH (208)	**Description:** The door position monitor switch is open but the door locks are made. If the DOOR CONTACT FLT ENABLED option = YES, the car is shut down and the door close button is rendered inoperative as long as the fault is present (per applicable elevator safety code). If the option = NO, the fault is logged but otherwise ignored. **Troubleshooting:** Check door position monitoring and door lock string inputs and related circuitry.
DPM OPEN-RUNNING (213) REAR DPM OPEN-RUNNING (789)	**Description:** Asserted if the door position monitoring switch is not made during a run. The car will make an emergency stop. **Troubleshooting:** Verify DPM input parameter. Verify DPM input electrically and mechanically.

Table 5.10 Touch Screen Event Listings

Event	Description
DRD FAIL TO ACT (599)	**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. 4. Replace the HC-DVR board.
DRD INPUT FAILURE (608)	**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. 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 MC-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. 5. Replace the HC-DVR board. 6. Make sure the motor is getting up to speed before the Y/D Transfer / Up to Speed time elapses. (for solid state starters, starting current may be to low)
DRDY IS OFF (313)	**Description:** Starter ready input is off. Fault bypassed in Construction/ Inspection. 1. Check the drive or starter for fault indication and troubleshoot. 2. Verify DRDY output and input to HC-MPU-2-TS.
DSE/EB2 STUCK OFF (130)	**Description:** Hydro Only. Down Slow Enable/EB2 commanded on but remains in low state. Not bypassed in any mode. **Troubleshooting:** Verify connection and status of output.
DSE/EB2 STUCK ON (129)	**Description:** Hydro Only. Down Slow Enable/EB2 have been reset but remains in active state. Bypassed in Inspection or Construction Bypass operation. **Troubleshooting:** Verify connection and status of output.
DLS1 IS LOW (268)	**Description:** Informational: DSL1 input is low. **Troubleshooting:** If in error, verify function of switch (if physical) and/or input.
DSL1 POSITION LOW (305)	**Description:** The car encountered the DSL1 switch at a position lower than that learned during the hoistway learn operation. **Troubleshooting:** 1. Verify position of switch (software or physical). 2. Repeat hoistway learn operation.

Table 5.10 Touch Screen Event Listings

Event	Description
DSL2 POSITION LOW (307)	**Description:** The car encountered the DSL2 switch at a position lower than that learned during the learn operation. The car will perform an emergency slowdown then proceed at correction speed to the terminal. **Troubleshooting:** Verify position of switch (software or physical). Repeat the learn operation (Utils > Landing System Utilities > Terminal Switch Learn).
DUPLICATE CAR ID (277)	**Description:** Informational: Same ID has been assigned to more than one car.
DUPLICATE DISPATCHER (280)	**Description:** Both cars in a duplex have been assigned the dispatcher role.
DVR1 IS OFFLINE (406)	**Description:** Driver board HC-DVR #1 is offline. **Troubleshooting:** 1. Power to the HC-DVR board may not be connected. 2. Check the CAN bus connection between the HC-DVR board and the HC-CHP CAN hub and power distribution board. 3. Make sure that the shunt has been removed from JP1 on the HC-DVR board. 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. If this message continues, the micro controller used for the HC-DVR board may need to be replaced. 6. Cut off defective Y2 MOV from DVR board. (DVR1 is Offline & Leveling Sensor Failure as below)
DVR2 AUX STARTER TIMEOUT (630) DVR3 AUX STARTER TIMEOUT (663) DVR4 AUX STARTER TIMEOUT (696)	**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).
DVR2 DN NORMAL LIM OPEN (648) DVR3 DN NORMAL LIM OPEN (681) DVR4 DN NORMAL LIM OPEN (714)	**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.
DVR2 DN TERM LIM FAIL (646) DVR3 DN TERM LIM FAIL (679) DVR4 DN TERM LIM FAIL (712)	**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.

Table 5.10 Touch Screen Event Listings

Event	Description
DRV2 DRD INPUT FAILURE (641) DVR3 DRD INPUT FAILURE (674) DVR4 DRD INPUT FAILURE (707)	**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 5-48). 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-2-TS board is about 3Vdc. The wiring or devices connected to DR1 input may not be terminated. 3. Check the Delta auxiliary contact wired to terminal DR1 and replace if necessary. 4. Replace the HC-DVR board. 5. Make sure the motor is getting up to speed before the Y/D Transfer / Up to Speed time elapse. (for solid state starters, starting current may be too low).
DRV2 EXCESS FAILED STARTS (643) DVR3 EXCESS FAILED STARTS (676) DVR4 EXCESS FAILED STARTS (709)	**Description:** The starter failed to start after three consecutive attempts. **Troubleshooting:** 1. Check the fault log to see what faults were generated when attempting to run the starter. To date, VCI operation increments the counter for this fault. 2. If car does NOT shut down completely after three attempts: Verify that High Speed Inspection = DISABLED under F3 menu. Having this Enabled will prevent complete shutdown after three attempts.
DVR2 IS OFFLINE (493)	**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.
DVR2 M2L INPUT FAILURE (635) DVR3 M2L INPUT FAILURE (668) DVR4 M2L INPUT FAILURE (701)	**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 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).

Table 5.10 Touch Screen Event Listings

Event	Description
DVR2 MDFE FAIL TO ACT (628) DVR3 MDFE FAIL TO ACT (661) DVR4 MDFE FAIL TO ACT (694)	**Description:** The MDFE input monitors the status of the DFE triac and the DFE triac driver. When either one 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.
DVR2 MDFE FAIL TO DEACT (627) DVR3 MDFE FAIL TO DEACT (660) DVR4 MDFE FAIL TO DEACT (693)	**Description:** The MDFE input monitors the status of the DFE triac and the DFE triac driver. When either one 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.
DVR2 MDSE FAIL TO ACT (626) DVR3 MDSE FAIL TO ACT (659) DVR4 MDSE FAIL TO ACT (692)	**Description:** The MDSE input monitors the status of the DSE triac and the DSE triac driver. When either one 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.
DVR2 MDSE FAIL TO DEACT (629) DVR3 MDSE FAIL TO DEACT (662) DVR4 MDSE FAIL TO DEACT (695)	**Description:** The MDSE input monitors the status of the DSE triac and the DSE triac driver. When either one 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.
DVR2 MRD INPUT FAILURE (639) DVR3 MRD INPUT FAILURE (672) DVR4 MRD INPUT FAILURE (705)	**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. 4. Replace the HC-DVR board.

Table 5.10 Touch Screen Event Listings

Event	Description
DVR2 MSSD FAIL TO ACT (631)	**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).
DVR2 MSSD FAIL TO DEACT (644)	**Description:** MSSD monitors the solid-state output of U1 and driver TY for proper operation. If either of them fails in the on position, this fault is generated. When either one 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
DVR2 MTD FAIL TO ACT (622) DVR3 MTD FAIL TO ACT (655) DVR4 MTD FAIL TO ACT (688)	**Description:** The MTD input monitors the status of the TD triac and the TD triac driver. When either one 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.
DVR2 MTD FAIL TO DEACT (623) DVR3 MTD FAIL TO DEACT (656) DVR4 MTD FAIL TO DEACT (689)	**Description:** The MTD input monitors the status of the TD triac and the TD triac driver. When either one 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.
DVR2 MTM FAIL TO ACT (618) DVR3 MTM FAIL TO ACT (651) DVR4 MTM FAIL TO ACT (684)	**Description:** The MTM input monitors the status of the TM triac and the TM triac driver. When either one 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.
DVR2 MTM FAIL TO DEACT (619) DVR3 MTM FAIL TO DEACT (652) DVR4 MTM FAIL TO DEACT (685)	**Description:** The MTM input monitors the status of the TM triac and the TM triac driver. When either one 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

Table 5.10 Touch Screen Event Listings

Event	Description
DVR2 MTY FAIL TO ACT (620) DVR3 MTY FAIL TO ACT (653) DVR4 MTY FAIL TO ACT (686)	**Description:** The MTY input monitors the status of the TY triac and the TY triac driver. When either one 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. The TY triac may have failed open. Replace the HC-DVR board.
DVR2 MTY FAIL TO DEACT (621) DVR3 MTY FAIL TO DEACT (654) DVR4 MTY FAIL TO DEACT (687)	**Description:** The MTY input monitors the status of the TY triac and the TY triac driver. When either one 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.
DVR2 MUFE FAIL TO ACT (633) DVR3 MUFE FAIL TO ACT (666) DVR4 MUFE FAIL TO ACT (699)	**Description:** The MUFE input monitors the status of the UFE triac and the UFE triac driver. When either one 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.
DVR2 MUFE FAIL TO DEACT (634) DVR3 MUFE FAIL TO DEACT (667) DVR4 MUFE FAIL TO DEACT (700)	**Description:** The MUFE input monitors the status of the UFE triac and the UFE triac driver. When either one 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.
DVR2 MUSE FAIL TO ACT (624) DVR3 MUSE FAIL TO ACT (657) DVR4 MUSE FAIL TO ACT (690)	**Description:** The MUSE input monitors the status of the USE triac and the USE triac driver. When either one 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.

Table 5.10 Touch Screen Event Listings

Event	Description
DVR2 MUSE FAIL TO DEACT (625) DVR3 MUSE FAIL TO DEACT (658) DVR4 MUSE FAIL TO DEACT (691)	**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
DVR2 OLM INPUT FAILURE (636) DVR3 OLM INPUT FAILURE (669) DVR4 OLM INPUT FAILURE (702)	**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). 4. Replace the HC-DVR board.
DVR2 OLM INPUT IS LOW (637) DVR3 OLM INPUT IS LOW (670) DVR4 OLM INPUT IS LOW (703)	**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). 3. Replace the HC-DVR board.
DVR2 RP SENSOR TRIPPED (638) DVR3 RP SENSOR TRIPPED (671) DVR4 RP SENSOR TRIPPED (704)	**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).
DVR2 STARTER TYPE ERROR (617) DVR3 STARTER TYPE ERROR (650) DVR4 STARTER TYPE ERROR (683)	**Description:** The HC-DVR board has received an invalid starter type from the from the MPU-2-TS board. **Troubleshooting:** May be caused by a communication error between the HC-MPU-2-TS and HC-DVR boards, call MCE Tech Support.
DVR2 UP NORMAL LIM OPEN (647) DVR3 UP NORMAL LIM OPEN (680) DVR4 UP NORMAL LIM OPEN (713)	**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. 4. Replace the HC-DVR board. 5. Verify integrity of the landing system.

Table 5.10 Touch Screen Event Listings

Event	Description
DVR2 UP TERM LIM FAIL (645) DVR3 UP TERM LIM FAIL (678) DVR4 UP TERM LIM FAIL (711)	**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. 3. Replace the HC-DVR board. **Additional Troubleshooting:** 1. Check the EDGE signals on terminal landings. Bad terminal magnets may cause this issue. 2. If working with a CTL-2, make sure the F7 parameter 72 is set to 'Virtual' and not 'Unused' as that may cause this issue. 3. If top landing is a short floor, check parameters 90 and 95 (assuming 72 and 73 are both virtual).
DVR2 YRD INPUT FAILURE (640) DVR3 YRD INPUT FAILURE (673) DVR4 YRD INPUT FAILURE (706)	**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. Check the Y auxiliary contact wired to terminal YR1 and replace if necessary. 2. Check the operation of the Y contactor. 3. Replace the HC-DVR board.
DVR3 DRD FAIL TO ACT (665) DVR4 DRD FAIL TO ACT (698)	**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. 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. 2. If any faults are displayed on the solid-state starter refer to the starter manual. 3. Replace the HC-DVR board.
DVR3 IS OFFLINE (494)	**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. 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 the SW1 settings on HC-DVR board #3: 1 = Off, 2 = On. 4. Verify that the setting for NUMBER OF MOTOR STARTERS = 3. 5. Verify that the setting for STARTER #3 TYPE is correct.
DVR3 MSSD FAIL TO ACT (664) DVR4 MSSD FAIL TO ACT (687)	**Description:** MSSD monitors the solid-state output of U1 and driver TY for proper operation. If either one 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. 2. Replace the HC-DVR board.

Table 5.10 Touch Screen Event Listings

Event	Description
DVR3 MSSD FAIL TO DEACT (677) DVR4 MSSD FAIL TO DEACT (710)	**Description:** MSSD monitors the solid-state output of U1 and driver TY for proper operation If either one fail in the on position this fault is generated. When either one 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.
DZF OUTPUT FAULT (EDGE) (150)	**Description:** Measured DZ and the 24VDC discrete DZ do not match. Fault-bypassed in Construction/Inspection. System Verifies: - LS-EDGE-EL is the selected landing system. **Troubleshooting:** Check for back-fed wires at the cartop board. When reader is sensing a DZ magnet (DZ LED on reader is on), there should be 24VDC at DZ terminal. Conversely, there should be about 0VDC at DZ terminal when reader is not sensing DZ.
DZR OUTPUT FAULT (EDGE) (151)	**Description:** Measured DZR and the 24VDC discrete DZR sent to the MC-LSI do not match. **Troubleshooting:** 1. Check for back-fed wires at the MC-LSI or HC-CTL-2 board. When the reader is sensing a DZR magnet (DZR LED on the reader is on), there should be 24VDC at the DZR_M terminal on the MC-LSI board. Conversely, there should be about 0VDC at the DZR-M terminal on the MC-LSI board when the reader is not sensing DZR.
EARTHQUAKE OPERATION (315)	**Description:** The EQI and/or CWI input is/are active. The car is on earthquake operation. Logged when earthquake input is activated. Bypassed in Construction bypass operation. **Troubleshooting:** Check state of inputs EQ SS and EQ CWT. Check the status of the EQI and CWI inputs. Check the counterweight derailment detection sensor. Check the seismic activity sensor.
EARTHQUAKE RECALL (93)	**Description:** The car is being recalled on earthquake operation.
EARTHQUAKE RUN (95)	**Description:** The car has performed an emergency stop in response to EQ SS and/or EQ CWT input activation, has recalled, and is subsequently moving at reduced speed in accordance to the selected earthquake code. Fault-bypassed in Construction. System Verifies: - Earthquake Data = EQ Run **Troubleshooting:** Press EQ RST on HC-MPU-2-TS board to reset.
EARTHQUAKE SHUTDOWN (94)	**Description:** Per the selected earthquake code, the car has lowered to the closest floor below its emergency stop position, opened its doors, and shut down. Fault-bypassed in Construction. System Verifies: - Earthquake Data = EQ Shutdown **Troubleshooting:** Press EQ RST on HC-MPU-2-TS board to reset.

Table 5.10 Touch Screen Event Listings

Event	Description
EMERGENCY DISPATCH (113)	**Description:** The hall call bus has failed and the car is operating on emergency dispatching to continue service to the building. Fault-bypassed in Construction/Inspection. Check OBD for message: 3HN comm loss or Emergency dispatch input (EM DISP) activated. System Verifies: - Emergency Dispatch Data = Emerg Dispatch **Troubleshooting:** Verify hall call functionality. Verify EM DISP input; System IO > Programmed Inputs (must be assigned to a valid input).
EMS IN CAR (337)	**Description:** Car has completed recall to EMS floor and medical personnel have activated the EMS switch in the car.
EMS RECALL (334)	**Description:** Emergency medical service has been initiated. **Troubleshooting:** If in error, check EMS input. If EMS service has not been activated, verify that no input has been programmed for the EMS function.
EMERGENCY DISPATCH HOLD (788)	**Description:** The emergency dispatch operation is enabled but currently on hold as configured via the as configured via the CONFIG 01 > SYSTEM TIMERS > EMERG DISP HOLD TIMER. Automatic car call registration will resume when this timer expires. **Troubleshooting:** Verify and confirm the desired value of the EMERG DISP HOLD TIMER. Set TIMER to OFF (0) if it is required to keep automatic car call registration during emergency dispatch operation. Verify hall call functionality. Verify EMDISP input; System IO > Programmed Inputs (must be assigned to a valid input).
EP CONFIG ERROR (278)	**Description:** An emergency power configuration error has been detected. The EPI spare input is programmed but the emergency power option is set to NONE or vice versa. **Troubleshooting:** Verify that there is no emergency power is enabled if the EPI input programmed or vice versa (CONFIG 03 > EMERGENCY POWER > EMERGENCY POWER TYPE).
EP NO COMM SHUTDOWN (808)	**Description:** Car has detected commercial power loss via its EPI input but has lost communication with the dispatcher. Cars shuts itself down to prevent overloading the generator if the dispatcher has selected another car to recall/run. **Troubleshooting:** Check the car's EPI input status and related circuitry. Check the communication status and external network connections related circuitry. Check that the ALIVE input is programmed, and related circuitry is functioning correctly. This input must be ON only if the dispatcher is powered and running.

Table 5.10 Touch Screen Event Listings

Event	Description
EP COMMAND/EPI MISMATCH (809)	**Description:** The car is communicating with the dispatcher, but its EPI input status does not match the emergency power command from the dispatcher (car detects commercial power loss but group is sending an emergency power OFF command or vice versa). Cars shuts itself down to prevent overloading the generator if the dispatcher has selected another car to recall/run. **Troubleshooting:** Check both the car and dispatcher EPI inputs statuses and related circuitry and make sure that the inputs match. Check that the ALIVE input is programmed, and related circuitry is functioning correctly. This input must be ON only if the dispatcher is powered and running.
EP RECALL (19)	**Description:** Emergency power is available, and the recall process has been initiated. Cannot be bypassed. System Verifies: - EP Data Status = EP Recall - EPI flag = 1 for normal operation (active low logic) **Troubleshooting:** If in error, check System IO > Programmed Inputs > EPI status.
EP RECALL COMPLETE (21)	**Description:** The car has completed recall to the designated recall floor. Cannot be bypassed. System Verifies: - EP Data Status = EP Recall Done
EP RECALL FAIL (22)	**Description:** Emergency power recall has been initiated but the car has failed to recall. Cannot be bypassed. System Verifies: - EP Data Status = EP Recall Fail **Troubleshooting:** Check that car is on automatic operation with no active faults.
EP RECALL ISV (20)	**Description:** The car is moving toward the recall floor under emergency power. Cannot be bypassed. System Verifies: - EP Data Status = EP Recall ISV **Troubleshooting:** Check the EPI status on CAR DIAG > EMERG. PWR & EARTHQUAKE. EPI input terminal must be 0V for normal operation.
EP RECALL NEXT FLOOR (282)	**Description:** Emergency power is available and recall to the next floor has been initiated. Cannot be bypassed. **Troubleshooting:** If in error, check System IO > Programmed Inputs > EPI status.
EP RUN (23)	**Description:** The car has been selected to run under emergency power. Cannot be bypassed. System Verifies: - EP Data Status = EP Run **Troubleshooting:** If in error, check that the EP Run has not been erroneously assigned to an input or, if a valid input has been assigned, verify the electrical state of that input and that it is wired correctly. Verify EP Auto (System IO > Programmed Inputs).
EP SHUTDOWN (18)	**Description:** Normal power has been lost and the car is stopped. The car will remain stopped until backup power becomes active or commercial power is restored. System Verifies: - EP Data Status = EP Shutdown **Troubleshooting:** If in error, check status of System IO > Programmed Inputs, EPI. Verify EPI not programmed if not used. If used, verify EPI wiring per job prints.

Table 5.10 Touch Screen Event Listings

Event	Description
EQ EMERGENCY STOP (92)	**Description:** Earthquake inputs EQ SS or EQ CWT have been activated and the car has performed an emergency stop. Further operation will be per the selected earthquake code. Fault-bypassed in Construction. System Verifies: - Earthquake Data = EQ Stop **Troubleshooting:** Verify System IO > Programmed Inputs, EQ SS or EQ CWT.
ESC INPUT LOW (139)	**Description:** The in-car emergency stop switch bypass input is low. If moving, the car will perform an emergency stop. The doors will not operate. System Verifies: - ESC input is low **Troubleshooting:** If in error, verify input and input device electrically and mechanically. Verify status System IO > System Inputs ESC.
EVENT LOG CLEARED (162)	**Description:** This message will appear momentarily when the event log is cleared through the touch screen. SYSTEM DIAG > EVENT LOG > CLEAR.
EXERCISE OPERATION (775)	**Description:** Car has been idle for a user-defined time and is now performing a user-defined number of exercise operation runs. During an exercise run, the car lowers to the bottom landing, then proceeds to the top landing and back down to the bottom without cycling the doors. The number of exercise runs is user defined. **Troubleshooting:** Check the user defined timer and number of exercise cycles in CONFIG 01 > ELEVATOR FEATURES > EXERCISE TIMER and CONFIG 01 > ELEVATOR FEATURES > EXERCISE CYCLES.
EXCESSIVE FAULTS (117)	**Description:** This fault is generated when there are more than ten faults that resulted in an emergency, controlled or ASAP stop. The counter resets if the car makes ten normal runs without any faults. The car is taken out of service and all registered calls are canceled. The car will proceed to the next available floor and cycle the doors to let the passengers out. Once at a floor, the **Excessive Faults Shutdown** fault is activated and the car will remain shut down until the Fault Reset button is pressed, Inspection is toggled or power to the controller is cycled. Fault-bypassed in Construction/ Inspection. 1. Access the event log and determine which recent events triggered the fault. 2. Troubleshoot those faults to prevent their recurrence.
FIRE BYPASSED (108)	**Description:** Detected when fire service is activated but the car cannot perform fire recall due to certain conditions (Inspection, Test, or Independent Service mode active). Cleared as soon as the conditions preventing fire recall are cleared. Cannot be bypassed. **Troubleshooting:** Check the current mode of operation and verify that the operation is per the selected user defined Elevator Safety Code.
FIRE II (24)	**Description:** Fire Phase II, in-car firefighter operation, is active. Cannot be bypassed. System Verifies: - Mode of Operation = Fire II **Troubleshooting:** If in error, verify in-car fire fighter switch mechanically and electrically. Verify status of System IO > Programmed Inputs > FR2 ON. Verify FR2 ON input is not shorted.

Table 5.10 Touch Screen Event Listings

Event	Description
FIRE II HOLD (17)	**Description:** The in-car fire fighter switch is in the HOLD position. Cannot be bypassed. System Verifies: - Mode of Operation = Op Mode Fire II - Fire Data = FIRE II HOLD **Troubleshooting:** If in error, verify in-car fire switch mechanically and electrically. Verify correct wiring per job prints. Verify status of FR2 HOLD flag at System IO > Programmed Inputs.
FIRE II RECALL (25)	**Description:** The doors are closed, the in-car fire switch is off and the car is recalling to the recall floor. Cannot be bypassed. System Verifies: - Mode of Operation = Fire Recall **Troubleshooting:** If in error, verify programmed Input System IO > Programmed Inputs > FR2 ON.
FIRE RECALL ALT (27)	**Description:** The car is recalling to the alternate fire recall floor. At the floor, the car will behave as configured. Cannot be bypassed. System Verifies: - Mode of Operation = Fire Recall Alt **Troubleshooting:** If in error, verify operation of fire/smoke sensors on main recall floor. Verify sensors wired according to job prints. Verify System IO > System Input > FRA = on for normal.
FIRE RECALL MAIN (26)	**Description:** The car is recalling to the main fire recall floor. At the floor, the car will behave as configured. Cannot be bypassed. System Verifies: - Mode of Operation = Fire Main **Troubleshooting:** 1. If in error, verify operation of fire/smoke sensors on floors other than main recall floor. 2. Verify sensors wired according to job prints. 3. Verify System IO > System Inputs, FRM.
FIRE RECALL: FR1 ON (242)	**Description:** Fire recall initiated by the main fire recall switch (HC-MPU-2-TS FR1 ON input active low). Car recalls to the designated fire floor (usually the lobby). **Troubleshooting:** Verify System IO > FR1 ON = Off for normal.
FIRE RECALL: FR1 ON2 (243)	**Description:** A spare input programmed for the FR1 ON2 has been activated. **Troubleshooting:** 1. Verify spare input programming. 2. Check terminal associated with input.
FIRE RECALL: FRA (244)	**Description:** Fire recall initiated by fire sensors in the lobby. HC-MPU-2-TS FRA input low. Car recalls to the alternate fire floor. **Troubleshooting:** Verify System IO > System Inputs > FRA = On for normal.
FIRE RECALL: FRS (241)	**Description:** The dedicated FRS input on the HC-MPU-2-TS has been activated. **Troubleshooting:** Check the main floor fire recall switch.
FIRE RECALL: FRSA (246)	**Description:** Fire recall initiated by the fire sensors in the machine room and/or hoistway (HC-MPU-2-TS FRSA input low). Car recalls to the alternate fire floor. **Troubleshooting:** Verify System IO > System Inputs > FRSA = On for normal.

Table 5.10 Touch Screen Event Listings

Event	Description
FIRE RECALL: FRSA OTHER (800)	**Description:** Fire recall initiated by other car(s) fire sensors in the machine room and/or hoistway. Car recalls to the alternate fire floor. **Troubleshooting:** Check the status and related circuitry of the FRSA OTHER spare input in System IO > Programmed Inputs > FRSA OTHER (ON for normal).
FIRE RECALL: FRSM (245)	**Description:** Recall initiated by one or more fire sensors at floors other than the ones at the lobby (HC-MPU-2-TS FRS input low). Car recalls to the designated fire floor (usually the lobby). **Troubleshooting:** Verify System IO > System Inputs > FRSM = On for normal.
FIRE RECALL: FRSM OTHER (799)	**Description:** Fire recall initiated by other car(s) fire sensors in the machine room and/or hoistway. Car recalls to the designated fire floor. **Troubleshooting:** Check the status and related circuitry of the FRSM OTHER spare input in System IO > Programmed Inputs > FRSM OTHER (ON for normal).
FLOOD OPERATION (29)	**Description:** Flood operation has been initiated. Cannot be bypassed. **Troubleshooting:** If in error, verify no programmable Input Pit Flood is configured. Verify System IO > Programmed Inputs > Pit Flood and initiating device.
FLOOD RECALL (30)	**Description:** The car is recalling to the designated flood operation recall floor. Cannot be bypassed. System Verifies: - Flood Data = Flood Recall **Troubleshooting:** If in error, verify no programmable Input Pit Flood is configured. Verify System IO > Programmed Inputs > Pit Flood and initiating device.
FLOOR CODE INVALID (212)	**Description:** An invalid (out of range) absolute floor code has been detected. On a stepping landing system: Check spare inputs (R0, R1, R2, etc) to ensure they are returning valid binary floor codes. Refer to landing system drawing in controller job prints. On an LS-EDGE landing system this fault may require performing the hoistway learn procedure to re-learn the floors.
FLOOR UNINTENDED MOTION (177)	**Description:** The controller has detected the car has left door zone with the doors not fully closed. Cannot be bypassed Reset after checking door inputs Reset by holding fault reset for 5 seconds on machine room inspection.
FLT BYPASS JP (185)	**Description:** The fault bypass jumper on the HC-MPU-2-TS board is in the BYPASS position. Cannot be bypassed.
FLT BYPASS JP: TIME OUT (186)	**Description:** The fault bypass jumper on the HC-MPU-2-TS board is in the BYPASS position and will be effective for the duration of the countdown timer displayed. When the timer expires the system will ignore the jumper and Fault Bypass will end. If more time in fault bypass is required, cycle power to the controller to "reset" the jumper or temporarily move the jumper to the OFF position before again placing it in the BYPASS position.
FOLLOWING ERROR (248)	**Description:** Commanded speed and speed feedback from the motor encoder have deviated by more than the percentage of Following Error set through F7, parameter 189. The car performs an emergency stop, dropping power to the motor and the brake. After stopping, the car will again attempt to run. If the error persists, the car will be removed from service.

Table 5.10 Touch Screen Event Listings

Event	Description
GROUP HC BUS FAILURE (847)	**Description:** A fuse or wiring problem has interrupted power to the hall call circuits. Activated by HCB FAIL message from the Group via the CAN bus. **Car actions:** The car goes into emergency dispatch operation (if not overridden via the related switch). **Troubleshooting:** 1. Check the Group for HCB FAIL message on Status display. 2. Check the hall call bus fuse and the wires to the hall call power inputs in the Group controller.
GS INPUT FAILURE (471) GSR INPUT FAILURE (502)	**Description:** The (front/rear) Gate Switch (GS) input has detected a failure of the ABGA or GBB outputs, DPM/R, DLAB/R or the gate switch
GS OPEN-RUNNING (235) REAR GS OPEN-RUNNING (790)	**Description:** Asserted if the car gate switch is not made during a run. The car will make an emergency stop. **Troubleshooting:** Verify GS input electrically and mechanically.
HALL CALLS BYPASSED (254)	**Description:** Hall calls are being bypassed. Typically due to heavy load status of car. **Troubleshooting:** Automatically corrected when car load allows additional passenger. Verify System IO > Programmed Inputs > Load Hvy.
HALL CALLS DISABLED (253)	**Description:** Hall calls have been disabled. Typically due to heavy load status of car. **Troubleshooting:** Automatically corrected when car load allows additional passenger. Verify System IO > Programmed Inputs > Load Hvy.
HALL DOB BYPASSED FRONT (830) HALL DOB BYPASSED REAR (831)	**Description:** A stuck (front/rear) hall door open button has been continuously activated for a user defined time and bypassed. **Car actions:** The door open button is rendered inoperative and the doors close. Doors close at reduced speed if there are no other reopening devices. **Troubleshooting:** 1. Check the door open button input and related circuitry. 2. Check the related stuck door open button timer. 3. Check the related option to bypass a stuck door open button. 4. Fault is cleared when the door open button is deactivated.
HC SECURITY DISABLED (821)	**Description:** Hall call security has been disabled. Informational. **Car actions:** Informational. All hall calls are enabled regardless of security options and inputs statuses or settings. **Troubleshooting:** 1. Check the SECURITY ENABLED option (override hall and car call security). 2. Check the SECRTY OV input (master security override switch). 3. Check the SEC HCEN OV input (hall call security override switch)
HC-UIO-2 PI OFFLINE (794) HC-UIO-2 CALLS OFFLINE (795) HC-UIO HOSPITAL OFFLINE (796) HC-UIO SPARE OFFLINE (797) HC-UIO SPARE OFFLINE (797) HC-UIO CARDREADR OFFLINE (798)	**Description:** The controller detected that a UIO board that was previously connected is no longer communicating. **Troubleshooting:** Check CAN termination Check cables to HC-UIO board to HC-CHP.

Table 5.10 Touch Screen Event Listings

Event	Description
HDB SWITCH FAULT (228)	**Description:** Generated when the HDB and HDBO inputs are in the same state (both low or both high) indicating a possible failure of the Hoistway Door Bypass Switch. **Troubleshooting:** Toggle hoistway door bypass switch and verify that diagnostic LEDs HDB, HDBO also toggle (System IO > System Inputs). Verify HDBPTST jumper is inserted in the OFF position.
HEAVY LOAD (46)	**Description:** The car is loaded beyond the heavy load setting. Under this condition, a moving car will ignore additional hall calls until the load is reduced by passenger departure. Fault-bypassed in Construction. System Verifies: - Status of input - Load Data = Load Heavy **Troubleshooting:** 1. If in error, verify no input is programmed for Load Hvy. Otherwise, verify status of input and input device. 1. Verify input wiring. 3. Verify System IO > Programmed Inputs > Load Hvy. 4. Calibrate load weigher.
HOIST. ACCESS CONSTRUCT (56)	**Description:** The car is on construction operation and hoistway access. Cannot be bypassed. **Troubleshooting:** Exit construction operation See Construction Operation on page 3-4
HOIST. ACCESS INSPECTION (60)	**Description:** The car is on Inspection mode and hoistway access. Cannot be bypassed. System Verifies: - Mode of Operation = Inspection HA **Troubleshooting:** If in error, verify INA input.
IMPROPER SHUTDOWN (EDGE) (158)	**Description:** This fault is generated by the LS-EDGE landing system if position storage fails during a power down. This may occur if the processors are manually reset, or the internal backup supply fails. This fault will cause a terminal sync. **Troubleshooting**: 1. If the fault is generated due to a manual rest of the processors, no action is required. 2. Observe the CPU LEDs on the LS-EDGE landing system at the moment of power loss, the LEDs must remain active for a period no less than 10 seconds. If they do not, replace the LS-EDGE landing system.
ICE-COP (3 or 7) is Offline (849-850)	**Description:** The controller has detected that an ICE-COP-2 board with configured I/O has been disconnected. **Car actions:** Car will stop at the next floor and be taken out of service. **Troubleshooting:** 1. Check connection of ICE-COP-2 boards in the control cabinet. 2. Check programming that I/O has not been assigned to ICE-COP-2 terminals if ICE-COP-2 boards are not being used.
ICPD INPUT FAILURE (465)	**Troubleshooting:** 1. Check for incorrect wiring or short on the HC-CTL-2 board ICPD input and 2 bus. 2. Replace the HC-CTL-2 board.

Table 5.10 Touch Screen Event Listings

Event	Description
ICPU INPUT FAILURE (466)	**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. 2. Replace the HC-CTL-2 board.
ICTD INPUT FAILURE (467)	**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. 2. Replace the HC-CTL-2 board.
ICTU INPUT FAILURE (468)	**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. 2. Replace the HC-CTL-2 board.
IN-CAR CONSTRUCT/BYPASS (216)	**Description:** Car panel inspection and construction operation are active and one or both of the Car/Hoistway Door Bypass switches is in the Bypass position. Cannot be bypassed. System Verifies: - ModeOfOperation = OpModeConstructionBPCP **Troubleshooting:** Exit construction operation (See Construction Operation on page 3-4)
IN-CAR CONSTRUCTION (55)	The car is operating in construction mode from the in-car controls.
IN-CAR INSP/BYPASS (116)	**Description:** Car Panel inspection is active and one or both of the Car/ Hoistway Door Bypass switches is in the Bypass position. Cannot be bypassed. System Verifies: - ModeofOperation = OpModeInspectionBPCP **Troubleshooting:** Turn off one or both of the Car/Hoistway Door Bypass switches.
IN-CAR INSP ENABLE FAULT (491)	**Description:** The In-Car Inspection Enable input is being seen active while the car is not on In-Car Inspection. The controller determined this input to be failed closed. **Troubleshooting:** Check In-Car enable switch. Check In-Car enable input.
IN-CAR INSPECTION (59)	**Description:** The car is on Inspection mode and is being operated from the in-car inspection station. Cannot be bypassed. System Verifies: - Mode of Operation = Inspection CP **Troubleshooting:** If in error, verify car panel inspection inputs.
INN/INA MISMATCH (507)	**Description:** This fault monitors the statuses of the INN, INA and INCP for failures when hoistway access is configured on the job but not necessarily active. **Troubleshooting**: 1. Verify that the INN, INA and INCP input are not low at the same time. 2. Verify that the INN, INA and INCP input are not high at the same time.
INDEPENDENT MODE (28)	**Description:** The car is running on independent mode and will not accept hall calls. Cannot be bypassed. System Verifies: Mode of Operation = Independent **Troubleshooting:** If in error, verify no input programmed IND SERV if IND SERV not available. Verify IND SERV input and initiating device wired per job prints.

Table 5.10 Touch Screen Event Listings

Event	Description
INSPECT DIR SW. FAIL (478)	**Description:** Both Machine Room Inspection UP and DN directions have been activated at the same time.
INSPECTION INVALID (97)	**Description:** Controller unable to establish proper mode of Inspection. Fault-bypassed in Construction/Inspection. System Verifies: - Mode of Operation = Inspection Invalid **Troubleshooting:** Verify all inspection inputs mechanically and electrically.
INVALID ACCESS ZONE (267)	**Description:** Car has been placed on Inspection Access but is outside the selected access zone. If in error: 1. Verify car position. 2. Verify CONFIG 02 > HOISTWAY SETUP > TOP|BOTTOM ACCESS DISTANCE. 3. Verify switch wiring.
INVALID MODE (6)	**Description:** The car is in an invalid operating mode. Appears temporarily at power up and is immediately replaced with the actual operating mode. If it appeared during normal operation, a running car would perform an emergency stop and shut down. A stopped car would remain stopped and shut down. Cannot be bypassed. System Verifies: - Mode of Operation = OpModeInvalid or OpModeInspectionInvalid **Troubleshooting:** 1. Cycle power to the controller. 2. Contact MCE; possible defective HC-MPU-2-TS board.
IO TERMINAL MAPPING FLT (240)	**Description:** More than one spare input or output are programmed to the same hardware I/O terminal. **Troubleshooting:** Verify spare inputs and outputs.
LEVELING OVERSPEED (322)	**Description:** A leveling overspeed has been detected. The car will perform an emergency stop and be removed from service. **Troubleshooting:** Verify landing system connections and configuration (CONFIG2 > System Control Parameters > Leveling Overspeed).
LLI ANTINUISANCE (251)	**Description:** Informational. The light load anti-nuisance call threshold has been achieved; additional car calls are being canceled. Self resetting. Cannot be bypassed.
LOW OIL: FIRE I (62)	**Description:** Hydro Only. Low hydraulic oil level detected and the car is recalling to the next available lower floor on Fire Phase I. The car will cycle its doors, then shut down. DOB remains active. Manual reset required. Cannot be bypassed. System Verifies: - Oil Data, Recall Done is not active - Oil Data = Oil Fire Recall - Recall Data = Recall LOS - Mode of Operation = Fire I
LOW OIL: FIRE II (63)	**Description:** Hydro Only. Low hydraulic oil level has been detected and the car is operating on in-car firefighter operation. Operation per Elevator Safety Code. Cannot be bypassed. System Verifies: - Oil Data, Recall Done is not active - Recall Data = Recall LOS - Mode of Operation = Fire II

Table 5.10 Touch Screen Event Listings

Event	Description
LOW OIL: ON (110)	**Description:** Hydro Only. The OIL LOW input is active. Cannot be bypassed. **Troubleshooting:** If in error, verify no OIL LOW input is programmed or the status of that input if programmed.
LOW OIL: RECALL (61)	**Description:** Hydro Only. Low hydraulic oil level has been detected. If car is stopped in a door zone, the doors will remain open to allow passengers to exit. Doors shall not remain open beyond 15 seconds and will close automatically upon timer expiration. Doors will not respond to hall button demand but will reopen if the in-car DOB is pressed. The car will shut down and manual reset is required. If car doors are closed, the car will recall to the bottom landing and open its doors (door conditions same as above). Cannot be bypassed.
LOW OIL: RECALL FAIL (65)	**Description:** Hydro Only. Low hydraulic oil level detected but car is unable to recall. Cannot be bypassed.
LOW OIL: SHUTDOWN (64)	**Description:** Hydro Only. The car has completed low oil level recall. Doors will cycle; car will shut down; DOB will remain active. Cannot be bypassed.
LS-EDGE BOOT CORRECTION (263)	**Description:** If the controller loses power, LS-EDGE continues to record position for a short period of time. When power is regained, if LS-EDGE determines that the car has moved from its last recorded position, it will perform a terminal sync to correct. **Troubleshooting:** Cycle power. LS-EDGE should clear the message.
LS-EDGE BOOT WITH ERROR (262)	**Description:** Initiated by the LS-EDGE-EL landing system. The LS-EDGE system has discovered an error while booting up after a power on or system reset. All calls will be canceled; doors will remain closed. Cannot be bypassed.
LS-EDGE CPU-B IS OFLINE (439)	**Description:** The controller can not see any communication to the LS-EDGE B processor. **Troubleshooting:** Check wiring to LS-Edge Firmware update the LS-Edge.
LS-EDGE COUNT ERROR (261)	**Description:** Initiated by the LS-EDGE-EL landing system. Position count upon detecting a previously learned magnet is outside the acceptable margin of error. All calls will be canceled; doors will remain closed. Cannot be bypassed. **Troubleshooting:** 1. Verify position of magnet. 2. Reset LS-EDGE. 3. Repeat hoistway learn if problem persists (Utils > Landing System Utilities > Hoistway Learn (Landing System Learn).
LS-EDGE FLOOR CHECKSUM (266)	**Description:** After a learn operation, the landing system and the controller both store the resulting checksum. On power up, the checksums are compared to ensure they match. If they do not, the car will not be allowed to move until a successful learn operation is performed. Bypass in Construction or Inspection bypass mode. **Troubleshooting:** Repeat hoistway learn if problem persists (Utils > Landing System Utilities > Hoistway Learn (Landing System Learn).
LS-EDGE LEARN ACTIVE (260)	**Description:** Informational message while LS-EDGE is performing a hoistway learn operation.

Table 5.10 Touch Screen Event Listings

Event	Description
LS-EDGE POSITION ERROR (264)	**Description:** Initiated by the LS-EDGE-EL landing system. LS-EDGE has detected a previously learned floor zone or terminal magnet outside learned position margins. If moving, the car will perform an emergency stop. If stopped, the car will not be allowed to move. Bypassed in Construction Bypass mode. **Troubleshooting:** 1. Verify magnet positions. 2. Repeat hoistway learn operation (Utils > Landing System Utilities > Hoistway Learn (Landing System Learn).
LS-EDGE: ACCESS OVRSPD (339)	**Description:** LS-EDGE has detected an overspeed while operating on hoistway access.
LS-EDGE: INSPECT OVRSPD (340)	**Description:** LS-EDGE has detected an overspeed while operating on Inspection mode. **Troubleshooting:** 1. Verify Inspection Overspeed setting (CONFIG02 > System Control Parameters > Inspection Overspeed). 2. Verify Profile Scale setting (CONFIG02 > System Control Parameters > Profile Scale).
M2L INPUT FAILURE (602)	**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). 5. Replace the HC-DVR board.
M2L IS LOW (121)	**Description:** 2LS bus unexpectedly low. Cannot be bypassed. **Troubleshooting:** Verify fuse F2MV on SCE-UPD board.
M2MV IS LOW (120)	**Description:** 2MV Bus (120VAC) monitoring input is low. Cannot be bypassed. Check fuse F2MV on the SCE-UPD board. Verify 120VAC across terminals X1B and X2B on the SCE-UPD.
MABGF INPUT FAILURE (470) MABGR INPUT FAILURE (501)	**Description:** The (Front/Rear) Access Gate Bypass Monitor (MABGF/R) input has detected a failure of the Access Bypass Gate A (ABGA/R) or Front/Rear Access Bypass Bottom (FABB/RABA) outputs. **Troubleshooting:** Replace the HC-RDR board
MABT INPUT FAILURE (477)	**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. If not, contact MCE for assistance.

Table 5.10 Touch Screen Event Listings

Event	Description
MACHINE ROOM CONSTRUCT (54)	**Description:** The car is on construction operation and machine room inspection. System Verifies:- Mode of Operation = Construction MR **Troubleshooting:** Exit construction operation (Set Up for Construction Operation on page 3-4).
MACHINE ROOM INSPECTION (58)	**Description:** The car is on machine room inspection. Cannot be bypassed. System Verifies:- Mode of Operation = Inspection MR If in error, verify position of machine room inspection switch.
MBAB INPUT FAILURE (475)	**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 board is low with respect to 1 bus.
MC-CPI-2 (0) IS OFFLINE (219) MC-CPI-2 (1) IS OFFLINE (220) MC-CPI-2 (2) IS OFFLINE (221) MC-CPI-2 (3) IS OFFLINE (222) MC-CPI-2 (4) IS OFFLINE (804) MC-CPI-2 (5) IS OFFLINE (805) MC-CPI-2 (6) IS OFFLINE (806) MC-CPI-2 (7) IS OFFLINE (807)	**Description:** The MC-CPI-2 at this ID is offline. Fault-bypassed in Construction. **Troubleshooting:** Verify CPI connections and power. Verify CPI ID switches correct and fully on or off. Cycle power to the controller. Contact MCE; possible defective MC-CPI-2 board.
MDFE FAIL TO ACT (595)	**Description:** The MDFE input monitors the status of the DFE triac and the DFE triac driver. When either one 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 FAIL TO DEACT (594)	**Description:** The MDFE input monitors the status of the DFE triac and the DFE triac driver. When either one 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 (489)	**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. 3. Replace the HC-DVR board.

Table 5.10 Touch Screen Event Listings

Event	Description
MDLR INPUT FAILURE (505)	**Description:** The Monitor Rear Door Lock (DLR) input has detected a failure of the Rear Hoistway Door Bypass (HDBBR) or Rear Bottom Access Bypass (BABBR) outputs, Rear Gate Switch (GSR), Rear Door Position Monitor (DPMR), or Rear Door Lock Access Bypass (DLABR) inputs. **Troubleshooting:** Check voltage on HC-CTL-2 board terminal DLABR. DPMR should activate two inches before DLABR. If DLR is active, GSR must also be active.
MDRE FAILED TO TURN OFF (309)	**Description:** MDRE monitors the solid state starter DRE device. The device did not open when expected. Cannot be bypassed. **Troubleshooting:** Check the associated wiring. Verify the DRE system output. Contact MCE; possible defective HC-MPU-2-TS board.
MDRE FAILED TO TURN ON (310)	**Description:** MDRE monitors the solid state starter DRE device. The device did not close when expected. Fault-bypassed in Construction/Inspection. **Troubleshooting:** Check the associated wiring. Verify the DRE system output. Contact MCE; possible defective HC-MPU-2-TS board.
MDSE FAIL TO ACT (593)	**Description:** The MDSE input monitors the status of the DSE triac and the DSE triac driver. When either one 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 FAIL TO DEACT (596)	**Description:** The MDSE input monitors the status of the DSE triac and the DSE triac driver. When either one 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.
MDZLV INPUT FAILURE (472)	**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 the HC-CTL-2 board. If the fault only occurs in the up direction it could be caused by an overlap of the LU and DZ sensor (hydro). If the fault only happens at a door zone after restoring a stop switch, then MDZLV is not going low when the stop switch is open. See if voltage is present at CTL terminal DLAB. If it is trace back to see why. DLAB should be powered by 2S and 2S should be low if a safety is open. The fault will also occur if MDZLV is high when DZ is low.

Table 5.10 Touch Screen Event Listings

Event	Description
MEB2 REDUNDANCY FAULT (320)	**Description:** Checks the emergency brake activation logic. MEB2 should be active every other run. **Troubleshooting:** Check connector at DSE/EB2 on SCE-HVI board. If connection is correct, go to PLD DIAG > PLD INPUTS. View flag MEB2. If MEB2 does not toggle every other run, contact MCE; possibly faulty SCE-HVI board.
MHDB INPUT FAILURE (473) MHDBR INPUT FAILURE (503)	**Description:** The (Front/Rear) Hoistway Door Bypass Monitor (MHDB/R) input has detected a failure of the Rear Hoistway Door Bypass (HDB/R) or (HDBB/R) outputs. **Troubleshooting:** Replace the HC-CTL-2 board.
MOTOR TIME OUT (10)	**Description:** Failure of the car to reach a target floor in the allowed time. **Troubleshooting:** Modify motor limit timer to a value that allows car to run the entire hatch without a fault. Ensure that drive or starter is not shutting down during a run. There may be a mechanical problem that prevents or slows the motion of the car.
MOTOR TIME OUT SHUTDOWN (226)	**Description:** The CONFIG01 timer, MOTOR/VALVE TIME LIMIT has been exceeded (typical 5 minutes; max 30 minutes). **Troubleshooting:** If car stalls in an express zone without door zone magnets it may take more than 5 minutes to arrive at a landing. Increase timer setting to allow sufficient time. Check event log for other events that may have prevented car from moving. Verify no obstructions.
MPUA IS OFFLINE (142)	**Description:** The MPU-B processor does not see any communication to MPU-A. **Troubleshooting:** Check all shunt jumpers are in the correct position on the HC-MPU-2-TS board.
MPUA: CAN COMM LOSS (11)	**Description:** The HC-MPU-2-TS does not see any CAN communication. **Troubleshooting:** Check CAN cable between HC-MPU-2-TS and HC-CHP board. Check all shunt jumpers are in the correct position on the HC-MPU-2-TS board.
MPUB START UP (813)	**Description:** The MPU-B processor logged that it has restarted.
MRD INPUT FAILURE (606)	**Description:** The M Contactor Redundancy (MRD) input monitors the normally closed auxiliary contact of the M contactor. **Troubleshooting:** The wiring or devices connected to MR1 input may not be terminated. Check the M auxiliary contact wired to terminal MR1 and replace if necessary. 1. Check the operation of the M contactor. 2. Replace the HC-DVR board.
MSAFL1 INPUT FAILURE (464)	**Description:** The MSAFL1 input monitors SAFL and SAFS relay contacts against the circuits that drive the relay coils. Bus 2L should be 120VAC and relay SAFL should be picked only if the doors are locked. **Troubleshooting:** 1. Check or replace relays SAFL and/or SAFS on the HC-CTL-2 board. 2. Check mis-wiring to 2L terminal. If SALF is not picked, then we should not read voltage on 2L.

Table 5.10 Touch Screen Event Listings

Event	Description
MSSD FAIL TO ACT (598)	**Description:** MSSD monitors the solid state output of U1 and driver TY for proper operation. If either one fails 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. 2. Replace the HC-DVR board.
MSSD FAIL TO DEACT (611)	**Description:** MSSD monitors the solid state output of U1 and driver TY for proper operation If either one fails 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.
MSSD FAILED ACTIVE (487)	**Description:** MSSD monitors the solid state output of U1 and driver TY for proper operation If either one fails in the on position this fault is generated. **Troubleshooting:** Check terminal SSD wiring. Replace the HC-DVR board.
MTAB INPUT FAILURE (476)	**Description:** The Top Access Bypass Monitor (MTAB) input has detected a failure of the Top Access Bypass (TAB) or (TABA) outputs. **Troubleshooting:** Verify TAB input is high when top access switch is turned. Replace the HC-CTL-2 board.
MTD FAIL TO ACT (589)	**Description:** The MTD input monitors the status of the TD triac and the TD triac driver. When either one fails to activate when expected this fault is generated. **Troubleshooting:** Check the starter configuration and programming record. Check motor contactor wiring and voltages at terminal DD1 on the HC-DVR board. The TD triac may have failed open. Replace the HC-DVR board.
MTD FAIL TO DEACT (590)	**Description:** The MTD input monitors the status of the TD triac and the TD triac driver. When either one fails to deactivate when expected this fault is generated. **Troubleshooting:** Check the starter configuration and programming record. Check motor contactor wiring and voltages at terminal DD1 on the HC-DVR board. The TD triac may have shorted. Replace the HC-DVR board.
MTM FAIL TO ACT (585)	**Description:** The MTM input monitors the status of the TM triac and the TM triac driver. When either one fails to activate when expected this fault is generated. **Troubleshooting:** Check the starter configuration and programming record. Check motor contactor wiring and voltages at terminal M1 on the HC-DVR board. The TM triac may have failed open. Replace the HC-DVR board.

Table 5.10 Touch Screen Event Listings

Event	Description
MTM FAIL TO DEACT (586)	**Description:** The MTM input monitors the status of the TM triac and the TM triac driver. When either one fails to deactivate when expected this fault is generated. **Troubleshooting:** Check the starter configuration and programming record. Check motor contactor wiring and voltages at terminal M1 on the HC-DVR board. The TM triac may have shorted. Replace the HC-DVR board.
MTY FAIL TO ACT (587)	**Description:** The MTY input monitors the status of the TY triac and the TY triac driver. When either one fails to activate when expected this fault is generated. **Troubleshooting:** Check the starter configuration and programming record. Check motor contactor wiring and voltages at terminal YD1 on the HC-DVR board. The TY triac may have failed open. Replace the HC-DVR board.
MTY FAIL TO DEACT (588)	**Description:** The MTY input monitors the status of the TY triac and the TY triac driver. When either one fails to deactivate when expected this fault is generated. **Troubleshooting:** Check the starter configuration and programming record. Check motor contactor wiring and voltages at terminal YD1 on the HC-DVR board. The TY triac may have shorted. Replace the HC-DVR board.
MUFE FAIL TO ACT (600)	**Description:** The MUFE input monitors the status of the UFE triac and the UFE triac driver. When either one 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:** Check the associated wiring. Check the up fast valve coil. Run the car up on inspection and verify that terminal UFE goes low. The UFE triac may have failed open. Replace the HC-DVR board.
MUFE FAIL TO DEACT (601)	**Description:** The MUFE input monitors the status of the UFE triac and the UFE triac driver. When either one 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:** Check the associated wiring. Check the up fast valve coil. The UFE triac may have shorted. Replace the HC-DVR board.
MUFE INPUT IS LOW (488)	**Description:** The MUFE input monitors the continuity of the Up Fast Valve coil and also checks the OFF state of the UFE triac. **Troubleshooting:** Check the termination of the valve coil at terminal UFE on the HC-DVR board. Check terminal UF for 120VAC with respect to 1 bus. Replace the HC-DVR board.

Table 5.10 Touch Screen Event Listings

Event	Description
MUSE FAIL TO ACT (591)	**Description:** The MUSE input monitors the status of the USE triac and the USE triac driver. When either one 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:** Check the associated wiring. Check the up fast valve coil. Run the car up on inspection and verify that terminal USE goes low. The USE triac may have failed open. Replace the HC-DVR board.
MUSE FAIL TO DEACT (592)	**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:** Check the associated wiring. Check the up fast valve coil. The USE triac may have shorted. Replace the HC-DVR board.
NO DOOR ZONE FAULT FRONT (193) NO DOOR ZONE FAULT REAR (811)	**Description:** DZ signal not seen at end of run. Fault-bypassed in Construction/Inspection. **Troubleshooting:** Verify DZ system input, PLD Diag > PLD Inputs & CAR Diag > CAR Flags. View DZ LED on HC-MPU-2-TS board.
NO LEVELING FAULT (195)	**Description:** No leveling inputs detected during run. Fault-bypassed in Construction/Inspection. Code 1: ULM or DLM detected. Code 2: Neither ULM nor DLM detected. **Troubleshooting:** Verify DLM, ULM system inputs, System IO > System Inputs.
NUDGING (37) NUDGING REAR (784)	**Description:** The door is closing in nudging mode. Fault-bypassed in Construction. System Verifies: - Door Flags = Nudging **Troubleshooting:** Check for stuck PHE/DOB/Safe Edge. Check for debris or obstruction in door track. System IO > Programmed Inputs > PHE/DOB/SAFE EDGE.
OIL PRESS: RECALL FAIL (259)	Hydro Only.
OIL PRESSURE: RECALL (100)	**Description:** Hydro Only. Loss of positive pressure detected. The car is recalling to the next available floor in the up direction. Cannot be bypassed.
OIL PRESSURE: SHUTDOWN (135)	**Description:** Hydro Only. Loss of positive pressure detected. The car has completed recall to the next available floor in the up direction. Cannot be bypassed.
OIL PRESSURE: SWITCH ON (109)	**Description:** Hydro Only. Loss of positive pressure detected. The car will recall to the next available floor in the up direction. Cannot be bypassed. **Troubleshooting:** Verify proper function of valves, motor, and pump. Check for obstructed return.

Table 5.10 Touch Screen Event Listings

Event	Description
OIL TEMP: FIRE I (67)	**Description:** Hydro Only. An over temperature oil condition has been detected and the car is recalling on Fire Phase I. Car will lower to the bottom landing or to the next lower floor. Doors will open then close within 15 seconds. Door open button will remain operative. Cannot be bypassed. System Verifies: - Oil Data, Recall Done is not True - Recall Data = Recall Oil Temp - Mode of Operation = Fire I
OIL TEMP: FIRE II (68)	**Description:** Hydro Only. An over temperature oil condition has been detected and the car is operating on in-car firefighter operation. Car will operate per Elevator Safety Code. Cannot be bypassed. System Verifies: - Oil Data, Recall Done is not True - Oil Data = Oil Fire Recall - Recall Data = Recall Oil Temp - Mode of Operation = Fire II
OIL TEMP: ON (111)	**Description:** Hydro Only. The oil (over) temperature input is active. Car will lower to the bottom landing, open its doors, and shut down. Manual reset required. Cannot be bypassed. System Verifies: - Oil Data =Oil Temp Recall and Oil Fire Recall are not true - Oil Temp input true
OIL TEMP: RECALL (66)	**Description:** Hydro Only. Oil over temperature detected. Car will lower to bottom landing, doors will open. Doors will close within 15 seconds. DOB will remain active. Cannot be bypassed. Manual reset required. System Verifies: - Oil Data = Oil Temp Recall
OIL TEMP: RECALL FAIL (70)	**Description:** Hydro Only. An over temperature oil condition has been detected and the car is unable to recall. Cannot be bypassed. System Verifies: - Oil Data = Oil Recall Fail - Recall Data = Recall Oil Temp
OIL TEMP: SHUTDOWN (69)	**Description:** Hydro Only. Oil temperature recall is complete. Cannot be bypassed. System Verifies: - Oil Data = Recall Done - Recall Data = Recall Oil Temp
OIL VISCOSITY (101)	**Description:** Hydro Only. If a temperature sensor determines the oil is too cold and no calls are registered, the car will move to the bottom landing (doors closed) and the pump motor will run without valve coils energized to circulate and heat the oil. Fault-bypassed in Construction. System Verifies: - Oil Data = Oil VCI Recall - Oil Data = Recall Done - Recall Data = Recall Oil VCI

Table 5.10 Touch Screen Event Listings

Event	Description
OLM INPUT FAILURE (603)	**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:** Check that IDC terminal 2L on the HC-CTL-2 board connects to IDC terminal 2L on the HC-DVR board. Check the wiring of the thermal overload between terminals TO1 and TO2 on the HC-DVR board. Check the wiring of the starter overload between terminal OL1 and OL2 (if present). Replace the HC-DVR board.
OLM INPUT IS LOW (604)	**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:** Check the wiring of the thermal overload between terminals TO1 and TO2 on the HC-DVR board. Check the wiring of the starter overload between terminal OL1 and OL2 (if present). Replace the HC-DVR board.
OUT OF SERVICE (39)	**Description:** The COS Timer has elapsed subsequent to the Car Delayed Timer having already elapsed. Fault-bypassed in Construction/Inspection. System Verifies: - Car Flags - Car Out of Service **Troubleshooting:** Determine the cause of the delay. See Car Delayed for additional information.
OVERLOAD (44) OVERLOAD 2 (45)	**Description:** Car is loaded beyond overload setting. Buzzer will sound and car will not leave floor until load is below the setting. Not generated in construction operation. Bypassed by FRS. **Troubleshooting:** If in error, verify no input is programmed for the Load Over function. Otherwise, calibrate load weigher. Verify status of input and input wiring.
PARAMETER RANGE FIT (239)	**Description:** When loading stored parameters, some parameters did not pass the valid range check. This message is not necessarily a problem but parameter verification is recommended. This may occur when: Changing software. If a parameter is corrupted. Using parameter files with different versions.
PARAMETER STORAGE FAULT (118)	**Description:** A fault occurred while parameters were being stored. Cannot be bypassed. The car will not be allowed to move. **Troubleshooting:** If fault occurred while updating software, reset processor C, repeat software update. If fault does not clear, see error code under STORAGE ERROR (MOTION DIAG>MOTION NUMERIC). Contact MCE.
PASSENGER MODE (0)	**Description:** Passenger mode active.

Table 5.10 Touch Screen Event Listings

Event	Description
PAUSED. . . (819)	**Description:** The event is logged during Sabbath operation in between trips (if enabled) when the car has served the building a number of times (as configured). This event is not logged and is only displayed on the LCD HOME screen (to avoid filling the log with this event). **Car actions:** Sabbath operation has been paused and the car will no longer automatically serve the building while paused. Sabbath operation will resume when the corresponding timer has elapsed. **Troubleshooting:** 1. Check and set the **SABBATH: # OF TRIPS** option as desired. 2. Check and set the **SABBATH: PAUSE TIME** option as desired.
PHE ANTINUIS. DISABLED (250)	**Description:** Informational. PHE anti-nuisance has been disabled.
PHE ANTINUISANCE (249)	**Description:** Informational. The photo eye anti-nuisance call threshold has been achieved; all car calls are canceled. Self resetting. Cannot be bypassed.
PHE2 BYPASS FRONT (838) PHE2 BYPASS REAR (841)	**Description:** The auxiliary (front/rear) photo-eye device (required for Peelle doors for PHE integrity tests has been continuously activated for a user-defined time and is now bypassed in accordance with the related user-defined settings. **Car actions:** The auxiliary photo-eye device is rendered inoperative, and doors are closed. Doors close at reduced speed if not other reopening devices are available. **Troubleshooting:** 1. Check the auxiliary photo-eye input and related circuitry. 2. Check the related used defined option to bypass the photo eye. 3. Check the related stuck photo eye user defined timer. 4. Fault is cleared when the auxiliary photo-eye input is deactivated.
PHE BYPASS FRONT (31) PHE BYPASS REAR (776)	**Description:** The door photo eye/infrared detector has been active for a timer determined period and is now being bypassed. Fault-bypassed in Construction. System Verifies: - Door Flags = Photo Eye Bypassed **Troubleshooting:** If in error, verify no input programmed PHE. Check the PHE input. See related Stuck PHE and Bypass Stuck PHE events.
PHE FAIL FRONT (32) PHE FAIL REAR (777)	**Description:** The door photo eye/infrared detector has failed. Issued when the photo eye has been continuously activated for a predetermined time while the doors are fully closed. Fault-bypassed in Construction. System Verifies: - Door Flags = Photo Eye Failed **Troubleshooting:** If in error, verify no input programmed if PHE not used. Check that input is properly wired and programmed. System IO > Programmed Inputs > PHE.

Table 5.10 Touch Screen Event Listings

Event	Description
PHE TEST FAIL FRONT(844) PHE TEST FAIL REAR (845)	**Description:** The (front/rear) photo eye device integrity test (required under section 2.13.3.4.9 of the A17.1a-2008/ CSA b44a-08 elevator safety code) has failed, indicating that one or both the main and auxiliary front photo eye devices are not functioning properly and unable to detect an object. **Car actions:** Car remains in service. Front doors are prevented from closing. The front photo eye devices integrity test is repeated until it is determined that both the main and auxiliary front photo eye devices are functioning properly and able to detect an object. **Troubleshooting:** 1. Check the related main and auxiliary photo eye inputs and related circuitry. 2. Check that the related LCTO test output is toggling before doors are closed. 3. Check that both the main and auxiliary front photo eye devices are functioning properly and able to detect an object.
PHE2 FAIL FRONT (839) PHE2 FAIL REAR (842)	**Description:** The auxiliary (front/rear) Photo eye input has been continuously activated for predetermined time (4 seconds) while doors were fully closed. **Car actions:** The auxiliary photo-eye device is rendered inoperative. **Troubleshooting:** 1. Check the auxiliary photo-eye input and related circuitry. 2. Check the related used defined option to bypass the photo eye. 3. Check the related stuck photo eye user defined timer. 4. Fault is cleared when the auxiliary photo-eye input is deactivated.
PLD WRITE FAULT (EDGE) (153)	**Description:** Initiated by LS-EDGE-EL landing system. The ETS trip value cannot be written to the landing system PLD. Cannot be bypassed. **Troubleshooting:** PLD hardware has failed or software is not loaded. Verify software versions for LS-EDGE-EL, Status Info > Version Info.
POSITIONING (9)	**Description:** Car position has not been established. The car is reestablishing position. Fault-bypassed in Construction/Inspection. System Verifies: - Car Flag Correction is active. - Car is not on Inspection or construction operation. - Car is on Passenger mode **Troubleshooting:** Car will move to reestablish position at a landing.
POWER LOSS..... (814)	**Description:** This is an informational event that is logged when a temporary power outage or a brownout is detected. **Troubleshooting:** None.
PROCESSING CALLS (209)	**Description:** Car is answering registered car/hall calls before recalling (i.e. one of the recall switches that is configured to finish answering registered calls before recalling the car has been activated). **Troubleshooting:** Check the related recall operation settings.
PTI RECALL (98)	**Description:** The car is recalling on emergency power operation. Fault-bypassed in Construction/Inspection. **Troubleshooting:** View System IO > Programmed Inputs > PTI.

Table 5.10 Touch Screen Event Listings

Event	Description
PTI SHUTDOWN (99)	**Description:** The car has stopped due to power loss. Fault-bypassed in Construction/Inspection. System Verifies: - Power Transfer Data = PTI Shutdown **Troubleshooting:** View System IO > Programmed Inputs > PTI.
PUMP POWER IS OFF (247)	**Description:** Hydro Only. Power has been removed from the pump by one or more of the following ESC, EB3B, EB3P, EB4A, or EB4P. Refer to your job prints.
PUMP UNABLE TO START (223)	**Description:** Hydro only.The pump failed to start when requested. **Troubleshooting:** Verify Pump Mon, MOTION Diag, MOTION Flags, is initially off but on once movement is initiated (Pump Enable is on). Verify Config 01, Up to Speed Delay provides enough time for pump to reach operating speed. Verify Pump at Speed (MOTION Diag, MOTION Flags) is initially off but on once movement is initiated.
QUAD SENSOR LOSS (EDGE) (152)	**Description:** Initiated by LS-EDGE-EL landing system. Indicates that one pair of quad differential signals from the landing sensor to the controller has failed. Fault-bypassed in Construction/Inspection. **Troubleshooting:** A hall effect sensor may have failed or the bias magnet is broken or defective.
QUADRATURE OFFSET CH-B (265)	**Description:** Initiated by LS-EDGE-EL landing system. Indicates Channel B offset from Channel A is not correct. Bypassed in Construction or Inspection Bypass operation.
RANDOM CALLS GENERATOR (17)	**Description:** The random call generator has been activated. This generator is used to exercise the elevator using random calls. **Troubleshooting:** Check parameter setting.
RANDOM CAR CALLS GEN (133)	**Description:** The random car call generator has been activated. This generator is used to exercise the elevator using random car calls. **Troubleshooting:** Check parameter setting.
RANDOM HALL CALLS GEN (134)	**Description:** The random hall call generator has been activated. This generator is used to exercise the elevator using random hall calls. **Troubleshooting:** Check parameter setting.
RECALL COMPLETE (345)	**Description:** Car has completed recall for the specified mode of operation and is at the user defined recall floor and has completed the configured door operation at that floor. Fault-bypassed in Construction/Inspection. **Troubleshooting:** If in error, verify inputs and programming (Config 01 > Configure Spare Inputs) for specified recall action.
RECALL COMMAND (846)	**Description:** The car is responding to a recall command from iMonitor. This command is overridden/bypassed by the recall switches. **Car actions:** The car recalls to the command's specified floor. Car calls disposition and door operation, as well as action when recall is complete are in accordance with the command's parameters. The command is ignored if the Keyboard Control (KCE) option is disabled. **Troubleshooting:** 1. Check the related Keyboard Control (KCE) option. 2. Check that the iMonitor is not sending the command and /or the command's parameters are set per the desired operation.

Table 5.10 Touch Screen Event Listings

Event	Description
RECALL SW/COMMAND	**Description:** This message is displayed on the second line of the OBD "**Mode of Operation**" window, only if the car is configured to go into independent service when the car has completed the recall (initiated by the recall switches or command). **Car actions:** None. This is informational only to indicate that the car is on independent service due to an active recall switch or command. **Troubleshooting:** 1. Check that all recall switches are deactivated. 2. Check the related Keyboard Control (KCE) option. 3. Check that the iMonitor is not sending the command and /or the command's parameters are set per the desired operation.
RECALL DONE (210) RECALL DONE . . . (335)	**Description:** Car has completed recall operation. **Troubleshooting:** Check recall input.
RECALL SW: BYPASSED (271)	**Description:** Informational. An active recall switch is bypassed due to a higher mode of operation.
Recall Switch 1 (40) Recall Switch 2 (41) Recall Switch 3 (42) Recall Switch 4 (43)	**Description:** Recall switch "n" has been activated. Fault-bypassed in Construction. System Verifies: - Mode of operation = Recall Switch 'n' - Recall Data Type = Recall Switch 'n' - Recall Data, Complete is not True. **Troubleshooting:** If in error, verify no input is programmed (Config 01 > Configure Spare Inputs) for this recall switch. Otherwise, verify switch mechanically and electrically. Verify state of input and input wiring.
RECALLING . . . (5)	**Description:** Car is recalling to selected recall floor (fire service, Pretest operation, Aux Power, Recalling switches, Floor operation, or PTI input). Fault-bypassed in Construction/Inspection. **Troubleshooting:** If in error, verify that the assigned recall input (System IO > Programmed Inputs) is inactive. Verify user defined recall floor.
RESTRICTED MODE (344)	**Description:** While the passcode remains active this message will be displayed on the Home screen and the car will not respond to hall calls. Please refer to Passcode (Restricted Mode) on page 4-15.
RESYNC. RECALL (350)	**Description:** Beginning on the day(s) and time designated by the RESYNCHRONIZATION DAYS and RESYNCHRONIZATION TIME parameters, when the car has been idle for 30 seconds, a RESYNC. RECALL begins and the car is recalled to the bottom floor. During the recall, a car or hall call will abort the recall. Once the car is again idle, the recall is again attempted. This cycle continues for one hour or until a successful resynchronization occurs.

Table 5.10 Touch Screen Event Listings

Event	Description
RESYNCHRONIZATION (349)	**Description:** Once the car reaches the bottom floor due to a RESYNC. RECALL, the car is taken out of service (no car or hall calls will be answered), the bottom terminal limits are bypassed and the DSE valve remains open for 30 seconds to allow the car to descend onto the buffers. The car is then returned to the bottom floor, all safety systems are returned to normal and the car is returned to passenger service. If, prior to completing Resynchronization, the Mode is changed to Inspection or the Stop switch is activated, the operation is aborted and the car is allowed to return to the bottom floor. If all safety devices have been returned to normal, the car is returned to passenger service.
FRONT/REAR **RETCAM** DLK FAULT (823)	This event shall be logged when a Retiring Cam Door Lock Fault is detected (see Retiring Cam Door Lock Protection Timing section).
FRONT **RETCAM** DLK FAULT (824) REAR **RETCAM** DLK FAULT (825)	**Description:** The door locks failed to make up within a predetermine time (30 seconds) after several attempts (4 attempts) to pick the retiring cam and lock the doors on cars equipped with retiring cam door lock mechanism. **Car actions:** The retiring cam output is deactivated, and the doors cycle between each unsuccessful attempt to lock the doors. Once the fault is detected, the car is taken out of service and doors re-open and remain open. Doors can be closed with constant pressure on the door close button. **Troubleshooting:** 1. Check the door locks and retiring cam circuitry. 2. Fault is cleared by mode of operation change, fault reset button or if the doors are fully closed with constant pressure on the door close button.
FRONT **RETCAM** MOTOR FLT. (826) REAR **RETCAM** MOTOR FLT. (827)	**Description:** The retiring cam output was active for a predetermined time (4 minutes) after doors have successfully locked. Monitored in the event the car fails to reach its destination withing that time. **Car actions:** The retiring cam output is deactivated. Emergency stop if the car was traveling when fault is detected. Car is taken out of service. If car is at a landing, doors shall re-open and remain open. **Troubleshooting:** 1. Check for any other faults that indicate that the car was not able to reach its destination. 2. Fault is cleared by mode of operation change or fault reset button.
RP SENSOR TRIPPED (605)	**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).
SABBATH OPERATION (817)	**Description:** The controller Has entered Sabbath Mode. **Troubleshooting:** Check Sabbath spare input terminal

Table 5.10 Touch Screen Event Listings

Event	Description
SABBATH NUDGING ENABLED (818)	**Description:** This event is logged at start and end of Sabbath operation only (to avoid filling the log with the nudging events). The event indicates that the Sabbath operation nudging option is enabled and that doors will close at reduced speed and torque while on Sabbath operation. **Car actions:** Doors will close at reduced speed and torque during Sabbath operation. **Troubleshooting:** 1. Check the related **SABBATH: NUDGING** option and make sure it is set as required.
SAFH INPUT LOW (140)	**Description:** The hoistway safety string input is low. Car will perform an emergency stop or, if at a floor, will not move. Doors remain as they are. System Verifies: - SAFH Input is low - SAFC input high **Troubleshooting:** If in error verify input and input devices mechanically and electrically.
SAFETY DROPPED (485)	**Description:** The Safety Circuit has been open due to a safety fault. **Troubleshooting:** Check fault diagnostics for SAFC and SAFH.
SAVING DISPATCH PARAMS (275)	**Description:** Appears when dispatching related parameters are being saved. Informational.
SAVING OTHER CAR PARAMS (276)	**Description:** Appears when parameters communicated by other car in duplex pair are being saved. Informational.
SD CARD ERROR (176)	**Description:** The micro-SD card used for event logging is damaged or improperly formatted. Remove and reseat the card. Replace the card with a new card of like capacity if required. Cannot be bypassed.
SD FILE SYSTEM ERROR (346)	**Description:** System has determined that data sent to SC card on HC-MPU-2-TS is invalid. **Troubleshooting:** Remove and reinsert SDRAM card and repeat file transfer.
SE BYPASS FRONT (33) SE BYPASS REAR (778)	**Description:** The door safe edge input has been bypassed. See SE Fail. Fault-bypassed in Construction. System Verifies: - Door Flags = Safe Edge Bypassed **Troubleshooting:** Verify no Safe Edge input programmed if safe edge is not used. See SE Fail (Config 01 > Configure Spare Inputs).
SE FAIL FRONT (34) SE FAIL REAR (779)	**Description:** The door safe edge has failed. Issued when the safe edge has been continuously activated for a predetermined period while the doors are fully closed. Fault-bypassed in Construction. System Verifies: - Door Flags = Safe Edge Failed **Troubleshooting:** Check for obstruction. Check that input is properly wired and programmed (Config 01 > Configure Spare Inputs).
SIMPLEX CAR ID ERROR (347)	**Description:** Generated if Number of Cars = 1 and Car ID is anything other than 1.

Table 5.10 Touch Screen Event Listings

Event	Description
SMM SHUTDOWN (356)	**Description:** The Suspension Members Monitor (SMM) fault detected that the SMM input is low. This active low input is normally used to detect slipping/damaged suspension means (ropes) on traction installations. This is a latching fault that requires manual resetting. **Troubleshooting:** 1. If this feature is not required, deprogram the SMM input. 2. Verify the status of the SMM input and associated circuitry.
SPA: LS-EDGE IS OFFLINE (159)	**Description:** SPA has detected loss of communication with LS-EDGE. **Troubleshooting:** Check CAN1 and CAN2 connections on HC-MPU-2-TS. Check connections on LS-EDGE.
SPB: LS-EDGE IS OFFLINE (163)	**Description:** SPB has detected loss of communication with LS-EDGE. **Troubleshooting:** Check CAN1 and CAN2 connections on HC-MPU-2-TS. Check connections on LS-EDGE.
STARTER FLT CONTACT OPEN (609)	**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 troubleshooting instructions. 2. Verify that terminal YR1 has 120VAC.
STARTER TYPE ERROR (584)	**Description:** The HC-DVR board has received an invalid starter type from the from the MPU-2-TS board. **Troubleshooting:** May be caused by a communication error between the HC-MPU-2-TS and HC-DVR boards, call MCE Tech Support.
STARTER(S) FAULTED (820)	**Description:** This fault is generated and shuts the car down when the number of failed starters fall below the minimum number of starters option setting
STUCK CAR CALL (102) STUCK CAR CALL REAR (103)	**Description:** A timer (10 seconds) limits the amount of time a car will be held at a floor due to a defective or stuck car call. When the timer expires, call demand at another floor will cause the defective call to be ignored and the car will continue to provide service. Fault-bypassed in Construction/ Inspection. System Verifies: - Car Flags, Stuck Car Call Timer Front = Timer Elapsed **Troubleshooting:** Verify car call input not continuously activated. (See Register Calls screen and/or programmed inputs.)
STUCK DOB FRONT (138) STUCK DOB REAR (783)	**Description:** The door open button has been detected as being pressed continuously. **Troubleshooting:** Check door open button, door open button input and diagnostic flag for DOB under System IO > Programmed Inputs > screen 2.
STUCK DOB HALL FRONT (828) STUCK DOB HALL REAR (829)	**Description:** The (front/rear) hall door open button has been continuously activated for a user defined time. **Car actions:** None if the option to bypass a stuck door open button is disabled. Otherwise, the door open button is rendered inoperative and the doors close. Doors close at reduced speed if no other reopening devices are available. **Troubleshooting:** 1. Check the door open button input and related circuitry. 2. Check the related stuck door open button timer. 3. Fault is cleared when the door open button is deactivated.

Table 5.10 Touch Screen Event Listings

Event	Description
STUCK F. DOOR ZONE FAULT (192) STUCK R. DOOR ZONE FAULT (810)	**Description:** Door zone did not go low during run. Fault-bypassed in Construction/Inspection. **Troubleshooting:** Verify activity. Check wiring. Verify DZ flag activity at Utilities > Landing System Utilities > Landing System View to see that DZ turns off when car is between floors.
STUCK DOWN HALL CALL F. (256) STUCK DOWN HALL CALL R. (258)	**Description:** System has detected a sticking down hall call button.
STUCK LEVELING FAULT (194)	**Description:** Leveling signal did not transition low at end of run. ULM and DLM are both active. Fault-bypassed in Construction/Inspection. **Troubleshooting:** Verify, UTILS > Landing System View > ULMF or DLMF. Verify landing system function and wiring.
STUCK PHE2 FRONT (840) STUCK PHE2 REAR (843)	**Description:** The auxiliary (front/rear) photo eye input has been continuously activated for a user defined time. **Car actions:** None if the option to bypass a stuck photo eye is disabled. Otherwise, the photo eye is rendered inoperative and the doors close. Doors close at reduced speed if no other reopening devices are available. **Troubleshooting:** 1. Check the auxiliary photo eye input and related circuitry. 2. Check the related stuck photo eye timer and option. 3. Fault is cleared when the door open button is deactivated.
STUCK PHOTO EYE FRONT (136) STUCK PHOTO EYE REAR (781)	**Description:** Photo eye input continuously active. If Bypass Stuck PHE (Config 01) is enabled, the controller will ignore the PHE and close the doors after the Stuck PHE Timer elapses or when the Car Delayed timer expires, whichever comes first. Fault-bypassed in Construction/Inspection. System Verifies: - Door Flags = Stuck Photo Eye Timer Elapsed - Door Flags, Photo Eye Bypassed and Photo Eye Failed are not true. **Troubleshooting:** Verify PHE status, System IO, Programmed Inputs. If no PHE is installed, PHE input should not be programmed. Verify function of PHE device.
STUCK SAFE EDGE FRONT (137) STUCK SAFE EDGE REAR (782)	**Description:** Safe edge input continuously active. If Bypass Stuck Safe Edge (Config 01) is enabled, the controller will ignore the SE and close the doors after the Stuck SE Timer elapses or when the Car Delayed timer expires, whichever comes first. Fault-bypassed in Construction/Inspection. System Verifies: - Door Flags, Stuck Safe Edge Timer = Elapsed - Door Flags Safety Edge Bypassed and Safe Edge Failed are not true. **Troubleshooting:** Verify Safe Edge status, System IO > Programmed Inputs. If no Safe Edge is installed, input should not be programmed. Verify function of Safe Edge device.

Table 5.10 Touch Screen Event Listings

Event	Description
STUCK SENSOR (EDGE) (154)	**Description:** Initiated by the LS-EDGE-EL landing system. A leveling or terminal sensor is not changing state. Fault-bypassed in Construction/ Inspection. **Troubleshooting:** Verify the LED indicators (UTILS > LS View) show state changes while traversing door zones, ETS, or Terminal magnets. Replace LS-EDGE-EL tape reader.
STUCK UP HALL CALL F. (255) STUCK UP HALL CALL R. (257)	**Description:** System has detected a sticking up hall call button.
SYNCING PARAMETERS (161)	**Description:** This message is shown when the duplex cars are synchronizing the system parameters upon connection. Do not reset the car while this message is active.
TERMINAL SWITCH LEARN (283)	**Description:** A terminal switch learn operation is in progress.
TERMINAL SYNC (EDGE) (157)	**Description:** Initiated by the LS-EDGE-EL landing system. Indicates that the landing system has lost position and is performing a terminal synch operation. Fault-bypassed in Construction.
TEST MODE (3)	**Description:** The controller is operating in Test Mode. This mode allows the car to be run at contract speed with door opening disabled to facilitate testing. Hall calls are not registered. Fault-bypassed in Construction/Inspection. System Verifies: - Mode of operation = Test **Troubleshooting:** If Test mode is not selected, check System IO > System Inputs, Test. Verify Test/Pretest switch not in Test position.
TOO MANY FAILED STARTS (610)	**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. To date, VCI operation increments the counter for this fault. **If car does NOT shut down completely after three attempts:** Verify that High Speed Inspection = DISABLED under F3 menu. Having this Enabled will prevent complete shutdown after three attempts.
TOP ACCESS SW. FAILURE (483)	**Description:** The Up and Down Top Access inputs are active at the same time.
TOP DEVIATION (EDGE) (156)	**Description:** Initiated by the LS-EDGE-EL landing system. LS-EDGE-EL encountered terminal magnets that do not match the learned positions. Fault-bypassed in Construction/Inspection. **Troubleshooting:** Verify magnets for terminals have not been changed. Relearn terminal magnet locations by performing a hoistway learn operation.
UFE/PM STUCK OFF (124)	**Description:** Up Fast Enable remains off when commanded to be active. No bypass in any mode. **Troubleshooting:** Verify UFE/PM output is correctly connected to the Up Fast Valve coil. Verify function of Up Fast Valve.
UFE/PM STUCK ON (123)	**Description:** Up Fast Enable remains on when commanded to be off. No bypass in any mode. **Troubleshooting:** Verify UFE/PM output is correctly connected to the Up Fast Valve coil. Verify function of Up Fast Valve.

Table 5.10 Touch Screen Event Listings

Event	Description
UNL AND DNL ARE LOW (132)	**Description:** The controller sees that the car is both at the top and bottom of the hoistway at the same time. This means one of the terminal inputs is mis-wired. **Troubleshooting:** Check inputs status for UNL and DNL.
UP NORMAL LIMIT OPEN (614)	**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. 4. Replace the HC-DVR board.
UP TERM LIMIT FAILURE (612)	**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. 3. Replace the HC-DVR board.
UPDATED PARAMETERS (816)	**Description:** Parameters have been updated.
USE/BR STUCK OFF (128)	**Description:** The Up Slow Enable/Brake Contactor output is stuck off. **Troubleshooting:** Verify status of output. Check connection of Up Slow valve at terminal USE/BR.
USE/BR STUCK ON (127)	**Description:** The Up Slow Enable/Brake Contactor output is stuck on **Troubleshooting:** Verify status of output. Check connection of Up Slow valve at terminal USE/BR.
USL1 IS LOW (269)	**Description:** Informational. USL1 input is low. **Troubleshooting:** If in error, verify function of switch (if physical) and/or input.
USL1 POSITION LOW (299)	**Description:** The car encountered the USL1 switch at a position lower than that learned during the hoistway learn operation. The car will perform an emergency slowdown then proceed at correction speed to the landing. **Troubleshooting:** Verify position of switch (software or physical). Repeat hoistway learn operation (Utils > Landing System Utilities > Terminal Switch Learn).
WAITING FOR IN-CAR SW (336)	**Informational.** The car is at a recall floor with doors open awaiting activation of the current mode of operation in-car switch.
USL (x) and DSL (x) are Low (8)	**Description:** Named Up and Down Slow Limit switches are low. The car will perform an emergency stop and will not be allowed to move. All calls will be canceled. If in a door zone the doors will be cycled to allow passengers to exit. Fault-bypassed in Construction. System Verifies: - Limit inputs USL and DSL low. - 2 bus has power. **Troubleshooting:** Verify switches mechanically and electrically. Verify input connections. View System IO > System Inputs, USL and DSL for correct status.

Table 5.10 Touch Screen Event Listings

Event	Description
UTL IS LOW (131)	**Description:** The Up Terminal Limit switch has opened. If moving up, the car will perform an emergency stop. This switch should not open unless the car overshoots the terminal and opens the switch. The open switch prevents further movement towards the terminal. Cannot be bypassed. System Verifies: - 2 bus has power. - UTL input is low. **Troubleshooting:** If in error, verify switches and connections mechanically and electrically. Check the state of the System IO > System Inputs > UTL, against the state of the switch (touchscreen landing system flags).
VALVE TIME OUT SHUTDOWN (87)	**Description:** Hydro Only. A hydraulic valve has been energized for an excessive period of time with the car moving down. Motor/Valve Limit timer may be set too low. If in motion, the car will stop immediately. The fault must be manually cleared (power cycle or place on Inspection) before operation resumes. Cannot be bypassed. System Verifies: - Motor Protection Data = VLT Fault **Troubleshooting:** Verify valve wiring is intact and is being energized. Troubleshoot the hydraulic power unit.
VISCOSITY SWITCH: ON (112)	**Description:** Hydro Only. The programmed VCI switch input is on. Oil flow indicates variation in oil viscosity outside acceptable limits and the car is lowering to the nearest floor below its current position or, if stopped in a door zone, will remain at the floor. Once safely in a door zone, the car will opens its doors and remove itself from service. If a temperature sensor determines the oil is too cold and no calls are registered, the car will move to the bottom landing (doors closed) and the pump motor will run without valve coils energized to circulate and heat the oil. Fault-bypassed in Construction. System Verifies: - Oil Data = Oil viscosity input is programmed - Oil Data = Oil VCI recall is not true
WAITING FOR IN-CAR SW (336)	**Description:** Informational. The car is at a recall floor with doors open awaiting activation of the current mode of operation in-car switch.
WARNING: FLTS BYPASSED (187)	**Description:** FAULTS ARE BEING BYPASSED. The fault bypass jumper on the HC-MPU-2-TS board is in the BYPASS position and Utilities/Fault Bypass is enabled for the active mode of operation (UTILS > Construct and Bypass Faults).
YRD INPUT FAILURE (607)	**Description:** The Y Contactor Redundancy (YRD) input monitors the normally closed auxiliary contact of the Y starter contactor. **Troubleshooting:** The wiring or devices connected to YR1 input may not be terminated. Check the Y auxiliary contact wired to terminal YR1 and replace if necessary. Check the operation of the Y contactor. Replace the HC-DVR board.

Event Log Viewing

Messages helpful to operational diagnostics are stored in an event log on the HC-MPU-2-TS board. The event log may be viewed through the on-board touch screen.

The event log files are in .csv (comma separated values) format. These files may be read as a continuous text file in applications like Notepad or Word pad or in a table format when opened using Microsoft Word or Excel.

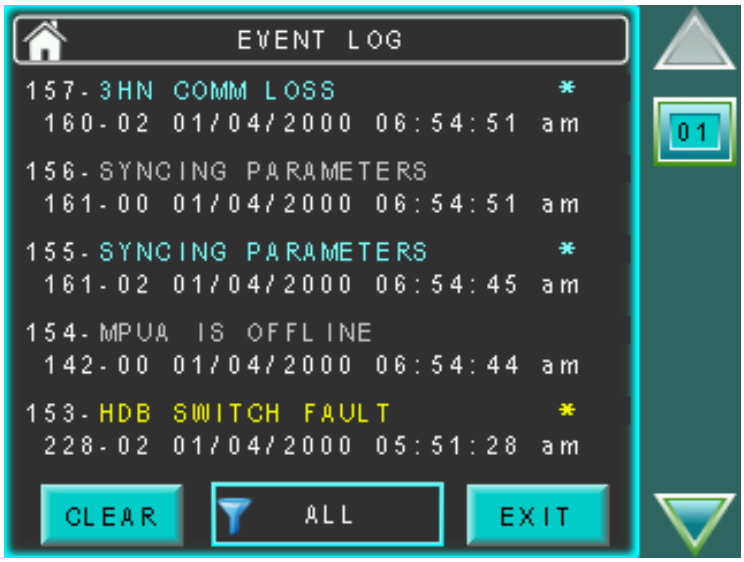
In instances when you are working with MCE Technical Support, log files may be easily attached to an email and sent to the MCE Technician for examination.

Touch Screen Log Access

1. Scroll down the touch screen to the System Diag tab.
2. Select Event Log.

Some events provide both ON and OFF status messages. In these instances, there will be an asterisk (*) at the end of the fault text to let you know that a second, OFF state, event (gray) will be in the

Event log entries are in color:
Red: Fault II Will cause an "Excessive" faults condition if too many occur in a 24 hour period.
Yellow: Fault I
Blue: Informational
Gray: Inactive



Filtering

A button at the bottom center of the screen allows you to filter the event display.

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Duplexing

A great advantage of the Motion 2000 TS 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 setting of the number of cars option. The duplexing logic provides for proper assignment of hall calls to cars and increases efficiency and decreases waiting time. (See Building Setup on page 5-8.)

For duplex operation, serial hall calls are connected to both cars as shown in the job prints. One car is selected to be the master dispatcher; the other is selected to be a local. For the car selected as the Dispatcher, set CONFIG 02, System Control Parameters, Primary Dispatcher to YES. For the other car, set Primary Dispatcher to NO.

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. 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 designated the dispatcher is identified by the Dispatcher LED on the System Status box of the LCD Home screen. The other car is identified by the same LED indicating the car ID of the car assuming the Dispatcher function. If the LED is blank, 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.

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.

- **PC Board Quick References**: Descriptions of circuit board connections, indicators, jumpers, and test points (see page 6-2).
- Call Bus Conditions (see page 6-35)
- General Installation (see page 6-35)
- Can Bus Termination (see page 6-37)
- On Board Diagnostics (see page 6-38)

PC Board Quick References

This section contains information about Motion 2000 TS 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.

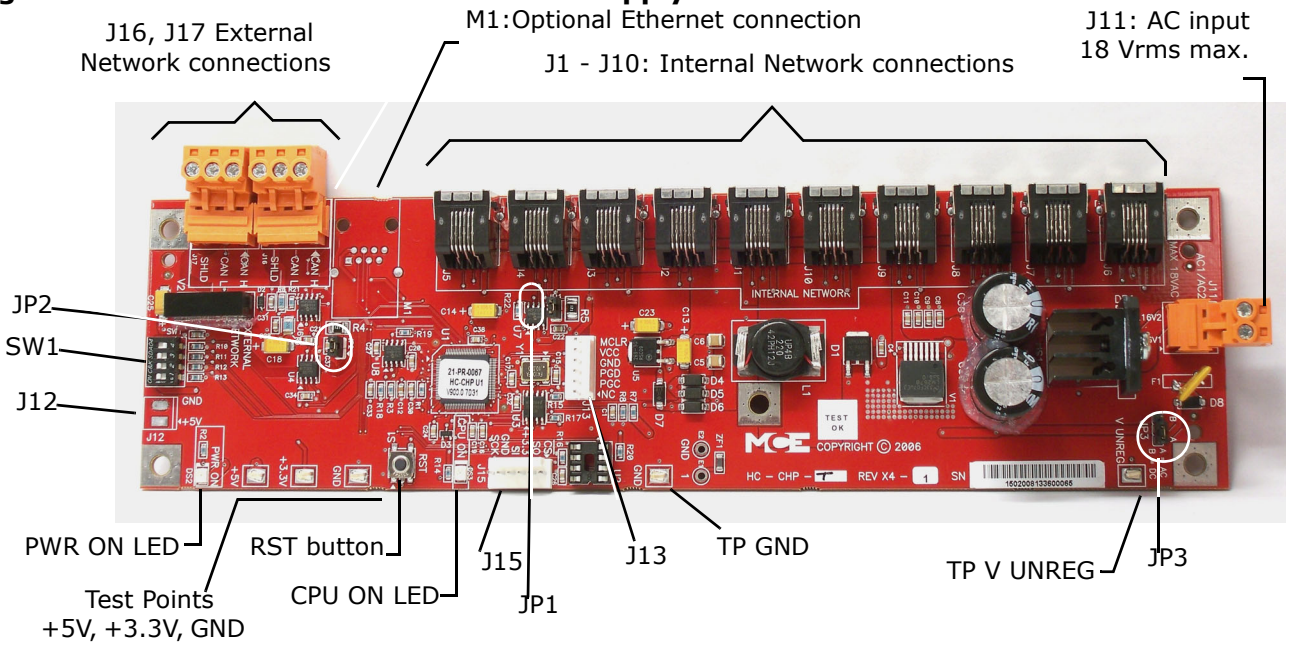
Table 6.1 Motion 2000 TS Circuit Boards

Board	Name	See
HC-**CHP**	CAN Hub and Power Supply Board	page 6-3
HC-**CTL-2**	Control Board	page 6-5
HC-**DVR**	Driver Board	page 6-12
HC-**MPU-2-TS**	Main Processor Unit Board	page 6-15
HC-**UIO-2**	Universal Input/Output Board	page 6-18
ICE-SF-2-X+M	Serial Fixture Interface Board	page 1-8
ICE-COP-2	Low Voltage Input/Output Board	page 6-28
MC-**CPI-2**	Car Panel Interface Board	page 6-29
MC-**LSI**	Landing System Interface Board	page 6-34
SC-**3HN**	Serial Hall Call Node Board	page 6-35

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).

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.

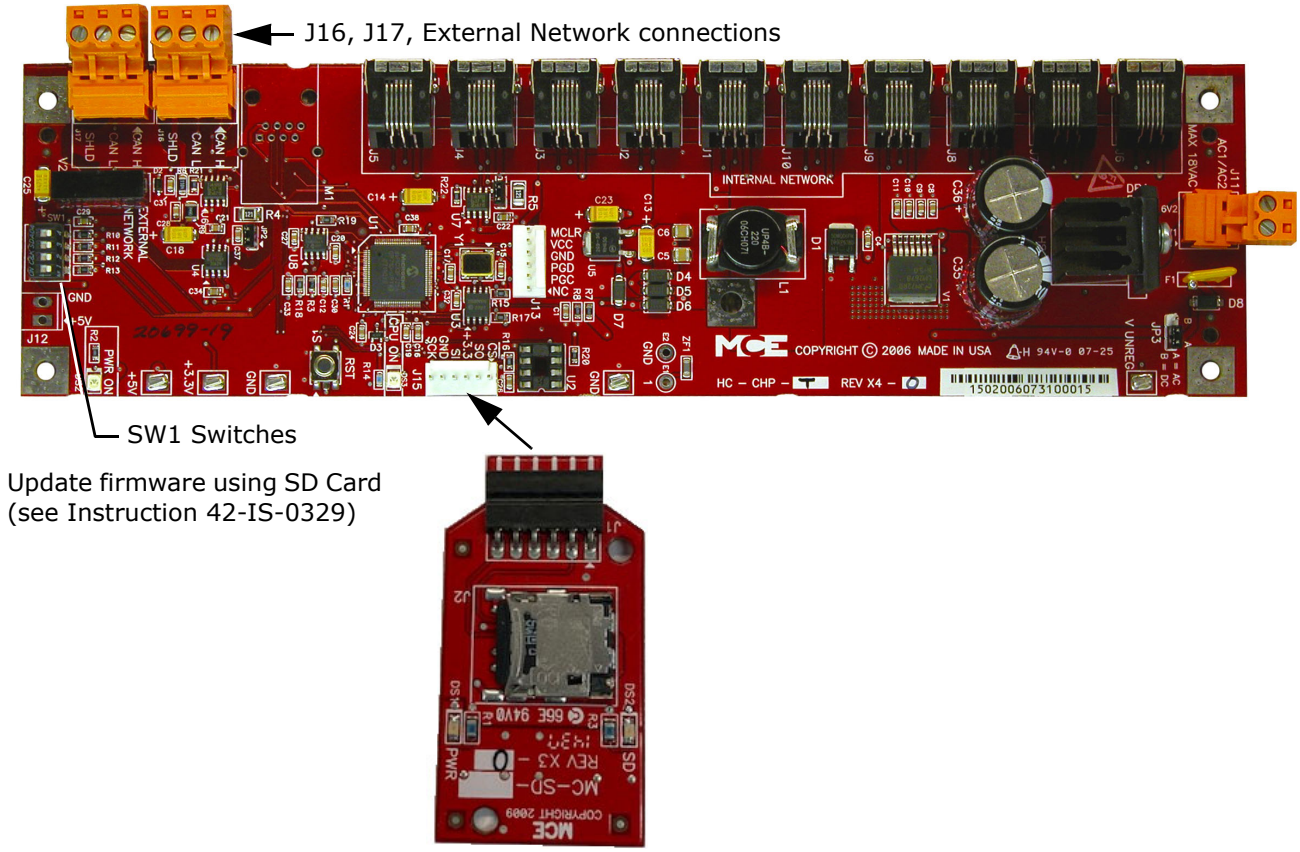
Indicators

- 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 TS 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 (Installs/reinstalls all versions)
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.

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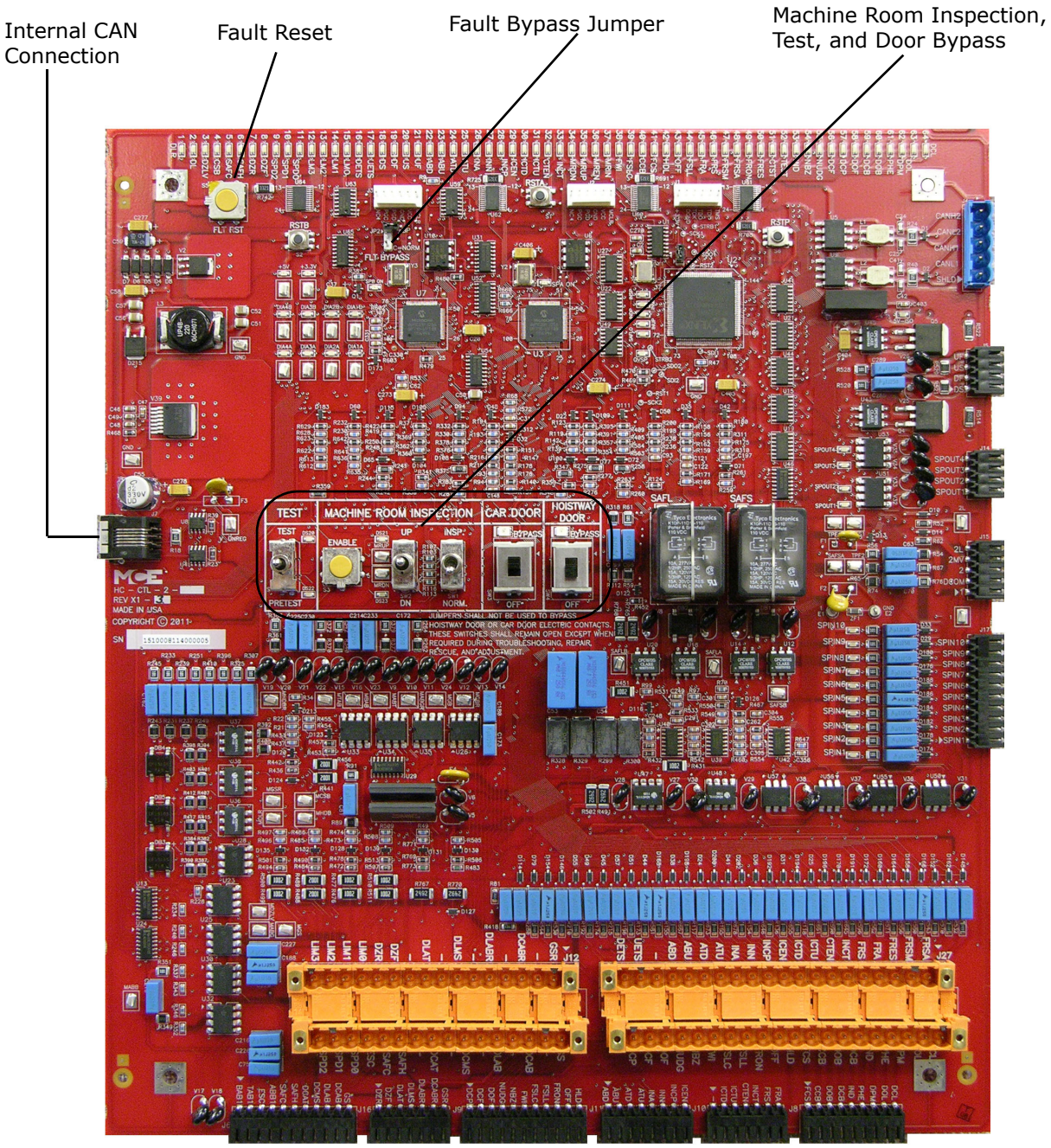
HC-CTL-2 Control Board

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 6.2 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 6.2 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 6.2 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 6.2 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 6.3 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 6.4 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 6.5 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 6.5 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.

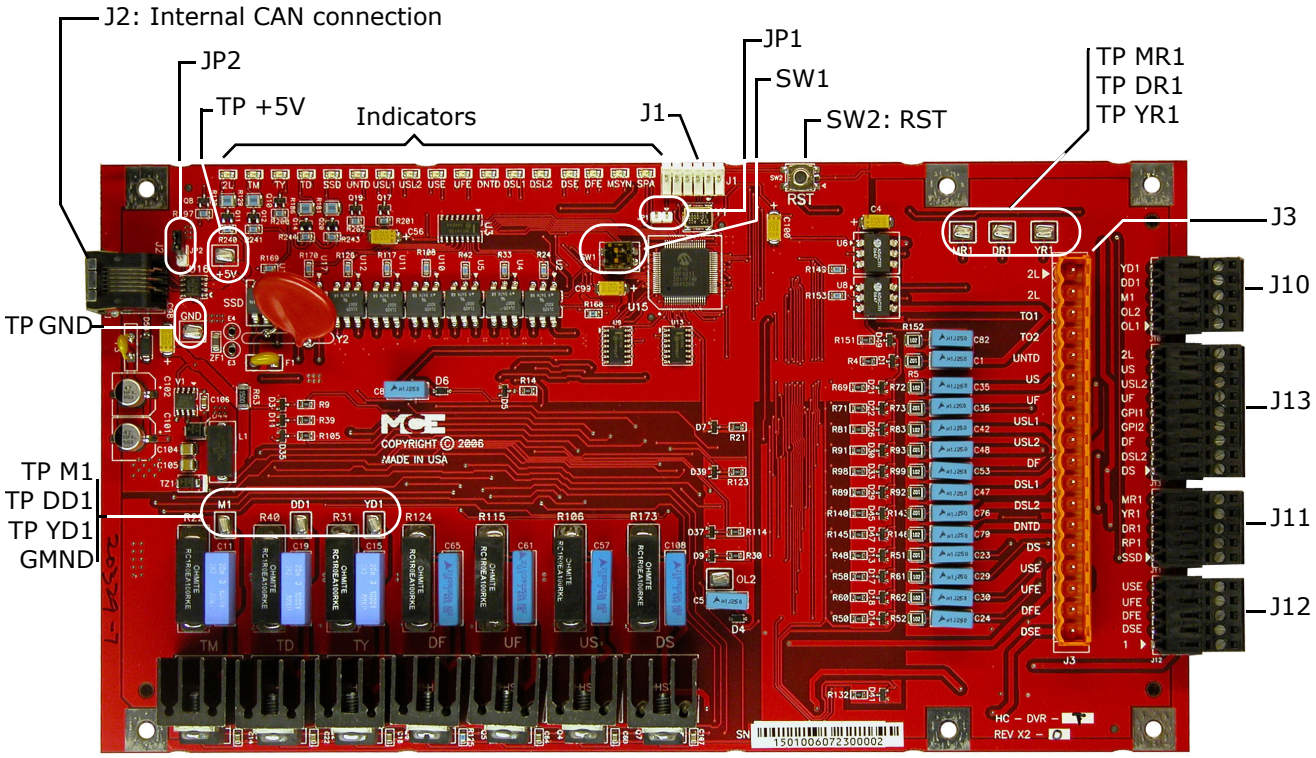
Table 6.6 HC-CTL-2 Board Switches

Switch	Description
S1	SPA U3 reset
S2	SPB processor U7 reset
S3	(Run) Enable button, Inspection operation
S4	Test/Pretest switch. page 1-15.
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 control the pumps 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 6.7 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 6.8 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 6.8 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 6.9 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-2-TS Main Processor Board

The HC-MPU-2-TS 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-2-TS Main Processor Unit Board

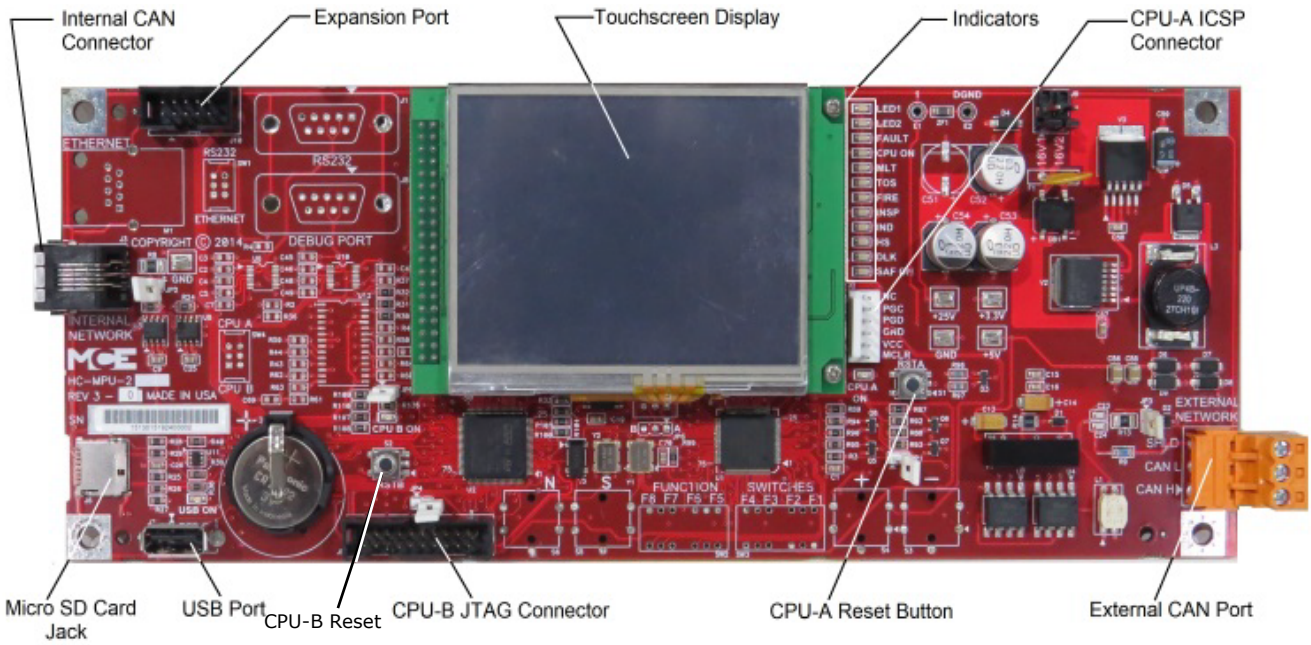


Table 6.10 HC-MPU-2-TS Board Jumpers

Jumper	Setting	Description
J1	Open	CPU A hard reset. Only required for 2K testing
J2	Open	Internal CAN network termination
J3	Closed	External CAN network termination
J4	Open	Boot Selection. Normal = Open
J5	Closed	JTAG Debug Jumper. Closed = Debug Mode

Table 6.11 HC-MPU-2-TS Board Indicators

Indicators	Description
CPU A ON	CPU A is executing its program
CPU B ON	CPU B is executing its program
LED1	Reserved
LED2	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 6.12 HC-MPU-2-TS 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 6.13 HC-MPU-2-TS Board Terminals

Connector	Description
J2	Used to program CPU A. IDC connector.
J4	External CAN Port. Three pin Weidmuller connector (CAN H, CAN L, SHLD). Signal for CAN connections outside the controller cabinet.
J3	Internal CAN Port. RJ12 connector/cable to the HC-CHP CAN Hub / Power Supply board.
J5	Used to program CPU B. Twenty pin header connector.
J9	Low voltage AC input (16V). Two pin IDC connector.

Table 6.14 HC-MPU-2-TS Board Switches

Switch	Description
S1	RSTA: Reset CPU A
S2	RSTB: Reset CPU B

HC-MPU-2-TS 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 6.15 HC-MPU-2-TS 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-2-TS parameters to be reset to default values.
2. On the HC-MPU-2-TS 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-2-TS 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-2 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-2 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.

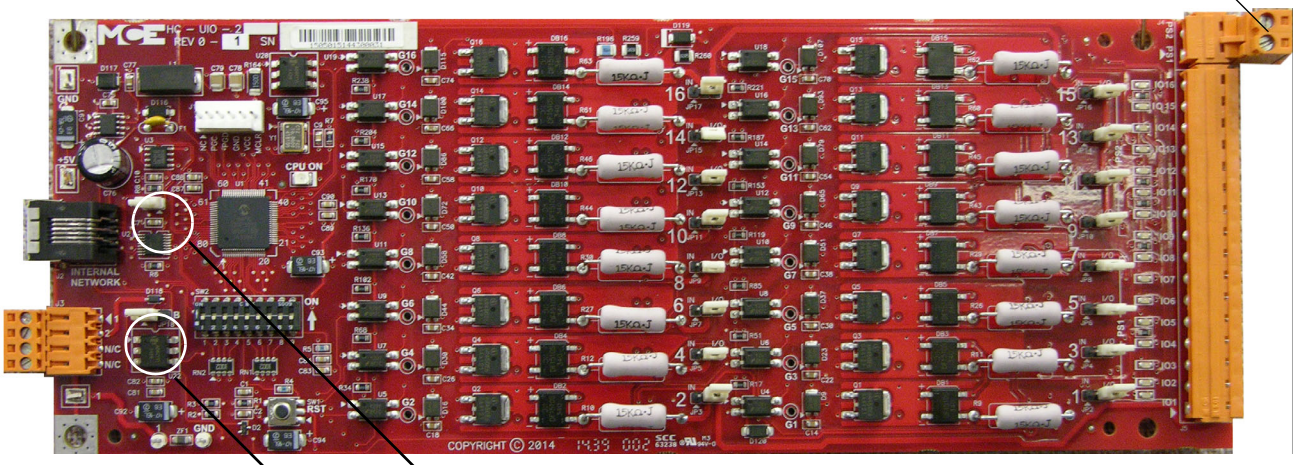


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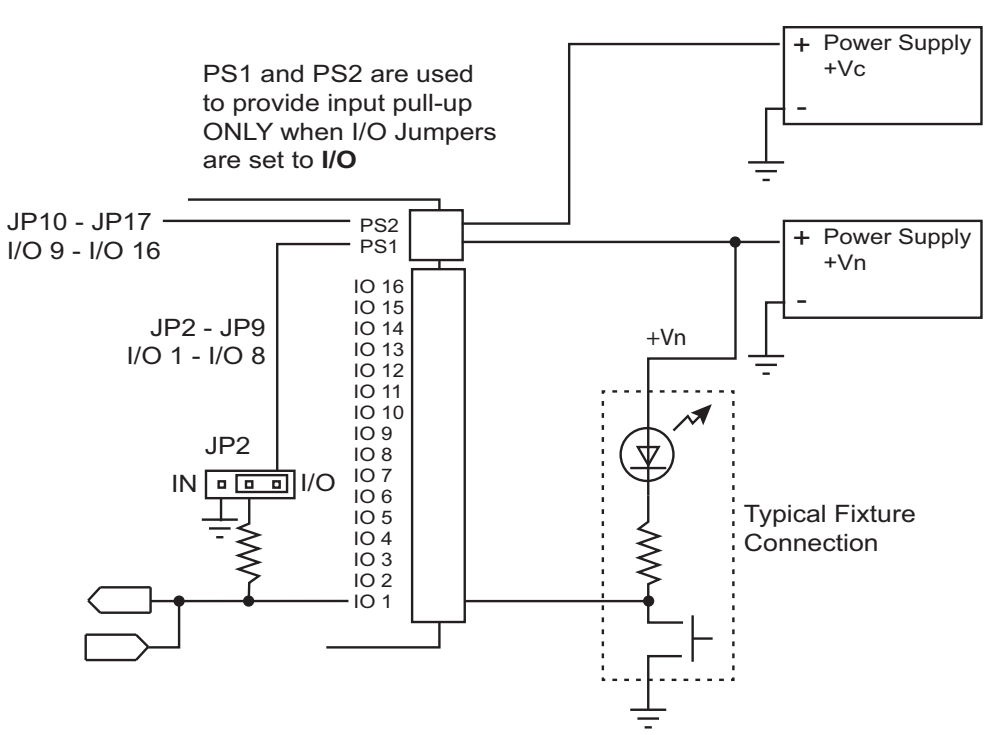
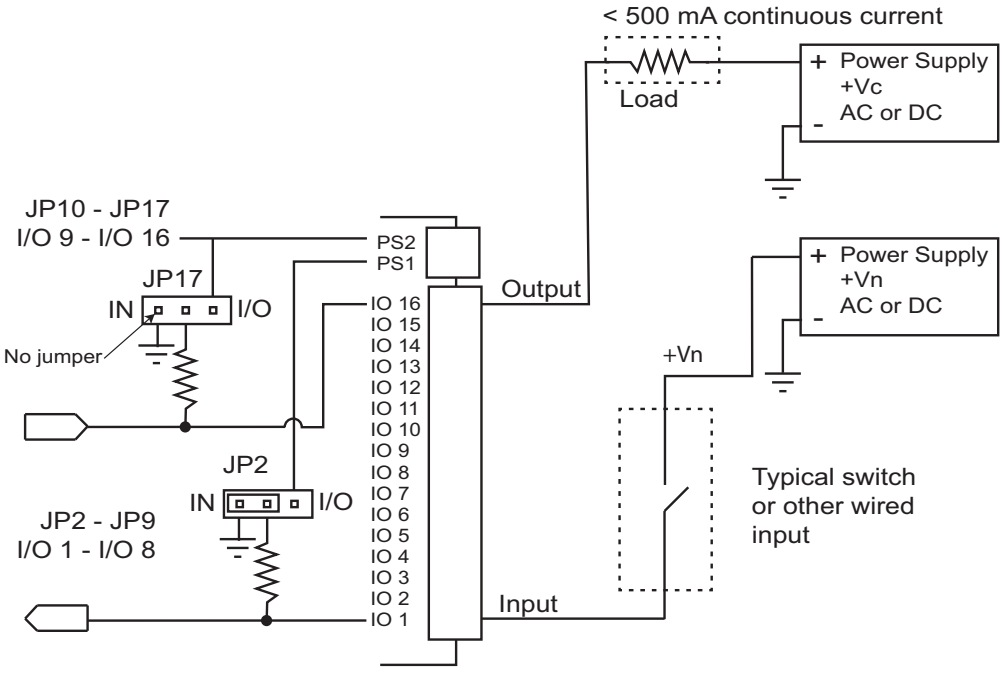
Figure 6.7 Typical Input and Output Connection (Board ID 0 to 15)



When using a board connection in I/O 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.

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.
- I/O1 - I/O16: 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). page 6-22.

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: I/O1 - I/O16

HC-UIO-2 Switch Settings (7, 8, and 9)

On the HC-UIO-2 Board switches 7 and 8 set the baud rate at which the CAN bus communicates with this board.

Table 6.16 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-2 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-2 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 I/O1 through I/O16..

Table 6.17 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 6.18 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 6.19 HC-UIO-2 Board Call Assignments

Board ID	Switch Setting 1	2	3	4	5	6	I/O 1 to I/O 16
00	Off	Off	Off	Off	Off	Off	HC-UIO-2 boards numbered 00 through 31 are used for call related I/O. The associated switch setting is shown to the left. Terminal assignments, beginning with terminal I/O 1 through I/O 16 on board 00, followed by terminal I/O 1 through I/O 16 on board 01, etc., are made in the following order: nn = TOP FLOOR OPTION • 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-2 board terminal assignments are determined by the settings of the following CONFIG 01>BUILDING SETUP MENU-: • BOTTOM FLOOR • TOP FLOOR • FLOOR **nn** OPENING (NONE/FRONT/REAR/BOTH 1-32) And the following CONFIG 03>BUILDING SECUTRITY menu: • CALLS ON UIO BOARD • UIO POSITION INDICATORS 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 6.20 HC-UIO-2 Spare Input / Output Assignments

Board ID	SW1 Setting 1	2	3	4	5	6	I/O Terminals 1	2	3	4	5	6	7	8	I/O Terminals 9	10	11	12	13	14	15	16
32	Off	Off	Off	Off	Off	**On**	Configurable Spare Inputs (CONFIG 1>CONFIGURE SPARE INPUTS								Configurable Spare Outputs (CONFIG 1> CONFIGURE SPARE OUTPUTS							
33	**On**	Off	Off	Off	Off	**On**																
*34	Off	**On**	Off	Off	Off	**On**																
*35	**On**	**On**	Off	Off	Off	**On**																
36	Off	Off	**On**	Off	Off	**On**																
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**																

* HC-UIO-2 Rev 2 will automatically configure the CAN port to communicate at 250k baud.
HC-UIO-2 Rev 4 - refer to Table 6.16 on page 21 to set switches 7 and 8 to communicate at 250k baud.
HC-UIO-2 - refer to Table 6.17 on page 21 to set switches 7 and 8 to communicate at 250k baud.

ICE-COP-2 Car Panel Interface Board

The ICE-COP-2 board converts the discrete closures from the panel buttons and switches to the data on the CAN serial bus to the car controller.

Spare assignable inputs to and outputs from ICE-COP-2 boards are available depending upon the 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) IO1 - IO7; RX (rear panel board) IO1-IO7. Spare outputs (Spare Outputs menu) appear as IO-13 IO-19 (COP FX and COP RX).

If the job has ICE-COP-2 boards, unused spare inputs to and outputs from these boards must be set to NOT USED. page 6-24.

Caution

Spare inputs and outputs used on the ICE-COP-2 boards must be 24 VDC, 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. Be sure to provide sufficient clearance for the components.

Caution

Do not replace C-RJ11-CAN-15 cables between the ICE-COP-2 and HC-CHP 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 job prints 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.

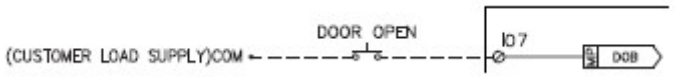
Normal Operation

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:

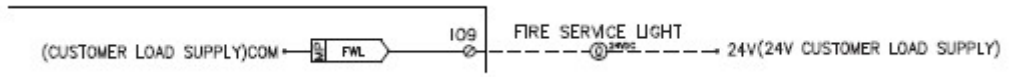
- Press the RST button on the board. The I/O LEDs will all cycle and the board will resume operation.

ICE-COP-2 Board Details

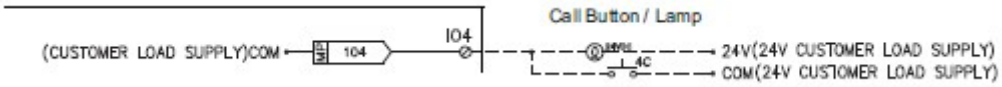
- **24V Inputs Only:** Typical circuit for terminals I1 through I16.



- **24V Outputs Only:** Typical circuits for terminals O1 through O16.



- **24V Inputs and Outputs Only:** Typical circuit for terminals IO1 through IO16.



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

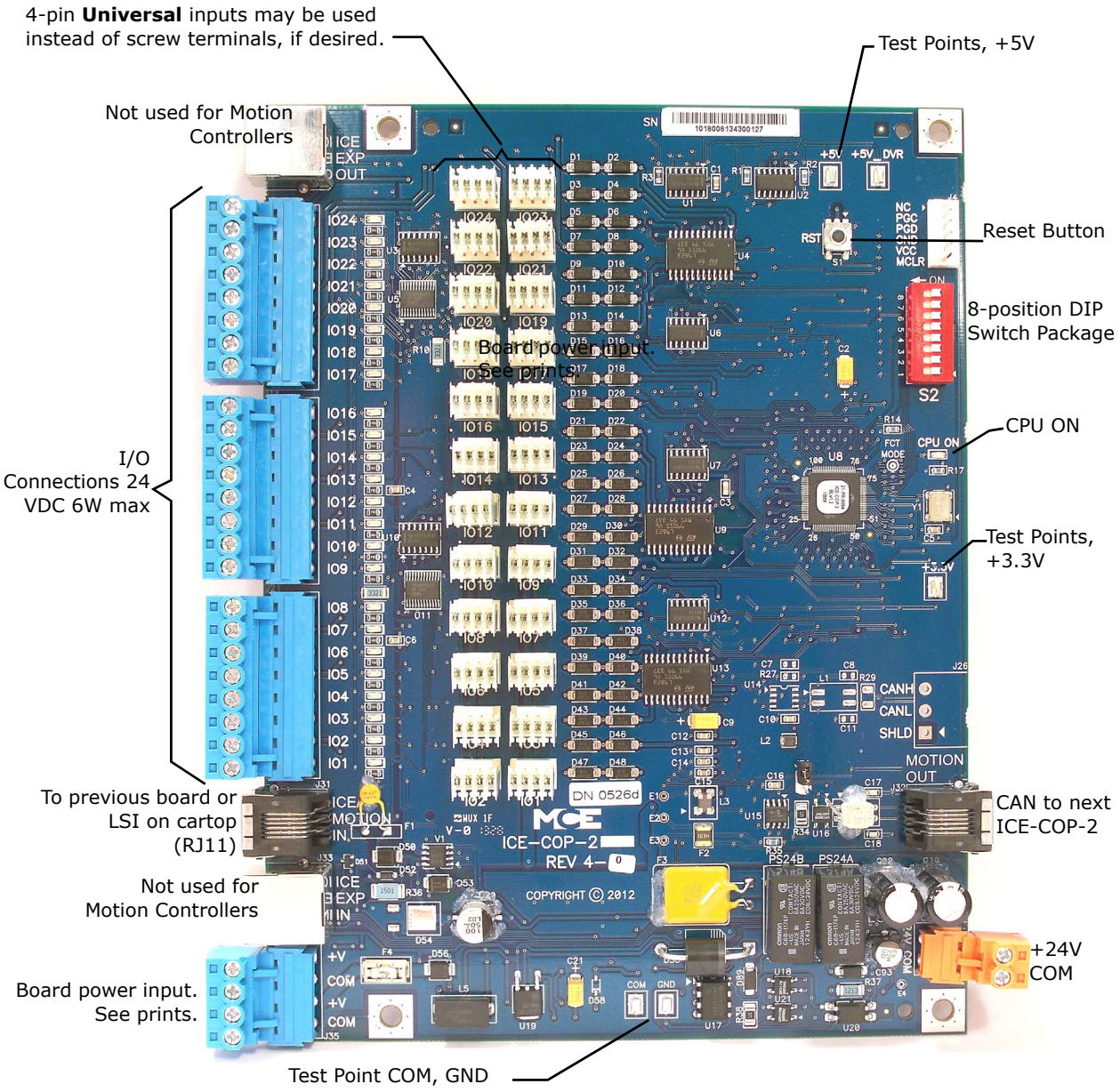
  On COP-2 boards with software version 1.1 or later, the input threshold level may be set to 900 or 700mV using DIP switch rocker 5.
  - Board revision X2-1 or greater: Recommended rocker 5 OFF: 900mV (default)
  - Board revision X2-0: Recommended, rocker 5 ON: 700mV
- Motion Board Addressing

  For Motion control, each COP-2 board used must have a unique address.
  - Addressing - switches 1, 2, and 3:

S2	SPARE I/O COP BOARDS		
Board	**SW1**	**SW2**	**SW3**
4	ON	ON	OFF
8	ON	ON	ON

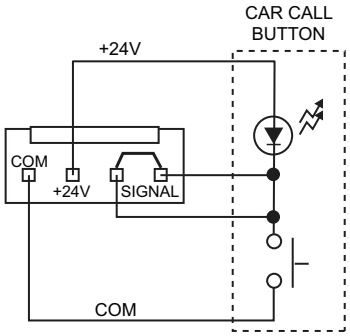
- Motion CAN Baud Rate
  - Switch 7 OFF: 250k (default)
  - Switch 7 ON: 500k
- Motion Unused Switches
  - Switches 4 and 6 are unused and should be left in the OFF position.
- **24V Power**: The 24V power supply from the cartop box must be connected to the 24V IN connector J35 on the first ICE-COP-2 board. If additional boards are used they are connected to 24V. 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 SUPPLY 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 transmissions.
  - 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 Serial Car Operating Panel Board



Caution

This system is designed for 24VDC circuits only. Connecting 120VAC or DC will open the input fuses.



Connection Example: Universal 4-pin Inputs

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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 CAR processor LED will be continuously lighted. If I/O LEDs remain in a static condition or the CAR 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.

MC-CPI-2 Car Panel Interface Board

The MC-CPI-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 MC-CPI-2 boards are used to accommodate rear doors or installations with many floors, COP buttons, and lamps.

Spare assignable inputs to and outputs from CPI-2 boards are available depending upon system configuration, front control panel only or front and rear control panels. (CONFIG 1 >CONFIGURE SPARE INPUTS and CONFIGURE SPARE OUTPUTS)

If the job has MC-CPI-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 CPI-2 board inputs and outputs and verify unused connections are set to NOT USED. page 5-25.

Caution

Spare inputs and outputs used on the CPI-2 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-2 board(s) inside the COP using the supplied hardware and providing sufficient clearance for the components.

Caution

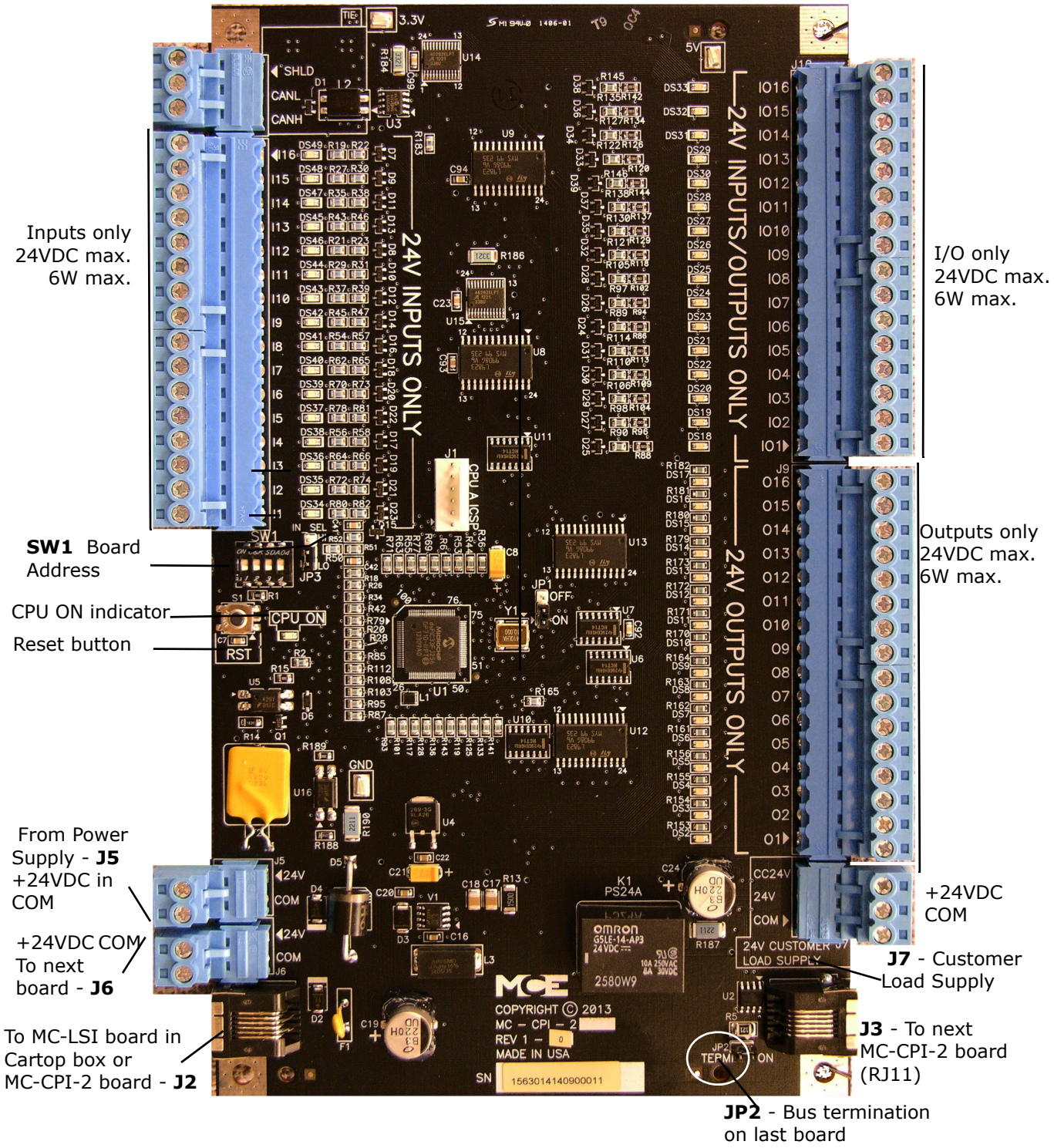
Do not replace C-RJ11-CAN-15 cables between the MC-CPI-2 and MC-LSI with RJ11 cables purchased locally. These cables MUST be replaced with C-RJ11-CAN-15 supplied by MCE. For a replacement cable, please contact MCE technical support.

3. Refer to the prints for the job to wire the MC-CPI-2 board. An example of a typical wiring print is included in this instruction (page 6-32).

Caution

This system is designed for 24 VDC circuits only! **Do not connect 120 VAC or DC to any terminal on the MC-CPI-2 board.** Connect only the 24V power from connector J6 (24V CUSTOMER LOAD SUPPLY) to the load. (page 6-31 and see “Example: MC-CPI-2 Wiring” on page 6-32).

Figure 7. MC-CPI-2 Serial Car Panel Interface Board

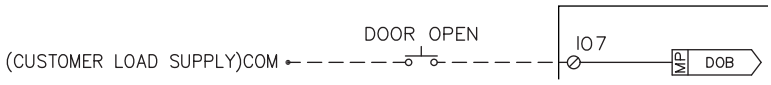


Caution

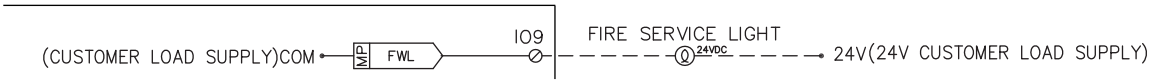
This system is designed for 24 VDC circuits maximum. Do not connect 120VAC or DC to any terminal on this board at any time.

MC-CPI-2 Board Details

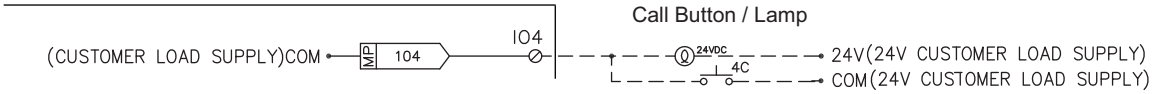
- **24V Inputs Only:** Typical circuit for terminals I1 through I16.



- **24V Outputs Only:** Typical circuit for terminals O1 through O16.



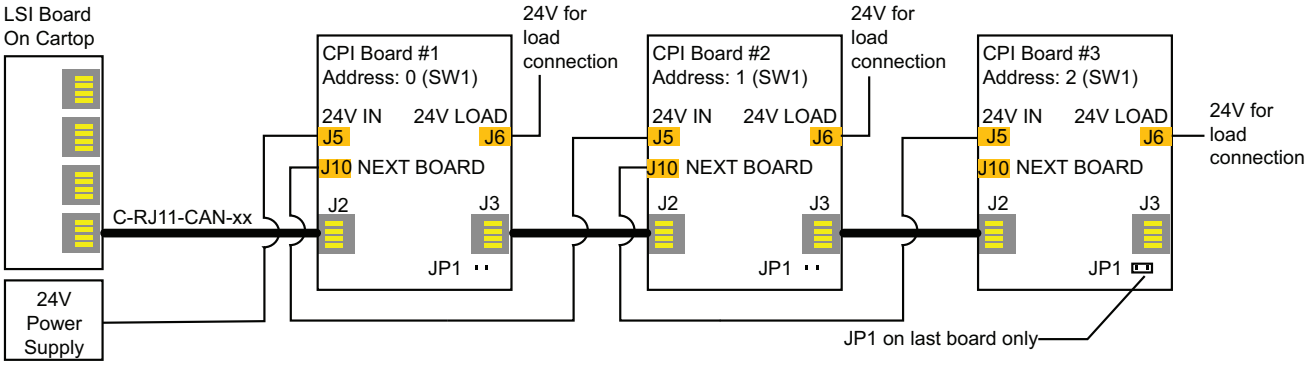
- **24V Inputs/Outputs Only:** Typical circuit for terminals I/O1 through I/O16.



- **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).

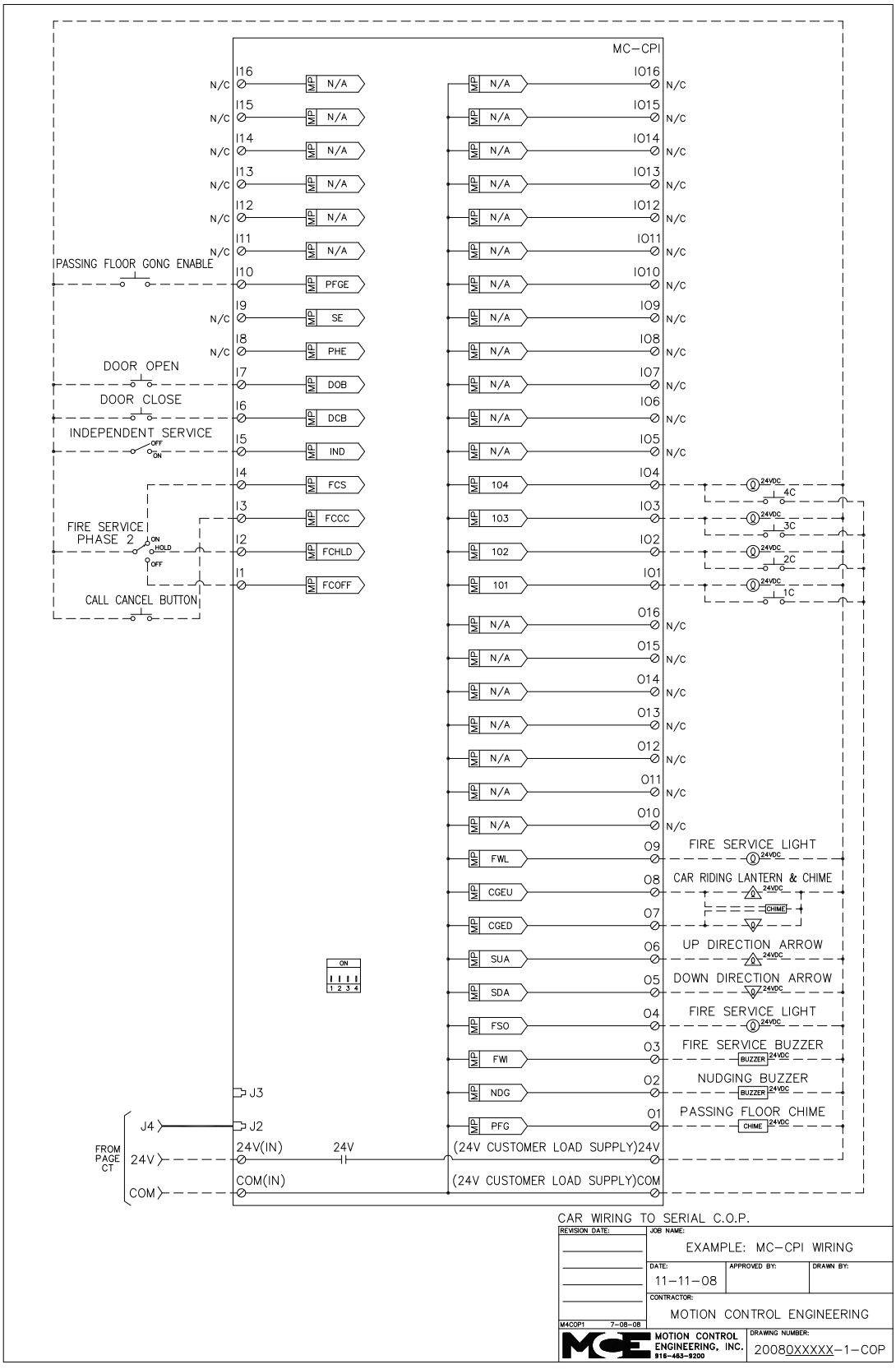
SW1	Front COP Boards				Rear COP Boards			
Board	DIP1	DIP2	DIP3	DIP4	DIP1	DIP2	DIP3	DIP4
1	Off	Off	Off	Off	Off	Off	On	Off
2	On	Off	Off	Off	On	Off	On	Off
3	Off	On	Off	Off	Off	On	On	Off
4	On	On	Off	Off	On	On	On	Off

- **24V Power**: The 24V power supply from the cartop box must be connected to the 24V IN connector on the first MC-CPI-2 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-2 board, it must have JP1 plugged in.)



- **Verifying Cartop Communication**: Check for firmware versions for UIO 34 or UIO 35 (see “Status Info” on page 5-39). This usually indicates communication with the cartop.

Figure 6.1 Example: MC-CPI-2 Wiring



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Before Applying Power

Prior to applying power to the MC-CPI-2board(s):

1. Disconnect all terminal connectors from the MC-CPI-2 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-2 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-2 board.** Connect only the 24V power from connector J6 (24V CUSTOMER LOAD SUPPLY) to the load (page 6-31 and see “Example: MC-CPI-2 Wiring” on page 6-32).

4. Power down the system.
5. Install the C-RJ11-CAN cable from J2 (Internal Network) on the MC-CPI-2 board to the MC-LSI (Landing System Interface board) in the cartop box.
6. Install the MC-CPI-2 board I/O connections (I/O terminals).
7. Install the MC-CPI-2 board power connections (24V and COM terminals).

Caution

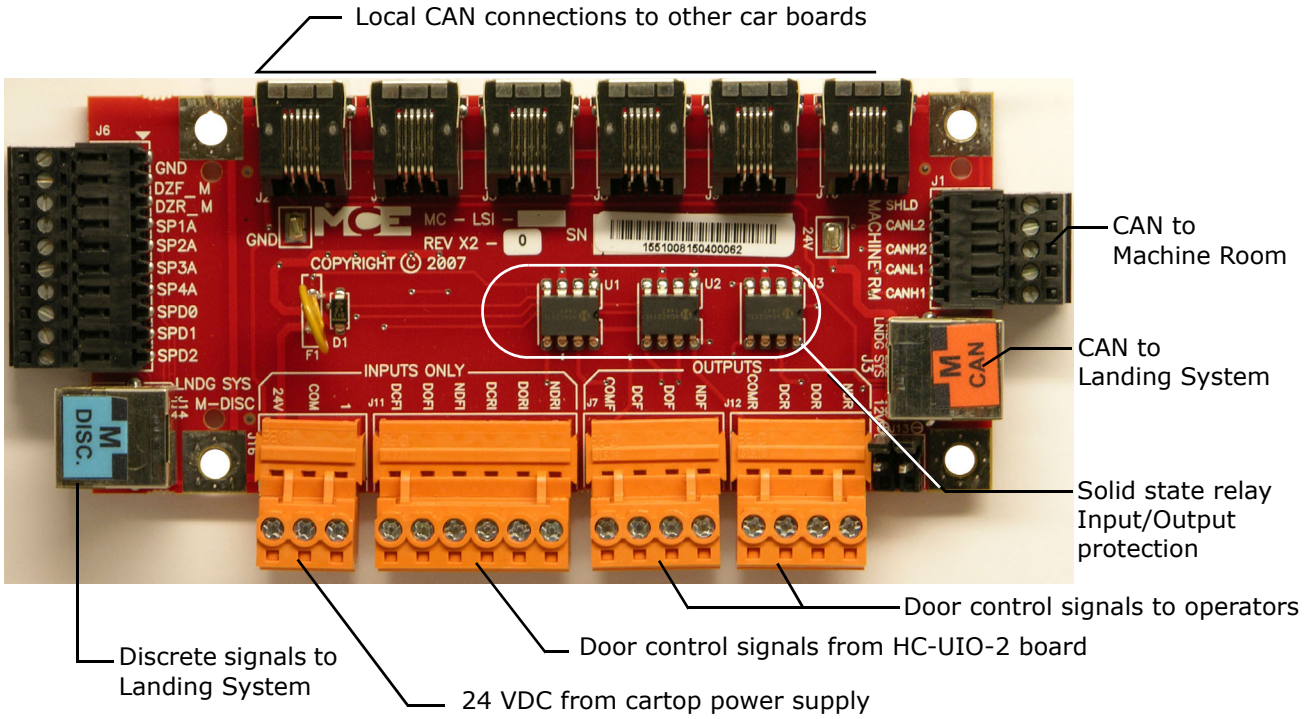
To avoid damage to the MC-CPI-2 boards, the system must be powered down before connecting and disconnecting the MC-CPI-2 board power connections (unplugging and plugging in the 24V and COM terminals).

8. Apply power to the system and verify that:
   - The MC-CPI-2 board **CPU On** 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-2) 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 TS controller.

Figure 6.2 MC-LSI Landing System Interface Board



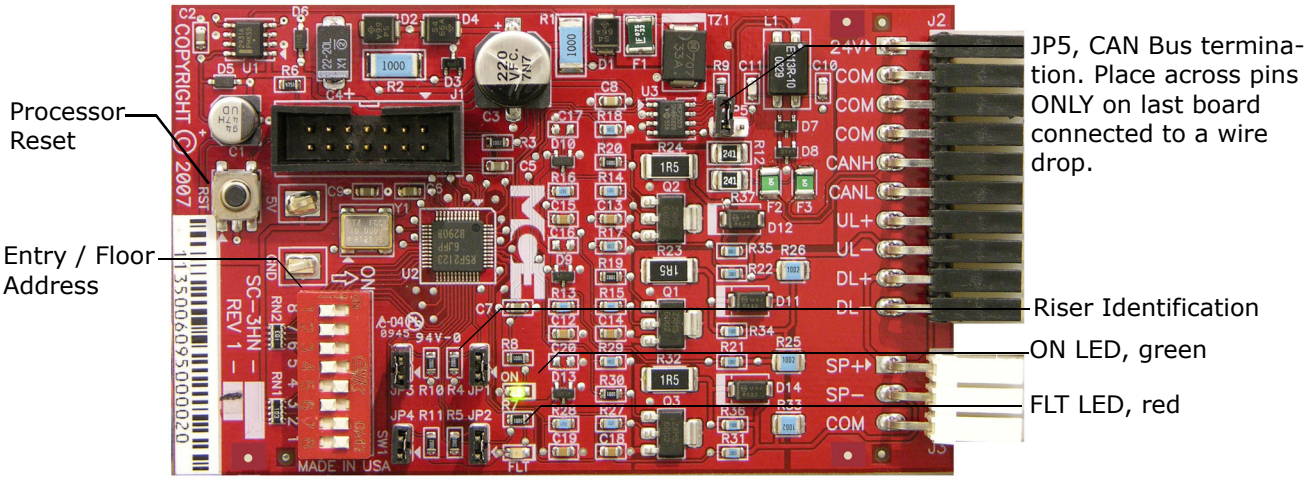
LSI Connections

- Local CAN: CAN signal and power to additional cartop box boards (HC-UIO-2, MC-CPI-2, 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-2:
  - 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.
2. Make connections to the signal/power drop. (See following page.)
3. Set floor number and door (F/R) location, 6-37.
4. Set riser assignment, 6-37.
5. Last board on wire drop only: Place a jumper on JP5. All other boards: Ensure jumper NOT placed across JP5 pins, 6-20.
6. Insert board in anti-static sleeves and tape closed using supplied ESD sticker.
7. Tuck bag/board into electrical box and reinstall hall call.

Inventory When all halls calls are installed and functioning properly, the system allows you to save them into memory (inventory them). In the future, when looking for a burned out LED or a stuck switch, the same UI screen will automatically test all inventoried hall calls for you. See Hall Bus Inventory on page 5-40.

Figure 6.4 Hall Call Node Wiring

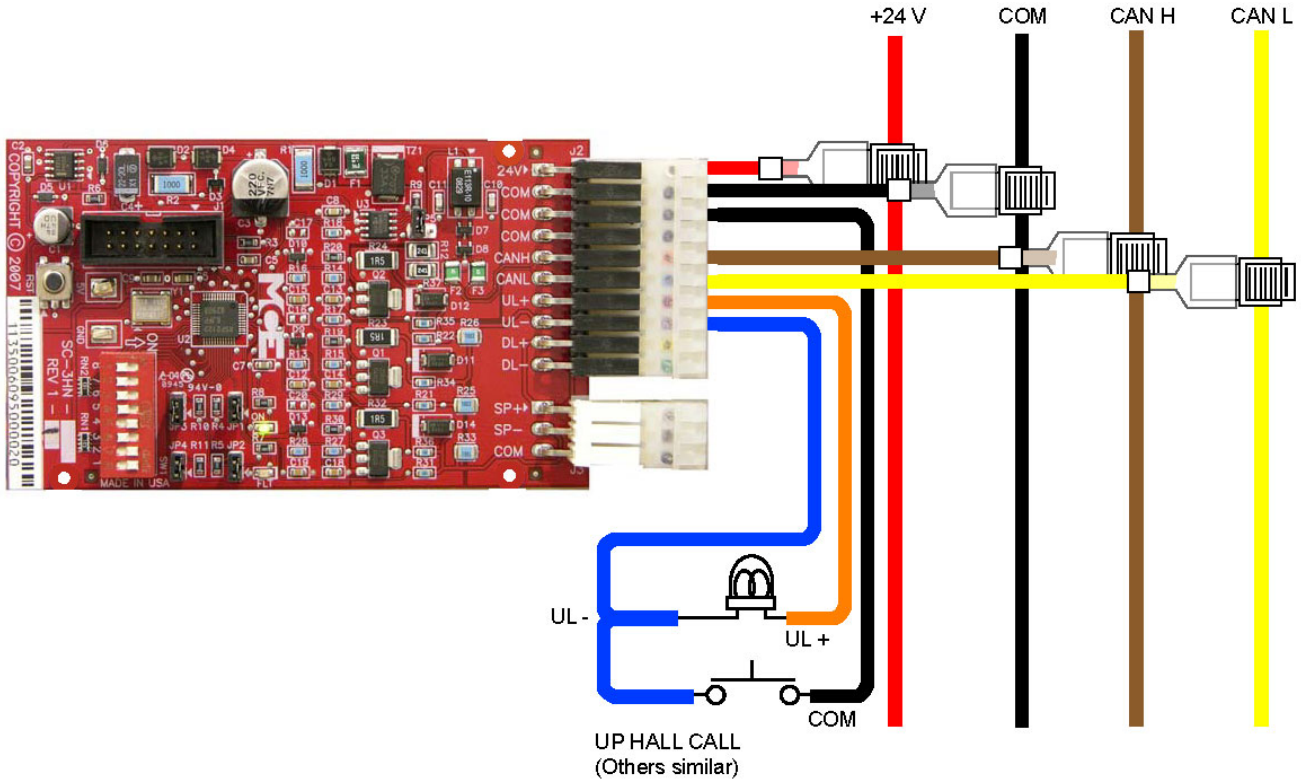


Table 6.21 Hall Wiring Colors

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

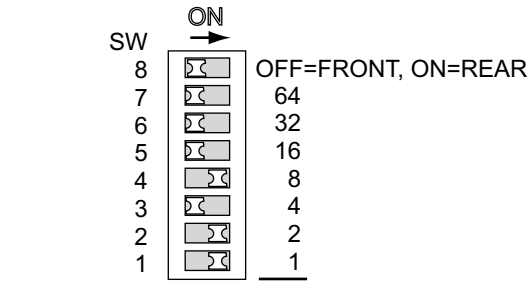
There may be up to four Main risers and four Auxiliary risers. Jumper locations JP3, JP2, and JP1 are used to assign the appropriate riser to the SC-3HN board. In the following table, a **1** indicates a jumper in place.

Table 6.22 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.

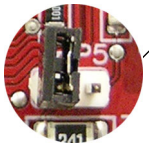
When setting addresses, use the values silk screened on the circuit board, not those shown on the DIP switch.

Baud Rate

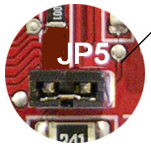
Jumper JP4 is reserved for future use to select a different CAN Bus baud rate should it become necessary. For now, the only option is to leave the JP4 jumper in place, setting baud rate to 125 kbps.

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.

INVENTORY

When all hall calls are installed and functioning properly, the system allows you to save them into memory (inventory them). In the future, when looking for a burned out LED or a stuck switch, the same UI screen will automatically test all inventoried hall calls for you. See Hall Bus Inventory on page 5-40.

Please refer to the Motion Group Manual, 42-02-G006, for configuration information relating to group hall calls.

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