GALaxy IV Traction Elevator Controller Manual

Magnetek Quattro AC/PM Drive

GAL Manufacturing Corp.
50 East 153rd Street
Bronx, NY 10451
Technical Support: 1-877-425-7778

Foreword

G.A.L. has developed this manual with usability and safety in mind. General and specific safety notices and precautions are defined in the manual. However, G.A.L. cannot be responsible for any injury to persons or damage to property (including the elevator equipment) resulting from negligence, misuse of the equipment, misinterpretation of instructions included in this manual, or due to any other cause beyond the control of G.A.L.

Version 1.5.5

Table of Contents

The label **WARNING** identifies procedures and practices that may result in personal injury and/or equipment damage if not correctly followed.

The label **NOTE** identifies information intended to be helpful in the described procedure or practice.

⚠ **WARNING:** Installation and wiring must be in accordance with the national electrical code, all local codes, and all elevator safety codes and standards. The 3-phase AC power supply to the equipment must originate from a properly fused disconnect or circuit breaker (not capable of delivering more than 10,000 RMS symmetrical amperes). Improper motor branch circuit protection will void warranty and may create a hazardous condition.

⚠ **WARNING:** Wiring to the controller terminals must be installed in a careful, neat manner. Stranded wire conductors must not have strands left out of the terminals. Leaving strands of wire out of the terminals creates potential shorts. All terminals and cable connectors must be seated properly.

⚠ **WARNING:** Elevator control products must be installed by elevator personnel who have been trained in the construction, maintenance, repair, inspection, and testing of elevator equipment. The elevator personnel must comply with all applicable safety codes and standards.

⚠ **WARNING:** This equipment is an O.E.M. product designed and built to comply with CSA B44.1/ASME A17.5, and the national electrical code, and it must be installed by a qualified contractor. It is the responsibility of the contractor to make sure that the installation is performed safely, and that it complies with all applicable codes.

⚠ **WARNING:** Proper grounding is vitally important to the safe and successful operation of this system. A separate ground wire should be installed from the building earth ground to the earth ground terminal in each controller. Proper conductor size must be utilized for grounding. In order to minimize resistance to ground, the shortest possible route should be used for the ground conductor. See national electrical code article 250-95, or related local applicable code.

⚠ **WARNING:** Use only the correct rated fusing for controller protection. Use of improperly rated fusing will void the warranty.

NOTE: Every precaution, whether or not specifically stated in this document, should be taken when installing, adjusting or servicing any elevator. All safety precautions should be followed to make sure life and limb of the service person and public is not endangered.

NOTE: Keep the control room/control space clean. Do not install the controller in a dusty area. Do not install the controller in a carpeted area. Keep control room/control space temperature between 32 F and 110 F. Avoid condensation on the equipment. Do not install the controller in a hazardous location and where excessive amounts of vapors or chemical fumes may be present. Make sure that the power supply feeding the elevator controller does not fluctuate more than +/- 1 percent

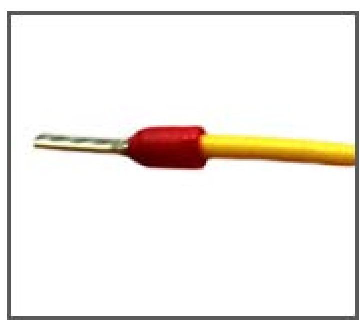
IMPORTANT NOTICE

Most of the field connections to GALaxy controls are made using stranded wire. When inserting this stranded wire into the terminals – especially those for EPD's (Electrical Protective Devices) – care must be taken to ensure that all the strands are properly inserted in to the terminals. Improper striping and insertion may leave strands outside the terminals. Strands not in the terminals may make contact with the wires from an adjacent terminal.

The danger associated with an occurrence such as this has led us to recommend that, for all connections to Safety Devices - those listed in A17.1 – 2013, Requirements 2.26.2.1 thru 2.26.2.39 as applicable, follow the guidelines listed below:

- Inspect all terminals used to connect safety devices. Ensure that the cage clamp is fully open before inserting a wire into the terminal block.
- Perform corrective action for wires with stray strands by one of the following methods:
  - Reconnect the wire with all wire strands correctly installed into the terminal. Visually verify that **no wire** strands are outside of the terminal. The conductor should be stripped and inserted completely into the terminal in such a manner that no more than two millimeters of bare wire is visible; or
  - Attach a ferrule to the end of field wire for safety devices (as pictured below) and insert the ferrule into the terminal; or
  - Use an acceptable method such as tinning.
- After removal and replacement of any of these field wires, the actual safety device should also be checked for proper operation

Crimp tool for Ferrule



Stranded Wire with Ferrule Attached

Section 1 – Product Description

The GALaxy traction elevator controller is a computer-based system that offers superior performance, flexibility and reliability. It has been designed to save time in installation and troubleshooting, but it is still very important that the field personnel familiarize themselves with this manual before attempting to install the equipment.

1.1 Specifications:

Standard Features:

- CSA B44.1-96 ASME A17.1-1996, ASME A17.1-2007, ASME A17.1-2010 certified
- Inspection Operation (car top and controller)
- Access Operation
- Independent Service
- Fire Service Phase I
- Fire Service Phase I Alternate Return
- Fire Service Phase II
- Emergency Power
- Earthquake Service
- On Board Diagnostics LEDs
- On Board LCD Interface
- Motor Protection Timers
- Door Motor Protection Timer
- Field Adjustable Parameters
- Elevator Duty Rated NEMA Motor

Environment:

- 35° F to 105° F ambient
- 12,000 feet altitude
- 95% humidity

Optional Features:

- Selective Rear Doors
- Attendant Service
- Code Blue Hospital Service
- Security
- Remote Diagnostics
- Emergency Power

1.2 Physical Layout of the Controller

To the right, a typical layout of the GALaxy controller is shown. The top cabinet houses the control boards, the bottom cabinet houses the drive and power connections, and the braking resistor cabinet houses the dynamic braking resistors.

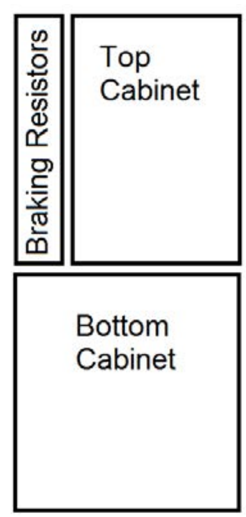


Figure 1.0 shows the top cabinet that usually consists of the following:

1. Main I/O Board: The 1102 main control board contains input and output devices, controller switches, fuses and field wiring terminal connections. The Main I/O Board also includes the Safety Processor, the Safety PAL and the NTS Processor.
2. Main CPU: The 1100 CPU board is a dual core 32-bit CPU. It executes the main control system programs. The main core runs the car operation and the secondary core runs the group operation.
3. LCD Interface: The 1005 LCD Interface board or 1101 LCD/VGA Interface provides a user interface to all controller adjustment and setup parameters. It also shows diagnostic information.
4. Power Supply Board: The power supply provides power to the computer and its peripheral boards. It is a 5 volt DC regulated power supply rated at 6 amps with overvoltage, and short circuit protection.
5. PI Driver Board. Driver for CE or E-Motive Position Indicator Displays.
6. Brake Power Board. Provides the DC power to the Brake Relay Board for the Brake.
7. Brake Relay Board. The Run and the Brake Contactors proved two electro-mechanical devices to remove power from the brake.
8. I/O Board. Provide input and output interface to buttons, switches, lights, and other devices. Can be either 24 VAC or 120 VAC.
9. Car I/O Panel. Provides space for additional car I/O.
10. Group I/O Panel. Provides inputs and outputs for group operation. The group I/O panel can be removed and placed in any car or a separate enclosure.

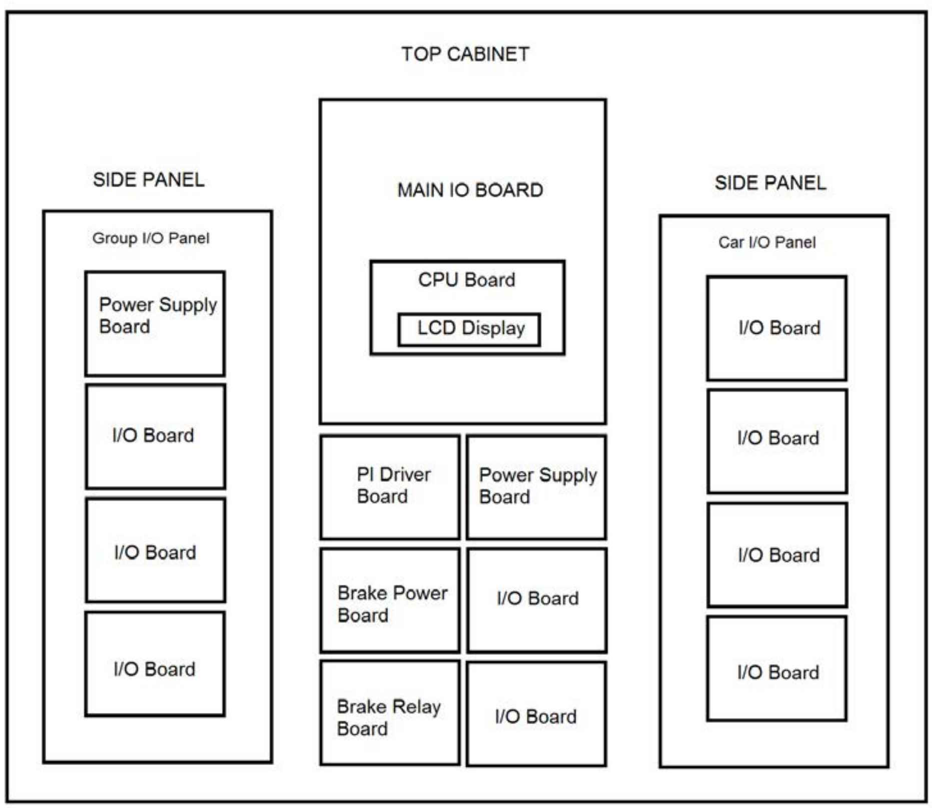


Figure 1.0: Typical Physical Layout of Top Cabinet

Figure 1.1 shows the bottom cabinet that usually consists of the following:

1. System Transformer: Transforms the line voltage to 120 VAC and 24 VAC. It is used to convert the line voltage to a lower voltage for the signals and other controller functions.
2. Brake Transformer: Transforms the line voltage to 145 VAC or 290 VAC to allow a closer match to the DC Brake voltage. This transformer is used when the line voltage is above 208 VAC.
3. Power Terminal Block. Terminal Block for line power input wiring and motor power wiring.
4. Line Filter. Prevents high frequency noise from returning to the line power.
5. AC Filter. Filter high frequency noise from 120 VAC Controller power.
6. Circuit Breakers. L1, L2, BK1, BK2 and BK3 controller power circuit breakers.
7. Signal Terminal Block. Provides interconnection for the earth ground and other signal wires to the top controller box.
8. Drive: Magnetek DSD-412 DC SCR Drive, Magnetek DC Quattro, HPV-600/900/900 PM or KEB Combivert F5 drives.
9. Motor Contactors: DC or AC rated motor contactor sized for each specific job.

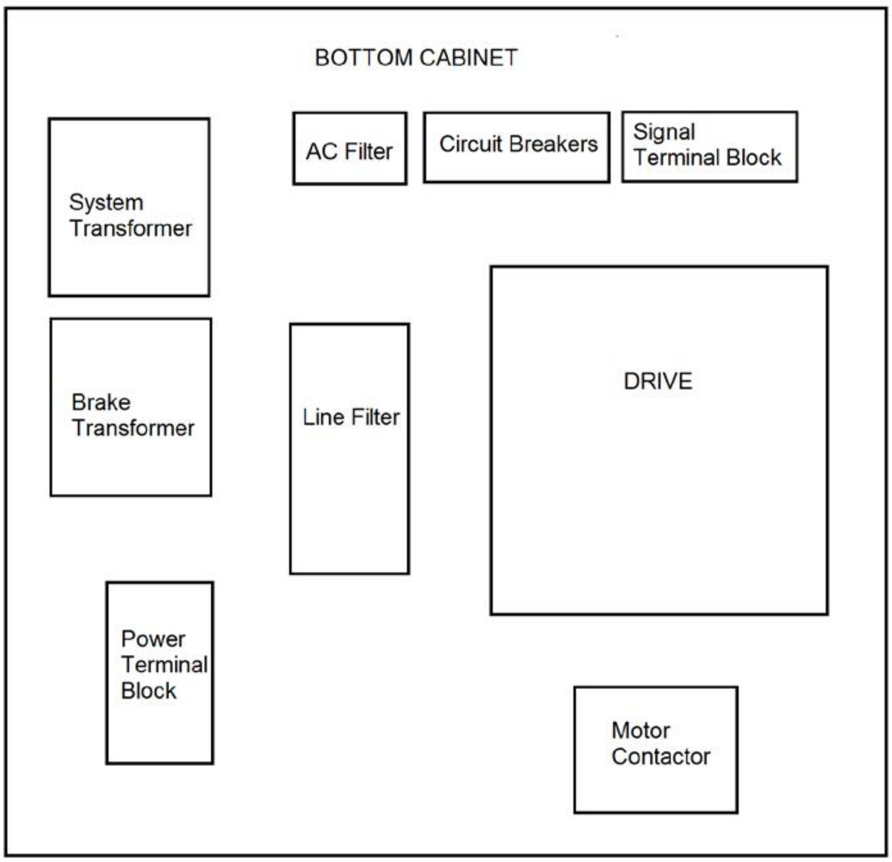


Figure 1.1: Typical Physical Layout of Bottom Cabinet

1.3 Selector System

The selector system for the GALaxy controller can be a tape system, a tapeless one or an Absolute Position System with an encoded touchless tape.

1.3.1 Tape Selector System

The tape system uses a perforated steel tape that is hung the length of the Hoistway. A set of magnets are placed on the tape at each floor having one 8" magnet as the door zone magnet and one to five smaller 2" magnets as binary position preset magnets. The selector is mounted on the car and is guided along the tape by nylon guides to keep the tape and magnets the proper distance from the selector sensors. The controller uses the door zone magnet to determine the elevator's level position relative to the floor. At the dead level position, the binary preset inputs are read in order to verify that the car is at the correct floor. A block diagram of the tape system is shown in Figure 1.2.

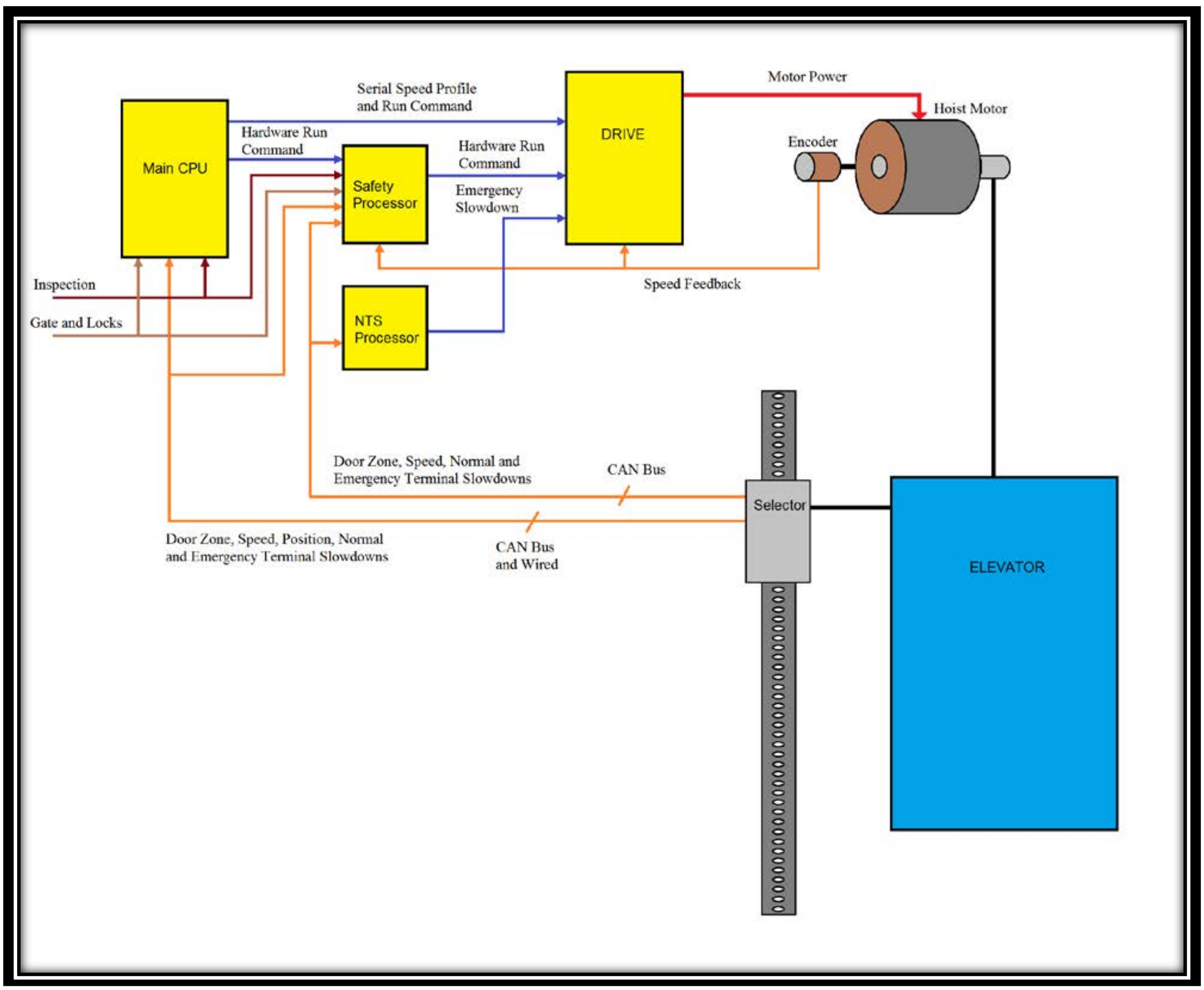


Figure 1.2: Tape Selector

1.3.3. Tapeless System

The tapeless system uses an absolute encoder mounted on the governor and a selector mounted on top the car with door zone and terminal slowdown sensors mounted in one unit. The door zone and slowdown magnets are mounted on the rail with a specially designed rail bracket. The rail bracket is pre-drilled so that the alignment of all door zone and slowdown magnets matches the alignment of the sensors on the selector. The door zone sensors are used for exact floor position on stop and re-leveling the car. The absolute encoder uses a CAN Open serial protocol to send an accurate position that is used for the primary speed feedback and position of the car. The encoder is coupled to a rotating shaft on the governor. If the governor on the job does not have a rotating shaft, it must be replaced with one that does. A block diagram of the tapeless selector system is shown in Figure 1.3.

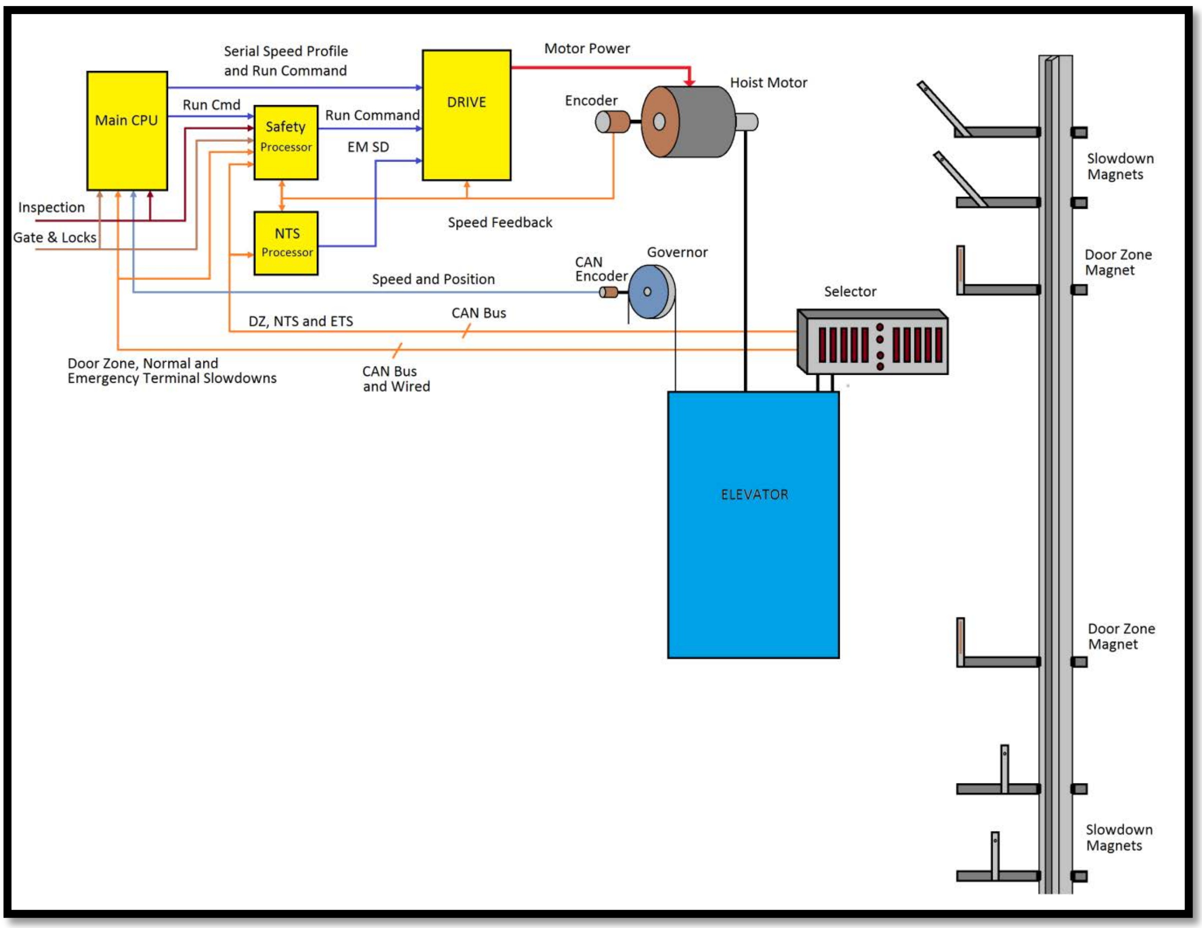


Figure 1.3: Tapeless System

1.3.4. Absolute Position System (APS) Selector

The Absolute Position System Selector uses an encoded tape that is read by two independent cameras. The device is SIL3 rated to supply position and velocity data over two independent CAN bus channels. The selector interface has two independent microprocessors, Processor 1 and Processor 2, that learn and record the hoistway data independent of the Main CPU. These two processors give redundant DZ, UN and DN outputs. Processor 1 uses channel A, the same one used by the Main CPU and Processor 2 uses channel B. Processor 2 also provides the NTS processor with velocity and slowdown inputs positions.

This selector system delivers 0.5mm accuracy, 50.8 pulses per inch. The ETS limits are read from magnetic switches mounted on rail brackets into the selector interface board. A block diagram of the Absolute Position System is shown in Figure 1.4.

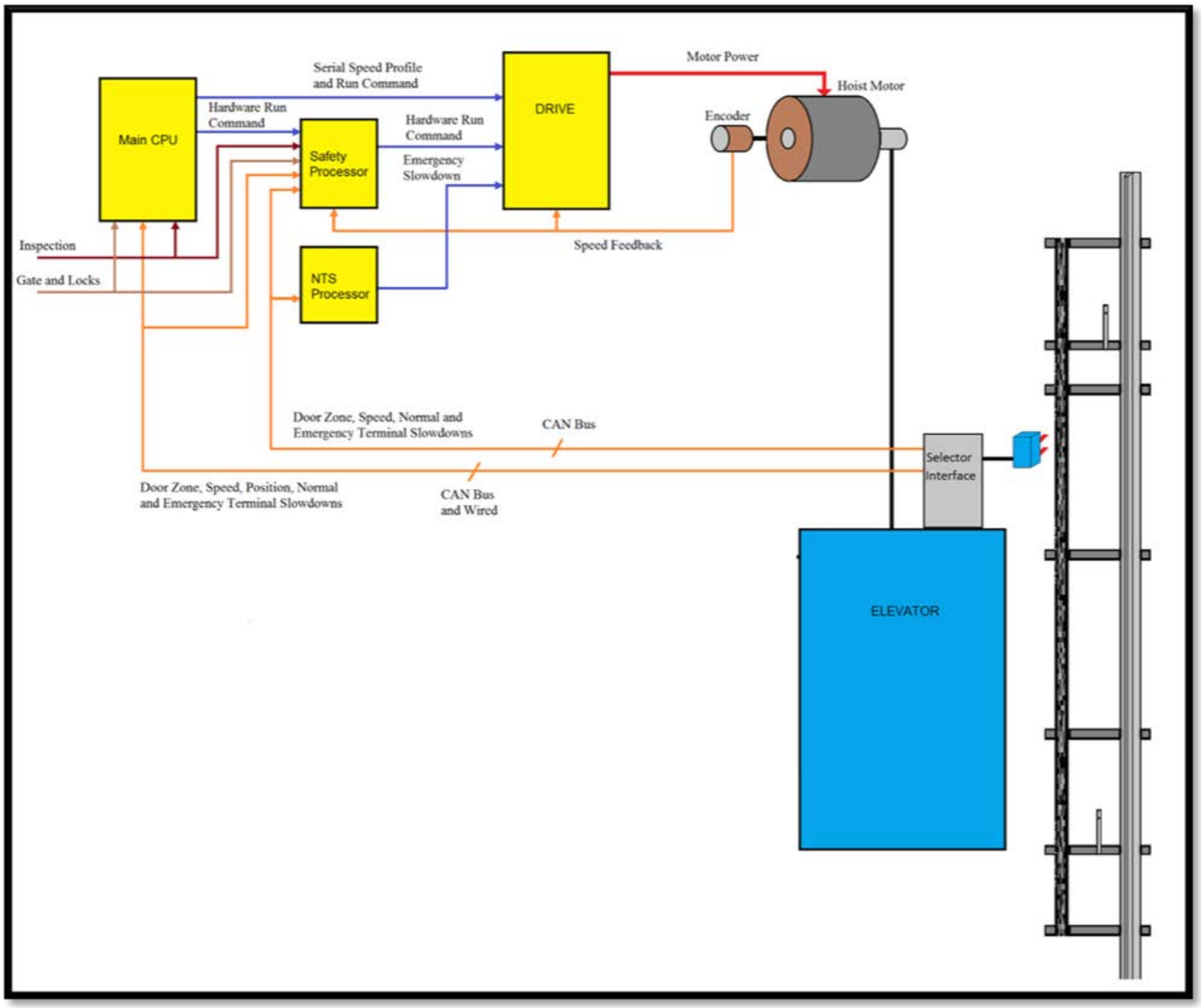


Figure 1.4: Absolute Position System Selector

1.3.4. Primary and Secondary Speed Feedback

On the tape system, the tape is perforated with 3/8 inch holes every 3/8 of an inch. Two sensors mounted on the selector send quadrature pulses back to the Main CPU for the primary speed and distance feedback. The NTS processor receives speed feedback from the Selector processor as a secondary speed feedback using opposite sensors from what the Main CPU uses. The Safety processor receives quadrature pulses from the motor encoder feedback.

On the CAN open tapeless system, the Main CPU receives position feedback from the CAN encoder mounted on the governor and calculates velocity from the change in position. The NTS processor and the Safety Processor receive pulses from the machine mounted incremental encoder to calculate velocity.

On the APS Selector, the Main CPU receives position feedback from the channel A camera CAN bus and calculates velocity from the change in position. The NTS processor receives slowdown limit and speed feedback from Processor 2 on the selector interface board using the channel B camera CAN bus. The Safety processor receives quadrature pulses from the motor encoder feedback.

With all selector systems, the Safety Processor uses velocity feedback to verify that the car is traveling at a safe speed when Emergency Terminal Slowdown limits are activated, when the car doors are open and when running on inspection. If the Safety Processor detects a velocity limit error it will immediately turn off the PIC enable output and drop the SFC relay to remove power from the driving machine and brake. The NTS processor uses velocity feedback to verify that the car is traveling at a safe speed when the Normal Terminal Limits are activated. If the NTS Processor detects a velocity limit error, it will turn off the NTS outputs to the drive causing the drive to initiate a timed slowdown.

1.4 Modes of Operation

1.4.1 Operating Sequence

Normal elevator operation, Automatic Mode, is selective-collective. When the elevator is traveling upwards to answer calls, all up hall calls at floors above the car are answered in the order reached by the car, regardless of the order in which the calls were registered. Upon reaching each landing with a car call or hall call registered, the car and hall doors at that floor are automatically opened.

The doors stay opened for a dwell time that is field adjustable. There are three different dwell times depending on whether it is a lobby call, car call, or hall call. The door will close before the set dwell time has elapsed if a passenger presses the door close button. The door will reopen before it is fully closed if the door open button is pressed, if a passenger pushes on the safety edge, if the photo-eye light beam is interrupted, or if a call for that floor in the direction of travel is pushed. The door will close when the door opening condition is eliminated. When the door has fully closed, the calls are answered.

When all up hall calls and car calls above the car have been answered, the elevator reverses direction and travels downward to answer car calls and down hall calls placed below the car. The calls are answered as previously described for up calls. When all calls below a down car are answered, the car reverses direction to repeat the cycle. In short, an elevator traveling up will bypass down hall calls, and an elevator traveling down will bypass up hall calls.

In buildings with more than one elevator grouped together, the actual time of arrival, “real time”, is used to estimate how long each elevator will take to answer a hall call. The elevator that can respond the fastest takes the call. Real time based dispatching permits the controllers to quickly respond to actual demand for elevator service. Some of the criteria used to estimate the time of arrival are as followed:

- Actual elevator floor to floor runs times.
- Actual run time to the floor whether it is a multi-floor run or a one floor run.
- Whether the elevator is in or out of service.
- Whether the elevator is in load weigh bypass mode.
- The direction and position of each elevator in the group.
- The average door cycle time at each stop.
- Status of each elevator, accelerating, full speed, decelerating, actual time in motion.
- Number of stops required due to car calls.
- Number of stops required due to previously assigned hall calls.
- System demand.

The above performance criteria is continuously measured and stored for improved accuracy in the dispatching algorithm. All of the above data is continuously scanned and the hall calls are reassigned if the conditions change and another car can respond faster. The ability to measure actual hall waiting time virtually eliminates long waiting and improves the average hall call waiting intervals throughout the building.

1.4.2 Reset Mode

Reset mode is initiated when the elevator power is first turned on, or when the system is reset. When the reset mode is initiated, the controller program is automatically loaded, and internal tests are run to ensure that both the car and controller are electrically operational before putting the car into service. The car will not move until reset mode is completed. Some of the internal tests that the controller performs are as follows: is the safety string made up; is the elevator on inspection operation; is the door close limit open; are the interlocks made up; is hoistway position correct. If all the safeties are made up, and the elevator is on automatic operation, and it is at floor level, the elevator will go into automatic mode. If the elevator is not at floor level, it will run slow speed down to the nearest floor, level into the floor, and reset the floor position count.

1.4.3 Safety String Open Mode

Safety string open mode is initiated when a safety is open. Some of the safeties are listed below:

- Reverse phase relay.
- Top final
- Bottom final
- Pit switch
- Car top stop switch
- Governor overspeed switch
- Safety operated switch
- Drive Ready relay

When the safety string is made back up, the elevator will go back to reset mode.

1.4.4 Controller Inspection Mode

The controller inspection mode is initiated by placing the “INS” switch on the 1102 board in the inspection position (down). Controller inspection mode permits operation of the car from the machine room. This mode performs the following operations:

- Enables the controller inspection “ENABLE”, “UP” and “DOWN” push buttons
- Door locks are active and must be closed to move the car.
- Pressing the controller “ENABLE” and “UP” pushbuttons causes the elevator to move at inspection speed in the up direction.
- Pressing the controller “ENABLE” and “DOWN” pushbuttons causes the elevator to move at inspection speed in the down direction.

1.4.5 Car Top Inspection Mode

This inspection mode is initiated by placing the inspection switch on top of the car in the inspection position. Inspection mode permits operation of the car from the car top inspection station. This mode performs the following operations:

- Disables access top and access bottom hall switches.
- Disables the controller "ENABLE", "UP" and "DOWN" push buttons.
- Door locks are active and must be closed to move the car.
- Enables the car top inspection station "SAFE", "UP" and "DOWN" push buttons
- Pressing the inspection station "UP" and "SAFE” pushbuttons causes the elevator to move at inspection speed in the up direction.
- Pressing the inspection station "DOWN" and "SAFE" pushbuttons causes the elevator to move at inspection speed in the down direction.

1.4.6 Access Mode

The access mode is initiated by placing the key operated access switch located in the car operating panel to the on position. Access mode allows entrance into the Hoistway by qualified and authorized elevator personnel for equipment inspection and service. Access to the top of the car is possible from the top landing, and access to the pit is possible from the bottom landing. Enabling this mode permits the following operation:

- Enables the access key switches at the top and bottom landing in the entrance door jambs.
- Bypasses the gate switch to allow car movement with the car door open.
- Bypasses the top or bottom landing hall door lock, depending on which terminal access switch is being keyed.
- Turning the access key switch to the up position causes the elevator to move at access speed in the up direction.
- Turning the access key switch to the down position causes the elevator to move at access speed in the down direction.

1.4.7 Independent Service Mode

The independent service mode is initiated by placing the key operated independent switch located in the car operating panel to the on position, or by placing the controller toggle switch "IND" to the down position. Independent mode permits operation of the car with an operator. This mode performs the following operations:

- Hall initiated calls are ignored.
- Hall lanterns and gongs are disabled.
- The doors open automatically and stay open until closed by the operator.
- Closing the doors requires constant pressure on the door close button.
- When the car door is closed, the car answers the nearest car initiated call in the direction of travel.

1.4.8 Load Weighing Bypass Mode

The load weighing bypass mode is initiated when the car is loaded to a predetermined percentage of full capacity, by closing a connection between terminals "LC" and "LW" or from serial communication from a load weighing device. Load weigh bypass mode allows the car to answer car calls and lighten the load before answering any more hall calls. This mode performs the following operations:

- Hall initiated calls are ignored.
- All other elevator functions operate as if on full automatic service.

1.4.9 Attendant Service Mode

The attendant service mode is initiated by placing the key operated attendant switch located in the car operating panel to the on position. Attendant mode permits operation of the car with an attendant. This mode performs the following operations:

- The doors open automatically and stay open until closed by the attendant.
- Closing the doors requires a momentary pressure on the door close button, or the up or down buttons located in the car operating panel.
- Hall initiated calls are answered unless there is constant pressure on the bypass button.
- Hall lanterns and gongs are enabled.
- The direction of preference can be specified by momentary pressure on the up or down buttons located in the car operating panel.

1.4.10 Code Blue Hospital Service Mode

Code blue hospital service mode is initiated by turning one of the code blue switches, located at each floor where medical emergency service is required, to the on position. A car is selected to respond to the code blue call. That car will perform the following:

- Cancel all car calls
- Any hall calls previously assigned will be transferred to another car.
- If traveling toward the code blue call, it will proceed nonstop to the code blue call floor.

- If traveling away from the code blue call, it will slow down and stop at the nearest floor, maintain doors closed, reverse direction and proceed nonstop to the code blue call floor.
- If at a floor other than the code blue call floor, the elevator will close the doors and proceed nonstop to the code blue call floor.
- Once at the code blue call floor, the doors will open and remain open.
- The code blue in car switch located in the car operating panel must then be turned to the on position. If the code blue in car switch is not turned to the on position within 60 seconds from the time the doors reach full open on the code blue call floor, the car will revert back to normal operation.
- Upon activation of the key switch, it will allow the car to accept a car call for any floor, close the doors, and proceed nonstop to the floor desired.
- The return of the code blue in car key switch to the normal position will restore the car to normal service.

1.4.11 Fire Service Phase I Mode

Fire service phase I is initiated when the primary smoke sensor is activated or the fire key switch located in the hall station on the primary return floor is turned to the on position. The primary return floor is usually the lobby floor, but could be another landing if it better serves the needs of emergency personnel when fighting a fire or performing rescues. When fire service phase I is enabled:

- The fire emergency return light illuminates and the fire buzzer sounds.
- The emergency stop switch is disabled when the door closes.
- The car travels to the primary return floor without answering any calls, then parks with the door open. The fire buzzer turns off, but the fire emergency return light stays illuminated.
- If the car is at a landing with the doors open, the doors will close, and the car will return non-stop to the primary return floor.
- If the car is traveling away from the primary return floor, the car will stop at the next landing, and then go immediately to the primary return floor.
- Turning the fire service key switch to the bypass position will restore the elevator to normal service.
- The elevator will perform per ASME A17.1 requirement 2.27.3 unless otherwise specified.

1.4.12 Fire Service Phase I Alternate Return Mode

Fire service phase I alternate return is initiated when the smoke sensor in front of the elevator at the primary return floor is activated. When fire service phase I alternate return is enabled:

- The fire emergency return light illuminates and the fire buzzer sounds.
- The emergency stop switch is disabled when the door closes.
- The car travels to the alternate return floor without answering any calls, then parks with the door open. The fire buzzer turns off, but the fire emergency return light stays illuminated.
- If the car is at a landing with the doors open, the doors will close, and the car will return nonstop to the alternate return floor. If the car is traveling away from the alternate

return floor, the car will stop at the next landing, and then go immediately to the alternate return floor.

- Turning the fire service key switch to the bypass position will restore the elevator to normal service.
- The elevator will perform per ASME A17.1 requirement 2.27.3 unless otherwise specified.

1.4.13 Fire Service Phase II Mode

To initiate fire service phase II, the car must first have been placed in fire service phase I, and, as a result, be parked at the designated level with the door fully open. Following that, the key operated fire service phase II switch, located in the car operating panel must be placed in the on position. Fire service phase II permits operation of the car by a fire fighter. This mode performs operations in accordance with ASME A17.1 requirement 2.27.3 as follows:

The doors close only with constant pressure on the door close button, after they have been fully opened.

- The doors open only with constant pressure on the door open button, after they have been fully closed.
- Hall lanterns and gongs are disabled.
  Safety edge and electric eye are disabled
- All registered car calls can be canceled with momentary pressure on the call cancel button located in the car operating panel.
- All hall calls are disabled.
- To remove the car from fire service phase II the car must be at the fire return landing with the doors in the full open position and the phase II switch turned to the off position.
- See ASME A17.1 requirement 2.27.3 for specific operation of fire service phase II.

1.4.14 Emergency Power

Emergency power is initiated when a connection is made between terminals “HC” and “EMP”. This mode performs the following operations:

- All cars are returned to the bottom floor one at a time, and remain there with their doors open.
- If a car is selected to run it will go back into normal operation.
- Removing the connection between terminals “HC” and “EMP” will remove the cars from emergency power operation.

1.4.15 Earthquake Mode

Earthquake mode is initiated upon activation of a seismic switch or counterweight derailment switch. This mode performs the following operations:

- If in motion, and the seismic switch is activated, the car will decelerate into slow speed, proceed to the nearest available floor, open the doors and shut down.
- If in motion, and the counterweight derailment switch is activated, and the car is moving away from the counterweight, then the car will decelerate into slow speed, and proceed to the nearest available floor, open the doors and shut down.
- If in motion, and the counterweight derailment switch is activated, and the car is moving toward the counterweight, then the car will perform an emergency stop, then move at slow speed away from the counterweight to the nearest available floor. After stopping at the nearest floor, the doors will open and the car will shut down.

1.4.16 Stalled Mode

Stalled mode is initiated when the elevator has been in run mode longer than the field adjustable anti-stall timer. This mode performs the following operations:

- Shuts down the elevator.
- Does not allow the elevator to restart until elevator is put on inspection or main line switch is cycled.
- The door open button remains active.

1.4.17 Automatic Mode

Since this is the normal operating mode, the controller automatically enters this mode if none of the previously described modes are activated, and if no fault is detected. The following operations are performed in automatic mode:

- The car operates in selective-collective control sequence when answering calls.
- Hall calls and car calls are functional.
- Hall lanterns and gongs are operational.
- Simplex Cars Park at the last call answered unless simplex lobby parking has been enabled in the program. In a multi-car group, a car is always parked at the lobby if no other demand exists.
- The doors remain closed when the car is parked

Section 2 - Installation

2.1 General Information

This section provides basic guidelines and recommendations for the proper installation of the controller equipment. These guidelines should be used as general instructions. They are not intended to usurp local codes and regulations.

2.2 Site Selection

When choosing the installation site of the controller, several factors should be considered. If at all possible, the controller should be installed in a location where the mechanic has a good view of the machine when he is standing in front of the controller. There should be no obstructions around the controller that would prevent proper routing of necessary conduits entering the controller. The controller doors should have enough room to fully open and close. All clearances, working space, lighting, and guarding should comply with governing codes.

2.3 Environmental Considerations

The standard controller package is provided with a NEMA 1 enclosure. This type of controller should be installed in a clean and dry environment. Ideally, the equipment room should be temperature controlled between 70 and 90 degrees F. However, control equipment will function properly within an ambient temperature range of 32 to 105 degrees F. If temperatures remain at the upper and lower extremes of this range for an extended period of time, the life expectancy of the control equipment may be shortened. If wet, dusty, or corrosive environments are expected, then optional non-standard enclosures can be provided. For example NEMA 4, NEMA 12, or NEMA 4X.

The control system is designed to have a high immunity to electrical noise, radio frequency radiation, and magnetic interference. However, high levels of these items could cause interference with certain parts of the control system.

The power supply feeding the controller should have a fluctuation of no greater than + or - 10%.

2.4 Wiring Guidelines and Instructions

2.4.1 The Wiring Prints

A complete set of wiring schematics will be provided for each job. Each set of wiring schematics is job specific. The job name and number will be listed in the bottom right corner of each page of the print.

2.4.2 Proper Field Wiring

Most of the field connections to GALaxy controls are made using stranded wire. When inserting this stranded wire into the terminals – especially those for EPD's (Electrical Protective Devices) – care must be taken to ensure that all the strands are properly inserted in to the terminals. Improper striping and insertion may leave strands outside the terminals. Strands not in the terminals may make contact with the wires from an adjacent terminal.

The danger associated with an occurrence such as this has led us to recommend that, for all connections to Safety Devices - those listed in A17.1 – 2013, Requirements 2.26.2.1 thru 2.26.2.39 as applicable, follow the guidelines listed below:

- Inspect all terminals used to connect safety devices. Ensure that the cage clamp is fully open before inserting a wire into the terminal block.
- Perform corrective action for wires with stray strands by one of the following methods:
  - Reconnect the wire with all wire strands correctly installed into the terminal. Visually verify that **<u>no wire</u>** strands are outside of the terminal. <u>The conductor should be stripped and inserted completely into the terminal in such a manner that no more than two millimeters of bare wire is visible</u>; or
  - Attach a ferrule to the end of field wire for safety devices and insert the ferrule into the terminal; or
  - Use an acceptable method such as tinning.
- After removal and replacement of any of these field wires, the actual safety device should also be checked for proper operation

2.4.3 Ground Wiring

Proper grounding of the power supply, controller, elevator car, and hoistway is required. Separate conductors should be run for EG (earth ground) and GND terminals. These terminals and conductors are detailed on the wiring schematics.

2.4.4 Hoistway Wiring

All hoistway wiring is detailed on the wiring schematics. The number of hoistway conductors is calculated and listed per job on the wiring schematics. A job specific "pull sheet" is also provided with the wiring schematics.

2.4.5 Elevator Car Wiring

All elevator car wiring is detailed on the wiring schematics. The number of traveling cable conductors is calculated and listed per job on the wiring schematics. A job specific "pull sheet" is also provided with the wiring schematics.

2.4.6 Machine Room Wiring

All machine room wiring is detailed on the wiring schematics. All wire sizes are listed for main power supply, motor wiring, brake wiring (traction only), and field wiring.

2.4.7 Wiring to Top of Car Selector

The car top selector is wired according to the schematics for the job. When using tape selector system, note that five twisted-shielded pairs are required in the traveling cable. This includes a twisted-shielded pair for the phone system.

2.5 Normal and Emergency Terminal Slowdown Limits

There are two sets of slowdown switches used, the Normal Terminal Slowdown Limits (including UN/DN, UT1/DT1, UT2/DT2, UT3/DT3, etc.) and Emergency Terminal Slowdown Limits (including UTS, DTS and ETS top and bottom). Note that the Normal Terminal Slowdown Limits are not considered part of an electrical protective device and can be read from an encoded tape instead of using physical switches.

The Normal Terminal Limits are used to cause the car to slowdown and stop at or near the terminal landing if the car hits the limit at a speed higher than the setup speed for that limit. The NTS processor monitors the speed of the car when the limits are hit independent of the Main CPU and if the speed is too high, will turn off an output to the drive to cause the drive to initiate a timed emergency slowdown. In addition, software on the Main CPU that is running independent to the speed profile software will clamp the speed command to the drive at the preset clamp velocity of each normal terminal slowdown limit.

The Emergency Terminal Slowdown limits are used to prevent the car from hitting the buffer at a speed greater than the rated buffer speed and to also slowdown and stop the car if the Normal Terminal Slowdown devices do not slowdown the car.

UTS and DTS emergency slowdown limit switches are used on all traction cars as the emergency terminal stopping device. On cars with reduced stroke buffers an ETS limit is used as a verification limit at both the top and bottom of the hoistway for redundancy. The Safety Processor monitors these switches as the slowdown speed verification points. If the car hits the limit at a speed greater than the preset speed parameter, power is immediately removed from the motor and brake for an emergency stop independent of the main CPU. UTS and DTS limits are used on all traction controllers as a secondary check to verify the car's preset position when floor level at the top or bottom landing.

The distance that the limits are placed from the terminal landing depends on the speed of the car. Table 1 shows the slowdown limit locations with respect to contract speed. Keep in mind that the table shows slowdown distances and not the magnet lengths. All distances are shown in inches.

FPM	UT/ DT *	UT1/ DT1	UT2/ DT2	UT3/ DT3	UT4/ DT4	UT5/ DT5	UT6/ DT6	UTS/ DTS	UTS/ DTS/ETS (Reduced Stroke buffer)
50	5"							4"	4"
75	9"							7"	7"
100	12"							10"	10"
150	21"							17"	17"
200	30"							22"	22"
250	45"							32"	32"
300	25"	50"						37"	37"
350	33"	65"						48"	48"
400	41"	83"						60"	60"
450	51"	102"						74"	74"
500	56"	113"						83"	83"
600	52"	105"	157"					114"	114"
700	70"	140"	209"					151"	151"
800	67"	135"	202"	269"				192"	192"
900	77"	153"	230"	306"				220"	220"
1000	75"	149"	224"	299"	373"			267"	267"
1100	89"	179"	268"	358"	447"			319"	319"
1200	88"	176"	264"	352"	440"	528"		375"	375"
1300	94"	188"	282"	376"	470"	564"		404"	404"
1400	93"	186"	279"	371"	464"	557"	650"	464"	464"

Table 1: Slowdown Distances from Terminal Landings (as of 2/13/17)
***Add 22" to UT/DT magnet length for tape selector**

The up and down directional limit switches UN and DN should be set to open two inches past the terminal floor levels. On the tape selector, the UN and DN limits are 18 inch magnets placed immediately above (touching) the top floor door zone magnet and below (touching) the bottom floor door zone magnet. Due to where the sensors are located on the selector, the sensors will activate 2 inches above and below the top and bottom floors, respectively. Also note that on the tape selector, to measure the correct length for the UT or DT magnets, select the slowdown distance from Table 1 and then add 22 inches. For a 350 fpm car, the magnet length would be 33" + 22" = 55".

When using the Absolute Position System (APS) selector, the slowdown limit positions are automatically calculated byte the GALX-1133 selector interface board. If the calculated slowdown values are not adequate, the distances can be modified from the LCD Interface under the "APS Selector Adj Var" menu.

2.6 Final Limit Switches

The top and bottom final limit switches should be set to open four inches past the terminal floor levels. These limit switch must be mechanical switches.

2.7 Selector Installation

2.7.1 Tape Selector Installation

The tape is installed by first attaching it at the top of the hoistway approximately 12 inches from the rail, see Figure 2.0. The tape is then unreeled from the top of the car while running down on inspection. At the bottom of the hoistway it is attached with a spring to provide proper tension on the tape. The selector is then mounted on the top of the car and is coupled to the tape by the nylon guides. Figure 2.1 shows a typical mounting of the selector to the crosshead. Figures 2.2-A and 2.2-B show a typical layout of the door zones and limits on a tape system.

The UN and DN direction limits are placed immediately below the bottom terminal floor door zone magnet and above the top terminal floor door zone magnet and should be cut to a length of 18 inches. The UT and DT limits are long magnets that should be cut to the length in Table 1 plus 22 inches. The DT magnet is mounted starting even with the bottom of the DN magnet extending up the hoistway (Figure 2.2-B). The UT magnet is mounted starting even with the top of the UN magnet extending down the hoistway (Figure 2.2-A).

The UT1, DT1, UTS and DTS limits are mounted on a plastic paddle that snaps on the back of the tape. Measure the distance for UT1 and UTS from the middle of the top floor door zone to the slowdown position according to the values in Table 1. Mount the plastic paddle by pressing it onto the back of the tape having the clips snap on through the holes. There may be a lip on the edge of the tape hole due to how the tape was punched. Use a file or grinder to smooth the edge before attempting to snap on the plastic paddle. Measure the distance for DT1 and DTS from the middle of the bottom floor door zone position to the slowdown position according to the values in Table 1. Again, mount the plastic paddle by pressing it onto the back of the tape having the clips snap on through the holes. Figure 2.5 shows the new selector interface board (GALX-1110AN).

2.7.1.1 Floor and Binary Magnet Installation

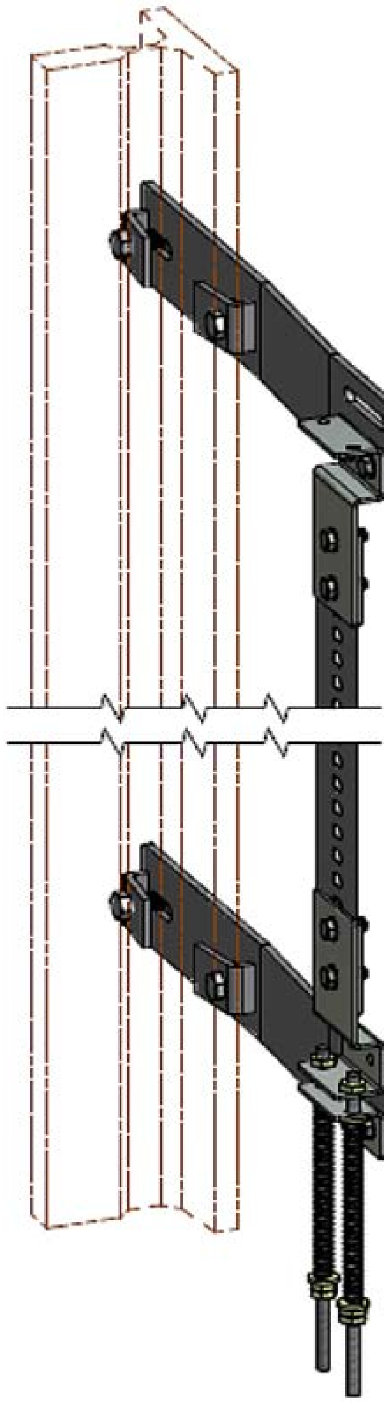
To install the floor magnets, the car is placed exactly level at the desired floor. The tape is then marked at the top left of the selector through a factory cut guide hole. The car is moved below the floor in order to gain access to the section of tape that was marked while the car was at floor level. A door zone template, provided by G.A.L., is placed at the mark and the door zone and binary preset magnets are placed in the appropriate locations in the template. The template is then removed from the tape, and the process is repeated for each floor level. Figure 2.4 shows the placement of the door zone template. Figure 2.6 and 2.7 shows the placement of the door zone magnets.

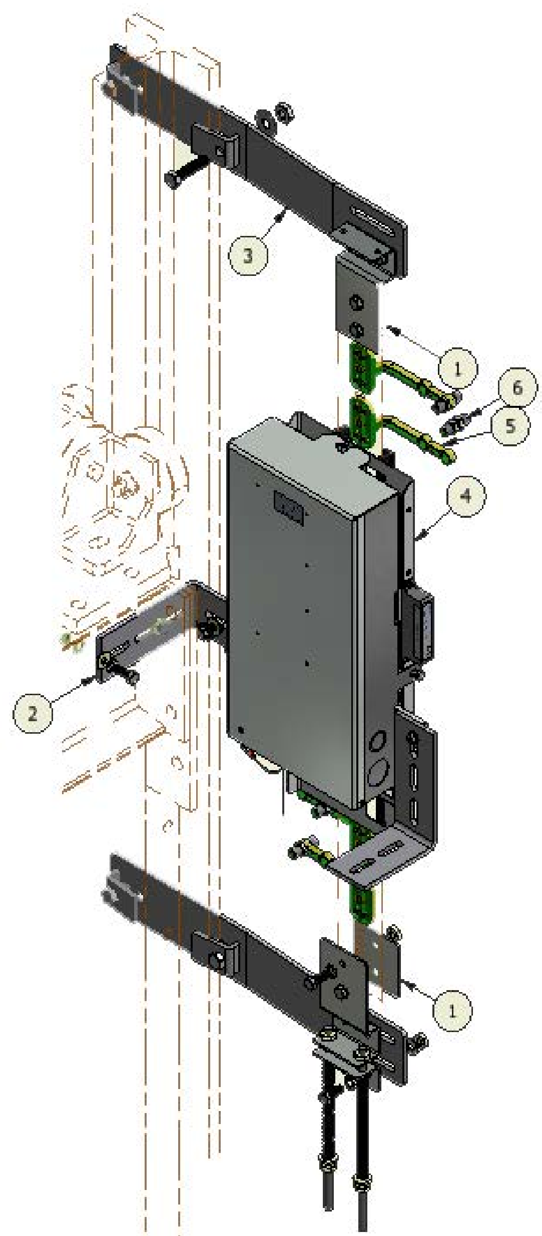
Table 4 shows which binary preset magnets are used for each floor. A "1"in the table indicates that a magnet is used and a "0" indicates no magnet. Note that the top and bottom floors do not use binary preset magnets.

Table 4: Binary Preset Magnets

Floor	BP32	BP16	BP8	BP4	BP2	BP1
1	0	0	0	0	0	0
2	0	0	0	0	1	0
3	0	0	0	0	1	1
4	0	0	0	1	0	0
5	0	0	0	1	0	1
6	0	0	0	1	1	0
7	0	0	0	1	1	1
8	0	0	1	0	0	0
9	0	0	1	0	0	1
10	0	0	1	0	1	0
11	0	0	1	0	1	1
12	0	0	1	1	0	0
13	0	0	1	1	0	1
14	0	0	1	1	1	0
15	0	0	1	1	1	1
16	0	1	0	0	0	0
17	0	1	0	0	0	1
18	0	1	0	0	1	0
19	0	1	0	0	1	1
20	0	1	0	1	0	0
21	0	1	0	1	0	1
22	0	1	0	1	1	0
23	0	1	0	1	1	1
24	0	1	1	0	0	0
25	0	1	1	0	0	1
26	0	1	1	0	1	0
27	0	1	1	0	1	1
28	0	1	1	1	0	0
29	0	1	1	1	0	1
30	0	1	1	1	1	0
31	0	1	1	1	1	1

Table 4: Binary Preset Magnets						
Floor	BP32	BP16	BP8	BP4	BP2	BP1
32	1	0	0	0	0	0
33	1	0	0	0	0	1
34	1	0	0	0	1	0
35	1	0	0	0	1	1
36	1	0	0	1	0	0
37	1	0	0	1	0	1
38	1	0	0	1	1	0
39	1	0	0	1	1	1
40	1	0	1	0	0	0
41	1	0	1	0	0	1
42	1	0	1	0	1	0
43	1	0	1	0	1	1
44	1	0	1	1	0	0
45	1	0	1	1	0	1
46	1	0	1	1	1	0
47	1	0	1	1	1	1
48	1	1	0	0	0	0
49	1	1	0	0	0	1
50	1	1	0	0	1	0
51	1	1	0	0	1	1
52	1	1	0	1	0	0
53	1	1	0	1	0	1
54	1	1	0	1	1	0
55	1	1	0	1	1	1
56	1	1	1	0	0	0
57	1	1	1	0	0	1
58	1	1	1	0	1	0
59	1	1	1	0	1	1
60	1	1	1	1	0	0





PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	PLATES ASSY,TENSION SPRG/THD ROD/BRKTS
2	2	ANGLE,POSITION DETECTION MOUNTING
3	1	KIT, GALAXY SELECTOR RAIL
4	1	READER, SELECTOR TAPED GALX-IV ASSY
5	4	CLIP, MAGNET MOUNTING TAPED SELECTOR
6	4	MAGNET TARGET, SOUTH FACE GREEN

Figure 2.0: Typical Tape Mounting **Figure 2.1: Typical Mounting of Selector**

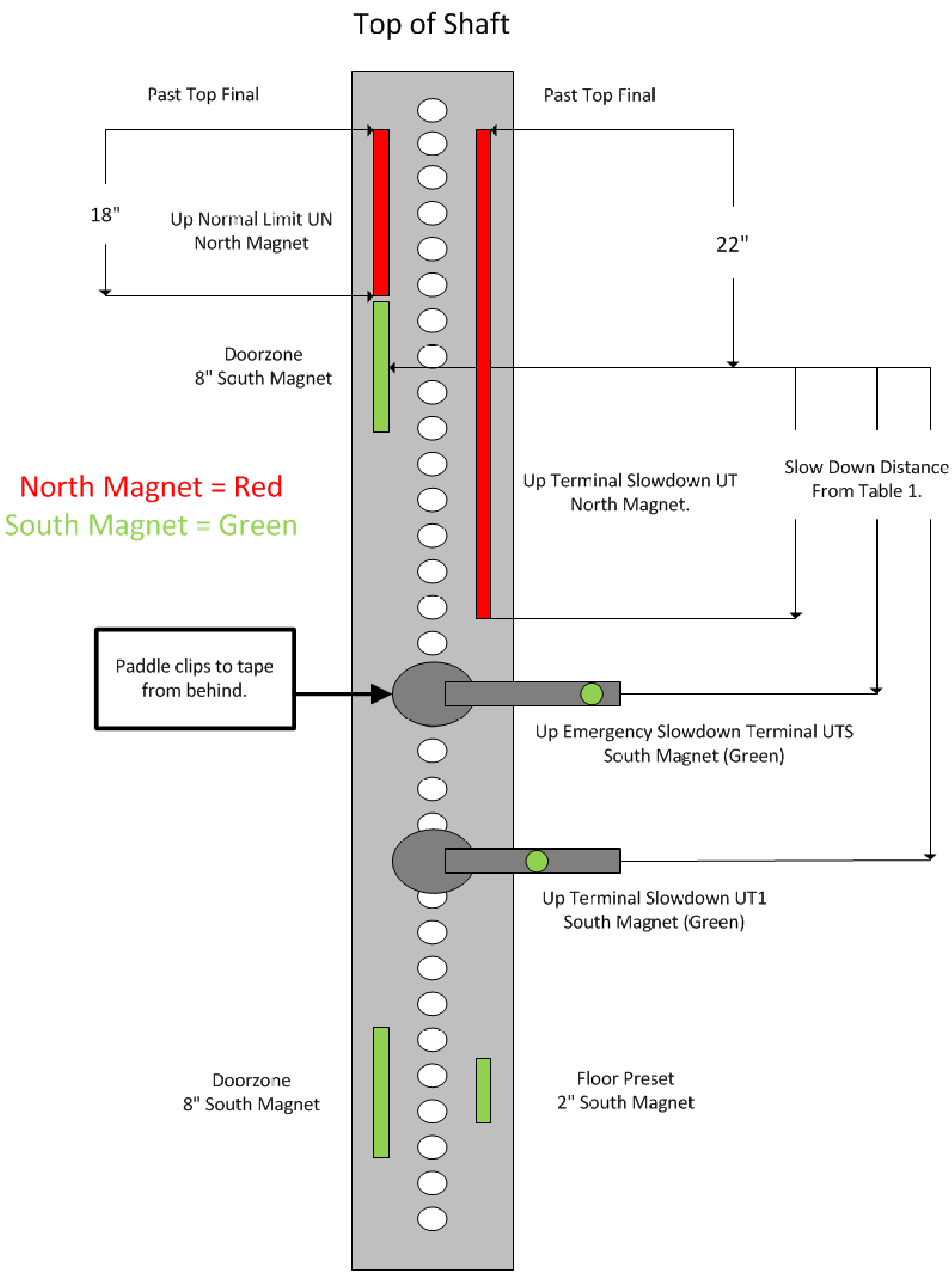


Figure 2.2-A: Typical Slowdown and door zone layout on tape. (Upper Section)

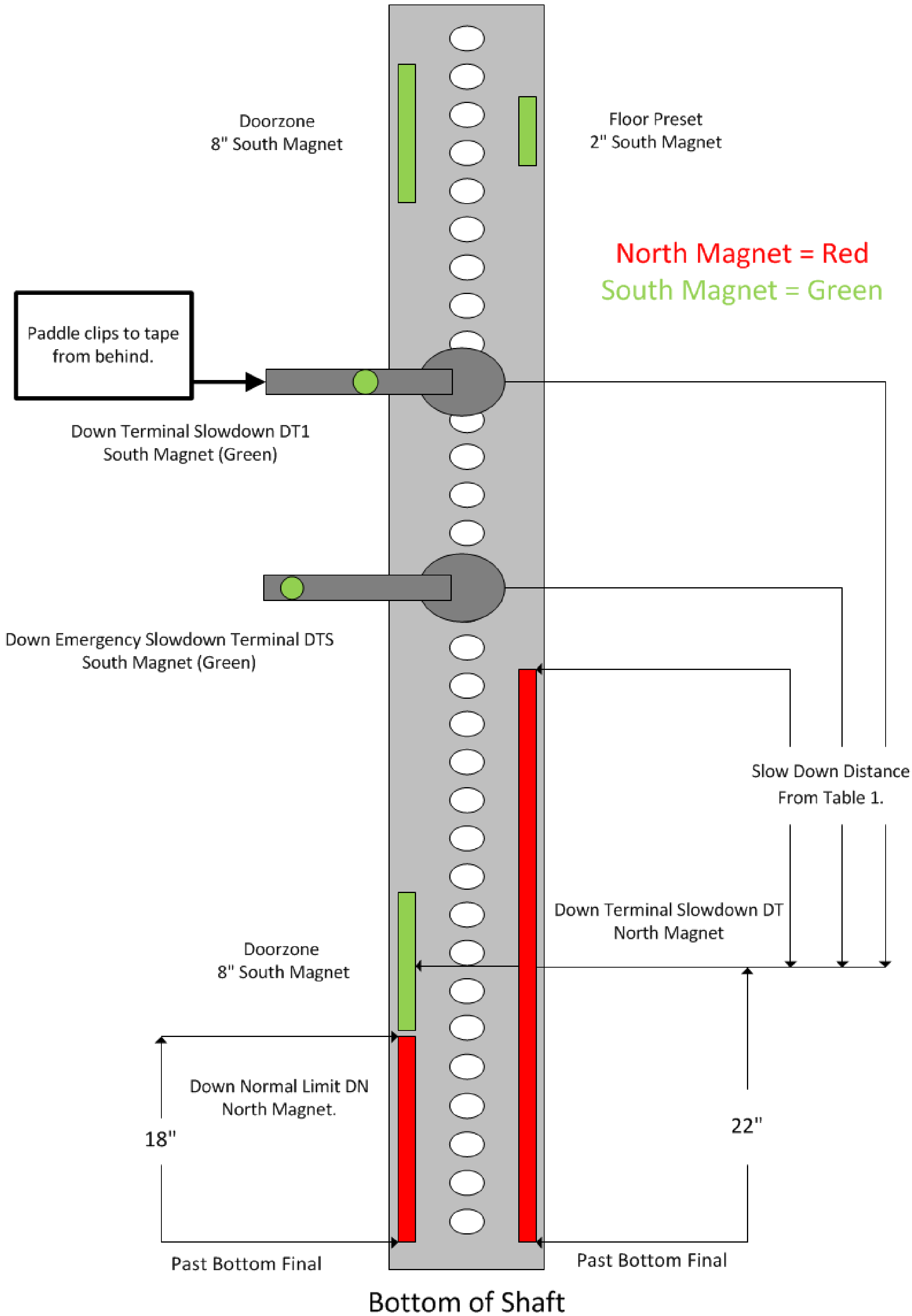


Figure 2.2-B: Typical Slowdown and door zone layout on tape. (Bottom Section)

Figure 2.3: Typical Selector Installation

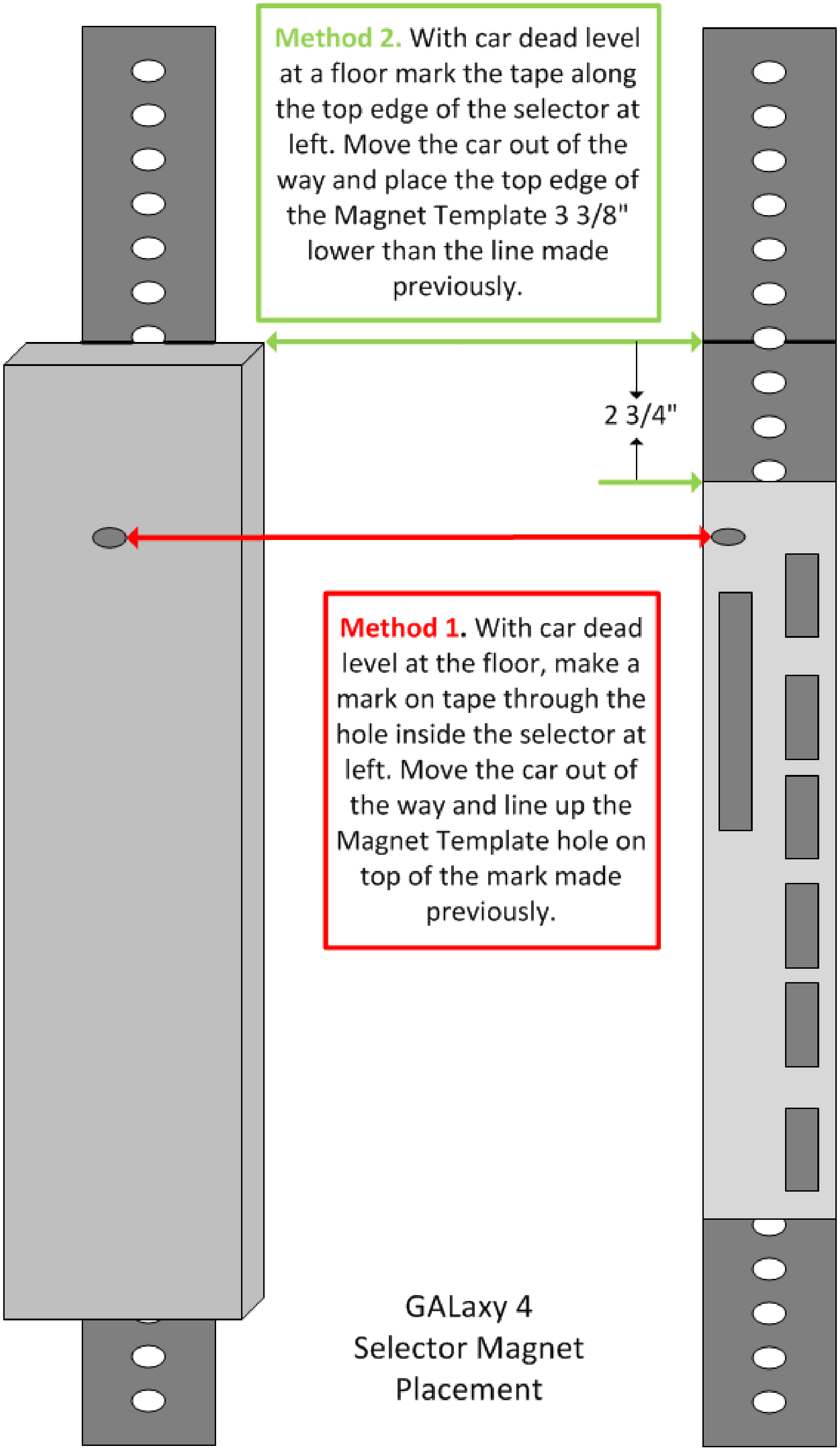


Figure 2.4: Selector Template Placement

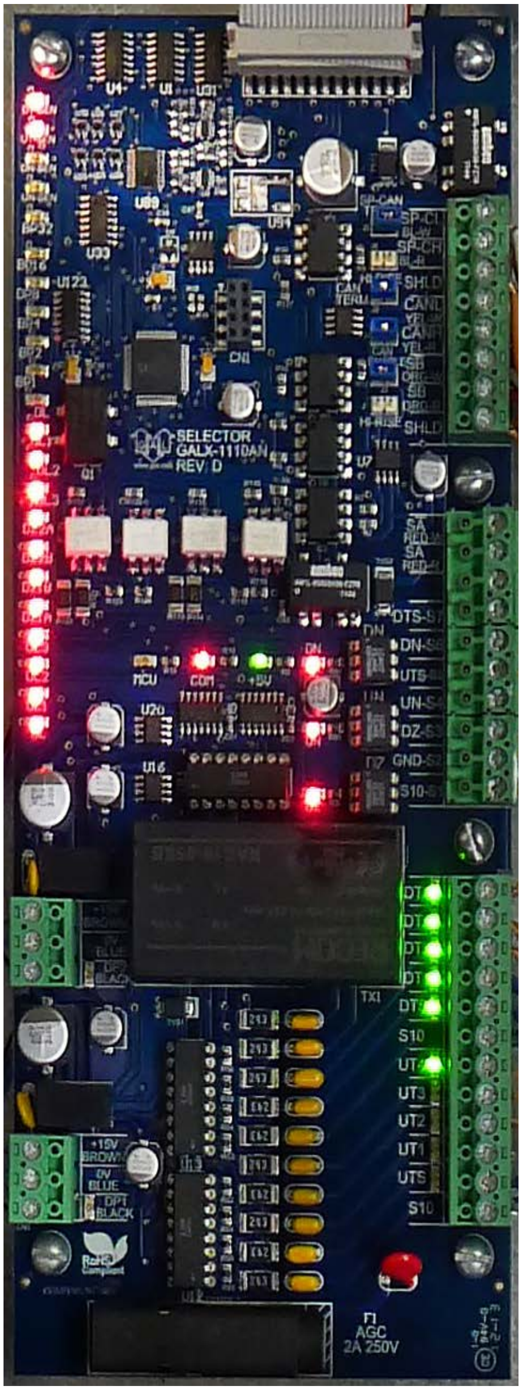


Figure 2.5: Selector Driver Board GALX-1110AN

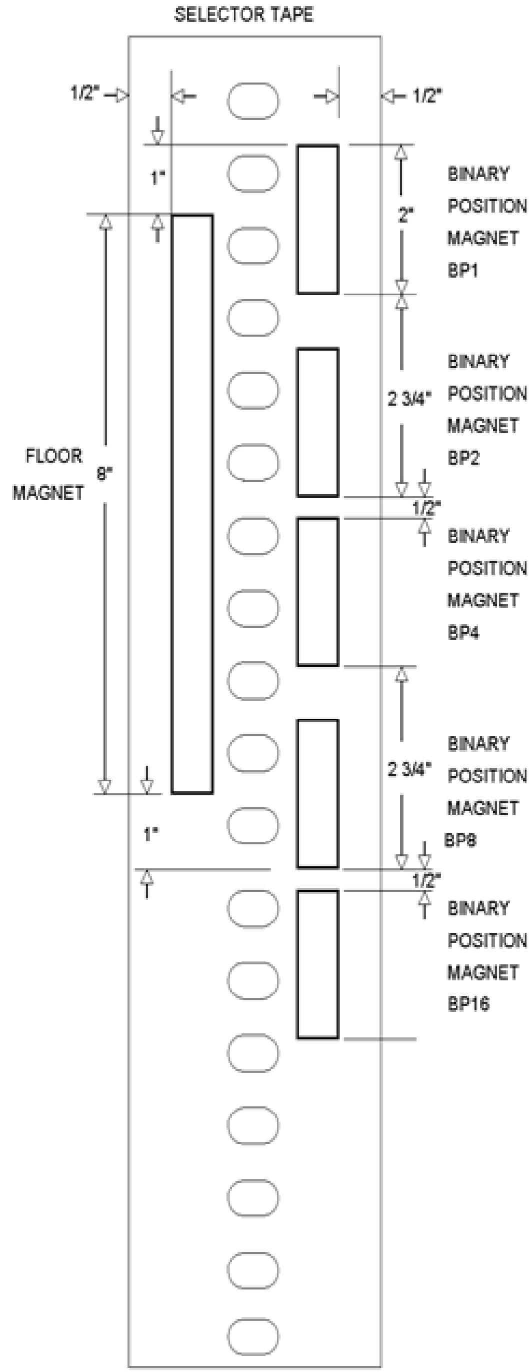
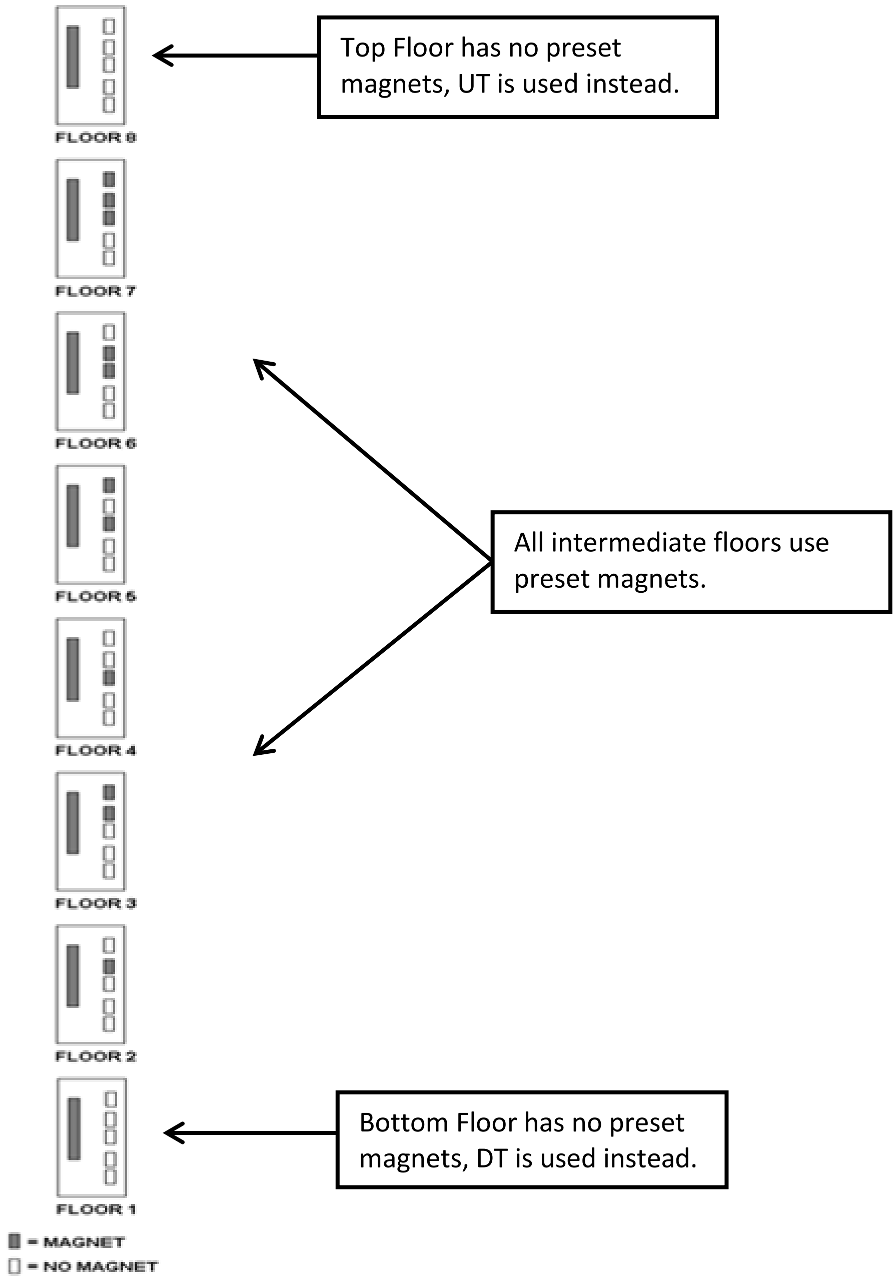


Figure 2.6: Selector Tape Layout

Figure 2.7: Door Zoon and Preset Magnets



2.7.2 Tapeless Selector Installation

Place the car dead level at any intermediate floor. Mount the selector box on the elevator cross head with the bracket provided. Notice that the box mounting holes are slotted to adjust the position of the box. Refer to figure 2.8 for an overall view setup of the selector box and the door zone and slowdown limit brackets. Mount one of the slim door zone metal strips on the far end of a rail bracket. Mount the door zone/rail bracket on the rail where the door zone metal strip lines up with the door zone sensors on the selector box. Make sure that the rail bracket is pushed completely on to the rail while tightening the adjacent rail clip bolt. Place the door zone magnet on the slim metal strip and complete the alignment of the selector box and the door zone in the correct position. This will ensure that all the door zone and slowdown magnets line up with the correct sensor. Adjust the door zone sensors to be 1 inch from the door zone magnet.

Continue to mount the door zones using the slim door zone/rail brackets at all the intermediate floors or if preferred, proceed to a terminal landing to work from one particular end of the hoistway.

Bring the car dead level to a terminal landing. There will be two wide door zone plates included that are specifically used for the terminal landings. Theses plates have three large holes to mount the normal limit magnets. The down normal limit DN is placed in the middle hole of the plate. The up normal limit UN is placed in the top hole of the plate. Notice that the bottom hole becomes the top hole if the plate is rotated 180 degrees. The door zone magnet is placed adjacent to the three normal limit holes but in line with the mounting screw holes. Mount the bracket at the terminal floor so that the door zone magnet lines up with the door zone sensors. Make sure that when at the top terminal floor, the magnet for the up normal limit is at the top of the door zone magnet. The down normal magnet at the bottom terminal floor will appear to be at the middle of the door zone magnet. Because of the placement of the limit sensors on the selector box, the up normal limit will activate 2 inches above the top floor and the bottom one will activate 2 inches below the bottom floor.

The selector box should be marked on the top to show the location of each slowdown sensor. If the box is not marked, us a black marker and mark the locations from the picture in figure 2.9. Using the slowdown distance table in section 3, mount each slowdown rail bracket at the measured distance. The appropriate slowdown flat metal extension strip mounts on the rail bracket depending on the limit location on the selector box. Look at which side of the rail the selector box is mounted for the specific elevator. The slowdown limits that line up in between the rail and the door zone use the short straight flat metal strip. These metal strips are mounted vertically on the rail bracket. The slowdown limits that line up outside of the door zone from the rail will use the long slowdown flat metal extension strips and will mount diagonally from the rail bracket. Mount the magnet on the metal extension strip and verify the alignment. Make sure that the magnet is ½ inch to ¾ inch from the slowdown sensor.

Once the top of car is wired and power is supplied to the selector, verify the activation of each door zone and slowdown magnet. Since the slowdown sensors will latch from passing a magnet, the sensor can possible be initially set incorrectly. To change the state of the sensor, pass a magnet across the sensor. The LEDs on the door zone sensors and on the selector board will aid in verifying the setup off all the door zone and slowdown limit magnets. Review the pictures in figures 2.10 and 2.11 for a typical tapeless installation.

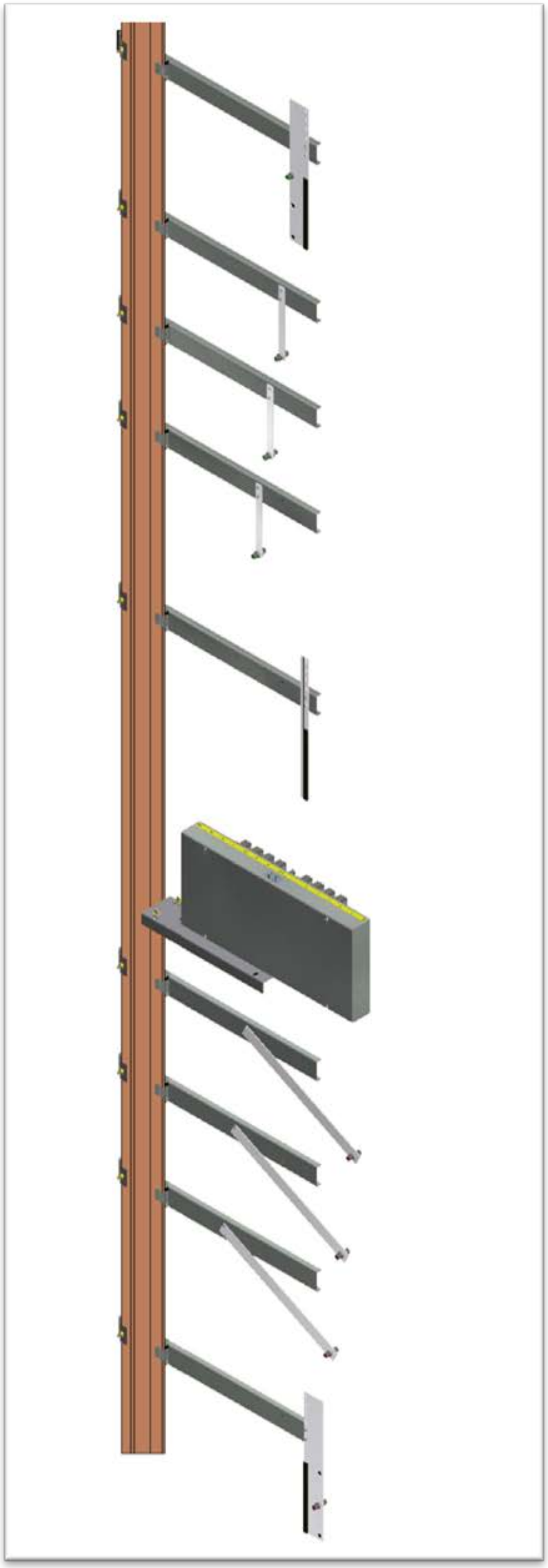


Figure 2.8 Selector, Door zone and Normal Terminal Slowdown Limit Mounting.

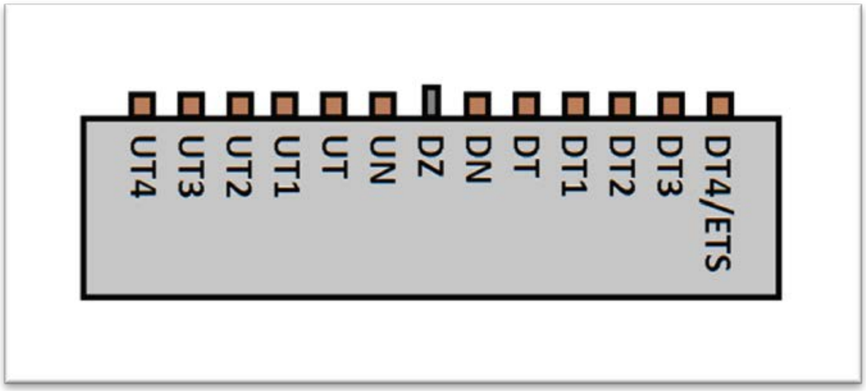


Figure 2.9 Placement of Sensor Labels on Selector Box

Figure 2.10: Typical Selector Box Installation

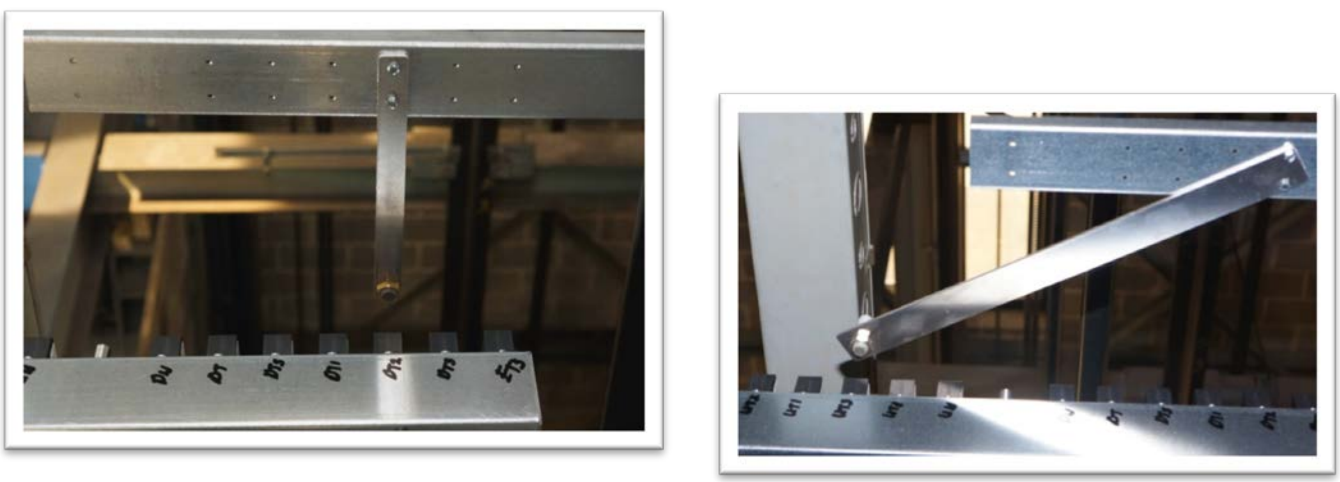


Figure 2.11: Typical Slowdown Bracket Installation

2.7.3 Absolute Position System Selector Installation

To mount the Absolute Position System Selector, follow steps 1 through 7 below.

Step 1: Mount top selector bracket and connect the optical absolute encoded tape.

- Mount the top J-hook selector bracket to the rail.
- Make sure the bracket is high enough that when counter weight buffer is fully depressed the selector doesn't hit the bracket.
- Connect the encoded tape to the top bracket. See Figure 2.12.
- Make sure you feed the tape through the front side of the bracket first, the side facing the car and then bend it around the top and lace it back down. See Figure 2.13
- Fasten it down with the supplied bracket and screws.

Figure 2.12: Encoded Tape Mounting

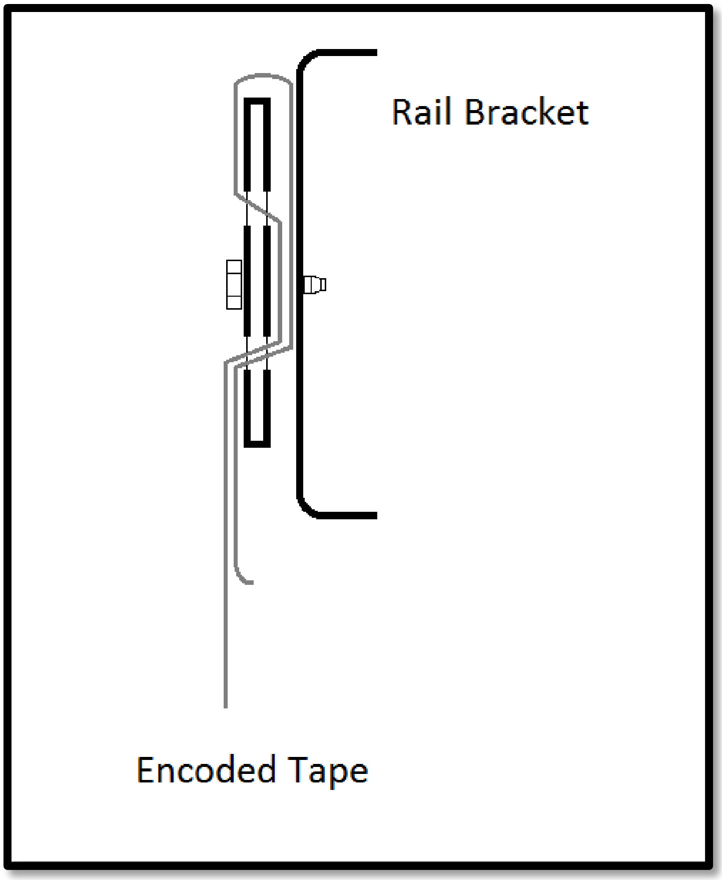


Figure 2.13: Encoded Tape Connected to Top Bracket

Step 2: Run down on inspection while unrolling the optical absolute encoded tape.

- Run down on inspection while unrolling the tape. See Figure 2.14.
- Make sure you do not kink the tape or bend it in too tight of a radius. The tape can be damaged and it should be handled with care.
- Make sure your hands are clean and you do not leave any grease or dirt on the front of the tape.

Figure 2.14: Unroll the tape

Step 3: Mount the bottom selector bracket and connect the optical absolute encoded tape.

- Mount the bottom selector bracket.
- Make sure the bracket is low enough, that when the car is on the buffer with it fully depressed, the selector does not hit the bracket. See Figure 2.15.
- Connect the encoded tape the rail bracket with the slack tape switch.
- Make sure you feed the tape through the front side of the bracket, the side facing the car, first and then bend it back up toward the back of the tape. See Figure 2.16
- Push the bracket down until the springs are depressed to the mark, this will put the equivalent of a 10kg weight. See Figure 2.17.

Figure 2.15: Bottom Bracket Mounting

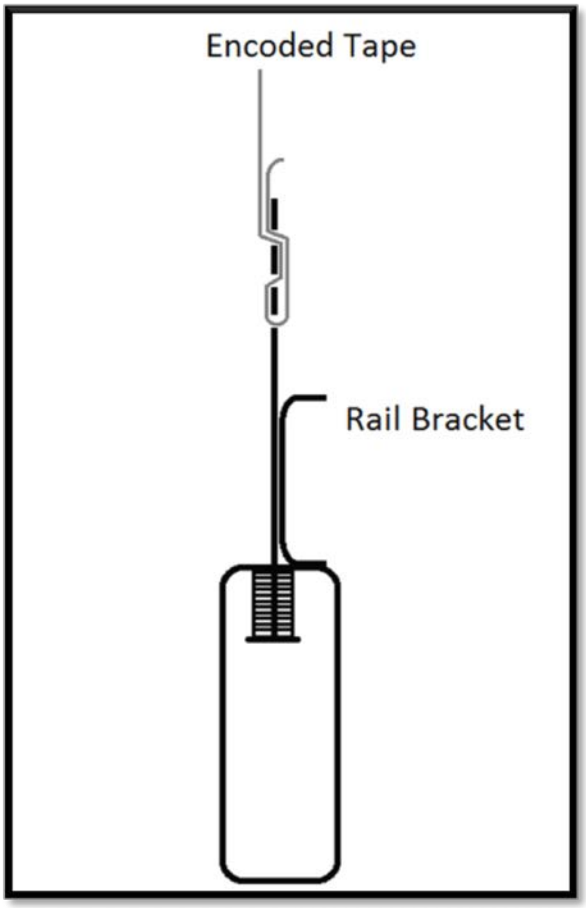


Figure 2.16: Encoded Tape connection.

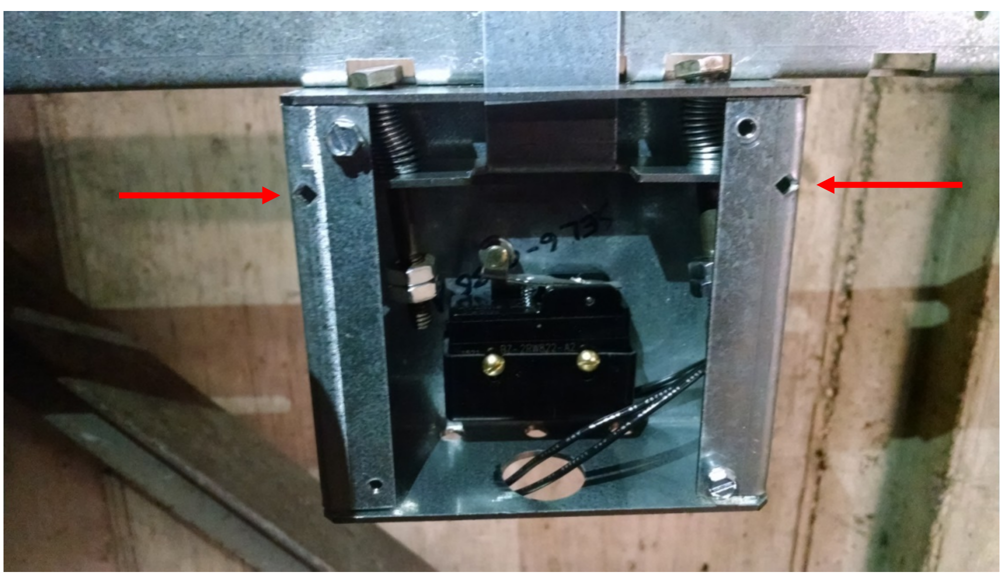


Figure 2.17: Bracket with springs depressed to the mark

Step 4: Mount the selector mounting bracket to the cross head.

- Mount the selector mounting bracket to the cross head.
- Use the roller guide bold to hold the top of the bracket and the I-beam clamp to hold the bottom.
- The face of the bracket should be about 5 1/2inches from the back of the rail. See Figure 2.18.
- The back of the bracket should be as close as possible to the cross head channel.
- Use a level and make sure it is plumb up and down.

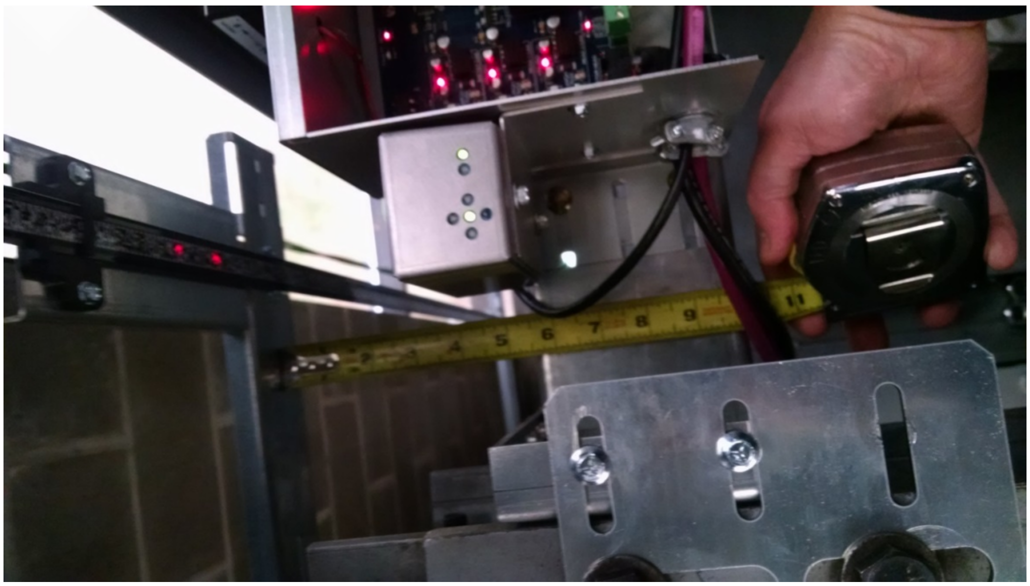


Figure 2.18: Selector Box Mounting Bracket

Step 5: Mount the selector box.

- Mount the selector box on the mounting bracket.
- The camera should be centered with the optical absolute encoded tape.
- The face of the camera should be 4 inches from the face of the optical absolute encoded tape. See Figure 2.19.

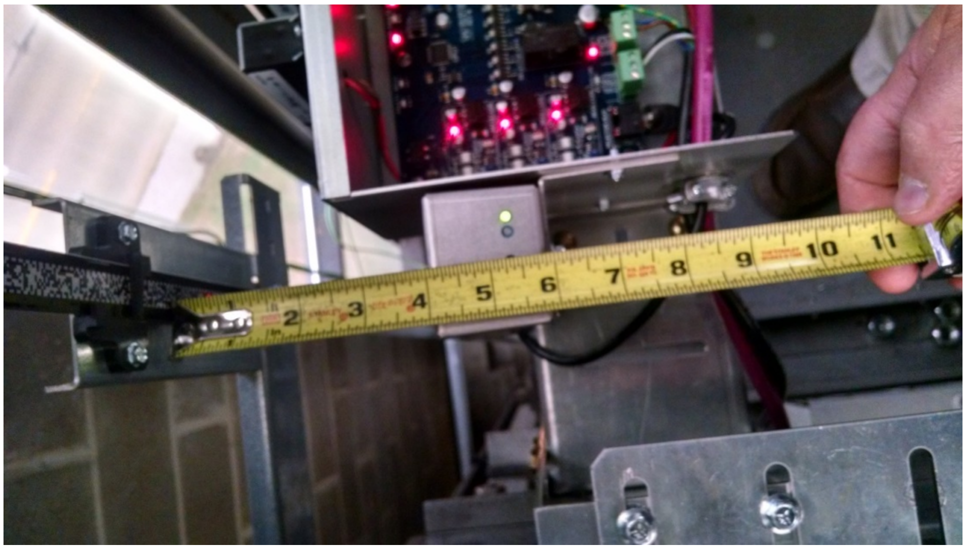


Figure 2.19: Camera 4 inches from tape

Step 6: Wire the APS selector according to the connection diagrams.

Please refer to the prints for an accurate diagram.

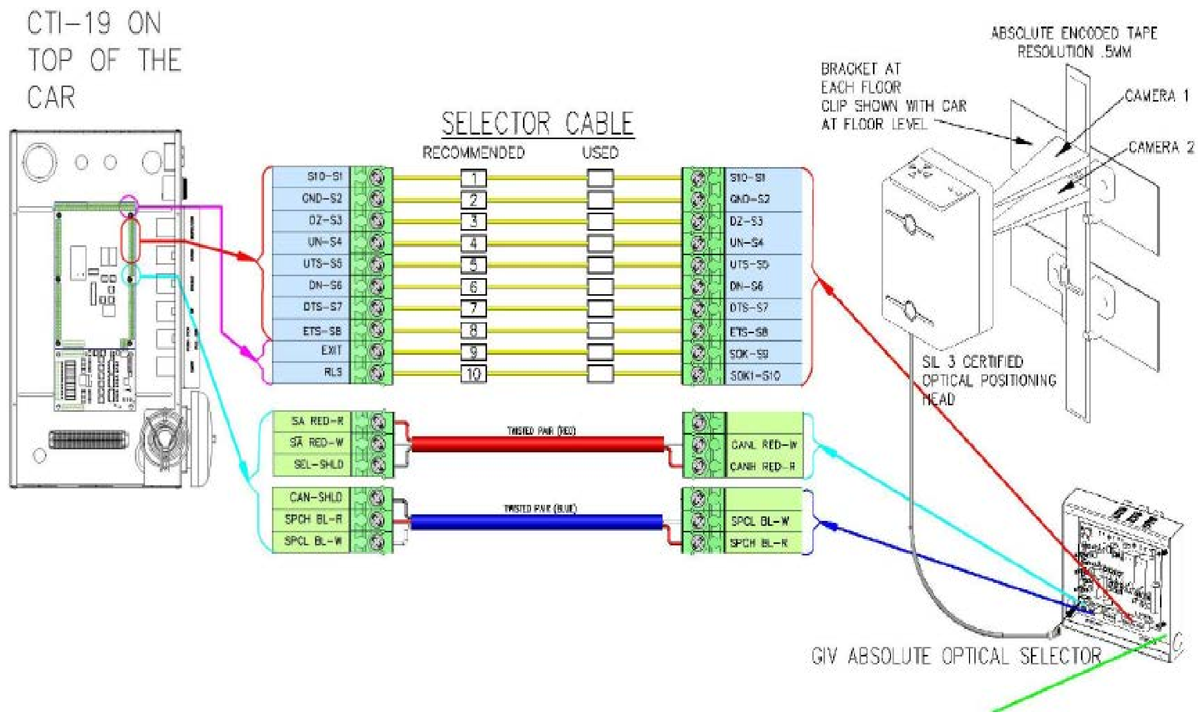


Figure 2.20

Step7: Fine adjustment of the Camera

- Make the fine adjustment of the camera.
- Adjust the camera so only the green light in the middle of the 4 red arrows is on.
- Put your hand in front of the camera for 5 seconds. Remove your hand from in front of the camera. You should see 2 LED's on the encoded tape. Adjust the camera so the LED's are in the center of the encoded tape.

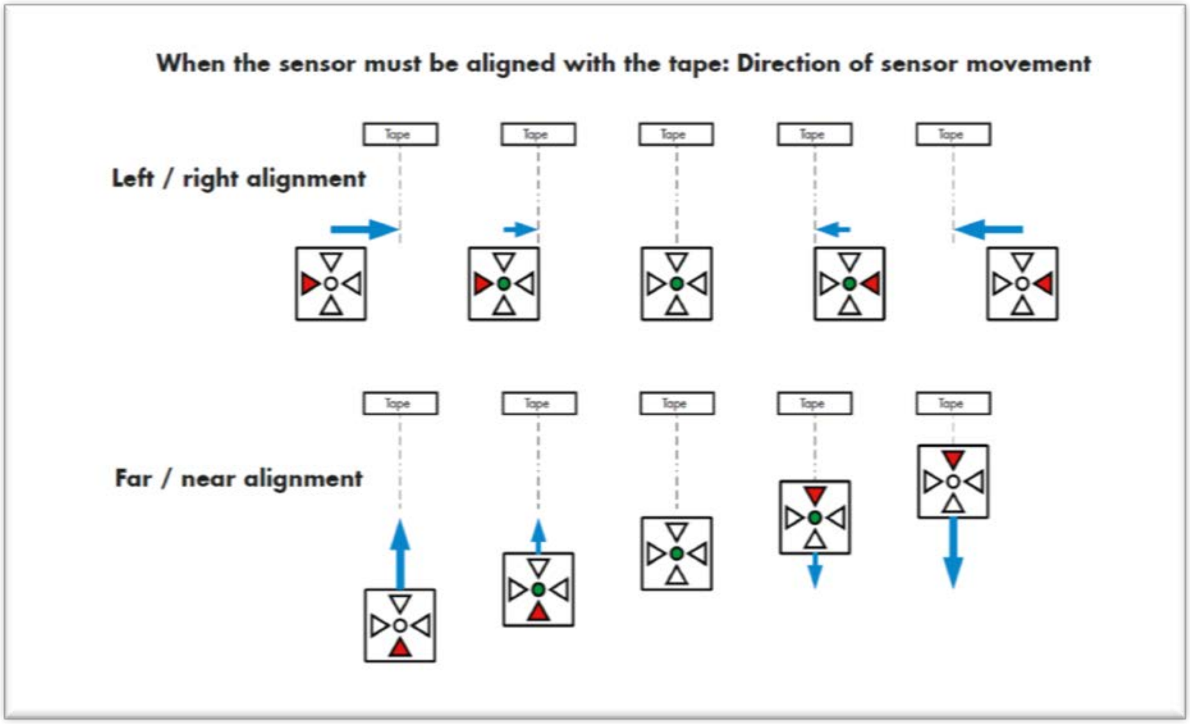


Figure 2.21

- Level the camera with a leveling device. This is very important!!!!! Spending a little time now will save lots of time later. It must be parallel and square to the encoder tape.

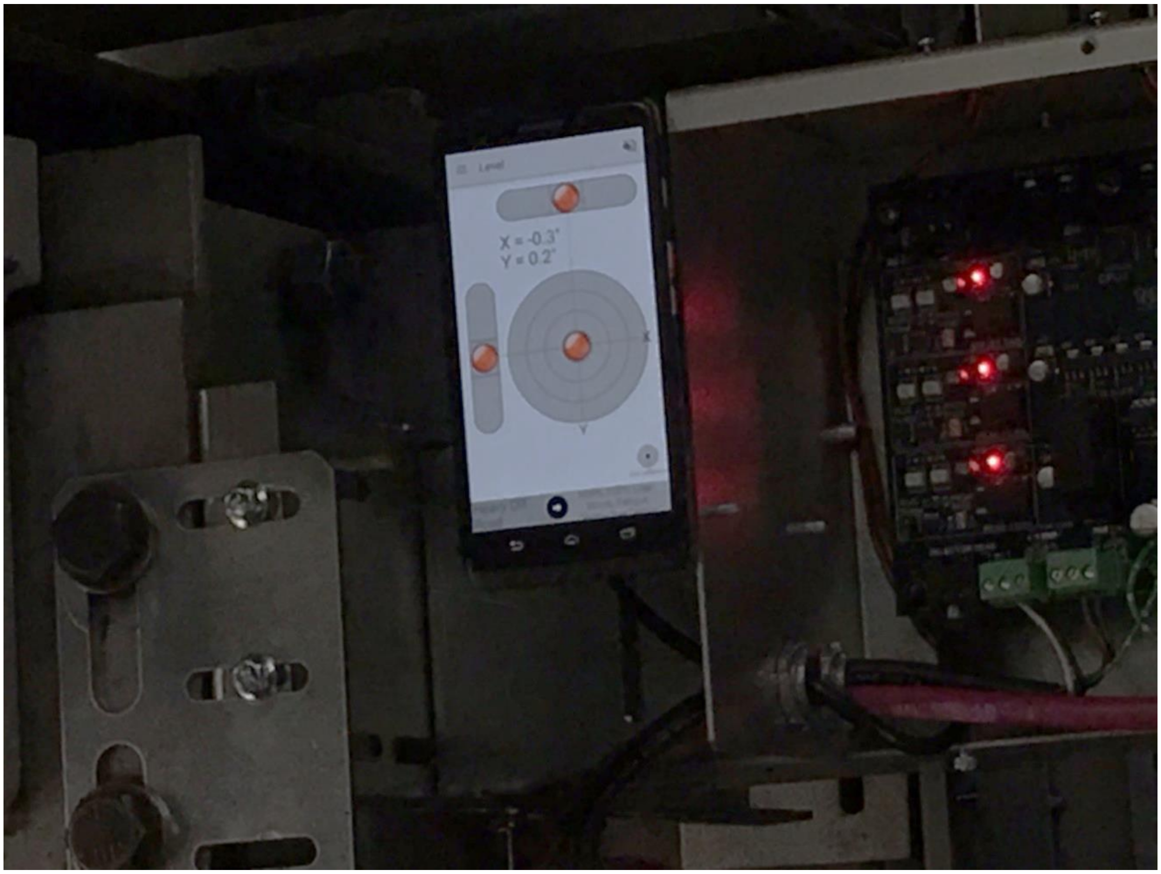


Figure 2.22

2.7.4 APS Selector Floor Position Setup (Hoistway Learn)

The hoistway learn procedure requires the selector interface board to communicate with the main CPU through the Safety CAN bus. The selector head must also communicate with the both CPUs on the selector interface board and with the main CPU. Proceed to Section 3 of this manual and then return to this section once the Learn Hoistway section is reached.

2.7.4.1 Verify that the APS Selector is installed correctly and Communicating.

From the Diagnostic menu on the LCD Interface, select the APS Selector Can Status. Verify that the APS Sel to Main CPU RxCnt is counting and that the On-line status equals 1. APSM on the display refers to the communications to the main CPU whereas APS2 refers to the communications to Processor 2 on the selector interface board. Continue through the menu items to verify that the CntA value for APSM is not zero, that there are no Errors or Warnings and that the alignment is centered and contrast shows OK. Also verify that the APS2 status shows that the RxCnt is counting and that the On-line status equals

1. Continue to verify that the CntB value for APS2 is not zero, that there are no Errors or Warnings and that the alignment is centered and contrast shows OK. Note also that the RxCnt for the APS2 device will increment much slower than for the Main CPU.

2.7.4.2 Set the Adjustable Variables – "APS Selector Adj Vars" in the Controller.

The following parameters must be setup prior to learning any floor positions.

- Set "**Top Speed**" to the contract speed of the job.
- Set "Number Valid Floors" to the number of floors with openings on this elevator.
- Set "Number of Limits" to the number of slow down limits required for the job speed. Refer to the Slowdown Distance Table 1 above in the section labeled "Normal and Emergency Terminal Slowdown Limits". Example: 350fpm job would be set to 2 limits.
- Set UT/DT Dist. If set to zero the distance is set automatically from the slowdown table in the manual. If this parameter is changed, it will not take effect until a learn operation is done at the top and bottom floor. It is recommended to set this parameter to zero unless the slowdown distance need to be adjusted.
- Set UT1/DT1… UT3/DT3 if required. If set to zero the distance is set automatically from the job speed slowdown table in the manual. If this parameter is changed, it will not take effect until a learn operation is done at the top and bottom floor. It is recommended to set these parameters to zero unless the slowdown distances need to be adjusted.
- Set Can Baud Rate to 0. 0 is 115.2K Baud. This parameter should not need to be changed.

2.7.4.2 Zero the hoistway

After the APS selector parameters are setup, continue the following steps to zero the hoistway table. From the Elevator Setup menu, select Learn Hoistway and follow the diagram below, Figure 2.21. Notice that the number of valid, number of limits and top speed will be verified. Be sure to select YES for First Time Setup and hit enter. When you see the message, "Setup Active. Hit Up or Dn to Scroll through", hit mode to escape to the main menu. You are now ready to setup the floors from the car.

LCD Interface
Learn Hoistway Submenu

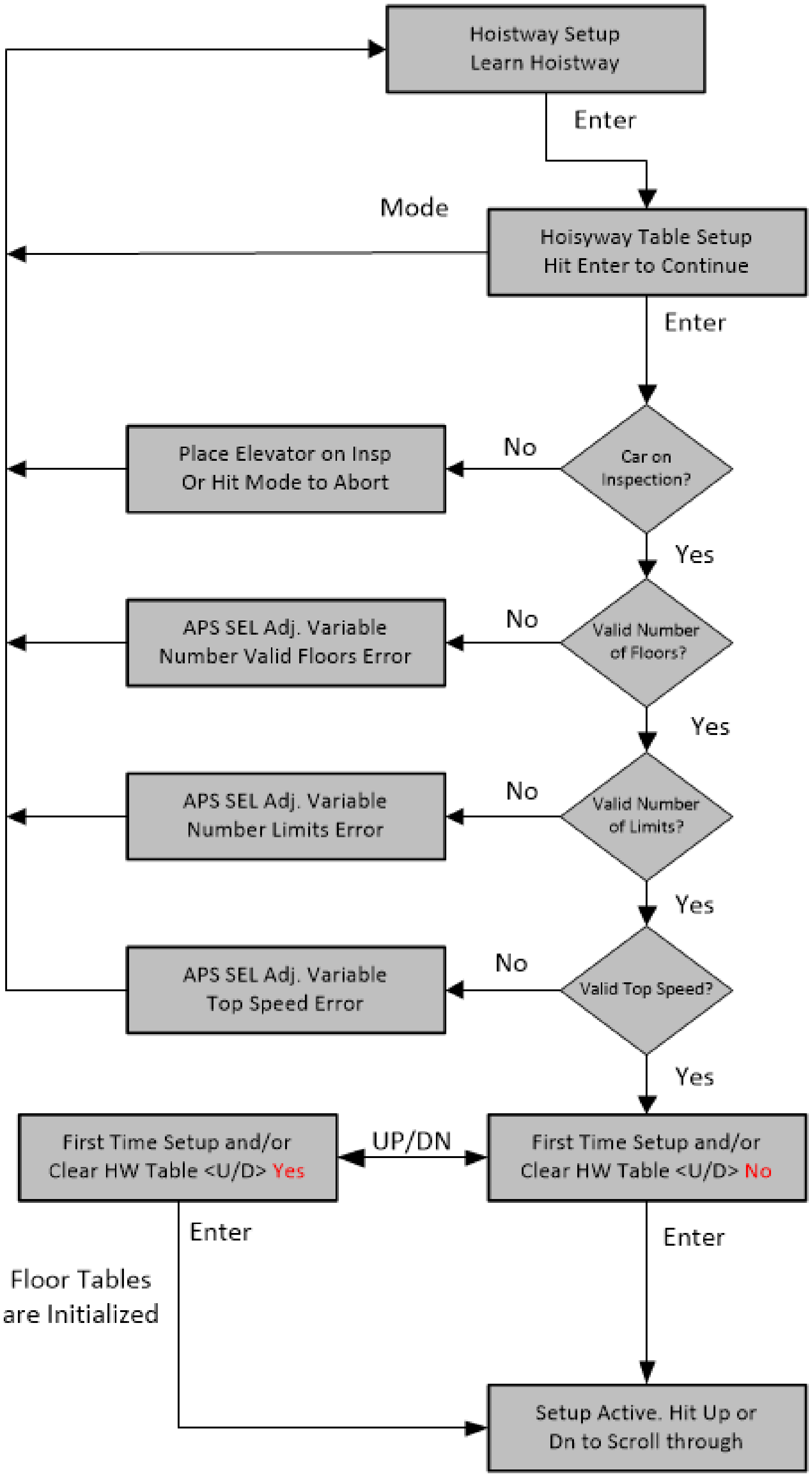


Figure 2.23

Step 1: Setting Hoistway Floor levels.

- Put the elevator on car top inspection and move the bypass switches to the bypass position.
- Move the jumper on the GALX-1133AN selector board to the setup position. See Figure 2.24.

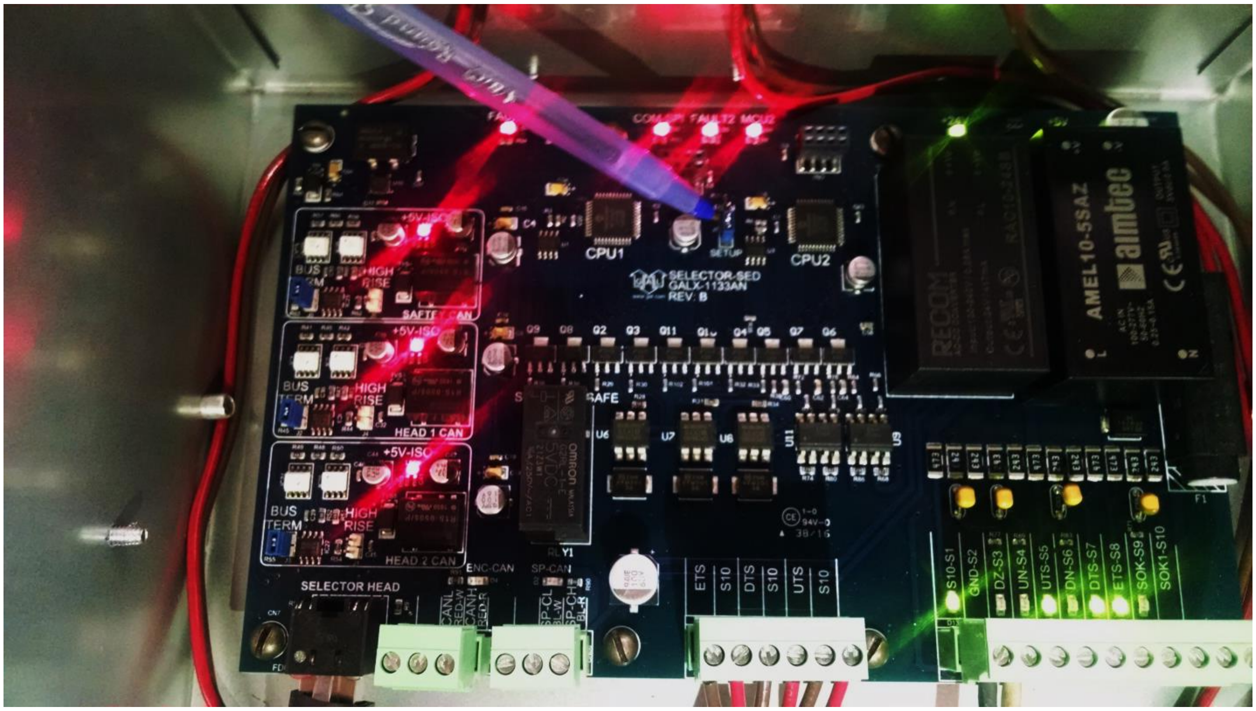


Figure 2.24: Selector Board Setup Jumper

- Move the car dead level with a floor. Pushing in the door open button, while pushing the inspection buttons to move the car will change the inspection speed for this run to 3 fpm. This will allow exact positioning at the floor level and still allow normal inspection speed runs in between floors when the door open button is not pressed.
- While setting the floor level position, use a straight edge across the sills to ensure dead level. Spending the time to position the car now will save lots of time later.
- Mount a floor rail bracket with a selector clip on it. Position the clip so it is centered in-between the two red LED's on the encoded tape. If the red LED's are not visible put your hand in between the camera and encoded tape for 5 seconds. See Figure 2.25.

Figure 2.25: Red Setup LED's.

- To record the floor position, push the car call buttons on the car operating panel in this sequence: 2nd floor, 1st floor, 2nd floor, 1st floor, Door close button. The car call light for floors 1 and 2 will light. After the two floor lights go off, push the car call button for the floor location of the car. That car call will light up and then flash for approximately 5 seconds and then go out. If the desired floor does not flash but stays solid, the floor was not learned. Make sure that the APS SEL adjustable variables are set properly. Also note, the 2nd floor is not the floor markings but the second landing from the bottom. The 1st floor is also not the floor marking but the bottom landing.
- Repeat this process until you have learned all valid floors. Then move the jumper on the GALX-1133AN board to the run positon. The hoistway learn is now complete.
- Position the car near a floor with the doors turned off. Exit the car and take it off inspection mode. The car should level into the floor.

Section 3 - Adjustment of the GALaxy – Magnetek Quattro AC/PM - Gearless Motor

3.1 GALaxy Controller Running Platform Wiring Setup

Prior to powering up the controller, making drive adjustments or attempting to run the hoist motor, please take the following steps:

- Familiarize yourself with all wiring schematics.
- Familiarize yourself with the Magnetek Quattro AC/PM Elevator Drive Technical Manual.

Check the power requirement and voltages according to the job schematics. To setup a running platform, make the following jumper connections on the 1102 Main I/O board:

Left side of board	Right side of board	Toggle Switches
S10 – GOV	HSS – FFS	Door Lock Bypass – Down (Bypassed)
GOV – TF	FFS – CST	Gate Bypass – Down (Bypassed)
TF – BF	CST – UN	Independent – Down
BF – PS	UN – DN	Auto Door – Down
PS – HSS	DN – INS	Stop Switch – Up (Run)
RG7 – RG5		

Run Bug	1106/1107 I/O Board
Inspection Common – INS	1102 board FEP – 1106/1107 FEP
Inspection Up – IU	FEP – MES
Inspection Down – ID	MES – ALT
Inspection Enable – IEN	ALT – MRS
	MRS – HWS
	HSW – HWS2

3.2 Initial Power-up

3.2.1 Check Main Line Voltage

With main-line disconnect in the off position, check the line-side voltage with a volt meter to insure the voltage matches the controller name tag “Input Power” voltage. Check to insure all three phases are present. If voltage is not correct or all three phases are not present, do not proceed until corrected.

3.2.2 Check Controller Voltage

Turn the main-line disconnect to the on position. Check the voltage at R, S, and T on the AC drive. Verify that all three phases are present. Check the voltage at fuses L1 and L2 on controller. If correct, check the voltage at terminal “LIN” and “24VI” with respect to “GND”. The voltage should read 120VAC for LIN and 24VAC for “24VI”. If correct, check the voltage at terminals “S10, L120, & L24” with respect to “GND”. “S10” and “L120” will read 120VAC and “L24” will read 24VAC. If not, check wiring diagram to determine problem before continuing. Verify what the voltage for “FEP” and “HCP” from the schematic is required for this job. Either supply can be wired for 24VAC or 120VAC. Verify that the voltage on the terminals match the voltage on the schematic.

3.2.3 Verify the Main CPU is Operating

Check to make sure that the “axy” of GALaxy on the 1005 or 1101 LCD interface is blinking. If the “axy” is blinking, continue to the next step. If not, check voltage at terminals 5V to 0V on the 1102 Main I/O board to insure 5VDC. If 5VDC is present and the “axy” on the 1005/1101 LCD interface is not blinking, then contact the factory.

**** Adjustment Note: (Prior to 3.2.4, 3.2.5 and 3.2.6)**
Instead of individually setting all the terminal limit velocity values for the Main CPU, the Safety Processor and the NTS Processor to contract speed, you can preset all limit velocities in one command. From the LCD Interface, under the “Software Utilities” menu, select to “Preset Limit Velocities”. All the limit velocities will be preset to the contract speed. The remaining parameters will still need to be preset.

3.2.4 Preset Adjustable Variable on the Main CPU and the Terminal Limit Digital Speed Clamps

Preset the following parameters from the LCD Interface “Adjustable Variables” menu, “Car Motion” sub menu:

TAPE:

- Top Speed (set to contract speed)
- Inspect Speed (set to 25 fpm)
- Encoder PPR = 64
- Encoder RPM = (fpm value of the contract speed and set Encoder Type = 4)
- Motor RPM (set to value of A1->CONTRACT MTR SPD in Quattro drive)

TAPELESS:

- Top Speed (set to contract speed)
- Inspect Speed (set to 25 fpm)
- Encoder PPR =10,000
- Encoder RPM = governor rpm
- Motor RPM (set to value of A1->CONTRACT MTR SPD in Quattro drive)

NOTE: For governor mounted encoders, to calculate the RPM, divide the contract speed of the car by the distance traveled in one revolution with the governor as shown below:

RPM = Speed fpm/ (diameter GOV (in feet) * pi)

For a 1 ft. diameter governor: RPM = 350/ (1*pi) = 350/3.1415 = 111.4
For a 16 in diameter governor (16/12 = 1.33ft): RPM = 350/ (1.33* 3.1415) = 350/4.188 = 83.5

You can use the table below to get the RPM: Find your Governor Diameter and then divide your car speed by the number in red to get the governor RPM.

Gov Diameter	Divisor
10"	2.616
11"	2.877
12"	3.141
13"	3.402
14"	3.662
15"	3.926
16"	4.187

Preset the encoder data from the LCD interface "Adjustable Variables" menu, "System Options" sub menu:

- Encoder Type (if tape selector, set to 4), (for tapeless, set to 0 for encoder based on cons.dat file setting) or set to:
  - 0=Based on CONS.DAT file
  - 1=Turck Encoder
  - 2=Dynapar Encoder
  - 3=Wachendorff Encoder
  - 4=Tape Selector Feedback
- Encoder Node (not used for tape selector), (If tapeless, set node ID as follows: Turck = 63, Dynapar = 1, Wachendorff = 127). This parameter gets set automatically when Encoder Type is changed.
- Encoder Baud (0=250K default, 1=125K(used if communication errors))

Check the software digital speed clamps from the LCD interface under the “Elevator Setup Menu”. The submenus for the clamp speeds are as follows:

- Set Ins/Leveling Clamp
- Set DT/UT Slowdown Clamp
- Set DT1/UT1 Slowdown Clamp
- Set DT2/UT2 Slowdown Clamp
- Set DT3/UT3 Slowdown Clamp
- Set DTS/UTS Slowdown Clamp

The speed for Ins/Leveling should be set to 140 fpm and all the remaining slowdown limit speeds should be set to the contract speed of the car. Please note that the displayed value of “Clamp Speed” is the value the clamp should be set to. The slowdown limit “Clamp Speed:” will show 0000 until the car is run into the limits and the speed is recorded. Please refer to the LCD interface section for the Elevator Setup Menu.

Example:

Clamp Speed: 0000 fpm <- Actual speed when limit is hit
DT/UT Limit: 0200 fpm <- Speed set by you for DT/UT limits

NOTE: The values of the clamp speed velocities above are only temporary settings until the car is running high speed. These values must be set as described in the final adjustment procedure.

3.2.5 Preset Adjustable Variables On Safety Processor.

The Safety Processor is a processor chip mounted on the 1102 Main I/O board and is accessed from the 1005/1101 LCD interface. The following adjustment variables must be initialized for job specific values.

- Top Speed (contract speed fpm)
- Encoder RPM (Set to Motor RPM)
- Encoder PPR (Set to 16535)
- Encoder Type (previously Fdbk Typ),(Set to 4 = Incremental Encoder)
- Control Type (Set to 2=Tract DF)
- 2 Stop (0=Mult-Stop. 1=2 Stop)
- Rear Doors (0=Front only, 1=Rear)
- UTS Velocity (Set to top speed)
- DTS Velocity (Set to top speed)
- Insp Velocity (Set to 140)
- Leveling Vel (Set to 140)
- ETS Up Vel(Set to top speed) (only used for reduced stroke buffer)
- ETS Down Vel (Set to top speed)(only used for reduced stroke buffer)
- Soft Stop Time (Set to 3)

For jobs with Reduced Stroke Buffer (ETSLD – Emergency Terminal Speed Limiting Device):

The Safety PAL ETS parameters must also be preset from the Safety Processor. Make sure that the Reduced Stroke Buffer jumper is placed on the MAIN I/O board and the Safety Processor variable Buffer Type is set to 1=Reduced Stroke. To preset the Safety PAL ETS up and down velocity set points, place the ETSLD Test jumper on the MAIN I/O board and set the Safety Processor variable ETS Setup Mode to 1=AdjPALets. Preset the following parameters:

- PAL ETS Up Vel(Set to top speed)
- PAL ETS Dn Vel (Set to top speed)

Remove the ETSLD Test jumper from the MAIN I/O board and set the ETS Setup Mode parameter to 0=Norm. Leave the Reduced Stroke Main I/O board jumper (directly above DNR, UP and FF chips on bottom right of the main board) in place and the Safety Processor variable for Buffer Type set for reduced stroke.

NOTE: The velocity values for the emergency terminal limits are temporary and are set to contract speed to prevent nuisance trips until the car is running high speed. These values must be set as described in the final adjustment procedure.

3.2.6 Preset Adjustable Variables on NTS Processor

The NTS Processor is also mounted on the 1102 Main I/O board and is also accessed from the 1005/1101 LCD Interface board. Set the follow adjustable parameters:

- Top Speed (contract speed)
- UT Velocity (top speed)
- DT Velocity (top speed)
- UT1 Velocity (top speed)
- DT1 Velocity (top speed)
- UTn Velocity (top speed)
- DTn Velocity (top speed)

NOTE: The velocity values for the normal terminal limit switches above are only temporary settings until car is running high speed. These values must be set as described in the final adjustment procedure.

3.2.7 Place Stop Switch in Run Position

Set the “STOP” toggle switch on the 1102 Main I/O board to the “RUN” position. Verify that input LED’s for “L120, HCP, FEP, DN, UN, FFS, GTS and SFC” are all on. If not, then correct field wiring.

3.2.8 Hoist Motor Data

The following functions must be entered or verified using the drive digital operator. Follow the instructions in the Quattro AC/PM drive manual to enter the following data:

DRIVE A1 Sub Menu:

- CONTRACT CAR SPD (from controller data)
- CONTRACT MTR SPD (from motor nameplate RPM)
- ENCODER PULSES (PPR from encoder on motor)

MOTOR A5 Sub Menu:

- MOTOR ID (pm default)
- RATED MTR PWR (from motor nameplate)
- RATED MTR VOLTS (from motor nameplate)
- RATED MOTOR CURR (from motor nameplate)

MOTOR POLES:

The number of poles is provided below if you are using one of the following motors:

- MAG05 = 66 poles
- MAG10 = 66 poles
- MAG15 = 66 poles

- Leroy Somer Z2 = 16 poles
- Leroy Somer Z3 = 16 poles
- Leroy Somer Z4 = 16 poles
- Leroy Somer Z6 = 32 poles
- Leroy Somer Z10 = 32 poles
- Leroy Somer Z20 = 32 poles

- Imperial 474 = 20 poles
- Imperial 475 = 24 poles
- Imperial 522 = 20 poles
- Imperial 525 = 20 poles
- Imperial 805 = 44 poles

- Hollister –Whitney GL-100 = 28 poles
- Hollister –Whitney GL-115 = 28 poles
- Hollister –Whitney GL-130 = 28 poles

- Hollister –Whitney GL-170 = 28 poles
- Hollister –Whitney GL-171 = 28 poles
- Hollister –Whitney GL-130A = 40 poles
- Hollister –Whitney GL-185 = 40 poles
- Hollister –Whitney GL-260 = 40 poles

If you are not using one of the motors listed and need to calculate the motor poles, use the following formula based from the motor name plate data:

Poles=2 X 60 X Motor Excitation frequency (Hz) / Rated Motor Speed (RPM).

The number of motor poles will always be a whole, even number.

MOTOR A6 Sub Menu:

- MOTOR POLES (motor nameplate or calculation)
- RATED MTR SPEED (motor RPM on nameplate)

Most of the drive parameters have been preset to values required for your specific job. Other parameters not listed here may need to be adjusted in the field. Please refer to the Magnetek Quattro AC/PM Technical manual for more parameter information and troubleshooting guidelines. From the digital operator for the drive, reset any active faults and clear the fault history log.

3.3 PM Start-Up Procedure

3.3.1 Make Sure Motor Operation Is Safe

**** WARNING!! Verify that the car is safe to operate as a running platform and that all individuals are clear of moving machinery. Make sure all hoistway doors are closed. If at all possible, place the car in the middle of the hoistway.**

3.3.2 Adjust the Brake Voltage

The controller utilizes an electronic brake board that is triggered from the Safety Processor on the Main I/O board. To adjust the brake voltage, navigate to the "Adjustable Variables" menu, and "Car Brake" sub menu on the LCD Interface. Set the "Brake Pick Volt", "Brake Hold Volt" and "Brk AC L-L Volt" to the proper values. Verify these voltages at the brake board AC1/AC2/AC3 and BK+/BK- terminals once it is possible to pick the brake.

3.3.3 Encoder Learn Procedure (no ropes on the sheave of the motor)

**** Very Important!! In most cases it is better to perform an Absolute Encoder Alignment Procedure prior to placing the ropes on the sheave of the motor.**

Before starting the encoder learn procedure, verify the wire connections between the drive, MC contactor and the motor. Lower the inspection speed on the controller to zero if it is not already zero.

Clear all active faults in the drive – the alignment cannot proceed if there are faults in the drive.

On the Quattro digital operator, go to the UTILITY U0 menu, select ROTOR ALIGN U10 and then select ALIGNMENT METHOD. Set the ALIGNMENT METHOD to OPEN LOOP. Navigate to the ALIGNMENT parameter and change the setting to ENABLE. The display will prompt with "BEGIN ALIGNMENT? NO". Change the NO to ON RUN.

Give the controller a command to run on inspection up or down. The motor should rotate smoothly back and forth for about 4 seconds without any faults. If a fault occurs on the drive please consult the section on PM Start-Up Procedure in the Quattro AC/PM Technical manual to resolve any faults. If faults persist contact G.A.L. Technical Support.

Once the encoder alignment procedure is complete, verify under A6 Motor the value of ENCODER ANG OFST is anything but 30000. If the value is 30000 then the alignment procedure did not work and must be performed again. Reset the inspection speed back to its original value. Prior to placing the ropes on the sheave of the motor verify that you are able to rotate the motor in the up direction and in the down direction. If the car runs in the wrong direction, change the "C1 MOTOR ROTATION" parameter to "REVERSE". If you can rotate the motor then proceed to the next step to check the inspection speed.

3.3.4 Encoder Learn Procedure (with ropes on the sheave of the motor)

Before starting the encoder learn procedure, verify the wire connections between the drive, MC contactor and the motor. Lower the inspection speed on the controller to zero if it is not already zero. Remove one wire from the brake coil on the main brake to prevent the brakes from picking. **Note: If a second brake on the motor is used as the emergency brake, it must pick during the test. Since this is an electrical protective device, it cannot be disable and the controller will monitor the emergency brake switch EBKS during this operation.**

Clear all active faults in the drive – the alignment cannot proceed if there are faults in the drive.

On the Quattro digital operator, go to the UTILITY U0 menu, select ROTOR ALIGN U10 and then select ALIGNMENT METHOD. Set the ALIGNMENT METHOD to AUTO ALIGN. Navigate to the ALIGNMENT parameter and change the setting to ENABLE. The display will prompt with "BEGIN ALIGNMENT? NO". Change the NO to ON RUN.

Give the controller a command to run on inspection up or down. You will hear all the contactors (BRK, RUN and MC) pick and stay energized on the controller. You will also hear a slight buzz from the motor and the RUN led on the drive will turn on. When the learn sequence is finished the drive will turn off the RUN led and drop the MC contactor. Release the up or down inspection button.

Verify that the ENCODER ANG OFST parameter is not equal to 30000. If it is, then the lean procedure must be repeated. If ENCODER ANG OFST is not 30000, record the angle offset value.

Return the wires back to the main and emergency brake to allow the brake to pick again. Set the inspection speed to 25 fpm. Run the car in either direction. If the car runs in the wrong direction, change the "C1 MOTOR ROTATION" parameter to "REVERSE".

3.3.5 Check Inspection Speed

If the inspection speed has not already been set, from the 1005/1101 LCD interface, navigate to the "Adjustable Variables" menu, "Car Motion" and set the "Inspect Speed = 25".

During controller testing at the factory, the drive is setup to run on an un-roped machine so the gain adjustments might be set too low. Be sure to verify the proper setting of the INERTIA and RESPONSE parameters on the drive.

Run the elevator on inspection, and verify that there is less than full load current draw on the Quattro digital operator D2 Submenu, MOTOR CURRENT. If not then relearn the encoder. Press the

"UP" inspection button and verify motor is rotating in the up direction, and then press the "DOWN" inspection button and verify that the motor is rotating in the down direction. If the car runs in the wrong direction, change the "C1 MOTOR ROTATION" parameter to "REVERSE".

With a hand held tachometer, check the speed of the elevator while running on inspection. The elevator should be running at 25 fpm. Also monitor the speed on the drive digital operator D1 submenu, SPEED FEEDBACK, and verify that it displays 25 fpm while also running on inspection.

From the 1005/1101 LCD interface, select the "Elevator Status" menu and then scroll down or up until the display shows "Dmd" and "Vel". While running on inspection, monitor the controller demand speed "Dmd" and the speed feedback "Vel". These values should both display 25.

If the demand and velocity feedback on the 1005/1101 LCD do not match, check the Encoder RPM, PPR and TYPE parameters from the "Adjustable Variables" menu. These variables should be set to values listed in section 3.2.4 Preset Adjustable Variable on the Main CPU and the Terminal Limit Digital Speed Clamps.

If the speed on the hand held tachometer and on "Dmd" and "Vel" all read 25 fpm (within +/- 2 fpm), continue to the next step. If not, contact G.A.L. Technical Support .

3.3.6 Verify Controller Encoder Direction

From the LCD interface "Elevator Status" menu, scroll down or up to display "Dir" and "DP". While moving the car on inspection, monitor "Dir" (direction) and "DP" (pulse counts). "Dir" should display "Up" when the car is moving up, and "Dn" when the car is moving down. The value of "DP" should increment when the car is moving up, and should decrement when the car is moving down.

If the direction is wrong or the pulse counts change in the wrong direction, then the encoder direction to the controller must be changed. From the 1005/1101 LCD Interface, navigate to the "Adjustable Variables" menu, "Car Motion" and set the "Encoder Dir = 1" if already 0 or set to 0 if already 1. The car may get an unintended motion fault (gripper fault) when the parameter is changed. If so, then reset the unintended motion fault from the "Elevator Setup" menu.

If the encoder is counting properly, proceed to the next section. If the encoder is not counting properly, contact G.A.L. Technical Support.

3.3.7 Motor Auto Tune Procedure

Before starting the motor auto tune procedure, review the Auto-Tune procedure in the appendix of the Magnetek Quattro AC/PM Drive manual. Lower the inspection speed on the controller to zero if it is not already zero. Remove one wire from the brake coil on the main brake to prevent the brakes from picking. **Note: If a second brake on the motor is used as the emergency brake, it must pick during the test. Since this is an electrical protective device, it cannot be disable and the controller will monitor the emergency brake switch EBKS during this operation.**

On the drive operator keypad, go to the UTILITY U0 menu, select AUTOTUNE SEL U12 and then select the parameter AUTOTUNE SELECT. Change AUTOTUNE SELECT from DISABLE to ON RUN. The drive is now ready to run the auto-tune function.

Give the controller a command to run on inspection up or down. You will hear all the contactors (BRK, RUN and MC) pick and stay energized on the controller. You will also hear a slight buzz from the motor and the RUN led on the drive will turn on. When the auto-tune sequence is finished the drive will display "AUTOTUNE IS DONE". Release the up or down inspection button.

After the auto-tune procedure, it may be necessary to relearn the encoder angle offset.

3.4 General Setup

When installation of all equipment is complete, and unit is ready for adjustment, continue with the following instructions. Before adjustment begins, the following items must be completed.

- All field wiring and safety circuits installed.
- Install temporary jumpers from terminal “FEP” to terminals “MES, ALT, MRS, HWS & HWS2”.
- All Normal and Emergency Terminal limit switches installed.
- All car and hoistway doors and interlocks installed and pre-adjusted.
- Selector and door zone targets such as magnets installed.
- Verify that the AC motor is properly wired.
- Verify that the encoder is connected properly.
- Car should be properly counterbalanced.

3.4.1 Set Toggle Switches

Set all toggle switches on the 1102 Main I/O board as follows:

- DOOR LOCKS - "OFF"
- IND - "IND"
- AUTO DOOR - "OFF"
- STOP - "STOP"

3.4.2 Make Sure the Car Is Safe

Verify that all elevator doors are closed and that all safety circuits are functional.

3.4.3 Ready the Car to Run On Inspection

From the 1005/1101 LCD interface, navigate to the "Adjustable Variables" menu, "Car Motion” and verify that "Inspect Speed = 0" for the motor learn procedure. Before attempting to move the car on inspection, verify again that all door locks, gate switches, safety circuits, and limit switches are functioning properly.

The car should be ready to run on inspection if all is wired correctly. Select the “Elevator Status” on the 1005/1101 LCD interface. The display should show “Out of Service” on the first line and “Inspection Mode” on the second. Scroll down the “Elevator Status” display until “SPB Vel” is shown. The “Svc=” will display one of the following types of inspection:

- “MR INS” (Machine Room)
- “CT INS” (Car Top)
- “ACCESS” (Access)
- “IC INS” (In Car)”
- “AUTO” (Not on Inspection)

To run the car from the machine room, “MR INS” should be displayed.

The “inspection string” consists of contacts from the inspection switches and the gate and lock bypass switches in series. One and only one of the five inspection inputs should be on for the car to run.

Starting from the car top inspection input, the five inspection inputs are, “INS” for car top, “ACC” for access, “ICI” for in- car, “MRI” for machine room, and “AUTO” for automatic (no inspection). The inspection string circuit is shown in Figure 3.1.

NOTE: Any one of the following conditions will cause an inspection error:

- More than one inspection input is on
- No inspection input is on
- Gate or Lock bypass switch is open and the car is not on car top inspection

If the controller is not on machine room inspection at this point, then verify all switch positions and wiring before proceeding.

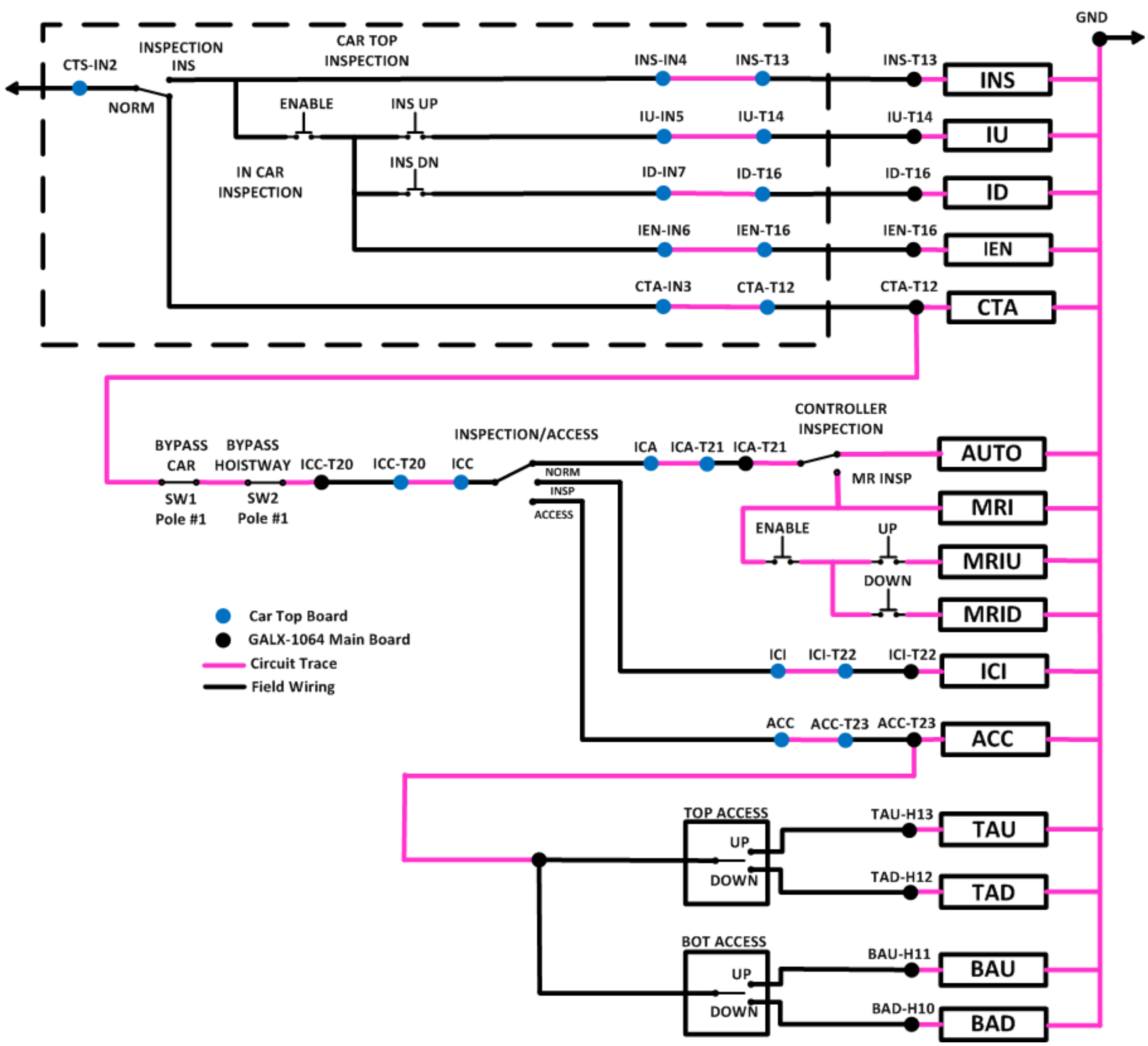


Figure 3.1: Inspection String Circuit

3.5 Prepare Car for Hoistway Learn

For controllers using the APS selector, return to the "APS Selector Floor Position Setup (Hoistway Learn)" instructions in section 2. After completing the Floor Position Setup, follow the sections below to verify the car speed on the Safety Processor and NTS Processor. Skip the Learn Hoistway section and then continue with Final Adjustment section.

3.5.1 Verify Selector and Slowdown Inputs

Run the elevator up on inspection until it stops on the up normal limit. The up and down normal limits should be set two inches above and below the terminal floors respectively. Verify the selector inputs are being set properly on the controller by running the elevator down until it stops on the down normal limit.

As the car approaches floor level going down, "DL" turns on first, then "DZ" and then finally "UL". At floor level, "UL, DL, and DZ" inputs should all be on at the same time. Leaving the floor going down "DL" will turn off first, then "DZ" and last "UL".

Also verify that the up and down terminal slowdown limits inputs "UT, UTS, DT & DTS" are breaking at the proper distances as shown in the slowdown table 2.0. "UT, UTS, DT & DTS" turn off when active.

3.5.2 Verify Car Speed on Safety Processor

Run the car in the up or down direction and check the car speed on the Safety Processor. From the 1005/1101 LCD interface, select the "Elevator Status" menu and then scroll down or up until the display shows "SPB Vel". The direction will show as a "U" or "D" next to the car speed. The speed shown should match the car's actual speed.

The ***secondary*** speed feedback comes from the encoder feedback on the motor. If the speed is not correct, from the 1005/1101 LCD interface, select the "Adjustable Variables" menu and then select the "Safety Proc Adj Vars" menu. Set the Safety Processor's "Encoder RPM" and "Encoder PPR" to the drive's setting for motor RPM and encoder PPR, respectively. Also set the "Encoder Type = 4" (Incremental Encoder). To adjust the velocity for the Safety Processor, increment or decrement the Encoder RPM parameter. If the direction is not correct, change the setting of the safety processor's "Encoder Dir" parameter. If the parameter is 0 then set it to 1 otherwise if it is 1, set it to 0.

3.5.3 Verify Car Speed on NTS Processor

Run the car in the up or down direction and check the car speed on the NTS Processor. From the 1005/1101 LCD interface, select the "Elevator Status" menu and then scroll down or up until the display shows "NTS Vel". The speed shown should match the car's actual speed. The direction will show as a "U" or "D" next to the car speed. For a tape system, there is no adjustment of the NTS velocity since it is calculated by the selector using the fixed 3/8" holes on the tape. Verify that the NTS Processor adjustable variable "Encoder Type" is set to 0=Sel Tape.

For a tapeless system, the velocity for the NTS comes from the motor encoder. Make sure the wires from the encoder A, A\, B and B\ are connected to the SA, SA\, SB and SB\ inputs as show on the job schematics. If the speed is not correct, from the 1005/1101 LCD interface, set the NTS Processor's "Encoder RPM" and "Encoder PPR" to the drive's setting for motor RPM and encoder PPR, respectively. Also, verify that the NTS Processor adjustable variable "Encoder Type" is set to 1=Motor Enc.

To reverse the velocity direction, go to the "NTS Proc Adj Vars" menu and select the "Velocity Dir" parameter. If the parameter is 0 then set it to 1 otherwise if it is 1, set it to 0.

3.6 Learn the Hoistway

Run the elevator down on inspection until it stops on the down normal limit switch. Verify that the “DN and DL” input LED’s are both off and that the "UL" and "DZ" LED's are on. From the 1005/1101 LCD interface navigate to the "Elevator Setup" menu, "Learn Hoistway". The learn procedure can be performed automatically by choosing "Auto" from the menu items, or performed manually by choosing "Insp” from the menu items. After choosing the learn method, follow the instructions displayed on 1005/1101 LCD interface.

In general, the car will run up from the "down normal limit" to the "up normal limit" at 30 fpm (this speed is fixed and cannot be changed). During this learn run, the DP count for each floor level and each limit switch will be stored in memory.

NOTE: The car must run the entire hoistway without stopping.

When the elevator starts a hoistway learn, the display will change to show the car velocity and the position count. Verify that the position count is incrementing as the elevator moves up. Also as the elevator passes each floor, the pulse count and distance for that floor should change and be stored. The pulse count for the terminal slowdowns will also be stored. The elevator will stop when it reaches the up normal limit. Follow the instructions on the 1005/1101 LCD interface by putting the car on inspection, and then the message "Hoistway Learn Complete" should be displayed.

Move the elevator on inspection until the “DZ and DL” LEDs are on. Set the “INS” toggle switch on the 1102 board to the “NORMAL” position, and the elevator should level down to floor level at the top floor. If so, proceed to final adjustment.

If the car levels down but does not run from a car call, then check “View Fault Log” on the 1005/1101 LCD interface for any fault information. Correct the item causing the fault and perform the hoistway learn again. After the problem is corrected, and a successful hoistway learn is performed, proceed to final adjustment.

3.7 Final Adjustment

3.7.1 Automatic Run

The elevator should now be sitting idle at the top floor. The "AUTO DOOR" switch should be set to the "OFF" position and the "IND" switch should be set to the "IND" position. If the learn procedure was successful the elevator should be ready to make an automatic run.

The default parameter settings for the ride quality should be adequate for an initial run. From the 1005/1101 LCD interface navigate to the "Set Calls and Lockouts" menu, "Setup Car Calls" and enter a car call. The elevator should run to answer the call. When the elevator levels in and stops at the floor, the doors will remain closed.

The acceleration and deceleration of the car should be smooth and stepless regardless of the distance of the run. The high speed of the car should be verified. To fine tune high speed, make high speed runs while monitoring the “Elevator Speed” on the “Home” screen of the drive’s LCD display. The display should show the car running at or near contract speed.

If the speed is slightly under or over contract speed, then verify that the drive “Motor Data” parameter CONTRACT MTR SPD A1 is set properly. The speed displayed on the drive should match the speed displayed on the 1005/1101 LCD interface, "Elevator Status" menu, "Dmd" and "Vel". This speed should also match the speed displayed on for the safety processor display "SPB Vel". For additional information on setting the contract speed of the car, please refer to the following section 3.7.6 Verify Top Speed.

3.7.2 Fine Tune the Ride Quality

In order to fine tune the ride quality, refer to Figure 3.2 which describes what part of the S-curve that the different parameters effect. In general, higher numbers in the given parameters, cause quicker and more abrupt changes from one mode to the next during a run. All of the S-curve parameters have a minimum and maximum value. The controller will not allow you to enter values that are not valid.

In some instances, the response of the drive may need to be adjusted so that the drive will properly follow the S-curve (demanded speed) from the controller. The response of the drive can be increased by adjusting the A1 RESPONSE and A1 INERTIA parameters in the drive. In general lower values make the drive less responsive, and higher values make the drive more responsive. As the gains are increased, the drive will cause the motor to follow the S-curve more closely. If these values are increased too much, the ride can become too bumpy or vibrations and audible noise may occur in the motor.

After adjusting the S-curve parameters for the desired ride, proceed to the next step.

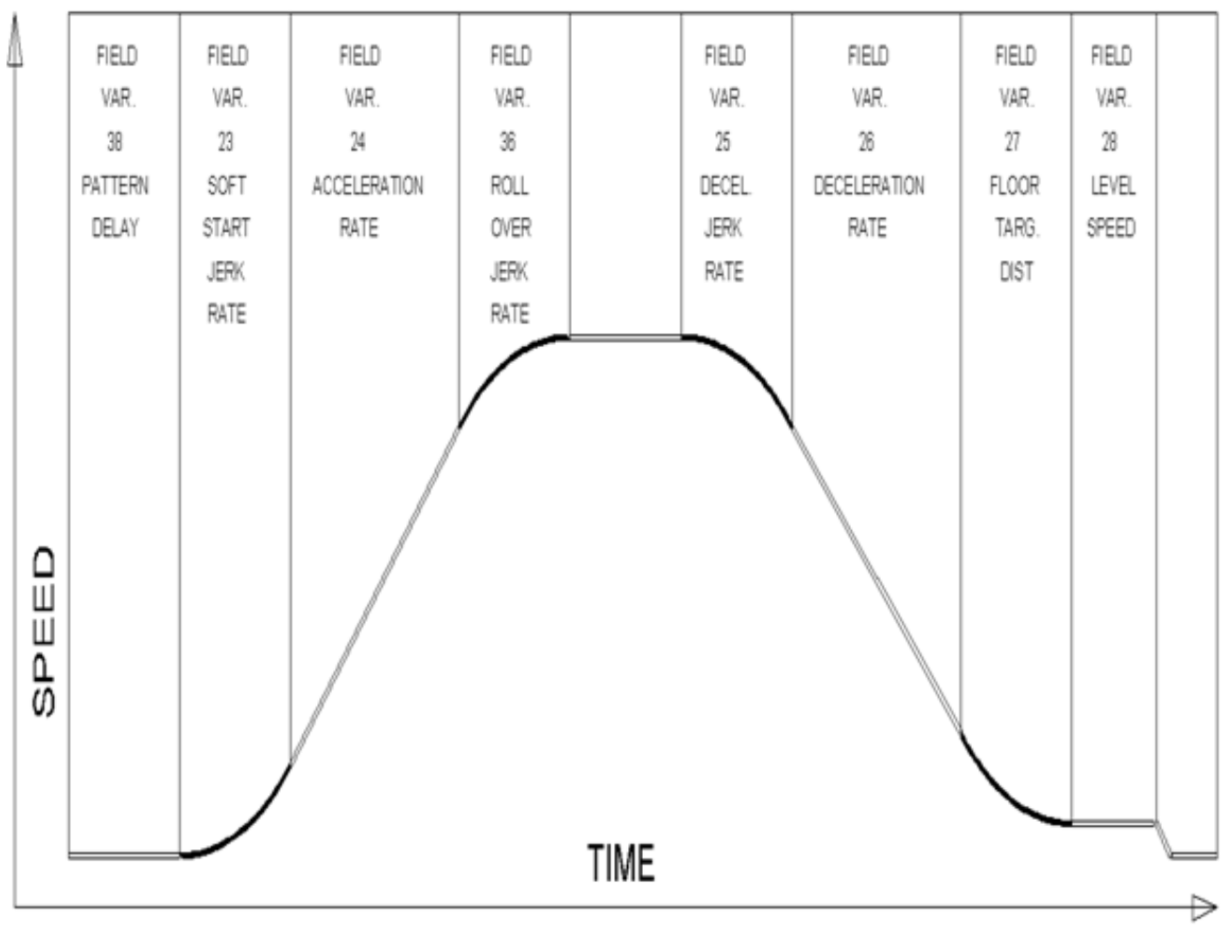


Figure 3.2: S-Curve Parameters

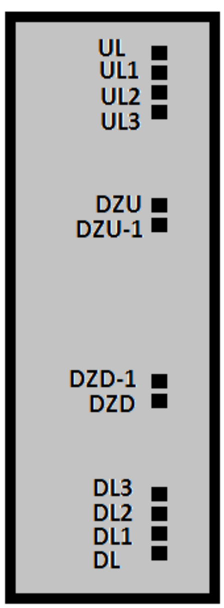
3.7.3 Adjust the Stop

When at floor level the “UL, DL, & DZ” input LED’s should all be on. If the elevator continually tries to seek floor level by leveling up and down, try the following steps to correct the problem:

- Increase the response of the drive by increasing the value of A1 RESPONSE in the Quattro drive, and retesting the car.
- Reduce the leveling and re-leveling velocity parameters from the 1005/1101 LCD interface "Adjustable Variables" menu, "Car Motion", "Leveling Speed" and "Relevel Speed".
- If the car still oscillates, adjust the "floor level zone" on the selector.

For a tapeless selector, the "floor level zone" is increased by moving the "UL" and "DL" sensors closer together.

For a tape selector, the "floor level zone" is increased or decreased by adjusting the “UL DoorZone Sel” parameter and the “DL DoorZone Sel” parameter. From the 1005/1101 LCD interface, navigate to the "Adjustable Variables" menu, "Car Motion" and select the appropriate door zone select parameter. There are four UL and four DL sensors on the selector sensor board. In the parameter, bit 0 represents the outer most sensors and bit 3 represents the inner most sensor. To use the two outer most sensors for both UL and DL, set both UL and DL parameters = 3. Since the UL and DL sensors can be selected independently, the door zone can be raised or lowered depending on which sensors are selected. The door zone gets larger as the number increases. See the board layout and table below:



Selector Sensor Board

Parameter Value	U/DL3	U/DL2	U/DL1	U/DL
	Inner most --------- Outer most			
0	0	0	0	1
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

Figure 3.3 Door Zone Selection Table

If the car stops hard on the brake then make the following adjustments. From the 1005/1101 LCD interface navigate to the "Adjustable Variables" menu, "Car Motion", and adjust both "Brake Drop Del" (brake drop delay) and "Soft Stop Time". These variables should be adjusted so that zero speed is observed at the end of the run prior to the brake setting. The controller should hold the car at zero speed for the duration of the "Soft Stop Time" which should continue while the brake is setting and for a short time after the brake sets. The soft stop time MUST be set to at least 0.5 seconds LONGER than the brake drop delay.

The "Soft Stop Time" setting in the 1005/1101 LCD interface should be compared with the setting in the "Safety Proc Adj Vars" menu, "Soft Stop Time". The setting of "Soft Stop Time" in the Safety Processor should be greater than the "Soft Stop Time" setting in the main CPU. A typical setting for the Safety Processor soft stop time is 3 seconds.

If the car spots when approaching the floor, the cause is usually due to the car not tracking (the drive response is set too low) or the speed profile into the floor is too aggressive. First try to increase the response of the drive by increasing the value of parameter A1 RESPONSE in the drive.

If the car still spots, increase the floor targeting distance and retest the ride. The default value for the floor targeting distance is 12 inches. Increase it by steps of 2 or 3 and continue retesting until the parameter is adjusted to 18. If no change is noticed, start again from 12 and decrease the value. The deceleration rate can also be reduced to help remove the spotting.

For elevators using an APS selector or a tapeless selector, a more exact stop can be achieved with setting the car to stop on pulse counts. From the Car Motion menu in Adjustable Variables, set the parameter “Stop On Pos Cnt” = 1. Adjustment for the Up or Down Level Distance is found in the “DZ & LZ Offset, Sel Cnt” menu in “Hoistway Tables”. Scroll through the menu to view the Pulses/Inch to be familiar with how much each pulse will affect the stop. The parameters “Dn Lev Dist” and “Up Lev Dist” are used as the number of pulse count to continue moving, before issuing a stop sequence, after the dead level position of the door zone is hit. “Dn Lev Dist” is used when the car is running down and “Up Lev Dist” when the car is running up. With a tapeless system, adjust the level distance values then check the actual position where the car has stopped. With the APS Selector, adjust the leveling distance for up and down going into the same floor until you are stopping exactly on the floor count learned as show on the diagnostic display.

Proceed with adjusting the start once the proper stop is achieved.

3.7.4 Adjust the Start

To provide a proper start, from the 1005/1101 LCD interface, navigate to the "Adjustable Variables" menu, "Car Motion" and adjust "Brake Pick Del" (brake pick delay), "Pattern Delay", and "Soft Start Jerk". Initially, set the brake pick delay to 0 and increase the pattern delay by steps of 0.1 second until the controller picks the brake completely before the motor starts to move. If roll back occurs, then reduce the pattern delay until there is no roll back. Sometimes, the timing works out better if the brake pick delay is set to 0.1 second. There are two pre-torque options. The first option is using a load-weighing device described in section 3.7.13 Analog Load Weigher Setup. The second option is using the Magnetek drive’s “Anti-Rollback" feature described in the next section.

After the "Start” is set properly, the car will start smoothly with no roll back and without feeling the brake. The soft start jerk rate can now be increased to provide a quicker transition from start to constant acceleration. Keep in mind that the larger the soft start number, the quicker the start. The ride should now be acceptable.

3.7.5 Anti-Rollback Adjustment

Anti-Rollback Operation can be used to prevent rollback on start without using a load weigher. To setup Anti-Rollback (ARB), place the empty car in the middle of the hoistway so that during test the car does not end up on the finals. Set the controller "Inspect Speed" = 0. Preset the following parameters on the drive:

- ARB SELECT (C1) = ARB3
- ARB ADVANCE (A1) = 0.30 sec
- ARB DECAY (A1) = 0.20 sec
- ARB TIMEOUT (A1) = 0.80 sec
- ARB DEADBAND (A1) = 15 pulses
- ARB KP (A1) = 1.0
- ARB KI (A1) = 5.0
- ARB FFWD (A1) = 0

Changing the ARB SELECT parameter from "DISABLE" to "ARB3" enables the anti-rollback operation mode in the drive. The ARB DEADBAND is the number of pulses that the drive has to see detect movement. ARB ADVANCE is the time the drive uses the high gains to develop torque set from ARB KP (proportional gain – how hard it responds) and ARB KI (integral gain – how quickly it responds). ARB DECAY is the time the drive spends lowering the high gains back to a normal value. ARB TIMEOUT is the maximum time the drive will wait for encoder feedback before leaving the ARB mode. The ARB TIMEOUT is set from ARB ADVANCE + ARB DECAY + 0.30 sec. From the preset settings the ARB TIMEOUT = 0.20 + 0.30 + 0.30 = 0.80 seconds.

Press the machine room inspection up or down run buttons to run the car at zero speed and monitor the movement of the car. If the car has rollback, increase the ARB AVANCE parameter in small increments of 0.05 seconds until the rollback is removed. If there is no rollback, decrease the ARB ADVANCE parameter in small decrements of 0.05 seconds until rollback occurs and then change the parameter back to the previous value with no rollback. Setting the ARB AVANCE parameter too large could cause the drive to react to noise on the speed feedback channel.

If any setting of ARB ADVANCE still produces rollback, try increasing the ARB DECAY parameter. If this value is too short, the drive may not be holding the torque long enough to prevent the car from moving. If this value is too large, it may cause audible noise and vibration.

Once the ARB ADVANCE and ARB DECAY values are determined, set the ARB TIMEOUT parameter. For additional information on setting the ARB parameter, please refer to the Magnetek Quattro AC/PM technical manual.

3.7.6 Verify Top Speed

To fine tune high speed, make high speed runs while monitoring the SPEED FEEDBACK on the Quattro drive display. The display should read contract speed, and it should match the speed displayed on the 1005/1101 LCD interface, "Elevator Status" menu, "Dmd" and "Vel". This speed should also match the speed displayed on the 1005/1101 LCD interface for the Safety Processor "SPB Vel" and the NTS Processor "NTS Vel". If all of these values are the same (+/- 2 fpm), then proceed to the `next step. If the speed is not correct, verify the actual speed of the car with a handheld tachometer on a vertical part of the car ropes. Increase or decrease drive parameter A1 CONTRACT MTR SPD until the actual elevator speed is correct. The AC drive display should also read contract speed. If A1 CONTRACT MTR SPD is changed, then the encoder RPM parameters for the Main CPU, Safety Processor or NTS processor may also need to be adjusted.

3.7.7 Adjust Safety Processor, NTS Processor and Main CPU Terminal Limit Velocity Speed Clamps

The Safety Processor, a processor chip located on the 1102 Main I/O board, monitors the speed of the elevator at the terminal landings independently from the main CPU. When the “UTS, DTS and ETS” limit switches are activated, the Safety Processor calculates the velocity of the elevator and compares that velocity with a stored velocity for each limit. If the velocity, when the switch activates, is greater than the limit velocity value, then the Safety Processor will generate a fault that stops the elevator by removing power from the driving machine and brake. The ETS limit activates at both the top and bottom terminal locations to verify the UTS and DTS limits when reduced stroke buffer is used.

The NTS Processor monitors the velocity of the car and all the Normal Terminal Slowdown Limits from the selector on a separate serial CAN bus. If a normal terminal limit is activated and the car is traveling faster than the limit velocity set point for that limit, the NTS processor will turn off the NTSD output to the drive causing the drive to initiate a timed emergency slowdown independent of the Main CPU speed profile and the Safety Processor. The deceleration rate and jerk rate are set by the drive parameters DECEL RATE 4, DECEL JERK IN 4 and DECEL JERK OUT 4. The target speed of the drive after the emergency slowdown is initiated is set from the parameter NTSD TARGET SPD. The car will continue at that speed until the terminal landing door zone or the normal limit is reached. If the command speed of the controller goes below the NTSD TARGET SPD, the drive will follow the command speed. Before testing the NTS operation, set the initial values for the drive as show below to be certain that the car will slow down fast enough to stop at the terminal landing:

- A2 DECEL RATE 4 (NTSD Deceleration Rate) = 5 ft/sec^2
- A2 DECEL JERK IN 4 (NTSD Decel Jerk In Rate) = 6 ft/sec^3
- A2 DECEL JERK OUT 4 (NTSD Decel Jerk Out Rate) = 6 ft/sec^3
- A1 NTSD TARGET SPD = 10 fpm
- C1 NTSD MODE = EXTERNAL
- C2 LOG IN 7 TB1-7 = NTSD INPUT 1

Once the slowdown operation is verified, the drive parameters can be decreased to allow for a smother stop.

The Main CPU also monitors the speed of the car independently of the speed profile. It also checks the Normal Terminal Slowdown limits and Emergency Terminal Slowdown limits for the correct location in the hoistway and to clamp the speed profile at each terminal limit. If a limit is activated at a position that is not consistent with the learned value, the Main CPU will initiate a timed deceleration pattern at the “Em Decel Rate” until the “Recovery Speed” is reached. When the car reaches a door zone, it will decelerate at the “Em Decel Lev” rate and then stop level at the floor. If the velocity of the elevator is greater than the limit velocity set point when a limit is activated, the Main CPU will clamp the speed profile velocity value to the set point value (clamp value). The normal and emergency slowdown positions are learned during the hoistway learn procedure.

To setup the limit velocity set point values for all three devices, navigate to the “Elevator Setup” menu on the 1005/1101 LCD interface and select the “Learn Limit Velocities” menu. Follow the directions on the screen to preset the limit values, set the car on independent with automatic doors turned off and then run the Learn Limit procedure.

The elevator will run to the top landing and then run one floor down, delay a short time, run back to the top floor and then record the limit velocities. The elevator will then run two floors down and again return to the top floor to record the values. The car will continue to increase the number floors to run down and the again run up until contract speed is reached. After learning the velocities for all the limits in the up direction, the car will then do the same procedure to the bottom floor to learn the velocities for the limits in the down direction.

Once the down direction limit velocities are learned, all the limit velocity values will be stored in memory. After a successful "learn" process, the 1005/1101 LCD display will show "Limit Velocity Learn Complete". If the process fails or is interrupted, the display will show "Limit Velocity Learn Failed" or "Limit Velocity Learn Interrupted". The reason for a limit learn failure would be from either the car not reaching contract speed during a run, the limits switches set too far from the terminal landing or a fault occurred during the learn process. If the learn was not successful, check the fault log for faults and make the necessary corrections. Refer to the appendix at the end of this manual for directions on running the normal terminal and emergency terminal limit test.

3.7.8 Manually Adjust the Safety Processor Terminal Limit Velocity Clamps and the NTS Processor Limit Velocity Clamps

To manually set the speed clamps on the Safety processor and NTS processor, make a one floor run to the top floor. After the car stops, record the velocity the car hits the "UTS" and "ETS" slowdown limits for the safety processor and the "UT, UT1, UT2 … UTn" limits for the NTS processor. "ETS" top and bottom limits are used on cars with reduced stroke buffers. The velocity values are shown from the "Elevator Status" menu on the 1005/1101 LCD interface as "UTSvel", "DTSvel", "ETUvel", "ETDvel", "UT Vel", "DT Vel", "UT1Vel", "DT1Vel" … "UTnVel" and "DTnVel". The single input "ETS" is used when the limit is activated at the top or bottom limit as a secondary check for UTS and DTS. When the car is at the top of the hoistway and ETS is hit, the velocity is shown as "ETUvel" and when the car is at the bottom of the hoistway and ETS is hit, the velocity is shown as "ETDvel".

Run the car again to the top repeatedly from 2 floors down, then 3 floors down, etc., until top speed is reached. Record the limit velocities displayed each time the car stops at the top floor.

Make the same runs to the bottom floor starting from 1 floor, then 2 floors, then 3 floors, etc., until top speed is reached. Again, use the "Elevator Status" menu on the 1005/1101 LCD interface to record the displayed limit velocities for "DTS and ETS" for the Safety processor and the "DT, DT1, DT2 … DTn" limits for the NTS processor. Do this each time the car stops at the bottom floor.

Take the highest speed value recorded in the runs to the top and bottom floors and add 10 fpm or 5% (whichever is larger) to that value to use as the clamp speed values for the respective limits. Enter the clamp speed values for the Safety Processor. From the 1005/1101 LCD interface, select the "Adjustable Variables" menu, then the "Safety Proc Adj Vars" menu and then enter the values for parameters "UTS Velocity", "DTS Velocity", "ETU Velocity" (ETS at the top) and "ETD Velocity" (ETS at the bottom) respectively.

Also, enter the clamp speed values for the NTS Processor. From the 1005/1101 LCD interface, select the "Adjustable Variables" menu, then the "NTS Proc Adj Vars" menu and then enter the values for parameters "UT Velocity", "DT Velocity", "UT1 Velocity", "DT1 Velocity" … "UTn Velocity" and "DTn Velocity" respectively.

3.7.9 Manually Adjust the Main CPU's Digital Slowdown Speed Clamps

Having just made several runs into the top and bottom landings, the main CPU has also recorded the car's velocity when the slowdown limits were activated. If the car has been powered down prior to this step, several runs must be made to the limits to allow the main CPU to record the limit velocity values.

From the 1005/1101 LCD interface, navigate to the "Elevator Setup" menu, "Set DT/UT Slowdown Clamp" and view the speed displayed for "Clamp Speed". Add 10 fpm to this "Clamp Speed" value and enter it into the "DT/UT Limit" value.

The number of slowdown limits depends on the speed of the car as show in the table below:

Car Speed	Number of Slowdown Limits	Clamp Number	Limit Used
<= 250 fpm	1	2	UT, DT
300-500 fpm	2	3	UT1, DT1
600-700 fmp	3	4	UT2, DT2
800 + fpm	4	5	UT3, DT3

Table 3.1: Slowdown Clamps

Adjust speed clamps for each slowdown limits used as determined by the elevator's contract speed.

3.7.10 Verify Inspection Velocity Clamp on Safety Processor

Place the car on inspection operation. From the 1005/1101 LCD interface, navigate to the "Adjustable Variables" menu, "Safety Proc Adj Vars" menu and then set the "Insp Velocity" parameter to 25 fpm. Navigate to the "Car Motion" menu and set the "Inspect Speed" to 50 fpm. Run the car in either direction and verify that the car shuts down when the speed rises above 25 fpm.

Navigate to the "Safety Proc Adj Vars" menu and then set the "Insp Velocity" parameter to a speed clamp value of 140 fpm. Navigate to the "Car Motion" menu and set the "Inspect Speed" to the desired value.

3.7.11 Reduced Stroke Buffer ETS Limits Setup

When the buffer is not rated for contract speed, the operation for reduced stroke buffer is required. This operation utilizes an Emergency Terminal Speed Limiting Device (ETSLD). The Safety Processor and the Safety PAL provide this function with the use of the UTS, DTS and ETS Terminal Limits. Both the Safety Processor and Safety PAL independently monitor the speed of the car and either can independently remove power from the driving machine and brake. This operation is enabled by having the Buffer Type in the controller configuration file set to 1 for Reduced Stroke Buffer, by the Safety Processor Adjustable Variable "Buffer Type" set to 1 for Reduced Stroke Buffer and the Reduced Stroke Buffer jumper being placed on the Main I/O board (directly above DNR, UP and FF chips in bottom right of the main board). If any one of the settings for all three devices, the Main CPU, the Safety Processor and the Safety PAL, does not match, the car is not allowed to run. This is done to ensure that the job remains setup to match the configuration file.

The ETS limit consists of a sensor on the selector that is activated from a magnet at the top of the hoistway and one at the bottom. This input is used as a redundant check for the UTS and DTS limits. All limits are monitored by both the Safety Processor and Safety PAL. The velocity set points used by the Safety Processor are the "ETS Up Vel" and "ETS Down Vel". Safety PAL velocity set points are the "PAL

ETS Up Vel" and "PAL ETS Dn Vel". To ensure complete independence of ETSLD, the parameters used by the Safety PAL are stored in a non-volatile device accessible only to the Safety PAL.

To Change the PAL ETS velocity parameter, the ETSLD Test jumper must be placed on the Main I/O board and "ETS Setup Mode" adjustable variable on the Safety Processor must be set to 1 = AdjPALets. If the PAL ETS parameters are changed without both of these settings, a new value can be entered but the existing value will not change. Note that the Safety PAL calculates the velocity in pulses per 30 milliseconds. To make it convenient for the user, the adjustable variable setting for PAL ETS up and down velocities are set in feet per minute. Depending on the amount of error from the encoder resolution, the value returned once a new value is entered is the closest calculated value. For example, setting a velocity value of 470 fpm may return a value of 473 fpm. Because of the jumper requirements of the ETSLD operation, the ETS limit velocities for the Safety PAL can only be setup manually.

3.7.12 Manual Setup of the ETS Limits Velocities

Before starting the setup procedure, place the ETSLD Test jumper on the Main I/O board and set the Safety Processor variable "ETS Setup Mode" to 1= AdjPALets. This will put the Safety PAL into Test/Setup mode which will also prevent the Safety PAL from detecting an ETS limit fault. While in this mode, the car cannot run in group operation or with the automatic doors enabled.

To set the speed clamps on the Safety PAL, make a one floor run to the top floor. After the car stops, view the "Elevator Status" display that shows the PAL velocity and status. Record the velocity at which the car hit the ETS limit. It will be displayed as "ETUvel". Run the car again to the top repeatedly from 2 floors down, then 3 floors down, etc., until top speed is reached. Record the limit velocities displayed each time the car stops at the top floor.

Make the same runs to the bottom floor starting from 1 floor, then 2 floors, then 3 floors, etc., until top speed is reached and record the velocity the car hits the ETS limit (displayed as "ETDvel"). Do this each time the car stops at the bottom floor.

Take the highest speed value recorded in the runs to the top and bottom floors and add 10 fpm or 5% (whichever is larger) to use as the clamp speed values for the respective limits. Enter the clamp speed values for the "PAL ETS Up Vel" and "PAL ETS Dn Vel" from the adjustable variables menu of the Safety Processor.

Remove the ETSLD Test jumper from the Main I/O board and set the Safety Processor variable "ETS Setup Mode" to 0=Norm. Make several trips to the terminal landings from various floors to verify that a nuisance trip from the Safety PAL does not occur.

3.7.13 Analog Load Weigher Setup

If the job uses an analog load weigher purchased from G.A.L., complete the following procedure.

NOTE: It is recommended using two people, one moving the weights and one in the machine room to set up the load weigher.

Mount the load weigher as described by the manufacturer. The load weigher control box will also contain a board supplied by G.A.L. that connects to the controller serial CAN bus and reads in the analog output from the load weighing device. Wire the load weigher and G.A.L. board according to the controller schematics.

Calibrate the load weighing device hardware according to the manufacturer's instructions. Following proper installation of the load weighing device, proceed to the next section.

3.7.13.1 Empty Car Setup

Verify that the load weighing device is communicating to the main CPU by performing the following steps. From the 1005/1101 LCD interface, navigate to the "Diagnostics" menu, "Car Comm Status", "Car to LW Board" and verify that "On-line = 1". If "On-line = 0" then verify wiring and installation of load weighing device.

From the 1005/1101 LCD interface, navigate to the "Elevator Setup" menu, "Load Weigher Setup", "Setup Load Weigher" and follow the instructions on the display as you go through the procedure.

It is okay to exit the setup screen to place a call and then return to it while the setup is being performed.

Run the car to the bottom floor and press Enter on the 1005/1101 LCD interface when prompted to do so to start the automatic setup sequence.

If the car is at the bottom floor and the doors are not closed (the doors will not close automatically from turning off the auto-door switch) then place a car call to run the car up one floor then back again. The doors will close when the call is placed.

When the automatic sequence is activated, the car will run to each floor and measure the empty load value. The 1005/1101 LCD interface will indicate when the sequence is finished.

3.7.13.2 Full Car Setup

The empty car setup must be successfully completed to run the full load setup.
Once the empty car setup is complete, run to the loading floor and set the "AUTO DOOR" switch to the "ON" position to allow weights to be loaded on the car. With the car fully loaded, set the "AUTO DOOR" switch to the "OFF" position and run the car to the bottom floor. Again if the doors are not closed, make a one floor run to force the doors to close.

With the car at the bottom floor, follow the instructions on the 1005/1101 LCD interface to start the full load setup sequence. The car will automatically run to each floor and measure the full load value. When the full load measurement is complete, the car can be run to the loading floor and the weights removed.

After the weights are removed, cycle the doors to complete the procedure. From the 1005/1101 LCD interface, navigate to the "Elevator Setup" menu, "Load Weigher Setup", "View/Modify LW Setup" and verify the load weigher status, "LW Device Stat: ON OK". If the status is "ON OK", then the load weigher should be accurately measuring the car load in real time. The percent load will be displayed, "Load: _%".

The percent load values for different service options can now be set. From the 1005/1101 LCD interface, navigate to the "Adjustable Variables" menu, "Service Options", and set the following variables:

- "Load Bypass"
- "Load Antinuisance"
- "Load Dispatch"
- "Load Overload"

NOTE: Setting the values of the variables above to 0% will disable that particular option.

3.7.13.3 Load Weighing Calibration Sequence

The load weigher is automatically calibrated once each week. If an error is detected during this calibration sequence, the load weigher and the pre-torque feature (if used) is disabled.

A load weighing calibration sequence can be manually activated by performing the following procedure. From the 1005/1101 LCD interface, navigate to the "Elevator Setup" menu, "Load Weigher Setup", "Load Weigher Calibration" and follow the instructions on the display.

3.7.14 Adjust the Motor Pre-torque

NOTE: The motor pre-torque uses the load value obtained from the analog load weigher and will only work if the load weigher has been installed properly, and the "Load Weigher Setup" has been performed successfully.

On the Quattro drive under User Switches C1 parameter, set Pre-Torque source to serial. Run the empty car to a middle floor. From the 1005/1101 LCD user interface, navigate to the "Adjustable Variables" menu, "Car Motion" and adjust the following parameters:

- "Balanced Load = 40" (typically car is 40% counterbalanced, but verify counterbalance percentage for each specific job)
- "Torque Amount = 50"
- "Pattern Delay = 2.5"
- "Brake Pick Del = 0.1"

The long pattern delay will allow an exaggerated amount of roll back in order for the pre-torquing to be set accurately. Make a one floor run down and observe the roll back when the brake picks at the start of the run. Increase the "Torque Amount" variable and continue to monitor the roll back while performing one floor runs in the down direction. As the "Torque Amount" is increased, the roll back should be minimized until the car will hold zero speed for the entire "Pattern Delay" time. A typical value for the "Torque Amount" is 80%. If the value is too large, the car will roll forward during the "Pattern Delay" time. If this occurs, decrease the value.

Note: The pattern delay must be at least 0.15 seconds (150 milliseconds). Setting the torque amount to 0.00 will disable the pre-torque feature. Also if the load weighing calibration sequence detects a load weighing error, the pre-torque feature is also automatically disabled.

3.7.15 Verify the Doors Are Safe

The elevator should now be adjusted. Verify that all door locks, gate switches, and safety circuits are operational. Set the "INS" switch to the "NORM" position and set the "AUTO DOOR" switch to the "ON" position. The elevator should level into the floor and open the doors. If the doors do not open, check the door operator wiring and cam adjustment. If the doors do open, the elevator is now on independent service.

3.7.16 Fine Tune the Ride Quality

Ride the elevator and evaluate the ride quality. Fine tune ride quality by navigating to the "Adjustable Variables" menu, "Car Motion" and adjusting the variables shown in Figure 4.2. Keep in mind that if acceleration or deceleration values are changed, the speed clamps for the safety processor board and the S-curve board may need to be re-adjusted.

To fine tune the floor level accuracy, determine if the controller is set to stop when "UL" and "DL" signals turn on, or if controller is set to stop off of the position count. From the 1005/1101 LCD interface, navigate to the "Adjustable Variables" menu, "Car Motion" and view the "Stop On Pos Cnt" variable. If "Stop On Pos Cnt= 0" then controller is set to stop when the "UL and "DL" signals turn on. If "Stop On Pos Cnt = 1" then controller is set to stop on a combination of the floor level magnet and the position count. The stop on position count function should only be used when the pulse feedback to the main CPU is greater than 25 pulses per inch. This would typically be used only with tapeless selectors.

With "Stop On Pos Cnt = 0", the floor levels should be set by adjusting the floor level magnet at each floor. For proper operation, the floor magnets should be set to exactly floor level. After the floor levels are set properly, perform another hoistway learn procedure.

With "Stop On Pos Cnt = 1", the floor levels are set by using both the floor magnet and the position count. For proper operation with this setting, the floor magnet should be set to exactly floor level. The final stop can then be fine-tuned by performing the following adjustments:

- Use the "Dn Lev Dist" and the "Up Lev Dist" parameters to make level changes at all floors. From the 1005/1101 LCD interface, navigate to the "Hoistway Tables" menu, "DZ & LZ Offset, Sel Cnt" and adjust "Dn Lev Dist" and "Up Lev Dist". The units for these variables are in "pulse counts". With "Stop On Pos Cnt =1" the car will continue to move for the "Dn Lev Dist" or "Up Lev Dist" after "UL and DL" turn on.

- Use the “FL Offset” adjustments to make level changes at individual floors. From the 1005/1101 LCD interface, navigate to the "Hoistway Tables" menu, "FL and FL Offset Count", and the offset count can be adjusted. These variables introduce an offset (+/-) to the stored floor count that was determined in the hoistway learn procedure.

NOTE: The number of pulse counts per inch can be viewed from the 1005/1101 LCD interface, "Hoistway Tables", "DZ & LZ Offset, Sel Cnt”, "Pulses/Inch".

NOTE: Regardless if "Stop On Pos Cnt=0" or if "Stop On Pos Cnt =1", the floor magnet must be set properly at floor level. If too large of values are entered into "Dn Lev Dist", "Up Lev Dist", or "FL Offset", the car will drive past the floor level magnet and re-level.

Check all signal devices for proper operation and remove all temporary jumpers. The adjustment should now be complete.

Section 4 - Troubleshooting

4.1 General Information

The GALaxy controller is equipped with a number of features that aid in troubleshooting any problems that may occur. The physical layout of the controller provides ready access to all I/O in order to make voltage measurements. All inputs have LED's that monitor the state of the input. The controller is equipped with the 1005/1101 LCD interface for the Main CPU, the Safety Processor, and the NTS Processor. Section 10 describes the use of the 1005/1101 LCD interface. In this section the basic points of troubleshooting will be detailed.

4.2 Microprocessor CPU

The CPU is very reliable and normally trouble free. With power turned on, the "axy" in GALaxy on the 1005/1101 LCD interface should be blinking at one second intervals to indicate that the CPU is running. If it is not blinking, then check voltage at the 5V terminal with respect to the 0V terminal on the 1102 Main I/O board. This voltage should read 5VDC. If not, then check the input and output voltage of the DC power supply. If the "axy" is not blinking and 5VDC is present at the 5V terminal with respect to the 0V terminal, then contact the factory. All job parameters that are field adjustable are stored in a non-volatile MRAM chip on the Main CPU board.

4.3 Input/Output Boards

The two main sections of all the I/O boards are the low voltage and the high voltage sections. The low voltage section consists of all the digital interfacing necessary for the CPU to communicate with the field components. The high voltage section consists of the field components (buttons, switches, lights, relays and sensors) and their associated input and output signals. The standard voltage for the Main I/O board and the COP board is 120VAC. However, the I/O expansion boards can accept a voltage range from 24 VAC, 24 VDC and 120 VAC. The rope gripper I/O's on the Main I/O board can accept up to 240 VAC

It is very important that the wiring schematics are reviewed in order to determine the voltages for which the controller was designed before applying power. The majority of problems that may arise with the control system are due to faulty inputs or outputs on the high voltage side of the system. For example, having a limit switch not feeding voltage or an acknowledgment light turning on. The GALaxy control system is designed to enable the technician to check both the high voltage section and the low voltage section to correct the problem.

The high voltage section is checked with a digital voltmeter or with the individual LEDs that are associated with each input. Depending on the particular input or output, the voltage measured at the terminal will either be "high" or "low" with respect to its reference point. For example, to determine whether or not the up terminal normal limit switch was feeding, the voltage should be measured at terminal "UN" with respect to "GND". If the switch is feeding it should read 120VAC. If the switch is open, the voltage should read less than 50VAC. Another means by which to determine whether the switch is feeding is to view the “UN” input LED. If the LED is on, the switch is feeding. If the LED is off, the switch is open.

The previous example determines whether or not the field component is functioning properly. However, to determine if the signal is actually being communicated to the CPU the signal must be checked on the low voltage section of the board. The low voltage section is checked from the 1005/1101 LCD interface. Using the previous example, from the 1005/1101 LCD interface, navigate to the "Inputs and Outputs" menu, "Car Inputs and Outputs" and scroll through the I/O list until the "UN" input is located. The LCD will display "UN=1" if the "UN" switch is feeding and "UN=0" if the switch is open.

All of the I/O’s are optically isolated between the high voltage section and the low voltage section. The input optoisolators and the output solid-state relays are socketed IC's that are labeled on the silk screen of the various I/O boards with a "U" number (for example U45). If it is determined through the previous troubleshooting procedures that the input signal is present at the terminal, but is not being communicated to the CPU, the input optoisolator may be defective and can be replaced in the field. If it is determined that the CPU is communicating the output signal to the solid-state relay, but the voltage does not go high at the terminal, the solid-state relay may be defective and can be replaced in the field. Any time IC’s are replaced, the power should be turned off and care should be taken in removal of the old chip and replacement of the new one.

All of the I/O and their associated IC’s are listed in the wiring schematics.

4.4 Run Sequence

The following diagram in Figure 4.0 shows the run sequence of the controller. The timing of BRK changes with the adjustment variable DON Start Control. When set to 0 the BRK output turns on before DON and when set to 1 BRK turns on after DON. The BRK timing typical works best with the adjustable variable set to 1.

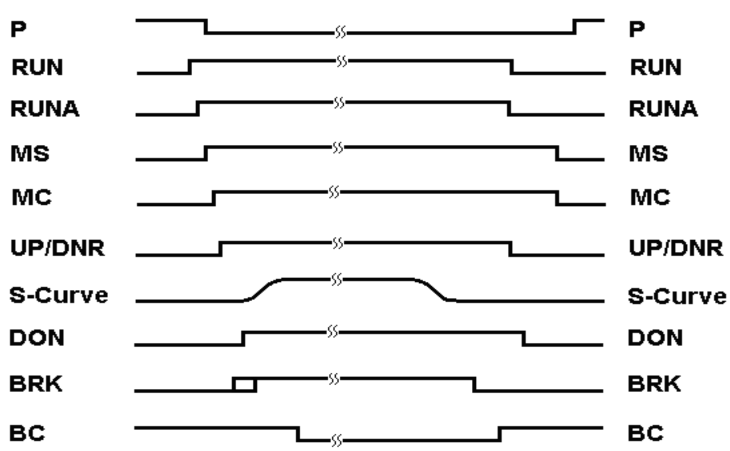


Figure 4.0 Run Sequence

4.5 The Safety Processor Functions

The Safety Processor and Safety PAL monitor controller run outputs, inputs, and velocity feedback. Its job is to interrupt or prevent a run in case of unsafe conditions.

The CPU outputs gated by the Safety PAL are:

Run Control - CPU Control outputs:
UP – Up Command
DNR – Down Command
UF – Up Fast Command
DF – Down Fas Command
RUNA – Run Control
BRK – Brake Control

The inputs monitored by the Safety Processor and Safety PAL are:

Door Status:
DLT – Door Lock Top
DLM – Door Lock Middle
DLB – Door Lock Bottom
GBP – Gate Bypass
LBP – Lock Bypass

Door Zone Status:
UL – Up Limit
DZ – Door Zone
DL – Down Limit

Inspection Status & Control:
Auto – Automatic Operation
ICI – In Car Inspection
ACC – Access
TAU – Top Access Up
TAD – Top Access Down
BAU – Bottom Access Up
BAD – Bottom Access Down
INS – Car Top Inspection
IU – Car Top Inspection Up
ID – Car Top Inspection Down
MRI – Motor Room Inspection
MRIU – Motor Room Inspection UP
MRID – Motor Room Inspection Down

Terminal Limit Status:
ETS – Emergency Terminal Slowdown Verification Input for both Up and Down
UTS – Up Emergency Slowdown
DTS – Down Emergency Slowdown

The Safety Processor controls the following outputs.

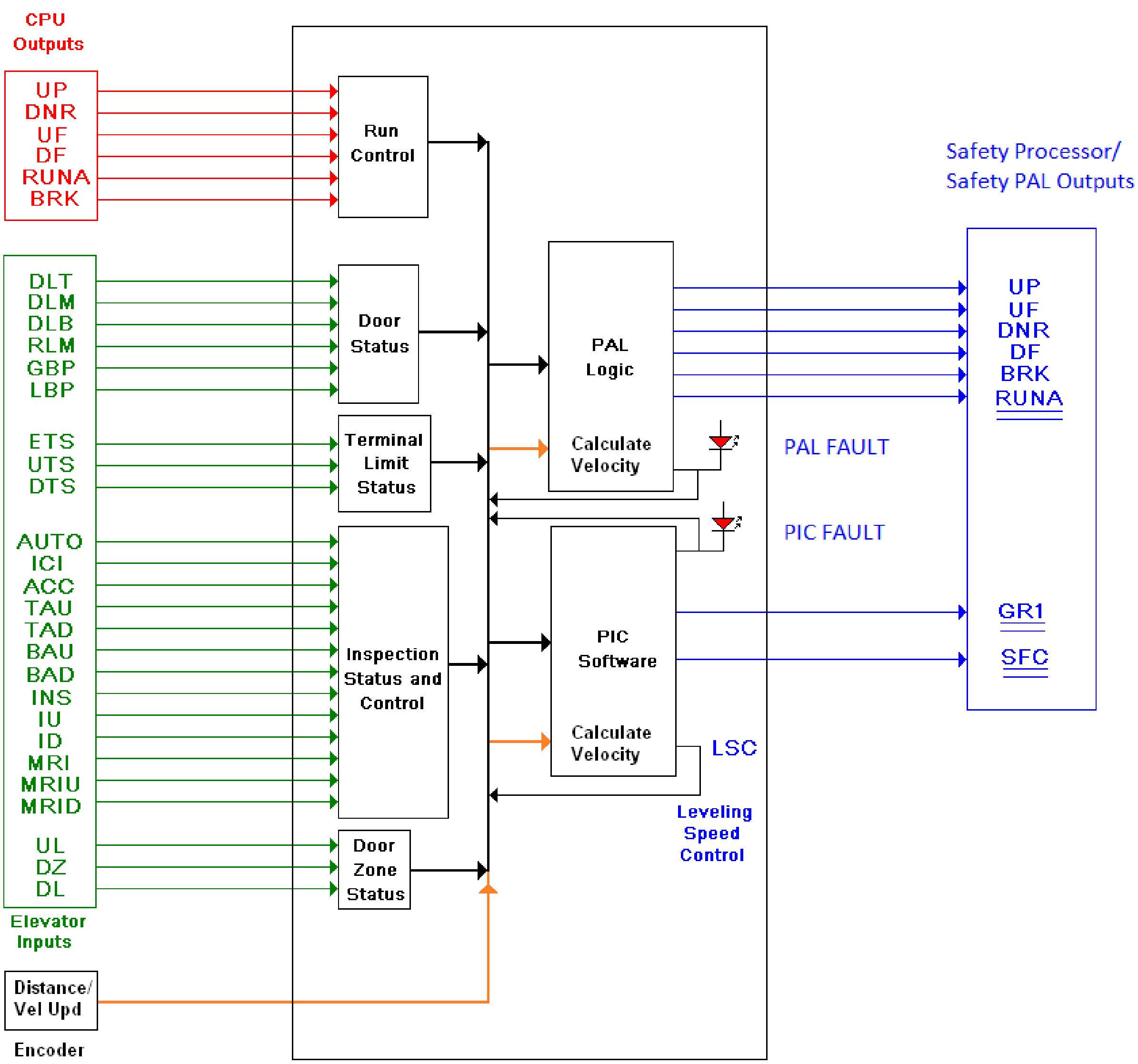
GR1 – GR1 Relay (Drops the Gripper)
SFC – SFC Relay Control

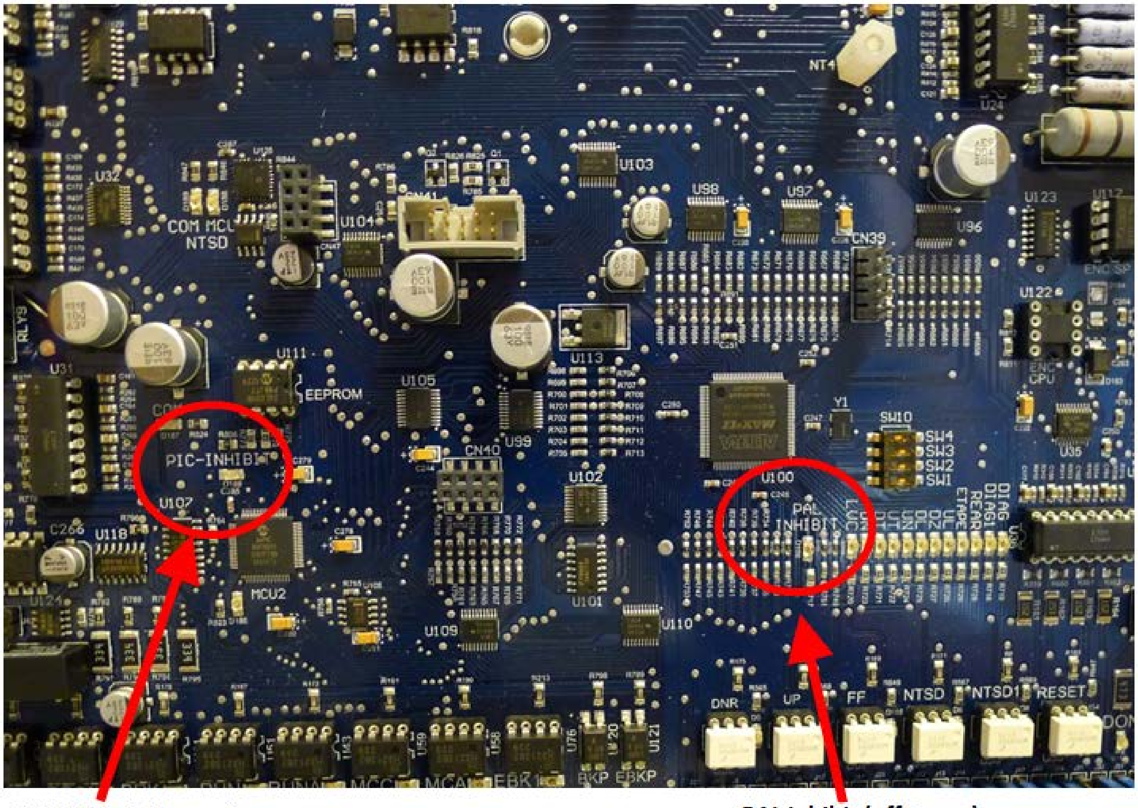
The Safety Processor also monitors the speed of the car and prevents over speeding and unintended motion as well as monitoring the leveling speed.

The Safety Processor stops or prevents a run by dropping the SFC control relay which in turn will open the safety string. The Safety PAL stops or prevents a run by dropping RUNA, BRK, UP, DNR, UF and DF outputs.

The following graphics illustrates all the Safety Processor and Safety PAL functions.

Safety Process/Safety PAL





PIC Inhibit (off to run)

PAL Inhibit (off to run)

Figure 4.1 1102 Main I/O Board

4.6 The Safety Processor and Safety PAL

The Safety Processor and Safety PAL have two fault LED’s, one on the bottom left of the board for the PIC inhibit and one on the bottom right of the board for the PAL inhibit. (See Figure 4.1)

Important: When either LED is on, the car is prevented from running.

The Safety Processor and Safety PAL perform the following functions:

- Verifies the speed of the car when the emergency terminal limits are activated
- Verifies that the doors are closed and safe to run
- Verifies all inspection operations
- Verifies that the car velocity is not greater than 150 fpm in the door zone and with the doors open.

While the Safety Processor and Safety PAL cannot turn on any run control signals, it can turn off the follow signals from the main CPU: RUNA, BRK, UP, and DNR. The SFC relay in the safety string is also controlled by the Safety Processor.

The Safety Processor detects two types of faults, active faults and velocity faults. Active faults are input conditions that are considered as unsafe or an error such as the lock bypass switch place on while the car is on automatic. Velocity faults are generated when the Safety Processor detects that the car speed is too high during certain conditions, such as hitting the DTS terminal limit at a speed greater than the speed setting for that limit. Both types of faults are reset after a 2 second delay when the condition is corrected and the main CPU is not commanding an up or down run.

The Safety Processor has two LEDs for CPU and CAN Bus communication status, MCU and COM. The MCU LED will blink at a one second interval to show that the Safety Processor is running. The COM LED blinks at a one second interval when it has communications with both the selector and NTS processor. If communications is lost with one of the two devices, the LED will blink at an irregular interval. If there is no communications with either device, the LED will turn off.

When troubleshooting errors detected by the Safety Processor or Safety PAL, take the following steps:

- Check LED status. Either PAL inhibit or PIC inhibit LED on indicates an error.
- View the elevator Safety Processor status under the "Elevator Status" menu. Anything other than Automatic or a valid inspection service is an error.
- Check the MCU and COM LED status. Both LEDs should be blinking at one second intervals.
- From the 1005/1101 LCD interface, navigate to the "SPB Inputs and Outputs" menu, and view all of the I/O status. See section 4.8 for a complete description of the input and output signals.
- From the 1005/1101 LCD interface, navigate to the "Faults Log" menu, and view the recorded faults for the "MRCan Device Fault". When a fault occurs on the Safety Processor it will transmit the fault code to the main CPU and the fault will be recorded in the main CPU fault log.

As mentioned earlier, RUNA is one of the signals that can be turned off by the Safety Processor Board. If a "RUNA Off" error is generated on the 1005/1101 LCD interface (main CPU), it is typically caused by the Safety Processor detecting an error at the instant the run is starting. When a RUNA Off error is recorded, check the status of the Safety Processor first.

Additional fault information is shown in the next section of system faults.

4.7 System Faults

Faults that are detected by the main CPU can be viewed on the 1005/1101 LCD interface by navigating to the "Fault Log" menu, "View Fault Log". The lists of possible faults detected by the main CPU are listed in section 6.1, Main CPU Faults. By pressing the "ENTER" button on the 1005/1101 LCD interface when the particular fault is being displayed, the interface will display detailed information for that fault. Section 6.4, Detailed Faults, describes this information.

In general, when a fault occurs, the system records the state of all the items listed in 6.4 and stores the data in two different buffers, the normal and long term fault buffers. The normal fault buffers can hold the 50 last faults that occurred and the long term fault buffer holds the last 600 faults that occurred. The data in the normal fault buffer is accessed from the "Fault Log" menu. The long term fault buffer can be copied to the SD Card and viewed from a PC using a text editor such as Word Pad.

Faults that are detected by the Safety Processor can be viewed on the 1005/1101 LCD interface by navigating to the "Faults Log" menu under "MRCan Device Fault". The possible faults detected by the Safety Processor are listed in section 6.3.

4.8 Main CPU Inputs and Outputs

Table 1: Main CPU Inputs & Outputs	
Name	**Description**
1CA-nCA	1st – Nth Floor Car Call Acknowledge Outputs
1CAR-nCAR	1st – Nth Floor Rear Car Call Acknowledge Outputs
1C-nC	1st – Nth Floor Car Call Inputs
1CR-nCR	1st – Nth Floor Rear Car Call Inputs
1U-(n-1)U	1st – (Nth-1) Floor Up Hall Call Inputs
1UA-(n-1)UA	1st – (Nth-1) Floor Up Hall Call Acknowledge Outputs
1UAR-(n-1)UAR	1st – (Nth-1) Floor Rear Up Hall Call Acknowledge Outputs
1UR-(n-1)UR	1st – (Nth-1) Floor Rear Up Hall Call Inputs
2DA-nDA	2nd – Nth Floor Down Hall Call Acknowledge Outputs
2DAR-nDAR	2nd – Nth Floor Rear Down Hall Call Acknowledge Outputs
2D-nD	2nd – Nth Floor Down Hall Call Inputs
2DR-nDR	2nd – Nth Floor Rear Down Hall Call Inputs
ACC	Access Operation Input
AD	Automatic Door Switch Input
ALT	Alternate Fire Smoke Detector Sensor Input
ATT	Attendant Operation Input
ATTDN	Attendant Down Input
ATTUP	Attendant Up Input
AUTO	Automatic Operation Input
B16	Binary Position Sensor 16 Input
B32	Binary Position Sensor 32 Input
BAD	Bottom Access Down Input
BAU	Bottom Access Up Input
BF	Bottom Final Input
BKS	Brake Switch Input
BP	Fire Phase I Smoke Detector Bypass Input
BP1	Binary Position Sensor 1 Input
BP2	Binary Position Sensor 2 Input
BP4	Binary Position Sensor 4 Input
BP8	Binary Position Sensor 8 Input
BRK	Brake Pilot Output
BRKi	Brake Control Input
BUZ	Machine Room Buzzer Output
CDL	Cab Down Lantern Output
COL	Counter Weight Collision Switch Input (Traction Elevators)
CS	In Car Stop Switch Input
CSS	Car Safety String Input

Table 1: Main CPU Inputs & Outputs	
Name	**Description**
CTA	Car Top Automatic Input
CTS	Car Top Stop Switch Input
CUL	Cab Up Lantern Output
DBC	Dynamic Brake Relay Control Output
DC	Door Close Output
DCB	Door Close Button Input
DCBR	Door Close Button Rear Input
DCC	DAC Clear Output
DCL	Door Close Limit Input
DCLR	Door Close Limit Rear Input
DCR	Door Close Rear Output
DDA	Down Direction Arrow Output
DFi	Down Fast Input
DL	Down Level Sensor Input
DL-1	Down Level Sensor Secondary Input
DLB	Door Lock Bottom Input.
DLB-1	Door Lock Bottom Secondary Input
DLM	Door Lock Middle Input
DLM-1	Door Lock Middle Secondary Input
DLT	Door Lock Top Input
DLT-1	Door Lock Top Secondary Input
DN	Down Normal Limit Input
DNi	Down Run Input
DNR	Down Pilot Output
DO	Door Open Output
DOB	Door Open Button Input
DOBR	Door Open Button Rear Input
DOL	Door Open Limit Input
DOLR	Door Open Limit Rear Input
DON	Drive On.
DOR	Door Open Rear Output
DPM	Door Protect Monitor Input
DT	Down Terminal Limit Input
DT1-6	Down Terminal Input 1-6
DTS	Down Emergency Terminal Slowdown Input
DZ	Door Zone Input
DZsn	Door Zone Sensor Input
EBK	Emergency Brake Relay Output

Table 1: Main CPU Inputs & Outputs	
Name	**Description**
EBK1	Emergency Brake 1 Secondary Relay Output
EBK1i	Emergency Brake 1 Secondary Relay Input
EBKi	Emergency Brake Relay Input
EE	Electric Eye Input
EER	Electric Eye Rear Input
EMP	Emergency Power Input
EPS	Emergency Power Select Input
EQ	Earthquake Sensor Input
ETS	Emergency Terminal Up and Down Secondary Input
FB	Fire Buzzer Output
FF	Full Field Pilot Output
FFS	Fire Fighters Stop Switch Input
FL	Fire Phase I Light Output
FS	Fire Phase I On Hall Switch Input
FS2	Fire Switch Phase II On Input
FS2C	Fire Switch Phase II Call Cancel Input
FS2H	Fire Switch Phase II Hold Input
FST	Fire Stop Switch Override Output
FSTP	Fire Stop Switch Override Output
FSTPI	Fire Stop Switch Override Input
GBP	Gate Switch Bypass Input.
GOV	Governor Switch Input
GR1R	Rope Gripper 1 Relay Output.
GR2R	Rope Gripper 2 Relay Output.
GRT1	Rope Gripper Test Input 1.
GRT2	Rope Gripper Test Input 2.
GS	Car Gate Switch Input
GS-1	Gate Switch Secondary Input.
GTS	Rope Gripper Trip Switch Input.
HB	Handicap Buzzer Output
HBE	Handicap Buzzer Enable Input
HSS	Hatch Safety String Input
HWS	Hoistway Smoke Sensor Input
HWS2	Hoistway Smoke Sensor 2 Input
ICI	In-Car Inspection Input.
ICR	Inconspicuous Riser Input
ID	Car top Inspection Down Input
IEN	Inspection Enable Input

Table 1: Main CPU Inputs & Outputs	
Name	**Description**
IND	Independent Input
INDC	Independent Input in COP
INS	Car Top Inspection Input
ISER	In Service Output
IU	Car Top Inspection Down Input
LBP	Lock Bypass Input
LD	Down Hall Lantern Output
LDR	Rear Down Hall Lantern Output
LE	Level Enable Output
LE1	Level Enable 1 Output.
LE2	Level Enable 2 Output
LU	Up Hall Lantern Output
LUR	Rear Up Hall Lantern Output
LWA	Load Weighing Anti-nuisance
LWB	Load Weighing Bypass Input
LWD	Load Weighing Dispatch
MCA	Motor Contactor Output
MCAI	Motor Contactor Input.
MCC	Motor Contactor Output
MCCi	Motor Contactor Input.
MCX	Motor Contactor Auxiliary Input in series with the SFC terminal
MES	Main Egress Smoke Detector Sensor Input
MRI	Motor Room Inspection Input.
MRID	Motor Room Inspection Down Input.
MRIE	Motor Room Inspection Enable Input
MRIU	Motor Room Inspection Up Input.
MRS	Motor Room Smoke Sensor Input
MRSW	Motor Room Stop Switch
NBFB	Nudging/Fire Buzzer Output
NTSD	Normal Terminal SlowDown Initiation Output
NTSD1	Normal Terminal SlowDown 1 Seconedary Initiation Output
NTSDi	Normal Terminal SlowDown Initiation Input
NUD	Door Nudging Output
NUDR	Door Nudging Rear Output
OVL	Overload Input
P	Potential (Run Contactor) Input
P1-Pn	1ST – Nth Discrete Floor Position Indicator Outputs
PFC	Primary Fault Control Output

Table 1: Main CPU Inputs & Outputs	
Name	**Description**
PFCi	Primary Fault Control Input
PS	Pit Switch Input
RDY	Drive Ready Input
RGS	Rear Car Gate Switch Input.
RGS-1	Rear Car Gate Switch Secondary Input
RLM	Rear Lock Middle Input.
RLM-1	Rear Lock Middle Secondary Input
RLS	Rail Lock Switch Input
RST	Reset Drive Output
RTL	Return to lobby Input
RUN	Run Pilot Output
RUNAi	Run Auxiliary Input
RUNi	Run Input.
RUNX	Run Auxiliary Relay Input (Hardware run signal to the drive)
S10	Controller Power Input
SE	Safety Edge Input
SER	Safety Edge Rear Input
SFCi	Secondary Fault Control Input.
TAD	Top Access Down Input.
TAU	Top Access Up Input.
TF	Top Final Input
TPL	Temp Low Input (Hydraulic Elevators)
UDA	Up Direction Arrow Output
UFi	Up Fast Input
UL	Up Level Sensor Input
UL-1	Up Level Sensor Secondary Input
UN	Up Normal Limit Input
UP	Up Pilot Output
Upi	Up Run Input
UT	Up Terminal Limit Input
UT1-6	Up Terminal Input 1-6
UTS	Up Emergency Terminal Slowdown Input

4.9 Safety Processor Inputs and Outputs

Table 2: Safety Processor Inputs & Outputs

Name	Description
ACC	Access. Input equals 1 when the car is on access operation.
AUTO	Auto Input. Input equals 1 when the car is on automatic operation.
CTI	Car Top Inspection. Input equals 1 when the car is on car top inspection.
DL-1	Down Level Secondary Input. Input from the selector that the car is on the down level sensor in the door zone.
DLB-1	Door Lock Bottom Secondary Input. Input equals 1 when the bottom door lock is made.
DLM-1	Door Lock Middle Secondary Input. Input equals 1 when the middle door locks are made.
DLT-1	Door Lock Top Secondary Input. Input equals 1 when the top door lock is made.
DNR	Down Run Output. Output from the main CPU when the car is running down.
DT	Down Terminal Slowdown. Input goes low when the car is on the down terminal slowdown limit.
DTS	Down Emergency Terminal Slowdown. Input goes low when the car is on the down emergency terminal slowdown limit.
GBP	Gate Bypass. This is the input from the gate bypass switch. 1=bypass switch is on.
GS-1	Gate Switch Secondary Input. Input equals 1 when the front door gate switch is made.
ICI	In Car Inspection. Input equals 1 when the car is on in-car inspection operation.
LBP	Lock Bypass. This is the input from the lock bypass switch. 1=bypass switch is on.
LSCS	Leveling Speed Control. Output comes on when the car is traveling less than 150 fpm.
MRI	Motor Room Inspection. Input equals 1 when the car is on motor room inspection.
RGS	Rear Gate Switch. Input equals 1 when the rear door gate switch is made.
RLM-1	Rear Lock Middle Input. Input equals 1 when the rear middle locks are made.
SFCO	Safety Fault Control Output. Output must be on to energize the SFC relay. When this relay is dropped out, the safety string will be opened.
UL-1	Up Level Secondary Input. Input from the selector that the car is on the up level sensor in the door zone.
UP	Up Run Output. Output from the main CPU when the car is running up.
UT	Up Terminal Slowdown. Input goes low when the car is on the up terminal slowdown limit.
UTS	Up Emergency Terminal Slowdown. Input goes low when the car is on the up emergency terminal slowdown limit.

4.9 NTS Processor Inputs and Outputs

Table 3: NTS Processor Inputs & Outputs	
Name	**Description**
DN	Down Normal Slowdown Input
DNR	Down Run Input
DT	Down Normal Terminal Slowdown Input
DT1-6	Down Normal Terminal Slowdown 1 - 6 Inputs
NTSD	Normal Terminal Slowdown Initiation Output
NTSD1	Normal Terminal Slowdown 1 Secondary Initiation Output
UN	Up Normal Slowdown Input
UP	Up Run Input
UT	Up Normal Terminal Slowdown Input
UT1-6	Up Normal Terminal Slowdown 1 - 6 Inputs

4.10 APS Selector Inputs and Outputs

Table 4: APS Selector Inputs & Outputs	
Name	**Description**
UL	P2 Up Level Input
DL	P2 Down Level Input
DZ	P2 Door Zone Input (DZU ANDed with DZD for a 2 inch door zone)
DZA	P2 Door Zone Auxiliary Input (DZU ORed with DZD for a 3 inch door zone)
DZU	P2 Door Zone Up Input (Turns on 2” below the floor until 2” above the floor)
DZD	P2 Door Zone Down Input (Turns on 2” above the floor until 2” below the floor)
DZ Clip	P2 Door Zone Clip Input (Turns on momentarily when the camera passes the clip)
UN	P2 Up Normal Stop Input (2” above the top floor)
DN	P2 Down Normal Stop Input (2” below the bottom floor)
DT	P2 Down Normal Terminal Slowdown Input
DT1-DT3	P2 Down Normal Terminal Slowdown 1-3 Inputs
UT	P2 Up Normal Terminal Slowdown Input
UT1-3	P2 Up Normal Terminal Slowdown 1 – 3 Inputs
*DZ	P1 Door Zone Input (2“ door zone)
*DZA	P1 Door Zone Auxiliary Input (3” door zone)
*DZ Clip	P1 Door Zone Clip Input (Turns on momentarily when the camera passes the clip)
*UN	P1 Up Normal Stop Input (2” above the top floor)
*DN	P1 Down Normal Stop Input (2” below the bottom floor)

Note: Inputs with an asterisk in front of the mnemonic are for Processor 1 on the selector interface board. All other inputs are for Processor 2 on the selector interface board. Processor 1 operates from the same camera channel as the Main CPU (channel A). Processor 2 operates from camera channel B.

4.11 Relocate I/Os

Special Relocation I/O's are located on the Machine Room CAN bus, the Car Top CAN bus and the Group CAN bus. Each CAN bus has three input and three outputs for this purpose and are named as follows:

MRCAN		CTCAN		GRCAN	
Inputs	Outputs	Inputs	Outputs	Inputs	Outputs
MSPI1	MSPO1	CSPI1	CSPO1	GSPI1	GSPO1
MSPI1	MSPO2	CSPI2	CSPO2	GSPI2	GSPO2
MSPI3	MDPO3	CSPI3	CSPO3	GSPI3	GSPO3

The locations of these I/O are preset in the io.dat file and can be viewed on the diagnostic I/O display or on the board electronic ink label.

To relocate the I/O, select the "Relocate I/O" menu from the "Inputs and Outputs" menu. Then select the "Add I/O Relocation". Use the Up or Down button to select the input type and location such as CSPI1, (CTCAN car spare input 1). The type is an input and CSPI1 is located where the desired Input will be relocated. Hit the Enter button and then the Up or Down to select the I/O to be relocated. Only I/O's allowed on the selected bus will be displayed. When you reach the I/O to be relocated, then hit the Enter button again. Once an I/O has been selected, power must be cycled on the controller for the relocation to take place.

To remove an individual I/O from the relocation table, select the "Remove I/O Relocation" menu and then "Select I/O: None" and hit enter. To remove all I/O relocations, select the "Clear Relocation Table" menu and hit enter. Please refer to the Inputs and Outputs menu of the LCD Interface section for a graphic view of the Relocate I/Os menu.

4.12 Car Trace Screen

The new Trace I/O Screen resembles a limited Car I/O Screen with the addition of status data at the bottom of the screen. It is essentially a recording of the car I/O data and status. It is the exact data that is stored in the fault log when a fault occurs.

This feature requires v7.01.07 software and above and can be found on the Machine Room Monitor, Group Menu under: Car Trace Screen. It is also viewable from the Galileo wireless interface.

The trace screen works as follows:

When the controller powers up, it starts storing trace information at the preset time interval, usually 10 msec but can be adjusted to 20, 30 or 40 msec. This means that data is recorded for 5 seconds duration and will continue to cycle until stopped by the F2 key or from a set trigger.

It stops storing data when a trigger condition occurs. The trace information is the same data that we store for each fault occurrence but is stored in volatile memory, i.e. ***you lose it when you cycle power***. Even though the trace data is not stored in non-volatile memory, the trigger setup conditions is stored in non-volatile memory and will not be lost when power is cycled.

The playback commands from the machine room monitor are:

- F1 to re-start the trace
- F2 to trigger a stop trace condition. When the trigger is activated the controller will store 35 more trace frames and then will stop.

- The Home key places the count (frame) to the trigger point after the trace is stopped – start of trigger.
- The End key places the count to the last frame after the trace has stopped (i.e. 35 frames after the trigger point) – end of trigger.
- If you hit the End key and then one Up arrow key, the frame will be at the start of the trace.
- The Up and Down arrows increments or decrements the frame by one count
- The Page Up and Page Down keys increments or decrements the frame by ten counts.
- The Right and Left arrow keys rotate some of the status screen data at the bottom of the screen.

Using the Galileo wireless interface, the playback commands are graphical and allow you to step through the trace one frame at a time, 10 frames at a time, move the slider to any position and to play the trace for the entire run using the play button.

The trace trigger and timing can be setup from the “Trace Setup” menu under “Software Utilities”. Below is a list of the trace setup menus and their functions:

- Stop Trace Recording
- Start Trace Recording
- Trace Time Interval – Time interval from 10 to 20, 30 or 40 msec. Extends the trace time from 5 seconds to 10, 15 or 20 seconds respectively.
- Trace Trigger Arm – Arm the trace for a condition after power up:
  - Always Armed
  - Power Up Reset
  - Initial At Floor
  - Motion Start
  - Initial Stop,
  - Re-level Start
  - Front Door Open Start
  - Front Door Dwell Start
  - Front Door Close Start
  - Rear Door Open Start
  - Rear Door Close Start
  - Rear Door Close Start
  - Inspection Start
  - Safety String Start
- Trace Trigger Window – Time window for logic events to be considered valid. When the trigger condition is set for more than one condition and a trigger condition occurs momentarily, this is the duration of time that the momentary condition is considered valid. A value of 35 should work fine.
- Setup Trace Trigger – The logic condition for the trace trigger to occur. There is an “AND” trigger variable and an “OR” trigger variable. When a trigger condition is selected, the user must set it in the “AND” or “OR” trigger variable. A trigger condition cannot be set in both trigger variables. The trigger occurs when all the “AND” conditions are met or any of the “OR” conditions are met. In addition, the trigger ARM must also be active. Trigger conditions can be set from the following:
  - Fault change
  - Fault match
  - servf change
  - servf match
  - procf change
  - procf match
  - run_statusf change
  - run_statusf match
  - slowdown change
  - slowdown match
  - rear slowdown change
  - rear slowdown match
  - statusf change
  - statusf match
  - statusf2 change
  - statusf2 match

  - Fault Bits 0 change
  - Fault Bits 0 match
  - Fault Bits 1 change
  - Fault Bits 1 match
  - Fault Bits 2 change
  - Fault Bits 2 match
  - Fault Bits 3 change
  - Fault Bits 3 match
  - SPB service change
  - SPB status change
  - SPB command change
  - NTS service change
  - NTS status change
  - NTS command change
- Show Trace Trigger Logic
- Clear Trace Trigger Logic

Section 5 – LCD Interface

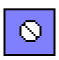
5.1 Operating the LDC Interface

UP button is used to scroll up to the next menu item or to increment a data value.

DOWN button is used to scroll down to the next menu item or to decrement a data value.

MODE button is used to go back to the previous menu or to select a digit of a data value.

ENTER button is used to select the menu item or to complete the operation of changing a data value.



Potentiometer is used to adjust the viewing angle. It will make the display lighter or darker.

The LCD display interface board uses a 2 line by 24 character display and four buttons. This interface allows the user to adjust parameters, view critical controller information, to implement the controller setup and to view the elevator status. Upon power-up the display shows a blinking GALaxy name to indicate the controller is running as show above.

The four inputs buttons used with the LCD display are, UP, DOWN, MODE and ENTER. The UP and DOWN buttons are used to scroll up and down to each menu item. When an appropriate menu item is reached, the ENTER button is used to select the item. Some menu items, once selected, show a second menu. Again, use the UP and DOWN buttons to scroll through the menu items and the ENTER button to select a particular item. The MODE button is used to go back to the previous menu. When a menu item is an adjustable variable, select the item with the ENTER button and change the variable with the UP or DOWN button. The MODE button is used to move the cursor to the next digit. When the appropriate value is reached, used the ENTER button to complete the variable change operation and return to the current menu.

The following are descriptions of the flowcharts at the end of the chapter. The descriptions and flowcharts are separated to allow more page territory to the graphics and make them more readable.

The descriptions are in the same order as the flowcharts.

LCD Interface Main Menu:

This flowchart shows all the top level menus in the system.

Elevator Status:

The elevator status display continuously updates to show the current status and fault information. The Up and Down keys allows access to both status display and the velocity display. When a system fault occurs, it will be displayed on the top line of the status display while the fault exist and will remain for 60 seconds after the fault is cleared. The following status information can be displayed:

Elevator Service:		
Out of Service	Fire Phase 1 Alt Return	Hall Switch Elevator Off
Automatic Service	Homing	Low Pressure
Independent Service	Reset Going Up	Hospital Service
Load Weighing By Pass	Reset Going Down	Priority Service
Attendant Service	Stalled Out of Service	Security Recall
Code Blue Service	Return to Lobby	Sabbath Service
Fire Service Phase 2	Load Weighing Overload	TUG Service
Emergency Power Service	Medical Emergency Serv	Hot Oil Operation
Earth Quake Service	Calibrate Load Weigher	Riot Control
Fire Phase 1 Main Return	Car Switch Elevator Off	

Elevator Status:		
Reset Mode	Constant Accel	Elevator Parked
Inspection Mode	Roll Over Max Vel	Waiting Assignment
Up Fast	Constant Velocity	Door Procedure
Up Transition	Roll Over Deccel	Elevator Stalled
Leveling Up	Constant Deccel	Reset Hydro Jack
Down Fast	Targeting Floor	Low Pressure Mode
Down Transition	Emergency Slowdown	Auto Learn HW Mode
Leveling Down	Safety String Open	Emp Recovery Mode
Soft Start Mode	Elevator Off Line	Hot Oil Mode

Door Status:		
Elev Door Closed	F2CPO Door Opening	F2HLD Door Opening
Elev Door Opening	F2CPO Door Closed	F2HLD Door Closed
Elev Door Dwelling	F2CPO Door Closing	F2HLD Door Closing
Elev Door Open	F2CPC Door Open	F2MBC Door Open
Elev Door Closing	F2CPC Door Opening	F2MBC Door Opening
Elev Door Nudging	F2CPC Door Closed	F2MBC Door Closed
F1RET Door Open	F2CPC Door Closing	F2MBC Door Closing
F2CPO Door Open	F2HLD Door Open	

Rear Door Status:		
Rear Door Closed	F2CPO RDor Opening	F2HLD RDor Opening
Rear Door Opening	F2CPO RDor Closed	F2HLD RDor Closed
Rear Door Dwelling	F2CPO RDor Closing	F2HLD RDor Closing
Rear Door Open	F2CPC RDor Open	F2MBC RDor Open
Rear Door Closing	F2CPC RDor Opening	F2MBC RDor Opening
Rear Door Nudging	F2CPC RDor Closed	F2MBC RDor Closed
F1RET RDor Open	F2CPC RDor Closing	F2MBC RDor Closing
F2CPO RDor Open	F2HLD RDor Open	

High Priority Elevator Status:		
S10 Input Off	Run Fault: Shutdown	KEB Drv Not In Run
HC Input Off	Annual Safety Test	At Floor Shutdown
SS Input Off	Waiting for SAFE	1036 Auto Run Hold
READY Input Off	Terminal Limit Flt	Reset Run Failure
Gripper/EBK Fault	GTS Input Off	Invalid SEL count
I/O Error	UL,DL,DZ Off at FL	COP can comm error
Insp or Byp Error	Brake CAN Error	Encoder can comm error
Bin. Pos. Error	Fire Stop Sw. Off	IO Test in progress
Position Error	SEL CAN Com Error	Gripper Test in progress
AD Input Off	UL or DL Fault	No Power to Drive
CS Input Off	Leveling Fault	Non Interference timer
Door Zone Fault	Hardware Init Flt	Door open request
Gate/Lock Fault	Front Door Cls Flt	Waiting for DPM
P Input On	Rear Door Clos Flt	Waiting for RPM
Looking for DCL	Line Voltage Fault	Viscosity operation
Door Close Contact	Door Voltage Fault	Leveling request
Brake Switch Fault	BK Lift Sw Run Flt	Terminal Limit Speed Clamp
TOC CAN Com Error	Door Motor OVL	Sped Rate Clamp
DRIVE Com Error	Learn Hoistway Flt	Front EE Test failed fault
Saf Proc Com Error	UPS Fault	Rear EE Test failed fault
DB Res. Temp. Trip	Em Brake CAN Error	Setup Mode No Auto

Fault Status:
See the CPU FAULTS Section

Set Calls and Lockouts:

When a car is in the group, the menu system allows access to setting both hall calls and car calls. When the controller is not the group, only car calls can be set. Rear car calls and lockouts are displayed only when the car has a rear door.

Car Call Test:

This menu allows the mechanic to initiate a continuous test of the elevator. The test can be conducted with the “AUTO DOORS” switch set to “ON” or “OFF”. By following the instructions from the menu, the “Car Call Test” can be initiated or discontinued. When performing the “Car Call Test”, the car will answer all of the registered calls in one direction. When the last call has been answered, the calls will be re- initiated automatically, and the car will answer the calls in the opposite direction. This operation will continue until one of the following occurs.

- The test is discontinued from the LCD interface
- The car is taken out of automatic operation
- A fault occurs

NOTE: The car will not perform the “Car Call Test” if it is on “Independent Service”.

NOTE: When performing the “Car Call Test” with the “AUTO DOORS” switch set to “OFF”, it is recommended to set the “Non-interference Time” to at least 5 seconds. From the LCD interface, navigate to the “Adjustable Variables” menu, “Car Timers” and set “Non Interfer T = 5”.

Inputs & Outputs:

Inputs and outputs show a “1” for ON and a “0” for OFF. A list every input and output used on the controller and the board it is located on is shown in the Troubleshooting section. The controller determines which boards are used depending on the options selected and the number of front and rear floors. The Input and Output menu has sub-menus to access car, group, Safety Processor and NTS Processor I/O’s. All I/O locations are determined from an io.dat file on the SD Card. I/O’s in the lines 0-13 and 138-146 of the io.dat file are placed at hardware dependent locations and their table location should never be changed.

Job Statistics:

The Job Statistics menu shows the number car calls and the number and percent of hall calls serviced since the job was started or since the job statistics were cleared. Listed are all the categories maintained:

- Number of Car Calls
- Number of Up Hall Calls
- Number of Down Hall Calls
- Number of Up Hall Calls with < 15 second wait time
- Number of Up Hall Calls with < 30 second wait time
- Number of Up Hall Calls with < 45 second wait time
- Number of Up Hall Calls with < 60 second wait time
- Number of Up Hall Calls with > 60 second wait time
- Number of Down Hall Calls with < 15 second wait time
- Number of Down Hall Calls with < 30 second wait time
- Number of Down Hall Calls with < 45 second wait time
- Number of Down Hall Calls with < 60 second wait time
- Number of Down Hall Calls with > 60 second wait time
- Percent of Hall Calls with < 15 second wait time
- Percent of Hall Calls with < 30 second wait time
- Percent of Hall Calls with < 45 second wait time
- Percent of Hall Calls with < 60 second wait time
- Percent of Hall Calls with > 60 second wait time

Adjustable Variables:

This Adjustable Variables menu allows modification of numerous field adjustable parameters for the main CPU, the Safety Processor and the NTS Processor. Refer to the Adjustable Variables section for a list of all parameters and their functions.

Car Timers:

This is an example of an Adjustable Variables submenu. Other Adjustable Variable submenus are similar

Date and Time:

It is important to set the date and time on the controller clock so that the fault log shows the correct time sequence that faults occur.

Diagnostics:

The diagnostics menu shows the communications status to all serial devices. For most devices, the device version and the transmit/receive counts are displayed. The transmit/receive counts should always be incrementing for all devices. All CAN bus communications ports show a “TxErr” and “RxErr” error counts that should always be zero. A non-zero value of the error count on a CAN channel or a receive counter not incrementing on any serial channel indicates a poor cable connection or electrical noise on the cable. The diagnostic menu also contains a “View System Status” display that logs changes in the faults, status and service of the elevator.

The following are all submenus of Diagnostics and are useful to troubleshoot status and communications.

Boards, systems, and other controllers are checked here for proper communications (on-Line) and firmware versions. The submenus are as follows:

- View System Status Log
- Group Comm Status
- Group CAN Comm Status
- Car CAN Comm Status
- Machine Room CAN Comm Status
- Safety CAN Comm Status
- Drive Comm Status

Software Utilities:

The software utilities menu allows the user to view the controller’s software version, run power-up mode, test the CPU watchdog timer, access SD Card operations and to preset all limit velocity values.

View Software Version: Display the software version, revision and interim revision in the form 7.00.31.

Run Power-Up Mode: The Power-Up Mode is a program that executes first upon power up of the controller. It checks that there is a valid controller program in memory and that a valid cons.dat file is on the SD Card. Once this is validated, the power up program runs the controller program. If the power up program is executed from the controller program or if during power up, the user presses and holds the enter and mode buttons, this routine does not run the controller program but stays in the power up routine to allow for updates of the controller program. The Power-Up Mode is also used to upload new controller software for the Main CPU, the Safety Processor and the NTS Processor from the SD Card.

Test Watchdog Reset: The watchdog is a CPU timer that must be updated periodically in software to confirm that the program is still running correctly. If the watchdog is not updated, the timer will expire and cause the CPU to do a hard reset to allow the program to restart. To test the watchdog timer, when the command is given, the controller program sits in an infinite software loop without updating the watchdog time to test that the reset function works.

Reset Debug Variables: The debug variables are set by a software engineer to aid in debugging a softw are problem. Some problems are especially difficult to catch because they occur infrequently or at seemingly random times. The debug variables are displayed in the detailed Elevator Status Menu so that a mechanic view the variable and report back to the software engineer. The reset debug variables menu allows the mechanic to reset the variables to zero to aid in debugging.

SD Card Read/Write Data: This menu item allows the user to read and write controller data to and from the SD Card. This menu is explained in detail in the next section.

SD Card Status: This is the Secured Digital Card Status showing if the card has been initialized (Init=1), if it is standard or High Capacity (HC=1), and if it can operate at an acceptable voltage level (VStat=1).

Power-Up Mode:

When the Main CPU powers up, it runs a power-up routine that verifies the checksum of the controller program in local flash memory and then verifies that the job configuration file is on the SD Card. If all is okay, the power-up routine jumps to the controller program. If the power up does not pass verifications, program control stays in the power-up routine and the elevator is not allowed to run. To enter power-mode (run the power-up routine), cycle the power while pressing the “Enter” and “Mode” button on the LCD Display Interface and then release the button when the display indicates to do so. Alternately, this mode can also be entered by placing the car on inspection and selecting the “Run Power-Up Mode” sub-menu item located in the “Software Utilities” menu.

Update / Verify Program

This menu is used to check the integrity of the CONS file, the controller program and the SD card itself. It is also used to update the controller software: the controller must be booted without an SDcard and when the “Power-Up Mode” screen is seen the SD card can be inserted and updated at the “Update/Verify Program”->”Load Program from SDCard” submenu.

Select Video Display:

This menu allows you to select different display screens when a machine room monitor is installed on this car. If the monitor is installed on a non-dispatcher car, then only information for that car is displayed on the monitor.

Service Activation Timers:

All services have either an input that triggers them or a condition that makes the service become active. The "Service Activation Timers" could be used in addition to those inputs. The timers will allow a feature to be turned on during specific times of the day without the need of a specific condition or switch to be turned on. All GALaxy traction and complex hydro controllers have service activation timers built in. You can program up to ten different timers (TIMER0 to TIMER9).

These timers will turn on services that will run only during these predefined times. At this moment, there are fourteen built in different services:

- Parking
- Alternate Parking
- Next Up
- Up Peak
- Down Peak
- Alternate Lobby
- Alternate Floor Security
- Car Call Lockouts
- Group Car Call Lockouts
- Car Call Override
- Group Car Call Override
- Sabbath
- CC Push Button Security
- Floor Security Table 2- 4

There are two different types of settings to choose from to determine when the timers will run:

(1) **Day of the Week:** this will allow you to turn on and off services for each individual day of the week. This is a total of seven on and off time settings.

(2) **Month and Day:** these will only run the date they are set for. There are three on and off settings for this type.

The most common setting will be “day of the week” but “month and day” timers will be useful for programming special events or holidays. Setting the “day of the week” timer makes the selected service run repeatedly every day. Month and Day timers will run only once a year.

Programming the timers could be done through the LCD interface or the Galileo Interface. Once the timers are programmed in, you could disable or enable the timer without modifying all the settings. In other words, a timer could be programmed completely and stay disabled until the building is ready for implementation. At that point you would just turn it on.

Display Hoistway Table:

This menu is useful for checking the direction of the encoder by watching if pulse counts are counting up or down. Once the hoistway is learned, the pulse count values for each floor can be displayed. If the pulse count for each floor is zero, the hoistway has not been learned or retained in memory. The velocity displayed here is the speed of the car read from the car's position feedback system. The top line shows current pulse count which can be compared to the stored pulse count. The second line are the learned values.

Note that the first landing should have a higher pulse and distance count than the DN values, ie. DN 0.0, first landing 0.1 (second line on the right). It is possible to adjust the pulse count slightly, but it is recommended that the magnets be moved and the hoistway relearned.

DZ & DZ Offset, Sel Cnt:

This menu provides status information when using a CAN open encoder. It also allows the mechanic to adjust the "Dn Lev Dist" and "Up Lev Dist" parameters in order to "fine tune" the floor levels after the car is running high speed. These parameters are valid when the "Stop on Pos" adjustable variable is enabled. Refer to the "Fine Tune The Ride Quality" in sections 3 for proper adjustment.

FL & FL Offset Count:

This menu allows the mechanic to adjust the stored floor count for each floor level. It also allows offsets to be used to "fine tune" the floor levels after the car is running high speed. The "Floor Level Offset" is valid when the "Stop on Pos" adjustable variable is enabled. Refer to the "Fine Tune The Ride Quality" in sections 3 for proper adjustment.

Reset Update Count Trig, Pulse Count Update Data:

This menu is valid when the "Pos Count Upd" variable is enabled. When this variable is enabled, the DP count will be updated while the car is in motion. The "Pulse Count Update Data" menu provides detailed information in order to properly set this variable. The "Reset Update Count Trig" menu allows the mechanic to manually reset the "Update Trigger".

Elevator Setup:

From this menu, the user can select to set all of the speed clamps, learn the hoistway, run an overspeed test, run a car buffer test or run a counterweight buffer test, open and close the doors on inspection and setup the load weigher.

Auto Learn Hoistway:

This operation is used to automatically learn the hoistway on initial setup. From the LCD Interface, select the "Elevator Setup" menu, use the up or down button to select the "Learn Hoistway" item and then hit enter. Follow the directions displayed for each step. Learn Hoistway can be initiated with the car located anywhere in the hoistway but is usually quicker to run the car to the bottom first.

Inspection Learn Hoistway:

This operation is used to manually learn the hoistway on initial setup. From the LCD Interface, select the "Elevator Setup" menu, use the up or down button to select the "Learn Hoistway" item and then hit enter. Follow the directions displayed for each step. Learn Hoistway can be initiated with the car located anywhere in the hoistway but is usually quicker to run the car to the bottom first.

Learn Limit Velocities:

This operation is used to setup the clamp values or trip velocities for the Main CPU, Safety Processor and NTS Processor for when the appropriate terminal limits are hit. From the LCD Interface, select the "Elevator Setup" menu, use the up or down button to select the "Learn Limit Velocities" item and then hit enter. Follow the directions displayed for each step. The "Learn Limit Velocities" procedure should be run only after the ride of the car is adjusted (acceleration and decelerations are set as desired).

Manually Setting Main CPU Speed clamps:

Once the car is running on automatic, the acceleration and deceleration rates are adjusted, and several runs have been made to the top and bottom terminals at contract speed, the speed clamps can then be adjusted. Using the set speed clamp menus on the LCD interface, select the clamp to adjust and hit enter to access that particular speed clamp setting. In the above illustration, the suggested setting is shown as the "Clamp Speed" and the actual clamp setting is shown as "Ins/ Level Spd". The enter button is used to enter and exit the edit mode. Once in the edit mode, the mode button selects the next digit to edit. The up and down buttons increment or decrement the clamp speed setting. All speed clamps are adjusted in the same manor. The speed clamps that can be adjusted are the inspection/leveling speed clamp, the Down and Up Terminal Slowdown speed clamps (DT/UT, DT1/UT1, DT2/UT2 and DT3/UT3) and the Down and Up Emergency Terminal Speed clamp (DTS/UTS).

Inspection Open – Close Door:

The menu allows the user to open or close the elevator doors from the up or down LCD interface buttons while the car is on inspection.

Lift Brake on Inspection:

The flowchart describes the steps needed to lift the brake on inspection. **WARNING**: Brake will lift during this test. Make sure all safety procedures are observed.

Loadweigher Setup:

The load weigher hardware is setup according to the manufacturer's instructions. The controller is then setup to read the empty and full load values at every floor

Load Weigher View/Modify:

In this menu the load limits can be modified.

Calibrate Load Weigher:

This is the procedure for calibrating the Loadweigher.

Counterweight & Buffer Test:

The car and counterweight buffer test follow the same menu operation. For specific instruction on executing a buffer test, refer to Appendix B.

Overspeed Test:

The overspeed test disables the velocity check for the car traveling faster than 15% over contract speed. The mechanism is disabled for one run. See Appendix B for instruction on running an overspeed test.

Reset Gripper Menu:

This shows the procedure for resetting a Gripper Fault.

Fault Log:

This menu allows the user to view or clear the fault log.

View Fault Log:

The fault display shows the fault, the car position, time and date the fault occurred and the number of occurrences. Faults are displayed in the order of occurrence with the order number displayed on the top left. The largest order number signifies the last fault that has occurred. Faults are stored in a circular buffer that fits up to 50 faults. Once the buffer is full the next fault over writes the oldest fault. Refer to the system faults in the troubleshooting section of this manual for possible causes of the fault and a description of the detailed fault data.

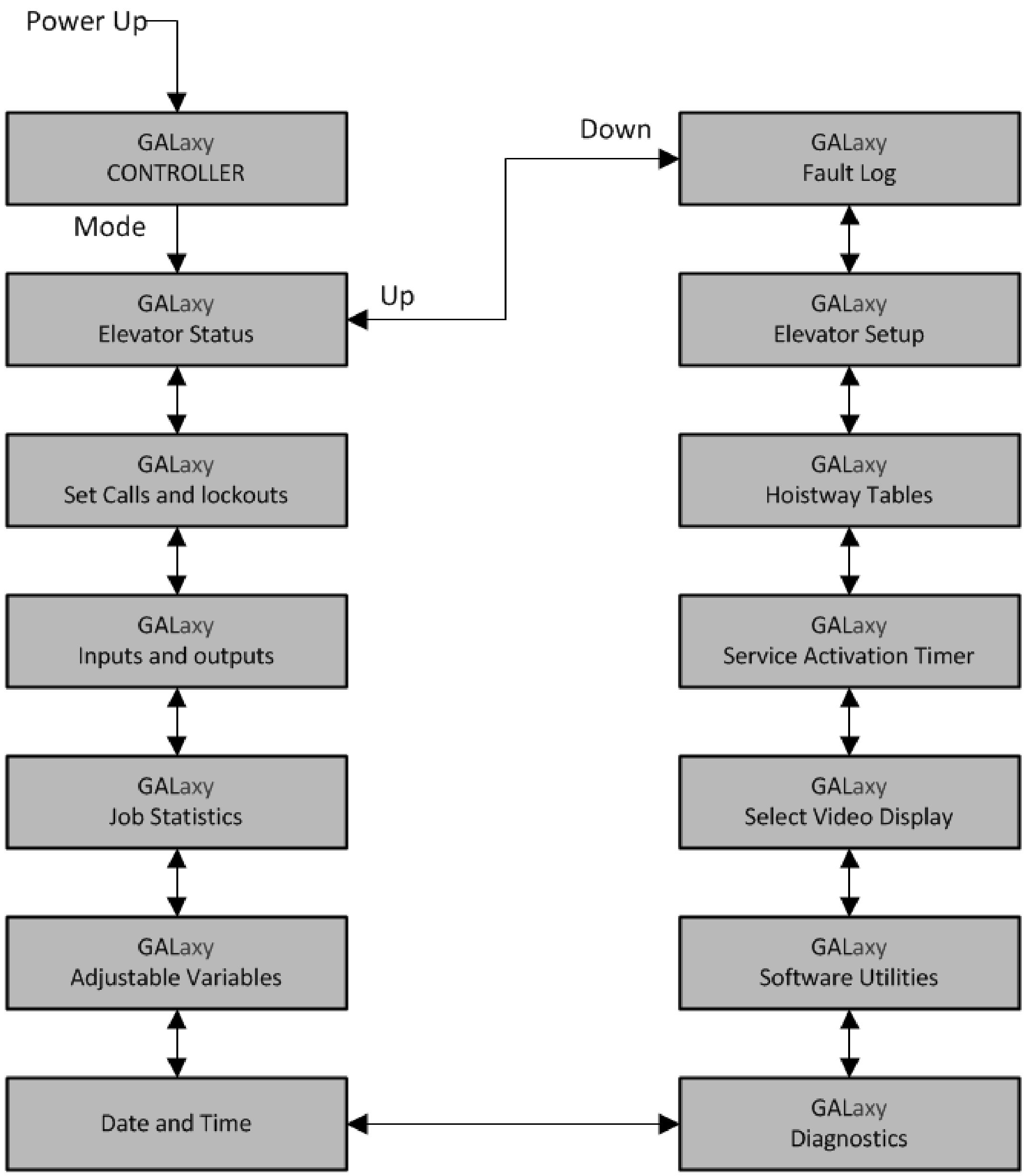
Clear fault log:

This operation clears the fault log. Once cleared, all faults will show "No Occurrences" until a new fault occurs.

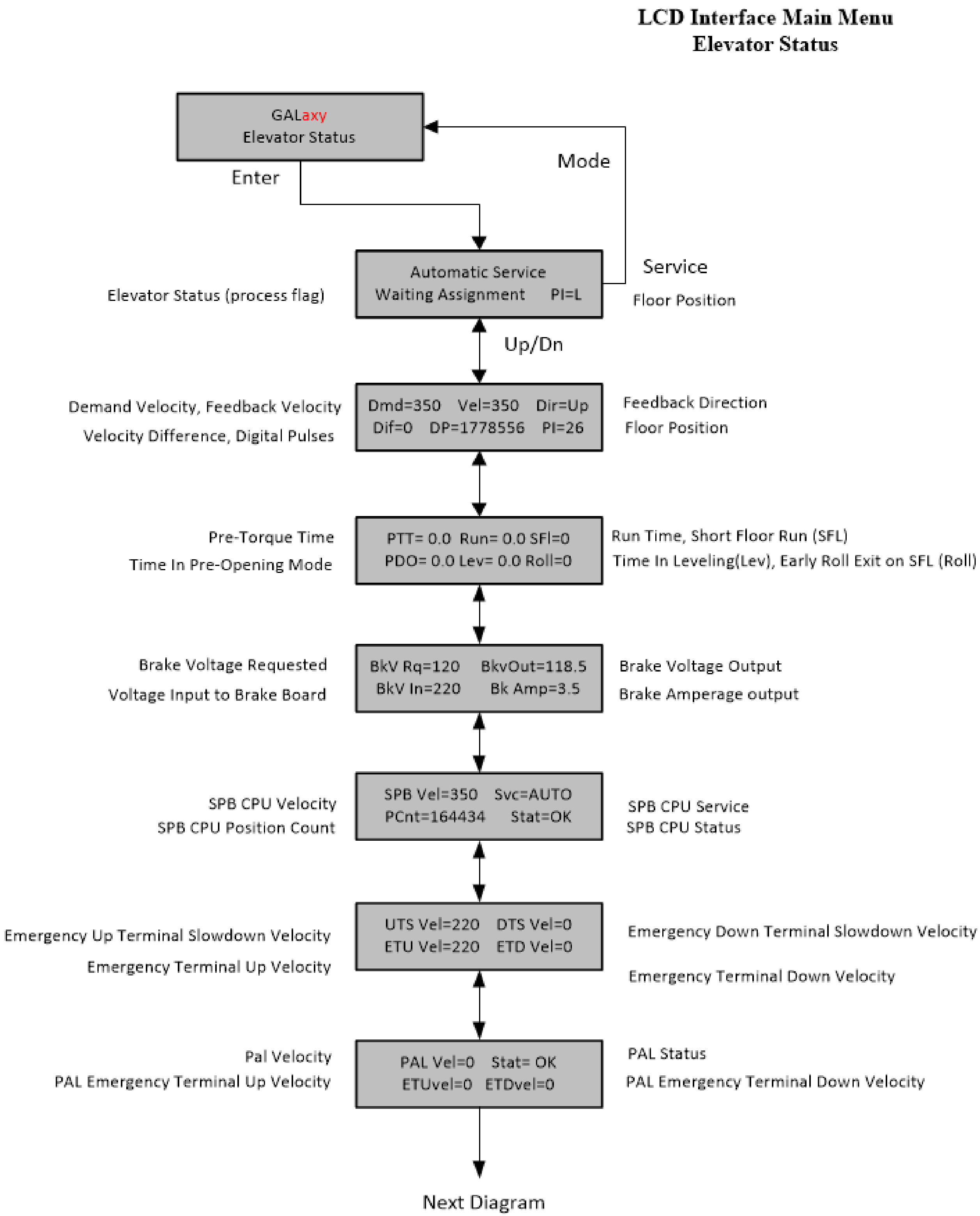
5.2 LCD Menu Diagrams

5.2.1 Main Menu

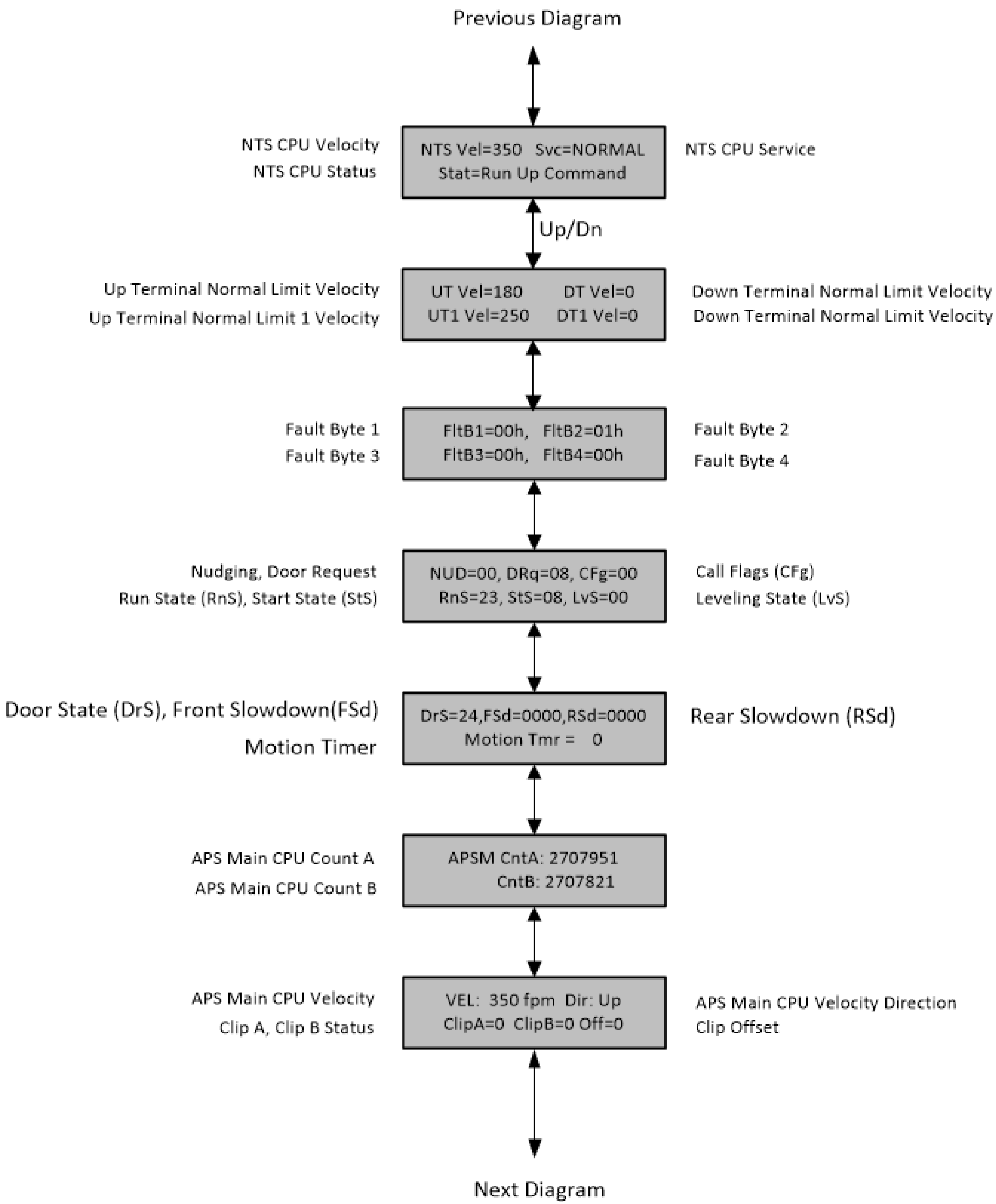
LCD Interface Main Menu



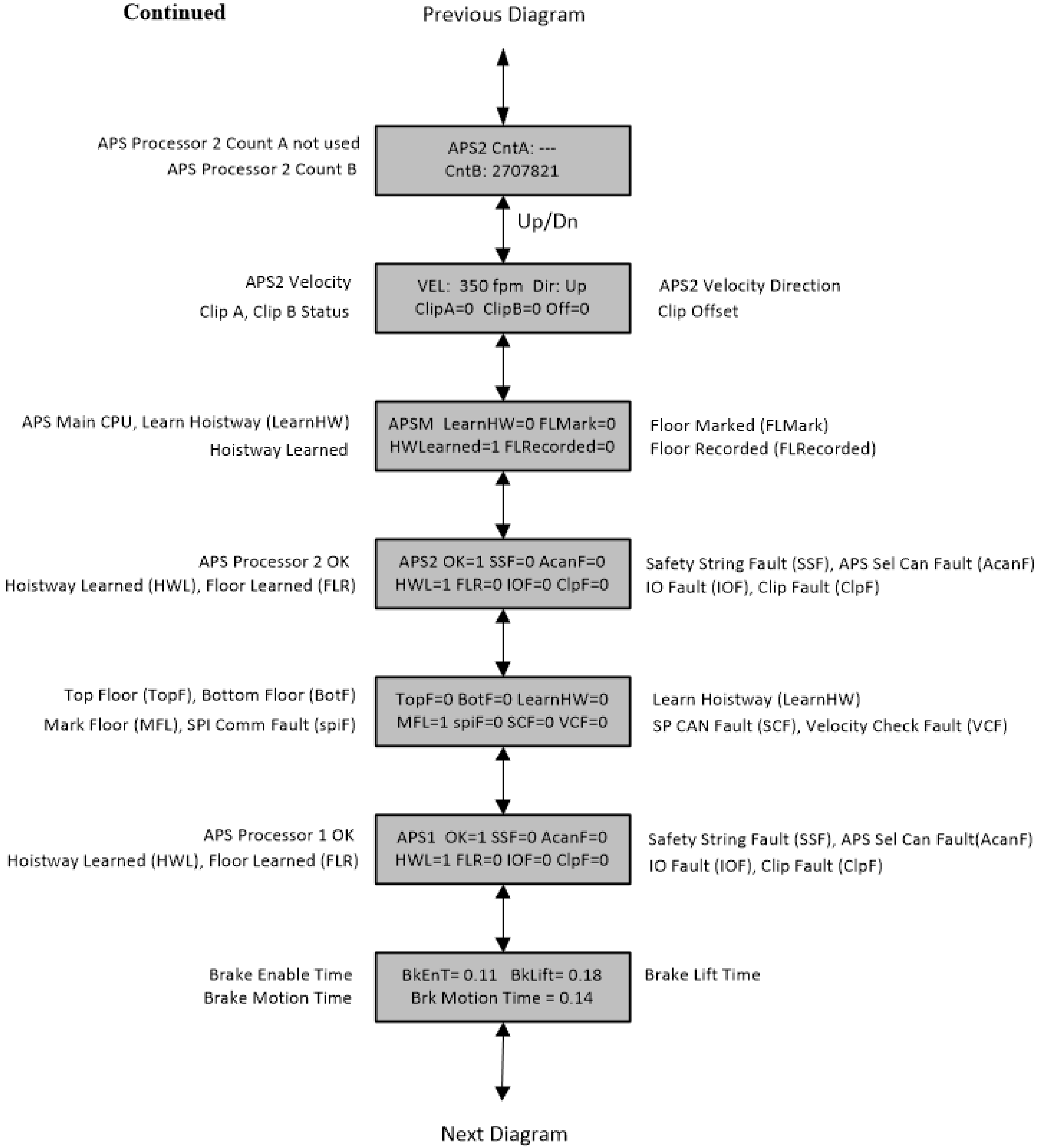
5.2.2 Elevator Status



LCD Interface Main Menu
Elevator Status
Continued

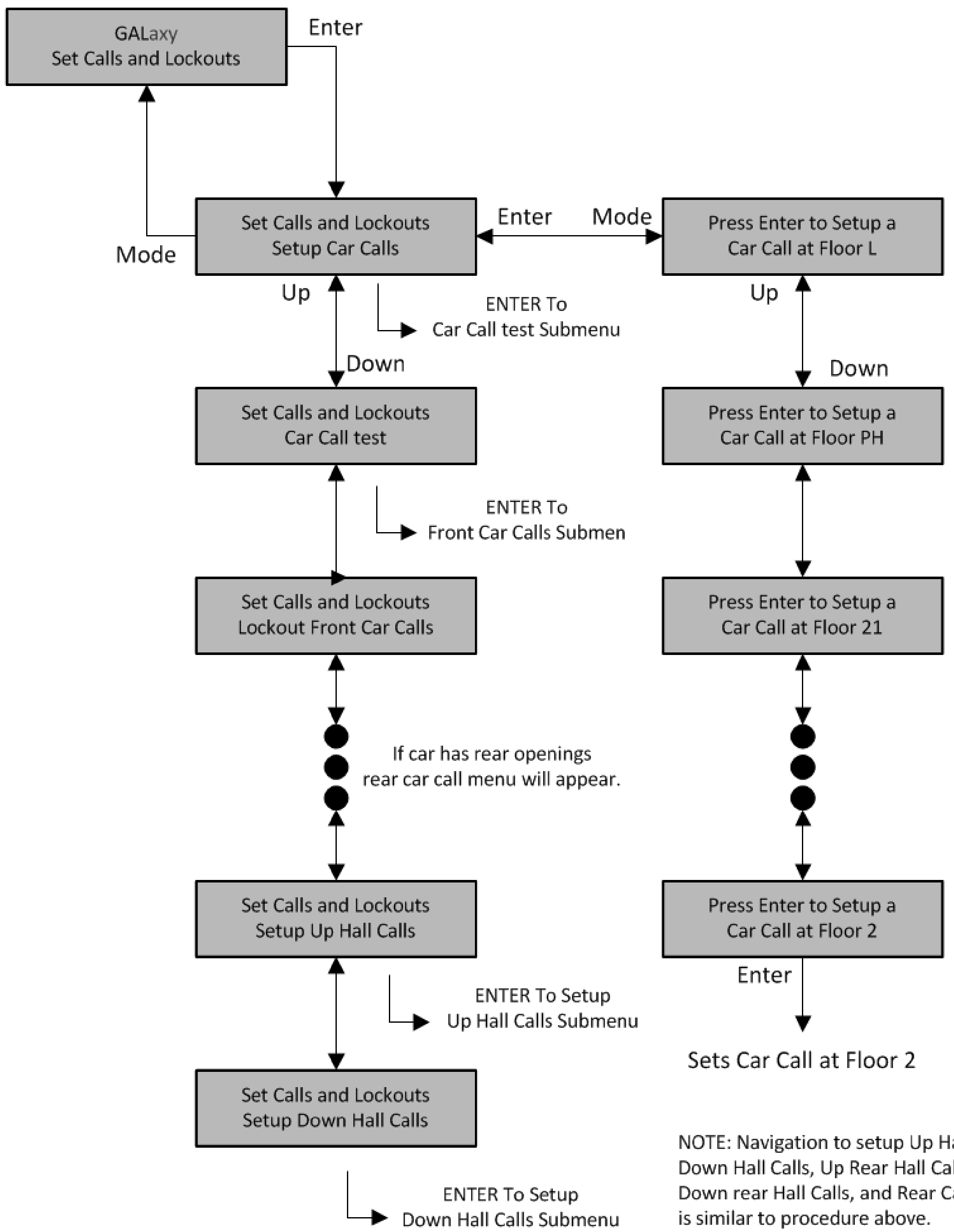


LCD Interface Main Menu
Elevator Status
Continued



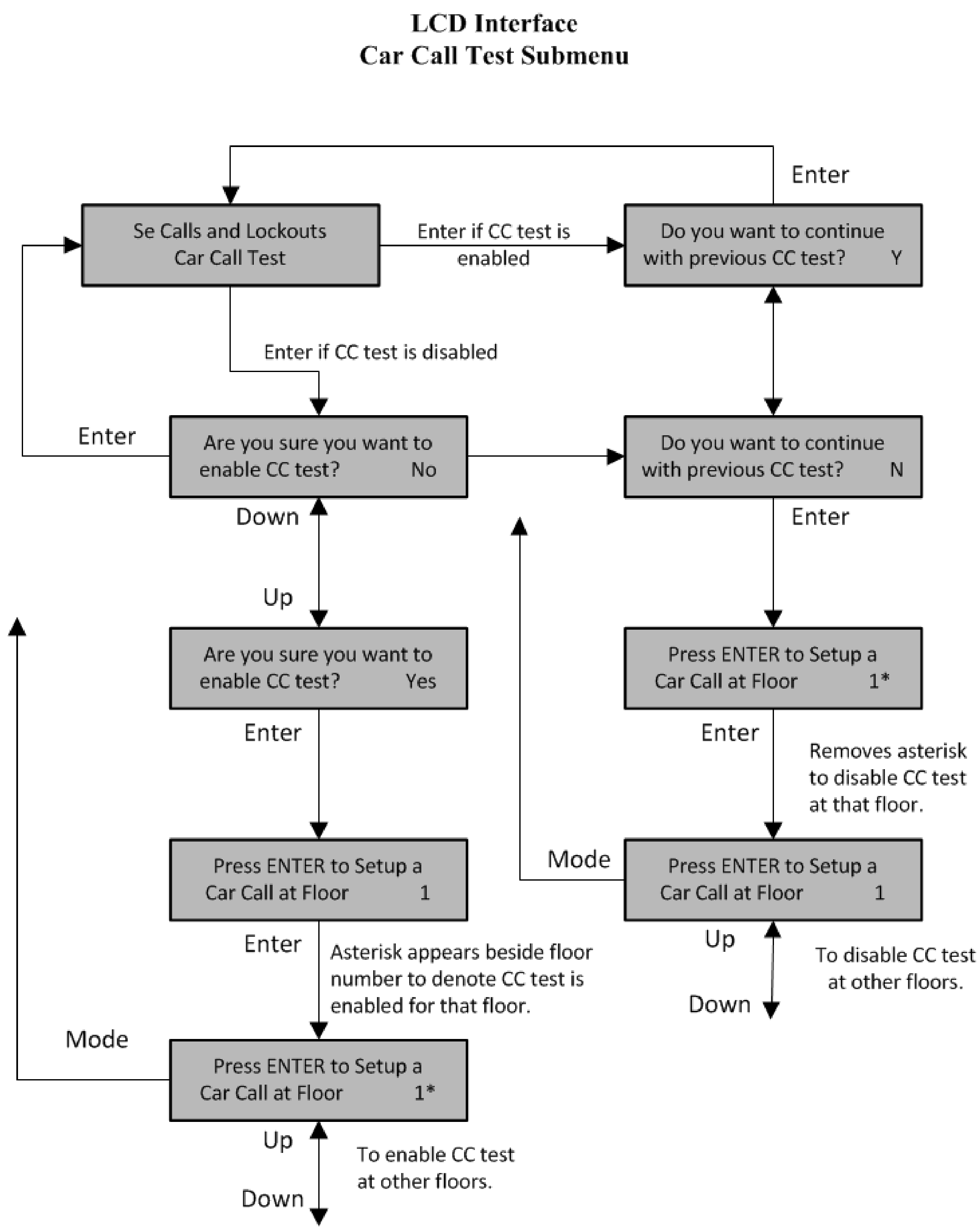
5.2.3 Set Calls and Lockouts

LCD Interface Main Menu
Set Calls and Lockouts



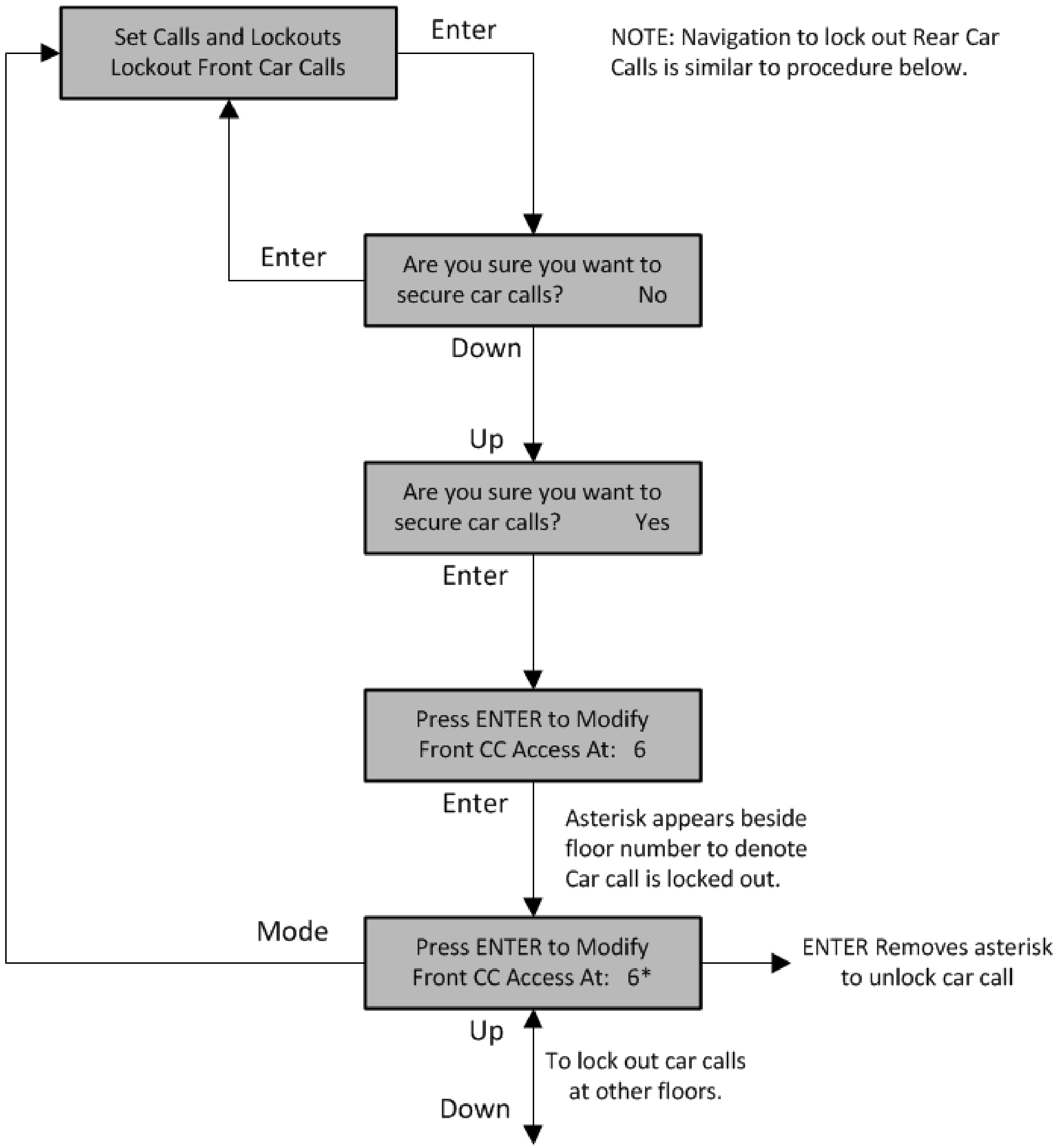
NOTE: Navigation to setup Up Hall Calls, Down Hall Calls, Up Rear Hall Calls, Down rear Hall Calls, and Rear Car Calls is similar to procedure above.

5.2.3.1 Car Call Test

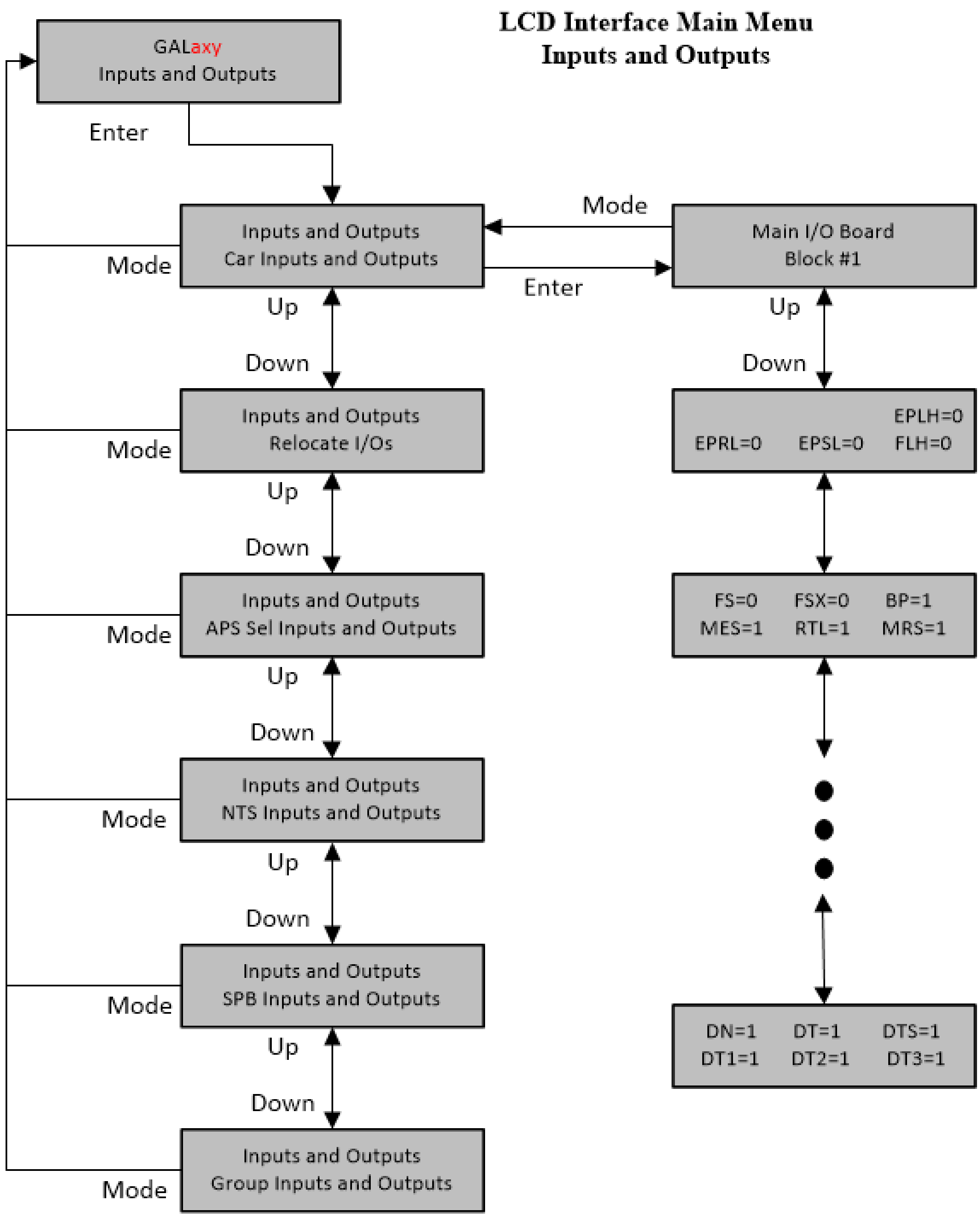


5.2.3.2 Lockout Front Car Calls

LCD Interface
Lockout Front Car Calls Submenu

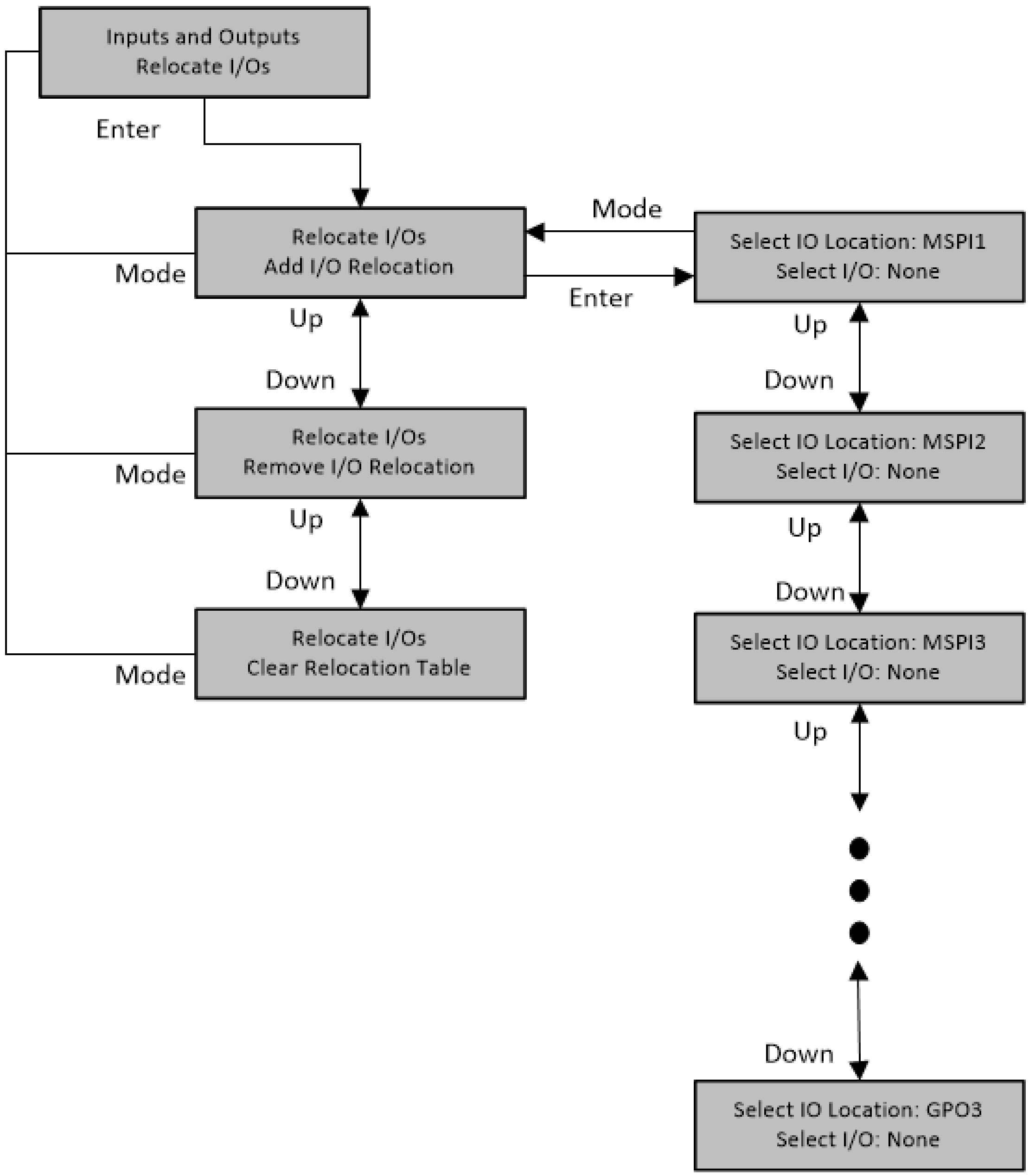


5.2.4 Inputs and Outputs



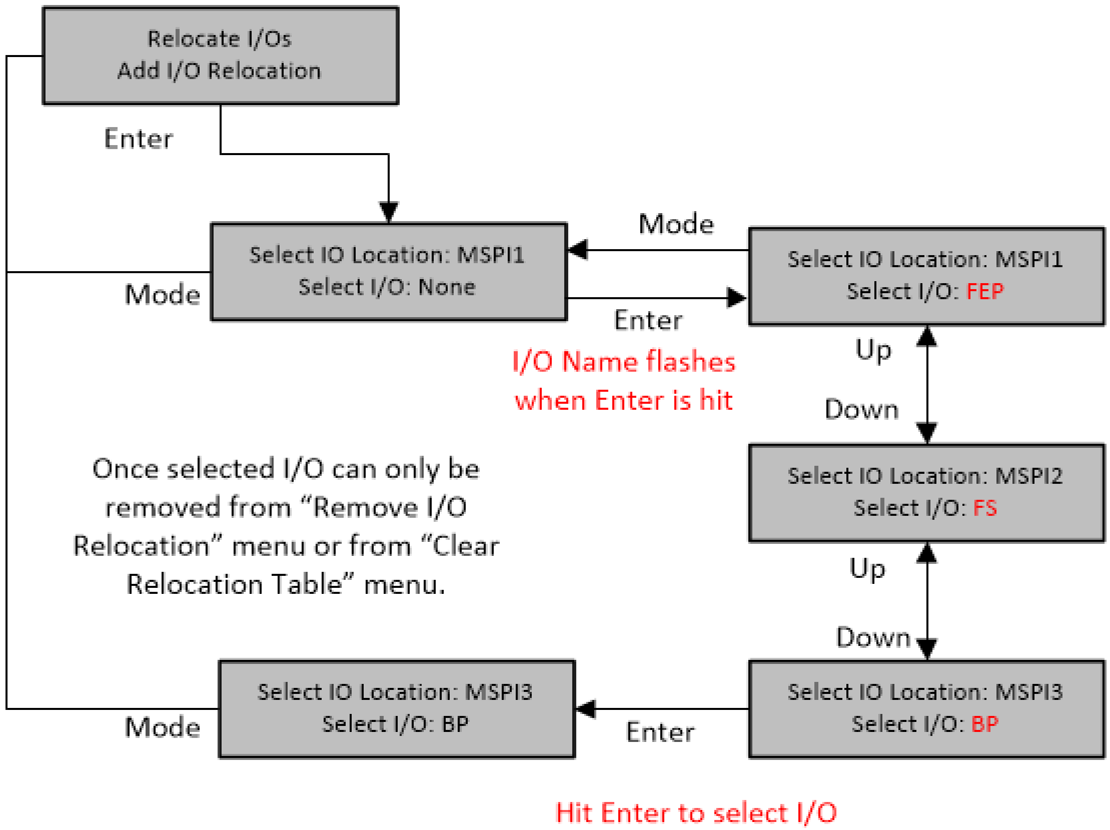
5.2.4.1 Relocate I/Os

LCD Interface Main Menu
Relocate I/Os



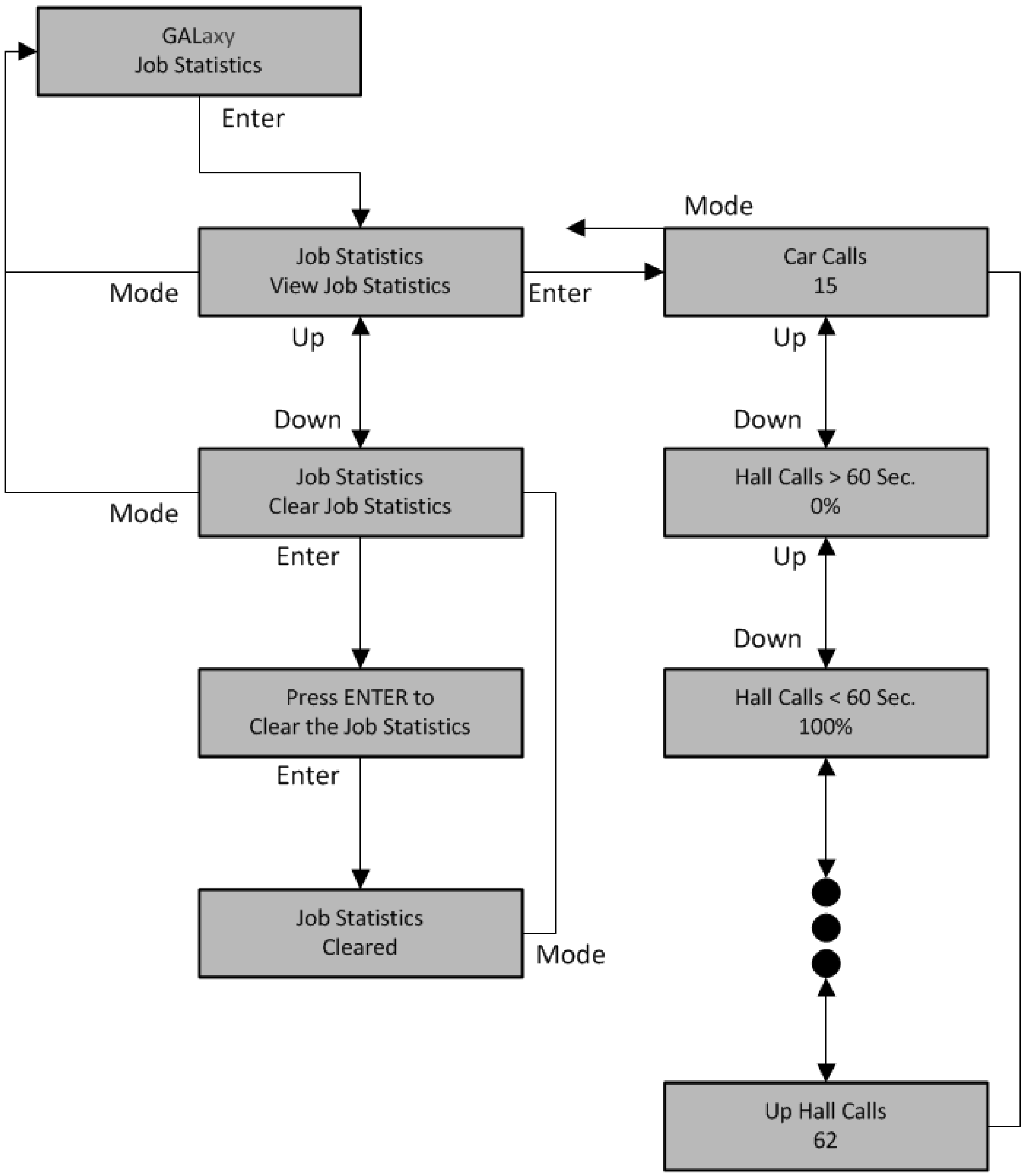
5.2.4.1 Add I/O Relocation

LCD Interface Main Menu
Add I/O Relocation

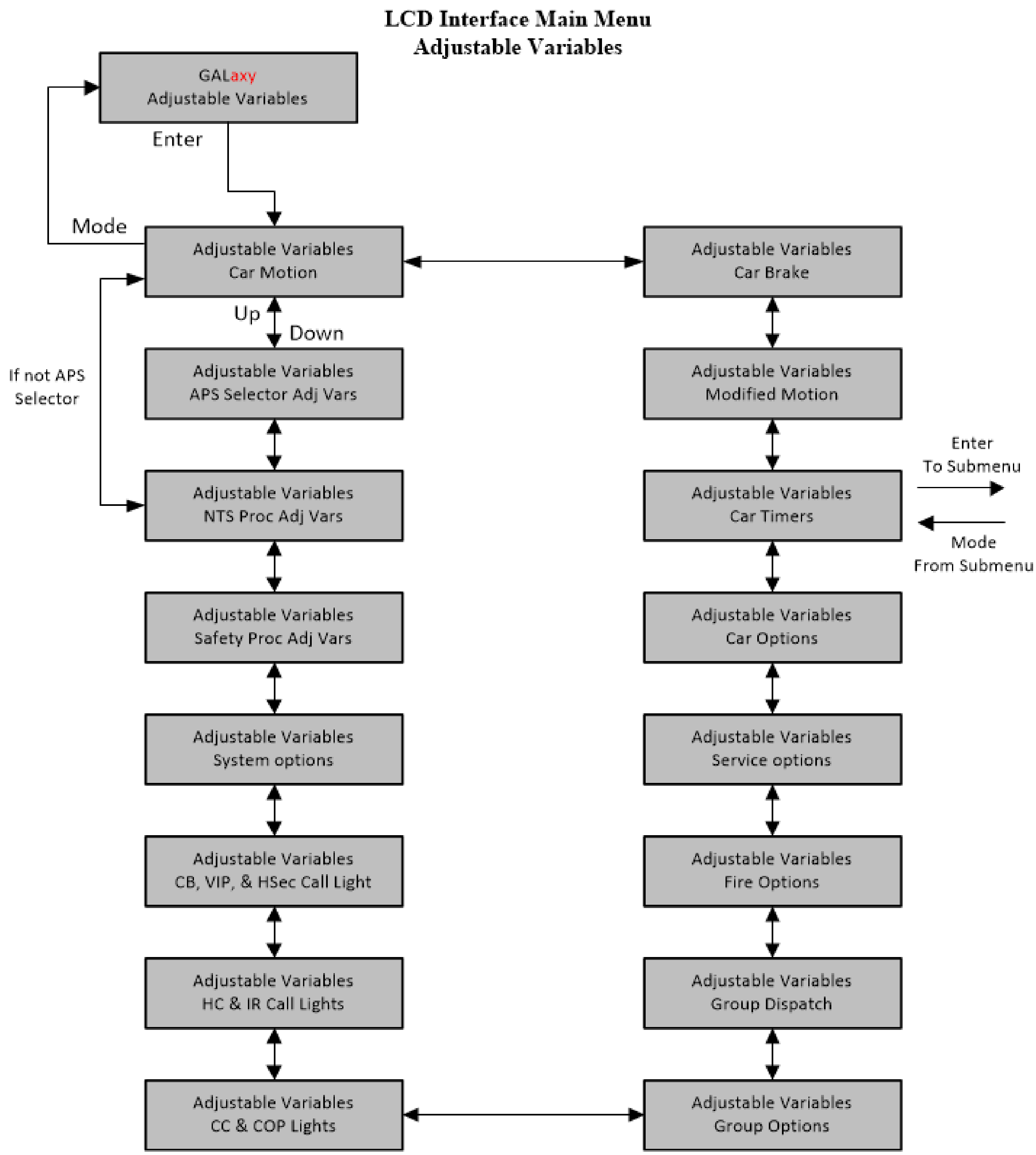


5.2.5 Job Statistics

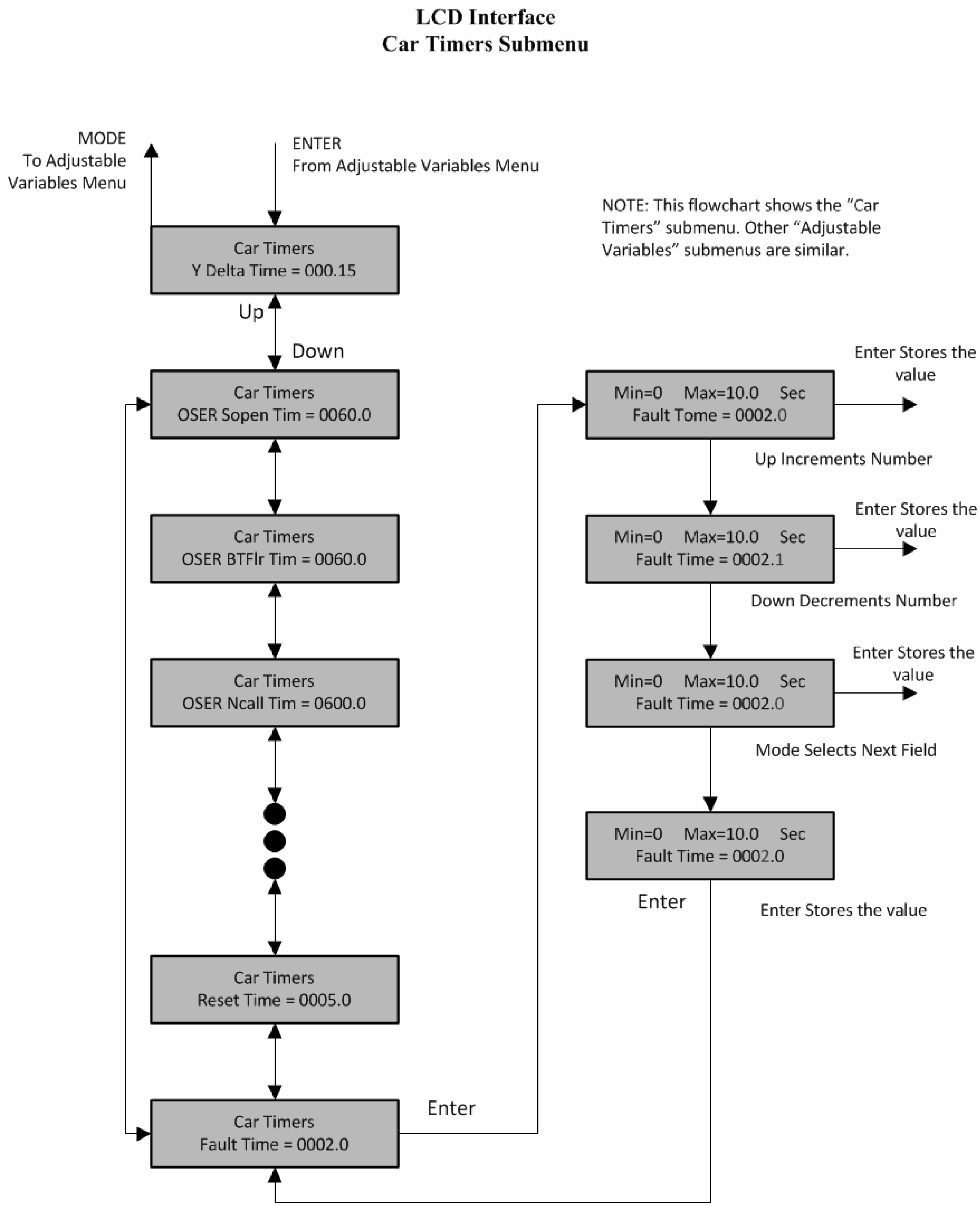
LCD Interface Main Menu
Job Statistics



5.2.6 Adjustable Variables

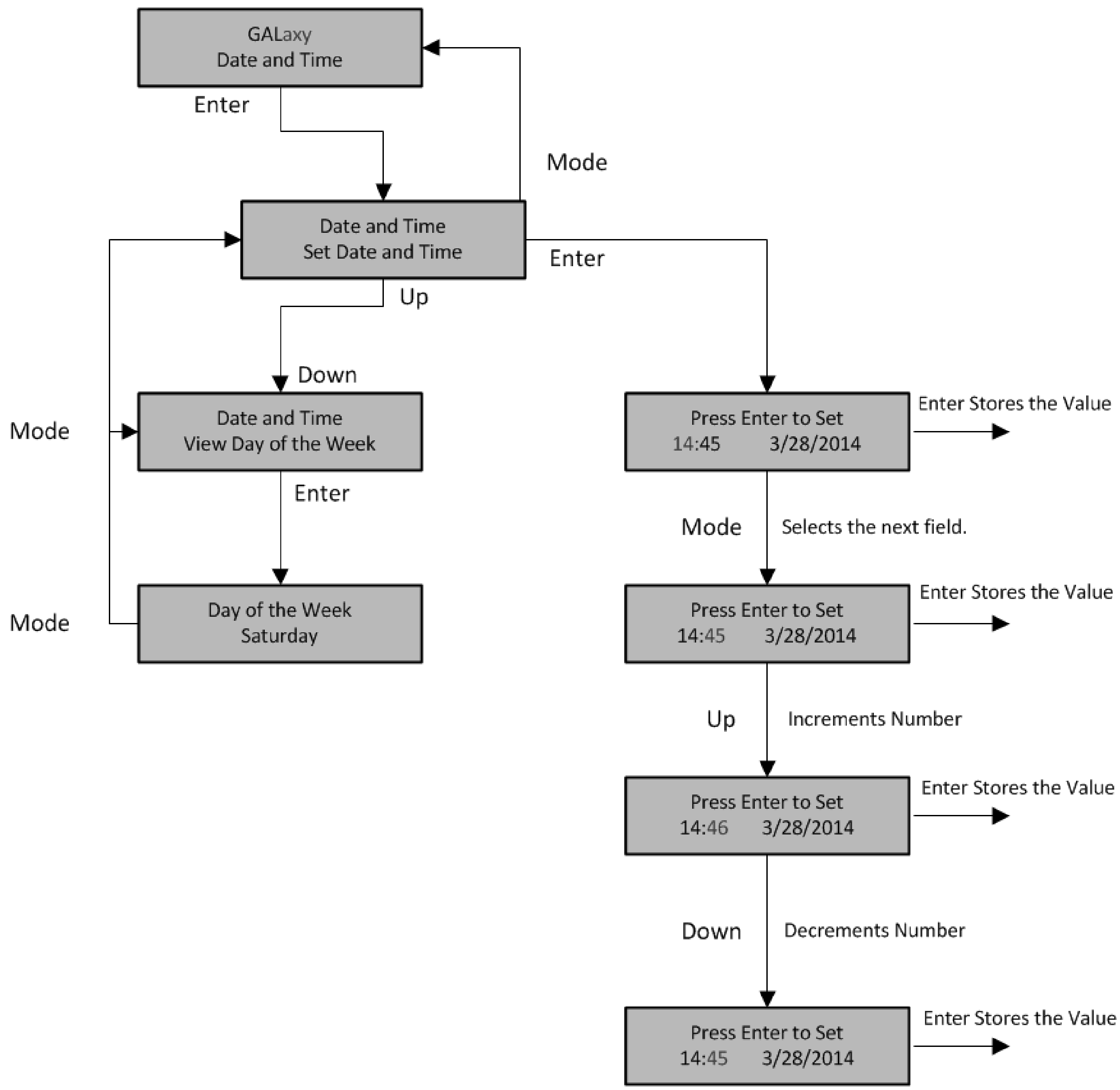


5.2.6.1 Car Timers

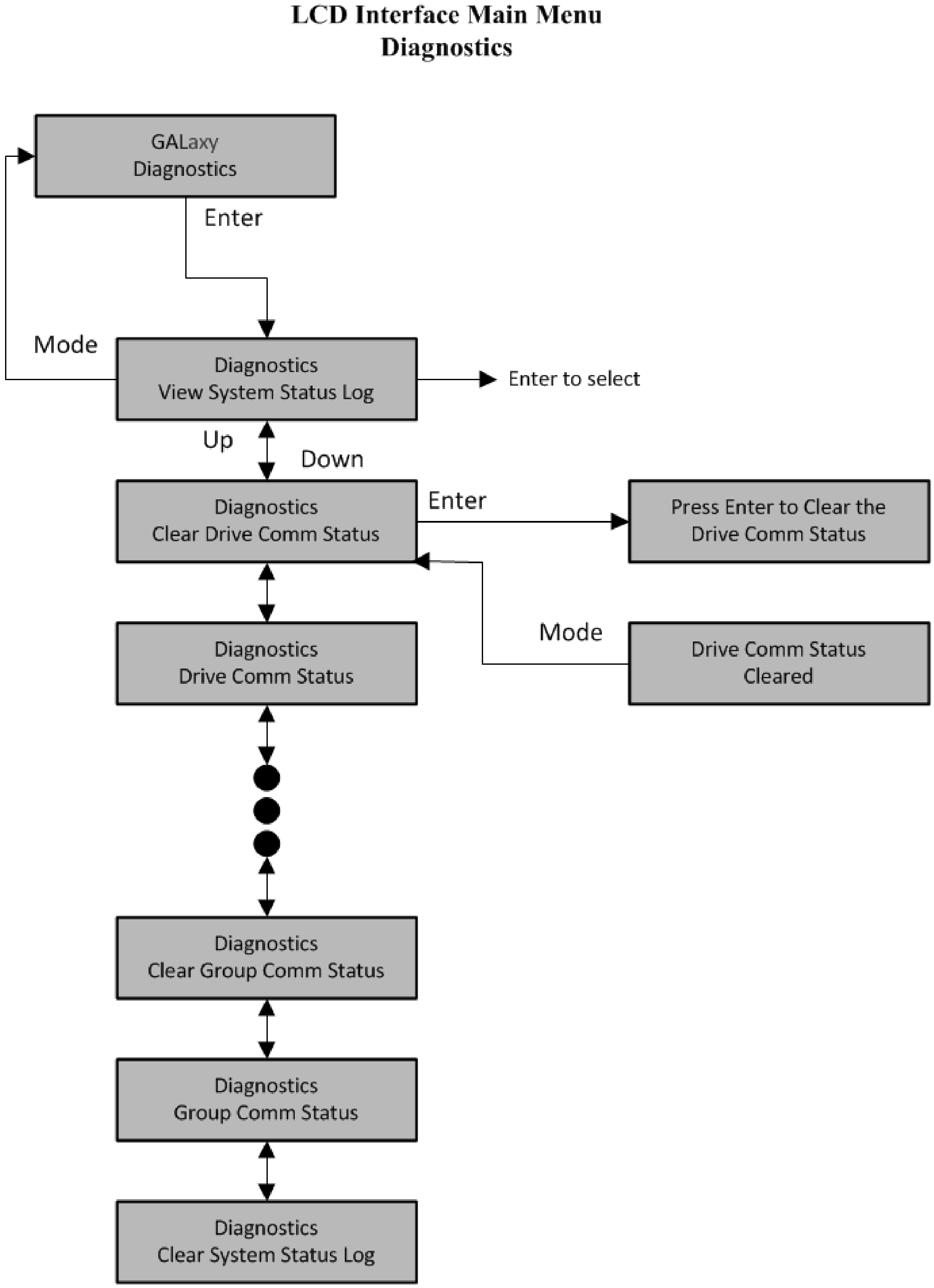


5.2.7 Date and Time

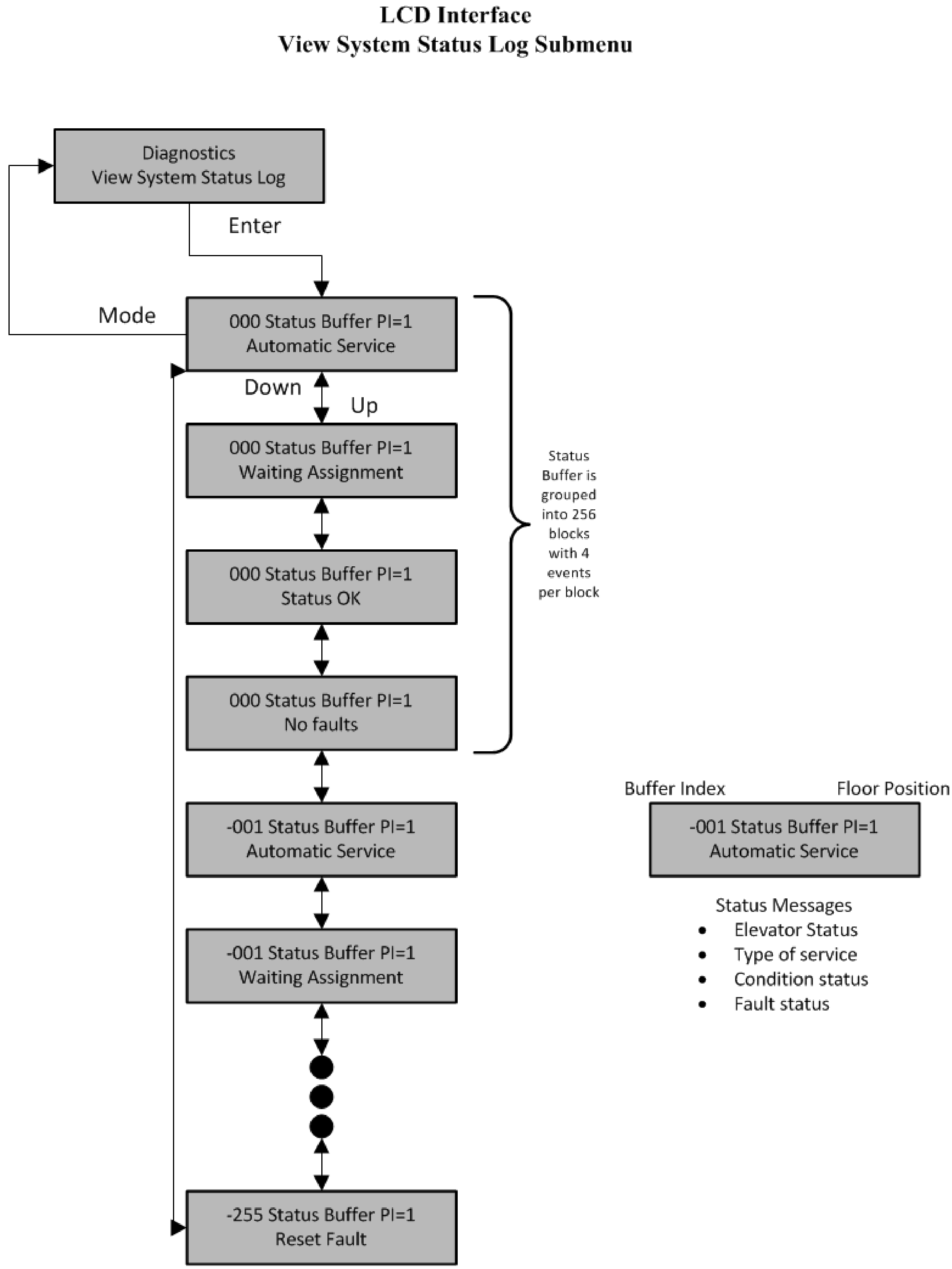
LCD Interface Main Menu
Date and Time



5.2.8 Diagnostics

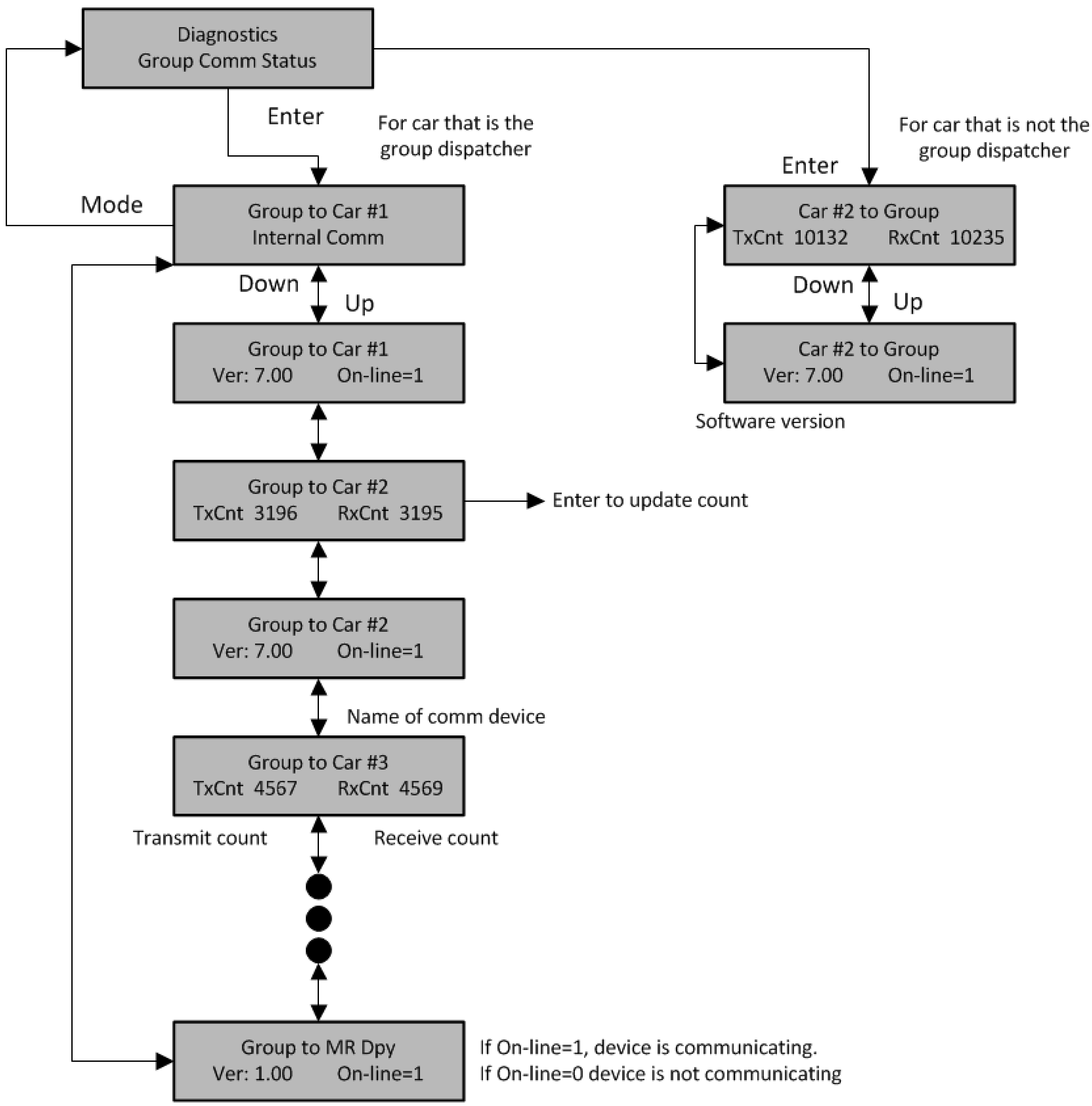


5.2.8.1 View System Status Log



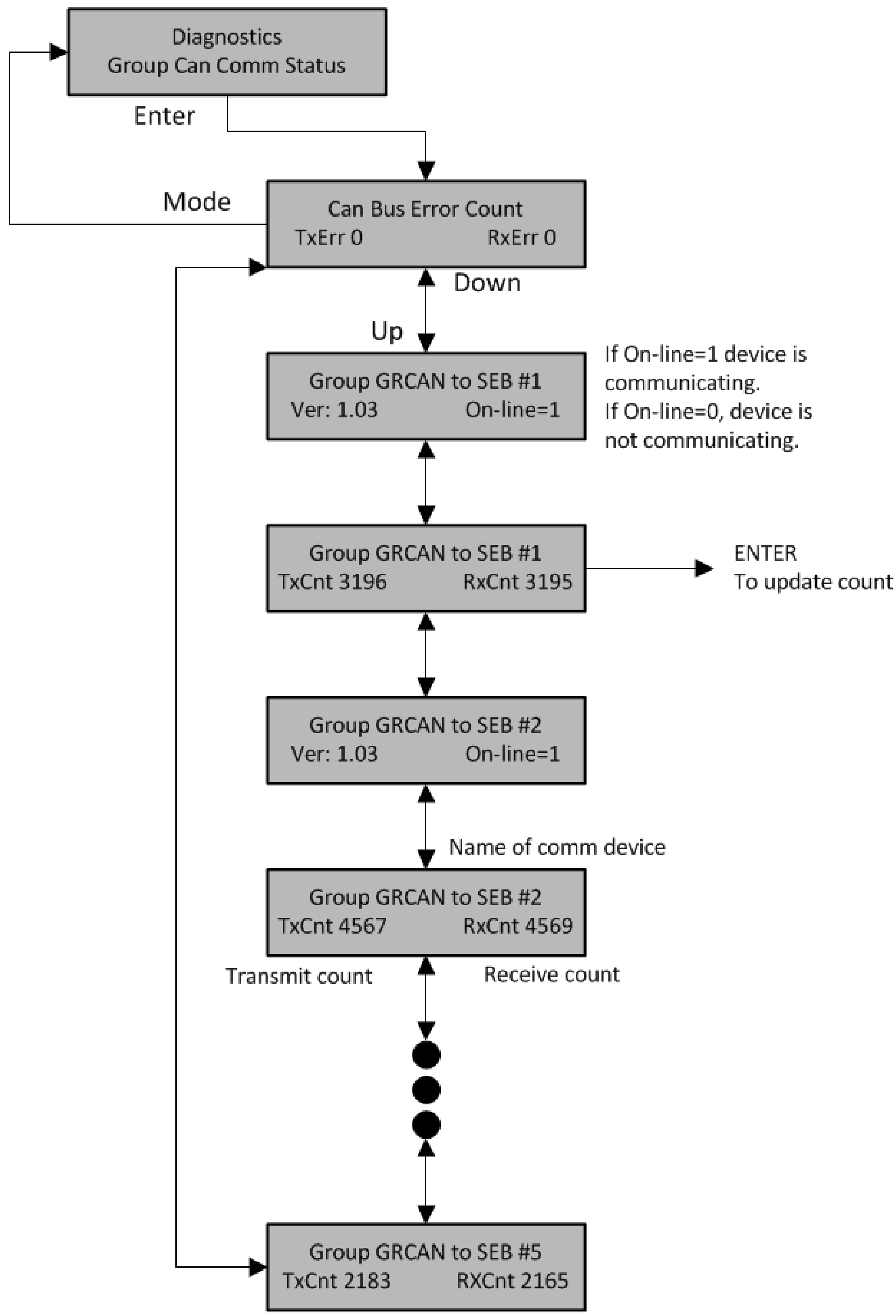
5.2.8.2 Group Comm Status

LCD Interface
Group Comm Status Submenu



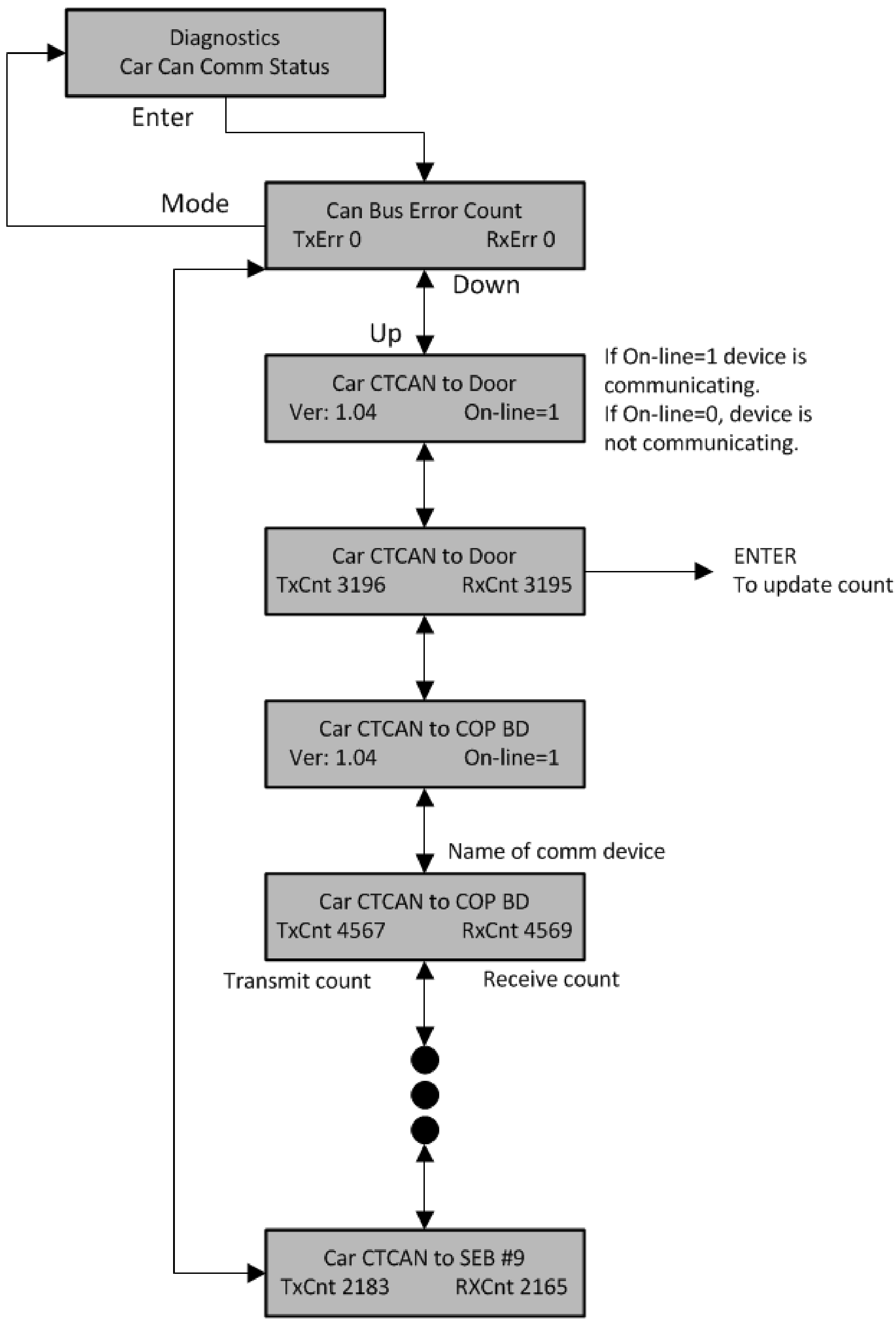
5.2.8.3 Group Can Comm Status

LCD Interface
Group Can Comm Status Submenu



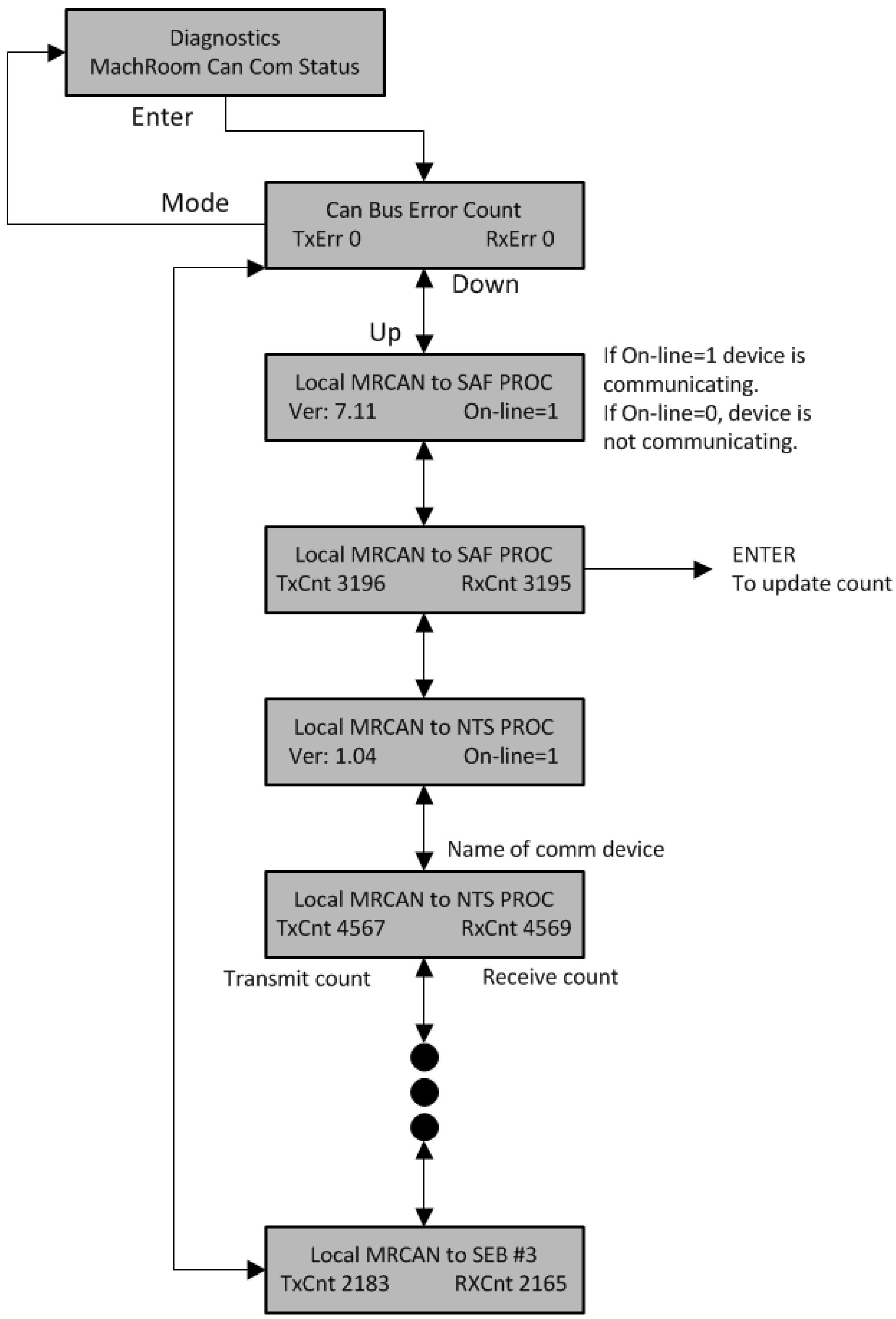
5.2.8.4 Car Can Comm Status

LCD Interface
Car Can Comm Status Submenu



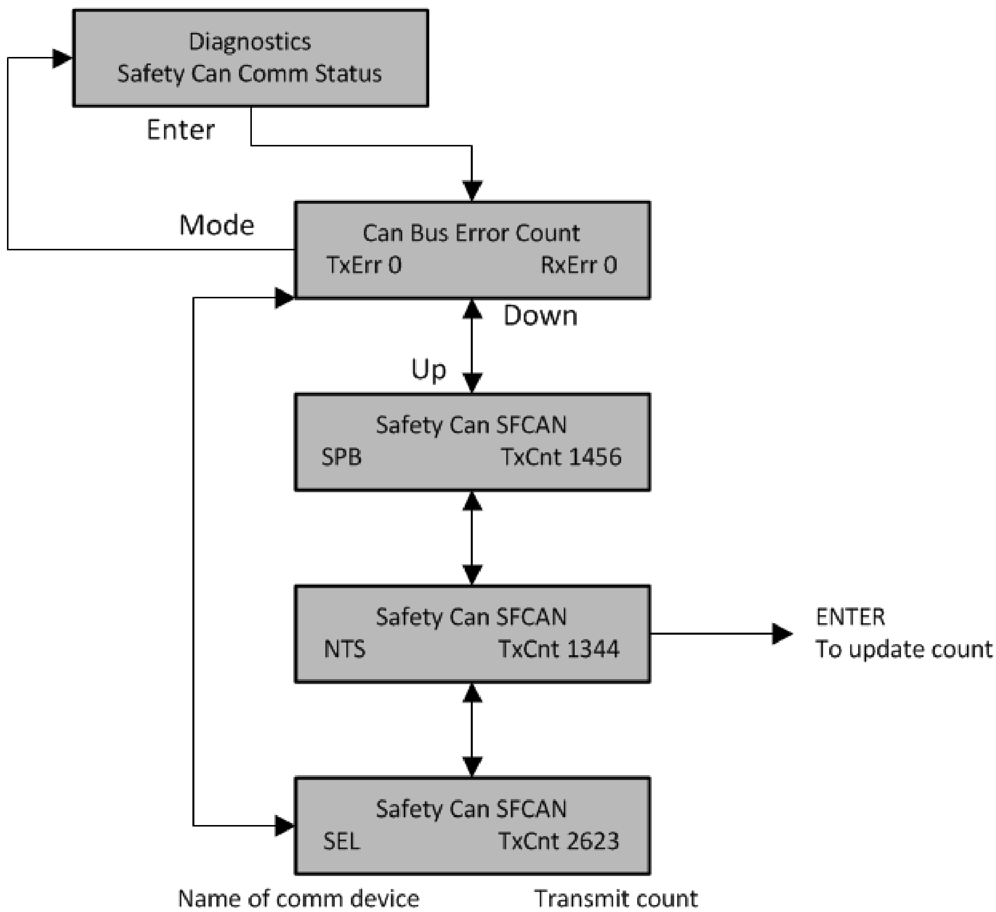
5.2.8.5 Machine Room Can Comm Status

LCD Interface
Machine Room Can Comm Status Submenu



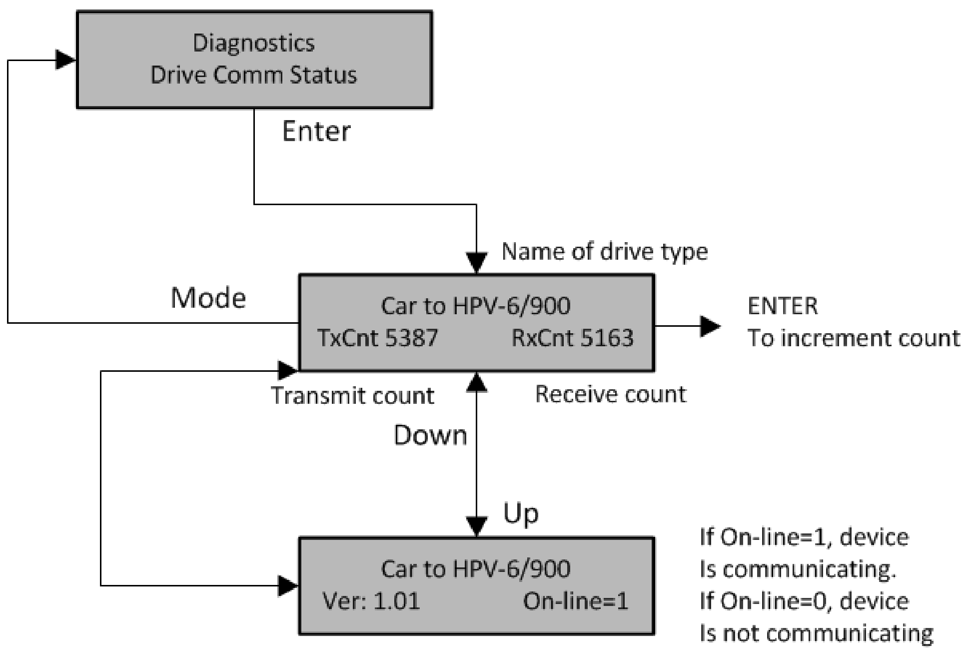
5.2.8.6 Safety Can Comm Status

LCD Interface
Safety Can Comm Status Submenu

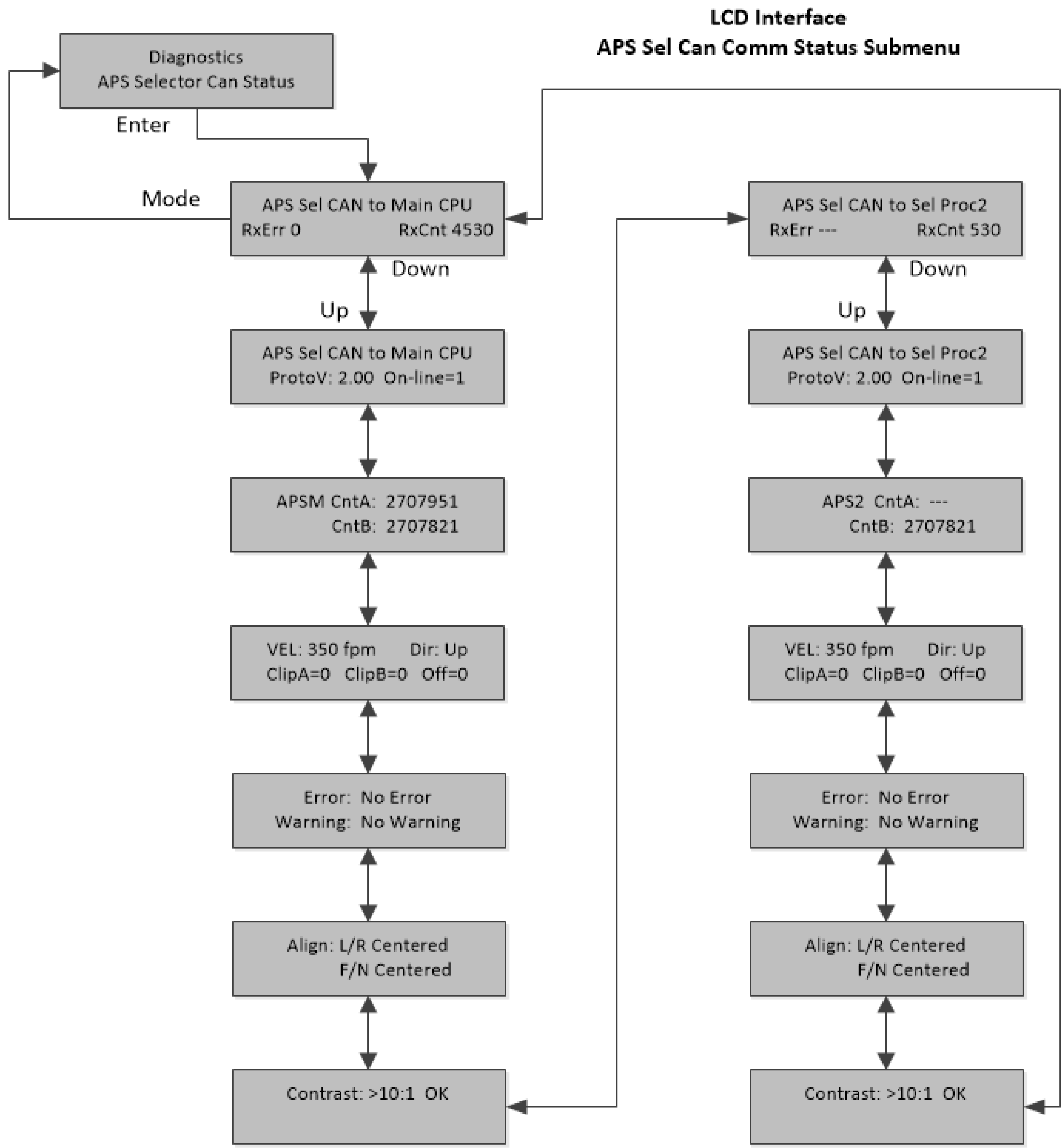


5.2.8.7 Drive Comm Status

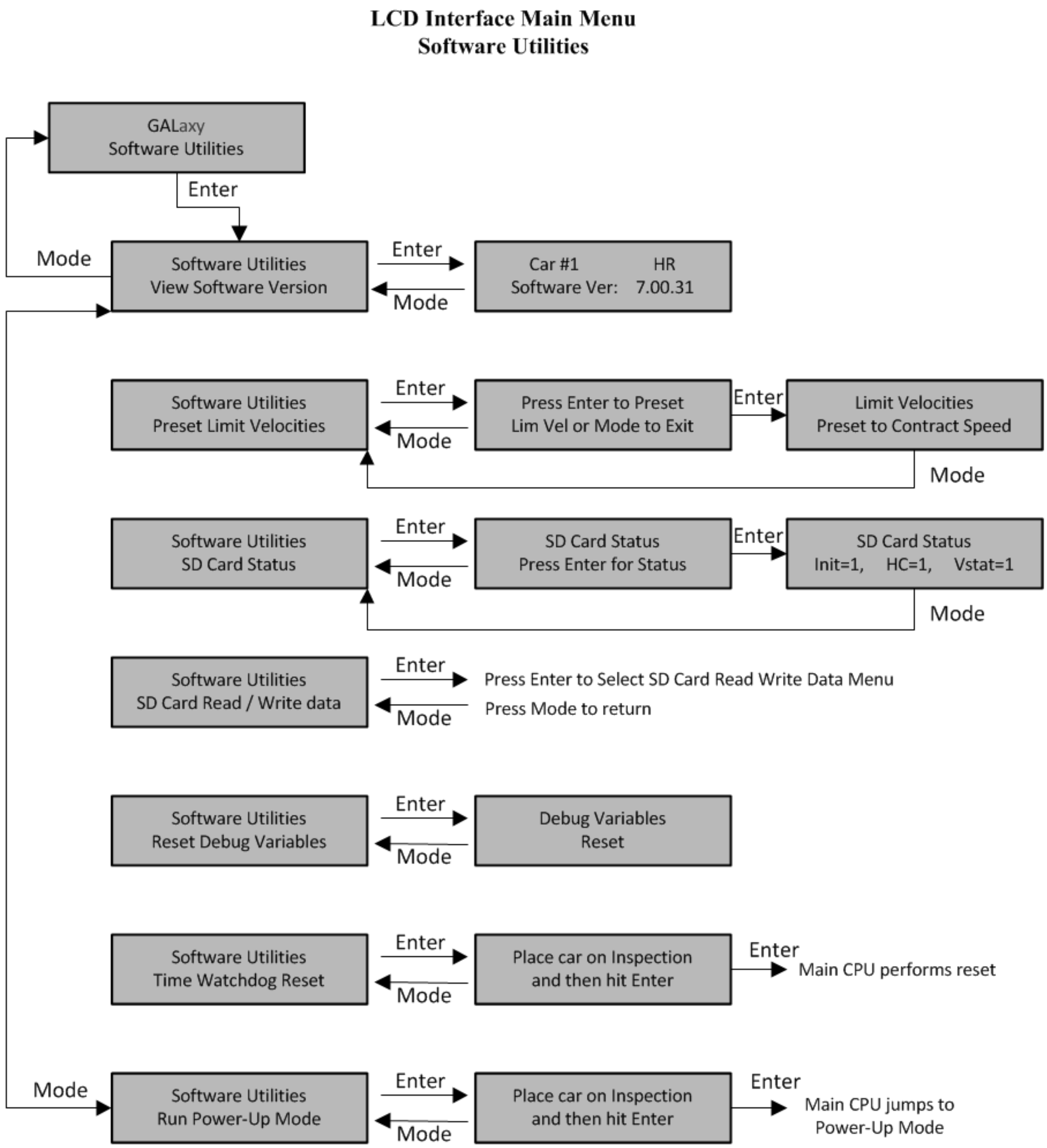
LCD Interface
Drive Comm Status Submenu



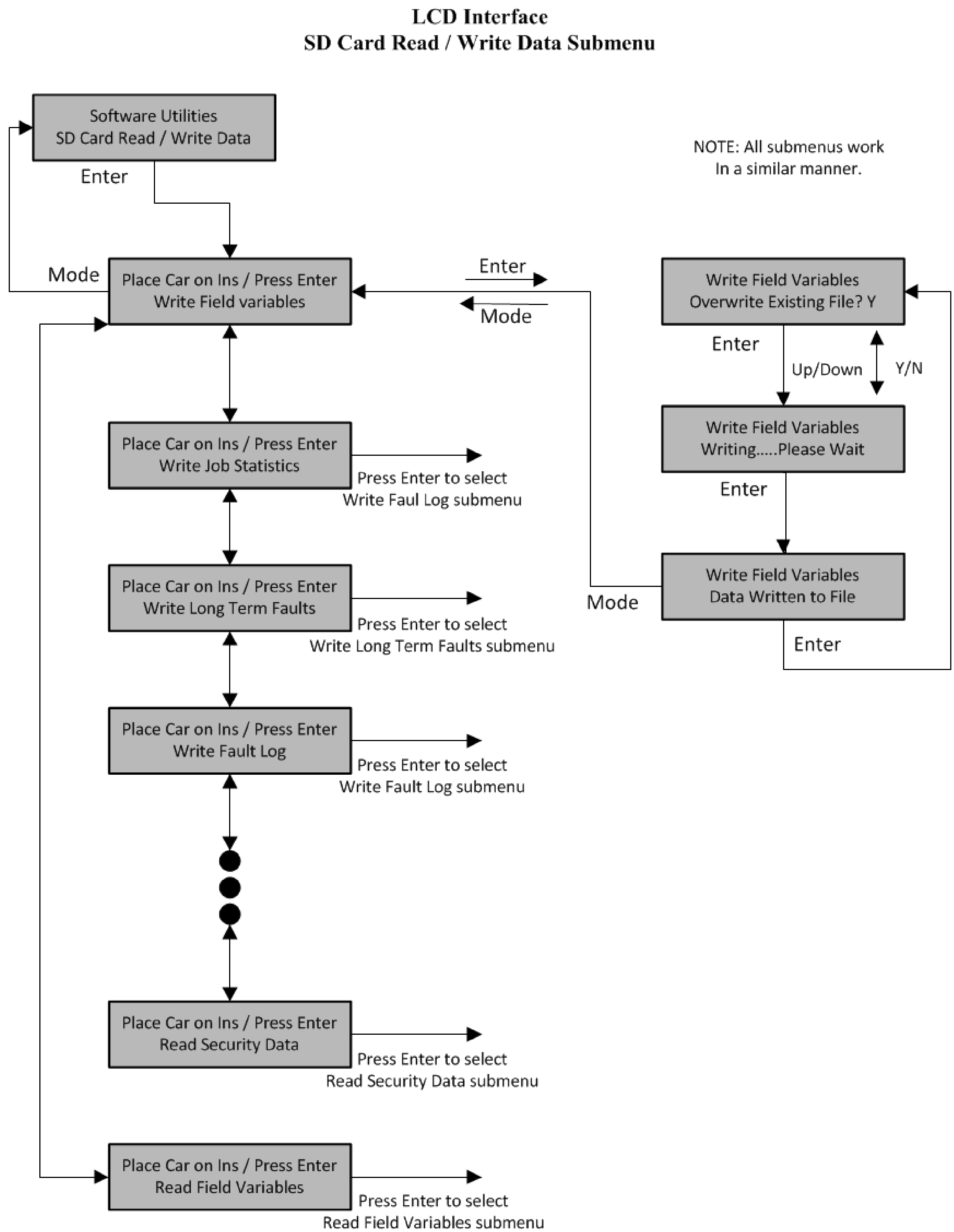
5.2.8.8 APS CAN Comm Status



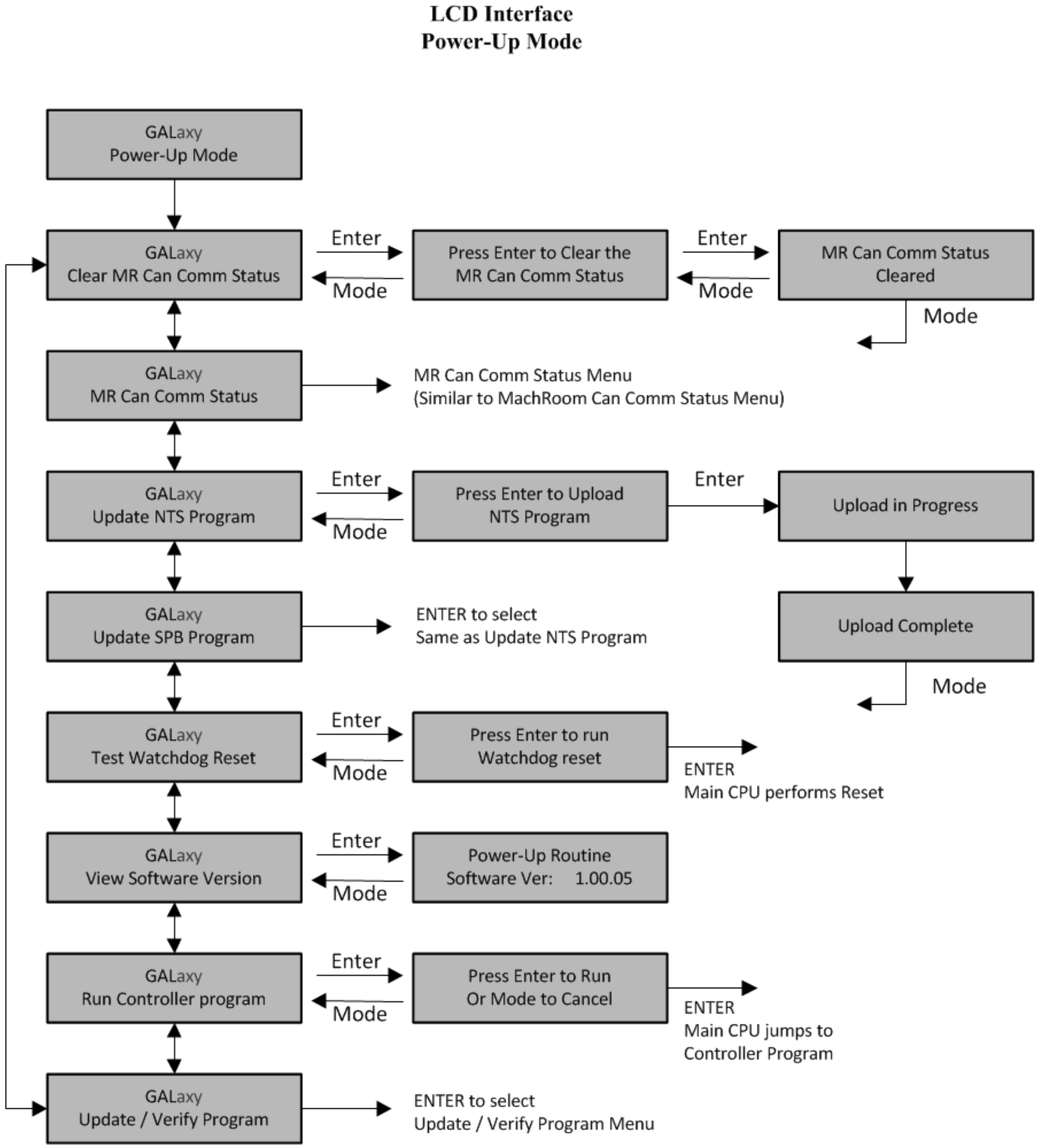
5.2.9 Software Utilities



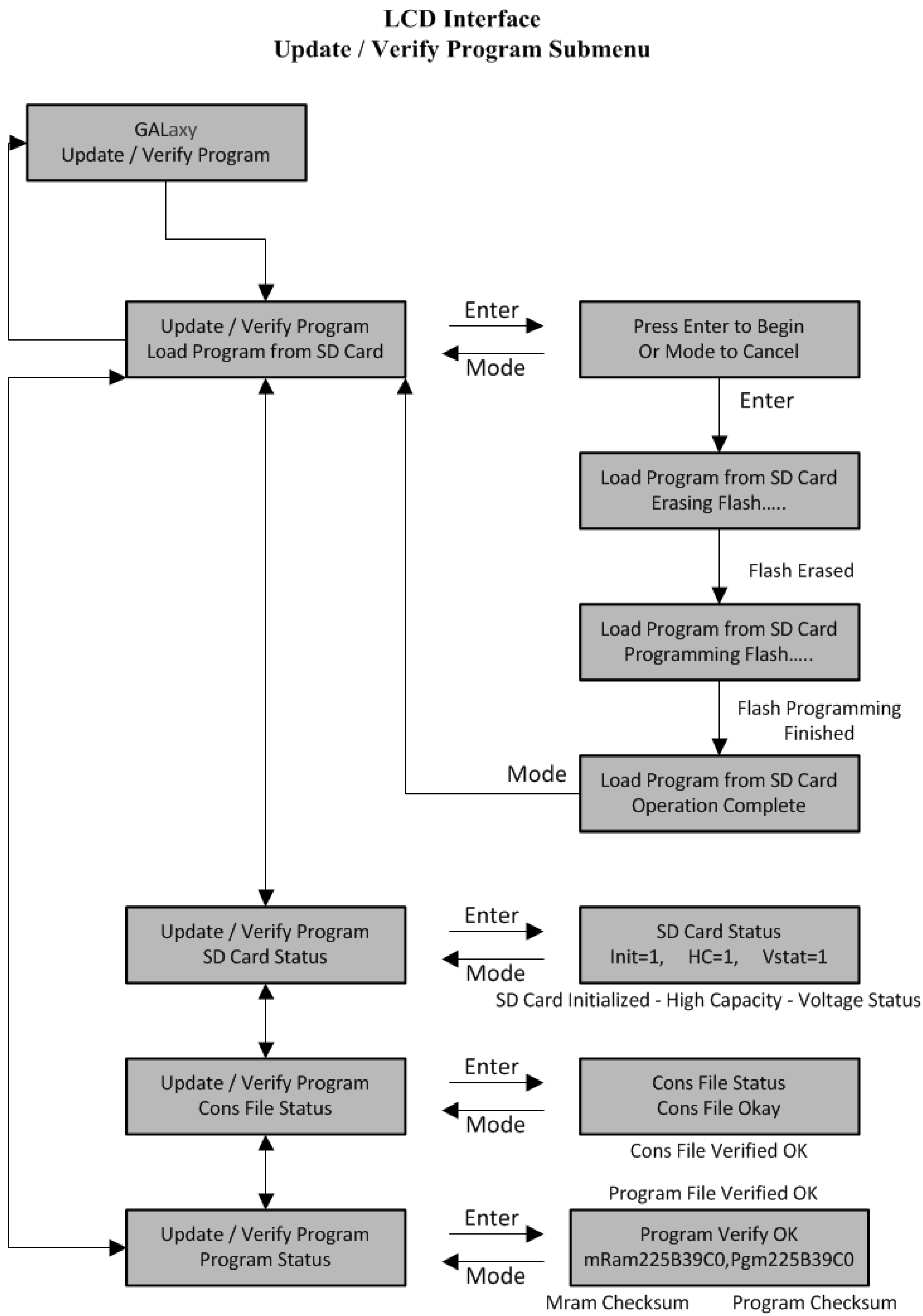
5.2.9.1 SD Card Rear/Write Data



5.2.9.2 Power-Up Mode

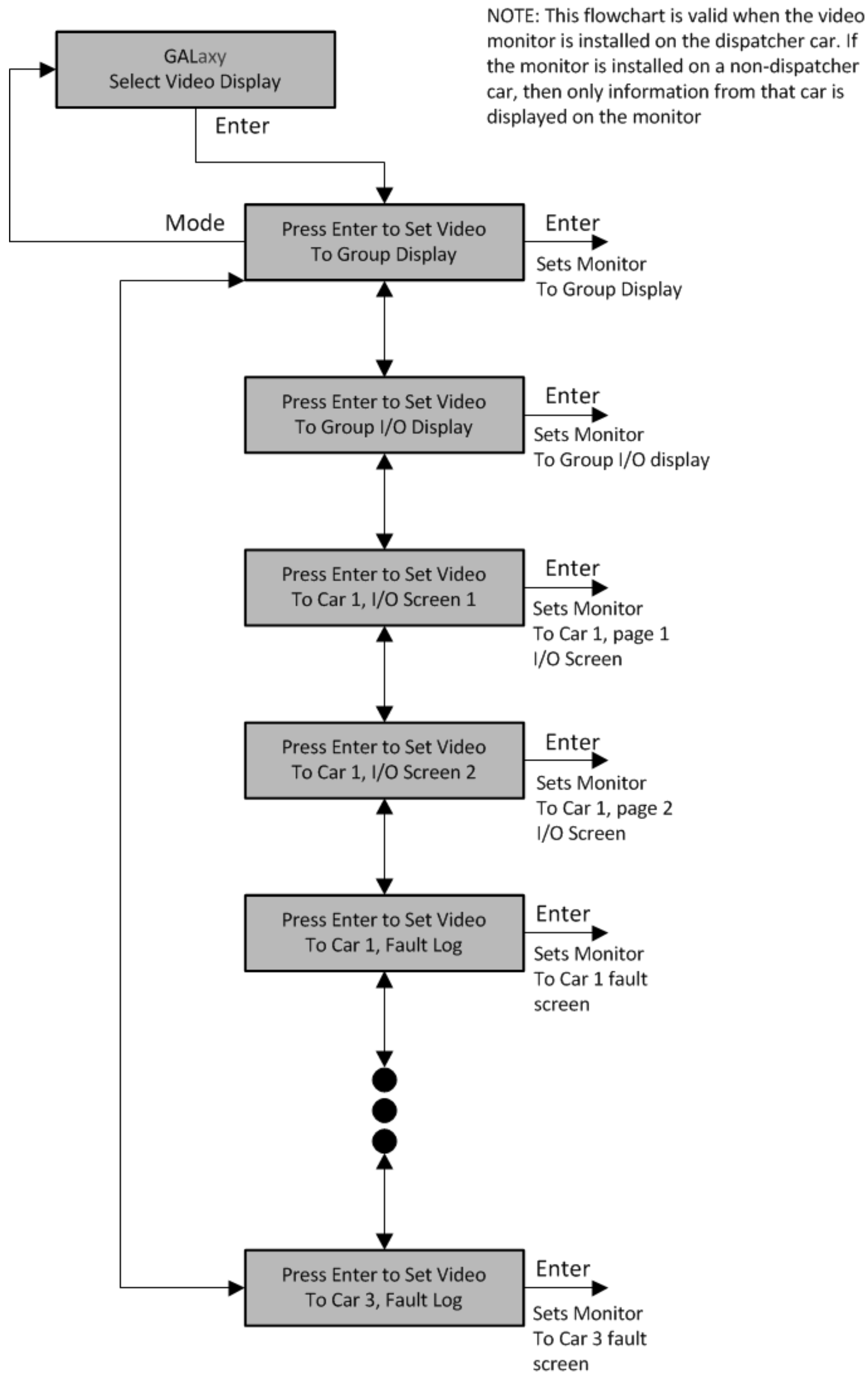


5.2.9.2.1 Update Verify Program



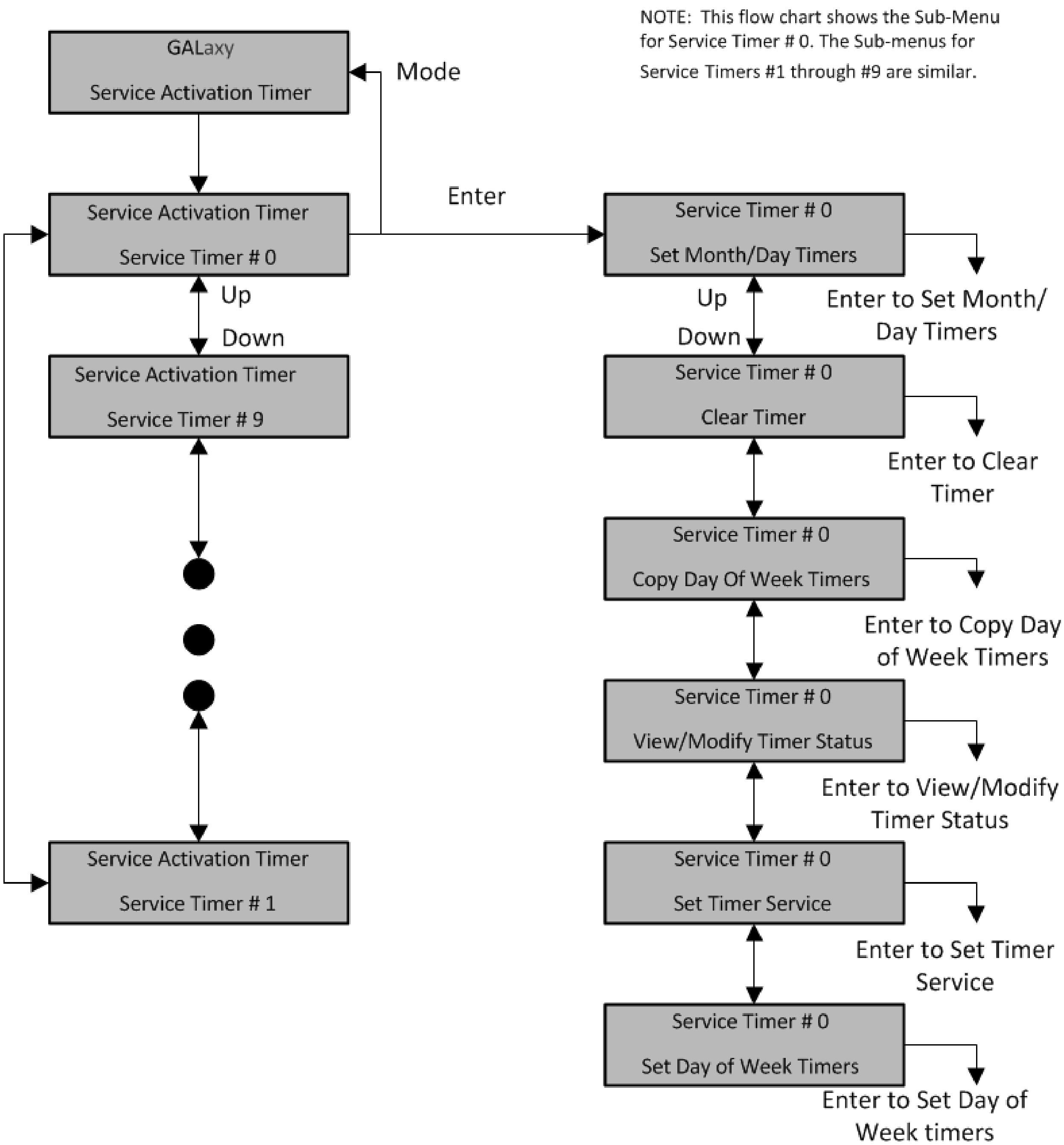
5.2.10 Select Video Display

LCD Interface Main Menu
Select Video Display

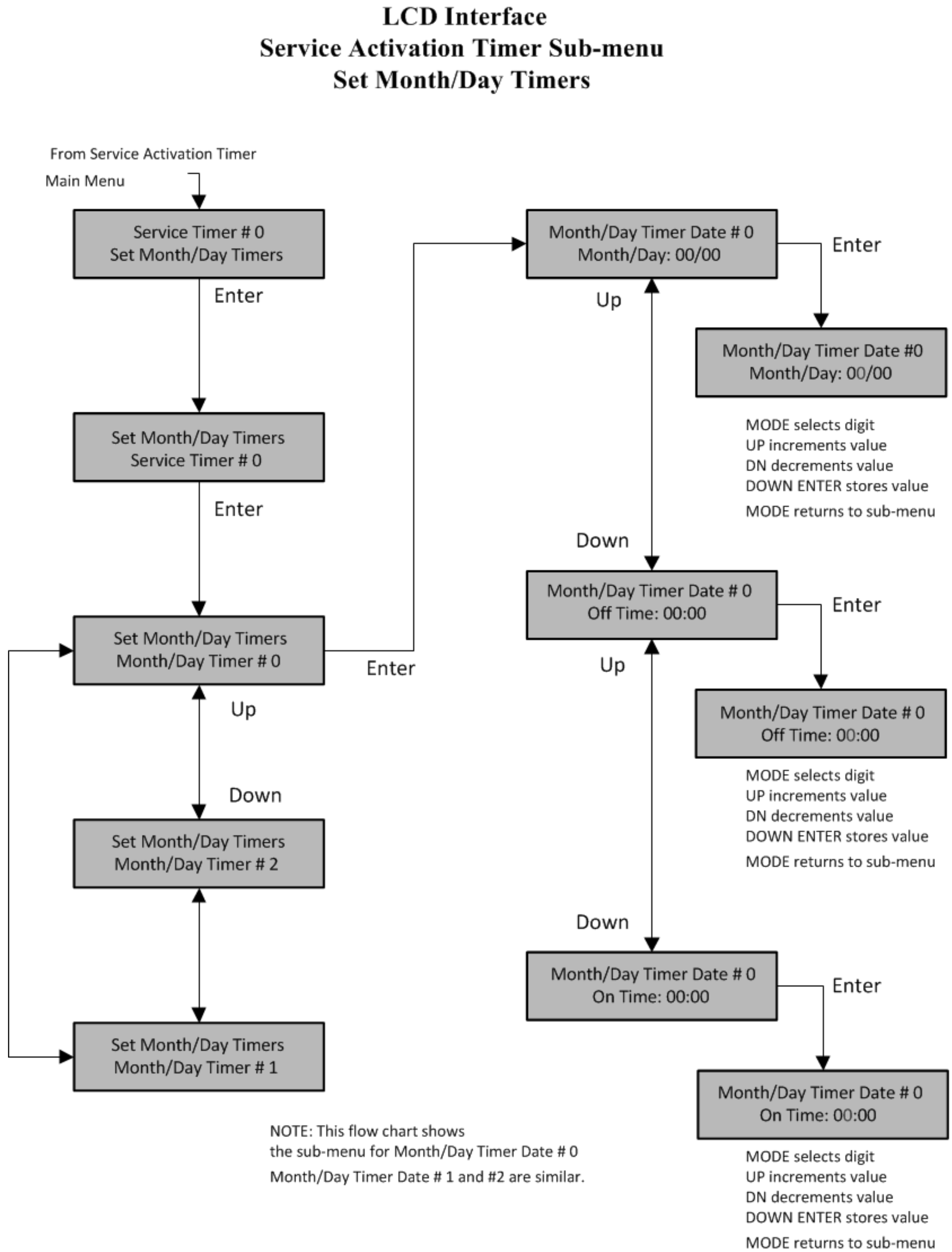


5.2.11 Service Activation Timer

LCD Interface Main Menu
Service Activation Timer

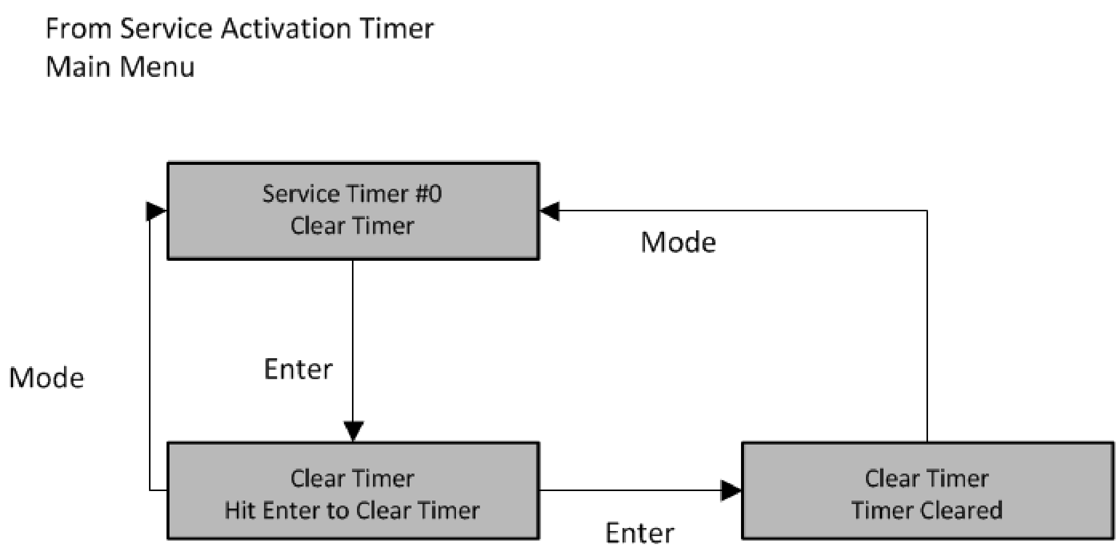


5.2.11.1 Set Month/Day Timers

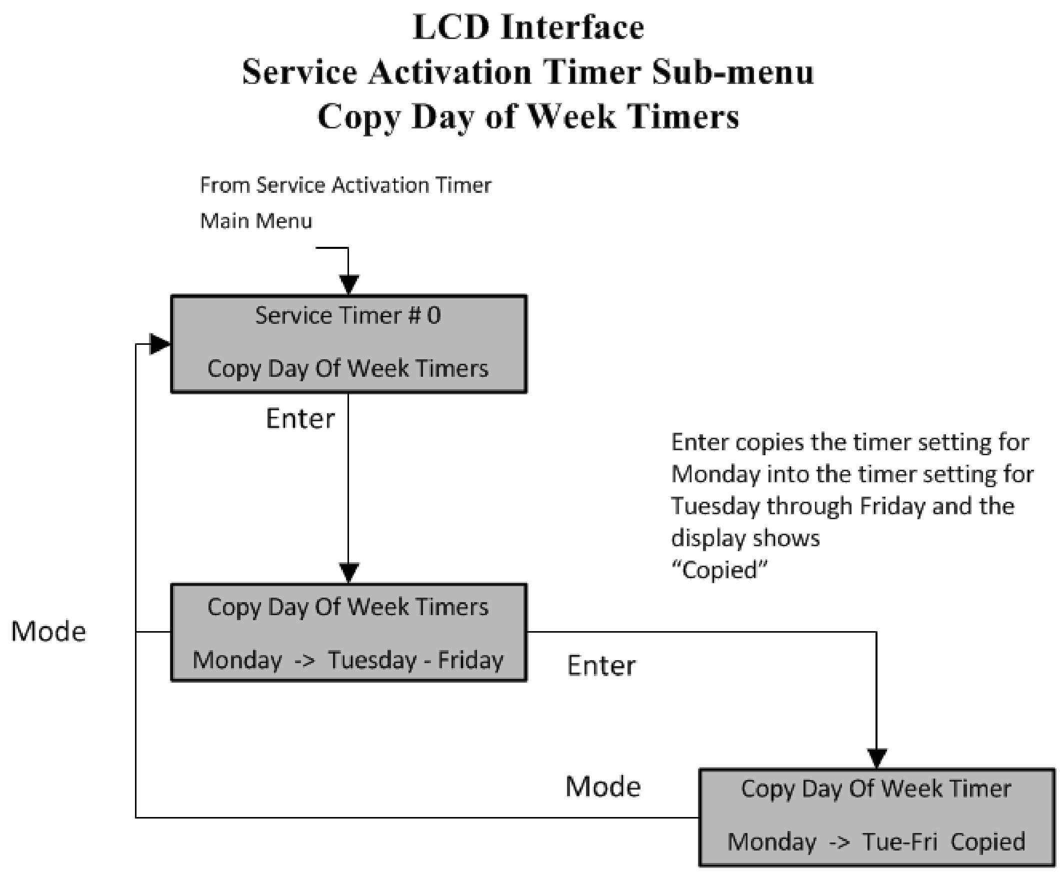


5.2.11.2 Clear Timers

LCD Interface
Service Activation Timer Sub-menu
Clear Timer

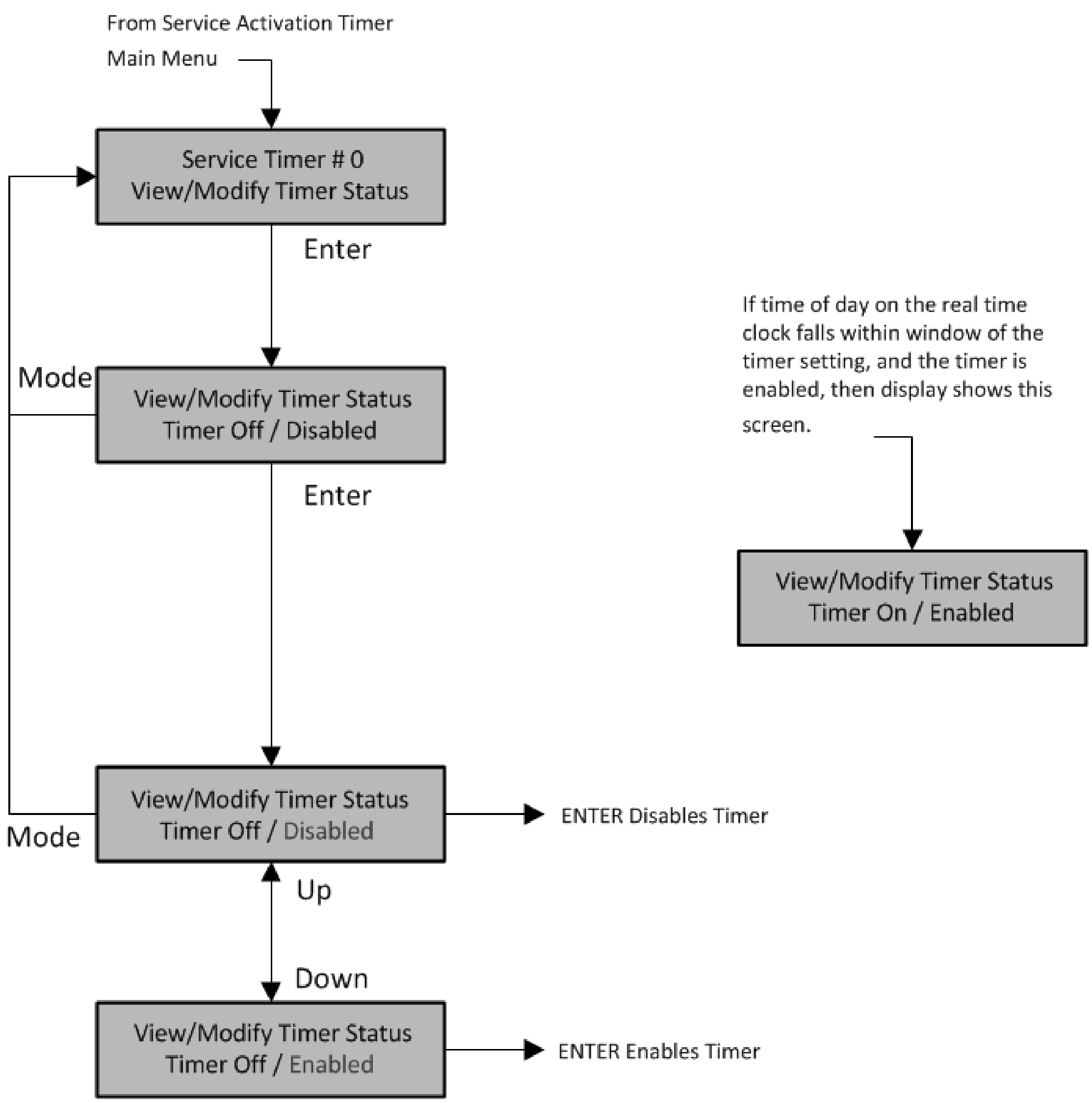


5.2.11.3 Copy Day of Week Timers

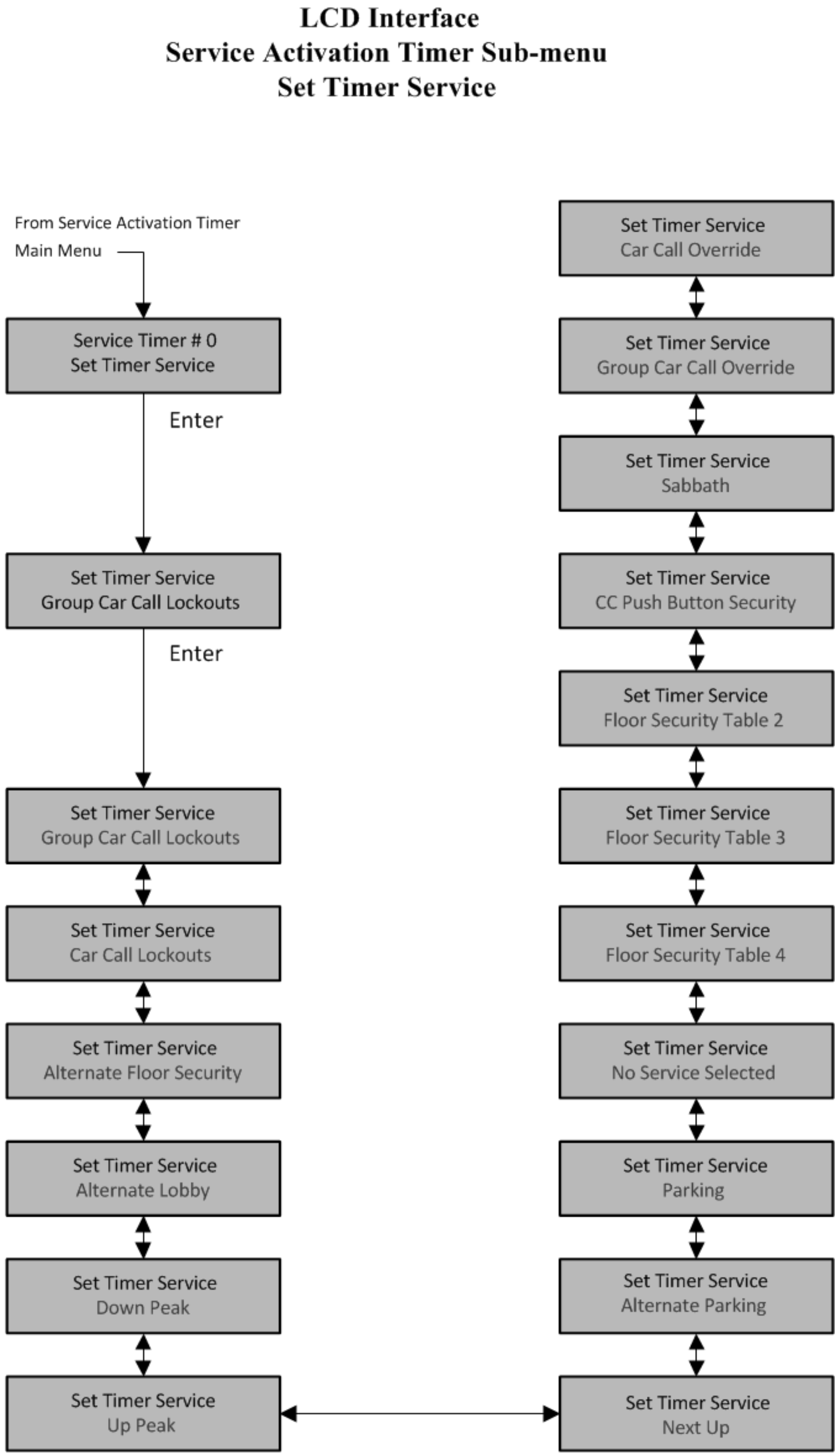


5.2.11.4 View/Modify Timer Status

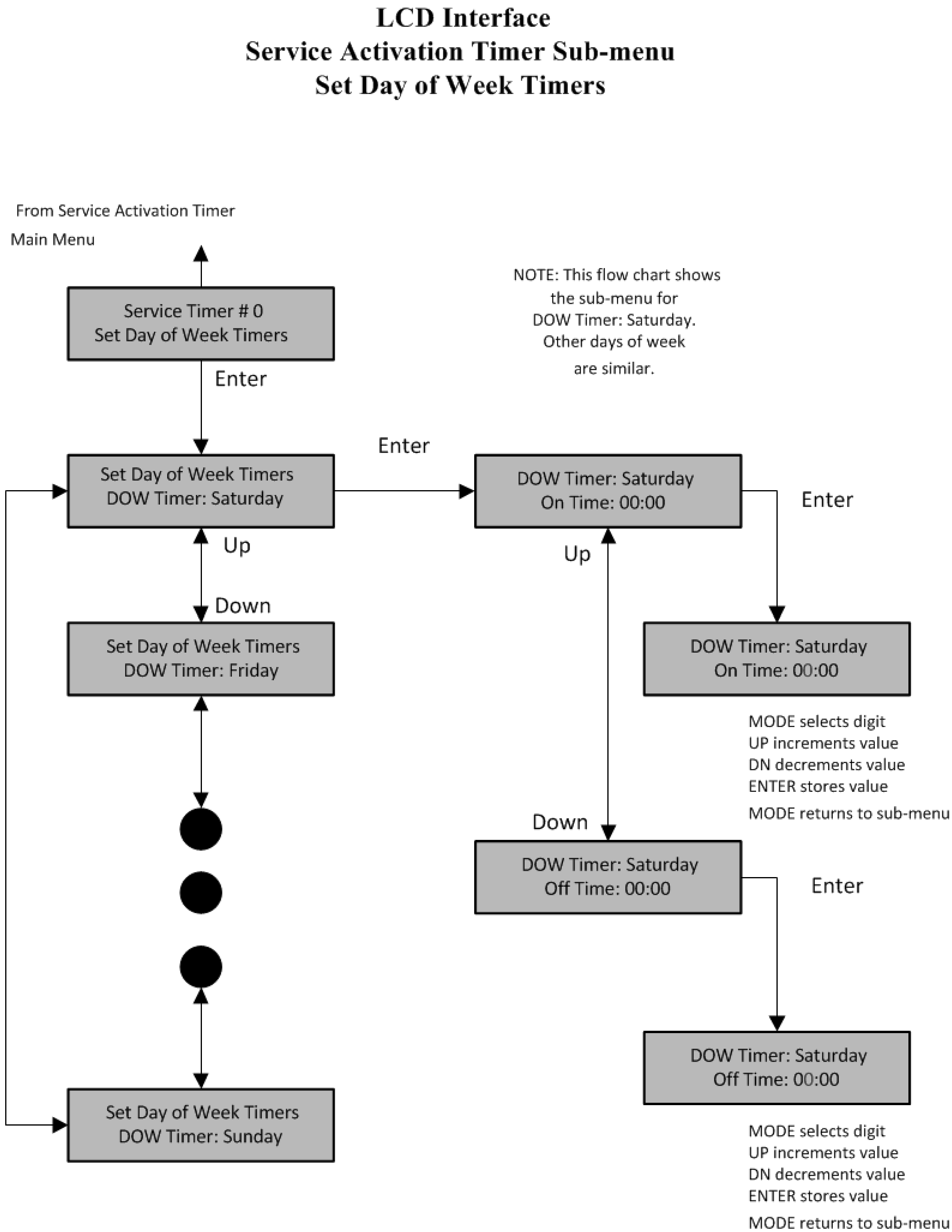
LCD Interface
Service Activation Timer Sub-menu
View/Modify Timer Status



5.2.11.5 Set Timer Service

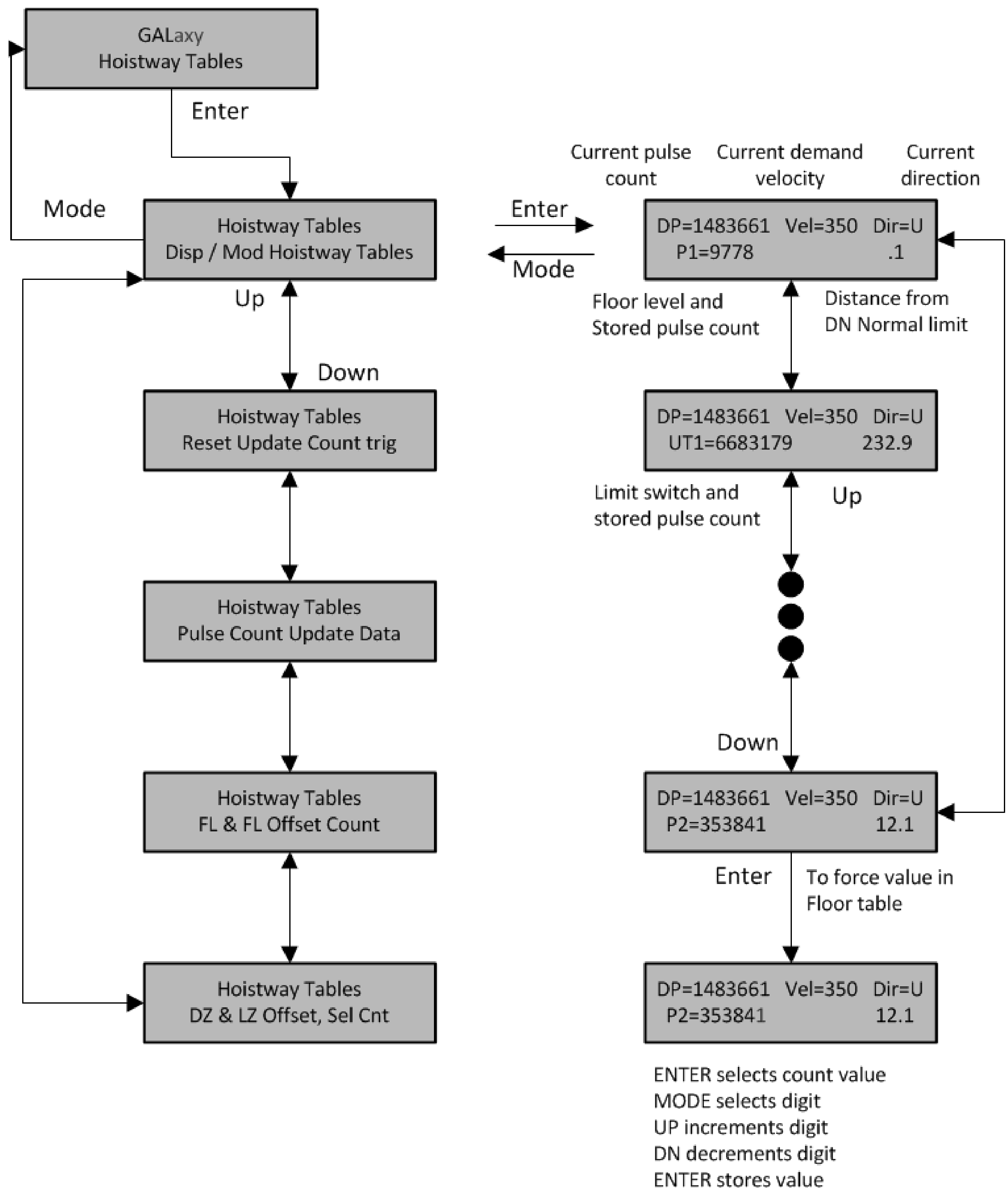


5.2.11.6 Set Day of Week Timers



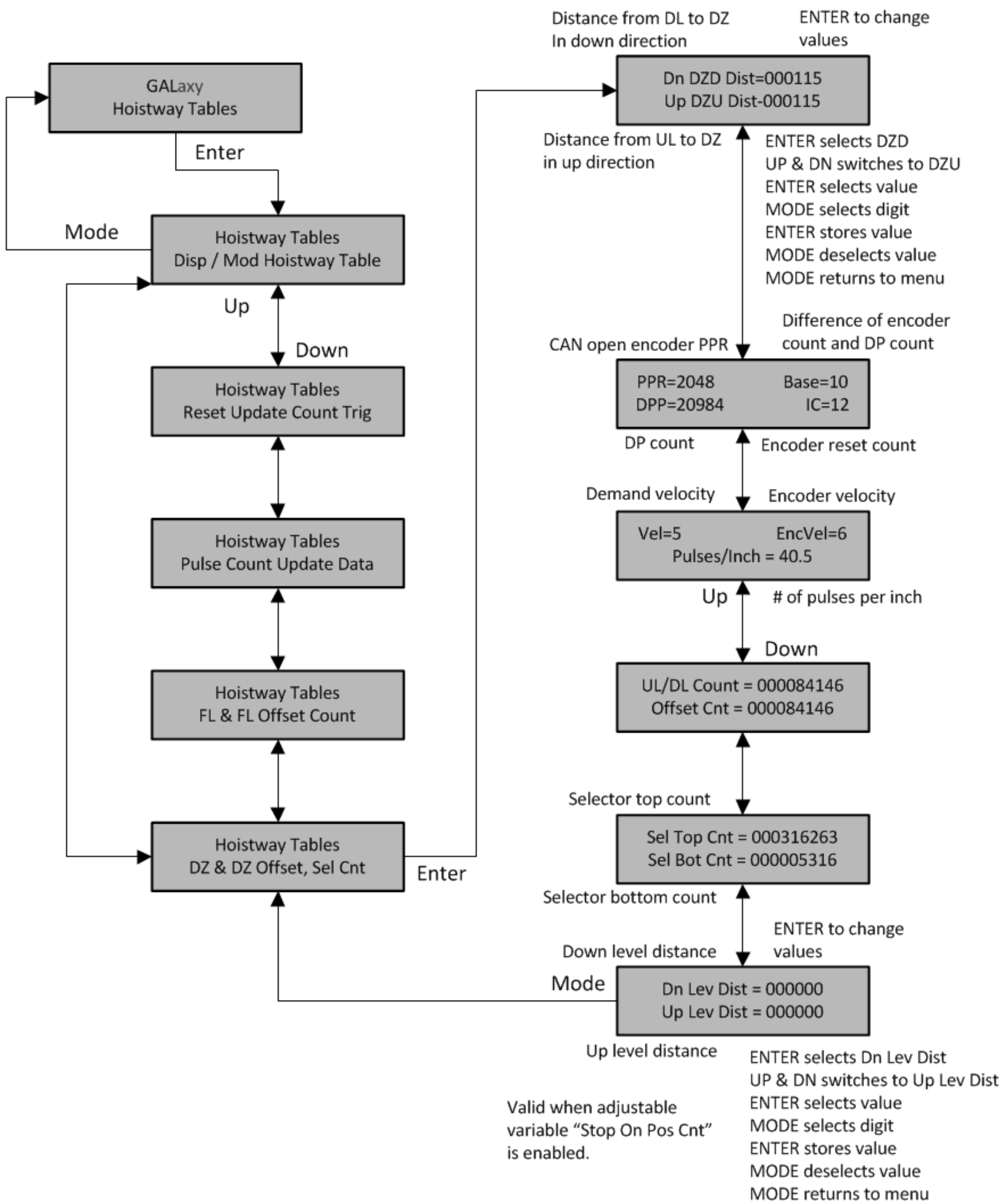
5.2.12 Display/Modify Hoistway Tables

LCD Interface Main Menu
Hoistway Tables
Disp / Mod Hoistway Tables Submenu



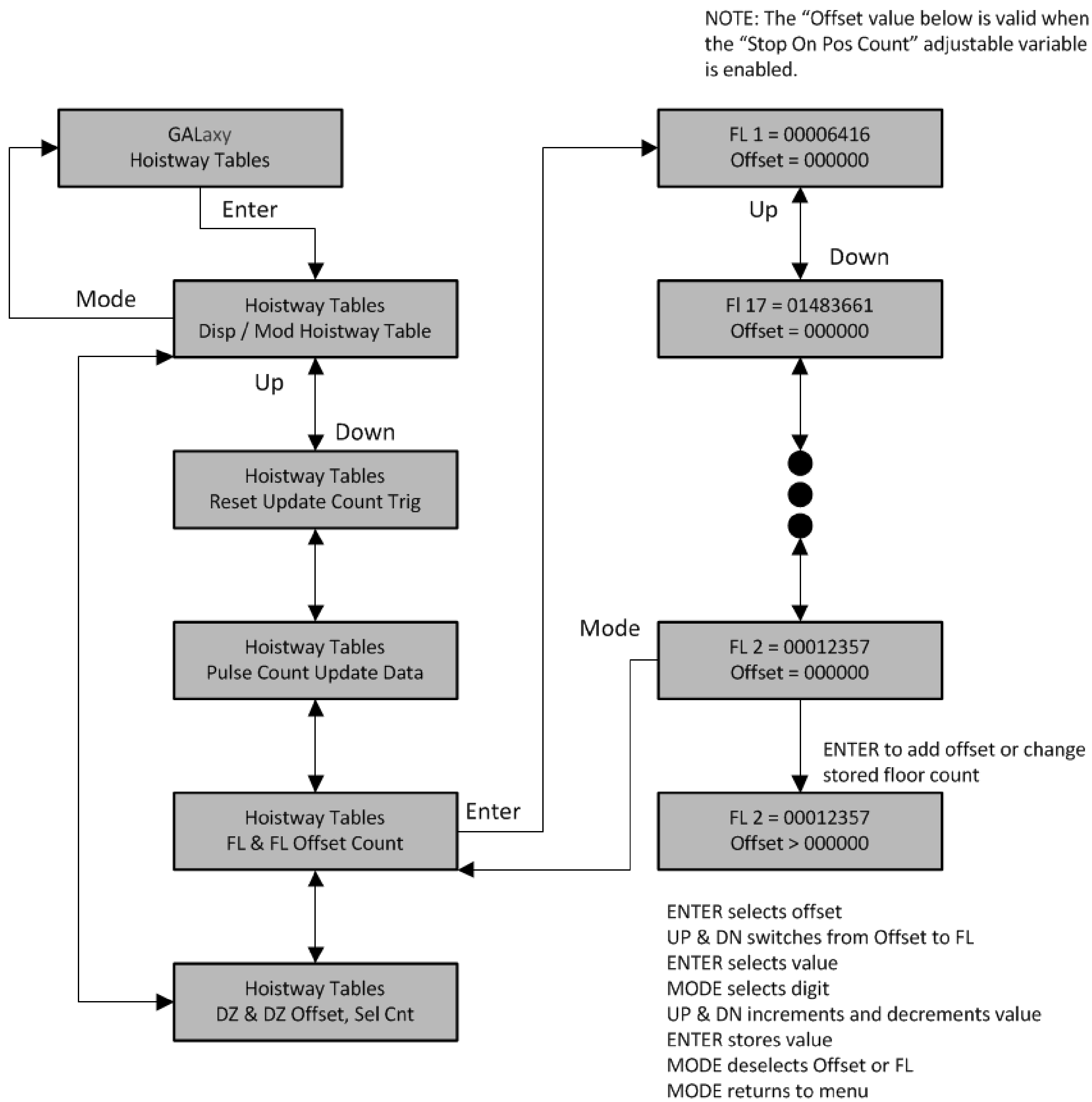
5.2.12.1 DZ & DZ Offset, Selector Count

LCD Interface Main Menu
Hoistway Tables
DZ & DZ Offset, Sel Cnt Submenu



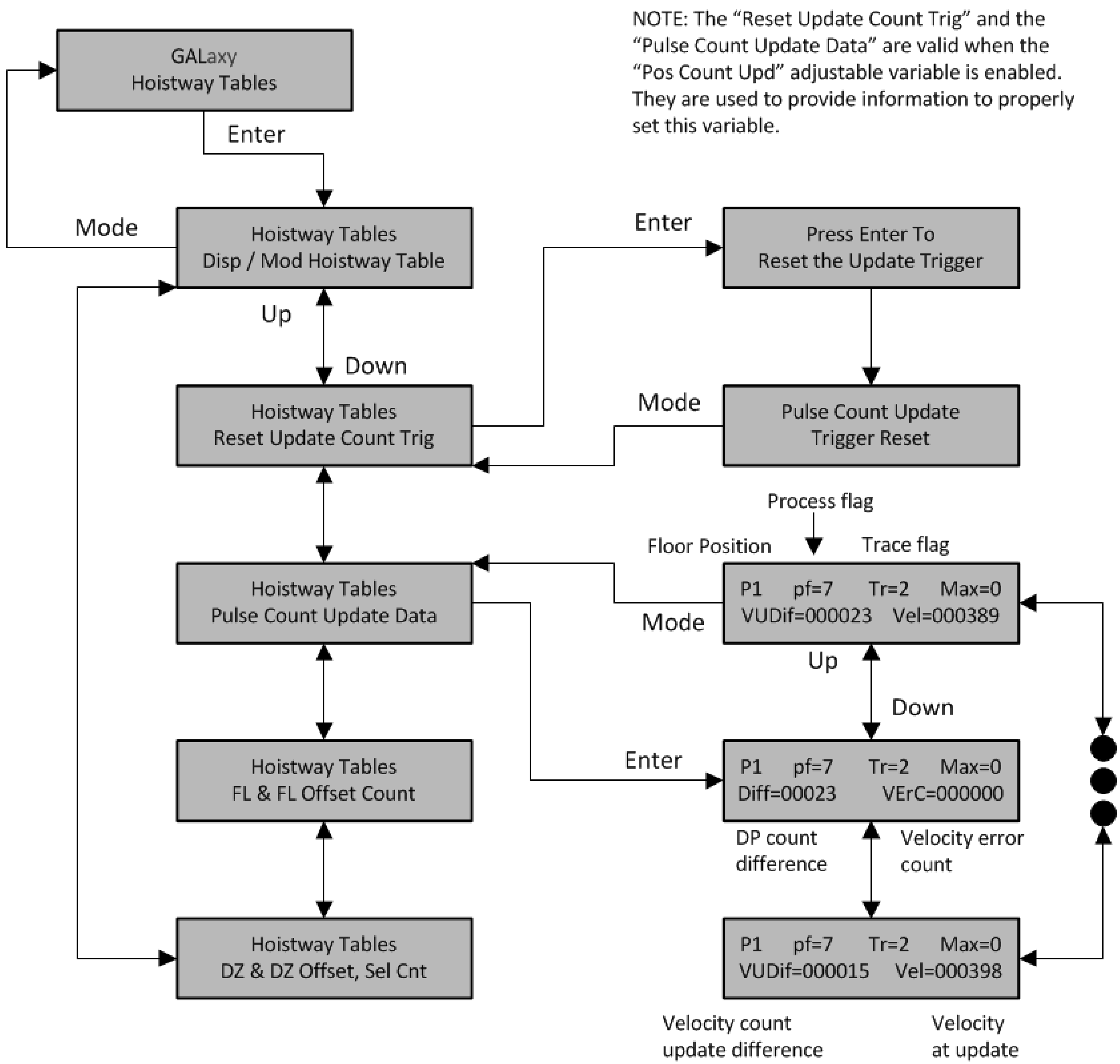
5.2.12.2 FL & FL Offset Count

LCD Interface Main Menu
Hoistway Tables
FL & FL Offset, Sel Cnt Submenu



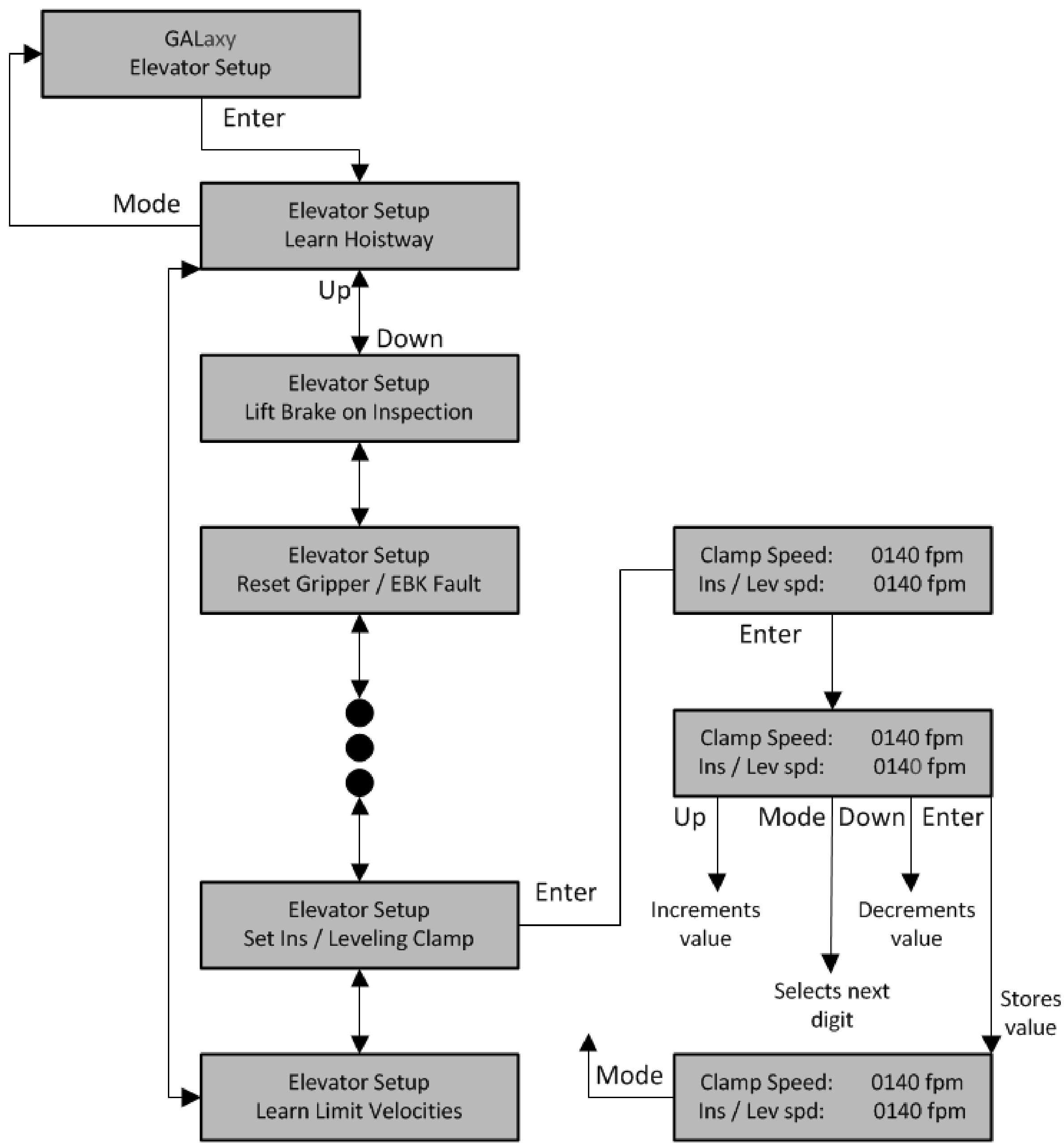
5.2.12.3 Reset Update Count, Pulse Count Update

LCD Interface Main Menu
Hoistway Tables
Reset Update Count Trig, Pulse Count Update Data Submenu



5.2.13 Elevator Setup

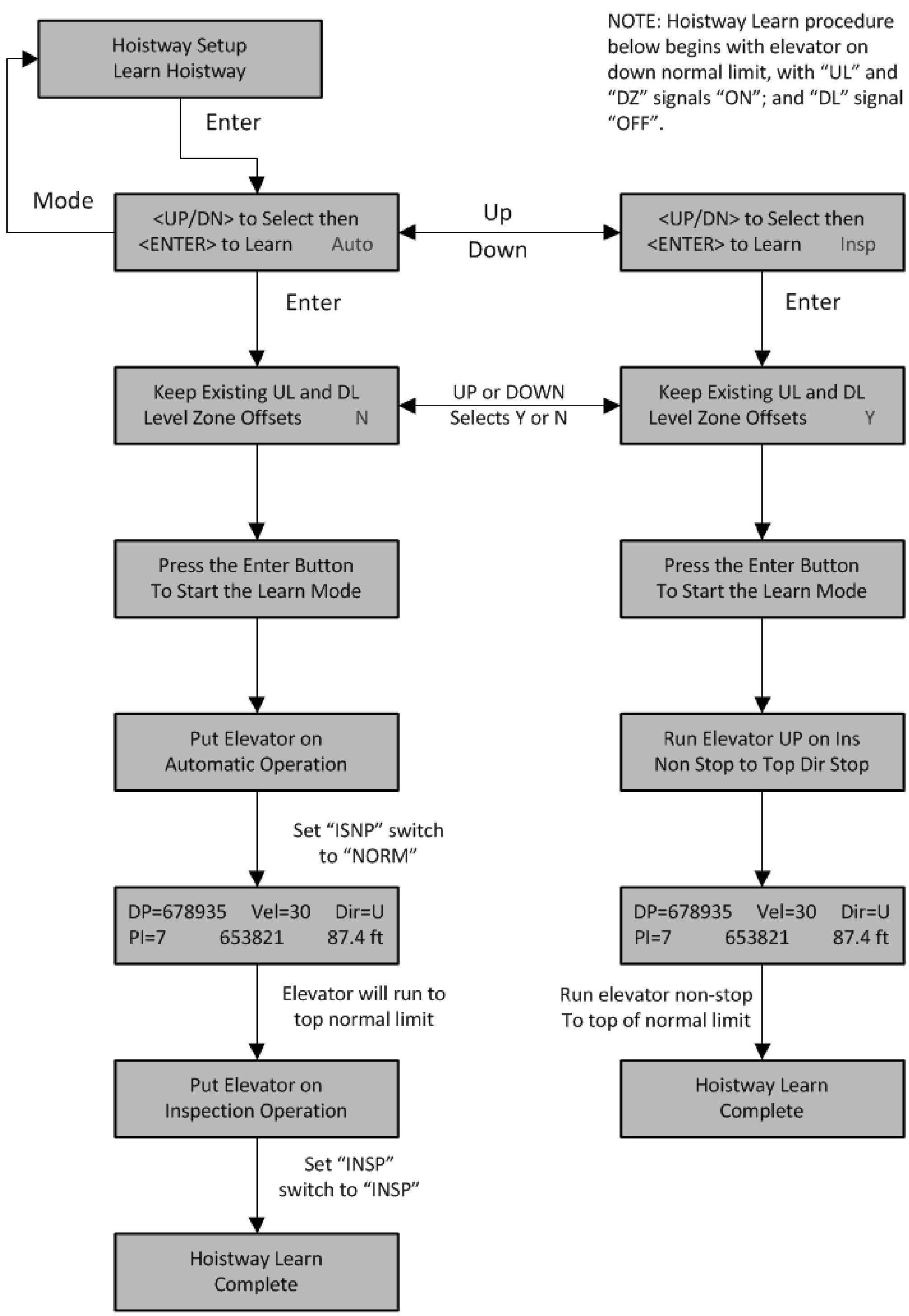
LCD Interface Main Menu
Elevator Setup



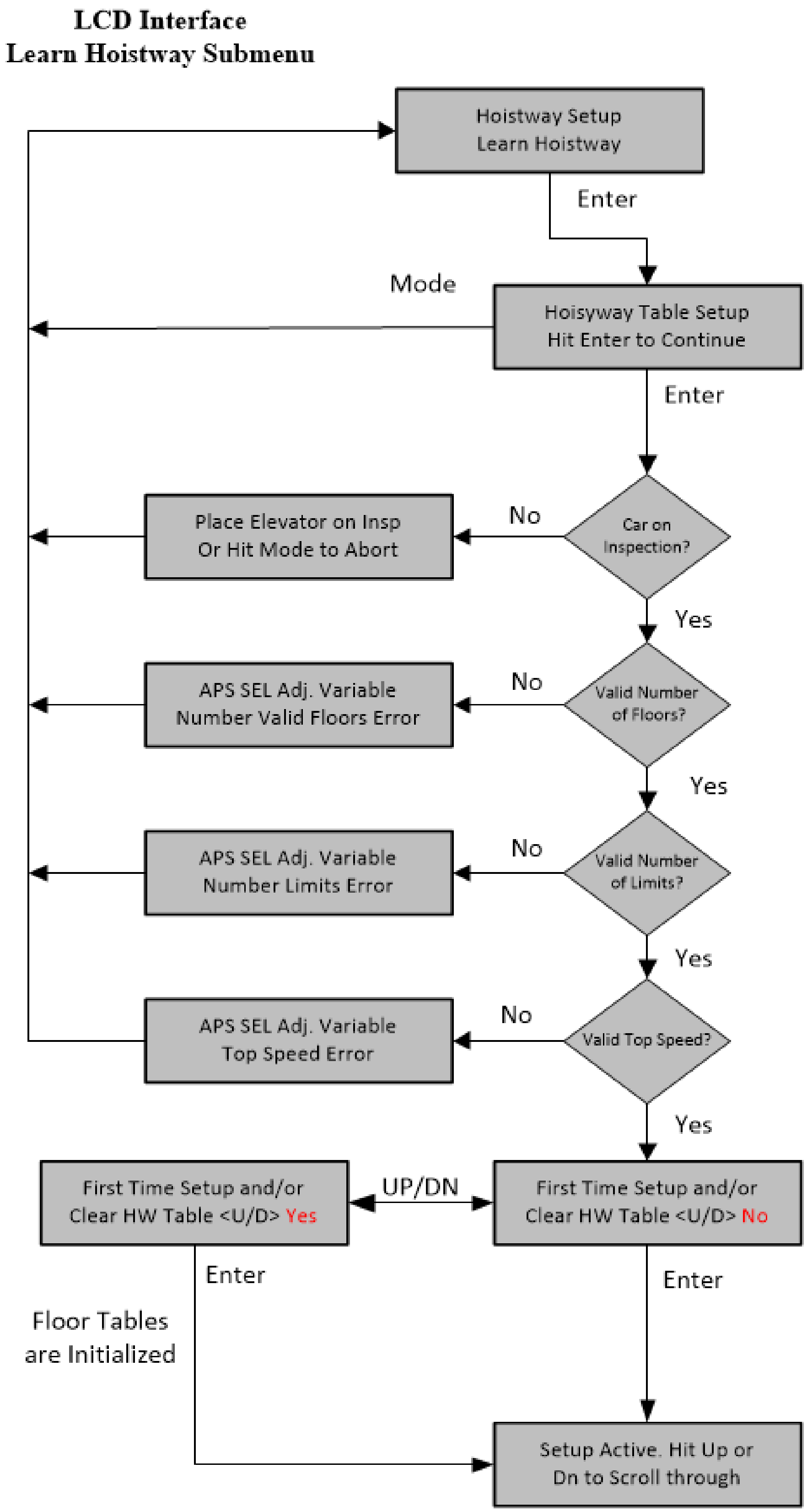
5.2.13.1 Learn Hoistway

5.2.13.1.1 Learn Hoistway for Tape and Tapeless

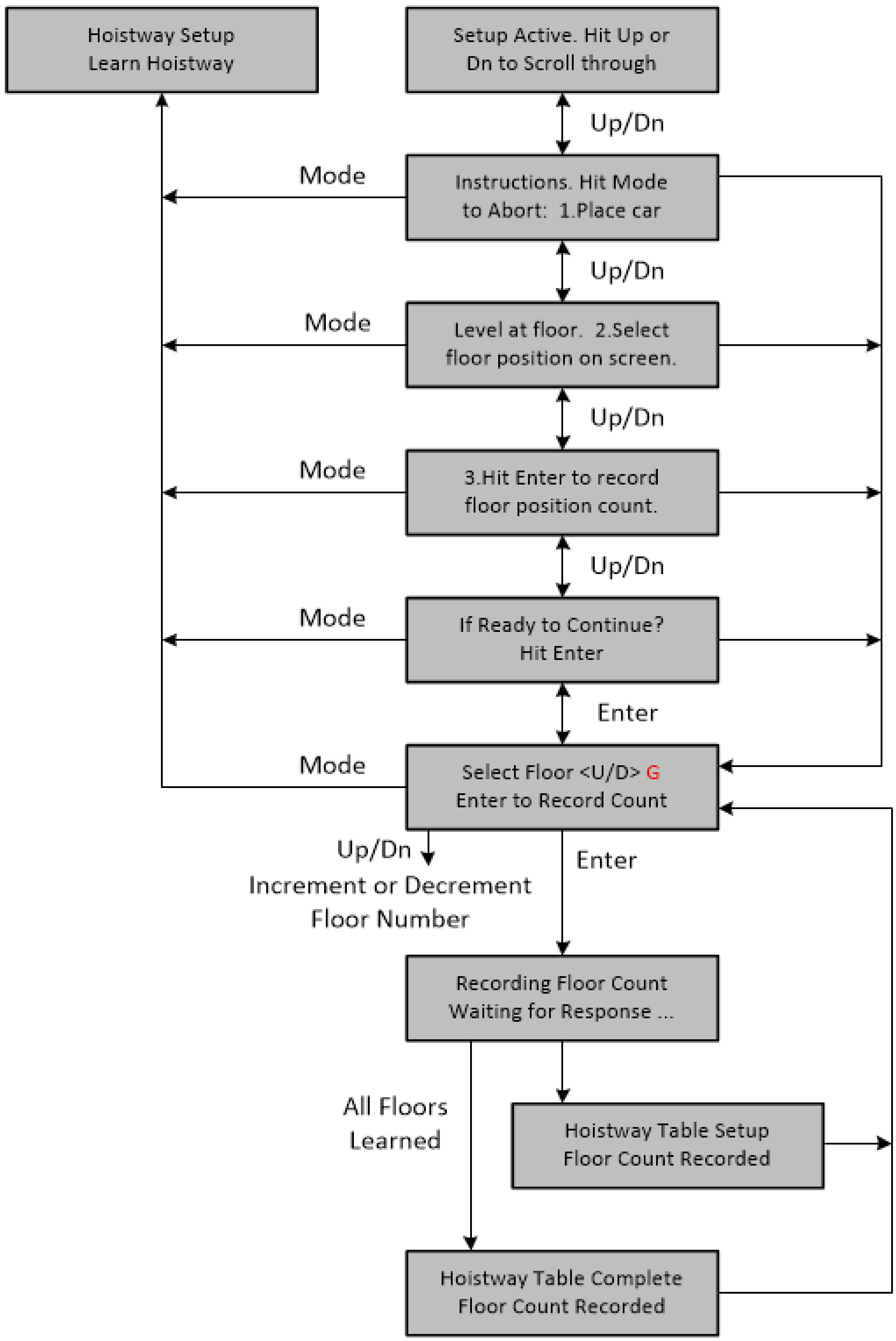
LCD Interface
Learn Hoistway Submenu



5.2.13.1.1 Learn Hoistway for Absolute Position System Selector

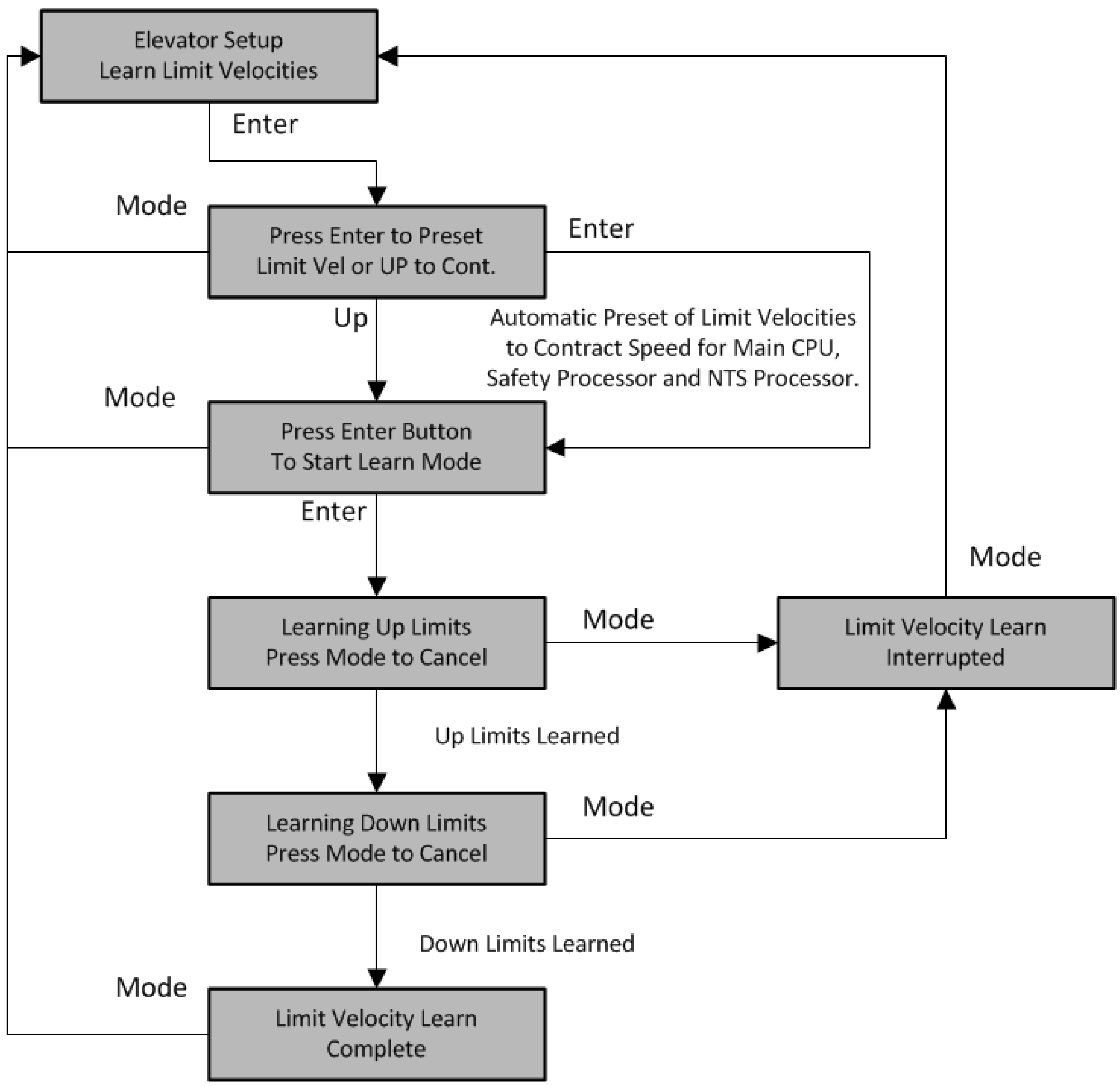


LCD Interface
Learn Hoistway Submenu
(Continued)



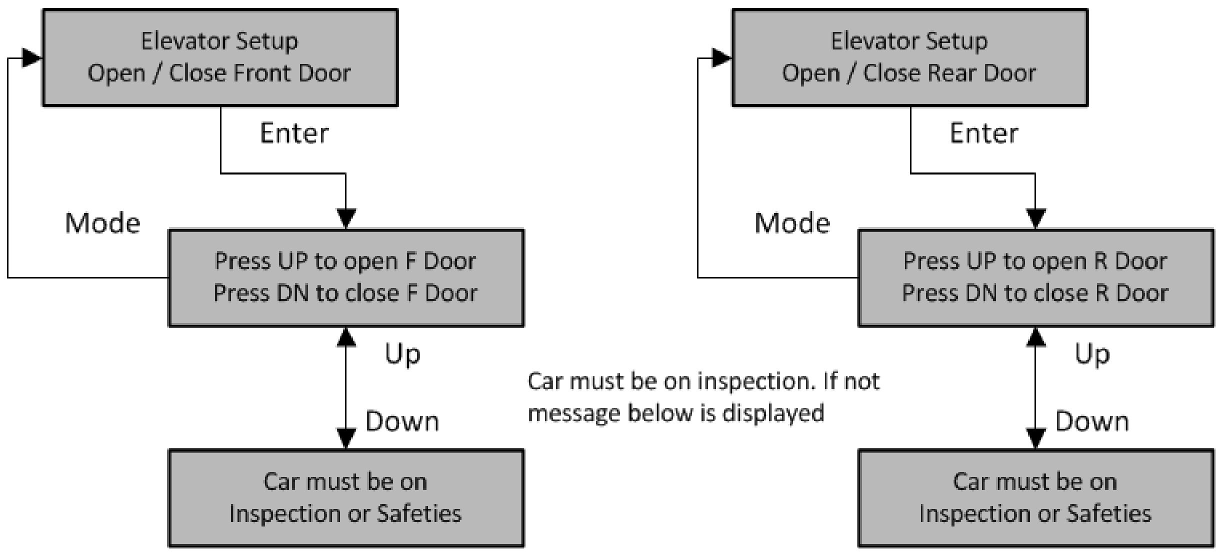
5.2.13.2 Learn Limit Velocities

LCD Interface
Learn Limit Velocities Submenu



5.2.13.3 Open/Close Door

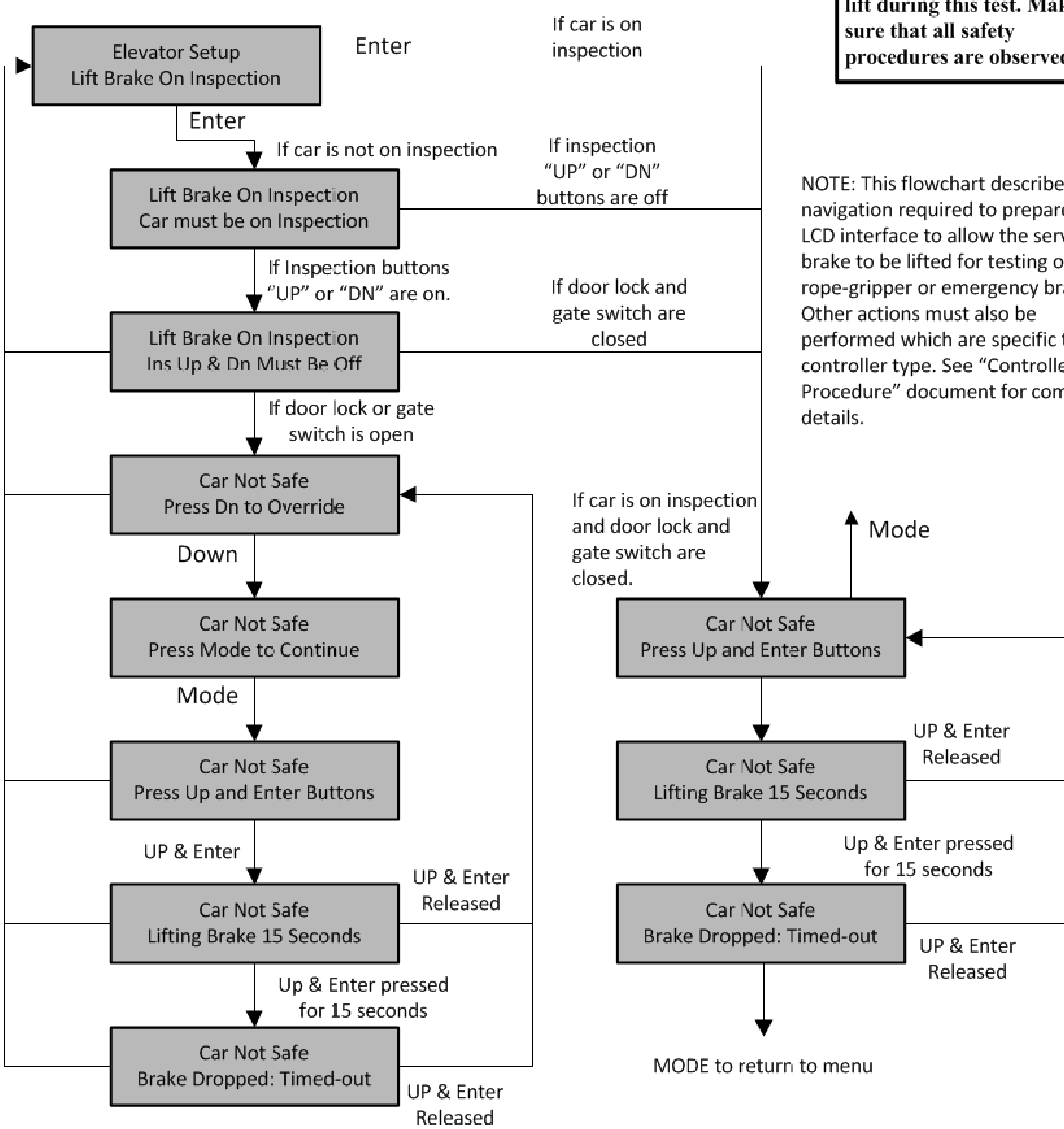
LCD Interface
Open / Close Front Door
Open / Close Rear Door



5.2.13.4 Lift Brake On Inspection

LCD Interface
Lift Brake On Inspection Submenu

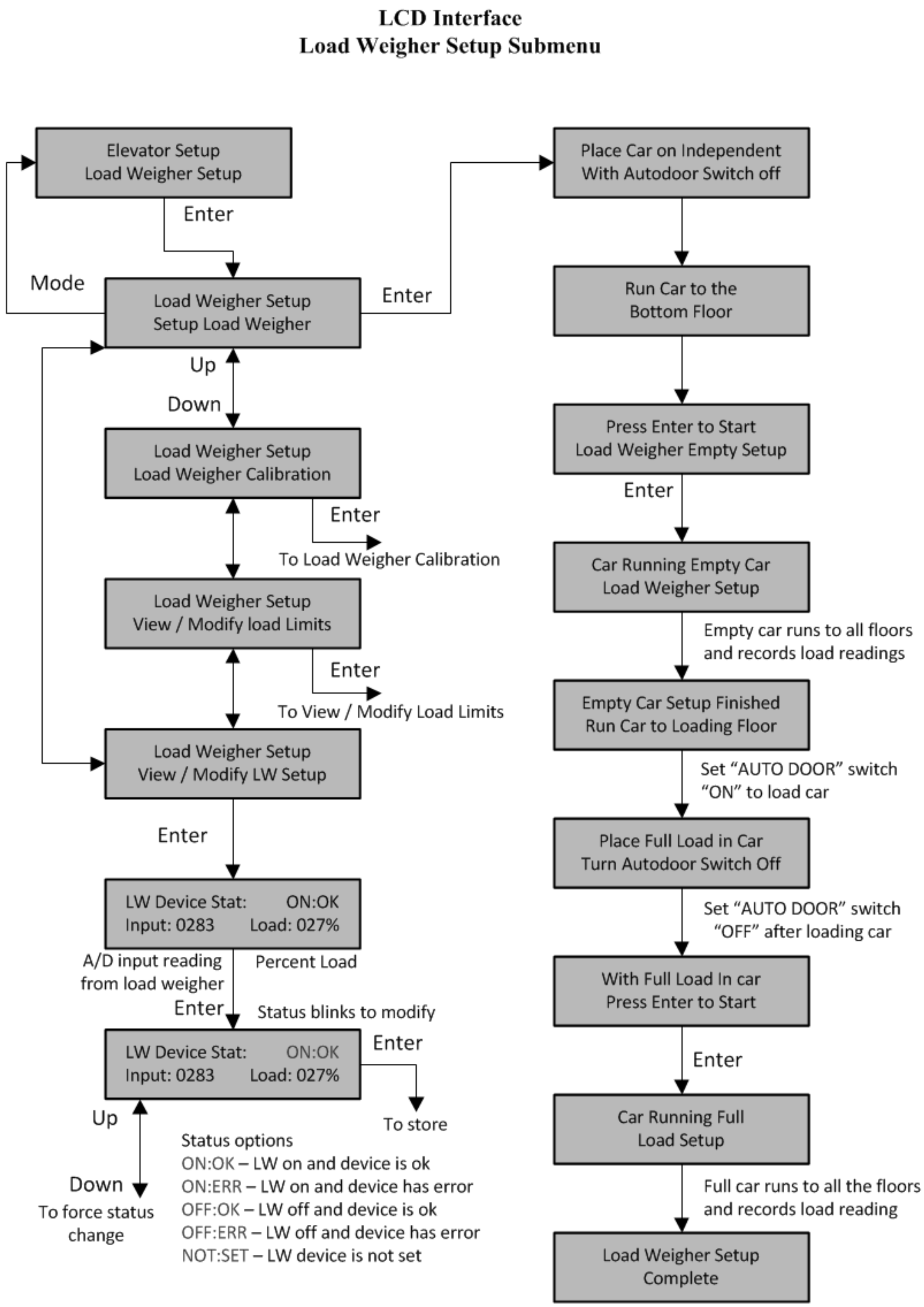
WARNING: Brake will lift during this test. Make sure that all safety procedures are observed.



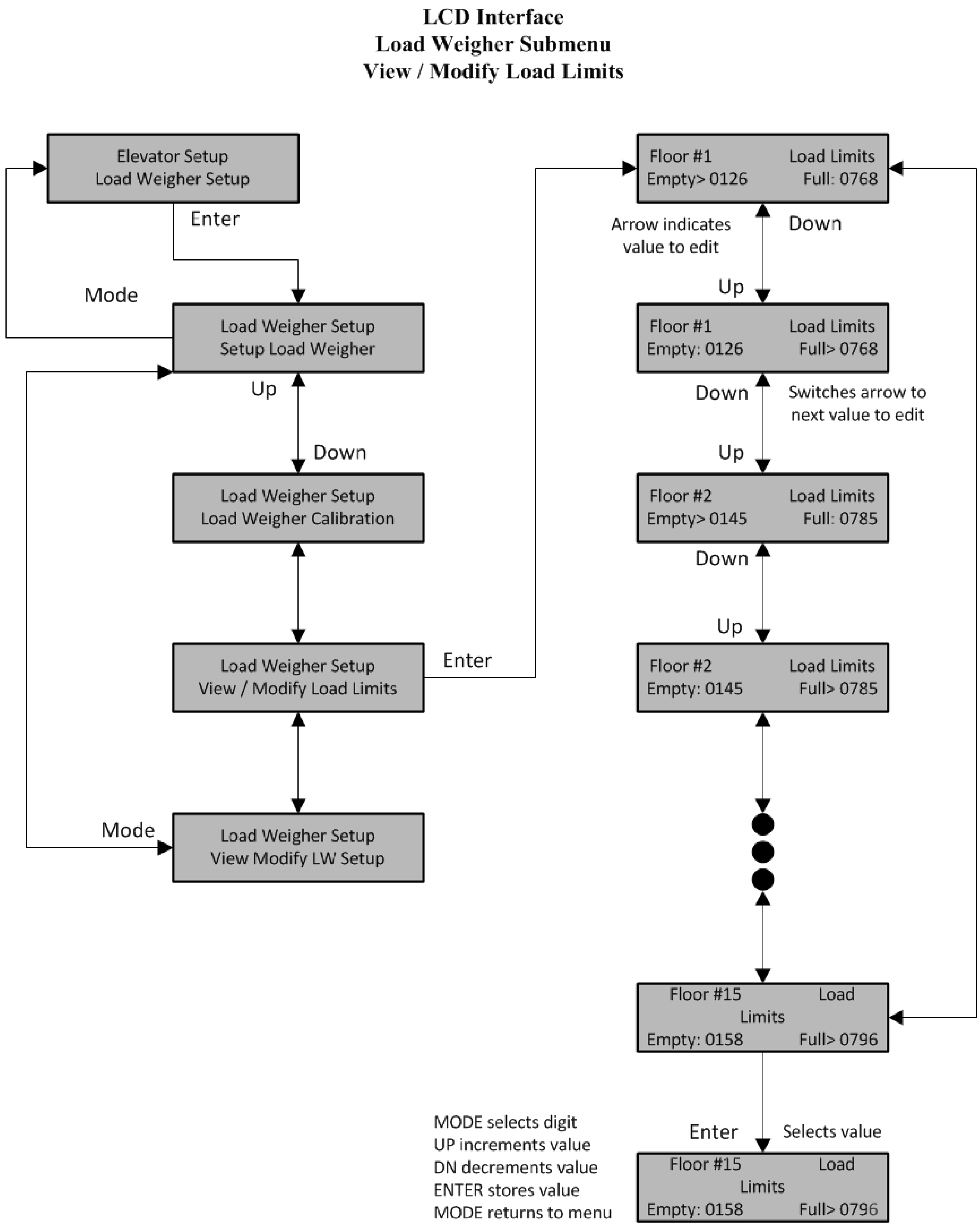
NOTE: This flowchart describes the navigation required to prepare the LCD interface to allow the service brake to be lifted for testing of the rope-gripper or emergency brake. Other actions must also be performed which are specific to the controller type. See "Controller Test Procedure" document for complete details.

5.2.13.5 Load Weigher Setup

5.2.13.5.1 Setup Load Weigher

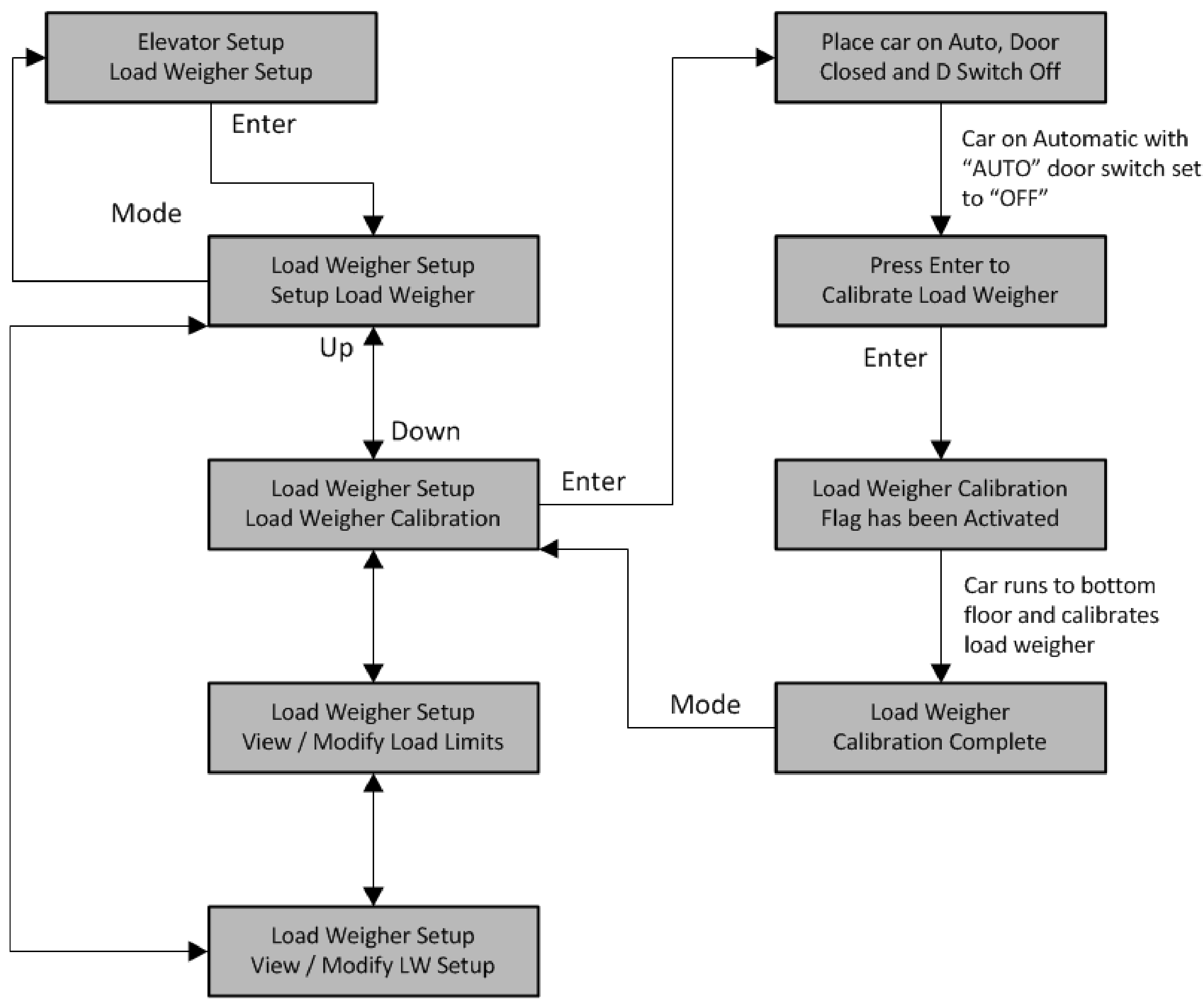


5.2.13.5.2 View/Modify Load Limits

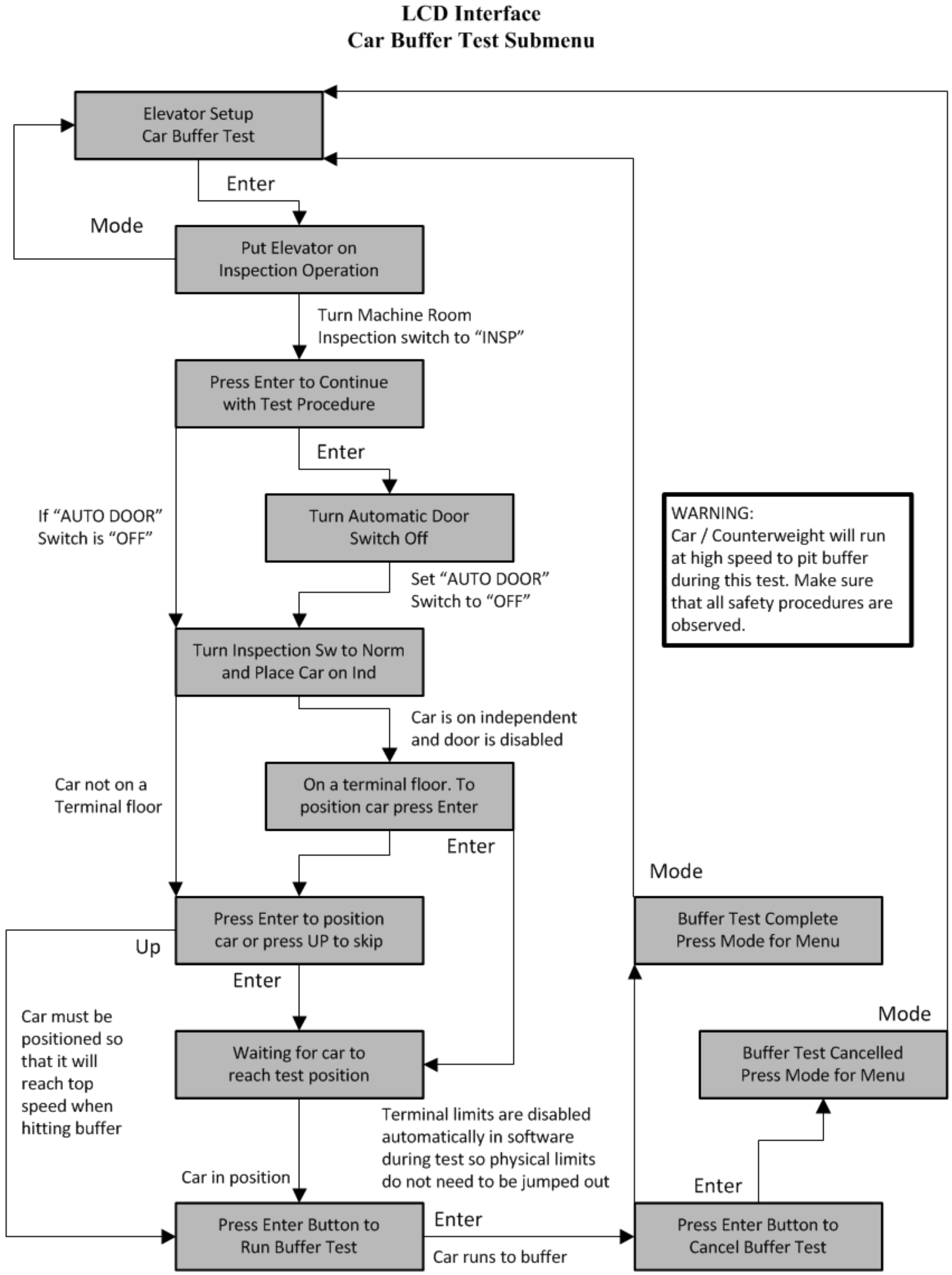


5.2.13.5.3 Calibrate Load Weigher

LCD Interface
Load Weigher Setup Submenu
Calibrate Load Weigher

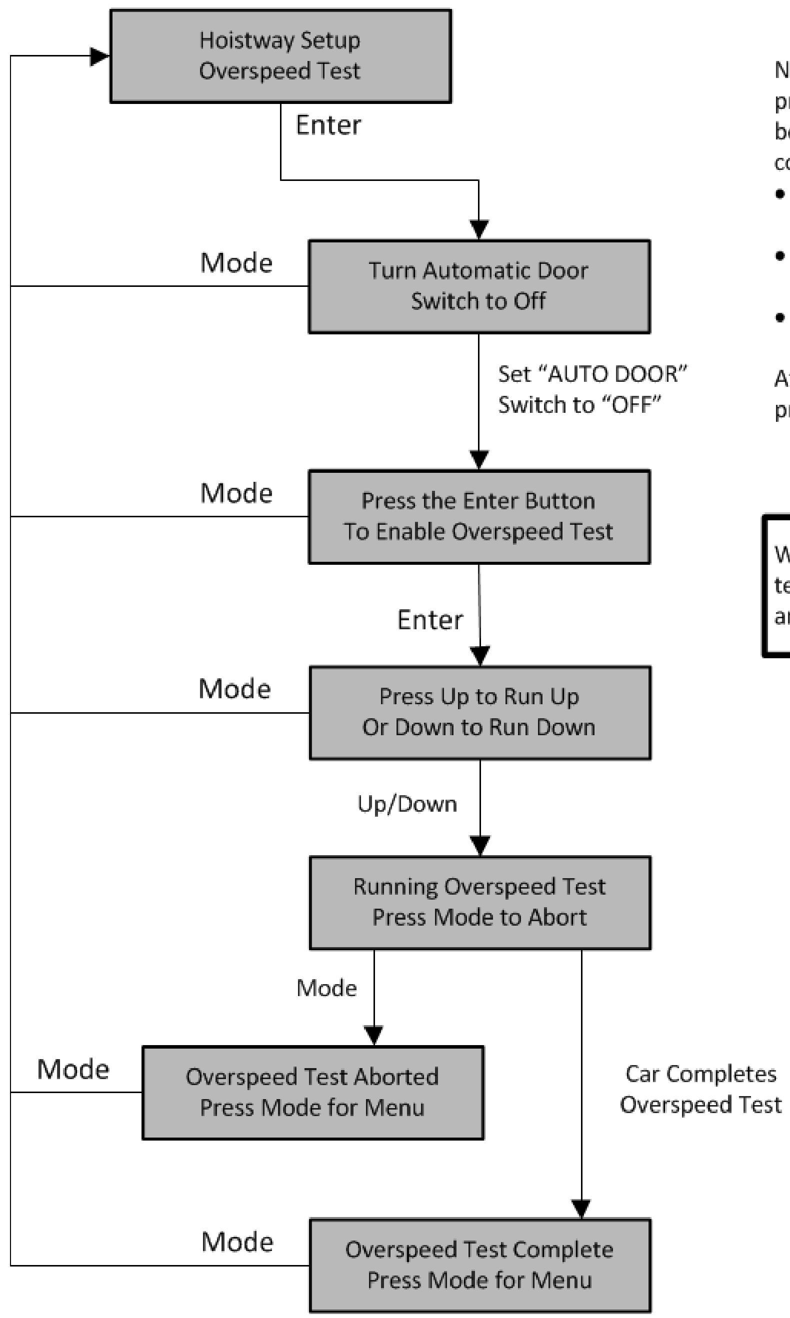


5.2.13.6 Car Buffer Test



5.2.13.7 Overspeed Test

LCD Interface
Overspeed Test Submenu



NOTE: Before performing Overspeed test procedure, the following parameters should be adjusted to force the car to run faster than contract speed.

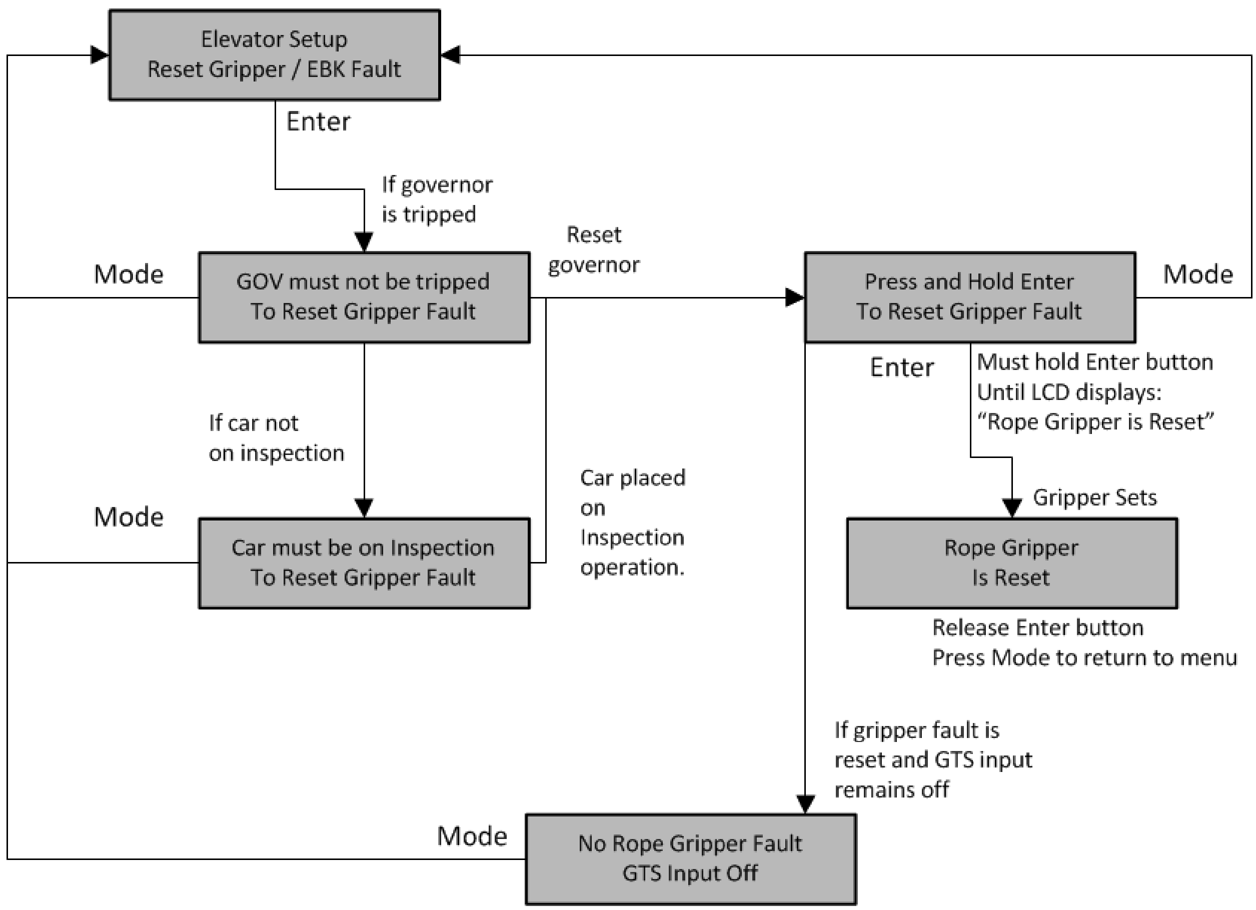
- For DSD 412 drive - drive function #11 Motor RPM
- For HPV600/900 – drive parameter A1 Contract MTR Speed
- For KEB F5 – Set LL16 to 125% and then set LL15 to Overspeed Test.

After test s complete, return parameters to proper values for contract speed.

WARNING: Car will overspeed during this test. Make sure that all safety procedures are observed.

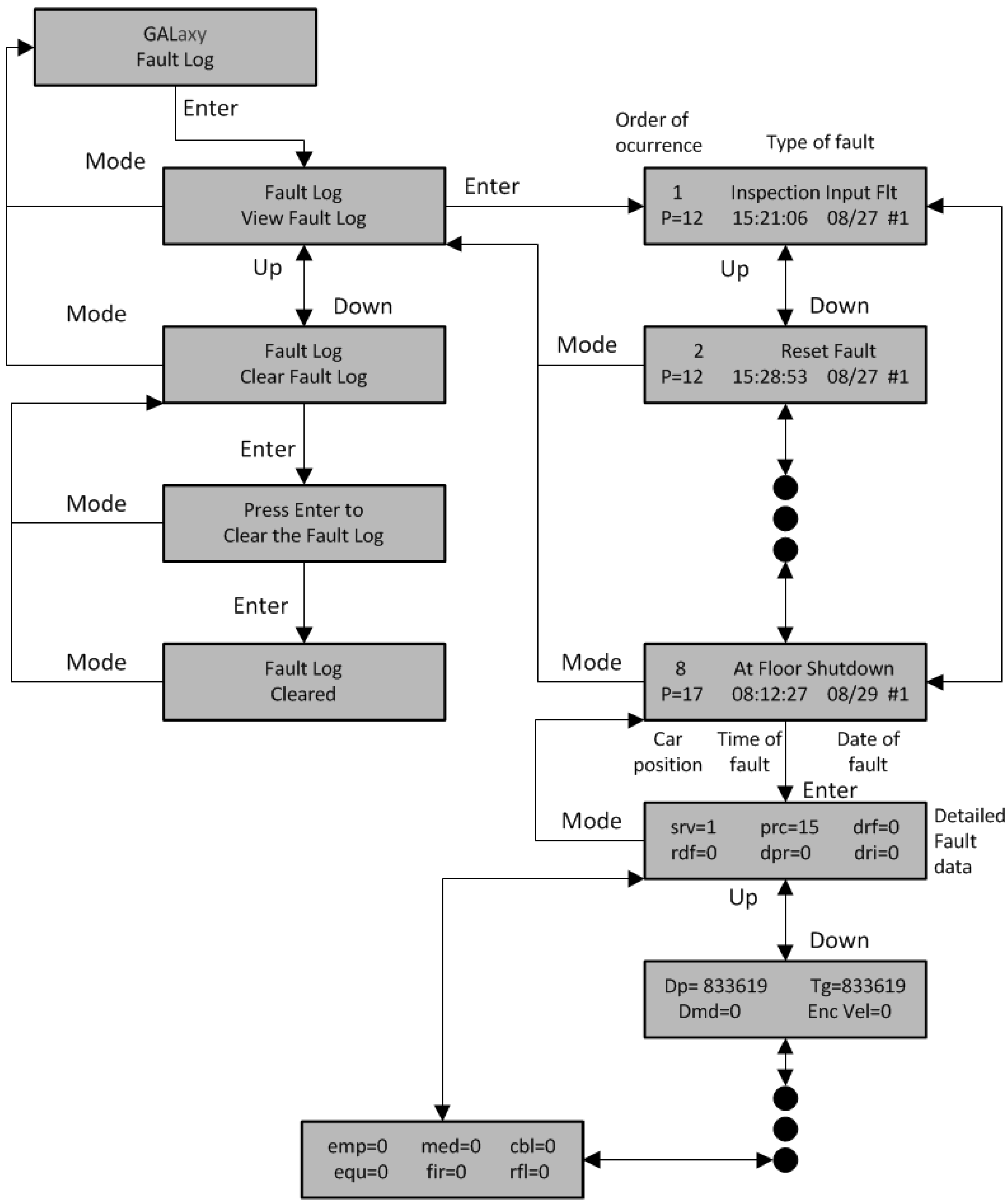
5.2.13.8 Reset Gripper Fault

LCD Interface
Reset Gripper Fault



5.2.14 Fault Log

LCD Interface Main Menu
Fault Log



Section 6 – Main CPU Faults & Detailed Faults

6.1 Main CPU Faults

Faults	Description	Possible Cause/Suggested Fix
Adv PreTrq Start Flt	Did not get safe on advance pre-torque start	• Advance pre-torque is enabled. When it activates, it waits for 5 seconds and expects the car to have moved by then fault gets declared. Possible Door operator or door lock failure caused car not to go.
APS Sel Brd CAN Error	APS (Abosolute Position System) Interface Board CAN Comm Fault	• Verify the RJ-45 connector from the selector camera to the selector interface board GALX-1133 is properly connected. • Verify that both LED's on the RJ-45 connector are blinking at 1 second intervals. • Make sure the CAT-6 cable is not run in parallel with any high voltage wires. • Replace the GALX-1133 board. • Replace the camera head.
APS Sel Brd Vel Fault	APS Selector Velocity Verification Fault (A and B channels do not match)	• Verify that both camera heads are clean, aligned and have a good contrast ratio (see diagnostic menu) • Check for communications errors for the selector to the selector interface board GALX-1133.
APS Sel P1 clip Fault	APS Selector Board P1 DZ Clip fault	• Processor 1 detected a door zone clip missing at the same floor for three consecutive stops on channel B. • Verify that the door zone clip is roughly in the middle of channel A and B cameras. Place the clip in the proper position • If the clip is missing or broken, then replace the clip. • Go to the LCD Interface on the Main CPU and select the Dpy APS Sel Valid Clips menu under the Hoistway Tables menu. Under the display for ClpP1, a bit is set for each floor with a valid clip. Position the elevator at the floor that does not have the bit set and re-learn the floor position.

Faults	Description	Possible Cause/Suggested Fix
APS Sel P1 IO Fault	APS Selector Board P1 DZ, DN, UN or SS input fault	• Processor 1 detected that the input for DZ, DN, UN or SS was off when the corresponding output was being turned on. • Faulty input, replace the input device. • Faulty output for DZ, DN or UN. Replace the output device. • Faulty Selector Safe Relay. Replace the relay. • Check the MRCAN Device fault for the APS Selector for more details.
APS Sel P1 SS Open	APS Selector Board P1 SS Open Fault	• Processor 1 detected that the Selector Safe Relay is not on when expected. This relay will open up the Safety String. • Check for other APS Selector board fault and correct the condition. • Faulty Selector Safe Relay. Replace the relay. • Check the MRCAN Device fault for the APS Selector for more details.
APS Sel P2 clip Fault	APS Selector Board P2 DZ Clip fault	• Processor 2 detected a door zone clip missing at the same floor for three consecutive stops on channel B. • Verify that the door zone clip is roughly in the middle of channel A and B cameras. Place the clip in the proper position • If the clip is missing or broken, then replace the clip. • Go to the LCD Interface on the Main CPU and select the Dpy APS Sel Valid Clips menu under the Hoistway Tables menu. Under the display for ClpP2, a bit is set for each floor with a valid clip. Position the elevator at the floor that does not have the bit set and re-learn the floor position.
APS Sel P2 IO Fault	APS Selector Board P2 DZ, DN, UN or SS input fault	• Processor 2 detected that the input for DZ, DN, UN or SS was off when the corresponding output was being turned on. • Faulty input, replace the input device. • Faulty output for DZ, DN or UN. Replace the output device. • Faulty Selector Safe Relay. Replace the relay. • Check the MRCAN Device fault for the APS Selector for more details.

Faults	Description	Possible Cause/Suggested Fix
APS Sel P2 SS Open	APS Selector Board P2 SS open Fault	• Processor 2 detected that the Selector Safe Relay is not on when expected. This relay will open up the Safety String. • Check for other APS Selector board fault and correct the condition. • Faulty Selector Safe Relay. Replace the relay. • Check the MRCAN Device fault for the APS Selector for more details.
APS Selector CAN Err	APS Absolute Position System Selector CAN Error. The Main CPU is not communicating with the APS Selector Channel A.	• Verify the proper connection for the twisted pair wires to the ENC-H and ENC-L terminals on GALX-1100AN CPU Board. • Noise on the CAN Bus, verify that the shield wire is connected according to the job print.
APS Selector Fault	APS Absolute Position System Selector Fault	• This fault may occur due to either an internal error, communications error, position validation error, velocity validation error on the APS Selector. • Possible solution is to clean the APS tape with damp soft cloth. • Check the MRCAN Device fault for the APS Selector for more details.
ASV Time-out Car 1	Automatic Service Time-out Car 1	• Car was not able to answer group hall call within the automatic service time-out timer. Look for fault condition on car.
ASV Time-out Car 2	Automatic Service Time-out Car 2	• Car was not able to answer group hall call within the automatic service time-out timer. Look for fault condition on car.
ASV Time-out Car 3	Automatic Service Time-out Car 3	• Car was not able to answer group hall call within the automatic service time-out timer. Look for fault condition on car.
ASV Time-out Car 4	Automatic Service Time-out Car 4	• Car was not able to answer group hall call within the automatic service time-out timer. Look for fault condition on car.
ASV Time-out Car 5	Automatic Service Time-out Car 5	• Car was not able to answer group hall call within the automatic service time-out timer. Look for fault condition on car.
ASV Time-out Car 6	Automatic Service Time-out Car 6	• Car was not able to answer group hall call within the automatic service time-out timer. Look for fault condition on car.
ASV Time-out Car 7	Automatic Service Time-out Car 7	• Car was not able to answer group hall call within the automatic service time-out timer. Look for fault condition on car.
ASV Time-out Car 8	Automatic Service Time-out Car 8	• Car was not able to answer group hall call within the automatic service time-out timer. Look for fault condition on car.
At Floor Shutdown	At floor shutdown	• Car faulted out while at floor. Look at the fault log for a different fault at the same time to determine cause of failure

Faults	Description	Possible Cause/Suggested Fix
Aut Swg Fr Door Open	Automatic Swing Front Door Open Fault. The swing door can only close by removing the door open signal and allowing the door to close mechanically. With this fault the door stayed open when the open signal was removed.	• Verify that the door that the ADO output has not failed on. If so then replace the output chip. • Verify that the door is not binding and is preventing from closing.
Aut Swg Rr Door Open	Automatic Swing Rear Door Open Fault. The swing door can only close by removing the door open signal and allowing the door to close mechanically. With this fault the door stayed open when the open signal was removed.	• Verify that the door that the ADOR output has not failed on. If so then replace the output chip. • Verify that the door is not binding and is preventing from closing.
Binary Input Fault	The floor position, read from binary inputs on the selector, does not match the car position.	• Excessive wear on the selector guides. • Preset magnet is missing or misaligned. • Faulty Hall Effect sensor on sensor board. • Faulty output on selector driver board. • Faulty BP1, BP2 or BP4 input
BKS Fault Slowdown	BKS Brake Switch Fault Slowdown. The brake lift switch dropped during the run causing the car to slowdown at the next available floor	• Faulty brake lift switch. • Low brake hold voltage
Bot Door Lock Fault	The Bottom Door Lock failed on while the door was open.	Faulty door lock. • Door lock not adjusted properly. • Jumper placed on door lock circuit. • Faulty wiring to DLB input. • Faulty DLB and DLB-1 inputs (For this to occur both DLB and DLB-1 inputs must fail on). • DOL input failed. Replace DOL input chip. • Door operator open limit DOL is not adjusted properly
Bot Final Limit Flt	Bottom Final Limit Open	• Car traveled onto the bottom final limit. • Faulty wiring of the final limit circuit.
Brake Drop Fault	Brake failed to drop. The BKS input did not close while stopped.	• Improper adjustment of brake switch. • Brake failed to drop.
Brake Pick Fault	Brake failed to pick. The BKS input did not open during the run.	• Improper adjustment of brake switch. • Brake failed to pick.

Faults	Description	Possible Cause/Suggested Fix
Brake Test Stall Flt	Brake Test Stall Fault. The elevator stalled during a brake test. A stall timer is running during the test using the Learn HW Stall time in the Car Timers menu. The is a protection timer that should never time-out. In an event that the car does not move during the test, the 6 second velocity timer should always expire first.	• Make sure the elevator can run properly at high speed. • Make sure the Learn HW Stall timer is set to 30 seconds or higher. The value set during a successful automatic hoistway learn would work fine.
Brake Test UN/DN Flt	Brake Test UN/DN Fault. The elevator hit the UN limit running in the up direction or DN limit running in the down direction during a brake test. The car will abort the brake test immediately if it is approaching or hits a terminal limit.	• Test run in the direction of the terminal floor. • UN or DN input failed or turned off unexpectedly during the test. Try to run the test again wihle monitoring the status of the UN and DN inputs. • UN or DN input off prior to starting the test. Check the status of the UN and DN inputs prior to the test and make sure that inputs work as expected. • Selector and/or limit not setup or adjusted properly.
Brake Test UT/DT Flt	Brake Test UT/DT Fault. The elevator hit the UT limit running in the up direction or DT limit running in the down direction during a brake test. The car will abort the brake test immediately if it is approaching or hits a terminal limit.	• Test run in the direction of the terminal floor. • UT or DT input failed or turned off unexpectedly during the test. Try to run the test again wihle monitoring the status of the UT and DT inputs. • UT or DT input off prior to starting the test. Check the status of the UT and DT inputs prior to the test and make sure that inputs work as expected. • Selector and/or limit not setup or adjusted properly.
BRK CAN Com Error	Brake Board Can Communication Error.	• Faulty Can communication wire connection. Verify proper twisted pair wires to the CANH and CANL terminals on the brake board. • Noise on the Can bus. Verify that the shield wire is connected according to the job print.
Brk Flt Set EM Brake	Emergency brake set from brake fault	• Brake Lift Sw' parameter is set to 2. There was a brake fault and this triggered an emergency brake/ gripper fault
Brk Flt Set Gripper	The Rope Gripper was tripped when the brake did not drop. The brake switch adjustable variable Can be set to only show the brake drop fault if the brake does not drop.	• Improper adjustment of brake switch. • Brake failed to drop.

Faults	Description	Possible Cause/Suggested Fix
BRK I/O Failed Off	The BRK input or output has failed off. The BRK coil is wired through a NO contact of MC, a NO regulator release contact of the drive (DON) and a BRK triac of the controller.	• Improper wiring of the brake BRK coil. Refer to prints for wire connections. • Faulty BRKi input. Replace BRKi input chip on 1102 board. • Faulty BRK output. Replace BRK output chip on 1102 board.
BRK I/O Failed On	The BRK input or output has failed on.	• Improper wiring of the brake BRK coil. Refer to prints for wire connections. • Faulty BRKi input. Replace BRKi input chip on 1102 board. • Faulty BRK output. Replace BRK output chip on 1102 board.
BRK Low DC Bus Volts	DC Bus Voltage is less than 80% of expected	• Incorrect Setting of Line to Line Brake voltage in Adjustable Variables • Incorrect dip-switch setting for Three Phase or Single Phase • Low Line Voltage • Rectifiers Blown or have bad Connection
BRK No Currnt w/Volt	Reading a resistance value (Vout/Aout) of 1000Ω or greater	• No Brake Connected • Bad Current Sensor • Check if board is low current or high current board
BRK No DC Bus Volts	DC Bus Voltage is less than 5VDC	• No AC Voltage Coming into AC1-AC2-AC3 • Rectifiers Blown or have bad Connection
BRK No Output Volts	If no DCBus Faults, Requested Output Voltage is greater than 0, Actual Output voltage is less than 3VDC	• IGBT Not Gating
BRK Over Current Flt	Average Current is higher than Preset Limit (based on board configuration)	• IGBT Shorted • Free Wheeling Diode Shorted • Gating Circuitry Shorted ON
BRK Over Voltage Flt	Output Voltage is at least 20V greater than the Voltage Requested.	• IGBT Shorted • Gating Circuitry shorted ON
BRK Rq Volt > DC Bus	Requested Output Voltage is 5% greater than the DC Bus Voltage	• Incorrect Setting of Pick/Hold/Re-level Voltage in Adjustable Variables • Low Line Voltage
Brk Test UTS/DTS Flt	Brake Test UTS/DTS Fault. The elevator hit the UTS limit running in the up direction or DTS limit running in the down direction during a brake test. The car will abort the brake test immediately if it is approaching or hits a terminal limit.	• Test run in the direction of the terminal floor. • UTS or DTS input failed or turned off unexpectedly during the test. Try to run the test again wihle monitoring the status of the UTS and DTS inputs. • UTS or DTS input off prior to starting the test. Check the status of the UTS and DTS inputs prior to the test and make sure that inputs work as expected. • Selector and/or limit not setup or adjusted properly.

Faults	Description	Possible Cause/Suggested Fix
Brk Test Vel Time-out	Brake Test Velocity Time-out. The car has 6 seconds to reach within 10 fpm of the top speed parameter. (See the Top Speed parameter in the Car Motion menu). The test is aborted if the desired speed is not reached within the 6 secon time period.	• The car did not reach top speed during the test. Make sure the car can reach top speed during a normal run. • Make sure that the encoder velocity feedback is displaying the correct velocity. • If it is necessary to run the test before the car can run top speed, reduce the top speed parameter in the Car Motion menu to a speed value that the car can reach within 6 seconds. • For a high speed car, the speed profile parameters may need to be adjusted so that the car can reach top speed quickly.
Buffer Switch Fault	Buffer Switch Open	• Verify that the buffer switch is set and the switch is closed. • Faulty wiring on the buffer switch circuit. • Car hit the buffer
Can Bus Off Error	Can Bus Off Error. The Can bus has been inactive for too long a period of time.	• Faulty CAN bus wiring. Check the Can bus terminal connections on all boards.
CAN spb bad command	Unintended Motion Command to Safety Processor unintentionally set	• This fault should never occur. Contact GAL.
Car 1 Comm Loss	The group car is not communicating with Car 1.	• Faulty wiring from R/T+ and R/T- from car to car. • Faulty U6 driver chip on 1100 board. • Noise on shield wire. Connect shield only on one end. • Noise on the communication wires. Run wires in separate conduit.
Car 2 Comm Loss	The group car is not communicating with Car 2.	• Faulty wiring from R/T+ and R/T- from car to car. • Faulty U6 driver chip on 1100 board. • Noise on shield wire. Connect shield only on one end. • Noise on the communication wires. Run wires in separate conduit.
Car 3 Comm Loss	The group car is not communicating with Car 3.	• Faulty wiring from R/T+ and R/T- from car to car. • Faulty U6 driver chip on 1100 board. • Noise on shield wire. Connect shield only on one end. • Noise on the communication wires. Run wires in separate conduit.
Car 4 Comm Loss	The group car is not communicating with Car 4.	• Faulty wiring from R/T+ and R/T- from car to car. • Faulty U6 driver chip on 1100 board. • Noise on shield wire. Connect shield only on one end. • Noise on the communication wires. Run wires in separate conduit.

Faults	Description	Possible Cause/Suggested Fix
Car 5 Comm Loss	The group car is not communicating with Car 5.	• Faulty wiring from R/T+ and R/T- from car to car. • Faulty U6 driver chip on 1100 board. • Noise on shield wire. Connect shield only on one end. • Noise on the communication wires. Run wires in separate conduit.
Car 6 Comm Loss	The group car is not communicating with Car 6	• Faulty wiring from R/T+ and R/T- from car to car. • Faulty U6 driver chip on 1100 board. • Noise on shield wire. Connect shield only on one end. • Noise on the communication wires. Run wires in separate conduit.
Car 7 Comm Loss	The group car is not communicating with Car 7	• Faulty wiring from R/T+ and R/T- from car to car. • Faulty U6 driver chip on 1100 board. • Noise on shield wire. Connect shield only on one end. • Noise on the communication wires. Run wires in separate conduit.
Car 8 Comm Loss	The group car is not communicating with Car 8	• Faulty wiring from R/T+ and R/T- from car to car. • Faulty U6 driver chip on 1100 board. • Noise on shield wire. Connect shield only on one end. • Noise on the communication wires. Run wires in separate conduit.
Car Call Light Fuse	Car Call Light Fuse Blown	• Check for short on the Car Call Light circuit.
Car Call Power Fuse	Car Call Power Fuse Blown	• Check for short on Car Call Power circuit.
Car Com Device Reset	Serial Car board reset unexpectedly. Usually caused by loss of power to the individual board.	• Usually caused by loss of power to the individual board. Check for loose connection on power to board. • Faulty I/O board.
Car Gate Safe Fault	Car Gate safe fault	• After Controller was safe with doors, gate switch and locks made and ready to run, a Gate switch (front or rear) input turned OFF.
Car Overspeed > 125%	Car Overspeed Greater than 125 percent of contract speed. This fault sets the gripper or emergency brake.	• Encoder PPR incorrectly set. Set to match the Drive’s Encoder Pulses. • Encoder RPM incorrectly set. Set to match the Motor or Governor RPM (depends on controller speed feedback). • The drive is not controlling the hoist machine motor. Check the response setting on the drive.

Faults	Description	Possible Cause/Suggested Fix
Car Safe Fault	The Car Safe Fault occurs from the wanting to run but does not have a critical input energized. Some of the conditions for a car safe fault will also cause other faults to be logged.	• The car does not have the gate or lock inputs and is running or trying to run • The gripper GTS input is not on. • The stop switch is open • An inspection string input fault. Only one input should be on in the inspection string (AUTO, CTI, ICI, ACC or MRI) • Gate or Lock Bypass switch is on when not on car top inspection
Car Safe Fault Preop	The car had a car safe fault while pre-opening the door.	• The car lost the DZ input while leveling into the floor and the door was open.
Car Safe Fault Start	The car had an onward call, had the door close limit but the car gate or door locks did not make after a 3 second time-out.	• The locks are not making properly when the door closes. • The door is not closing properly.
Car Safety Sw. Fault	Car Safety Switch Fault	• Verify that the car safety is not tripped. • Faulty wiring in the car safety circuit
Car Top Stop Switch	Car top stop switch	• Safety String Fault. Refer to Safety String Page on Diagrams. Check/replace input Chip.
CCB FET Open Blue	Car Call Board FET open blue	• Faulty LED signal from RGB Board. Look at detailed car faults log to determine device. 'dev' gives you address for global CAN device, 'dv2' gives you local CAN device and 'pf1' the number for the IO location within the local board.
CCB FET Open Green	Car Call Board FET open green	• Faulty LED signal from RGB Board. Look at detailed car faults log to determine device. 'dev' gives you address for global CAN device, 'dv2' gives you local CAN device and 'pf1' the number for the IO location within the local board.
CCB FET Open Red	Car Call Board FET open red	• Faulty LED signal from RGB Board. Look at detailed car faults log to determine device. 'dev' gives you address for global CAN device, 'dv2' gives you local CAN device and 'pf1' the number for the IO location within the local board.
CCB FET Short Blue	Car Call Board FET short blue	• Faulty LED signal from RGB Board. Look at detailed car faults log to determine device. 'dev' gives you address for global CAN device, 'dv2' gives you local CAN device and 'pf1' the number for the IO location within the local board.
CCB FET Short Green	Car Call Board FET short green	• Faulty LED signal from RGB Board. Look at detailed car faults log to determine device. 'dev' gives you address for global CAN device, 'dv2' gives you local CAN device and 'pf1' the number for the IO location within the local board.

Faults	Description	Possible Cause/Suggested Fix
CCB FET Short Red	Car Call Board FET short red	• Faulty LED signal from RGB Board. Look at detailed car faults log to determine device. 'dev' gives you address for global CAN device, 'dv2' gives you local CAN device and 'pf1' the number for the IO location within the local board.
CCB LED Open Blue	Car Call Board LED open blue	• Faulty LED signal from RGB Board. Look at detailed car faults log to determine device. 'dev' gives you address for global CAN device, 'dv2' gives you local CAN device and 'pf1' the number for the IO location within the local board.
CCB LED Open Green	Car Call Board LED open green	• Faulty LED signal from RGB Board. Look at detailed car faults log to determine device. 'dev' gives you address for global CAN device, 'dv2' gives you local CAN device and 'pf1' the number for the IO location within the local board.
CCB LED Open Red	Car Call Board LED open red	• Faulty LED signal from RGB Board. Look at detailed car faults log to determine device. 'dev' gives you address for global CAN device, 'dv2' gives you local CAN device and 'pf1' the number for the IO location within the local board.
CCB LED Short Blue	Car Call Board LED short blue	• Faulty LED signal from RGB Board. Look at detailed car faults log to determine device. 'dev' gives you address for global CAN device, 'dv2' gives you local CAN device and 'pf1' the number for the IO location within the local board.
CCB LED Short Green	Car Call Board LED short green	• Faulty LED signal from RGB Board. Look at detailed car faults log to determine device. 'dev' gives you address for global CAN device, 'dv2' gives you local CAN device and 'pf1' the number for the IO location within the local board.
CCB LED Short Red	Car Call Board LED short red	• Faulty LED signal from RGB Board. Look at detailed car faults log to determine device. 'dev' gives you address for global CAN device, 'dv2' gives you local CAN device and 'pf1' the number for the IO location within the local board.
CCB No Comm Aux Bd 1	Car Call Board local aux board 1 comm loss	• Comm loss to RGB Auxiliary Car Call Board. Check wiring and bus termination jumpers on boards. If problem persists, check Car Comm Status under diagnostics.
CCB No Comm Aux Bd 2	Car Call Board local aux board 2 comm loss	• Comm loss to RGB Auxiliary Car Call Board. Check wiring and bus termination jumpers on boards. If problem persists, check Car Comm Status under diagnostics.

Faults	Description	Possible Cause/Suggested Fix
CCB No Comm Board 1	Car Call Board local board 1 comm loss	• Comm loss to RGB Car Call Board. Check wiring and bus termination jumpers on boards. If problem persists, check Car Comm Status under diagnostics.
CCB No Comm Board 2	Car Call Board local board 2 comm loss	• Comm loss to RGB Car Call Board. Check wiring and bus termination jumpers on boards. If problem persists, check Car Comm Status under diagnostics.
CCB No LED Board	Car Call LED board missing	• Faulty LED signal from RGB Board. Look at detailed car faults log to determine device. 'dev' gives you address for global CAN device, 'dv2' gives you local CAN device and 'pf1' the number for the IO location within the local board.
CCB Stuck Button	Car Call Board stuck button	• Faulty LED signal from RGB Board. Look at detailed car faults log to determine device. 'dev' gives you address for global CAN device, 'dv2' gives you local CAN device and 'pf1' the number for the IO location within the local board.
Comp. Switch Fault	Compensating Rope Switch Open	• Verify that the compensating rope switch is set and the switch is closed. • Improper cabling of the compensating ropes on the sheave.
COP CAN Com Error	COP Board Can Communication Error.	• Faulty Can communication wire connection. Verify proper twisted pair wires to the canh and canl terminals on the brake board. • Noise on the Can bus. Verify that the shield wire is connected according to the job print.
CTCAN Device Fault	Device on the Car Top CAN Port has a Fault	• Look at the details of the fault. The device name and the error code that caused the fault are listed. • Look up the fault code for the device for debugging information.
CTCAN Device Reset	Device on the Car Top CAN Port has reset	• Look at the details of the fault. The device name and the error code that caused the fault are listed. • The device requested an initialization packet from the main CPU. Typically this occurs during power up or from a power cycle of the individual device. • Ignore the error if the controller power has been cycled. Otherwise, check the device communications and power connections.
CWT Sw Error at DT	Car 'above cwt' flag was set for above the counterweight when the car hit the down terminal slowdown limit.	• The counterweight switch was not hit during the run or the car was lost when powered up. • Faulty wiring of the counterweight switch. • Improper adjustment of the counterweight switch.

Faults	Description	Possible Cause/Suggested Fix
CWT Sw Error at UT	Car 'above cwt' flag was set for below the counterweight when the car hit the up terminal slowdown limit.	• The counterweight switch was not hit during the run or the car was lost when powered up. • Faulty wiring of the counterweight switch. • Improper adjustment of the counterweight switch.
DBR Temperature Flt	Dynamic Braking Resistor Temperature Fault. The temperature for the dynamic braking resistors is read in through a temperature sensor mounted above the resistors. When the temperature sensor opens a contact, the CPU detects a temperature fault, an error is recorded, the car is shut down at the next floor and the DBC relay is de energized to open the DB Resistor circuit.	• Faulty Temperature Sensor. If the DB Resistors are not hot, check the temperature sensor input board connected to the CPU board. The input LED should be on when the temperature is okay. If the LED is not on, jump the two terminals on the temperature input board and the LED should go on. If the LED goes on then the Temperature Sensor is bad. Replace the Temperature Sensor. • Faulty Temperature Sensor Input Board. Test the sensor input as above. If the LED does not turn on when the input terminals are jumped together, replace the Temperature Sensor Input Board.
Delta off Fault	DEL input did not come on at start or went off during a run.	• The delta contact did not make on a Y-Delta starter. • The MC contact did not make on an across-the-line starter • The 'at speed' contact did not make on an electronic soft-starter. • Faulty DEL input. Replace the DEL input chip.
Delta On Fault	DEL input failed on when is should have been off. This would occur at the start of a run when the I/O's are checked. The input failed on or the contact for the input failed closed.	• Faulty DEL input (failed on). Check the input and output status on the LCD interface. • Faulty contact for DEL input failed on. Replace the DEL input chip.
DF I/O Failed Off	The DF input or output has failed off	Hydro • Fault on Safety Processor Board. The Safety Processor Board can disable the run control to the SDF output chip. Check if the PIC or PAL inhibit LED turns on when the car attempts to run. Check the elevator service, faults, and inputs/outputs on the Safety Processor Board LCD display. • Faulty wiring to the SC common on the MAIN I/O board. • Faulty wiring to the SDF terminal on the MAIN I/O board. • Faulty wiring to the Down Fast valve. • Faulty SDFi input (replace input chip). • Faulty SDF output (replace output chip).

Faults	Description	Possible Cause/Suggested Fix
DF I/O Failed On	The DF input or output has failed on.	Hydro • Faulty SDFi input (replace input chip). • Faulty SDF output (replace output chip).
DL Failed On Fault	DL Failed On Fault. The DL leveling sensor did not turn off during a run.	• DL hall effect sensor bad on selector sensor board. Replace sensor board. • DL input on selector driver board is bad. Replace selector driver board.
DL20 Phone Test Failed	Phone Test from DL20 phone monitoring device indicated a failure	• Refer to the manufacturers troubleshooting guide for the DL20.
DLB & DLB-1 Opposite	Input failure on one of the Door Lock Bottom (DLB) inputs.	• Faulty DLB or DLB-1 input (replace input chip).
DLM & DLM-1 Opposite	Input failure on one of the Door Lock Middle (DLM) inputs.	• Faulty DLM or DLM-1 input (replace input chip).
DLT & DLT-1 Opposite	Input failure on one of the Door Lock Top (DLT) inputs.	• Faulty DLT or DLT-1 input (replace input chip).
Dn Directional Fault	Car unexpectedly hit the Down Normal Limit while running down.	• Faulty wiring for the DN limit. • Tape Selector: Incorrect placement of DT magnet (too close to center of tape). • Tapeless Selector: Incorrect placement of DT magnet not aligned properly with magnetic sensor on selector (cross talk from DT magnet to DN sensor).
Dn Normal SW Setup	Down Normal must turn on before reaching bottom floor dead level	• The down normal needs to be moved down so when the car is Dead level at the bottom landing DN is ON. Allow at least 2 inches run before DN turns OFF

Faults	Description	Possible Cause/Suggested Fix
DNR I/O Failed Off	The DNR input or output has failed off.	• Fault on Safety Processor. The Safety Processor is located on the MAIN I/O board. This device can disable the run control to the DNR output chip. Check if the SAF-PROC or SAF-PAL FAULT LEDs turn on when the car attempts to run. Check the elevator service, faults, and inputs/outputs on the Safety Processor status of the LCD Display Interface. • Faulty DNR output or DNRi input. Replace the DNR output and DNRi input chip. • No 24VDC from the drive. Refer to Schematics. • Incorrect jumper placement on MAIN I/O board. Verify that jumpers on the bottom center of the board are positioned correctly for SOURCE or SINK. The jumpers depend on the drive type and is shown on the drive portion of the job schematic. If necessary move the jumpers to the correct position. • RUN, MC or BRK auxiliary contact not making properly. Verify the operation and contact integrity.
DNR I/O Failed On	The DNR input or output has failed on.	• Faulty DNR output. Replace the DNR output chip. • Faulty DNRi input. Replace DNRi input chip. • Incorrect jumper placement on MAIN I/O board. Verify that jumpers on the bottom center of the board are positioned correctly for SOURCE or SINK. The jumpers depend on the drive type and is shown on the drive portion of the job schematic. If necessary move the jumpers to the correct position.
DON I/O Failed Off	The DON input or the drive run relay contact has failed off. The run relay on the drive turns on the DON input (Drive ON) indicating that the regulator is released and the drive is controlling the motor.	• Loss of voltage on terminal SFC. • MC contact in series with the drive run relay opened. See MCX Off Fault for additional information. • The drive faulted on start and dropped the run relay. Check the drive fault log. • Faulty DRO relay controlled by the drive. • Faulty DON input on the controller. Replace the DON input chip. • The run relay in the drive is not programmed properly. Check the default drive setup for the run relay output.

Faults	Description	Possible Cause/Suggested Fix
DON I/O Failed On	The DON input or the drive output has failed on. When the drive is turned off, the run relay on the drive will drop out turning off DON.	• Improper wiring of the Drive On contact controlled by the drive.. Refer to prints for wire connections. • Faulty wiring to the DON input. • Faulty DON input on the controller. Replace the DON input chip. • Faulty DRO relay failed on. • The control of the DRO relay by the drive is not programmed properly. Check the default drive setup for the DRive On output.
Door Close Fault	The door did not reach the Door Close Limit within the door close protection time.	• Door Close Limit (DCL) not adjusted properly. • Faulty Door Close Limit (DCL). Replace DCL input chip. • Trash in door track preventing door from closing.
Door Lock Safe Fault	Door lock safe fault	• After Controller was safe with doors, gate switch and locks made and ready to run, a door lock inputs turned OFF.
Door Low Voltage Flt	Door Line Voltage Low	• Voltage Sensor Board Related. Voltage being monitored for Door Operator dropped below the setting for parameter 'Low Door Volt '
Door Motor Overload	Door Motor Overload	• Door Motor Overload signal tripped. Check Input chip for DMO signal
Door Open Fault	The door did not reach the Door Open Limit within the door open protection time.	• Door Open Limit (DOL) not adjusted properly. • Faulty Door Open Limit (DOL). Replace DOL input chip.
Door Zone Aux On Flt	The auxiliary door zone input failed on.	• One or both of the DZA sensors on the selector sensor board failed. Replace selector sensor board. • Faulty selector board. Replace the selector board.
Door Zone Off Fault	Door Zone Fault occurs from the following conditions: • The car is not on UL or DL when expected. • The car does not have DZ when expected. • The DZ relay does not drop out while in motion.	The car does not have DZ when it is expected to be level at the floor. DZ output on selector board failed on or did not turn on. (Replace DZ output on selector driver board). One or both of the DZ sensors on the selector sensor board failed. Replace selector sensor board. • DZ input on 1102 board failed on or off. Replace DZ input on 1102 board.
Door Zone On Fault	The door zone input failed on.	• DZ output on selector board did not turn off. (Replace DZ output on selector driver board). • One or both of the DZ sensors on the selector sensor board failed. Replace selector sensor board. • DZ input on the 1102 board failed. Replace DZ input on 1102 board.

Faults	Description	Possible Cause/Suggested Fix
DoorZone Aux Off Flt	The auxiliary door zone input failed off.	• One or both of the DZA sensors on the selector sensor board failed. Replace selector sensor board. • Faulty Selector Driver Board. Replace the Selector Board
DPM Input Fault	The DPM input fault occurs when door opens and the DPM input did not go off.	• DPM switch not setup properly on the door operator. • Faulty DPM input. Replace DPM input chip.
DPM Off/GS or DL On	DPM Off with Gate Switch or Door Lock On. The Door Protection Module input must go on before gate switch or door lock inputs go on.	• The DPM switch on the door operator is not setup properly. DPM should turn on before the Gate Switch is made. • There is no DPM input on the door operator. Jump the DPM input to the GS-1 terminal. • Fault DPM input. Replace the DPM input chip.
Drive Com Rcv Error	Controller has a communications error with drive. The controller has not received a valid message from the drive for more than one second.	• Faulty communications cable connection. Check the drive twisted pairs connected from the drive to the 1100 CPU board. Noise on the communication cable. Verify that the shield on the communications cable to the drive is connected to earth ground on one end. • Open the DB9 connector to the drive and verify that the wires are soldered properly. • Faulty communication chip. Replace the 1100 CPU board.
Drive has Com Error	Drive has a communications error. The controller has received a message from the drive that it has communication receive errors.	• Faulty communications cable connection. Check the drive twisted pairs connected from the drive to the 1100 CPU board. Noise on the communication cable. Verify that the shield on the communications cable to the drive is connected to earth ground on one end. • Open the DB9 connector to the drive and verify that the wires are soldered properly. • Faulty communication chip. Replace the 1100 CPU board.
Drive Ready Fault	The drive has a fault	• The drive has or had a fault. Check the drive fault log. • Faulty RDY input. (Replace the RDY input). • Faulty Drive SFD relay. (Replace the SFD Relay). • Faulty Drive RDY relay. (Replace the RDY Relay).

Faults	Description	Possible Cause/Suggested Fix
DT count Fault	The verification position count for the DT input switch was off by more than 10 inches when the switch was activated.	• The car was lost due to a preset error. Check the guides on the selector. Check the fault log for binary preset errors. • The controller has a faulty encoder signal for the pulse count. Check that the car can make long runs without overshooting the floor or stopping short of the floor. • The power common to the limit switches was lost. Check fuse F1 on the selector board. • Incorrect counting of pulse counts. For Tapeless, check encoder connection to motor and encoder wiring. For Tape, check pulse sensors for proper quadrature at selector. • Hoistway not learned properly. Perform a hoistway learn procedure. • DT magnet not adjusted properly. Check at slow speed if sensor input is breaking, making and then braking again. Magnet needs to be closer to the sensor on the selector.
DT Failed On Fault	DT input Failed On Fault. The car was at the bottom floor and the DTS input was low true (DTS switch made) but the DT input was high (DT not made).	• The DTS limit is not installed. The DTS limit is used on all controllers as a verification that the car at the bottom most landing. Add the DTS limit. • The DT did not break at the bottom terminal landing. Adjust or replace the DT switch. • Faulty DT input. Replace selector board. • Faulty DT sensor on selector sensor board. Replace the sensor board for tape selector or replace the individual DT sensor on tapeless selector.
DT1 count Fault	The verification position count for the DT1 input switch was off by more than 10 inches when the switch was activated.	• The car was lost due to a preset error. Check the guides on the selector. Check the fault log for binary preset errors. • The controller has a faulty encoder signal for the pulse count. Check that the car can make long runs without overshooting the floor or stopping short of the floor. • The power common to the limit switches was lost. Check fuse F1 on the selector board. • Incorrect counting of pulse counts. For Tapeless, check encoder connection to motor and encoder wiring. For Tape, check pulse sensors for proper quadrature at selector. • Hoistway not learned properly. Perform a hoistway learn procedure. • DT1 magnet not adjusted properly. Check at slow speed if sensor input is breaking, making and then braking again. Magnet needs to be closer to the sensor on the selector.

Faults	Description	Possible Cause/Suggested Fix
DT2 count Fault	The verification position count for the DT2 input switch was off by more than 14 inches when the switch was activated.	• The car was lost due to a preset error. Check the guides on the selector. Check the fault log for binary preset errors. • The controller has a faulty encoder signal for the pulse count. Check that the car can make long runs without overshooting the floor or stopping short of the floor. • The power common to the limit switches was lost. Check fuse F1 on the selector board. • Incorrect counting of pulse counts. For Tapeless, check encoder connection to motor and encoder wiring. For Tape, check pulse sensors for proper quadrature at selector. • Hoistway not learned properly. Perform a hoistway learn procedure. • DT2 magnet not adjusted properly. Check at slow speed if sensor input is breaking, making and then braking again. Magnet needs to be closer to the sensor on the selector.
DT3 count Fault	The verification position count for the DT3 input switch was off by more than 18 inches when the switch was activated.	• The car was lost due to a preset error. Check the guides on the selector. Check the fault log for binary preset errors. • The controller has a faulty encoder signal for the pulse count. Check that the car can make long runs without overshooting the floor or stopping short of the floor. • The power common to the limit switches was lost. Check fuse F1 on the selector board. • Incorrect counting of pulse counts. For Tapeless, check encoder connection to motor and encoder wiring. For Tape, check pulse sensors for proper quadrature at selector. • Hoistway not learned properly. Perform a hoistway learn procedure. • DT3 magnet not adjusted properly. Check at slow speed if sensor input is breaking, making and then braking again. Magnet needs to be closer to the sensor on the selector.

Faults	Description	Possible Cause/Suggested Fix
DT4 count Fault	The verification position count for the DT4 input switch was off by more than 24 inches when the switch was activated.	• The car was lost due to a preset error. Check the guides on the selector. Check the fault log for binary preset errors. • The controller has a faulty encoder signal for the pulse count. Check that the car can make long runs without overshooting the floor or stopping short of the floor. • The power common to the limit switches was lost. Check fuse F1 on the selector board. • Incorrect counting of pulse counts. For Tapeless, check encoder connection to motor and encoder wiring. For Tape, check pulse sensors for proper quadrature at selector. • Hoistway not learned properly. Perform a hoistway learn procedure. • DT4 magnet not adjusted properly. Check at slow speed if sensor input is breaking, making and then braking again. Magnet needs to be closer to the sensor on the selector.
DT5 count Fault	The verification position count for the DT5 input switch was off by more than 32 inches when the switch was activated.	• The car was lost due to a preset error. Check the guides on the selector. Check the fault log for binary preset errors. • The controller has a faulty encoder signal for the pulse count. Check that the car can make long runs without overshooting the floor or stopping short of the floor. • The power common to the limit switches was lost. Check fuse F1 on the selector board. • Incorrect counting of pulse counts. For Tapeless, check encoder connection to motor and encoder wiring. For Tape, check pulse sensors for proper quadrature at selector. • Hoistway not learned properly. Perform a hoistway learn procedure. • DT5 magnet not adjusted properly. Check at slow speed if sensor input is breaking, making and then braking again. Magnet needs to be closer to the sensor on the selector.

Faults	Description	Possible Cause/Suggested Fix
DT6 count Fault	The verification position count for the DT6 input switch was off by more than 42 inches when the switch was activated.	• The car was lost due to a preset error. Check the guides on the selector. Check the fault log for binary preset errors. • The controller has a faulty encoder signal for the pulse count. Check that the car can make long runs without overshooting the floor or stopping short of the floor. • The power common to the limit switches was lost. Check fuse F1 on the selector board. • Incorrect counting of pulse counts. For Tapeless, check encoder connection to motor and encoder wiring. For Tape, check pulse sensors for proper quadrature at selector. • Hoistway not learned properly. Perform a hoistway learn procedure. • DT6 magnet not adjusted properly. Check at slow speed if sensor input is breaking, making and then braking again. Magnet needs to be closer to the sensor on the selector.
DTS count Fault	Down Terminal Slowdown Limit Count Fault. The verification position count for the DTS input switch was off by more than 10 inches when the switch was activated.	• The car was lost due to a preset error. Check the guides on the selector. Check the fault log for binary preset errors. • The controller has a faulty encoder signal for the pulse count. Check that the car can make long runs without overshooting the floor or stopping short of the floor. • The power common to the limit switches was lost. Check fuse F1 on the selector board. • Incorrect counting of pulse counts. For Tapeless, check encoder connection to motor and encoder wiring. For Tape, check pulse sensors for proper quadrature at selector. • Hoistway not learned properly. Perform a hoistway learn procedure. • DTS magnet not adjusted properly. Check at slow speed if sensor input is breaking, making and then braking again. Magnet needs to be closer to the sensor on the selector.
DTS Failed On Fault	DTS input Failed On Fault. The car was at the bottom floor and the DT input was low true (DT switch made) but the DTS input was high (DTS not made).	• The DT switch is not wired or DT input was lost. The state of DT is compared to that of DTS. • The DTS limit did not break at the bottom terminal landing. Adjust the DTS magnet. • Faulty DTS input. Replace the DTS input chip on the 1102 board. • Faulty DTS sensor on selector sensor board. Replace the sensor board for tape selector or replace the individual DTS sensor on tapeless selector.

Faults	Description	Possible Cause/Suggested Fix
EBAi Input Off Fault	Emergency brake test contacts in BA1,BA2 failed off	• Possible bad NC contact on BA1 or BA2 relays • Check wiring on emergency brake relays • Replace EBAi input on expansion i/o board
EBAi Input On Fault	Emergency brake test contacts in BA1,BA2 failed on	• Make sure BA1 and BA2 relays are being cycled • Replace EBAi input on expansion i/o board
EBBi Input Off Fault	Emergency brake test contacts in BB1,BB2 failed off	• Possible bad NC contact on BB1 or BB2 relays • Check wiring on emergency brake relays • Replace EBBi input on expansion i/o board
EBBi Input On Fault	Emergency brake test contacts in BB1,BB2 failed on	• Make sure BB1 and BB2 relays are being cycled • Replace EBBi input on expansion i/o board
EBK1 Input Failed OFF	Emergency Brake EBK1i failed off fault	• Locate EBK1 and visually determine if output is turning ON and OFF Faulty EBK1i input chip. Replace the EBK1i input chip. • Faulty EBK1 output Chip. Replace the EBK1 output chip.
EBK1 Input Failed ON	Emergency Brake EBK1 failed on fault	• Locate EBK1 and visually determine if output is turning ON and OFF Faulty EBK1i input chip. Replace the EBK1i input chip. • Faulty EBK1 output Chip. Replace the EBK1 output chip.
EBK2 Input Failed OFF	Emergency Brake EBK2 failed off fault	• Locate EBK2 and visually determine if output is turning ON and OFF Faulty EBK2i input chip. Replace the EBK2i input chip. • Faulty EBK2 output Chip. Replace the EBK2 output chip.
EBK2 Input Failed ON	Emergency Brake EBK2 failed on fault	• Locate EBK2 and visually determine if output is turning ON and OFF Faulty EBK2i input chip. Replace the EBK2i input chip. • Faulty EBK1 output Chip. Replace the EBK2 output chip.
EE Ram Failed	EE Ram (MRAM Memory) Fault. Valid magnetoresistive memory is not found	• Faulty 1100 CPU board. Replace 1100 CPU board
EE Tst EE1 Failed OFF	Electric Eye Test. Freight door electric eye input EE1 failed off.	• Verify that the electric eye input EE1 pulses on during the electric eye test. • Possible faulty electric eye device. • Possible faulty EE1 input - replace the input.
EE Tst EE1 Failed ON	Electric Eye Test. Freight door electric eye input EE1 failed on.	• Verify that the electric eye input EE1 is off before the electric eye test. • Possible faulty electric eye device. • Possible faulty EE1 input - replace the input.
EE Tst EE2 Failed OFF	Electric Eye Test. Freight door electric eye input EE2 failed off.	• Verify that the electric eye input EE2 pulses on during the electric eye test. • Possible faulty electric eye device. • Possible faulty EE2 input - replace the input.

Faults	Description	Possible Cause/Suggested Fix
EE Tst EE2 Failed ON	Electric Eye Test. Freight door electric eye input EE2 failed on.	• Verify that the electric eye input EE2 is off before the electric eye test. • Possible faulty electric eye device. • Possible faulty EE2 input - replace the input.
EE Tst EER1 Faild OFF	Electric Eye Test. Freight rear door electric eye input EER1 failed off.	• Verify that the electric eye input EER1 pulses on during the electric eye test. • Possible faulty electric eye device. • Possible faulty EER1 input - replace the input.
EE Tst EER1 Faild ON	Electric Eye Test. Freight rear door electric eye input EER1 failed on.	• Verify that the electric eye input EER1 is off before the electric eye test. • Possible faulty electric eye device. • Possible faulty EER1 input - replace the input.
EE Tst EER2 Faild OFF	Electric Eye Test. Freight rear door electric eye input EER2 failed off.	• Verify that the electric eye input EER2 pulses on during the electric eye test. • Possible faulty electric eye device. • Possible faulty EER2 input - replace the input.
EE Tst EER2 Faild ON	Electric Eye Test. Freight rear door electric eye input EER2 failed on.	• Verify that the electric eye input EER2 is off before the electric eye test. • Possible faulty electric eye device. • Possible faulty EER2 input - replace the input.
EM Brake Input OFF	After the controller turn on the output EBKC, EBKi never came on	• Improper wiring of the brake EBRKC coil. Refer to prints for wire connections. • Faulty EBKi input. Replace EBKi input chip on i/o board. • Faulty EBKC output. Replace EBKC output chip on i/o board
EM Brake Input ON	The EBKi input or EBKC output has failed on.	• Improper wiring of the brake Emergency Brake coil. Refer to prints for wire connections. • Faulty EBKi input. Replace EBKi input chip on i/o board. • Faulty EBKC output. Replace EBKC output chip on i/o board.
EM Brake Switch OFF	Emergency brake switch EBKS failed off once the car stopped	• Improper wiring of Emergency brake switch. • Faulty EBKS input. Replace EBKS input chip on i/o board.
EM Brake Switch ON	Emergency brake switch EBKS failed off once the car stopped	• Improper wiring of Emergency brake switch. • Faulty EBKS input. Replace EBKS input chip on i/o board. • Check adjustment of Emergency brake switch.
EM BRK CAN Com Error	Emergency Brake Board Can Communication Error.	• Faulty CAN communication wire connection. Verify proper twisted pair wires to the CANH and CANL terminals on the brake board. • Noise on the CAN Bus. Verify that the shield wire is connected according to the job print.
Emergency Brake Trip	Emergency Brake Trip fault	• Controller may have seen car overspeed, unintended motion or lost governor input (GOV).

Faults	Description	Possible Cause/Suggested Fix
Enc Can Bus Ack Err	Encoder CAN Bus acknowledge error	Can Open Encoder is not pulling the acknowledge line when datat is being transmitted to it. Verify the following: • The Encoder is properly wired according to the schematic. • The Controller's encoder can baud rate matches that of the encoder. • Proper voltage is supplied to the encoder.
Enc Can Bus Idle Err	Encoder CAN Bus idle	Encoder CAN bus is floating for too many bit times so an idle bus is detected. Verify the following: • The Encoder is properly wired according to the schematic. • The Controller's encoder can baud rate matches that of the encoder. • Proper voltage is supplied to the encoder.
Enc Can Bus Off Err	Encoder CAN Bus off	Controller detected more than 255 transmit errors on CAN bus to the encoder. The CAN bus device is re-initialized to re-establish communications to the encoder. Verify the following: • The Encoder is properly wired according to the schematic. • The Controller's encoder can baud rate matches that of the encoder. • Proper voltage is supplied to the encoder.
Enc Can Packet Fault	Encoder CAN Bus packet fault	Can Open Encoder did not respond with the expected packet. This could be caused by noise on the encoder cable. Make sure the encoder cable is properly shielded.
Encoder Busy Error	Encoder busy fault	• Can Open Encoder appears as busy and it is not taking signals from controller. Check encoder to see if it failed. Check wiring and shield connections as well as voltage from the GALX-1100 CPU Board.
Encoder Com Error	Encoder communication error. Encoder board detected Comm error while talking to the CAN Open encoder	• Verify Connections on Encoder Board. Possible Noise on Encoder cable. Check Encoder Voltage. Check for wires shield connections on GALX-1100 CPU Board.

Faults	Description	Possible Cause/Suggested Fix
Encoder Count Error	Encoder Count Error. An error is announced when the encoder count value is greater than 4 inches in 3 milliseconds.	• Faulty encoder connection. Verify the encoder connection to the controller. The CAN Open Encoder connects directly to the GALX-1100 board on a tapeless system. On a tape system the encoder feedback connects to the GALX-1102 board and is routed to the GALX-1100 Board through a ribbon cable between the two boards. Verify the following: • The encoder device is wired properly and is properly shielded. Refer to the print for the proper connection. • The Controller's encoder can baud rate matches that of the encoder (tapeless selector). • Proper voltage is supplied to the encoder (tapeless selector). • The pulse signals from the tape selector read the correct voltage with the car running (2.9 volts at the controller). • The pulse sensors are mounted the correct distance from the tape (measured 5-7 volts at the sensor output on the selector board).
Encoder Dir Fault	Encoder direction fault. Controller is in motion with an encoder velocity of more than 50 feet per minute and the direction in the encoder feedback is opposite to the direction run command. This fault sets the rope gripper or emergency brake. Disable this fault by setting Field Variable Enc Dir Flt Dis to 1=Disabled.	• Check for proper Voltage on Encoder. Verify Connections on Encoder Board. • Possible Noise on Encoder cable. • Check for wires shield connections on encoder Isolation Board.
Encoder Init	Encoder initialization fault. Encoder board failed to initialize CAN open Encoder	• Verify Connections on Encoder Board. • Possible Noise on Encoder cable. Check Encoder Voltage. • Check for wires shield connections on GALX-1100 CPU Board.
Encoder PPR Error	PPR setting error from CAN Open encoder	• Controller attempted to set PPR on the CAN Open Encoder but when we read it back, it did not change. • Possible Noise on Encoder cable. Check Encoder Voltage. • Check for wires shield connections on GALX-1100 CPU Board.
Encoder Preset Flt	Encoder Preset error generated because controller could not stablish position from Can open encoder.	• Can Open Encoder / Encoder Board lost track of car position. • Possible Noise on Encoder cable. Check Encoder Voltage. • Check for wires shield connections on GALX-1100 CPU Board.

Faults	Description	Possible Cause/Suggested Fix
EP Recall Car 1 OTS	Emergency Power Recall Car Out of Service Car 1	Car 1 was out of service while elevators were in an Emergency Power Recall Sequence • Check faults for car 1
EP Recall Car 2 OTS	Emergency Power Recall Car Out of Service Car 2	Car 2 was out of service while elevators were in an Emergency Power Recall Sequence • Check faults for car 2
EP Recall Car 3 OTS	Emergency Power Recall Car Out of Service Car 3	Car 3 was out of service while elevators were in an Emergency Power Recall Sequence • Check faults for car 3
EP Recall Car 4 OTS	Emergency Power Recall Car Out of Service Car 4	Car 4 was out of service while elevators were in an Emergency Power Recall Sequence • Check faults for car 4
EP Recall Car 5 OTS	Emergency Power Recall Car Out of Service Car 5	Car 5 was out of service while elevators were in an Emergency Power Recall Sequence • Check faults for car 5
EP Recall Car 6 OTS	Emergency Power Recall Car Out of Service Car 6	Car 6 was out of service while elevators were in an Emergency Power Recall Sequence • Check faults for car 6
EP Recall Car 7 OTS	Emergency Power Recall Car Out of Service Car 7	Car 7 was out of service while elevators were in an Emergency Power Recall Sequence • Check faults for car 7
EP Recall Car 8 OTS	Emergency Power Recall Car Out of Service Car 8	Car 8 was out of service while elevators were in an Emergency Power Recall Sequence • Check faults for car 8
EPR Pwr Lost Moving	EP Recovery power lost while moving	• Controller failed to turn on Normal Power Drive and Emergency Power Drive outputs (NPD and EPD) while in motion. Condition should not occur.
EPRecall Car1 Tim-ot	Emergency Power Recall Time-out Car 1	• Car 1 timeout while it was in Emergency power recall mode Make sure the field variable 'Recall Timeout' is set properly to allow the car enough time to recover if it is between floors and away from Emergency Power Floor If you have a blank shaft, consider increasing the Recovery Speed (default 25fpm)
EPRecall Car2 Tim-ot	Emergency Power Recall Time-out Car 2	• Car 2 timeout while it was in Emergency power recall mode Make sure the field variable 'Recall Timeout' is set properly to allow the car enough time to recover if it is between floors and away from Emergency Power Floor If you have a blank shaft, consider increasing the Recovery Speed (default 25fpm)

Faults	Description	Possible Cause/Suggested Fix
EPRecall Car3 Tim-ot	Emergency Power Recall Time-out Car 3	• Car 3 timeout while it was in Emergency power recall mode Make sure the field variable 'Recall Timeout' is set properly to allow the car enough time to recover if it is between floors and away from Emergency Power Floor If you have a blank shaft, consider increasing the Recovery Speed (default 25fpm)
EPRecall Car4 Tim-ot	Emergency Power Recall Time-out Car 4	• Car 4 timeout while it was in Emergency power recall mode Make sure the field variable 'Recall Timeout' is set properly to allow the car enough time to recover if it is between floors and away from Emergency Power Floor If you have a blank shaft, consider increasing the Recovery Speed (default 25fpm)
EPRecall Car5 Tim-ot	Emergency Power Recall Time-out Car 5	• Car 5 timeout while it was in Emergency power recall mode Make sure the field variable 'Recall Timeout' is set properly to allow the car enough time to recover if it is between floors and away from Emergency Power Floor If you have a blank shaft, consider increasing the Recovery Speed (default 25fpm)
EPRecall Car6 Tim-ot	Emergency Power Recall Time-out Car 6	• Car 6 timeout while it was in Emergency power recall mode Make sure the field variable 'Recall Timeout' is set properly to allow the car enough time to recover if it is between floors and away from Emergency Power Floor If you have a blank shaft, consider increasing the Recovery Speed (default 25fpm)
EPRecall Car7 Tim-ot	Emergency Power Recall Time-out Car 7	• Car 7 timeout while it was in Emergency power recall mode Make sure the field variable 'Recall Timeout' is set properly to allow the car enough time to recover if it is between floors and away from Emergency Power Floor If you have a blank shaft, consider increasing the Recovery Speed (default 25fpm)
EPRecall Car8 Tim-ot	Emergency Power Recall Time-out Car 8	• Car 8 timeout while it was in Emergency power recall mode Make sure the field variable 'Recall Timeout' is set properly to allow the car enough time to recover if it is between floors and away from Emergency Power Floor If you have a blank shaft, consider increasing the Recovery Speed (default 25fpm)

Faults	Description	Possible Cause/Suggested Fix
Estop Fault	An emergency stop occurred while moving or attempting to move.	The 'P' input did not drop from MC, BRK or RUN contactors being energized. • The drive on (DON) input did not energize or dropped out while running. • The BRK contactor did not energize or dropped out while running. • BRKI input did not turn on or dropped out while running. • The MCX contactor did not energize or dropped out while running • The MCX input did not turn on or dropped out while running. • The stop switch was pulled while running. • The car was not safe usually from clipping a door lock. See Car Safe Fault. • The stall protection timer timed-out. (Hydro only) An emergency power recall was initiated while the car was running up. • The pulse count stopped counting
ETS Failed On Bottom Fl	While at the bottom floor, the car detected that the ETS input did not go off as expected.	• The ETS input on the Main I/O board failed on. Replace the input chip. • The ETS magnet is too far from the sensor. • The ETS magnet fell of the rail bracket. • The ETS magnet rail bracket was moved or hit. • The ETS output from the selector failed on. Replace the output chip. • The ETS sensor failed in the on position. Replace the sensor.
ETS Failed On Top Fl	While at the top floor, the car detected that the ETS input did not go off as expected.	• The ETS input on the Main I/O board failed on. Replace the input chip. • The ETS magnet is too far from the sensor. • The ETS magnet fell of the rail bracket. • The ETS magnet rail bracket was moved or hit. • The ETS output from the selector failed on. Replace the output chip. • The ETS sensor failed in the on position. Replace the sensor.
FDoor Close Cont Flt	Door Close Contact safe fault	.• After Controller was safe with doors, gate switch, door contacts and locks made and ready to run, a door contact input turned OFF.
FEP Fuse Blown Fault	Fire/Emergency Circuit Fuse is Blown	• Short Circuit on the FEP Circuit.
FETST OFF Fault	Front Door Electric Eye Test Failed OFF. Output is turned on cause the electric eye outputs to controller input EE1 and EE2 to pulse.	• FETST output or FETST input failed in the off state. • Replace the FETST output chip. • Replace the FETST input chip.

Faults	Description	Possible Cause/Suggested Fix
FETST ON Fault	Front Door Electric Eye Test Failed ON. Output is turned on cause the electric eye outputs to controller input EE1 and EE2 to pulse.	• FETST output or FETST input failed in the on state. • Replace the FETST output chip. • Replace the FETST input chip.
Field Vars Deflt Ini	Field Variables Default Initialization. Field adjustable variables are being initialized for the first time.	• Job related parameters are invalid. This error occurs on the first time the GALX-1100 CPU board is being powered up.
Field Vars Relocated	Field Variables Relocated.	The software has been updated to a newer version that required parameters to be relocated. This is normal and should only occur once. If an older version software is later installed, the job parameters may be lost.
Fire Fighter Stop Sw	Fire Fighter Stop Sw	• Fire Fighter Stop switch is pulled. • Faulty wire connection in the Fire Fighter stop switch circuit.
Fld Var Partial Init	Field variables partial table initialized. Controller did not see extended memory intialized before. It should occur once when updating controller software	• The software has been updated. This is normal and should only occur once. If fault constantly occurs please contact GAL.
Front Det Edge Fault	Front Detector Edge Time-out	• The Electric Eye signal stayed on continuously for longer than the parameter 'EE Time-out' is set to.
FST I/O Failed Off	The FST input on the 1102 board did not pick up when expected.	• Faulty FST output chip. Replace output chip. • Faulty FSTI input chip. Replace input chip.
FST I/O Failed On	The FST input on the 1102 board did not drop out when expected.	• Faulty FST output chip. Replace output chip. • Faulty FSTI input chip. Replace input chip.
FSTP I/O Failed Off	The FSTP input on the 1102 board did not pick up when expected.	• Faulty FST1 output chip. Replace output chip. • Faulty FSTI input chip. Replace input chip.
FSTP I/O Failed On	The FSTP input on the 1102 board did not drop out up when expected	• Faulty FST1 output chip. Replace output chip. • Faulty FSTI input chip. Replace input chip.
FVARS Backup Init	Field Variables Backup Init. Field variables backed up for the first time.	Older software did not backup the field variables. When new software replaces the older software this error will be displayed. If this error occurs every time the CPU powers up, then the CPU may be faulty and should be replaced.

Faults	Description	Possible Cause/Suggested Fix
FVARS Backup Tbl Cksm	Field Variables Backup Table Checksum Error. The verification checksum for the backup field variable table has failed.	During power outages or brown-outs, enough noise can be generated on the 5V DC supply to cause an error in reading the field variables table on power up. For this reason we keep the data in two separate tables. If only one table checksum error occurs, then valid data will be restored. No action is required.
FVARS Backup Tbl Err	Field Variables Backup Table Error. The field variables from the backup MRAM table does not match the variable read into memory from the main MRAM table.	Most likely, if this error occurs, other FVARS errors will also occur. A once-in-a-while occurance of this error can be ignored if it is not accompanied by the follwoing errors: FVARS Both Tbl Chksum error or FVARS Tbl Chksum Error. If either error occurs with this error, the main CPU board should be replace.
FVARS Both Tbl Chksum	Field Variables Both Table Checksum Table error. The verification checksum for both the main field variable table and backup table has failed.	Field Variable data is stored in two separate MRAM tables and a checksum of each table is stored in a separate location. When the system powers up, the checksum of each table is verified. If one table fails verification, the field variables are copied from the table that passed verification and then both tables are updated with valid data. If both checksum verifications fail, data is copied from the main table and an error code is displayed. • If this fault occurs, replace the main CPU board.
FVARS Tbl Chksum Err	Field Variables Table Checksum Error. The verification checksum for the main field variable table has failed.	During power outages or brown-outs, enough noise can be generated on the 5V DC supply to cause an error in reading the field variables table on power up. For this reason we keep the data in two separate tables. If only one table checksum error occurs, then valid data will be restored. No action is required.
Gate Switch Fault	The Gate Switch failed on while the door was open.	• Gate switch not adjusted properly. • GS input failed on. Replace GS input on 1102 board.
Gate/Lock Byp Sw Flt	The gate or lock bypass switch was on while the car was NOT on car top inspection.	• Gate or Lock bypass switch on the controller 1102 board is in the on position. • Gate or Lock bypass input failed on. Replace GBP OR LBP input chip on 1102 board.
GOV Overspeed Trip	Governor Overspeed Trip. An ascending overspeed fault occurred from the governor switch opening. This fault sets the gripper or emergency brake.	• Verify that the car runs controlled on inspection. If not, increase the response, inertia or gains of the drive. • Verify that the car runs controlled on automatic. The car may be overshooting the roll into top speed. If so, increase the response, inertia or gains of the drive. • Verify that the car runs properly with full load. If not, adjust the drive.

Faults	Description	Possible Cause/Suggested Fix
Governor Switch Flt	Governor Switch Tripped.	• Verify that the governor switch is set properly. • Verify that the drive is setup properly and that the car does not overspeed.
GOVRi Input On Fault	GOVRi input failed on.	• The GOVRi input chip failed. Replace the chip. • The governor reset switch is stuck on. • The GOVRi input is jumped on.
GRCAN Device Fault	Device on the Group CAN Port has a Fault	• Look at the details of the fault. The device name and the error code that caused the fault are listed. • Look up the fault code for the device for debugging information.
GRCAN Device Reset	Device on the Group CAN Port has reset	• Look at the details of the fault. The device name and the error code that caused the fault are listed. • The device requested an initialization packet from the main CPU. Typically this occurs during power up or from a power cycle of the individual device. • Ignore the error if the controller power has been cycled. Otherwise, check the device communications and power connections.
Gripper did not Pick	The rope gripper did not pick when the GR1 and GR2 relays were energized.	• Faulty wiring to the rope gripper. • Faulty GTS switch on rope gripper. Make sure that the switch opens and closes properly when the gripper is energized and dropped. • Faulty GTS input. Replace the GTS input chip.
Gripper Trip Fault	An overspeed or uncontrolled motion caused the rope gripper to trip.	• Check if the governor has tripped from. • Make sure that the brake can hold the car. See last page of this section for more detailed information.
Group Comm Loss	The car that was acting as the group car has stopped communicating.	• Faulty wiring from TX+/TX- from car to car. • Faulty U6 driver chip on the GALX-1100 CPU board (next to the connector for the group comm). Call GAL. • Noise on shield wire. Connect shield only on one end. • Noise on the communication wires. Run wires in separate conduit.
Grp Comm Config Err	Group Comm configuration error.	• There as a device trying to get initialized that should not be on the bus • Check detailed fault data for 'dev' to identify board address
GRT1 input Off Fault	While testing the rope gripper relays, the contacts for GR1R or GR2R did not close or the GRT1 input failed off.	• Faulty GR1R or GR2R relays. Replace both GR1R and GR2R relays. • Faulty GRT1 input. Replace the GRT1 input chip.

Faults	Description	Possible Cause/Suggested Fix
GRT1 input On Fault	While testing the rope gripper relays, the contacts for GR1R or GR2R did not open or the GRT1 input failed on.	• Faulty GR1R or GR2R relays. Replace both GR1R and GR2R relays. • Faulty GRT1 input. Replace the GRT1 input chip.
GRT2 input Off Fault	While in a door zone the DZ and DZ1 contacts used in the rope gripper circuit were not closed or the GRT2 input failed off.	Faulty DZ or DZ1 relays. Replace both DZ and DZ1 relays. • Faulty GRT2 input. Replace the GRT2 input chip. Faulty LE or LE1 outputs. When a DZ input is on from the selector DZ output, LE and LE1 outputs control the DZ and DZ1 relays respectively. Replace the LE and LE1 output chips.
GRT2 input On Fault	The DZ and DZ1 contacts used in the rope gripper circuit did not open during a run or the GRT2 input failed on.	Faulty DZ or DZ1 relays. Replace both DZ and DZ1 relays. • Faulty GRT2 input. Replace the GRT2 input chip. Faulty LE or LE1 outputs. When a DZ input is on from the selector DZ output, LE and LE1 outputs control the DZ and DZ1 relays respectively. Replace the LE and LE1 output chips.
GS & GS_1 Opposite	Input failure on one of the Gate Switch (GS) inputs.	• GS or GS-1 input failed on. Replace GS or GS-1 input chip. • Check status of input from Input and Output menu on the LCD interface.
GTS Input Off Fault	Emergency Brake: GTS input did not turn on while doing the safety check for PFC and SFC relays.	• Check wiring for emergency brake • Check emergency brake relays during safety check • Faulty GTS input chip. Replace input chip.
GTS Input On Fault	Emergency Brake: GTS input did not turn off while doing the safety check for PFC and SFC relays.	• Check wiring for emergency brake • Check emergency brake relays during safety check • Faulty GTS input chip. Replace input chip.
Hall Call Light Fuse	Hall Call Light Fuse Blown	• Check for short on the Hall Call Light circuit.
Hatch Safety Fault	Hatch Safety Fault	The HSS input is off. • A device contact in the hatch safety string has opened. • The HSS input has failed off.
HC Com Device Reset	Serial Hall Call board reset unexpectedly. Usually caused by loss of power to the individual board.	• Usually caused by loss of power to the individual board. • Faulty power connection to board. • Fault hall call board.
HC DrvBd Rx from Bot	Not receiving packets from the bottom station	• Cable is bad or disconnected • Cables going to wrong port (i.e., switched TO ABOVE and TO BELOW) • Transmitter from device above or below is bad, check faults for that device. • Receiver on board is bad – replace device

Faults	Description	Possible Cause/Suggested Fix
HC DrvBd Tx to Bot	Can't internally read information from Transmitter to bottom station	• Cable connecting two devices could be flip-flopped (i.e., gray wire goes from pin 1 on one end to pin 8 on the other end). Disconnect cable, and if fault changes to Rx Fault, the problem is the cable. • Cables going to wrong port (i.e., switched TO ABOVE and TO BELOW) • Transmitter is bad – replace the Device.
HC DvrBd Rx from Top	Not receiving packets from the top station.	• Cable is bad or disconnected • Cables going to wrong port (i.e., switched TO ABOVE and TO BELOW) • Transmitter from device above or below is bad, check faults for that device. • Receiver on board is bad – replace device
HC DvrBd Too Few Dev	Too Few stations detected based on configuration – will only trigger if loop is closed (i.e. will not trigger if device #5 is not functioning, causing driver to establish communication with all but one station.)	• Check configuration and number of stations
HC DvrBd TooMany Dev	Too Many stations detected based on configuration.	• Check configuration and number of stations
HC DvrBd Tx to Top	Can't internally read information from Transmitter to top station.	• Cable connecting two devices could be flip-flopped (i.e., gray wire goes from pin 1 on one end to pin 8 on the other end). Disconnect cable, and if fault changes to Rx Fault, the problem is the cable. • Cables going to wrong port (i.e., switched TO ABOVE and TO BELOW) • Transmitter is bad – replace the Device.
HC Fuse Blown Fault	The HC input is off. No power on HC.	• Make sure that the hall call power for each car is in phase. During a power up for car 1 while car 2 is powering the hall call power could cause a momentary short if the hall call power for each car is not in phase. • Short circuit in the hall call lighting circuitry.
HCB Ax Dn Input Ovld	HCB Aux Down input overload	• Controller detected overload in the input from the Aux terminal at the station. To identify fault device refer to Detailed Fault Log 'dev' and 'dv2' will provide address for Serial Driver address and Station where the fault was generated.
HCB Ax Up Input Ovld	HCB Aux Up input overload	• Controller detected overload in the input from the Aux terminal at the station. To identify fault device refer to Detailed Fault Log 'dev' and 'dv2' will provide address for Serial Driver address and Station where the fault was generated.

Faults	Description	Possible Cause/Suggested Fix
HCB Device Comm Loss	The Driver does not see this HCB device	• Comm faults above and below a device – check wiring • Board not powering up – check 24VAC and MCU on device • Fuses blown on driver
HCB Device Reset	The HCB has just comeback online	• Fixed previous problem. There is a power/communication problem, where the board is either resetting (power) or temporarily losing communication on both ports.
HCB Dn FET Open	HCB fet open down	• Replace GALX-1054AN
HCB Dn FET Short	HCB fet short down	• Replace GALX-1054AN
HCB Dn Input Ovrload	HCB Down input overload	• Controller detected overload in the input from the LED board at the station. To identify fault device refer to Detailed Fault Log 'dev' and 'dv2' will provide address for Serial Driver address and Station where the fault was generated.
HCB Dn LED Open	HCB led open down	• Make Sure there is a GALX-1056AN attached to the proper connector (Up LED always attached to CN5, Down LED attached to CN5 if only down call at that station (like the top floor), otherwise attached via ribbon at CN6. • Replace GALX-1056AN for the associated up or down call.
HCB Dn LED Short	HCB led short down	• Make Sure there is a GALX-1056AN attached to the proper connector (Up LED always attached to CN5, Down LED attached to CN5 if only down call at that station (like the top floor), otherwise attached via ribbon at CN6. • Replace GALX-1056AN for the associated up or down call.
HCB FET Open Blue Dn	HCB fet open blue down	• Replace GALX-1054AN
HCB FET Open Blue Up	HCB fet open blue up	• Replace GALX-1054AN
HCB FET Open Grn Dn	HCB fet open green down	• Replace GALX-1054AN
HCB FET Open Grn Up	HCB fet open green up	• Replace GALX-1054AN
HCB FET Open Red Dn	HCB fet open red down	• Replace GALX-1054AN
HCB FET Open Red Up	HCB fet short red up	• Replace GALX-1054AN

Faults	Description	Possible Cause/Suggested Fix
HCB FET Short Blu Dn	HCB fet short blue down	• Replace GALX-1054AN
HCB FET Short Blu Up	HCB fet short blue up	• Replace GALX-1054AN
HCB FET Short Grn Dn	HCB fet short green down	• Replace GALX-1054AN
HCB FET Short Grn Up	HCB fet short green up	• Replace GALX-1054AN
HCB FET Short Red Dn	HCB fet short red down	• Replace GALX-1054AN
HCB FET Short Red Up	HCB fet short red up	• Replace GALX-1054AN
HCB Invalid Floor	HCB has invalid floor	• This fault is only intended for internal use to identify floors that need to be skipped in diagnostics. It should never occur
HCB LED Open Blue Dn	HCB led open blue down	• Make Sure there is a GALX-1056AN attached to the proper connector (Up LED always attached to CN5, Down LED attached to CN5 if only down call at that station (like the top floor), otherwise attached via ribbon at CN6. • Replace GALX-1056AN for the associated up or down call.
HCB LED Open Blue Up	HCB led open blue up	• Make Sure there is a GALX-1056AN attached to the proper connector (Up LED always attached to CN5, Down LED attached to CN5 if only down call at that station (like the top floor), otherwise attached via ribbon at CN6. • Replace GALX-1056AN for the associated up or down call.
HCB LED Open Grn Dn	HCB led open green down	• Make Sure there is a GALX-1056AN attached to the proper connector (Up LED always attached to CN5, Down LED attached to CN5 if only down call at that station (like the top floor), otherwise attached via ribbon at CN6. • Replace GALX-1056AN for the associated up or down call.
HCB LED Open Grn Up	HCB led open green up	• Make Sure there is a GALX-1056AN attached to the proper connector (Up LED always attached to CN5, Down LED attached to CN5 if only down call at that station (like the top floor), otherwise attached via ribbon at CN6. • Replace GALX-1056AN for the associated up or down call.
HCB LED Open Red Dn	HCB led open red down	• Make Sure there is a GALX-1056AN attached to the proper connector (Up LED always attached to CN5, Down LED attached to CN5 if only down call at that station (like the top floor), otherwise attached via ribbon at CN6. • Replace GALX-1056AN for the associated up or down call.

Faults	Description	Possible Cause/Suggested Fix
HCB LED Open Red Up	HCB led short red up	• Make Sure there is a GALX-1056AN attached to the proper connector (Up LED always attached to CN5, Down LED attached to CN5 if only down call at that station (like the top floor), otherwise attached via ribbon at CN6. • Replace GALX-1056AN for the associated up or down call.
HCB LED Short Blu Dn	HCB led short blue down	• Make Sure there is a GALX-1056AN attached to the proper connector (Up LED always attached to CN5, Down LED attached to CN5 if only down call at that station (like the top floor), otherwise attached via ribbon at CN6. • Replace GALX-1056AN for the associated up or down call.
HCB LED Short Blu Up	HCB led short blue up	• Make Sure there is a GALX-1056AN attached to the proper connector (Up LED always attached to CN5, Down LED attached to CN5 if only down call at that station (like the top floor), otherwise attached via ribbon at CN6. • Replace GALX-1056AN for the associated up or down call.
HCB LED Short Grn Dn	HCB led short green down	• Make Sure there is a GALX-1056AN attached to the proper connector (Up LED always attached to CN5, Down LED attached to CN5 if only down call at that station (like the top floor), otherwise attached via ribbon at CN6. • Replace GALX-1056AN for the associated up or down call.
HCB LED Short Grn Up	HCB led short green up	• Make Sure there is a GALX-1056AN attached to the proper connector (Up LED always attached to CN5, Down LED attached to CN5 if only down call at that station (like the top floor), otherwise attached via ribbon at CN6. • Replace GALX-1056AN for the associated up or down call.
HCB LED Short Red Dn	HCB led short red down	• Make Sure there is a GALX-1056AN attached to the proper connector (Up LED always attached to CN5, Down LED attached to CN5 if only down call at that station (like the top floor), otherwise attached via ribbon at CN6. • Replace GALX-1056AN for the associated up or down call.
HCB LED Short Red Up	HCB led short red up	• Make Sure there is a GALX-1056AN attached to the proper connector (Up LED always attached to CN5, Down LED attached to CN5 if only down call at that station (like the top floor), otherwise attached via ribbon at CN6. • Replace GALX-1056AN for the associated up or down call.

Faults	Description	Possible Cause/Suggested Fix
HCB Low Supply Volt	Hall call board has low supply voltage	• Low voltage at Hall call device level. To identify fault device refer to Detailed Fault Log 'dev' and 'dv2' will provide address for Serial Driver address and Station where the fault was generated.
HCB No Dn LED Board	HCB No Down Led Board Detected	• HCB board could not detect an LED board • Replace LED board (GALX-1085AN)
HCB No Up LED Board	HCB No Up Led Board Detected	• HCB board could not detect an LED board • Replace LED board (GALX-1085AN)
HCB Rx from above fl	HCB rx fault up to above floor	• Receiver on board is bad – replace device • Cable is bad or disconnected • Cables going to wrong port (i.e., switched to above and to below) • Transmitter from device above is bad.
HCB Rx from below fl	HCB rx fault down from below floor	• Receiver on board is bad – replace device • Cable is bad or disconnected • Cables going to wrong port (i.e., switched to above and to below) • Transmitter from device below is bad.
HCB Stuck Dn Button	HCB stuck button down	• Button is physically stuck – fix button • Input is stuck on or shorted – replace device
HCB Stuck Up Button	HCB stuck button up	• Button is physically stuck – fix button • Input is stuck on or shorted – replace device
HCB Tx to above fl	Can't internally read information from Transmitter to device above	• Cable connecting two devices could be flip-flopped (i.e., gray wire goes from pin 1 on one end to pin 8 on the other end). Disconnect cable, and if fault changes to Rx Fault, the problem is the cable. • Transmitter is bad, Replace the Device
HCB Tx to below fl	Can't internally read information from Transmitter to device below	• Cable connecting two devices could be flip-flopped (i.e., gray wire goes from pin 1 on one end to pin 8 on the other end). Disconnect cable, and if fault changes to Rx Fault, the problem is the cable. • Transmitter is bad, Replace the Device
HCB Up FET Open	HCB fet open up	• Replace GALX-1054AN
HCB Up FET Short	HCB fet short up	• Replace GALX-1054AN
HCB Up Input Ovrload	HCB Up input overload	• Controller detected overload in the input from the LED board at the station. To identify fault device refer to Detailed Fault Log 'dev' and 'dv2' will provide address for Serial Driver address and Station where the fault was generated.

Faults	Description	Possible Cause/Suggested Fix
HCB Up LED Open	HCB led open up	• Make Sure there is a GALX-1056AN attached to the proper connector (Up LED always attached to CN5, Down LED attached to CN5 if only down call at that station (like the top floor), otherwise attached via ribbon at CN6. • Replace GALX-1056AN for the associated up or down call.
HCB Up LED Short	HCB led short up	• Make Sure there is a GALX-1056AN attached to the proper connector (Up LED always attached to CN5, Down LED attached to CN5 if only down call at that station (like the top floor), otherwise attached via ribbon at CN6. • Replace GALX-1056AN for the associated up or down call.
Hoist Motor Overload	Hoist Motor Overload	• Hoist Motor Overload signal tripped. Check Input chip for HMO input
Hoistway Default Ini	Hoistway Default Initialization. Hoistway values are being initialized for the first time.	• Job related hoistway setup information is invalid. This occurs on the first time the GALX-1100 CPU board is being powered up.
Hoistway Learn Fault	Car is on automatic and the hoistway has not been learned.	• Hoistway learn procedure needs to be performed. • Faulty ram-flash memory chip.
Hoistway Update Init	Hoistway Update Initialization. Table of door zone positions for hoistway used to update position count while traveling has been initialized for the fires time.	• Job related hoistway setup information is invalid. This occurs on the first time the GALX-1100 CPU board is being powered up.
Hot Oil Fault	Hot Oil Fault	• Hydro only - Job is configured for hot oil detect. TPH input turned ON. Check for defective input.
Inspection Input Flt	More than one input is on in the inspection string. The inspection string condition is also shown on the safety processor.	• Faulty Top of Car inspection wiring. Verify voltage on CTA and ICA terminals when car top inspection switch is in the run position. Verify INS input when switch in the inspection position. • Verify that one and only one inspection string inputs is on: AUTO, MRI, INS, ICI and ACC. • Faulty inspection string input: AUTO, MRI, INS, ICI or ACC. Replace faulty input chip
Inspection Up/Dn Sw	An up or down inspection run input was on when first entering into inspection operation. This caused from a faulty inspection up or down switch or from someone holding the up or down run button when placing the car on inspection.	• Faulty inspection up or down input: IU, ID, MRIU, MRIU, BAD, BAU, TAD or TAU. Replace faulty input chip. • Faulty inspection wiring keeping an inspection up or down input on. • Placing the car on inspection while holding an up or down run button

Faults	Description	Possible Cause/Suggested Fix
Invald DT or DT1 Cnt	Invalid DT or DT1 Count. The position count for DT is greater than the count for DT1	• Invalid hoistway learn. Re-learn the hoistway. • The hoistway has not been learned. Learn the hoistway. • If this problem is not corrected with a hoistway learn, contact the factory
Invald FL Offset Cnt	Invalid Floor Offset Count. If the offset count is greater than 3 inches.	• The offset starts out at zero and is modified by the adjuster. This value should never be greater than 3 inches. • Encoder was changed from lower resolution to higher resolution which would cause the offset value to be out of range. Correct the offset value.
Invalid DN or DT Cnt	Invalid DN or DT Count. The position count for DN is greater than the count for DT	• Invalid hoistway learn. Re-learn the hoistway. • The hoistway has not been learned. Learn the hoistway. • If this problem is not corrected with a hoistway learn, contact the factory
Invalid Fault Code	Invalid Fault Code	Device error not recognized by controller.
Invalid Floor Count	Invalid Floor Count. The floor count of the floor above must always be larger than the floor below. An above floor count was lower than the floor below in the floor hoistway table	• Invalid hoistway learn. Re-learn the hoistway. • The hoistway has not been learned. Learn the hoistway. • If this problem is not corrected with a hoistway learn, contact the factory
Invalid SEL Bot Cnt	Invalid Selector Bottom Count. (Tapeless selector) The bottom floor count is less then 4000. The count is initialized at 5000.	• Invalid hoistway learn. Re-learn the hoistway. • The hoistway has not been learned. Learn the hoistway. • If this problem is not corrected with a hoistway learn, contact the factory
Invalid SEL Top Cnt	Invalid Selector Top Count. The top selector count minus the bottom selector count is less than the number of floors times 30. The count averaged less than 30 counts per floor.	• Invalid hoistway learn. Re-learn the hoistway. • The hoistway has not been learned. Learn the hoistway. • If this problem is not corrected with a hoistway learn, contact the factory
Invalid UT or UN Cnt	Invalid UT or UN Count. The position count for UT is greater than the count for UN	• Invalid hoistway learn. Re-learn the hoistway. • The hoistway has not been learned. Learn the hoistway. • If this problem is not corrected with a hoistway learn, contact the factory
Invld DT1 or DT2 Cnt	Invalid DT1 or DT2 Count. The position count for DT1 is greater than the count for DT2	• Invalid hoistway learn. Re-learn the hoistway. • The hoistway has not been learned. Learn the hoistway. • If this problem is not corrected with a hoistway learn, contact the factory

Faults	Description	Possible Cause/Suggested Fix
Invld DT2 or DT3 Cnt	Invalid DT2 or DT3 Count. The position count for DT2 is greater than the count for DT3	• Invalid hoistway learn. Re-learn the hoistway. • The hoistway has not been learned. Learn the hoistway. • If this problem is not corrected with a hoistway learn, contact the factory
Invld DT3 or DT4 Cnt	Invalid DT3 or DT4 Count. The position count for DT3 is greater than the count for DT4	• Invalid hoistway learn. Re-learn the hoistway. • The hoistway has not been learned. Learn the hoistway. • If this problem is not corrected with a hoistway learn, contact the factory
Invld DT4 or DT5 Cnt	Invalid DT4 or DT5 Count. The position count for DT4 is greater than the count for DT5	• Invalid hoistway learn. Re-learn the hoistway. • The hoistway has not been learned. Learn the hoistway. • If this problem is not corrected with a hoistway learn, contact the factory
Invld DT5 or DT6 Cnt	Invalid DT5 or DT6 Count. The position count for DT5 is greater than the count for DT6	• Invalid hoistway learn. Re-learn the hoistway. • The hoistway has not been learned. Learn the hoistway. • If this problem is not corrected with a hoistway learn, contact the factory
Invld DZU or DZD Cnt	Invalid DZU or DZD Count. If the DZU count is greater than the floor position count or the DZD count is less than the floor position count, then this error is declared.	• Invalid hoistway learn. Re-learn the hoistway. • The hoistway has not been learned. Learn the hoistway. • If this problem is not corrected with a hoistway learn, contact the factory
Invld UT1 or UT Cnt	Invalid UT1 or UT Count. The position count for UT1 is greater than the count for UT	• Invalid hoistway learn. Re-learn the hoistway. • The hoistway has not been learned. Learn the hoistway. • If this problem is not corrected with a hoistway learn, contact the factory
Invld UT2 or UT1 Cnt	Invalid UT2 or UT1 Count. The position count for UT2 is greater than the count for UT1	• Invalid hoistway learn. Re-learn the hoistway. • The hoistway has not been learned. Learn the hoistway. • If this problem is not corrected with a hoistway learn, contact the factory
Invld UT3 or UT2 Cnt	Invalid UT3 or UT2 Count. The position count for UT3 is greater than the count for UT2	• Invalid hoistway learn. Re-learn the hoistway. • The hoistway has not been learned. Learn the hoistway. • If this problem is not corrected with a hoistway learn, contact the factory
Invld UT4 or UT3 Cnt	Invalid UT4 or UT3 Count. The position count for UT4 is greater than the count for UT3	• Invalid hoistway learn. Re-learn the hoistway. • The hoistway has not been learned. Learn the hoistway. • If this problem is not corrected with a hoistway learn, contact the factory

Faults	Description	Possible Cause/Suggested Fix
Invld UT5 or UT4 Cnt	Invalid UT5 or UT4 Count. The position count for UT5 is greater than the count for UT4	• Invalid hoistway learn. Re-learn the hoistway. • The hoistway has not been learned. Learn the hoistway. • If this problem is not corrected with a hoistway learn, contact the factory
Invld UT6 or UT5 Cnt	Invalid UT6 or UT5 Count. The position count for UT6 is greater than the count for UT5	• Invalid hoistway learn. Re-learn the hoistway. • The hoistway has not been learned. Learn the hoistway. • If this problem is not corrected with a hoistway learn, contact the factory
Invlid Top Floor Cnt	Invalid Top Floor Count. The top floor count is zero.	• Invalid hoistway learn. Re-learn the hoistway. • The hoistway has not been learned. Learn the hoistway. • If this problem is not corrected with a hoistway learn, contact the factory
KEB Not In Run Mode	Keb drive not in run mode. We need to verify that the drive is in Run Mode before we do every Run.	• LF.03 was not set to zero with the car in automatic. If the error occurred while troubleshooting disregard error. If it happens when in service, check drive for possible cause of this parameter not being set properly.
L1 Low Line Voltage	L1 Line Voltage Low	• Voltage Sensor Board Related. Voltage being monitored on L1 dropped below the setting for parameter ' Low Line Volt '
L2 Low Line Voltage	L2 Line Voltage Low	• Voltage Sensor Board Related. Voltage being monitored on L2 dropped below the setting for parameter ' Low Line Volt '
L3 Low Line Voltage	L3 Line Voltage Low	• Voltage Sensor Board Related. Voltage being monitored on L3 dropped below the setting for parameter ' Low Line Volt '
Learn HW Safe Fault	Part of the safety string open while in automatic learn hoistway mode	• Check for possible faults on the safety processor or drive • Door locks, gate switch or contacts open while in motion
Learn HW Stall Fault	Car timed out while learning hoistway in auto	• Increase field variable 'Hoistway Learn Stall Time' and try again
Lev Flt Set EM Brake	Emergency brake set from leveling fault	• A leveling fault occurred and the parameter 'Adjustable Options->Car Options->Leveling Fault = ' is set so it trips the Rope Gripper/Emergency Brake
Lev Flt Set Gripper	Gripper set from leveling fault	A leveling fault occurred and the Field Variable in Leveling Fault in the Car Options menu is set to 1=Set Grip/EB so it trips the Rope Gripper/Emergency Brake. Verify that the car relevels properly. • Adjust car leveling speed. • Adjust drive response. • Adjust relevel brake parameters. • See Leveling Fault.

Faults	Description	Possible Cause/Suggested Fix
Level Stop Cnt Fault	Leveling stop fault occured from incorrect count. As the car was leveling off the pulses, UL or DL turned off.	• Floor offset value set too high. Increase dead zone when the car is configured to stop on the pulses instead of just the magnet • Ensure outer sensors are set no more than 7.5 inches apart
Leveling Fault	Leveling Fault. When the car attempted to drop the brake, the car moved out of the dead level. The leveling fault count was incremented. If this occurs more times than the adjustable variable 'Level Fault Cnt' then this error is declared.	• Brake is dropping too slowly. Adjust the drop of the brake. The drive is not holding zero speed. Run the car on inspection at 5fpm and while running change the inspection speed to zero. The car should stop and hold zero. • The response is not high enough on the drive. • Brake contactor is not dropping properly.
Leveling Tim-out Flt	Leveling Time-out Fault	• Car overshot floor and continue leveling. • Car targeted floor too soon and was creeping to the floor in leveling. • Check for causes of invalid pulse counts or invalid floor positions • Invalid floor position preset • Faulty encoder connection • Faulty encoder wiring
Limit Opp Dir Flt	Car hit limits in wrong direction. In a single Run every Limit switch signal should only change state once or not change at all. If car was travelling down and an Up Terminal Slowdown switch goes LOW after we go in motion we will detect that as a fault. This fault will drop the gripper or emergency brake. Disable this fault with field variable Lim Dir Flt Dis set to 1=Disabled.	• If Controller is not really faulting, check that Slowdowns are not at the same position as the dead level position. On Gear-less jobs roll back could cause this extra change of state and therefore generate the fault. In that event reposition Terminal Slowdown by a couple of inches.
Load Weigh Var Init	Load weigher init	• Invalid load weigher table on power up. The load weigher table will be re-initiallized to zero and the load weigher must be re-setup. • If this error persist, the MRAM on the CPU board is faulty. Replace the CPU board. • Ignore this error if the load weigher is not being used.
Lobby Hall Call Fuse	Lobby Call common fuse	• Lobby Common fuse blown. Check Input chip for LHC
Low Pressure Fault	Low Oil Pressure Fault. The low oil pressure switch has been activated.	• Low oil in the tank. • Faulty LOS input if low oil switch option is being used. Replace the LOS input chip. • Faulty Low Oil Switch. If low oil switch option is being used. • Verify the operation of the low oil switch.

Faults	Description	Possible Cause/Suggested Fix
Lowoil Switch Fault	Low Oil Switch Fault. The low oil switch became active	• Low oil in the hydraulic tank • Faulty wiring to the low oil input • Faulty low oil input. Replace LOS input.
LW Calibration Error	Load Weigher Calibration Error. The load weigher attempted to do an automatic calibration and could not be calibrated.	The load weigher device should be re-calibrated according to the manufacturer's instructions.
LW Load Table Fault	A fault was detected in the Load weigher load tables. The empty load value was greater than or equal to the full load value at a valid floor.	• The load weigher might not be calibrated properly • The load weigher setup might have been interrupted before being completed. • Faulty load weigher device. • The load weigher device is not setup. • The load weigher data was not stored properly in the MRAM memory or was not read in properly on power up. • Invalid load weigher data read from or written to the SD card during an SD card job setup read.
LW Load Table Fault	A fault was detected in the Load weigher load tables. The empty load value was greater than or equal to the full load value at a valid floor.	• The load weigher might not be calibrated properly • The load weigher setup might have been interrupted before being completed. • Faulty load weigher device. • The load weigher device is not setup. • The load weigher data was not stored properly in the MRAM memory or was not read in properly on power up. • Invalid load weigher data read from or written to the SD card during an SD card job setup read.
Machine Room Stop Sw	Machine Room Stop Switch is Opened	• Turn off the Machine Room Stop Switch. • Faulty Machine Room Stop Switch
MCA I/O Failed Off	The MCA input or output has failed off.	• Faulty MCAi input chip. Replace input chip. • Faulty MCA output chip. Replace output chip.
MCA I/O Failed On	The MCA input or output has failed on.	• Faulty MCAi input chip. Replace input chip. • Faulty MCA output chip. Replace output chip.
MCC I/O Failed Off	The MCC input or output has failed off.	• Faulty MCCi input chip. Replace input chip. • Faulty MCC output chip. Replace output chip.
MCC I/O Failed On	The MCC input or output has failed on.	• Faulty MCCi input chip. Replace input chip. • Faulty MCC output chip. Replace output chip.
MCX Off Fault	The MCX contact is off when it is expected to be on.	• Faulty Auxiliary MC Contact. Replace the AUX contact block or wire to a spare contact (if available). • Faulty MCX input chip. Replace the input chip.

Faults	Description	Possible Cause/Suggested Fix
MCX On Fault	The MCX contact is on when it is expected to be off.	• Faulty Auxiliary MC Contact. Replace the AUX contact block or wire to a spare contact (if available). • Faulty MCX input chip. Replace the input chip.
Mid Door Lock Fault	The Middle Door Lock failed on while the door was open.	Faulty door lock. • Jumper on door lock circuit. • Door lock not adjusted properly. • Faulty wiring to DLM input. Faulty DLM and DLM-1 inputs (For this to occur both DLM and DLM-1 inputs must fail on). • DOL input failed. Replace DOL input chip. • Door operator open limit DOL is not adjusted properly
Motion Exit GTS Flt	GTS Motion emergency exit	GTS input opened unexpectedly during a run. • Fault GTS switch on the rope gripper. Replace or correct the switch activation
Motion Exit Ins Flt	emergency motion exit from inspection	Car was in motion before going in inspection Mode. Check for inspection inputs faulting out or Automatic input going low.
MRAM Hardware Fault	MRAM Fault	The MRAM is tested on power up and has failed the test. Replace the CPU board.
MRAM Write Error	MRAM Write Error. After parameter data RAM has been modified through the user interface, the data is automatically writen to MRAM for non-volatile storage. After the data is store it is compared with the original parameter data. If it does not match a fault is recorded.	• This error should not occur. If it does occur, the problem is either a fault CPU board or MRAM chip. Replace the CPU board.
MRCAN Device Fault	Device on the Machine Room CAN Port has a Fault	• Look at the details of the fault. The device name and the error code that caused the fault are listed. • Look up the fault code for the device for debugging information.
MRCAN Device Reset	Device on the Machine Room CAN Port has reset	• Look at the details of the fault. The device name and the error code that caused the fault are listed. • The device requested an initialization packet from the main CPU. Typically this occurs during power up or from a power cycle of the individual device. • Ignore the error if the controller power has been cycled. Otherwise, check the device communications and power connections.

Faults	Description	Possible Cause/Suggested Fix
NTS Fault Dn Dir Run	NTS Fault Down Direction Run. The NTS processor hit a normal terminal limit going down at a velocity greater than the limit velocity paramerter. This error is detected by the main CPU when the NTSDi input turns off during a run. Check the fault log for an MRCAN Device Fault showing the specific limit fault that occured.	• If the NTSDi input does not turn on after the car stops, there may be a faulty NTSD input chip. Verify that the NTSD outputs are on and if so, replace the NTSDi input chip. • If the NTSD output are not on after the car stops, check the status of the output of NTSD on the inputs and Outputs display for the NTS procdssor. If the LCD Display Interface shows that the NTS processor has the outputs on but the NTSD LEDs are not, then there may be a faulty NTSD output chip. Replace the NTSD chip that has its corresponding LED off. • Verify that the limit activates at the correct location in the hoistway. • Verify the speed that the car hits the limit and adjust the limit velocity if necessary. • If the acceleration or deceleration rates were change after the limit velocities were learned, the learn process may need to be repeated or the limit may need to be moved.
NTS Fault Up Dir Run	NTS Fault Up Direction Run. The NTS processor hit a normal terminal limit going up at a velocity greater than the limit velocity paramerter. This error is detected by the main CPU when the NTSDi input turns off during a run. Check the fault log for an MRCAN Device Fault showing the specific limit fault that occured.	• If the NTSDi input does not turn on after the car stops, there may be a faulty NTSD input chip. Verify that the NTSD outputs are on and if so, replace the NTSDi input chip. • If the NTSD output are not on after the car stops, check the status of the output of NTSD on the inputs and Outputs display for the NTS procdssor. If the LCD Display Interface shows that the NTS processor has the outputs on but the NTSD LEDs are not, then there may be a faulty NTSD output chip. Replace the NTSD chip that has its corresponding LED off. • Verify that the limit activates at the correct location in the hoistway. • Verify the speed that the car hits the limit and adjust the limit velocity if necessary. • If the acceleration or deceleration rates were change after the limit velocities were learned, the learn process may need to be repeated or the limit may need to be moved.

Faults	Description	Possible Cause/Suggested Fix
NTS Limit Vel Fault	NTS Limit Velocity Fault. During a limit learn, the velocity for one of the limits was recorded at a speed greater then the contract speed of the car. The velocity value of the limit is set to contract speed - 1.	• View all the limit velocity values of the NTS processor. If a limit velocity value is set to contract speed - 1, then the limit may need to be moved closer to the terminal landing so that the car hits the limit at a slower speed. • Verify the velocity of the NTS processor during a normal run. • If the velocity value is correct, there could be enough of a delay that the car has started the slowdown but the velocity value has not been updated for the NTS processor. Try moving the limits closer to the terminal landing. • If using a tape selector, the velocity value that the NTS processor uses comes from the selector CPU. This value should also match the speed of the main CPU. Verify the proper pulse signals going into and out of the selector. • If using a tapeless selector. the NTS processor calculates the velocity from the motor encoder pulses. The velocity value will need to be adjusted to match the actual car speed. Increase the NTS RPM paramerer value to reduce the NTS velocity or reduce the RPM to increase the NTS velocity.
Overspeed Fault	Car overspeed fault. If the car goes 15% over contract speed the fault will be logged and the car will do an emergency stop. This fault will set the gripper or emergency brake if parameter Griper/EBK Trip is set to +2OvSp.	Encoder PPR incorrectly set. Set to match the Drive's Encoder Pulses. • Encoder RPM incorrectly set. Set to match the Motor's RPM. The drive is not controlling the hoist machine motor. Check the response setting on the drive.
P Input Off Fault	The normally closed contacts on MC, BRK or RUN contactors did not drop.	• Not enough current draw through all three contacts. Place a 10K 3W resistor from the normally closed contact of RUN to GND. • Faulty normally closed contacts on MC, BK or RUN. Replace auxiliary contacts.
P Input On Fault	The 'P' input did not drop out while the car was running. This input should drop out when MC, BRK and Run contactors are energized.	Faulty contactor or auxiliary contacts on MC, BRK, or RUN. Replace auxiliary contacts or entire contactor
PFC Relay Failed Off	PFC relay did not pick up as expected	• Faulty PFC output chip. Replace output chip. • Faulty PFC relay on main I/O Board (1102). Replace PFC relay.
PFC Relay Failed On	PFC relay did not drop as expected when performing a SFC/PFC test.	• Faulty PFC output chip. Replace output chip. • Faulty PFC relay on main I/O Board (1102). Replace PFC relay.

Faults	Description	Possible Cause/Suggested Fix
PFC-SFC Test Lost DZ	Lost DZ input when performing a SFC/PFC test.	• DZ output on selector board did not turn on. (Replace DZ output on selector driver board). One or both of the DZ sensors on the selector sensor board failed. Replace selector sensor board. • DZ input on the 1102 board failed. Replace DZ input on 1102 board. • Check leveling magnet.
Pit Door Switch Flt	Pit Door Switch Open	• Verify that the pit door switch is closed. • Faulty wiring on the pit door switch circuit.
Pit Switch Fault	Pit Switch Input Open	• Verify that the pit switch is closed. • Faulty wiring on the pit switch circuit.
Pls Er 75% Top Speed	Pulse Error occurred while car is running greater then 75% of contract speed. The pulse counts have to change a minimum distance by the time the car reaches 75% of top speed.	• This error occurs if the car looses its pulse feedback from the encoder. • Make sure that the encoder is not slipping. • Check the encoder cable from the drive to the controller. • Also check the ribbon cable from the encoder isolation on the 1102 board to the encoder input on the 1100 CPU board..
Position Fault	The Terminal limits do not match the car position (UT or DT is hit but the car position is not at the top or bottom floor).	• Car is out of step from faulty selector inputs. Check that the DZ, UL and DL selector inputs work properly at each floor. • Car missed a slowdown input magnet. Check that the US and DS selector inputs work properly prior to each landing. • UT or DT input lost from the safety string being opened. • Improper adjustment of UT or DT limit switches
Possible DRV/SPB Er	The controller CPU lost the stop switch input, but has the SS and GTS inputs ON indicating that the drive or Safety Processor board has opened the safety string.	• View the faults on the Safety Processor display and debug from the fault code listed. • View the drive faults log or led status and debug as directed from the drive manual.
Power Up Reset	Whenever power is cycled on the controller this error will indicate that the controller CPU was reset	• This error code is normal for a power loss. If power was not lost and the CPU re-boots, verify the +5VDC on the CPU power connector reads in the range of 4.90 and 5.1 VDC. If out of range, adjust the 5VDC supply pot for the correct voltage.
Pulse Error > 75 fpm	Pulse count shows a travel distance less then 2 inches while the car demand velocity is greater than 75 fpm.	• Make sure that the encoder is not slipping. Check the ribbon cable from the encoder isolationonn the GALX-1102 Main I/O board to the encoder connection on the GALX-1100 CPU board. Possible faulty encoder isolation on Main I/O board, faulty ribbon cable or faulty encoder CPU board.

Faults	Description	Possible Cause/Suggested Fix
Rail Lock Switch Flt	Rail Lock Safety Switch Input is not on when expected.	• Check the rail lock contact on the COP board. • Faulty RLS input. Replace the input. • If there is not rail lock device (required for MRL elevators) this input may need to be jumped.
RCM / Lock Flt	Retiring Cam/Lock fault. Job has door contacts and door lock inputs as well as retiring cam output. Door locks are not coming on when trying to leave the floor.	• Door Contacts were already closed and the controller attempted to energize the retiring cam (RCM) several times and the door locks did not turn on. After 4 attempts, it will declare this fault. Check locks or retiring cam device.
RDoor Close Cont Flt	Rear Door Close Contact safe fault	• After Controller was safe with doors, gate switch, door contacts and locks made and ready to run, a door contact input turned OFF.
Rear Bot Lock Fault	The Rear Bottom Door Lock failed on while the door was open (door on the rear door open limit).	Faulty door lock. • Jumper placed on door lock circuit. • Rear door lock not adjusted properly. • Faulty wiring to DLB input. Faulty DLB and DLB-1 inputs (For this to occur both DLB and DLB-1 inputs must fail on). • DOLR input failed. Replace DOLR input chip. • Rear door operator open limit is not adjusted properly
Rear Det Edge Fault	Rear Detector Edge Time-out	• The Rear Electric Eye signal stayed on continuously for longer than the parameter 'EE Time-out' is set to.
Rear Door Close Flt	The rear door did not reach the Rear Door Close Limit within the door close protection time.	• Rear Door Close Limit (DCLR) not adjusted properly. • Faulty Rear Door Close Limit (DCLR). Replace DCRL input. • Trash in door track preventing door from closing.
Rear Door Open Fault	The rear door did not reach the Rear Door Open Limit within the door open protection time.	• Rear Door Open Limit (DOLR) not adjusted properly. • Faulty Rear Door Open Limit (DOLR). Replace DOLR input.
Rear Gate Sw Fault	The Rear Gate Switch failed on while the door was open.	• Rear Gate switch not adjusted properly. • RGS input failed on. Replace RGS input.
Rear Mid Lock Fault	The Middle Door Lock failed on while the door was open.	Faulty door lock. • Jumper placed on door lock circuit. • Rear door lock not adjusted properly. • Faulty wiring to RLM input. Faulty RLM and RLM-1 inputs (For this to occur both RLM and RLM-1 inputs must fail on). • DOLR input failed. Replace DOLR input chip. • Rear door operator open limit is not adjusted properly

Faults	Description	Possible Cause/Suggested Fix
Rear Top Lock Fault	The Rear Top Door Lock failed on while the door was open.	Faulty door lock. • Jumper placed on door lock circuit. • Rear door lock not adjusted properly. • Faulty wiring to DLT input. Faulty DLT and DLT-1 inputs (For this to occur both DLT and DLT-1 inputs must fail on). • DOLR input failed. Replace DOLR input chip. • Rear door operator open limit is not adjusted properly
Reset Fault	Anytime the system detects one of the following faults a reset fault is logged: • Power is cycled • Controller finds itself out of the door zone. • Binary input fault. • Terminal limits do not match the current position. • Car has been switched off of inspection. • After an open safety string has been closed.	• This fault is logged under normal conditions. Check the fault log for error that would indicate a fault condition prior to the reset fault.
RETST OFF Fault	Rear Door Electric Eye Test Failed OFF. Output is turned on cause the electric eye outputs to controller input EER1 and EER2 to pulse.	• RETST output or RETST input failed in the on state. • Replace the RETST output chip. • Replace the RETST input chip.
RETST ON Fault	Rear Door Electric Eye Test Failed ON. Output is turned on cause the electric eye outputs to controller input EER1 and EER2 to pulse.	• RETST output or RETST input failed in the on state. • Replace the RETST output chip. • Replace the RETST input chip.
RGS & RGS-1 Opposite	Input failure on one of the Rear Gate Switch (RGS) inputs.	• Faulty RGS or RGS-1 input. Replace input chip.
RLM & RLM-1 Opposite	Input failure on one of the Rear Lock Middle (RLM) inputs	• Faulty RLM or RLM-1 input. Replace input chip.
RPM Input Fault	RPM Input Fault. The Rear Door Protection input stayed on when the rear door reached full open.	• RPM switch not setup properly on the door operator. Faulty RPM input. Replace RPM input chip.
RPM Off/RGS or DL On	RPM Off with Rear Gate Switch or Door Lock On. The Rear Door Protection Module input must go on before rear gate switch or door lock inputs go on.	The RPM switch on the door operator is not setup properly. There is no RPM input on the door operator. Jump the RPM input to the RGS terminal. • Faulty RPM input. Replace the RPM input chip.

Faults	Description	Possible Cause/Suggested Fix
Run Fault: Shutdown	Run Fault: Shutdown. If the car attempts to run 4 consecutive times and incurs a specific type of emergency stop without making a successful run, the car is shutdown and this error code is shown. The specific types of emergency stops to cause this fault are as follows: 1. The car has picked the brake and is in the run mode for more than 2 seconds and the position pulse has not changed. 2. The car is demanding a velocity greater than 75 fpm and change in position	• Verify that the brake is lifting properly. • Verify that the encoder pulses increment and decrement when running up or down.
RUN I/O Failed Off	The RUN input or output has failed off.	Traction • Faulty wiring to RN1 terminal. • Faulty RUNi input. Replace the RUNi input chip. • Faulty RUN output. Replace the RUN output chip. Hydro • Faulty wiring at the SC terminal. Verify that the valve common SC terminal on the Main I/O board is connected properly. • Faulty RUNi input. Replace the RUNi input chip. • Faulty RUN output. Replace the RUN output chip.
RUN I/O Failed On	The RUN input or output has failed on.	Traction • Faulty wiring to RN1 terminal. • Faulty RUNi input. Replace the RUNi input chip. • Faulty RUN output. Replace the RUN output chip. Hydro • Faulty wiring at the SC terminal. Verify that the valve common SC terminal on the Main I/O board is connected properly. • Faulty RUNi input. Replace the RUNi input chip. • Faulty RUN output. Replace the RUN output chip.
Run Inhibit Rset Cnt	Run inhibit from reset count	• Once the car is in Reset mode, the controller attempted 5 times to come off reset but it keeps being sent back in reset.
RUN O/RUN I Failed	RUN output failed off or RUNi input failed on	• Faulty RUNi input chip. Replace input chip. • Faulty RUN output chip. Replace output chip.

Faults	Description	Possible Cause/Suggested Fix
RUN O/RUNA I Failed	RUN output failed off or RUNAi input failed on	• Faulty RUNAi input chip. Replace input chip. • Faulty RUN output chip. Replace output chip.
RUN, RUNA, DNR Fail	The RUN input or output, the RUNA output or the DNR output failed to turn on.	Hydro • Faulty wiring at the SC terminal. Verify that the valve common SC terminal on the Main I/O board is connected properly. • Faulty wiring at the SD terminal. Verify that the down valve is wired to the SD terminal on the Main I/O board. • Faulty SDi input (replace input chip). • Faulty SD output (replace output chip). • Faulty RUNi input. Replace the RUNi input chip. • Faulty RUN output. Replace the RUN output chip.
RUN, RUNA, UP Fail	The RUN input or output, the RUNA output or the UP output failed to run on.	Hydro • Faulty wiring at the SC terminal. Verify that the valve common SC terminal on the Main I/O board is connected properly. • Faulty wiring at the SU terminal. Verify that the down valve is wired to the SU terminal on the Main I/O board. • Faulty SUi input (replace input chip). • Faulty SU output (replace output chip). • Faulty RUNi input. Replace the RUNi input chip. • Faulty RUN output. Replace the RUN output chip.
RUNA I/O Failed Off	The RUNA input or output has failed off.	Traction • Fault on Safety Processor Board. This board Can disable the run control to the RUNA output chip. Check if the PIC or PAL inhibit LEDs are on or if they turn on when the car attempts to run. Check the elevator service, faults, and inputs/outputs on the Safety Processor Board LCD display. • Faulty RUNAi input. Replace the RUNAi input chip. • Faulty RUNA output. Replace the RUNA output chip. Hydro • Faulty wiring at the SC terminal. Verify that the valve common SC terminal on the Main I/O board is connected properly. • Faulty RUNAi input. Replace RUNAi input chip. • Faulty RUNA output. Replace RUNA output chip. • Faulty RUN output. Replace RUN output chip.

Faults	Description	Possible Cause/Suggested Fix
RUNA I/O Failed On	The RUNA input or output has failed on	Traction • Faulty RUNAi input. Replace the RUNAi input chip. • Faulty RUNA output. Replace the RUNA output chip. Hydro • Faulty wiring at the SC terminal. Verify that the valve common SC terminal on the Main I/O board is connected properly. • Faulty RUN output. Replace RUN output chip. • Faulty RUNAi input. Replace RUNAi input chip. • Faulty RUNA output. Replace RUNA output chip.
RUNA O/RUN I Failed	RUNA output or RUNI input failed	• RUNA output failed off. Replace the RUNA output chip. Or • RUNI input failed off. Replace the RUNI input chip.
RUNX Failed Off	RUNX relay contact Failed OFF. The RUNX relay coil is wired in parellel with the RUN relay. Only one contact is use and is in series with the enable on the drive. The contact is monitored by main CPU with the RUNX input.	• Verify that the RUNX relay is turning on as expected. The relay coil or the contact could be faulty. Replace the RUNX relay. • The RUNX LED should turnn on when MC and RUNX relays turn on. If the RUNX LED does not turn on, manually pick the MC contactor and check for voltage on the CCFM terminal. If there is no voltage on CCFM, diagnose and correct the problem with the MC contactor. • Attempt to run the car on inspection and watch the RUNX LED. If the RUNX LED does not turn on the replace the RUNX relay. • Attempt to run the car on inspection and monitor the voltage on EN terminal. If the RUNX LED turns on and there is voltage on the EN terminal, replace the RUNX input chip.
RUNX Failed On	RUNX relay contact Failed ON. The RUNX relay coil is wired in parellel with the RUN relay. Only one contact is use and is in series with the enable on the drive. The contact is monitored by main CPU with the RUNX input.	• Verify that the RUNX relay is droping out as expected. The relay coil or the contact could be faulty. Replace the RUNX relay. • The RUNX LED should be off when MC is off. If the RUNX LED remains on, check for voltage on the CCFM terminal. If there is voltage on CCFM, diagnose and correct the problem with the MC contactor. • If the RUNX LED is off, push the MC contactor in. If the RUNX LED turn off then the RUNX contact is stuck on. Replace the RUNX relay. • If the RUNX LED is off but the input shows on the main CPU inpupt display, then replace the RUNX input chip.

Faults	Description	Possible Cause/Suggested Fix
RUNX Off While Motion	RUNX Off While Elevator is in Motion. The RUNX contact is tested at the start of a run but is also expected to remain energized during the entire run.	• The MC contactor could have dropped unexpectedly. Run the car again and monitor the status of the MC contactor. Usually you would get an MCX input off fault if this occurs. • Monitor the 24 VDC at the CCFM input. If the 24 VDC drops during the run then the MC auxiliary contact is bad. Replace the contact. • Monitor the RUNX LED during a run. If the LED turns off then the RUNX relay is possible faulty. Replace the RUNX relay. • Check for other faults in the fault log during the same time period. If the RUN relay is also dropping, the fault is most likely cause by something in the RUN circuit. Check for RUN or RUNA I/O Faults.
S10 Fuse Blown Fault	The S10 input is off. No Power on S10	• Short from S10 to GND.
Safety String Fault	Safety string fault occurs from the following conditions: • The safety string is open (SS input is off). • The drive ready input is not energized from the drive. • The potential to run input 'P' is off.	• The safety string is open (SS input if off). Refer to the job prints and check all circuits ahead of the SS input.
SEB CAN Com Error	Serial Expansion Board Can Communications Error. One of the Serial Expansion boards is not communicating with the main CPU.	• From the LCD user interface, select the Diagnostic menu and then the Car Com Status menu. The device that is not communicating will be shown with the online status equal 0. • Check the terminal connection for the twisted pair wires.
SEL CAN Com Error	Top of car selector board communication error.	• From the LCD user interface, select the Diagnostic menu and then the Car Com Status menu. If the selector board is not communicating it will show with the online status equal to 0. • Check the terminal connection for the twisted pair wires. Verify that CANH and CANL on the selector board are wired to CANH and CANL to the top of car board respectively.
Selector Count Fault	Selector Count Fault. If the hoistway has been learned and the selector count init flag (tapeless selector) is not set then this error is declared.	• The governor encoder has lost battery power. • The encoder was disconnected from the governor. • Faulty encoder connection to the governor • Loss of communications from the Safety Processor Board to the encoder.

Faults	Description	Possible Cause/Suggested Fix
Selector DZ Off Fault	Selector DZ that is sent to the controller over serial port does not match hardwired DZ on Main I/O Board	• From the LCD user interface, navigate to the 'Input and Outputs' menu and then select the 'Car Inputs and Outputs'. View the selector DZSL status and compare it to the DZ/DZ-1 inputs on the main I/O board. • Verify the correct voltage of the DZ input on the main I/O board. • Verify the correct voltage on the selector DZ output.
Selector Preset Flt	Selector preset position fault	• Controller could not established position from selector pulse count or tapeless encoder. It tried to establish position but pulse count did not match floor tables. • Check pulses on Safety processor board, encoder comm and 485 encoder.
SFC Relay Failed Off	SFC relay did not pick up as expected.	• Faulty SFC output chip. Replace output chip. • Faulty SFC relay on main I/O Board (1102). Replace SFC relay.
SFC Relay Failed On	SFC relay did not drop as expected when performing a SFC/PFC test.	• Faulty SFC output chip. Replace output chip. • Faulty SFC relay on main I/O Board (1102). Replace SFC relay.
Shutdown Alarm	Shutdown Alarm: The controller is out of service from a fault condition for a time period greater than adjustable shutdown alarm timer.	• This error is logged so the system can send notification from the Galileo Monitoring System. Check the previous error that was logged to determine the cause.
Side Emerg. Exit Flt	Side Emergency Exit Fault	• Verify that the side emergency exit is properly shut and the switch is closed. • Faulty wiring in the side emergency exit circuit.
Slip Detect Fault	Slip Detection Fault (SPB Velocity difference fault). There is a speed difference between the CPU and the safety processor board possibly because of Rope Slippage. This fault will set the rope gripper or the emregency brake. For jobs with local A17.1 code earlier than 2010 this fault can be disabled by setting the Field Variable Slip Det Dis to =1 Disabled. For jobs with 2010 code and later, the gripper or emergency brake will be set regardless of this parameter value.	• This is a Slip detection mechanism required for 2010 code. The field variable Slip Vel Diff determines how many feet per minute the two speeds could be apart to detect the fault. • Verify the velocity of the Safety Processor and the main CPU. • Mark the ropes dead level at a particular floor. Run the car away from the floor and then back to the floor. Measure the rope slip. Replace the ropes if necessary.

Faults	Description	Possible Cause/Suggested Fix
SPB CAN Com Error	Safety Processor Can Communications Error. The Safety Processor is not communicating to the main CPU.	• Verify that the MCU LED for the Safety Processor is bllinking. If not then call GAL. • Verify that the bus termination jumper is placed on the GALX-1102 board for the Machine Room CAN bus..
SPB Enc Opp Dir Flt	Safety Processor encoder opposite direction fault in tapeless encoder jobs. Car moving up while CPU is giving a Down command or viceversa. This fault sets the rope gripper or emergency brake. Disable this fault by setting Field Variable SPB Dir Flt Dis to 1=Disabled.	• Speed was greater than 100 foot per minute while the Safety Processor detected velocity in the opposite direction of the controller run command. • Possible Noise on Encoder cable. Check Encoder Voltage. • Check for wires shield connections on GALX-1102 Board.
SPB Limit Vel Fault	SPB Limit Velocity Fault. During a limit learn, the velocity for one of the limits was recorded at a speed greater then the contract speed of the car. The velocity value of the limit is set to contract speed - 1.	• View all the limit velocity values of the safety processor. If a limit velocity value is set to contract speed - 1, then the limit may need to be moved closer to the terminal landing so that the car hits the limit at a slower speed. • Verify the velocity of the safety processor during a normal run. If the velocity value is too high compared to the actual speed of the car, change the RPM parameter for the safety processor until the speed matches the actual car speed. Increase the RPM value to reduce the SPB velocity or reduce the RPM to increase the SPB velocity.
SPB SAF CAN Fault	Safety Processor has a Safety CAN fault	• Verify proper twisted pair wires to the SPCH and SPCL terminals on the 1102 board. • Noise on the CAN Bus, verify that the shield wire is connected according to the job print.
SPB SFC Off Fault	Safety Processor SFC fault. CPU detected SFC (Secondary Fault Controller) turn off while the ready input (RDY) was still on	• Check for faults from the safety processor under MRCAN device fault on the LCD Display Interface. • Replace SFC (EQR) input chip • If no voltage at SFC terminal and no faults in safety processor, replace output chip for SFC on the main i/o board
SPB Unintend Motion	Safety Processor unintended motion	• Safety processor detected unintended motion of elevator with the doors open

Faults	Description	Possible Cause/Suggested Fix
Speed Control Exit	Speed Control Exited from a fault condition.	• The Electrical Safety String was open during a run. Check the safety string inputs. • The Drive dropped the SFD relay causing the RDY input to drop. Check the drive for faults. • The S10 input turned off. Possible short in traveling cable or bad S10 input. Correct short condition or replace S10 input on 1102 board. • GTS input turned off during run. Rope Gripper turned off. • Inspection Switch applied during run.
Stalled Fault	Stall Fault occurs if the motion run timer exceeds the stall protection time. The motion run timer is incremented while the car is trying to run.	• Increase Stall Timer on the controller under Adjustable Variables and Car Timers. Set the timer to allow the car to run the entire hoistway at the recovery speed. • The recovery speed parameter may need to be increased to 50 fpm or higher. Typically do not set higher than 80 fpm. If the recovery speed parameter has been changed. Run the car in between floors on inspection and then return the car to automatic. Verify that the car recovers to a landing without overshooting the floor.
Stop Switch Fault	Stop switch is pulled while the car is in motion.	• Stop switch is pulled. • Faulty wire connection in the stop switch circuit.
Target Fault at DT	When going down, the target count should always be below the position count. This fault is logged if the target count is above the position count when the DT slowdown limit is hit.	• This fault should never occur. Please call the factory if this fault occurs.
Target Fault at DT1	This fault is logged if the target count is above the position count when the DT1 slowdown limit is hit	• This fault should never occur. Please call the factory if this fault occurs.
Target Fault at DT2	This fault is logged if the target count is above the position count when the DT2 slowdown limit is hit.	• This fault should never occur. Please call the factory if this fault occurs.
Target Fault at DT3	This fault is logged if the target count is above the position count when the DT3 slowdown limit is hit.	• This fault should never occur. Please call the factory if this fault occurs.
Target Fault at DT4	This fault is logged if the target count is above the position count when the DT4 slowdown limit is hit.	• This fault should never occur. Please call the factory if this fault occurs.

Faults	Description	Possible Cause/Suggested Fix
Target Fault at DT5	This fault is logged if the target count is above the position count when the DT5 slowdown limit is hit.	• This fault should never occur. Please call the factory if this fault occurs.
Target Fault at DT6	This fault is logged if the target count is above the position count when the DT6 slowdown limit is hit.	• This fault should never occur. Please call the factory if this fault occurs.
Target Fault at DTS	This fault is logged if the target count is above the position count when the DTS slowdown limit is hit.	• This fault should never occur. Please call the factory if this fault occurs.
Target Fault at UT	When going up, the target count should always be above the position count. This fault is logged if the target count is below the position count when the UT slowdown limit is hit.	• This fault should never occur. Please call the factory if this fault occurs.
Target Fault at UT1	This fault is logged if the target count is below the position count when the UT1 slowdown limit is hit.	• This fault should never occur. Please call the factory if this fault occurs.
Target Fault at UT2	This fault is logged if the target count is below the position count when the UT2 slowdown limit is hit.	• This fault should never occur. Please call the factory if this fault occurs.
Target Fault at UT3	This fault is logged if the target count is below the position count when the UT3 slowdown limit is hit.	• This fault should never occur. Please call the factory if this fault occurs.
Target Fault at UT4	This fault is logged if the target count is below the position count when the UT4 slowdown limit is hit.	• This fault should never occur. Please call the factory if this fault occurs.
Target Fault at UT5	This fault is logged if the target count is below the position count when the UT5 slowdown limit is hit.	• This fault should never occur. Please call the factory if this fault occurs.
Target Fault at UT6	This fault is logged if the target count is below the position count when the UT6 slowdown limit is hit.	• This fault should never occur. Please call the factory if this fault occurs.
Target Fault at UTS	This fault is logged if the target count is above the position count when the UTS slowdown limit is hit.	• This fault should never occur. Please call the factory if this fault occurs.

Faults	Description	Possible Cause/Suggested Fix
Top Door Lock Fault	The Top Door Lock failed on while the door was open.	• Faulty door lock. • Jumper on door lock circuit. • Door lock not adjusted properly. • Faulty wiring to DLT input. • Faulty DLT and DLT-1 inputs (For this to occur both DLT and DLT-1 inputs must fail on). • DOL input failed. Replace DOL input chip. • Door operator open limit DOL is not adjusted properly
Top Emerg. Exit Flt	Top Emergency Exit Fault	• Verify that the top emergency exit is properly shut and the switch is closed. • Faulty wiring in the top emergency exit circuit. • Faulty wiring in the side emergency exit circuit.
Top Final Limit Flt	Top Final Limit Open	• Car traveled onto the top final limit. • Faulty wiring of the final limit circuit.
UL and DL Off Fault	Both UL and DL level sensors are off when car is at a floor.	• Faulty adjustment of the selector head. • Worn selector guides. Replace selector guides. • Faulty Door Zone Magnet. If this fault occurs at one particular floor, replace the door zone magnet at the floor. • Faulty sensor board. Replace the selector sensor board.
UL Failed On Fault	UL Failed On Fault. The UL leveling sensor did not go off during a run.	• UL hall effect sensor bad on selector sensor board. Replace sensor board. • UL Output Driver failed on. Replace output on selector driver board. • UL inputs failed on. Replace the selector driver board.
UL,DL & DZ Off at FL	UL, DL & DZ sensors off at floor. The car thinks it should be at a floor or is at a floor and all the floor sensors have turned off.	• Loss of power on the selector. • Faulty cable from the selector driver board to the sensor or sensor board. • Faulty wiring from the selector driver board to the main I/O board (1102).
UL,DL Learn Cnt Flt	Pulses per inch are incorrect from the Encoder RPM/ PPR settings	• Dead Zone was estimated to be greater than eight inches • Make sure the car is running at correct speed before learning the hoistway • The recommended distance between UL and DL sensors in tapeless system is 7.5 inches if the controller is configured to stop on pulses

Faults	Description	Possible Cause/Suggested Fix
UL/DL Dir Seq Fault	UL and DL Direction Fault. Once the car is in Motion, controller verifies the order for the leveling signals. UL, DZ and DL should come in the right sequence depending in the direction of travel. This fault sets the rope gripper or emergency brake. Disable this fault by setting Field Variable ULDL DirFlt Dis to 1=Disabled.	• During Setup, the leveling signals may be wired incorrectly. Once in service this fault should not occur. If detected, Check Detailed Fault data to determine direction of travel as well as possible inputs causing error.
UMotion Auto DO No DZ	Unintended Motion on Automatic with Door Open and Not on a Door Zone. The car was on a door zone with the doors open and then unexpectedly left the door zone while on automatic. This fault sets the gripper or emergency brake.	• Verify that the car is not loosing a door zone signal at the floor with the doors open. • Verify that the brake drops properly when the car stops. Adjust the brake. • Verify that the main brake can hold a full load. Adjust the brake.
UMotion Enc Velocity	Unintended Motion Encoder Velocity. The controller detected an unintended motion fault from the encoder feedback velocity. This fault sets the gripper or emergency brake.	• Verify that the brake drops properly when the car stops. Adjust the brake. • Verify that the main brake drops quickly during a high speed stop (opening a door lock). The brake resistor value for a high current brake may need to be adjusted to a lower value. • Verify that the main brake can hold a full load. Adjust the brake.
UMotion Ins DO No DZ	Unintended Motion on Inspection with Door Open and Not on a Door Zone. The car was on a door zone with the doors open and then unexpectedly left the door zone while on inspection. This fault sets the gripper or emergency brake.	• Verify that the car is not loosing a door zone signal at the floor with the doors open. • Verify that the brake drops properly when the car stops. Adjust the brake. • Verify that the main brake can hold a full load. Adjust the brake.
UMotion SPB Velocity	Unintended Motion Safety Processor Velocity. The controller detected an unintended motion fault from the Safety Processors velocity. The safety process also checks for unintended motion separate from the check on the main CPU. Field variable Griper/EBK Trip set to +1=SPB will cause the main CPU to set the gripper or emergency brake when this fault occurs.	• Verify that the brake drops properly when the car stops. Adjust the brake. • Verify that the main brake drops quickly during a high speed stop (opening a door lock). The brake resistor value for a high current brake may need to be adjusted to a lower value. • Verify that the main brake can hold a full load. Adjust the brake.

Faults	Description	Possible Cause/Suggested Fix
Uncontrolled Leveling	Uncontrolled Leveling Fault. This fault sets the gripper or emergency brake.	Verify that the car relevels properly. • The response, inertia or other gains on the drive may need to be increased. • Check for drive fault during releveling • The brake may not be dropping properly. Readjust the brake.
Unintended Motion Ft	Unintended Motion fault	• Unintended motion occurred. Car moved out of door zone with doors open or it had a speed feedback when not running from main encoder. If Adjustable Variables->Car Options->'Griper/EBK Trip' is SET then Safety processor speed could cause fault as well.
Up Directional Fault	Car unexpectedly hit the Up Normal Limit while running up.	• Faulty wiring for the UN limit. • Tape Selector: Incorrect placement of UT magnet (too close to center of tape). • Tapeless Selector: Incorrect placement of UT magnet not aligned properly with magnetic sensor on selector (cross talk from UT magnet to UN sensor).
UP I/O Failed Off	The UP input or output has failed off	• Fault on Safety Processor. The Safety Processor is located on the MAIN I/O board. This device can disable the run control to the DNR output chip. Check if the SAF-PROC or SAF-PAL FAULT LEDs turn on when the car attempts to run. Check the elevator service, faults, and inputs/outputs on the Safety Processor status of the LCD Display Interface. • Faulty UP output or UPi input. Replace the UP output and UPi input chip. • No 24VDC from the drive. Refer to Schematics. • Incorrect jumper placement on MAIN I/O board. Verify that jumpers on the bottom center of the board are positioned correctly for SOURCE or SINK. The jumpers depend on the drive type and is shown on the drive portion of the job schematic. If necessary move the jumpers to the correct position. • RUN, MC or BRK auxiliary contact not making properly. Verify the operation and contact integrity.
UP I/O Failed On	The UP input or output has failed on.	• Faulty UP output. Replace the UP output chip. • Faulty UPi input. Replace UPi input chip. • Incorrect jumper placement on 1102 board. Verify that jumpers on the bottom center of the board are positioned correctly for SOURCE or SINK. The jumpers depend on the drive type and is shown on the drive portion of the job schematic. If necessary move the jumpers to the correct position.

Faults	Description	Possible Cause/Suggested Fix
Up Normal SW Setup	Up Normal must turn off after reaching the top floor dead level	• Up Normal (UN) switch Turned off before controller detected top landing. The up normal may need to move up so it records dead level at top floor before UN turns OFF. If problem persists, look at hoistway tables to detect possible defective magnets.
UPF I/O Failed Off	The UPF input or output has failed off.	Hydro • Fault on Safety Processor Board. The Safety Processor Board can disable the run control to the UPF output chip. Check if the PIC or PAL inhibit LED turns on when the car attempts to run. Check the elevator service, faults, and inputs/outputs on the Safety Processor Board LCD display. • Faulty wiring to the SC common on the MAIN I/O board. • Faulty wiring to the SUF terminal on the MAIN I/O board. • Faulty wiring to the Up Fast valve • Faulty SDFi input (replace input chip). • Faulty SDF output (replace output chip).
UPF I/O Failed On	The UPF input or output has failed on.	Hydro • Faulty SUFi input (replace input chip). • Faulty SUF output (replace output chip).
UPS Comm Fault	Power loss: Controller cannot establish comm to UPS	• Check wiring and shielded pairs • Defective comm board • Possible bad UPS unit
UPS Low Bat Capacity	power loss ups battery capacity low fault	Battery Capacity went below the threshold set by the parameter 'Low Bat Cap Lev'
UPS Low Bat Voltage	Power loss: ups battery fault	• Defective battery inside UPS unit • Replace UPS
UPS Low Battery Flt	Power loss: ups battery fault	• UPS Battery voltage has dropped below 18V • Replace unit
UPS On Battery Power	Power loss: ups on battery power	• No Line voltage on UPS. Unit running on battery power
UPS Turned Off	Power loss: ups turned off	• Power loss on UPS. Power has been turned off
User Variable Init	User variable initialization	User related parameters such a password and telephone numbers are being initialized. This error occurs on the first time the GALX-1100 CPU board is being powered up.

Faults	Description	Possible Cause/Suggested Fix
UT count Fault	The verification position count for the UT input switch was off by more than 10 inches when the switch was activated.	• The car was lost due to a preset error. Check the guides on the selector. Check the fault log for binary preset errors. • The controller has a faulty encoder signal for the pulse count. Check that the car can make long runs without overshooting the floor or stopping short of the floor. • The power common to the limit switches was lost. Check fuse F1 on the selector board. • Incorrect counting of pulse counts. For Tapeless, check encoder connection to motor and encoder wiring. For Tape, check pulse sensors for proper quadrature at selector. • Hoistway not learned properly. Perform a hoistway learn procedure. • UT magnet not adjusted properly. Check at slow speed if sensor input is breaking, making and then braking again. Magnet needs to be closer to the sensor on the selector.
UT Failed On Fault	UT input Failed On Fault. The car was at the top floor and the UTS input was low true (UTS switch made) but the UT input was high (UT not made).	• The UTS limit is not installed. The UTS limit is used on all controllers as a verification that the car at the top most landing. Add the UTS limit. • The UT did not break at the top terminal landing. Adjust or replace the UT switch. • Faulty UT input. Replace selector board. • Faulty UT sensor on selector sensor board. Replace the sensor board for tape selector or replace the individual UT sensor on tapeless selector.
UT1 count Fault	The verification position count for the UT1 input switch was off by more than 10 inches when the switch was activated.	• The car was lost due to a preset error. Check the guides on the selector. Check the fault log for binary preset errors. • The controller has a faulty encoder signal for the pulse count. Check that the car can make long runs without overshooting the floor or stopping short of the floor. • The power common to the limit switches was lost. Check fuse F1 on the selector board. • Incorrect counting of pulse counts. For Tapeless, check encoder connection to motor and encoder wiring. For Tape, check pulse sensors for proper quadrature at selector. • Hoistway not learned properly. Perform a hoistway learn procedure. • UT1 magnet not adjusted properly. Check at slow speed if sensor input is breaking, making and then braking again. Magnet needs to be closer to the sensor on the selector.

Faults	Description	Possible Cause/Suggested Fix
UT2 count Fault	The verification position count for the UT2 input switch was off by more than 14 inches when the switch was activated.	• The car was lost due to a preset error. Check the guides on the selector. Check the fault log for binary preset errors. • The controller has a faulty encoder signal for the pulse count. Check that the car can make long runs without overshooting the floor or stopping short of the floor. • The power common to the limit switches was lost. Check fuse F1 on the selector board. • Incorrect counting of pulse counts. For Tapeless, check encoder connection to motor and encoder wiring. For Tape, check pulse sensors for proper quadrature at selector. • Hoistway not learned properly. Perform a hoistway learn procedure. • UT2 magnet not adjusted properly. Check at slow speed if sensor input is breaking, making and then braking again. Magnet needs to be closer to the sensor on the selector.
UT3 count Fault	The verification position count for the UT3 input switch was off by more than 18 inches when the switch was activated.	• The car was lost due to a preset error. Check the guides on the selector. Check the fault log for binary preset errors. • The controller has a faulty encoder signal for the pulse count. Check that the car can make long runs without overshooting the floor or stopping short of the floor. • The power common to the limit switches was lost. Check fuse F1 on the selector board. • Incorrect counting of pulse counts. For Tapeless, check encoder connection to motor and encoder wiring. For Tape, check pulse sensors for proper quadrature at selector. • Hoistway not learned properly. Perform a hoistway learn procedure. • UT3 magnet not adjusted properly. Check at slow speed if sensor input is breaking, making and then braking again. Magnet needs to be closer to the sensor on the selector.

Faults	Description	Possible Cause/Suggested Fix
UT4 count Fault	The verification position count for the UT4 input switch was off by more than 24 inches when the switch was activated.	• The car was lost due to a preset error. Check the guides on the selector. Check the fault log for binary preset errors. • The controller has a faulty encoder signal for the pulse count. Check that the car can make long runs without overshooting the floor or stopping short of the floor. • The power common to the limit switches was lost. Check fuse F1 on the selector board. • Incorrect counting of pulse counts. For Tapeless, check encoder connection to motor and encoder wiring. For Tape, check pulse sensors for proper quadrature at selector. • Hoistway not learned properly. Perform a hoistway learn procedure. • UT4 magnet not adjusted properly. Check at slow speed if sensor input is breaking, making and then braking again. Magnet needs to be closer to the sensor on the selector.
UT5 count Fault	The verification position count for the UT5 input switch was off by more than 32 inches when the switch was activated.	• The car was lost due to a preset error. Check the guides on the selector. Check the fault log for binary preset errors. • The controller has a faulty encoder signal for the pulse count. Check that the car can make long runs without overshooting the floor or stopping short of the floor. • The power common to the limit switches was lost. Check fuse F1 on the selector board. • Incorrect counting of pulse counts. For Tapeless, check encoder connection to motor and encoder wiring. For Tape, check pulse sensors for proper quadrature at selector. • Hoistway not learned properly. Perform a hoistway learn procedure. • UT5 magnet not adjusted properly. Check at slow speed if sensor input is breaking, making and then braking again. Magnet needs to be closer to the sensor on the selector.

Faults	Description	Possible Cause/Suggested Fix
UT6 count Fault	The verification position count for the UT6 input switch was off by more than 42 inches when the switch was activated..	• The car was lost due to a preset error. Check the guides on the selector. Check the fault log for binary preset errors. • The controller has a faulty encoder signal for the pulse count. Check that the car can make long runs without overshooting the floor or stopping short of the floor. • The power common to the limit switches was lost. Check fuse F1 on the selector board. • Incorrect counting of pulse counts. For Tapeless, check encoder connection to motor and encoder wiring. For Tape, check pulse sensors for proper quadrature at selector. • Hoistway not learned properly. Perform a hoistway learn procedure. • UT6 magnet not adjusted properly. Check at slow speed if sensor input is breaking, making and then braking again. Magnet needs to be closer to the sensor on the selector.
UTM Contact/GTS Flt	UTS contact/GTS input pick fault	GTS input did not come on. Gripper is set and GTS did not come on or turned OFF momentarily
UTS count Fault	Up Terminal Slowdown Limit Count Fault. The verification position count for the UTS input switch was off by more than 10 inches when the switch was activated.	• The car was lost due to a preset error. Check the guides on the selector. Check the fault log for binary preset errors. • The controller has a faulty encoder signal for the pulse count. Check that the car can make long runs without overshooting the floor or stopping short of the floor. • The power common to the limit switches was lost. Check fuse F1 on the selector board. • Incorrect counting of pulse counts. For Tapeless, check encoder connection to motor and encoder wiring. For Tape, check pulse sensors for proper quadrature at selector. • Hoistway not learned properly. Perform a hoistway learn procedure. • UTS magnet not adjusted properly. Check at slow speed if sensor input is breaking, making and then braking again. Magnet needs to be closer to the sensor on the selector.

Faults	Description	Possible Cause/Suggested Fix
UTS Failed On Fault	UTS input Failed On Fault. The car was at the top floor and the UT input was low true (UT switch made) but the UTS input was high (UTS not made).	• The UT switch is not wired or UT input was lost. The state of UT is compared to that of UTS. • The UTS limit did not break at the top terminal landing. Adjust the UTS magnet. • Faulty UTS input. Replace the UTS input chip on the 1102 board. • Faulty UTS sensor on selector sensor board. Replace the sensor board for tape selector or replace the individual UTS sensor on tapeless selector.
Velocity Diff Fault	Velocity difference between demand and encoder feedback. This fault sets the rope gripper or emergency brake. Disable this fault by setting Field Variable Vel Diff Dis to 1=Disabled.	• Controller detected a difference between demand and feedback speed greater than the setting under 'Velocity Diff' when the car is decelerating. Make sure speed is tracking properly in acceleration and deceleration. Adjust 'Velocity Diff' based on Speed of the car.
Wrong Dir Pls Run Dn	Wrong Direction Pulses while car running down. The pulse counts should be counting down while the car is running down.	• Check the jumper on the encoder isolation board. If this car has been previously running properly, the encoder isolation board could be faulty. If during initial setup, change the jumpers for A and A not.
Wrong Dir Pls Run Up	Wrong Direction Pulses while car running up. The pulse counts should be counting up while the car is running up.	• Check the jumper on the encoder isolation board. If this car has been previously running properly, the encoder isolation board could be faulty. If during initial setup, change the jumpers for A and A not.
XBK Low DC Bus Volts	Aux Brake board low dc bus voltage fault	• Incorrect Setting of Line to Line Brake voltage in Adjustable Variables • Incorrect dip-switch setting for Three Phase or Single Phase • Low Line Voltage • Rectifiers Blown or have bad Connection
XBK No Currnt w/Volt	Aux Brake board no current fault with voltage applied	• No Brake Connected • Bad Current Sensor • Check if board is low current or high current board.
XBK No DC Bus Volts	Aux Brake board no dc bus voltage fault	• No AC Voltage Coming into AC1-AC2-AC3 • Rectifiers Blown or have bad Connection
XBK No Output Volts	Aux Brake board not output voltage fault	• IGBT Not Gating
XBK Over Current Flt	Aux Brake board over current fault	• IGBT Shorted • Free Wheeling Diode Shorted • Gating Circuitry Shorted ON
XBK Over Voltage Flt	Aux Brake board over voltage fault	• IGBT Shorted • Gating Circuitry shorted ON
XBK Rq Volt > DC Bus	Aux Brake board dmd voltage greater than dc bus voltage fault	• Incorrect Setting of Pick/Hold/Re-level Voltage in Adjustable Variables • Low Line Voltage

Faults	Description	Possible Cause/Suggested Fix
Zero Vel Decel Roll	Zero Velocity Deceleration Roll. The controller calculated a velocity value of zero during the roll in to constant deceleration.	• This fault should never occur. Please call the factory if this fault occurs.

6.2 Device Fault in Fault Log

This section describes the specific device faults from devices on the Machine Room CAN (MRCAN), Car Top CAN (CTCAN) and Group CAN (GRCAN) serial ports.

Fault	Description	Possible Cause/Suggested Fix
Address Error	Invalid Address for device	• Program error.
Comm Fault	Selector, Safety Processor or NTS Processor recorded a communications fault on its CAN bus port	• Faulty Can communication wire connection. Verify proper twisted pair wires to the canh and canl terminals on the brake board. • Noise on the Can bus. Verify that the shield wire is connected according to the job print.
DL/GS Fault	Door Lock/Gate Switch Fault.	• Car is moving outside the door zone with the door open. The car will immediately shut down.
DN Pulse Fault	Selector pulsed the DN latch multiple times but the DN state was not latched	• Memory of the DN sensor is stored on a state saver latch device. Replace the Selector Board.
DT Limit Vel Fault, DT1 Limit Vel Fault, DT2 Limit Vel Fault, DT3 Limit Vel Fault, DT4 Limit Vel Fault, DT5 Limit Vel Fault, DT6 Limit Vel Fault	NTS Processor detected a car speed at the DT,DT1, DT2, DT3, DT4, DT6 or DT6 terminal limit that was greater that the clamp (parameter) speed	• Verify that the limit activates at the correct location in the hoistway. • Verify the speed that the car hits the limit and adjust the limit velocity if necessary. • If the acceleration or deceleration rates were change after the limit velocities were learned, the learn process may need to be repeated or the limit may need to be moved.
DT Pulse Fault	Selector pulsed the DT latch multiple times but the DT state was not latched	• Memory of the DT sensor is stored on a state saver latch device. Replace the Selector Board.
DTS Speed Fault	Safety Processor detected a car speed at the DTS terminal limit that was greater that the clamp (parameter) speed	• Verify that the limit activates at the correct location in the hoistway. • Verify the speed that the car hits the limit and adjust the limit velocity if necessary. • If the acceleration or deceleration rates were change after the limit velocities were learned, the learn process may need to be repeated or the limit may need to be moved.
EEprom Fault	EE Prom for device is not working properly	• Defective EEprom device or EEprom device is not installed. The car will not be able to run until the EEprom is installed or replaced.
ETS Down Speed Fault	Safety Processor detected a car speed at the ETD terminal limit that was greater that the clamp (parameter) speed	• Verify that the limit activates at the correct location in the hoistway. • Verify the speed that the car hits the limit and adjust the limit velocity if necessary. • If the acceleration or deceleration rates were change after the limit velocities were learned, the learn process may need to be repeated or the limit may need to be moved.
ETS Down Speed	Safety Processor detected	• Verify that the limit activates at the correct

Fault	Description	Possible Cause/Suggested Fix
Fault	a car speed at the ETS Down terminal limit that was greater that the clamp (parameter) speed	location in the hoistway. • Verify the speed that the car hits the limit and adjust the limit velocity if necessary. • If the acceleration or deceleration rates were change after the limit velocities were learned, the learn process may need to be repeated or the limit may need to be moved.
ETS Up Speed Fault	Safety Processor detected a car speed at the ETU terminal limit that was greater that the clamp (parameter) speed	• Verify that the limit activates at the correct location in the hoistway. • Verify the speed that the car hits the limit and adjust the limit velocity if necessary. • If the acceleration or deceleration rates were change after the limit velocities were learned, the learn process may need to be repeated or the limit may need to be moved.
ETS Up Speed Fault	Safety Processor detected a car speed at the ETS Up terminal limit that was greater that the clamp (parameter) speed	• Verify that the limit activates at the correct location in the hoistway. • Verify the speed that the car hits the limit and adjust the limit velocity if necessary. • If the acceleration or deceleration rates were change after the limit velocities were learned, the learn process may need to be repeated or the limit may need to be moved.
INS DO Speed Fault	Inspection Door Open Fault	• A door is open while running on inspection and the gate and locks are not being bypassed. The car will immediately shut down.
INS Speed Fault	Inspection Speed Fault	• The car exceeded the INS Velocity adjustable variable while running on inspection. The car will immediately shut down.
Invalid Fault	Fault code greater than table value	• Can occur if device program version is newer that the controller program version and the device has a new fault that is not yet recorded in the controller program.
IO Fault	I/O Fault. An input is on in error. The Elevator Status display will show the I/O error.	• All inspection inputs and the auto input are off. • More than one inspection or auto input is on at the same time. • A bypass input is on while the car is not on Car top inspection. • Both up and down run output from the main CPU are on at the same time. • The car will not be able to run until the error is cleared.
LEV Speed Fault	Leveling Speed Fault.	• Car was traveling at a speed greater than the leveling speed parameter in the door zone with the door open. • Leveling Vel adjustable variable may be set too low.

Fault	Description	Possible Cause/Suggested Fix
No Pulses Fault	Pulse Error.	• Not enough pulses have occurred during the Pulse Fault Time period. This error is detected only on automatic operation. Verify that the encoder LED for the Safety Processor on the Main I/O board blinks while the car is running on inspection. Also verify that the Safety Processor Velocity displayed on the "Elevator Status" display is correct. Possible causes are as follows: • Improper connection to the motor encoder. Refer to the job specific prints. • Improper connection of encoder jumpers on Main I/O board.
Norm Lim Clk Pulse Flt	Selector pulsed the clock of the UN or DN latch multiple times but the state was not latched	• Replace the Selector Board.
NTSD Comm Fault	Selector or Safety Processor recorded a communications fault with the NTS Processor on the Safety CAN bus port.	• Faulty Can communication wire connection. Verify proper twisted pair wires to the canh and canl terminals on the brake board. • Noise on the Can bus. Verify that the shield wire is connected according to the job print.
P1 APS Sel CAN Flt	Processor 1 on the APS Selector interface board is not communicating with the APS camera head on channel B.	• Verify the RJ-45 connector from the selector camera to the selector interface board GALX-1133 is properly connected. • Verify that both LED's on the RJ-45 connector are blinking at 1 second intervals. • Make sure the CAT-6 cable is not run in parallel with any high voltage wires. • Replace the GALX-1133 board. • Replace the camera head.
P1 APS Vel Check Flt	Processor 1 on the APS Selector interface board detected a Velocity Check fault between channal A and channel B.	• Verify that both camera heads are clean, aligned and have a good contrast ratio (see diagnostic menu) • Check for communications errors for the camera head to the selector interface board GALX-1133
P1 DN Input Fault	Processor 1 on the APS Selector interface board detected a Down Normal Limit input fault.	• Processor 1 detected that the input for DN was off when the output was being turned on. • Faulty input, replace the input device. • Faulty output for DN. Replace the output device.
P1 DZ Clip Fault	Processor 1 on the APS Selector interface board detected a door zone clip missing.	• Processor 1 detected a door zone clip missing at the same floor for three consecutive stops on channel B. • Verify that the door zone clip is roughly in the middle of channel A and B cameras. Place the clip in the proper position • If the clip is missing or broken, then replace the clip.

Fault	Description	Possible Cause/Suggested Fix
		• Go to the LCD Interface on the Main CPU and select the Dpy APS Sel Valid Clips menu under the Hoistway Tables menu. Under the display for ClpP1, a bit is set for each floor with a valid clip. Position the elevator at the floor that does not have the bit set and re-learn the floor position.
P1 DZ Input Fault	Processor 1 on the APS Selector interface board detected a door zone input fault.	• Processor 1 detected that the input for DZ was off when the output was being turned on. • Faulty input, replace the input device. • Faulty output for DZ. Replace the output device.
P1 HoistW Floor Flt	Processor 1 on the APS Selector interface board has a hoistway learn flag set but does not have a valid floor table.	• If the installation process to learn all the floors is not complete then then ignore this error. • Complete the learn process. • Go to the LCD Interface on the Main CPU and select the Dpy APS Sel Valid Floors menu under the Hoistway Tables menu. Under the display for FLRP1, a bit is set for each valid floor. Position the elevator at the floor that does not have the bit set and re-learn the floor position.
P1 HoistW Flr Cnt Er	Processor 1 on the APS Selector interface board has a floor count on a floor that is higher than the floor above.	• If the installation process to learn all the floors is not complete then then ignore this error. • Complete the learn process. • Go to the LCD Interface on the Main CPU and select the Dpy APS Sel Valid Floors menu under the Hoistway Tables menu. Under the display for FLRP1, a bit is set for each valid floor. Position the elevator at the floor that does not have the bit set and re-learn the floor position.
P1 HoistW Flr Cnt=0	Processor 1 on the APS Selector interface board has a hoistway floor count value that is zero.	• If the installation process to learn all the floors is not complete then then ignore this error. • Complete the learn process. • Go to the LCD Interface on the Main CPU and select the Dpy APS Sel Valid Floors menu under the Hoistway Tables menu. Under the display for FLRP1, a bit is set for each valid floor. Position the elevator at the floor that does not have the bit set and re-learn the floor position.
P1 HoistW Setup Flt	Processor 1 on the APS Selector interface board has a hoistway setup fault.	• If the installation process to learn all the floors is not complete then then ignore this error. • Complete the learn process. • Go to the LCD Interface on the Main CPU and select the Dpy APS Sel Valid Floors menu under the Hoistway Tables menu. Under the display for FLRP1, a bit is set for each valid floor. Position the elevator at the floor that does not have the bit set and re-learn the floor position.
P1 SS Input Fault	Processor 1 on the APS	• Processor 1 detected that the input for SS was off

Fault	Description	Possible Cause/Suggested Fix
	Selector interface board detected a Selector Safe input fault.	when the output was being turned on. • Faulty input, replace the input device. • Faulty Selector Safe Relay. Replace the relay.
P1 SS Open Fault	Processor 1 on the APS Selector interface board detected that Selector Safe Relay output is open (off).	• Processor 1 detected that the input SS is off. • The device has a fault conditon. Check other APS fault codes and correct the condition. • Faulty Selector Safe Relay. Replace the relay.
P1 UN Input Fault	Processor 1 on the APS Selector interface board detected a Up Normal Limit input fault.	• Processor 1 detected that the input for UN was off when the output was being turned on. • Faulty input, replace the input device. • Faulty output for UN. Replace the output device.
P2 APS Sel CAN Flt	Processor 2 on the APS Selector interface board is not communicating with the APS camera head on channel B.	• Verify the RJ-45 connector from the selector camera to the selector interface board GALX-1133 is properly connected. • Verify that both LED's on the RJ-45 connector are blinking at 1 second intervals. • Make sure the CAT-6 cable is not run in parallel with any high voltage wires. • Replace the GALX-1133 board. • Replace the camera head.
P2 DN Input Fault	Processor 2 on the APS Selector interface board detected a Down Normal Limit input fault.	• Processor 2 detected that the input for DN was off when the output was being turned on. • Faulty input, replace the input device. • Faulty output for DN. Replace the output device.
P2 DZ Clip Fault	Processor 2 on the APS Selector interface board detected a door zone clip missing.	• Processor 2 detected a door zone clip missing at the same floor for three consecutive stops on channel B. • Verify that the door zone clip is roughly in the middle of channel A and B cameras. Place the clip in the proper position • If the clip is missing or broken, then replace the clip. • Go to the LCD Interface on the Main CPU and select the Dpy APS Sel Valid Clips menu under the Hoistway Tables menu. Under the display for ClpP2, a bit is set for each floor with a valid clip. Position the elevator at the floor that does not have the bit set and re-learn the floor position.
P2 DZ Input Fault	Processor 2 on the APS Selector interface board detected a door zone input fault.	• Processor 2 detected that the input for DZ was off when the output was being turned on. • Faulty input, replace the input device. • Faulty output for DZ. Replace the output device.
P2 HoistW Floor Flt	Processor 2 on the APS Selector interface board has a hoistway learn flag set but does not have a valid floor table.	• If installation process to learn all the floors is not complete then then ignore this error. • Complete the learn process. • Go to the LCD Interface on the Main CPU and select the Dpy APS Sel Valid Floors menu under the Hoistway Tables menu. Under the display for

Fault	Description	Possible Cause/Suggested Fix
		FLRP2, a bit is set for each valid floor. Position the elevator at the floor that does not have the bit set and re-learn the floor position.
P2 HoistW Flr Cnt Er	Processor 2 on the APS Selector interface board has a floor count on a floor that is higher than the floor above.	• If installation process to learn all the floors is not complete then then ignore this error. • Go to the LCD Interface on the Main CPU and select the Dpy APS Sel Valid Floors menu under the Hoistway Tables menu. A bit is set for each valid floor. Position the elevator at the floor that does not have the bit set and re-learn the floor position.
P2 HoistW Flr Cnt=0	Processor 2 on the APS Selector interface board has a hoistway floor count value that is zero.	• If installation process to learn all the floors is not complete then then ignore this error. • Complete the learn process. • Go to the LCD Interface on the Main CPU and select the Dpy APS Sel Valid Floors menu under the Hoistway Tables menu. Under the display for FLRP2, a bit is set for each valid floor. Position the elevator at the floor that does not have the bit set and re-learn the floor position.
P2 HoistW Setup Flt	Processor 2 on the APS Selector interface board has a hoistway setup fault.	• If the installation process to learn all the floors is not complete then then ignore this error. • Complete the learn process. • Go to the LCD Interface on the Main CPU and select the Dpy APS Sel Valid Floors menu under the Hoistway Tables menu. Under the display for FLRP2, a bit is set for each valid floor. Position the elevator at the floor that does not have the bit set and re-learn the floor position.
P2 SP CAN Com Fault	Processor 2 on the APS Selector interface board is not communicating on the SPCAN bus with the NTS processor or the Safety Processor.	• Verify proper twisted pair wires to the SPCH and SPCL terminals on the 1102 board. • Noise on the CAN Bus, verify that the shield wire is connected according to the job print.
P2 SPI Com Fault	Processor 2 is not communicating through the SPI serial port with Processor 1 on the APS Selector interface board.	• Cycle the power on the board. If the problem persist, replace the board.
P2 SS Open Fault	Processor 2 on the APS Selector interface board detected a Selector Safe input fault.	• Processor 2 detected that the input for SS was off when the output was being turned on. • Faulty input, replace the input device. • Faulty Selector Safe Relay. Replace the relay.
P2 UN Input Fault	Processor 2 on the APS Selector interface board detected a Up Normal Limit input fault.	• Processor 2 detected that the input for UN was off when the output was being turned on. • Faulty input, replace the input device. • Faulty output for UN. Replace the output device.

Fault	Description	Possible Cause/Suggested Fix
PAL Error	PAL is not functioning properly	• Replace the Main I/O Board
PAL ETS Dn Spd Flt	The Safety PAL detected a car speed at the ETS Down terminal limit that was greater than the clamp speed.	• Verify that the limit activates at the correct location in the hoistway. • Verify the speed that the car hits the limit and adjust the limit velocity if necessary. • If the acceleration or deceleration rates were change after the limit velocities were learned, the learn process may need to be repeated or the limit may need to be moved. • Verify the parameter setting in the Safety Processor for PAL ETS Dn Vel.
PAL ETS Up Spd Flt	The Safety PAL detected a car speed at the ETS Up terminal limit that was greater than the clamp speed.	• Verify that the limit activates at the correct location in the hoistway. • Verify the speed that the car hits the limit and adjust the limit velocity if necessary. • If the acceleration or deceleration rates were change after the limit velocities were learned, the learn process may need to be repeated or the limit may need to be moved. • Verify the parameter setting in the Safety Processor for PAL ETS Up Vel.
Parameter Setup Fault	Device has a parameter setup fault	• Check the device parameters and make sure they are all within range.
Reset Brown-out	Device reset from power brown-out	• Fault is enabled from LCD Interface menu “Adjustable Variables” then select “NTS Proc Adj Vars” or “SPB Proc Adj Vars” and set parameter “Debug Mode” = 1. This is used for engineering debugging only.
Reset Debug Trap	Device Reset from Debug Trap	• Fault is enabled from LCD Interface menu “Adjustable Variables” then select “NTS Proc Adj Vars” or “SPB Proc Adj Vars” and set parameter “Debug Mode” = 1. This is used for engineering debugging only.
Reset Idle Clock	Device reset clock failure	• Fault is enabled from LCD Interface menu “Adjustable Variables” then select “NTS Proc Adj Vars” or “SPB Proc Adj Vars” and set parameter “Debug Mode” = 1. This is used for engineering debugging only.
Reset Illegal Op Code	Device Reset from Illegal Operation Code	• Fault is enabled from LCD Interface menu “Adjustable Variables” then select “NTS Proc Adj Vars” or “SPB Proc Adj Vars” and set parameter “Debug Mode” = 1. This is used for engineering debugging only.

Fault	Description	Possible Cause/Suggested Fix
Reset MCLR Error	Device Reset from MCLR Error	• Fault is enabled from LCD Interface menu "Adjustable Variables" then select "NTS Proc Adj Vars" or "SPB Proc Adj Vars" and set parameter "Debug Mode" = 1. This is used for engineering debugging only.
Reset Power-up	Normal power-up reset	• Fault is enabled from LCD Interface menu "Adjustable Variables" then select "NTS Proc Adj Vars" or "SPB Proc Adj Vars" and set parameter "Debug Mode" = 1. This is used for engineering debugging only.
Reset Sleep Wakeup	Device reset from sleep condition	• Fault is enabled from LCD Interface menu "Adjustable Variables" then select "NTS Proc Adj Vars" or "SPB Proc Adj Vars" and set parameter "Debug Mode" = 1. This is used for engineering debugging only.
Reset Software	Device reset from software reset	• Fault is enabled from LCD Interface menu "Adjustable Variables" then select "NTS Proc Adj Vars" or "SPB Proc Adj Vars" and set parameter "Debug Mode" = 1. This is used for engineering debugging only.
Reset Watch Dog Timeout	Device reset from watchdog timeout	• Fault is enabled from LCD Interface menu "Adjustable Variables" then select "NTS Proc Adj Vars" or "SPB Proc Adj Vars" and set parameter "Debug Mode" = 1. This is used for engineering debugging only.
SEL Comm Fault	Safety Processor or NTS Processor recorded a communications fault with the Selector on the Safety CAN bus port.	• Faulty Can communication wire connection. Verify proper twisted pair wires to the canh and canl terminals on the brake board. • Noise on the Can bus. Verify that the shield wire is connected according to the job print.
SPB Comm Fault	Selector or NTS Processor recorded a communications fault with the Safety Processor on the Safety CAN bus port.	• Faulty Can communication wire connection. Verify proper twisted pair wires to the canh and canl terminals on the brake board. • Noise on the Can bus. Verify that the shield wire is connected according to the job print.
Term Lim Clk Pulse Flt	Selector pulsed the clock of the UT or DT latch multiple times but the state was not latched	• Replace the Selector Board.
UN Pulse Fault	Selector pulsed the UN latch multiple times but the UN state was not latched	• Memory of the UN sensor is stored on a state saver latch device. Replace the Selector Board.
Unintended Motion Fault	Unintended motion detected	• No up or down run signal and velocity greater than 75 fpm.
UT Limit Vel Fault, UT1 Limit Vel Fault, UT2 Limit Vel Fault,	NTS Processor detected a car speed at the UT, UT1, UT2, UT3, UT4, UT5 or UT6	• Verify that the limit activates at the correct location in the hoistway. • Verify the speed that the car hits the limit and

Fault	Description	Possible Cause/Suggested Fix
UT3 Limit Vel Fault, UT4 Limit Vel Fault, UT5 Limit Vel Fault, UT6 Limit Vel Fault,	terminal limit that was greater that the clamp (parameter) speed	adjust the limit velocity if necessary. • If the acceleration or deceleration rates were change after the limit velocities were learned, the learn process may need to be repeated or the limit may need to be moved.
UT Pulse Fault	Selector pulsed the UT latch multiple times but the UT state was not latched	• Memory of the UT sensor is stored on a state saver latch device. Replace the Selector Board.
UTS Speed Fault	Safety Processor detected a car speed at the UTS terminal limit that was greater that the clamp (parameter) speed	• Verify that the limit activates at the correct location in the hoistway. • Verify the speed that the car hits the limit and adjust the limit velocity if necessary. • If the acceleration or deceleration rates were change after the limit velocities were learned, the learn process may need to be repeated or the limit may need to be moved.

6.3 Detailed Faults Data and Description

Example of data stored in the standard or long term fault log:

```
517 Inspection Input Flt  2:10:14  2/19/2015 Position = 1 Occurrences =   1
srv=000, prc=002, drf=000, rdf=000, dpr=000, dir=000, emp=000, med=000
cbl=000, equ=000, fir=000, rfi=000, hsf=000, stf=000, cal=000, esp=000
nst=000, rlv=000, ste=001, dfs=000, st0=000, ins=01h, nds=000, dev=00h
pf1=00h, pf2=00h, dv2=00h, io0=a1h, io1=0fh, io2=7eh, io3=20h, io4=c3h
io5=6fh, io6=7ch, io7=8dh, io8=00h, io9=00h, ioA=c7h, ioB=f7h, ioC=ffh
ioD=fbh, ioE=35h, ioF=00h, ioG=00h, ioH=f0h, ioI=0fh, ioJ=f1h, ioK=0fh
ioL=3fh, ioM=30h, ioN=00h, ioO=05h, ioP=07h, ioQ=00h
ioR=00h, ioS=00h, ioT=00h
statusf=00000040h, statusf2=00000000h
DPP Count =  126400, Target =       0, Drv Vel =     0, Enc Vel =     0
Calc Vel =     0, Dmd Vel =     0, Vel Diff =     0, Enc Dir =  0
SPB Poscnt =       0, SPB Vel =     0
SPB Serv =  0h, SPB Cmd =  4h, SPB Stat =  0h
SPB ios1=00h, ios2=00h, ios3=00h, ios4=00h, ios5=00h
Flt Bits 1 =  1h, Flt Bits 2 =  0h, Flt Bits 3 =  1h, Flt Bits 4 =  0h
SS Status=0000h, PWR Status=0000h, Run Status=008013f8h
NTS Vel =     0, NTS Serv =  0h, NTS Cmd =  0h, NTS Stat =  0h
NTS Lim Flt[0] =  0h, NTS Lim Flt[1] =  0h, NTS Lim Flt[2] =  0h
NTS ios1=00h, ios2=00h, ios3=00h
Nudg Flags=00h, Door Req=08h, Call Flags=00h
Chk Run=23h, Chk Start=00h, Chk Level=00h, Chk Door=24h
Front SD=0000h, Rear SD=0000h, Motion Tmr=00001
PAL Vel=00000, PAL Statusf=00h, Inspect Svc=000
Drive Command=0000h, Drive Statusf=0000h
Torque Command=00000, Motor Torque=00000, Percent Load=  4
```

Example of detailed fault data on LCD Display Interface:

```
  "srv= 0, prc= 2, drf= 0  "
  "rdf= 0, dpr= 0, dir= 0  "
  "emp= 0, med= 0, cbl= 0  "
  "equ= 0, fir= 0, rfi= 0  "
  "hsf= 0, stf= 0, cal= 0  "
  "esp= 0, nst= 0, rlv= 0  "
  "ste= 1, dsf= 0, st0= 0  "
  "ins=01, nds= 0, dev=00  "
  "pf1=00, pf2=00, dv2=00  "
  "io0=A1, io1=0F, io2=7E  "
  "io3=20, io4=C3, io5=6F  "
  "io6=7C, io7=8D, io8=00  "
  "io9=00, ioA=C7, ioB=F7  "
  "ioC=FF, ioD=FB, ioE=35  "
  "ioF=00, ioG=00, ioH=F0  "
  "ioI=0F, ioJ=F1, ioK=0F  "
  "ioL=3F, ioM=30, ioN=00  "
  "ioO=05, ioP=07, ioQ=00  "
  "ioR=05, ioS=07, ioT=00  "
  "   statusf = 00000040   "
  "  statusf2 = 00000000   "
  "Dp=  126400, Tg=       0"
```

```
"DrvV=    0, EncVel=    0"
"CalcV=    0,DmdVel=    0"
"VDif=    0, Enc Dir = 0 "
"SPB Cnt =        0      "
"SPB Vel=    0, Stat=00  "
"SPB Srv=00,Cmd=04,S1=00 "
"S2=00,S3=00,S4=00,S5=00 "
"FltB1=01     FltB2=00   "
"FltB3=01     FltB4=00   "
"SsStat=0000,PwrStat=0000"
"Run Status = 008013f8   "
"NTS Vel=    0, Stat=00  "
"NTS Serv=00, Cmd=00     "
"LmF1=00 LmF2=00 LmF3=00 "
"Nio1=00 Nio2=00 Nio3=00 "
"Nud=00, DRq=08, CFg=00  "
"RnS=23, StS=00, LvS=00  "
"DrS=24,FSd=0000,RSd=0000"
"Motion Tmr =     1      "
"PAL Vel=00000, Stat=    "
"Ins Svc=00, % Load =   4"
"DrvCmd=0000,TrqCmd=    0"
"DvStat=0000,MtrTrq=    0"
```

SRV: SRV Service Flag	
0 = Out of Service	15 = Return to Lobby
1 = Automatic	16 = Load Overload
2 = Independent	17 = Massachusetts Medical Emergency
3 = Load Weighing Bypass	18 = Calibrate load weigher
4 = Attendant	19 = CS Elevator Off
5 = Code Blue	20 = HS Elevator Off
6 = Fire Phase 2	21 = Low Pressure Operation
7 = Emergency Power	22 = Hospital Service Operation
8 = Earthquake Emergency	23 = VIP Service Operation
9 = Fire Phase 1 Main Egress	24 = Security Recall
10 = Fire Phase 1 Alternate Egress	25 = Sabbath service
11 = Homing	26 = TUG Service operation
12 = Reset Run Up	27= Hot Oil Operation
13 = Reset Run Down	28= Riot Control
14 = Low Oil Operation	

PRC: Process Flag	
1 = Reset 2 = Inspection 3 = Motion: hsf=1, dir=1, Up Fast hsf=0, dir=1, ul=0, Up Transition hsf=0, dir=1, ul=1, Up Leveling hsf=1, dir=2, Down Fast hsf=0, dir=2, dl=0, Down Transition hsf=0, dir=2, dl=1, Down Leveling 4 = Motion Mode 1 – Soft Start 5 = Motion Mode 2 – Constant Acceleration 6 = Motion Mode 3 – Roll Over to Max Velocity 7 = Motion Mode 4 – Constant Velocity 8 = Motion Mode 5 – Roll Over to Deceleration 9 = Motion Mode 6 – Constant Deceleration	10 = Motion Mode 7 – Targeting Floor 11 = Motion Mode 8 – Emergency Slowdown 12 = Safety String 13 = Turned Off 14 = Parked 15 = Waiting Assignment 16 = Doors Operation 17 = Elevator Stalled (or Low Oil for Hydro) 18 = Elevator Resetting Hydro Jack 19 = Elevator on Low Oil Pressure mode 20 = Elevator is in Automatic Learn Hoistway 21 = Elevator is in Emergency Power Recovery 22= Hot Oil Mode

DRF: Front Door Flag	RDF: Rear Door Flag
0 = Door Closed 1 = Door Opening 2 = Door Dwelling 3 = Door Closing 4 = Door Nudging Closed	0 = Door Closed 1 = Door Opening 2 = Door Dwelling 3 = Door Closing 4 = Door Nudging Closed

DPR: Direction Preference Flag	DIR: Car Direction Flag
0 = None 1 = Up 2 = Down	0 = None 1 = Up 2 = Down

EMP: Emergency Power Flag	
0 = Not on Emergency Power 1 = On Emergency Power Waiting 2 = On Emergency Power Waiting with Doors Open 3 = On Emergency Power Returning Home 4 = On Em. Power Returned Home with Doors Open	5 = On Em. Power Returned Home with Doors Closed 6 = On Emergency Power and Selected to Run 7 = On Emergency Power waiting with Doors Closed

MED: Medical Emergency	
0 = No Medical Emergency Service 1 = Recall Car to Medical Emergency Recall Floor 2 = At Return Floor with Door Open (Return Complete)	4 = On EMS Car Call Service 5 = On EMS Car Hold Service (key off but not at the recall floor)

CBL: Code Blue Flag	
0 = No Code Blue 1 = Recall to Emergency Floor 2 = At Code Blue Floor	3 = At Code Blue Floor with Door Open 4 = Finished Code Blue

EQU: Earthquake Flag	
0 = Not on Earthquake Operation 1 = Earthquake Sensor Activated 2 = Counterweight Derailment Sensor Activated	3 = Recover Away From the Counterweight 4 = Stopped at a Floor

FIR: Fire Flag	
0 = Not on Fire Service 1 = Phase 1 Main Egress Return 2 = Phase 1 Alternate Egress Return 3 = Phase 1 Completed 4 = Phase 2 Door Hold	5 = Phase 2 Constant Pressure Door Open 6 = Phase 2 Constant Pressure Door Close 7 = Phase 2 Door Hold 8 = Phase 2 Momentary DCB Door Close

RFI: Rear Fire Flag	
0 = Not on Fire Service 1 = Phase 1 Main Rear Egress Return 2 = Phase 1 Alternate Rear Egress Return 3 = Phase 1 Completed 4 = Phase 2 Rear Door Hold	5 = Phase 2 Constant Pressure Rear Door Open 6 = Phase 2 Constant Pressure Rear Door Close 7 = Phase 2 Rear Door Hold 8 = Phase 2 Momentary DCB Rear Door Close

HSF: High Speed Flag	STF: Start Flag
0 = No High Speed 1 = High Speed	0 = Not valid Start 1 = Start of Run

CAL: Direction of Calls	
0 = No Call 1 = Above Call	2 = Below Call 3 = Above and Below Calls

ESP: Emergency Stop Flag	NST: Need to Stop Flag
1 = Emergency Stop	1 = Car need to stop at next floor

RLV: Re-level Flag	STE: Step Flag
1 = Car in re-leveling	1 = Step to the next position (non-distance feedback)

DSF (dsf): Door Status Flags	
Bit 0: (preDO) Pre-open Door Flag Bit 1: (dsUP) Door Open Sequence Up Pilot Bit 2: (dsDP) Door Open Sequence Down Pilot Bit 3: (dsNP) Door Open Sequence No Pilot	Bit 4: (rdsUP) Rear Door Open Sequence Up Pilot Bit 5: (rdsDP) Rear Door Open Sequence Down Pilot Bit 6: (rdsNP) Rear Door Open Sequence No Pilot Bit 7:

ST0: Next Stop Floor - Floor number of next stop

INS: Inspection Status Flag (Status bit set to “1” when switch is on)	
Bit 0: (INS) Car Top Inspection Bit 1: (MRIN) Machine Room Inspection Bit 2: (ACC) Access Bit 3: (ICI) In Car Inspection	Bit 4: (LBP) Lock Bypass Bit 5: (GBP) Gate Bypass Bit 6: (AUTI) Not in Automatic (AUTO==0)

NDS: Next Car Up Door Sequence	
0 = Initiate Next Up Door Open 1 = Opening Next Up Door 2 = Door full open on Next Up	3 = Allow door close for onward call 4 = Allow door close while on next up

DEV: Device Number	DV2: Device 2 Number

PF1: Program Flag 1	PF2: Program Flag 2

STATUSF: Control Status Flag (Status bit set to “1” when status active)	
Bit 0: (sfS10) NO S10 power Bit 1: (sfHC) NO HC power Bit 2: (sfSS) NO SS input Bit 3: (sfRDY) Drive not ready Bit 4: (sfGRP) Gripper/EBK error Bit 5: (sfIO) I/O error during redundancy check Bit 6: (sfINS) Inspection or lock bypass fault Bit 7: (sfBPI) Binary Position Input Error Bit 8: (sfPOS) Position Error Bit 9: (sfAD) No automatic Doors Bit 10: (sfSTP) Stop switch open Bit 11: (sfDZ) Door Zone fault Bit 12: (sfGDL) Gate or Door lock fault Bit 13: (sfP) No Potential “P” Input Bit 14: (sfDCL)No DCL Bit 15: (sfDCC) No Door Close Contact Bit 16: (sfBKS) Brake lift switch error	Bit 17: (sfTOC) Top of Car Communications Error Bit 18: (sfDRV) Drive Communications Error Bit 19: (sfSPB) Safety Processor Board Communications Error Bit 20: (sfDBR) DB Resistor Temp. Error Bit 21: (sfSHD) Shutdown (too many run attempts with faults) Bit 22: (sfAST) Annual Safety Test Bit 23: (sfSAF) Waiting for Safe (Door Locks and Gate) Bit 24: (sfTLM) UT,UTS,DT or DTS limit error Bit 25: (sfGTS) GTS input off Bit 26: (sfDZF) UL, DL and DZ off at floor Bit 27: (sfBKC) Brake Board Can Error Bit 28: (sfFST) Fire Fighter Stop Switch Bit 29: (sfSEL) Selector Can error Bit 30: (sfUDL) UL or DL fault Bit 31: (sfLEV) Leveling fault

STATUSF2: Control Status Flag (Status bit set to "1" when status active)	
Bit 0: (sfHWI) Hardware Init fault	Bit 16: (sfECN) Encoder can comm error
Bit 1: (sfFDC) Front Door Closing Fault	Bit 17: (sfIOT) IO Test in progress
Bit 2: (sfRDC) Rear Door Closing Fault	Bit 18: (sfGRT) Gripper Test in progress
Bit 3: (sfLVF) Line Voltage Fault	Bit 19: (sfDVP) No Power to Drive
Bit 4: (sfDVF) Door Voltage Fault	Bit 20: (sfNIT) Non Interference timer
Bit 5: (sfBKR) Brake lift switch run error	Bit 21: (sfDRQ) Door open request
Bit 6: (sfDMO) Door motor overload	Bit 22: (sfDPM) Waiting for DPM
Bit 7: (sfHWL) Learn Hoistway Fault	Bit 23: (sfRPM) Waiting for RPM
Bit 8: (sfHWL) Power Loss UPS Fault	Bit 24: (sfVSC) Viscosity operation
Bit 9: (sfEBK) Emergency Brake Can error	Bit 25: (sfLVR) Leveling request
Bit 10: (sfKEB) KEB Drive Not in Run Mode	Bit 26: (sfTSP) Terminal Limit Speed Clamp
Bit 11: (sfAFS) At Floor Shutdown	Bit 27: (sfSPR) Sped Rate Clamp
Bit 12: (s1036) 1036 board connected	Bit 28: (sfEES) Front EE Test failed fault
Bit 13: (sfRSR) Reset run fault	Bit 29: (sfERS) Rear EE Test failed fault
Bit 14: (sfSCT) Invalid SEL count	Bit 30:
Bit 15: (sfCOP) COP can comm error	Bit 31:

DPP Count (DP): Position counts in pulses	Target (TG) = Target Count in pulses

Drv Vel (DrvV): Velocity sent to the Drive in fpm (From Dmd Vel and rate limited)	Enc Vel : Velocity feedback from Encoder in fpm

Calc Vel (CalcV): Speed profile calculated velocity in fpm	Dmd Vel: Demand Velocity (From Calc Vel and speed clamp limited)

Vel Diff (VDif): Velocity Difference (Drv Vel – Enc Vel) in fpm	Enc Dir: Encoder Direction 0=none, 1=up, 2=down

SPB Cnt: Safety Processor Position Count	SPB Vel: Safety Processor Velocity in fpm

SPB Serv: Safety Processor Board Service:	
0: Automatic	9: Velocity Error
1: Car Top Inspection	10: UP Error on pwrup
2: Gate Bypass operation	11: DNR Error on pwrup
3: Lock Bypass Operation	12: Both UNI and DNI inputs
4: Access	13: EEprom Error
5: Motor Room Inspection	14: No UTS Error
6: In Car Inspection	15: No DTS Error
7: Inspection Error	16: Pulse Error
8: Gate or Lock Bypass Err	17: Unintended Motion Error

SPB Cmd: Safety Processor Command. (Controller command to safety processor)	
Bit 0: 1 = Initialize Position Bit 1: 1 = Immediate update Bit 0: (ntsTV) 1 = NTS Test (verification) Bit 1: (etsTV) 1 = ETS Test (verification) Bit 2: (rUMOT) 1 = Reset Unintended motion fault Bit 3: (sUMOT) 1 = Set Unintended motion fault Bit 4: (gr1T) 1 = GR1 test Bit 5: (sfcT) 1 = SFC test Bit 6: (gr1PK) 1 = GR1 pick command Bit 7: (sMENU) 1 = Force Car Speed Menu	Bit 8: (brkTG) 1 = Trigger Brake Bit 9: (ebkTG) 1 = Trigger Emergency Brake Bit10: (bkLV) 0 = Brk Line Voltage, 1 = Em Brk Line Voltage Bit11: (rCAN2) 1 = Reset can2 comm status Bit12: (ntsT) 1 = NTS Test Bit13: (etsT) 1 = ETS Test Bit14: (adDIS) 1 = Automatic Door disabled Bit15: (sUMTV) 1 = Set Unintended motion fault (verification)

SPB Stat: Safety Processor Status	
Bit 0: (SFC) Secondary Fault Control (1=fault) Bit 1: (FLT) Pic Fault (SPB CPU 1=fault) Bit 2: (GRF) Gripper Fault (1=fault) Bit 3: (COM) Comm Fault (1=fault)	Bit 4: (VEL) Velocity Fault (1=fault) Bit 5: (PCI) Position Count Initialized (1=initialized) Bit 6: (ACT) Active Fault (1=fault) Bit 7: (PCU) Position Count Updated (1=updated)

SPB ios1: (S1) Safety Processor I/O Byte 1		SPB ios2: (S2) Safety Processor I/O Byte 2	
Bit 0: DLM	Bit 4: LBP	Bit 0: ICI	Bit 4: RGS
Bit 1: DL	Bit 5: MRI	Bit 1: ACC	Bit 5: RLM
Bit 2: AUTO	Bit 6: UL	Bit 2: UTS	Bit 6: DLB
Bit 3: GBP	Bit 7: INS	Bit 3: DTS	Bit 7: DZO

SPB ios3: (S3) Safety Processor I/O Byte 3		SPB ios4: (S4) Safety Processor I/O Byte 4	
Bit 0: unused	Bit 4: DNR	Bit 0: SFCO	Bit 4: velFLT
Bit 1: unused	Bit 5: GS	Bit 1: PICEN	Bit 5: posINIT
Bit 2: ETS	Bit 6: DLT	Bit 2: LSC	Bit 6: actFLT
Bit 3: UP	Bit 7: unused	Bit 3: comFLT	Bit 7: posUPD

SPB ios5: (S5) Safety Processor I/O Byte 5	
Bit 0: GR1 Bit 1: unused Bit 2: unused Bit 3: unused	Bit 4: unused Bit 5: unused Bit 6: Up Velocity Direction Bit 7: Down Velocity Direction

Flt Bits 1 (FltB1): Faults Bits 1 (Byte 0)	
Bit 0: (fHWLN) Hoistway Not Learned (1=fault) Bit 1: (fHWI) Hardware Init Fault (1=fault) Bit 2: (fLIMD) Limit Direction Fault Bit 3: (fSPBD) Safety Processor Direction Fault	Bit 4: (fVELD) Velocity Decel Difference Fault Bit 5: (fSPVD) Safety Processor Velocity Difference Fault Bit 6: (fUDLD) UL DL Direction Fault Bit 7: (fLEV) Leveling Fault

Flt Bits 2 (FltB2): Fault Bits 2 (Byte 1)	
Bit 0: (fCOPC) COP CAN COM error Bit 1: (fSPBC) Safety Processor CAN COM error Bit 2: (fB1B2) unused Bit 3: (fB1B3) unused	Bit 4: (fSLCT) Selector Count Valid Bit 5: (fSELC) Selector CAN COM error Bit 6: (fENCC) CAN Encoder COM error Bit 7: (fENCI) CAN Encoder Init

Flt Bits 3 (FltB3): Fault Bits 3 (Byte 2)	
Bit 0: (fDVOF) Drive com off line (1=off line) Bit 1: (fDBRT) DBR Temperature Fault Bit 2: (fMTOL) Door Motor Overload Bit 3: (FB2B3) unused	Bit 4: (fB2B4) unused Bit 5: (fB2B5) unused Bit 6: (fB2B6) unused Bit 7: (fB2B7) unused

Flt Bits 4 (FltB4): Fault Bits 4 (Byte 3)	
Bit 0: (fGRIP) Gripper/EMBK Fault Bit 1: (fENCD) Encoder Direction Fault Bit 2: (fB3B2) unused Bit 3: (fB3B3) unused	Bit 4: (fB3B4) unused Bit 5: (fB3B5) unused Bit 6: (fB3B6) unused Bit 7: (fB3B7) unused

SS Status: Safety String Status	
Bit 0: (ssGOV) Governor input open Bit 1: (ssTF)Top Final Limit Open Bit 2: (ssBF) Bottom Final Limit open Bit 3: (ssPS) Pit Switch open Bit 4: (ssHSS) Hoistway Safety Bit 5: (ssCTS) Car Top Stop switch open Bit 6: (ssCSS) Car Safety Switch open Bit 7: (ssRLS) Rail Lock Switch	Bit 8: (ssFFS) Fire Fighter Stop Switch Bit 9: (ssCST) Car Stop Switch Bit 10: (ssMRS) Machine Room Stop Switch Bit 11: (ssGTS) Gripper Trip Switch Bit 12: Bit 13: Bit 14: Bit 15:

PWR Status: Power Status	
Bit 0: (psHC) Hall call power loss Bit 1: (psHCL) Hall call light power loss Bit 2: (psCC) Car call power loss Bit 3: (psCCL) Car call light power loss Bit 4: (psLHC) Lobby Hall common power loss Bit 5: (psFEP) Fire/Emergency Power Loss Bit 6: Bit 7:	Bit 8: Bit 9: Bit 10: Bit 11: Bit 12: Bit 13: Bit 14: Bit 15:

Run Status: Control Run Status Flag (Status bit set to “1” when status active)	
Bit 0: (rsRUN) Car is running	Bit 16: (rsEE) Electric eye or Detector Edge
Bit 1: (rsDNR) Down run signal	Bit 17: (rsSE) Safety Edge
Bit 2: (rsUP) Up run signal	Bit 18: (rsEER) Rear Electric eye or Detector edge
Bit 3: (rsDL) Down door zone Limit	Bit 19: (rsSER) Rear Safety Edge
Bit 4: (rsUL) Up door zone limit	Bit 20: (rsHSF) High Speed Flag
Bit 5: (rsDZ) Door Zone	Bit 21: (rsSTF) Start Flag
Bit 6: (rsDLT) Door Lock Top	Bit 22: (rLSTF) Leveling Start Flag
Bit 7: (rsDLM) Door Lock Middle	Bit 23: (rsDZA) Door Zone OR'd
Bit 8: (rsDLB) Door Lock bottom	Bit 24: (rsDO) Door Open
Bit 9: (rsGS) Gate Switch	Bit 25: (rsDC) Door Close
Bit 10: (rsRLM) Rear Door Lock Middle	Bit 26: (rsDOR) Rear Door Open
Bit 11: (rsRGS) Rear Gate Switch	Bit 27: (rsDCR) Rear Door Close
Bit 12: (rsDOL) Door open limit (0=active)	Bit 28:
Bit 13: (rsDCL) Door Close Limit (0=active)	Bit 29:
Bit 14: (rDOLR) Rear door open limit (0=active)	Bit 30:
Bit 15: (rDCLR) Rear door close limit (0=active)	Bit 31:

NTS Vel: NTS Processor Velocity

NTS Stat: NTS Processor Status	
Bit 0: Direction up, Bit 1: Direction down Bit 2: SEL comm okay Bit 3: SPB comm okay	Bit 4: Velocity direction (should match up or down) Bit 5: Direction fault Bit 6: Limit (EMSD) fault Bit 7: Velocity fault

NTS Serv: NTS Processor Service	
1 = normal 2 = EM Slowdown	3 = UN Limit Stop 4 = DN Limit Stop

NTS Cmd: NTS Processor Command	
Bit 0: 1 = (EMSD) Emergency Slowdown Bit 1: 1 = (NTST) NTS Test	Bit 2: 1 = (ETST) ETS Test Bit 3: 1 = (ADD) Automatic Door disabled

LimFlt0: Limit Fault Byte 0		LimFlt1: Limit Fault Byte 1	
Bit0: unF Bit1: Bit2: utF Bit3:	Bit4: utsF Bit5: ut1F Bit6: ut2F Bit7: ut3F	Bit0: ut4F Bit1: ut5F Bit2: ut6F Bit3	Bit4: dnF Bit5: Bit6: dtF Bit7:

LimFlt2: Limit Fault Byte 2		NTSIO1: NTS Processor I/O Byte 1	
Bit0: dtsF Bit1: dt1F Bit2: dt2F Bit3: dt3F	Bit4: dt4F Bit5: dt5F Bit6: dt6F Bit7:	Bit 0: UN Bit 1: UT Bit 2: UT1 Bit 3: UT2	Bit 4: UT3 Bit 5: UT4 Bit 6: UT5 Bit 7: UT6

NTSIO2: NTS Processor I/O Byte 2		NTSIO3: NTS Processor I/O Byte 3	
Bit 0: DN Bit 1: DT Bit 2: DT1 Bit 3: DT2	Bit 4: DT3 Bit 5: DT4 Bit 6: DT5 Bit 7: DT6	Bit 0: UPI Bit 1: DNRI Bit 2: NTSD Bit 3: NTSD1	Bit 4: Bit 5: Bit 6: Bit 7

Nudg Flags (Nud): Door Nudging Flags	
Bit 0: (ngUP) Nudging Closed with Up Pilot Bit 1: (ngDP) Nudging Closed with Down Pilot Bit 2: (ngNP) Nudging Closed with No Pilot Bit 3:	Bit 4: (rngUP) Rear Nudging Closed with UP Bit 5: (rngDP) Rear Nudging Closed with Down Bit 6: (rngNP) Rear Nudging Closed with No Pilot Bit 7:

Door Req (DRq): Door Request Flags	
Bit 0: (doRQ) Front Door Open Request Bit 1: (dbRQ) Front Door Open Button Request Bit 2: (cdRQ) Front Car Call Door Open Request Bit 3: (doEN) Front Door Open Enable	Bit 4: (rdoRQ) Rear Door Open Request Bit 5: (rdbRQ) Rear Door Open Button Request Bit 6: (rcdRQ) Rear Car Call Door Open Request Bit 7: (rdoEN) Rear Door Open Enable

Call Flags (CFg): Onward Call Flags	
Bit 0: (dcAB) Directional Call Above Bit 1: (dcBL) Directional Call Below Bit 2: (owcAB) Onward Call Above Bit 3: (owcBL) Onward Call Below	Bit 4: (occAB) Onward Car Call Above Bit 5: (occBL) Onward Car Call Below Bit 6: (ohcAB) Onward Hall Call Above Bit 7: (ohcBL) Onward Hall Call Below

Chk Run (RnS) : Check Run Status – Software location of last execution of the check run status routine.

Chk Start (StS) : Check Start Status – Software location of the last execution of the check start routine.

Chk Level (LvS): Check Leveling Status – Software location of the last execution of the check leveling routine.

Chk Door (DrS): Check Door Status – Software location of the last execution of the check door routine.

Front SD (FSd): Front Slowdown Flags	
Bit 0: (UC) Up Hall Call Slowdown Bit 1: (DC) Down Hall Call Slowdown Bit 2: (CC) Car Call Slowdown Bit 3: Bit 4: (UD) Up Call Door Open Request Bit 5: (DD) Down Call Door Open Request Bit 6: (CD) Car Call Door Open Request Bit 7:	Bit 8: (IU) IR Up Hall Call Slowdown Bit 9: (ID) IR Down Hall Call Slowdown Bit 10: Bit 11: Bit 12: Bit 13: Bit 14: Bit 15:

Rear SD (RSd): Rear Slowdown Flags	
Bit 0: (UC) Up Hall Call Slowdown Bit 1: (DC) Down Hall Call Slowdown Bit 2: (CC) Car Call Slowdown Bit 3: Bit 4: (UD) Up Call Door Open Request Bit 5: (DD) Down Call Door Open Request Bit 6: (CD) Car Call Door Open Request Bit 7:	Bit 8: (IU) IR Up Hall Call Slowdown Bit 9: (ID) IR Down Hall Call Slowdown Bit 10: Bit 11: Bit 12: Bit 13: Bit 14: Bit 15:

Motion Tmr: Motion Timer – Timer while the car is in or attempting motion. 100 msec

PAL Vel: Safety PAL Velocity in fpm

PAL Stat: Safety PAL Status	
Bit 0: (PFT) Pulse Fault, Bit 1: (UTF) ETSU Fault Bit 2: (DTF) ETSD Fault Bit 3: (FLT) PAL Fault	Bit 4: (RSB) Reduced Stroke Buffer Enabled Bit 5: (TST) ESLD Test (Ignore ESLD and/or Write Parameter Enable) Bit 6: (REN) Rear Door Enable Bit 7: Encoder Direction (0=normal, 1=invert)

Inspect Svc: Inspection Service	
0 = Invalid Inspection Input 1 = Car Top Inspection 2 = Machine Room Inspection 3 = Access Inspection 4 = In-Car Inspection	5 = Car Top Inspection Lock Bypass 6 = Car Top Inspection Gate Bypass 7 = Car Top Inspection Gate and Lock Bypass

% Load:Percent Load Calculated load value from the load weigher

DrvCmd: Drive Command	
Bit 0: (CRL) 1=Control Release Bit 1: (FLT) 1=Error Occurred Bit 2: (RUN) 0=stop, 1=run Bit 3: (REV) 0=forward, 1=reverse Bit 4: Bit 5: Bit 7:	Bit 8: Bit 9: Bit 10: Bit 11: Bit 12: Bit 13: Bit 14: Bit 15:

DvStat: Drive Status Flag (KEB LED Keypad)	
Bit 0: (RUN) Run or Control Release Bit 1: (RST) Reset Fault Bit 2: (UP) Run Forward Bit 3: (DN) Run Reverse Bit 4: Bit 5: Bit 7:	Bit 8: Bit 9: Bit 10: Bit 11: Bit 12: Bit 13: Bit 14: Bit 15:

DvStat: Drive Status Flag (KEB LCD Keypad) (See Inverter Status GD02 in 6.3.3 at the end of this section or search for GD02 in the KEB Manual)

TrqCmd: Torque Command – Calculated Torque value sent to the drive

MtrTrq: Motro Torque – Actual torque value from the drive

6.3.1 Detailed Fault I/O Data Example

The data in the I/O block is read from left to right with the left-most bit being the MSB (Most Significant Bit) and the right-most bit being the LSB (Least Significant Bit). Each bit represents the state (on or off) of the corresponding I/O. The table below provides the HEX number and the associated Binary number.

CONVERSION TABLE

HEX	BINARY	DECIMAL
0	0 0 0 0	0
1	0 0 0 1	1
2	0 0 1 0	2
3	0 0 1 1	3
4	0 1 0 0	4
5	0 1 0 1	5
6	0 1 1 0	6
7	0 1 1 1	7
8	1 0 0 0	8
9	1 0 0 1	9
A	1 0 1 0	10
B	1 0 1 1	11
C	1 1 0 0	12
D	1 1 0 1	13
E	1 1 1 0	14
F	1 1 1 1	15

The ***example*** below shows how to interpret the detailed fault data for the I/O blocks. Given that IO0 is a value of "D1" hex. Place the "D" in the first hex value block and then the "1" in the second hex value block. Follow the red arrows below. Go to the next diagram to convert the inputs to binary.

HEX	BINARY
0	0 0 0 0
1	0 0 0 1
2	0 0 1 0
3	0 0 1 1
4	0 1 0 0
5	0 1 0 1
6	0 1 1 0
7	0 1 1 1
8	1 0 0 0
9	1 0 0 1
A	1 0 1 0
B	1 0 1 1
C	1 1 0 0
D	1 1 0 1
E	1 1 1 0
F	1 1 1 1

I/O BLOCK	IO0							
HEX VALUE	D				1			
BINARY (0 = OFF | 1 = ON)								
I/O NAME	GOV	EBKi	S10	LPH	GBP	LBP	IND	AD

Place the Binary value for D (1101) in the first four bit locations and then place the binary value for 1 (0001) in the last four bit locations. The 1's show which inputs are on.

HEX	BINARY
0	0 0 0 0
1	0 0 0 1
2	0 0 1 0
3	0 0 1 1
4	0 1 0 0
5	0 1 0 1
6	0 1 1 0
7	0 1 1 1
8	1 0 0 0
9	1 0 0 1
A	1 0 1 0
B	1 0 1 1
C	1 1 0 0
D	1 1 0 1
E	1 1 1 0
F	1 1 1 1

I/O BLOCK	IO0							
HEX VALUE	D				1			
BINARY (0 = OFF | 1 = ON)	1	1	O	1	0	0	0	1
I/O NAME	GOV	EBKi	S10	LPH	GBP	LBP	IND	AD

6.3.2 Detailed Fault I/O Data Form

I/O Blocks:

I/O BLOCK	IO0							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME	GOV	EBKi	S10	LPH	GBP	LBP	IND	AD

I/O BLOCK	IO1							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME	TAD	BAU	BAD	ACC	HSS	PS	BF	TF

I/O BLOCK	IO2							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME	RLM	DLT-1	DLT	DLM-1	DLM	DLB-1	DLB	TAU

I/O BLOCK	IO3							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME	EBK1i	EBKS	BKS	MDCR	BDC	MDC	TDC	RLM-1

I/O BLOCK	IO4							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME	MRSW	AUTO	MRI	MRIU	MRIE	MRID	PFCi	SFCi

I/O BLOCK	IO5							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME	FST	GS-1	GS	RGS-1	GRT2	GRT1	GTS	RDY

I/O BLOCK	IO6							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME	RGS	DZ-1	DZ	UN	UTS	DN	DTS	CTA

I/O BLOCK	IO7							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME	INS	IU	IEN	ID	FFS	CS	ICI	P

I/O BLOCK	IO8							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME	RUNX	RUNAi	MCX	RUNi	BRKi	DON	MCAi	MCCi

I/O BLOCK	IO9							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME					ETS	UPI	NTSDi	DNI

I/O BLOCK	IOA							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME	FSTP1	FSTP	LE1	LE	GR2R	FLH		

I/O BLOCK	IOB							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME	EBK1	BUZ	FF	DBG	PFCO	MCA	MCC	RST

I/O BLOCK	IOC							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME	UPF	UP	DF	DNR	RUN	RUNA		

I/O BLOCK	IOD							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME						DBC	EBK	BRK

I/O BLOCK	IOE							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME	HWS	MRS	ALT	MES	FSX	BP	FS	FEP

I/O BLOCK	IOF							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME					EMP	EPT	EPS	HWS2

I/O BLOCK	IOG							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME					DET	CTS	CSS	RLS

I/O BLOCK	IOH							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME	LIG	FAN	CDL	CUL	IFB	IFL		

I/O BLOCK	IOI							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME (Tape)	DZD-1	DZU-1	DZD	DZU	DL	DZA	DZ-2	UL
I/O NAME (Tapeless)			DZD	DZU	DL	DZA	DZ-2	UL

I/O BLOCK	IOJ							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME	DL4	DL3	DL2	DL1	UL4	UL3	UL2	UL1

I/O BLOCK	IOK							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME (Tape)			BP32	BP16	BP8	BP4	BP2	BP1
I/O NAME (Tapeless)								

I/O BLOCK	IOL							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME (Tape)	UT3	UT2	UT1	UTS-1	UTsn	UT	UNsn	UN-1
I/O NAME (Tapeless)	UT3	UT2	UT1	UTS-1		UT		UN-1

I/O BLOCK	IOM							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME (Tape)	DTsn	DT	DNsn	DN-1		UT6	UT5	UT4
I/O NAME (Tapeless)		DT		DN-1		UT6	UT5	UT4

I/O BLOCK	ION							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME		DT6	DT5	DT4	DT3	DT2	DT1	DTS-1

I/O BLOCK	IOO							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME				SE	DCL	DOL	EE	DPM

I/O BLOCK	IOP							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME		RVD	REV	DO	HVD	DC	NUD	

I/O BLOCK	IOQ							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME		ALM*	HBE*	DOB	DCB	FS2C	FS2H	FS2OF

I/O BLOCK	IOR							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME	8C	7C	6C	5C	4C	3C	2C	1C

I/O BLOCK	IOS							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME				SER	DCLR	DOLR	EER	RPM

I/O BLOCK	IOT							
HEX VALUE								
BINARY (0 = OFF | 1 = ON)	**MSB**							**LSB**
I/O NAME		RVDR	REVR	DOR	HVDR	DCR	NUDR	

***Note: I/O location depends on specific job.**

Note: On earlier software versions, some of the selector I/O name will not match the table above. The software version 7.1.26 and above is setup to work with either name. To make the names match, the io.dat file could be changed as follows:

Tape Selector

From:

```
141,   UL, DZsn,  DZA,   DL, DZ1A, DZ2A, DZ1B, DZ2B,
144,  UNL, UNsn,   UT, UTsn,UTSsn,     ,     ,     ,
145,     ,     ,     ,     ,  DNL, DNsn,   DT, DTsn,
146,DTSsn,     ,     ,     ,     ,     ,     ,     ,
```

To:

```
141,   UL, DZ-2,  DZA,   DL,  DZU,  DZD,DZU-1,DZD-1,
144, UN-1, UNsn,   UT, UTsn,UTS-1,     ,     ,     ,
145,     ,     ,     ,     , DN-1, DNsn,   DT, DTsn,
146,DTS-1,     ,     ,     ,     ,     ,     ,     ,
```

Tapeless Selector

From:

```
141,   UL, DZsn,  DZA,   DL,  DZU,  DZD,     ,     ,
144,     , UNsn,   UT,     ,UTSsn,     ,     ,     ,
145,     ,     ,     ,     ,     , DNsn,   DT,     ,
146,DTSsn,     ,     ,     ,     ,     ,     ,     ,
```

To:

```
141,   UL, DZ-2,  DZA,   DL,  DZU,  DZD,     ,     ,
144, UN-1,     ,   UT,     ,UTS-1,     ,     ,     ,
145,     ,     ,     ,     , DN-1,     ,   DT,     ,
146,DTS-1,     ,     ,     ,     ,     ,     ,     ,
```

6.3.3 KEB Inverter Status DG02 Table

KEB Inverter Status DG02	
Number	Status Description
0	No Operation
1	EOP - Error Over Voltage
2	EUP - Error Under Voltage
3	EUPh - Error Input Phase Failure
4	EOC - Error Over Current
5	EIPh - Error Output Phase Failure
6	EOHI - Error Overheat Internal
7	EnOHI - No Error Overheat Internal
8	EOH - Error Overheat Power Module
9	EdOH - Error Motor Overheat
11	EndOH - No Error Motor Overheat
12	EPU - Error Power Unit
13	no_PU - Power Unit Not Ready
15	ELSF - Error Charge Relay Fault
16	EOL - Error Overload
17	EnOL - No Error Overload
18	EbuS - HSP5 Serial Comm.
19	EOL2 - Error Overload Low Speed
20	EnOL2 - No Error Overload Low Speed
23	ESbuS - Error Bus Synchronization
24	EACC - Error Maximum Acceleration
25	ESCL - Error Speed Control Limit
30	EOH2 - Error Motor Protection
31	EEF - Error External Fault
32	EEnC1 - Error Encoder 1
34	EEnC2 - Error Encoder 2
35	EEnCC - Error Encoder Interface
36	EnOH - No Error Overheat Power Module
39	ESEt - Error Set
44	ESLF - Error Software Limit Forward
45	ESLr - Error Software Limit Reverse
46	EPrF - Error Protection Rotation Forward
47	EPrr - Error Protection Rotation Reverse
49	EPuci - Error Power Unit Code Invalid
50	EPuch - Power Unit Changed
51	Edri - Error Driver Relay
52	EHyb - Error Encoder Card
53	EiEd - Input Error Detection
54	Eco1 - Error Counter Overrun 1
55	Eco2 - Error Counter Overrun 2

KEB Inverter Status DG02	
Number	Status Description
56	Ebr - Error Low Motor Current
57	Eini - Error Initialization MFC
58	EOS - Error Overspeed
59	EHybC - Error Encoder Card Changed
60	ECdd - Error Calculating Motor Data
64	Up Acceleration
65	Up Deceleration
66	Up Constant Speed
67	Down Acceleration
68	Down Deceleration
69	Down Constant Speed
70	No Direction Selected
71	Stall
72	LA Stop
73	Ld Stop
74	Speed Search
75	DC Brake
76	Base Block
77	Low Speed / DC Brake
78	Power Off
79	Quick Stop
80	Hardware Current Limit
81	Search for Reference Active
82	Calculate Motor Data
83	Positioning
84	Low Speed / Power Off
85	Closing Brake
86	Opening Brake
87	Abnormal Stop Overheat Interior
88	No Alarm Overheat Power Module
89	Abnormal Stop Overheat Power Module
90	Abnormal Stop External Fault
91	No Alarm Drive Overheat
92	No Alarm Stop Overheat Interior
93	Abnormal Stop Bus
94	Abnormal Stop Protection Rotation Forward
95	Abnormal Stop Protection Rotation Reverse
96	Abnormal Stop Drive Overheat
97	Abnormal Stop Motor Protection
98	No Abnormal Stop Overload
99	Abnormal Stop Overload
100	Abnormal Stop Overload 2

KEB Inverter Status DG02	
Number	Status Description
101	No Abnormal Stop Overload 2
102	Abnormal Stop Set
103	Abnormal Stop Bus Synchronization
104	Abnormal Stop Software Limit Forward
105	Abnormal Stop Software Limit Reverse
106	Abnormal Stop Maximum Acceleration
107	Abnormal Stop Speed Control Limit
121	Ready for Positioning
122	Positioning Active
123	Position Not Accessible
124	Protection Rotation Forward
125	Protection Rotation Reverse
126	Position Not Accessible Ignored
127	Calculate Motor Data Complete
128	Reference Found
150	Main Contact Failure
151	Brake Switch Failure
152	Speed Following Error
153	Speed Selection Error
154	ETS Input Failure
155	ETS Overspeed
156	NTS Input Failure
157	Analog Signal Failure
158	Unintended Movement
159	Secure Fault Reset
160	ESD Input Failure
161	Direction Selection Failure
162	Drive Enabled Switched Off
163	Error Field Bus Watchdog
164	Error Commutation Position
165	Error Excessive Acceleration
166	Error Serial Command Speed
170	UPS Mode
171	Reduced Torque
172	Emergency Profi le
173	Emergency Generator Speed
174	Earthquake Speed
175	Emergency Slowdown
200	No Communication to Encoder Card
201	Encoder Communication OK
202	Encoder Not Defi ned
206	No Communication to Encoder

KEB Inverter Status DG02	
Number	Status Description
207	Incremental Count Deviation
208	Encoder PPR does not match LE01
209	Interface ID is wrong
213	Encoder Overtemperature
214	Encoder Overspeed
215	Encoder Supply Voltage Too Low
216	Internal Encoder Error
217	Formatting Encoder
221	New Encoder Identifi ed
222	Undefi ned Encoder Error
223	Encoder Interface Busy

Section 7 – Adjustable Variables

7.1 Main CPU Adjustable Variables

Table 1: Car Motion					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Acceleration	50	300	92	fpm/s	Acceleration Rate. The constant acceleration rate to reach top speed.
Access DT Dist	0	120	24	inches	Access DT Distance. Distance from DT limit for the bottom access limit to be software activated. The controller counts pulses from the DT limit.
Access Speed	0	75	35	fpm	Access Speed. Car velocity while running on access
Access UT Dist	0	120	24	inches	Access UT Distance. Distance from UT limit for the top access limit to be software activated. The controller counts pulses from the UT limit.
Adv Pre-Torque	0	1	0	-	Advance pretorque. When set, the controller will pick the motor contactor and pretorque the motor when the door closes to the DLM limit. It is enabled to improve floor to floor times when pretorque is used. 0 = off, 1 = on
Balanced Load	0	100	40	%	Balanced Load. Percent load of the counterweight.
Decel Jerk	50	480	125	fpm/s/s	Deceleration Jerk Rate. Maximum jerk rate to roll from top speed to constant deceleration.
Decel Rate	50	300	92	fpm/s	Deceleration Rate. The constant deceleration rate from top speed to leveling speed when stopping for a floor.
Dist Feed Fwd	0	1.3	0	-	Distance Feed Forward. During the final approach to the floor, when using a tape selector, the number of pulses to calculate the velocity is 64 pulses per foot. So during this time, if the CPU does not see a distance change, it calculates the distance the car should move over the next ten millisecond period and then uses that value to calculate next velocity value. This value is a multiplier for what percentage of the velocity calculation to uses. When the next pulse comes in, the CPU calculates the velocity value as normal.
DL DeadZone Sel	0	15	3	-	Dead Zone Sensor. Adjusts the width of the door zone from four DL sensors. DL 1 is the outer most sensors whereas DL 4 is the inner most sensor. Each of the four bits, 0-3, of this parameter represents which DL sensor is being used. Bit 0 for sensor DL1 ... Bit 3 for sensor DL4. So a value of 3 will use sensor DL1 and DL2. (Used on tape applications). A value of 0 defaults to using DL1.
DON Start Ctrl	0	1	1	-	DON Start Ctrl. Drive ON Start Control. When set to 1 the controller starts the pattern delay after the drive on signal (DON) from the drive.

Table 1: Car Motion					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Drv Speed Mult	0.25	2	1	-	Used for KEB drive to adjust the speed of the elevator.
EM Decel Lev	50	300	100	fpm/s	Emergency Deceleration rate to Leveling rate.
Em Decel Rate	80	360	180	fpm/s	Emergency Deceleration Rate. The rate at which the elevator will decelerate when it is doing an emergency slowdown.
Encoder Dir	0	1	0	-	Encoder direction for CAN Bus encoder. Set to zero or one during Setup to get correct direction of pulses for the CAN encoder
Encoder PPR	60	32000	2048	PPR	Encoder Pulses Per Revolution. The number of pulses the motor encoder has per revolution.
Encoder RPM	1	3000	105	RPM	Encoder Revolutions Per Minute. The number of revolutions per minute the motor makes at top speed.
Field Weaken	60	110	110	% vel	Field Weakening Velocity. Percent of velocity above which the motor field is weakened to allow the car to reach top speed.
Floor Targ Dis	1.2	25	12	inches	Floor Target Distance. Distance to start leveling mode into the floor. Increasing this distance will lower the jerk rate.
Ins Decel Stop	50	480	300	fpm/s	Inspection Deceleration stop rate. The rate for the elevator to decelerate from inspection speed to zero.
Inspect Speed	0	150	40	fpm	Inspection Speed. Maximum car speed while running on inspection.
Leveling Speed	1	15	5	fpm	Leveling Speed. Maximum car speed while leveling into the floor.
Motor RPM	0	3000	500	RPM	Motor RPM (used for keb drive)
Overspeed Trip	80	125	110	%	Over speed Trip. Percentage of contract speed the controller will drop the rope gripper.
Pattern Delay	0	3	0	sec	Pattern Delay. Delay time before the speed profile will start.
Pls Cnt Upd Err	0	2	1	inches	Position Count Update Error. If the count is off by more than this value and the update flag is enabled, the position pulse count is updated. If this value is set to zero and the update flag is enabled, then the pulse count is updated every time the DZ is hit at high speed.
Pls Err Delay	1	10000	5000	1/sec	Position Count Update Error Delay. This number is the time delay from when DZ is hit until the input is read. The time delay parameter, times the current speed of the car, is used to estimate the number of pulses the count will change during the turn on time of the DZ input.

Table 1: Car Motion					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Pos Count Upd	0	7	0	-	Position Count Update Flag. The pulse count is checked every time the DZ input is hit. +1=Update the DPP floor count as the elevator passes by a landing and hits DZ. +2=Interrupt the CPU when DZ hit otherwise the update is done during the loop time (roughly 1 msec). +4=Update every time the DZ is hit and the car is at constant speed regardless of the pulse count update error value.
Preopen Delay	0	3200	0.5	sec	Preopen Delay. Delay time to preopen the door starting from when the car reaches 3 inches from dead level and the door can safely be opened.
Recovery Speed	15	100	25	fpm	Recovery speed to the nearest floor.
Relev Pat Dly	0	3	0	sec	Relevel Pattern Delay. Delay time before speed profile will start on a relevel.
Relev St Time	0	2	0	sec	Relevel Start Velocity Hold Time. If relevel start speed is set to a non zero value, controller will use that value for the speed before going in relevel velocity This parameter controls how long we stay in Relevel Start Velocity
Relev Strt Spd	0	15	0	fpm	Re-level Start Speed. Maximum starting velocity for a re-level. Car will stay in relevel Start speed for a time set by parameter ' Relev St Time ' and then switch to relevel Speed
Relevel Speed	1	15	6	fpm	Re-level Speed. Maximum car speed during re-leveling operation.
Roll Over Jerk	50	480	125	fpm/s/s	Rollover Jerk Rate. Maximum roll jerk rate while rolling into top speed.
Rope Comp Torq	0	50	0	offset	Rope Compensation Torque. Used primarily on gearless machines that do not have any compensating chains. This parameter adds torque to the pretorque value to compensate for weight of the elevator cables holding the car. The value is calculated from the position of the car in the hoistway.
Soft Start Jerk	50	480	125	fpm/s/s	Soft Start Jerk Rate. Maximum jerk rate to roll into constant acceleration from a dead stop.
Soft Stop Time	0.2	30	1	sec	Soft Stop Time. For Hydraulic Elevators – time the motor is kept running after the valve is turned off. For Traction Elevators – time that zero speed is held until the brake is set.
Stop Decel Rate	5	225	50	fpm/s	Stop Deceleration Rate. Rate to bring the velocity from leveling speed to zero speed.
Stop On Pos Cnt	0	1	0	-	Stop On Position Count. Enable to stop the elevator on position pulse count. Used only for tapeless application. It requires cons file setting to be enabled and readjustment of leveling sensors for it to work.
Top Speed	25	Contract Speed	0	fpm	Top Speed or contract speed of the car. If set to zero, or set to a value greater than top speed, it will use top speed in cons file

Table 1: Car Motion					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Torque Amount	0	100	0	gain	Torque Amount. Multiplier for the amount of torque proportional to the load. A value of 100 will give 100 percent torque with 100 percent load or 60 percent torque with an empty car.
Torque Down Amt	0	100	0	gain	Torque Down Amount. Torque Amount for down direction of travel. Multiplier for the amount of torque proportional to the load. A value of 100 will give 100 percent torque with 100 percent load or 60 percent torque with an empty car. If this value is set to zero then the Torque Amount parameter above will be used for both up and down direction.
Torque Ramp Tim	0	1	0	sec	Torque Ramp Time. The amount of time for the torque to ramp up prior to the elevator leaving the floor during pattern delay.
UL DeadZone Sel	0	15	3	-	UL Dead Zone Sensor. Adjusts the width of the door zone from four UL sensors. UL 1 is the outer most sensors whereas UL 4 is the inner most sensor. Each of the four bits, 0-3, of this parameter represents which UL sensor is being used. Bit 0 for sensor UL1 … Bit 3 for sensor UL4. So a value of 3 will use sensor UL1 and UL2. (Used on tape applications). A value of 0 defaults to using UL1.

Table 1: Car Brake					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Brake Drop Del	0	5	0.1	sec	Brake Drop Delay. Delay time to drop the brake after the car has stopped and is dead level at the floor.
Brake Hold Volt	20	400	160	volts	Brake Hold Voltage. Voltage to hold the brake for the remainder of the run.
Brake Opto Dly	0	7372	5500	3686/m sec	Brake Opto Delay. The SCR Brake board trigger circuit uses optocoupler devices that have a turn on delay of roughly 1 millisecond but can vary from part to part and vary from different input filtering. This parameter is used to compensate for different turn on delays to start of triggering of the SCRs. Only change this value at the advice of a G.A.L. Technician.
Brake Pick Del	0	5	0	sec	Brake Pick Delay. Delay time to pick the brake after the run relay is energized.
Brake Pick Time	0.1	6	3	sec	Brake Pick Time. Duration of applied brake pick voltage before changing to the hold voltage.
Brake Pick Volt	20	400	230	volts	Brake Pick Voltage. DC Voltage to pick the brake. Brake voltage will start at start voltage and then ramp to pick voltage.
Brk AC L-L Volt	80	300	240	volts	Brake AC Line to Line Voltage. AC input voltage to the brake board.
Brk Drop Rate	0	5	0	sec	Brake Drop Rate Time. Time value for brake to ramp from start voltage to zero.
Brk Drop Start	0	1	0	-	Brake Drop timing during Leveling. 0 = Normal brake drop 1 = Early drop selected
Brk Drop Volt	0	200	0	volts	Brake initial drop Voltage. DC Voltage to start the brake drop. Brake voltage will start at this value ramp down to zero volts.
Brk Phase Inp	0	1	0	-	Brake Phase Input. 0 = Single phase, 1 = 3 phase.
Brk Pick Rate	0	2	0	sec	Brake Pick Rate Time. Time value for brake to ramp from start voltage to pick voltage.
Brk Pick Start	0	400	0	volts	Brake Pick Start Voltage. Initial DC Voltage to pick the brake. Brake voltage will ramp to pick voltage.
Brk Relev Rate	0	2	0	sec	Brake Relevel Rate Time. Time value for brake to ramp from relevel start voltage to relevel voltage.
Brk Relev Start	0	400	0	volts	Brake Relevel Start Voltage. Initial DC Voltage to pick the brake on a relevel. Brake voltage will ramp to relevel voltage.
Brk Relev Volt	10	400	230	volts	Brake Relevel Voltage. Brake voltage applied on the brake coil during a relevel. This parameter useful to have a partial brake lift on relevel. Relevel brake voltage will start at relevel start voltage and then ramp to relevel voltage.
Brk Resistance	0.1	500	283	Ohms	Brake Resistance. Resistance value measured on the brake coil on ohms.
EmBk Drop Dly	0	360	0	sec	Emergency Brake Drop Delay. Delay time to drop the brake after the car has stopped and is dead level at the floor.

Table 1: Car Brake					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
EmBk Drop Rate	0	1.5	0	sec	Emergency Brake Drop Rate Time. Time value for brake to ramp from start voltage to zero.
EmBk Hold Volt	0	400	160	volts	Emergency Brake Hold Voltage. Voltage to hold the emergency brake for the remainder of the run.
EmBk L-L VAC	80	300	240	volts	Brake AC Line to Line Voltage. AC input voltage to the brake board.
EmBk Opto Dly	0	7372	5500	3686/m sec	Emergency Brake Opto Delay. The SCR Brake board trigger circuit uses optocoupler devices that have a turn on delay of roughly 1 millisecond but can vary from part to part and vary from different input filtering. This parameter is used to compensate for different turn on delays to start of triggering of the SCRs. Only change this value at the advice of a G.A.L. Technician.
EmBk Phase In	0	1	0	-	Emergency Brake Phase Input. 0 = Single phase, 1 = 3 phase.
EmBk Pick Rate	0	2	0	sec	Emergency Brake Pick Rate Time. Time value for emergency brake to ramp from start voltage to pick voltage. Only used if two brake boards are installed.
EmBk Pick Tim	0	10	3	sec	Emergency Brake Pick Time. Duration of applied emergency brake pick voltage before changing to the hold voltage. Only used if two brake boards are installed.
EmBk Pick Volt	0	400	230	volts	Emergency Brake Pick Voltage. DC Voltage to pick the emergency brake. Brake voltage will start at start voltage and then ramp to pick voltage. Only used if two brake boards are installed.
Pwl Bk Off Tim	0	5	0	sec	Power Loss Brake Off Time. When Pwl Bk On Tim and Pwl Bk Off Tim are set to a non zero values, the timers are used to pulse the brake contactor output on and off while recovering the car with Power loss brake option.
Pwl Brk On Tim	0	5	1	sec	Power Loss Brake On Time. When Pwl Bk On Tim and Pwl Bk Off Tim are set to a non zero values, the timers are used to pulse the brake contactor output on and off while recovering the car with Power loss brake option
Relev Brk Delay	0	5	0	sec	Relevel Brake Delay. Time delay to lift the brake during a relevel.
Relev Brk LowV	0	1	0	-	Relevel Brake Low Voltage. Set to a 1 to relevel the car with the hold voltage to create a partial pick of the brake. Not used with electronic brake board.

Table 3: Modified Motion

Field Variable	Min	Max	Initial	Units	Description
EP Accel Rate	50	300	92	fpm/s	Emergency Power Accel Rate
EP Decel Jerk	50	480	125	fpm/s/s	Emergency Power Decel Jerk rate
EP Decel Rate	50	300	92	fpm/s	Emergency Power Decel Rate
EP Recov Speed	10	100	25	fpm	Emergency power recovery speed. Recovery speed during emergency car recovery. Used when the emergency power recovery source can only provide enough power to bring the car to the floor in the direction of the load.
EP Roll Jerk	50	480	125	fpm/s/s	Emergency Power Roll Jerk rate
EP SoftSt Jerk	50	480	125	fpm/s/s	Emergency Power Soft Start Jerk
EP Target Dist	1.2	25	12	inches	Emergency Power Floor Target Distance
EP Top Speed	10	Contract Speed	100	fpm	Top Speed for Emergency Power
ShFl Accel Rate	50	300	92	fpm/s	Short Floor Acceleration Rate. The constant acceleration rate to reach top speed.
ShFl Decel Rate	50	300	92	fpm/s	Short Floor Deceleration Rate. The constant deceleration rate from top speed to leveling speed when stopping for a floor.
ShFl SoftSt Jrk	50	480	125	fpm/s/s	Short Floor Soft Start Jerk Rate. Maximum jerk rate to roll into constant acceleration from a dead stop.
Short Fl Cntrl	0	7	0	-	Short Floor Control. 0=Default is that the car relevels to the short floor. +1=Car will make a run between very short floors instead of re-leveling. +2= Short floor slowdown magnets between short floors (non-distance feedback). +4=Mid Short floor slowdown magnets between short floors (non-distance feedback).
Short Fl Dist	10	72	30	inches	Short Floor Distance. Any floor less than this distance is considered a short floor. The short floor flag gets set and if preopening is enabled, it can be specifically disabled for the short floor run.
ShrtFl Decl Jrk	50	480	125	fpm/s/s	Short Floor Deceleration Jerk Rate. Maximum jerk rate to roll from top speed to constant deceleration.
ShrtFl Roll Jrk	50	480	125	fpm/s/s	Short Floor Rollover Jerk Rate. Maximum roll jerk rate while rolling into top speed.
ShrtFl Targ Dis	1.2	25	8	inches	Short Floor Target Distance. Distance to start leveling mode into the floor. Increasing this distance will lower the jerk rate.

Table 4: Car Timers

Field Variable	Min	Max	Initial	Units	Description
Adv Door En Tim	0	240	0	sec	Advanced Door Enable time. Door open advance enable time to open the opposite door when operating with non-simultaneous doors. If there is a request for both doors, instead of waiting for the first open door to close completely before opening the second door, the second door starts to open after the advance door enable time while the first door is closing.
Att Buz Delay	0	900	60	sec	Attendant Buzzer Delay. Buzzer sounds if a hall call is entered and the car has not started moving within this delay time. This function is disabled when set to zero.
AttBuz Off Time	0	30	0	sec	Attendant Buzzer Off Time. Cycle off time to turn attendant buzzer on and off once attendant delay time function has been meet (See ATT Buz Delay). Buzzer will stay on continuously if this timer set to zero.
AttBuz On Time	1	30	5	sec	Attendant Buzzer On Time. Cycle on timer to turn attendant buzzer on and off once attendant delay time function has been meet (See ATTBuz Delay).
Auto Swg DO Dly	0	10	10	sec	Auto Swing Door Open Delay. Delay time to turn enable the auto swing door open output.
Car Call Dwell	1	60	2	sec	Car Call Dwell. Door open dwell time when answering a car call only.
CB Door Time	1	3200	60	sec	Code Blue Door Time. Door time for Code blue operation once elevator is at the emergency floor before EMS is energized
Chime onCC Time	0.1	2	0.2	sec	Chime on Car Call Time. Handicap buzzer on CC. Length of beep time
CL Pulse Time	0	320	5	sec	Car Lantern Pulse Time
Door Delay Time	0	1.5	0	sec	Door Delay Time. Delay time between DO and DC to switch when opening or closing the door.
Door Fail Time	10	3200	25	sec	Door Fail Time. Time with power on the door without getting the door open limit.
EE Test Time	0	2	2	sec	Electric Eye Test for Automatic Freight Doors
EE Time-out	0	3200	40	sec	Electric Eye Time-out time. If the Electric Eye or detector edge is on continuously for this amount of time,it will be flagged as timed-out and the controller will ignore the EE input and close the door on nudging. When set to zero, this feature is disabled.
Fault Time	0	10	2	sec	Fault Time. Delay time before allowing the car to run after a fault occurs.
FR DC Time-out	1	3200	1	sec	Freight Door Close Time-out. The amount of time prior to closing the doors on automatic freight door operation.
FR Pwr DO Time	0	30	1	sec	Freight Door Power Door Open Time. The amount of time to turn on the power door open relay on automatic freight door operation.
Gen/Lt/Fan Time	30	3200	360	sec	Generator Run/Cab Light/Fan Time. Length of time to leave the generator running or the Cab light and fan on after there is no longer a demand to run.

Table 4: Car Timers					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Grip/EBK Rset T	0	20	4	sec	Gripper/Emergency Brake Reset Time. The amount of time it takes for the rope gripper to reset on power-up.
Hall Call Dwell	1	60	4	sec	Hall Call Dwell. Door open dwell time when answering a hall call or both a hall and car call.
Hall Lant Dly	0	15	0	sec	Hall Lantern Delay time. By default, when set to zero, hall lanterns go off as soon as the car starts to slow down to arrive at a floor. When set to a nonzero value, this will be used as a timer for the hall lantern to go off prior to arrive at the floor. For example, if set to three seconds, hall lanterns will turn on approximately three seconds before the car arrives to the floor regardless of the speed of the car. We recommend to set this parameter for high speed cars.
Handicap Dwell	1	120	25	sec	Handicap Dwell. Extended door time from pressing the ED button in the car.
HEOF Auto Rst T	0	3200	0	sec	HEOF Auto reset time. When the hall elevator off function is activated from the HEOF input being turned on, the car will be taken out of service until the input is turned off. Once the input is off, the car will stay out of service until the auto reset timer times out.
IND Rcl2Lby tmr	10	60	20	sec	Independent Recall to Lobby Timer. Recall delay for car in independent when 'IND Rcl to Lby ' is set.
Lant Off Time	0	2	0.2	sec	Lantern Off Time. Used for double stroke gongs. The lantern off time is the delay time after the lantern first turns on until it turns off.
Lant On Time	0	2	0.7	sec	Lantern On time. Used for double stroke gongs. The lantern will turn on, turn off and then turn on again. The Lantern on time is the delay time from when the lantern first turns on until it turns on the second time.
Learn HW Stall	1	3200	30	sec	Automatic Hoistway Learn Stall Time.The time required for a hoistway learn is calculated by the number of floor at an average height of 12.5 feet. This stall time value is added to the calculated value for the maximum time allowed for the auto hoist way learn to run. If floor heights are taller or if there is a blind shaft,this timer may need to be increased to the additional floor height times 1.2 (multiplier for car running at 30fpm). For a blind shaft of 50 feet then use a timer value of 50 * 1.2 = 60.0 seconds.
Lobby Dwell	1	60	5	sec	Lobby Dwell. Door open dwell time for a car at the lobby.
ManDoor Buz Dly	0	900	0	sec	Manual Door Buzzer Delay. On a car with manual doors,sound the buzzer if the door is left open and a call is entered after this time delay. This function is disabled when set to zero.

Table 4: Car Timers

Field Variable	Min	Max	Initial	Units	Description
Max Door Hld T	0	3200	0	sec	Maximum door hold time to be allowed when the extended dwelling input (ED) is pressed. If set to zero, there will be no limit on how long the car will be held on ED. When set to a value, this will be the maximum allowed time for the car to held by ED input, then car will go on regular dwelling timers (car or hall call dwelling timers)
Non Interfer T	1	60	2	sec	Non-Interference Time. Time between when you stop and when you can run again.
Nudging Time	20	3200	60	sec	Nudging Time. Delay time for a door to be held before going into nudging.
OSER BTFlr Tim	0	900	60	sec	Out of Service Between Floors Time. Timer to control the OSERL output. Used with OSERL Control option 1 for 'between floors for over a minute' set to 2.
OSER Ncall Tim	0	900	600	sec	Out of Service Not responding to Calls Time. Timer to control the OSERL output. Used with OSERL Control option 1 for 'not responding to calls' set to 1.
OSER Sopen Tim	0	900	60	sec	Out of Service Safety String Open Time. Time to control the OSERL output. Used with OSERL control option 1 for ' SS open' set to 4.
Pas Chime Time	0.2	2	0.5	sec	Floor Passing Chime Time. Length of time the floor passing chime will sound when a floor is passed.
RC dropfail Tim	0.5	5.5	0.5	sec	Retiring Cam Drop Fail Time. Retiring cam drop fail safe delay for manual doors. Time it waits when car arrives to the floor before it drops the output.
RC Pick Delay	0	7	0	sec	Retiring Cam Pick Delay. The amount of delay time for the retiring cam to pick once the doors are closed.
Relev Dly Tim	0	2	1	sec	Relevel Delay Time. The amount of delay time before the car will re-level. This would be used for jobs that have excessive rope stretch.
Reset Time	0	10	5	sec	Reset Time. Delay time in the reset mode before allowing the car to run.
RTL Dwell Time	1	60	8	sec	Return To Lobby Dwell Time. If Return To Lobby is set to cycled doors at the lobby, use this timer to control how long they will dwell before closing in return to lobby mode.
Run Cycle Time	0	300	0	hours	Run Cycle Time. Used to initiate a run when the elevator has been sitting idle for a period of time. Used for jobs that have high friction bearing machines.
Sabb Buzz Delay	1	10	5	sec	Sabbath Door Buzzer timer prior to doors closing: jobs where the light curtain is disabled in Sabbath operation required a buzzer prior to the door closing sequence. This timer warns people the light curtains are about to be enabled (output name: SABUZ)

Table 4: Car Timers					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Sabbath Dwell	1	60	10	sec	Sabbath Door Dwell Time: car will wait this amount of time on every floor for Sabbath operation except at the lobby where it will follow the handicap dwell door time (separate timer)
Sec Disable Tim	0	3200	0	sec	Security Disable Time. This timer is used with a security disable input button at the lobby. When the button is pressed, the car call security is disabled for the time value set from this parameter.
Short Dwell Tim	0	60	1	sec	Short Door Dwell Time. Door open dwell time when the doors re-open on a door open button, electric eye, safety edge or door hold button.
Stall Time	20	3200	60	sec	Stall Time. Maximum time a run is requested but the car is not moving.
VIP Door Time	1	3200	20	sec	VIP door time. The amount of time the car will park at the VIP recall floor prior to going to automatic service.
Y Delta Time	1	5	1.5	sec	Y-Delta Time. Transfer time to change motor from Y start to Delta run. Timer also used for DEL or MCX turn on time with controllers without y-delta starters.

Table 5: Car Options					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Arrival Lant	0	1	0	-	Arrival Lantern, 1 = activate lant/gong without onward call
Behind CC Canc	0	1	0	-	Behind Car Call Cancel. When enabled the elevator will not latch any car calls in the opposite direction of travel.
Binary Preset	0	1	0	-	Binary Preset. 1 = Always update the car position count based on binary preset when the position doesn't not match. 0 = Update the car position count based on the binary preset when the car recovers into a floor.
Brake Lift Sw	0	2	1	-	Brake Lift Switch. If set to 1 or 2 a brake lift switch fault is detected. The car is prevented from running if the brake does not drop or if the brake did not pick on the previous run. The car is allowed to run after the brake drops. If set to 2 the rope gripper will set if the brake does not drop and the can only be reset by placing the car on inspection and back to automatic.
Cab Lant Ctrl	0	2	0	-	Cab Lantern control. The default is for the cab lanterns to go off when the door is fully open. This allows the cab lanterns to go off earlier. +1 ring cab lanterns as soon as door starts to open, + 2 ring the cab lanterns when the door reaches DPM point.
Cl Gate No Pref	0	1	0	-	Close Gate (Swing Door) when No Onward Preference. The gate on a swing door normally stays open until a call is placed. This bit causes the gate to close while the car is setting at the floor.
COP/Remote CC	0	7	0	-	COP/Remote Car Call Select. 0=Both COP and Remote Car Call Station used to enter calls. 1=Separate: COP only or Remote CC only used to enter car calls.+2=C-R: Car calls entered on the COP sets the acknowledgment light on the Remote station. +4=R-C: Car calls entered on the Remote station sets the acknowledgment light on the COP.
COP/Remote Dis	0	14	0	-	COP/Remote Disable: +1 = Up Direction Disable COP, +2 = Down Direction Disable COP, +4 = Up Direction Disable Remote Panel, +8 = Down Direction Disable Remote Panel
DCB Canc Dwell	0	1	0	-	Door Close Button Cancel Dwell time. When this parameter is set to 1 we do not allow DCB to cancel the door dwell time. It basically disables DCB to shorten door dwell time.
DO No Actv DOL	0	1	0		Door Open Output when not Active DOL. When the door is fully open and hits the DOL, the DO is turned off and stays off even if the door drifts off of DOL. With this bit set, the DO output will turn on any time the DOL is lost.
DOB Over Nudg	0	1	0		DOB Over Nudging. If set the door open button will open the door when the door is nudging closed.

Table 5: Car Options					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
DoorOpenL Ctrl	0	16	0	-	Door Open Light Control. The way 'DoorOpenL Ctrl' parameter works is as below: +1 Set OPENL on phase 1 completed +2 Set OPENL on RTL return to lobby +4 Set OPENL on emp returned home with doors open, also sets OPENL on emp and selected to run +8 Set OPENL on when Lobby Floor +16 Set OPENL all the time
Double Stroke	0	1	1	-	Double Stroke Gong Selection: Select 1 or 2 gongs for down hall calls. 0 = 1 gong and 1 = 2 gongs.
Drive Rdy Flts	1	10	5	count	Drive Ready Fault Reset Count. Number of times the drive can be reset in a 20 minute time period.
DZ gripper ctl	0	1	0	-	DZ gripper trip control. When set to 0, the gripper will detect out of the door zone from DZ only. When set to 1 the controller will use DZ anded with DZA which change the trip zone from 2 inches to 6 inches.
EE Cancel Dwell	0	1	0	-	Electric Eye Cancel Dwell. By turning this parameter on you disable the short dwelling door time from the electric eye signal (EE). By default the short dwelling time is enabled.
EM Brake Sw	0	1	0	-	Emergency Brake Switch Control 0 = don't start if brake switch does not pick, 1 = ignore brake switch on start
Enc Dir Flt Dis	0	1	0	-	Encoder direction fault disable. Default is enable (=0). Set 1 to disables fault
GOV Gripper/EBK	0	1	0	-	Governor Switch Gripper/Emergency Brake Trip Control. Sets and latches a gripper fault immediately when the governor switch is opened. 1=Latches the gripper fault only if the governor switch is opened while the car is traveling at contract speed or above 150 fpm. When the gripper fault is latched it must be reset from the LCD interface for the car to run.
Griper/EBK Buz	0	1	0	-	Gripper/Emergency Brake Buzzer. Turn on buzzer if you have an active rope gripper or emergency break fault
Gripper/EBK Trip	0	3	3	-	Gripper/Emergency Brake Trip. 0 = Off, +1 = Safety processor speed, +2 = Overspeed
HB/PI Dis NV Fl	0	1	0	-	Handicap Buzzer/PI Display Control. When set to 1, do not sound HB or update floor PI when passing an invalid floor.
Hndcap Time Flr	Bottom Floor	Top Floor	1	floor	Handicap Time Floor. If the job is configured to have an extended door input at a hall station, this parameter configures the floor number when parameter will change door timing. Follows fvexdt timer. It will operate for EDHL only
Invert BLS	0	1	0	-	Invert Brake Lift Switch. When set inverts the logic for the brake lift switch to use a normally close switch instead of normally open.

Table 5: Car Options					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Invert CLF	0	1	1	-	Invert the logic for the car light fan. If set to 0 car light fan is normally open. If set to 1 car light fan is normally closed.
Invert ISER	0	7	0	-	Invert In Service Output. When set to 1, the in service light output is turned off when the car is in service instead of turned on. When set to a 2 the ISER output will function as an elevator in use light. When set to a 4, this output functions as out of service from a shutdown and does not include independent, inspection or recovery mode.
Lant Pref Dly	0	3	0	sec	Lantern Preference change Delay. When the direction preference for the elevator changes, we clear the lanterns and wait for this amount of time before the lanterns are turned on again.
Level Fault Cnt	3	10	3	count	Level Fault Count. Maximum count of consecutive re-level tries when a re-level error is detected. A relevel error is detected when the brake is dropped and the car moves out the level zone.
Leveling Fault	0	1	0	-	Leveling fault effect. Set to 0=drop everything, 1= set emergency brake or gripper when a leveling fault occurs. It will have to be manually reset.
Lim Dir Flt Dis	0	1	0	-	Limit direction fault disable. Controller confirms the car direction of travel as it hits the terminal limits. Default is enable (=0). Set 1 to disables fault
LobbyLan NCU/IR	0	1	0	-	Lobby Lantern NCU/IR. When set to 0, light the lanterns on IR service at each floor. The lantern will not light at the lobby if next up operation is selected because the IR car will not be selected to be the next up car. If set to 1. the IR car will light the lantern at all the floors and the lobby even with the system on next up operation.
Min Door Tim En	0	1	0	-	Minimum Door Time Enable. When set = 1, the minimum door time for a car call or a hall call is set from the car or hall call dwell timers and cannot be shortened by the Door Close button.
NCU Lant Ctrl	0	3	0	-	Next Up Direction Lantern Control. +1=Turn off hall lantern after next up time. +2=Turn off cab lantern after next up time.
NCU Pref Ctrl	0	1	0	-	Next Up Preference Control. When set allows direction preference to change before the door starts to close after the next up door time.
No HC Door Reop	0	3	0	-	No Hall Call Button Door Reopen. When set do not reopen the door from an at floor hall call.

Table 5: Car Options					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Non-Simul Doors	0	2	0	-	Non-Simultaneous Doors. If set to 0 then both front and rear doors will open at the same time if there is a demand at both the front and rear openings. If set to a 1 the front doors will open first before the rear doors open if there is a demand to open. If set to a 2 the rear doors will open first before the front doors open if there is ab demand to open.
Nudge Dis Ctl	0	7	0	-	Nudging Disable Control. When set to +1 do not turn on the NUD output when doors are in nudging close mode, basically you are disabling nudging output. If set to +2 and when doors are in nudging close mode and SE input is ON, keep doors open and also keep FB/NB output latched. If set to a +4 sound the nudging buzzer but do not close the doors on nudging.
Nudge No Calls	0	1	0	-	Nudge with No Calls. If set to a 1 the doors will close on nudging even if the elevator has no onward calls.
OSERL OutCtrl 1	0	7	0	-	Out of Service Light control +1 = not responding to calls; +2 = between floors for over a minute +4 = SS open. When this parameter as well as OSERL OutCtrl 2 is set to zero, the output will just operate as an Out of service light.
OSERL OutCtrl 2	0	1	0	-	Out of Service Light control + 1= Alarm. When this parameter as well as OSERL OutCtrl 2 is set to zero, the output will just operate as an Out of service light.
Preopen Doors	0	3	0	-	Preopen Doors. Setting this option to a 1 will enable preopening of the doors. If retiring cam used with auto door, RCM will also turn on at the preopening point. +2=exclude short floors.
Rad Pos Ind	6	48	6	inches	Radial Position Indicator. Used for radial Position indicator output. It adjustes the range for the distace from the floor where the poistion indicator outputs should turn on and off
RCF out enable	0	1	0	-	Retiring Cam for Freight output enable. When you Turn on this parameter. It shows a retiring cam output in controller. RCF that mirrors the signal from RCM. You need to reboot CPU everytime you change parameter for change to take effect.
RCM Control	0	3	0	-	Retiring Cam Control. When set to 1, hold the retiring cam up at the floor if there is no pilot to open the door (manual doors). The retiring cam will drop after 5 minutes. When set to 2, RCM output turns on when DZ hit to advance the RCM ahead of the door open (auto door with retiring cam) otherwise the default is that RCM turns on when dead level. If preopening is set RCM and DO turn on when DZ hit.
Secnd Risr Lant	0	1	0	-	Second Riser Lantern. Turn on cab lantern only when IR call answered. If this parameter is set cab lanterns will only turn on when answering second riser calls.

Table 5: Car Options					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Slip Det Dis	0	1	0	-	Slip Velocity Difference disable. Default is enable (=0). Set 1 to disables fault. Can only be disabled with code previous to A17.1 2010.
Slip Vel Diff	0	300	150	fpm	Slip Velocity Difference fault trip value. This parameter determines Maximum allowable difference between Safety processor speed and controller speed.
SPB Dir Flt Dis	0	1	0	-	SPB direction fault disable. Default is enable (=0). Set 1 to disables fault
ULDL DirFlt Dis	0	1	0	-	UL/DL direction fault disable. Controller confirms the car direction of travel when it passes the UL and DL door zone limits. Default is enable (=0). Set 1 to disables fault
Vel Diff Dis	0	1	0	fpm	Velocity difference fault disable. Default is enable (=0). Set 1 to disables fault
Velocity Diff	50	300	150	fpm	Velocity Difference. Maximum velocity difference between Encoder feedback and demand velocity. When the difference exceeds this setting, 'Velocity Diff Fault' will occur.

Table 6: Service Options					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Access Bot Fl	Bottom Floor	Top Floor	1	floor	Access Bottom Floor. Floor for bottom access
Access Door Cls	0	1	0	-	Access Door Close. When on access operation the car runs with the Door Lock and GS open. By turning this parameter on, the car needs to have the gate switch signal ON in order to run. It should be used on hoistways where the car door will physically hit something if moved on access operation
Access Top Fl	Bottom Floor	Top Floor	2	floor	Access Top Floor. Floor for top access
Att Buz ctrl	0	1	1	-	Attendant Buzzer Control. 0= Hall Calls only 1= Hall Calls and Car Calls
Att CC from HC	0	1	0	-	Attendant Car Call from Hall Call. When set to 1 and the car is on Attendant service the respective car call will register when a hall call is registered.
CCPBS on Gp Sec	0	1	0	-	CCPBS on group car call security. This variable enables Car Call Push Button Security with group car call lockout switches. The configuration file setting for security type and car call push button security must also be set.
CCS on Sabbath	0	1	0	-	Car Call Security on Sabbath. When this parameter is enabled, sabbath car calls will not latch on floors that have been secured using car call lockouts security
CEOF Control	0	7	0	-	Car Elevator Off options: Car Elevator Off Options: +1=Recall, +2=Keep Door Open, +4=Turn off CLF
CEOF Control 2	0	15	0	-	Car Elevator Off Options 2: +1= Keep doors Closed (do not cycle on reversal), +2 = do not blink Elevator Off Light, +4 = Elevator Off Auto Reset With Timer , +8 = Enable Elevator Off Light to indicate the car finished recall of elevator off mode
DOB Over Sec	0	5	0	-	DOB Override Security. This parameter allows the car to open the door at a secured floor when the car is secured from the following conditions: Set to 1, the DOB will be allowed to open the door at any secured floor. Set to 2, the DOB can open the door at floors secured from group security floor mask table. Set to 3 allows the DOB to open the front door at floors secured by car call lockout security (switches or card reader). Set to 4 allows the DOB to open the rear door at floors secured from rear car call lockout security. When set to 5 allows the DOB to open the door at floors locked out by group security floor mask tables when the car is also on independent.
Door Hold Msg	0	1	0	-	Door Hold Message. Set to enable Extended Door Time Message Indicator in CE Driver board

Table 6: Service Options					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Elev Off Ret Fl	0	Top Floor	0	floor	Elevator Off Return Floor. Related to HEOF input. This setting is to be used in conjunction with 'Elev Off Ctl = +1'. If the elevator is configured to recall, this parameter will determine what floor the car should be recalled to in elevator off mode. if Parameter is set to zero, car will be returned to the Lobby.
Handicap Load	0	100	40	%	Handicap Load (Car Capacity). Percent load when above this value, the car my not have enough room for a person in a wheelchair. Cars with loads below this value would be given a preference to get an assignment at a floor requested by a handicap person.
HC Acknwldg Bzz	0	1	0	-	HC Acknowledge Attendant Buzzer - Buzz once (for one sec) every time a call comes in 0 = disable 1 = enable
HEOF Control	0	7	0	-	Hall Elevator Off Control. +1=Recall car when key switch activated. +2=Keep door open at the shutdown floor. +4=Allow the cab light and fan to time-out even though the door is open but the car is shut down.
HEOF Control 2	0	15	0	-	Hall Elevator Off Options 2: +1= Keep doors Closed (do not cycle) +2 = do not blink HEOFL, +4 = Auto Reset when input off and timer expires. +8 = Use HEOFL to indicate car finished recall.
HEOF Control 3	0	1	0	-	Hall Elevator Off Options 3. +1= only activate if doors are closed. See other Hall Elevator Off Options as well.
HEOF Over Ind	0	1	0	-	Hall Elevator off override independent 1 = wait for timer to expire and then recall the car
IND Door Cl CC	0	1	0	-	Independent Door Close Car Call. Enable to close the doors from a car call when the elevator is on independent.
Ind Over Sec	0	7	0	-	Independent Overrides Security. Set to 1 to allow independent service to override security car call lockouts. Set to 2 to override Security Floor Mask configurations and set to 4 to override remote car call station.
IND Rcl to Lby	0	1	0	-	Independent Recall to Lobby. Forces the car to recall to the lobby when on independent and no calls are made
Ins Door Close	0	1	0	-	Inspection Door Close. When set to 1, the door close output will turn on when the up or down inspection run button is pressed.
INSEC Outp Ctl	0	1	0	-	INSEC - in security Output invert. Output located on the car call security Board
Load Antinuisan	0	100	20	%	Load Anti-nuisance. Percent load when below this set point will cause the car to drop its car calls. This function is disabled when set to zero.
Load Bypass	0	100	60	%	Load Bypass. Percent load when above this set point will cause the car to bypass hall calls. This function is disabled when set to zero.

Table 6: Service Options					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Load Dispatch	0	100	40	%	Load Dispatch. This set point is used as a trigger to activate Up Peak operations in the group. Each time the car leaves the lobby with a load greater than this value, the group will increment the Up Peak Trigger. This function is disabled when set to zero.
Load Overload	0	125	110	%	Load Overload. Percent load when above this set point will cause the car to go on overload operation (sit at the floor with the door open and the overload light on). When the load goes below this value, the car will automatically return to service. This function is disabled when set to zero.
LW Anti-nuisan	0	50	0	count	Load Weighing Anti-nuisance. Set to the maximum number of car calls that can been entered before all car calls are cancelled without the load switch LWA input on. Once the load switch is on, all car calls will stay latched. If set to 0, this function is disabled.
Manual Dir En	0	4	0	-	Attendant Manual Direction Enable. If set to 1, it works in conjunction with the ATTUP and ATTDN to determine direction of travel. If set to 2, it reads the ATTUP input and use it as a START button. If set to 4, it will not allow car calls to be registered until the door is fully closed.
No Psg Run Cnt	0	10	0	count	No Passenger Run Count. When set to a number other than zero, the car call antinuisance feature is activated. This count is the number of times the car will run from a car call without detecting that a passenger has broken the detector edge. Once the count is reached, all remaining car calls will be cancelled.
PI Serv Msg 1	0	Max Service	0	Service Number	PI Service Message 1. When the car service matches this number, user message 1 is sent to the PI display. This will correspond to user PI display message 17.
PI Serv Msg 2	0	Max Service	0	Service Number	PI Service Message 2. When the car service matches this number, user message 2 is sent to the PI display. This will correspond to user PI display message 18.
PI Serv Msg 3	0	Max Service	0	Service Number	Service message 3 display. Used for Custom messages. Need to be programmed by CE electronics and GAL for special messages
Return To Lobby	0	7	0	-	Return to Lobby Option. +1=cycle door at lobby, +2=cancel car calls when activated, +4=cycle door on reversal.
RTL Door Selct	0	2	0	-	Return To Lobby Door Select. This variable allow you to specify door open type on 'Return to Lobby' service, when it is set to 0 = the car will open only front door, 1 = the car will open only rear doors, and when it is set to 2, the car will open both front and rear

Table 6: Service Options					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Sabbath Dis Ctl	0	7	0	-	Sabbath disable control variable - Add all numbers of the features you want to disable while in Sabbath operation: +1=PIs, +2=Lanterns, +4=directional arrows
Sabbath En Ctl	0	7	0	-	Sabbath Enable control variable. Set to zero disables all options. +1 = Allow IR momentarily to override Sabbath operation. +2 = Lobby Dwell time in Sabbath follows handicap door dwell time instead of the lobby dwell time. +4 = Wait until car is at lobby to turn off Sabbath operation
Sabbath En Ctl2	0	3	0	-	Sabbath Enable control: +1 when the car is placed on Sabbath operation, it waits to go to the lobby before switching to Sabbath Operation, +2 used the cab lanterns as directional arrows. This allows people on the hall ways to know direction of travel for the elevator
Sabbath Mode	0	1	0	-	Sabbath Collective Mode. when set to 0 we do dn collective car calls, if set to 1 we do up collective car calls.
Sec Reassign CC	0	3	0	-	Security Reassign Car Call. Re-assign secured car call to opposite door. Used with security configuration cons.dat file setting: cons[SecFlCfg] = 2. 0 = disabled, +1 = in case front CC are secured, reassign them as rear, +2 = in case rear CC are secured, reassign them as front.
Sec Recall 2	0	2	0	-	Security recall control 2. 0 = out of group on first recall. 1 = out of group on all recalls. 2= no out of group recalls.
Security Floor	0	Top Floor	1	floor	Security Floor. The security recall floor. This is the floor where the security guard would be stationed. This floor would not be locked out when on security.
Security Recall	0	15	0	-	Security Recall Selection. 0=No: No Recall, +1=Recall to Security Floor on activation of security. +2=Cycle front door once recalled to the Security Floor. +4=Cycle rear door once recalled to the Security Floor. +8=Always recall to security floor after each run.
Service LT CTL	0	30	0	Service Number	Service Light Control. When the configuration file parameter cons[servOUT] is set to 1 or 2, the service output SERVO will turn on when the car service matches the car service number in this parameter.
SR CCSec by Dir	0	2	0	-	Second Riser Car Call Security by Direction. Allows calls in the one direction but disables them in the other. 1 = Allow calls in the up direction (above the floor) but disable them going down, 2 = Allow calls in the down direction (below the floor) but disable then going up.

Table 6: Service Options					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Stop At Lobby	0	15	0	-	Stop at Lobby. 0 = do not automatically stop at lobby, +1 = The car will stop at the lobby when the car is traveling up and the car is below the lobby floor. +2 = The car will stop at the lobby when the car is traveling down and the car is above the lobby floor. 3 = The car will stop at the lobby when traveling in either direction. +4=Stop at lobby with any onward call past the lobby. +8=Recall to the lobby
Vip Lant Ctrl	0	3	0	-	VIP lantern control: 0 = Do not ring lanterns on VIP, 1 = ring up or down lantern at VIP floor when the door is fully open, 2 = ring up or down lantern at VIP floor before the door is opened.
VIP multi call	0	1	0	-	VIP Multiple Calls. When set to default value 0, VIP feature works as single call and when 'VIP multi call' set to 1, the car will be allowed to make multiple VIP calls until no more car calls are entered and until the VIP sequence time-out timer is expired.

Table 7: Emergency Services					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
ALT Fire Floor	Bottom Floor	Top Floor	2	floor	Alternate Fire Floor.
Alt Rcl FS Off	0	3	0	-	Alternate Floor Recall Fire Service Off. Add +1 to have the elevator recall back to the alternate floor when the lobby fire switch is turned to the off position and car recalled to the main fire floor. +2 allows the car to return to the alternate landing even if sensor was reset
Aux. Fire Sw.	0	1	0	-	Auxiliary Fire Switch. When set, the controller expects an auxiliary hall fire switch to be used.
CB Buzzer Ctrl	0	1	0	-	Code blue Buzzer Control: 1 = Turn on while in code blue recall
CB over FS	0	1	0	-	Code Blue over Fire Service: +1 Enable to have code blue prevent car from recalling in FS
CB Over Ind	0	1	0	-	Code Blue Override Independent 1 = wait for timer to expire and then recall the car
CB single call	0	1	0	-	Code Blue Single Car Call. 0 = car on Code Blue operation allows multiple car calls on Hospital Service., 1 = Allow only a single call once place on Hospital Service.
Cl Door F1 Rcl	0	1	0	-	Close Door after Fire phase 1 Recall. When set to 1, elevator will close the doors after phase 1 recall and reopen from a hall call (Denver Fire service amendment)
Em Power Floor	Bottom Floor	Top Floor	1	floor	Emergency Power Recall Floor.
EMS/HS after CB	0	1	0	-	EMS(Emergency Medical Service)/HS(Hospital Service) after Code Blue. This is a Code Blue bypass control. When set to zero car goes from Auto to Hospital service, bypassing the code blue sequence, when EMS switch is turned on. When set to 1, Hospital service only activates after a code blue recall.
EP Recovery Dir	0	1	0	-	Emergency Power Recovery Direction. Recover to the nearest floor on emergency power. 0 = based on movement of the car when brake is picked. 1 = based on load weighing device. Used when the emergency power recovery source can only provide enough power to bring the car to the floor in the direction of the load.
EPS Sel No Grp	0	2	0	-	Emergency Power Selection Switch operation with no Group active. 0 = Run Automatic, 1 = Recall first and then run automatic, 2 = Recall only; do not run after recall.
F1 DC Time-out	10	60	20	sec	Fire phase 1 Door Close Time-out. The amount of time it will take before the car doors start to close while the car is on Independent or Attendant service prior to recalling the elevator on Fire Phase 1.
F1 Door Dwell	1	90	60	sec	Fire phase 1 Door Dwell time. Fire Service Phase one complete dwell time when 'Cl Door F1 Rcl' parameter is set. (Denver FS phase1 dwell time)

Table 7: Emergency Services					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
F2 DOB ovr DCB	0	1	0	-	Fire Phase 2 Door Open Button overrides Door Close Button. When set to 1, it allows Door Open Button will override Door Close Button on phase 2. (for Miami)
Fire Main Floor	Bottom Floor	Top Floor	1	floor	Fire Main Floor.
Fire Option	0	3	0	-	Fire Option. Recall Reset Selection: 0 = Reset fire service phase 1 after hall switch is turned off and car returns to fire floor. 1 = Reset phase 1 immediately after hall switch is turned off.
Fire Option 2	0	3	1	-	Fire Option 2. +1=Initiate a phase 2 recall only when the door is open (Chicago fire). +2=Disable flashing FL on phase 2 (Chicago fire).
Fire Sw Loc	0	4	0	-	Fire Switch Location. Location of fire hall switch. 0 = Main/Alt Front, 1 = Main Rear/Alt Front, 2 = Main Front/Alt Rear, 3 = Main/Alt Rear, 4=Set from Dispatcher Car selection.
FireL Emer Pwr	0	1	1	-	Fire Light control during emergency power – Enable to cause the fire light FL to turn off if the car is not selected to run.
FireL OTS Ret	0	1	0	-	Fire light control for Out of Service cars: enabling this parameter will turn off the fire light in the event the car cannot recall for being out of service. It could be in Earthquake, low oil, stall, etc.
Flash CB Light	0	1	0	-	Flash Code Blue Light. When set to 1 the code blue light inside the car station will flash.
Hall Fire Light	0	4	0	-	Hall Fire Light. The variable controls the FLH output on the controller so it can be used for a hall fire light or a fire security override. The default operation is that FLH turns on while the car is on phase 1 or phase 2 fire service. +1=On while phase 1 is in effect, +2=Flash FLH at 1 second intervals while activated, +4=FLH follows the Fire Light (FL) logic.
Hoistw Fire Ret	0	1	0	-	Hoistway Fire Sensor Return Floor Selection. 0 = Return to the Main fire floor, 1 = Return to the Alternate fire floor.
HSV Door Cl CC	0	1	0	-	Hospital Service Close door Car Call. Close the doors from a car call when the car is on Hospital Service.
HWS 2 Fire Loc	0	1	50	-	Fire service hoistway HWS2 sensor location 0 = same HW 1 = Seprate hoistway
HWS 2 Fire Ret	0	1	0	-	Second hoistway fire service sensor return option. 0 = Main recall floor 1 = Alternate recall floor.
MachRm Fire Ret	0	1	0	-	Machine Room Fire Sensor Return Floor Selection. 0 = Return to the Main fire floor, 1 = Return to the Alternate fire floor.
Med CCS Ovrride	0	1	0	-	Medical service override car call security. When set to 1, medical service car will override car call security.

Table 7: Emergency Services					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Med Door Reopen	0	2	0	-	Medical service Door Reopen. When car is in medical Service, this parameter determines the door open sequence for re-open: 0=Stop, 1=Constant pressure, 2=momentary to DOL
Med Em Floor	Bottom Floor	Top Floor	1	floor	Medical Emergency Return floor.
Med Em Sw Loc	0	1	0	-	Medical Emergency Switch Location. Selects the switch location for the front or rear door.
Med Ind Ovrride	0	2	0	-	Medical Service overrides independent control: 0=Immediate, 1=After Delay, 2=No override
Rcl from F1 Alt	0	1	0	-	Recall from Fire Phase 1 Alternate floor. If the car has returned to the alternate floor from a smoke sensor and when two fire hall switch are used, both must be on to recall the car from the alternate floor to the main floor. When this flag is set to 1, the car will recall from the alternate floor to the main floor from either hall fire key switch. (Set to 1 for Mass. fire service).
Recall Reset	0	3	0	-	Recall Reset Selection. 0 = Reset fire service phase 1 after hall switch cycled through reset and turned off and car returns to fire floor. 1 = Reset phase 1 immediately after hall switch is cycled through reset and then turned off. 2 = reset fire service without cycling fire switch through reset but turned off only if the smoke sensors were not activated..
Recall Reset 2	0	1	0	-	Recall Reset Selection 2: 0 = Reset fire service phase 1 with car at any floor. 1 = Reset phase 1 only if car at fire recall floor.

Table 8: Group Dispatch					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Alt Lobby Floor	1	Top Floor	1	floor	Alternate Lobby Floor. Galaxy groups could be configured to have an alternate lobby. Switching between regular lobby and alternate lobby could be done by means of liftnet, Galileo, controller input or service timer. Once the alternate lobby is enabled, controllers will use this landing as the lobby floor for all dispatching purposes.
Alt Parking Fl	1	Top Floor	1	floor	Alternate parking floor. Normally, during parking operation, one floor is always parked at the lobby. With alternate parking floor operation, a free car is parked at the alternate parking floor instead of the lobby floor. This operation is controlled by an input or from a service timer.
Asgn Park Fl DO	0	1	0	-	Assign Parking Floor with Door Open. By default we only park cars that have the doors closed after a time delay. this parameters allows to re-assign parking to cars with doors open as long as they do not have a direction to run.
Auto SVC tm-out	0	1	0	-	Auto Service Time-out. 0 = Disable, 1 = Enable When this parameter is enabled and 'Auto SVC tot TM' parameter time is set accordingly, each car is checked for answering assigned hall calls. If the car does not move to answer calls in the required time, it is put into AST service. Hall calls that are assigned to that car are reassigned to working cars in the group. The group then periodically assigns hall calls to the AST car to verify if it can be put back into the group for normal operation.
Auto SVC tot TM	10	3200	120	sec	Auto Service Time Out Time. This time in seconds is used in conjunction with 'Auto SVC tm-out' and is the amount of time that the group will wait before setting a 'not moving/responding' car as timed out.
Dis Opp HC Time	10	30	10	sec	Disable Opposite Hall Call Time: Specify amount of time the opposite hall call will be disabled.
Disable Opp HC	0	15	0	-	Disable Opposite Hall Call after initial hall call is entered: When the first up or down hall call is hit, disable opposite call for the time set; +1=front hc riser,+2=rear hc riser,+4=ir front hc riser,+8=ir rear hc riser
Dn Peak Contrl	0	1	0	-	Down peak control 0 = Normal down peak 1 = Heavy down peak
Dn Pk Trig Cnt	1	100	12	count	Down Peak Trigger Count. Number of down hall calls above the lobby that are set within the down peak trigger time to place the system on down peak operation.
Dn Pk Trig Time	0	3200	60	sec	Down Peak Trigger Time. The time interval to count the number of down hall calls above the lobby to activate down peak operation.
Down Peak Pool	0	Number Cars	0	car	Down Peak Pool. Number of cars to be utilized for down peak.
Down Peak Time	0	3200	180	sec	Down Peak Duration Time. The duration time for down peak operation once down peak is activated.

Table 8: Group Dispatch					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
ETA Co CC Time	0	60	15	sec	TA Coincident Car Call Time. Hall calls will be assigned to the car with the coincident car call unless the car without the coincident car call can reach the call faster then ETA Coincident Car Call Time.
ETA Min Time	0	60	6	sec	ETA Minimum Time. For a hall call to be assigned to a new car, the difference in ETA must be greater than the ETA Minimum Time.
Grp Timer Park	0	Number Cars	0	car	Group service Timer Park cars. This is the number of parking cars when parking is set from the Service Activation Timer for Group parking.
High Priorty FL	0	Top Floor	0	floor	High Priority Floor. When this parameter is set to a floor number other than zero the high priority operation is activated. If there is a call latched at the high priority floor and the timer set from the 'High Priority TM' expires, the group will choose the best car by considering only car calls. It will remove all hall calls on that best car except for the priority floor hall call. The car will serve all car calls and then service the priority floor before being assigned another hall call from the group..
High Priorty TM	6	254	60	sec	High Priority Time. Works in conjunction with parameter 'High Priority Floor', it is the amount of time to wait before removing hall calls assigned to the selected best car.
Lobby Floor	Bottom Floor	Top Floor	1	floor	Lobby Floor.
Lobby Req Cntrl	0	1	0	-	Lobby Request Control. If the lobby request variable is set to non-zero, then that is how many cars are requested to the lobby all the time. When this flag is set to 1, the lobby request is only used when next up is active. Next Up can be active all the time, from a dedicated input or from Up Peak.
Lobby Request	0	Number Cars	0	car	Lobby Request. Number of Cars Requested to the Lobby floor. Used with Next Car Up operation.
Next Car Up	0	7	0	-	Next Car Up. Set to 1 or 2 will activate the Next Car Up operation. If set to 1 the next up car will open its door at the lobby and keep it open. The car is allowed to leave the floor after the Lobby Dwell time expires but will remain at the floor with the door open until an onward call is assigned to it. If set to 2 the next up car will close its door after the Lobby Dwell time expires and go off of next up but will remain at the lobby. An up hall call at the lobby will cause the car to open its door and go on next up. When set to 4, Next up is activated on Up Peak detection only. Next up can also be activated from an input.
Park Delay Time	0	120	8	sec	Parking Delay Time. Time delay an idle car waits before being parked.
Parking	0	Number Cars	1	car	Number of Cars to Park. One car is parked at the lobby. The remaining cars are parked at the most used floors of the building. If set to zero, no cars are parked.

Table 8: Group Dispatch					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Parking floor 1	0	Top Floor	0	floor	Parking Floor 1. Floor to park the idle car. If set to zero, the group will use number of hall call history to decide where to park the car. The parking variable must be set to at least 1 for this function to work. See also Parking Type.
Parking floor 2	0	Top Floor	0	floor	Parking Floor 2. Floor to park the idle car. If set to zero, the group will use number of hall call history to decide where to park the car. The parking variable must be set to at least 1 for this function to work. See also Parking Type.
Parking floor 3	0	Top Floor	0	floor	Parking Floor 3. Floor to park the idle car. If set to zero, the group will use number of hall call history to decide where to park the car. The parking variable must be set to at least 1 for this function to work. See also Parking Type.
Parking floor 4	0	Top Floor	0	floor	Parking Floor 4. Floor to park the idle car. If set to zero, the group will use number of hall call history to decide where to park the car. The parking variable must be set to at least 1 for this function to work. See also Parking Type.
Parking floor 5	0	Top Floor	0	floor	Parking Floor 5. Floor to park the idle car. If set to zero, the group will use number of hall call history to decide where to park the car. The parking variable must be set to at least 1 for this function to work. See also Parking Type.
Parking floor 6	0	Top Floor	0	floor	Parking Floor 6. Floor to park the idle car. If set to zero, the group will use number of hall call history to decide where to park the car. The parking variable must be set to at least 1 for this function to work. See also Parking Type.
Parking floor 7	0	Top Floor	0	floor	Parking Floor 7. Floor to park the idle car. If set to zero, the group will use number of hall call history to decide where to park the car. The parking variable must be set to at least 1 for this function to work. See also Parking Type.
Parking Type	0	3	0	-	Parking Type. Determines the type of parking operation that is implemented by the group. 0=park free cars to floors with the most hall calls for that 15 minute period. 1=Divide the hoistway by the number of cars and place a car in each zone starting with the lobby. 2=Park cars according to the adjustable variable parking floor. Note that during parking, a car is always parked at the Lobby except when the option for alternate parking floor is selected through an input.
Parking Width	0	Top Floor	0	floor	Parking Width. The number of floor that a car is within to be considered parked at the parking floor. See also Parking Type.
Up Peak Contrl	0	1	0	-	Up Peak Control. 0 = Normal up peak 1 = Heavy up peak
Up Peak Pool	0	Number Cars	1	car	Up Peak Pool. Number of cars to be utilized for up peak.

Table 8: Group Dispatch					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Up Peak Time	0	3200	180	sec	Up Peak Duration Time. The duration time for up peak operation once up peak is activated. If set to zero, up peak operation will never turn on.
Up Pk CC Count	1	40	3	count	Up Peak Car Call Count. Number of car calls the car must have when leaving the lobby to count as an up peak trigger.
Up Pk Trig Cnt	1	100	3	count	Up Peak Trigger Count. The number of up peak triggers that are set within the up peak trigger time to activate up peak operation. Up peak triggers are counted when the car leaves the lobby with the load dispatch input set or with the more car calls than the up peak car call count.
Up Pk Trig Time	0	3200	60	sec	Up Peak Trigger Time. The time interval to count the number of up peak triggers.

Table 9: Group Options					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
1st EP Run Car	0	Number Cars	1	car	First Emergency Power Run Car. This is the first car selected to run. If this car cannot run, the next consecutive car is selected.
1st Rcl EPSF 2	0	Number Cars	2	car	First Return Car Emergency Power Service Feeder 2.. This will be the first car recalled in Emergency Power (the rest are done sequentially in a loop) for power feeder 2
1st Recall Car	0	Number Cars	1	car	First Recall Car. This is the first car allowed to recall during the emergency power recall sequence. The recall sequence continues in consecutive order and then loops around until all cars are recalled.
1st Run EPSF 2	0	Number Cars	2	car	First Run Car Emergency Power Service Feeder 2. This will be the first car selected to run on emergency power (the rest are done sequentially in a loop) for power feeder 2
2nd IR Car	0	Number Cars	0	car	2nd Inconspicuous Riser Car. Set this option to have a second car answer the Inconspicuous Risers.
ATT Pref Time	0	60	0	sec	Attendant ETA Preference Time. When set to non-zero, the car not on attendant service has this time added to its ETA time. This causes the attendant car to be given a preference for the hall call.
CB Button Loc	0	2	0	-	Code Blue Location: 0=CB on CB, 1 = CB on HCB, 2 = CB on IR
CB IR Penalty	0	60	10	sec	IR Car Code Blue penalty time. It is used to calculate and give preference to cars in fully automatic operation
CB Rcll Any Car	0	1	0	-	Code Blue Recall Any Call. 0= Disable; =1 enables dispatcher to recall any car If Code Blue Cars 1 and 2 are not available. If you want to select any car as your primary option, make Code Blue Car and Code Blue Car #2 equal to zero and enable this setting.
CB Req Ind Car	0	1	0	-	Code Blue Request Independent Car. Code blue request for car on independent operation. Set to 1 in dispatcher in all cars so the car could be requested (flash EML) if the car is in independent mode.
CB Sel IR Car	0	1	0	-	Code blue over IR car
CB SRiser Car	0	Number Cars	0	car	Code Blue second riser car select
Code Blue Car	0	Number Cars	0	car	Code Blue Car. When a code blue call is initiated, this will be the first car to be sent to respond. If car is not available, see variables 'Code Blue Car#2' and 'CB Rcll Any Car' for more options.
Code Blue Car#2	0	Number Cars	0	car	Code Blue Car #2. When a code blue call is initiated, this will be the car to be sent to respond in the event that first 'Code Blue Car' is not available, see variables 'Code Blue Car' and 'CB Rcll Any Car' for more options.

Table 9: Group Options					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Dispatcher Car	0	Number Cars	0	car	Dispatcher Car. If set to 1, this car is allowed to become the dispatcher. In normal operation, this variable would be set to zero and car #1 would be the dispatcher. If car #1 is shut down, car #2 automatically becomes the dispatcher. During installation, it may be necessary to force car #3 or above to be the dispatcher until car #1 or #2 are brought on line.
Em Power Cars	1	Number Cars	1	car	Number of Emergency Power Cars that can run at the same time on the emergency power source.
Emerg Dispatch	0	7	0	-	Emergency Dispatch. This parameter is applied to both the car that is selected as the dispatcher and also the non-dispatcher cars. If set to 1 and hall call power lost, the dispatcher car will set down hall calls above the lobby and up hall call at and below the lobby. For the non-dispatcher cars, if set to a 1, and communications is lost to the dispatcher car, the car will dispatch itself to down hall calls above the lobby and up hall calls below the lobby. The front hall call and rear hall call bits settings are only used for the dispatcher car and when set, if communication is lost to a particular hall call board, hall calls are set for the affected floors.
EMP ATT car 1st	0	1	0	-	Emergency Power Attendant Car First. Select and Prioritize the attendant car for running on emergency power service. It won't be recalled. After recall is complete for the group, It recovers and goes back in service
EmPwr Op Output	0	3	0	-	Emergency Power Operation LED. This parameter controls the group outputs for emergency power status for each car. 0=Outputs are on for cars that are operational. 1=Outputs on for cars on normal power. 2=Outputs on for car on emergency power. 3=Outputs on for cars that are being recalled.
EmPwr Pk Output	0	2	0	-	Emergency Power Park LED. This parameter controls the group outputs for emergency power parked status for each car. 0 = cars are parked on emergency power. 1=cars are parked or selected to run.
EP Man Sel En	0	3	1	-	Emergency Power Manual Select Enable: +1 Car is selected to run when the currently selected car completes its recall. If set to zero, the recall sequence is aborted and any moving car will stop at the next floor to allow the selected car to run. Setting this variable to +2 makes the selected car wait for all the cars to recall before being selected to run.
EP Rcl Out en	0	1	0	-	Emergency cars finished Recalling Output enable. It enables an output in the hall call board for Emergency Power Complete (EPCOM). This setting is only read in power up so after changing this setting you need to reboot the controller.
EP Recall Delay	0	3200	15	sec	Emergency power recall delay time. Time delay before the group starts the emergency power recall sequence.

Table 9: Group Options					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
EP Recover Tim	1	60	20	sec	Emergency Power Recover Time. When elevators are in Emergency Power recall, this is the time that the dispatcher will wait for each car to recover to a floor. If the car is in the middle of a blind shaft, you need to calculate the time each car may take to get to a floor in emergency power recovery speed.
Grp CC Ovrride	0	1	0	-	Group Car Call Override. Normally visitor access allows the car call security to be overridden momentarily from a push button in an owners apartment. With this parameter set to 1, the security override works directly from a key switch input.
Grp CC Sec OvrT	1	240	60	sec	Group car call security override timer. This is the amount of time that the car call security is overridden when a group car call security override button is pressed.
Handicap Wait	0	255	0	sec	Handicap Car Wait Time. Special operation that when a passenger presses a handicap hall button, the group adds this time to the ETA of all cars that do not have enough capacity. See Handicap Capacity in car options. Normally, if a car is at the floor of the handicap hall call, it will get the assignment regardless of the handicap capacity unless this value is set to 255.
HC Asg SecType	0	15	0	-	Hall Call Assignment Security Type. Use with Special Priority Service. Determines what hall calls should be given a special priority. Settings are 1=up, 2=dn, 4=upr, 8=dnr
HC Securty ctrl	0	2	0	-	Hall Call Security Control. Set what riser the hall call security inputs work with: 0 = only standard hall calls; 1 = standard hall calls and Second Riser hall calls ; 2 = only Second Riser hall calls
HC X-Assign En	0	5	0	-	Hall Call Cross Assignment Enable. When set to 1 front hall call cross assignment is enabled, 4=Rear hall call cross assignment and 5=front and rear hall call cross assignment. The group will look for cross assignment calls as well as hall calls. Power should be cycled on controller after this variable is modified so all communications to all devices are made. When set to 2, then hall calls cross cancellation is used and hall calls are are not cancelled when all cars are out of service. A setting of 3 for both hall call assignment and cancellation is not valid and may cause unpredictable results.
HC X-Assign ETA	0	500	60	sec	Hall Call Cross Assignment ETA limit. If ETA for hall call assignment is greater than this ETA limit, the hall call will be cross-assigned to the old group controller.
Invert HC Sec	0	1	0	-	Invert Hall Call Security. When set to 1, hall call security inputs are secured when the security input goes off from a normally closed switch. Normally, the security input must be on to secure the hall call.
IR Car	0	Numbe r Cars	0	car	Inconspicuous Riser Car. This car is assigned all the IR hall calls.

Table 9: Group Options					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
IR Control	0	7	0	-	Inconspicuous Riser Control. This parameter alters how IR riser service is activated or deactivated. 0 = IR active from ICR or RICR input. +1 = IR activated when any IR call is activated.. +2=Finish car calls then answer IR calls, +4 = Finish car call before going off IR.
Number Vip Cars	0	Number Cars	1		Number of VIP Cars. Number of cars allow to service VIP (priority service) calls at one time.
OTS No HC Canc	0	1	0	-	Out of Service No Hall Call Cancelled. Do not cancel hall calls if cars are out of service. This is used in accordance with cross assignment feature.
Recall Timeout	1	600	60	sec	Recall Time-out. The time allowed for the car to reach the recall floor during the emergency power recall sequence. If this timer expires, the next car is selected to recall.
Sabbath Restart	0	3200	8	sec	Sabbath Restart Delay Time. The amount of time after the elevator answered the last sabbath call to restart the process.
Secnd Risr Ctl	0	3	0	-	Second Riser Control. Defines the second riser operation. 0=Car defined for second riser answer second riser call and standard hall calls. 1=Car defined for second riser answer only second riser calls. 2=Second riser call or'ed with standard riser calls if second riser operation not selected from input.
Single Auto PB	0	5	0	-	Single Automatic Push Button Operation. 0 = Manual Doors (this would be the normal operation for cars with manual doors). 1 = Enable SAPB operation for simplex car with automatic doors. 2 = Disable SAPB operation for cars with manual doors. 3 = Invalid setting. 4 = Allow only one car call to be entered at floor for cars with manual doors regardless of the door position. 5 = Allow only one car call to be entered at floor for cars with automatic doors. This feature normally allows only hall calls and car calls to register when the doors are closed.
Skip Car@RcFLDO	0	1	0	-	Skip Car at Recall Floor with Door Open. While on Emergency Power Recall sequence: if enabled, out of service cars at the Emergency Power Recall floor with door open will be given a chance to run, 0=override immediately, 1=override after time-delay. Time delay defined by variable 'EP Recover Tim"
SkipCarN@RcFLDO	0	1	0	-	Skip Car Not at Recall Floor with Door Open. While on Emergency Power Recall sequence: if enabled, out of service cars at the Emergency Power Recall floor with door open will be given a chance to run, 0=override immediately, 1=override after time-delay. Time delay defined by variable 'EP Recover Tim"
Third Risr Ctrl	0	1	0	-	Third Riser Control. Defines the third riser operation. 0=Car defined for third riser answer third riser calls and standard hall calls. 1=Car defined for third riser answer only third riser calls.

Table 9: Group Options					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Vid Pos Car 1	1	Number Cars	1	car	Video Position Car 1. The column where the car is displayed on the dispatch screen starts from left to right for positions 1 through 6 (8 for high rise cars). Car 1 through 6 positions are defaulted to display positions 1 through 6 respectively. Changing the car's video position changes the column where the car is displayed.
Vid Pos Car 2	1	Number Cars	2	car	Video Position Car 2. See Video Position Car 1 for an explanation.
Vid Pos Car 3	1	Number Cars	3	car	Video Position Car 3. See Video Position Car 1 for an explanation.
Vid Pos Car 4	1	Number Cars	4	car	Video Position Car 4. See Video Position Car 1 for an explanation.
Vid Pos Car 5	1	Number Cars	5	car	Video Position Car 5. See Video Position Car 1 for an explanation.
Vid Pos Car 6	1	Number Cars	6	car	Video Position Car 6. See Video Position Car 1 for an explanation.
Vid Pos Car 7	1	Number Cars	7	car	Video Position Car 7. See Video Position Car 1 for an explanation.
Vid Pos Car 8	1	Number Cars	8	car	Video Position Car 8. See Video Position Car 1 for an explanation.
Vip Button Loc	0	2	0	-	Vip Button Location. 0 = vip on vip, 1 = Vip on HCB, 2 = Vip on IR
VIP Operation	0	3	0	-	Vip (Priority Call) Operation. +1=Cancel hall call if no cars available for VIP call. +2= Cancel car call upon initiation of being selected as the VIP car.
X-Assign Cars	0	Number Cars	0	car	Cross Assignment Cars. Number of cars in the old group to assign calls using cross assignment system.

Table 10: CC & COP Lights					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Backlight Lt	0	63	0	color	Enable Backlight Output Lights for RGB style output lights in COP Bit0: Fire, Bit1: Medical, Bit2: Emergency, Bit3: OTS, Bit4: Att Up/Dn Light, Bit5: Non-CC
CC AttDn Blue	0	100	0	%	Car Call Button Attendant Dn Light blue intensity
CC AttDn Bright	0	100	100	%	Car Call Button Attendant Dn Light brightness
CC AttDn Color	0	15	0	color	Car Call Button Attendant Dn Light Color: 0 Based on parameters 1 Red 2 Orange 3 Yellow 4 Chartreuse 5 Green 6 Aquamarine 7 Cyan 8 Azure 9 Blue 10 Violet 11 Magenta 12 Rose 13 Rose white 14 Warm white 15 Cool white
CC AttDn Green	0	100	0	%	Car Call Button Attendant Dn Light green intensity
CC AttDn Red	0	100	100	%	Car Call Button Attendant Dn Light red intensity
CC AttUp Blue	0	100	0	%	Car Call Button Attendant Up Light blue intensity
CC AttUp Bright	0	100	100	%	Car Call Button Attendant Up Light brightness
CC AttUp Color	0	15	0	color	Car Call Button Attendant Up Light Color: 0 Based on parameters 1 Red 2 Orange 3 Yellow 4 Chartreuse 5 Green 6 Aquamarine 7 Cyan 8 Azure 9 Blue 10 Violet 11 Magenta 12 Rose 13 Rose white 14 Warm white 15 Cool white
CC AttUp Green	0	100	100	%	Car Call Button Attendant Up Light green intensity
CC AttUp Red	0	100	0	%	Car Call Button Attendant Up Light red intensity
CC Light Ctl	0	3	0		This configures the options for flashing car call lights: +1 = Flash Car Call Security, +2= Flash Attendant Annunciator Sequence
CC Off Blue	0	100	50	%	Car Call Off blue intensity

Table 10: CC & COP Lights					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
CC Off Bright	0	100	20	%	Car Call output off brightness for led
CC Off Color	0	15	15	color	Car Call Button Light Off Color 0 Based on RGB intensity parameters 1 Red 2 Orange 3 Yellow 4 Chartreuse 5 Green 6 Aquamarine 7 Cyan 8 Azure 9 Blue 10 Violet 11 Magenta 12 Rose 13 Rose white 14 Warm white 15 Cool white
CC Off Green	0	100	100	%	Car Call Off green intensity
CC Off Red	0	100	62.5	%	Car Call Off red intensity
CC On Blue	0	100	50	%	Car Call On blue intensity
CC On Bright	0	100	100	%	Car Call output on brightness for led
CC On Color	0	15	15	color	Car Call Button Light On Color 0 Based on RGB intensity parameters 1 Red 2 Orange 3 Yellow 4 Chartreuse 5 Green 6 Aquamarine 7 Cyan 8 Azure 9 Blue 10 Violet 11 Magenta 12 Rose 13 Rose white 14 Warm white 15 Cool white
CC On Green	0	100	100	%	Car Call On green intensity
CC On Red	0	100	62.5	%	Car Call On red intensity
CC Sec Blue	0	100	100	%	Car Call Security Light blue intensity
CC Sec Bright	0	100	100	%	Car Call Security Light brightness

Table 10: CC & COP Lights					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
CC Sec Color	0	15	15	color	Car Call Button Security Color 0 Based on RGB intensity parameters 1 Red 2 Orange 3 Yellow 4 Chartreuse 5 Green 6 Aquamarine 7 Cyan 8 Azure 9 Blue 10 Violet 11 Magenta 12 Rose 13 Rose white 14 Warm white 15 Cool white
CC Sec Green	0	100	0	%	Car Call Security Light green intensity
CC Sec Red	0	100	100	%	Car Call Security Light red intensity
Emer Lt Blue	0	100	0	%	Emergency light blue intensity
Emer Lt Bright	0	100	100	%	Emergency light brightness
Emer Lt Color	0	15	0	color	Emergency light Color 0 Based on parameters 1 Red 2 Orange 3 Yellow 4 Chartreuse 5 Green 6 Aquamarine 7 Cyan 8 Azure 9 Blue 10 Violet 11 Magenta 12 Rose 13 Rose white 14 Warm white 15 Cool white
Emer Lt Green	0	100	100	%	Emergency light green intensity
Emer Lt Red	0	100	75	%	Emergency light red intensity
Fire Lt Blue	0	100	50	%	Fire light blue intensity
Fire Lt Bright	0	100	100	%	Fire light brightness

Table 10: CC & COP Lights					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Fire Lt Color	0	15	0	color	Fire light Color: 0 Based on parameters 1 Red 2 Orange 3 Yellow 4 Chartreuse 5 Green 6 Aquamarine 7 Cyan 8 Azure 9 Blue 10 Violet 11 Magenta 12 Rose 13 Rose white 14 Warm white 15 Cool white
Fire Lt Green	0	100	100	%	Fire light green intensity
Fire Lt Red	0	100	62.5	%	Fire light red intensity
Med Lt Blue	0	100	100	%	Medical light blue intensity
Med Lt Bright	0	100	100	%	Medical light brightness
Med Lt Color	0	15	0	color	Medical light Color: 0 Based on parameters 1 Red 2 Orange 3 Yellow 4 Chartreuse 5 Green 6 Aquamarine 7 Cyan 8 Azure 9 Blue 10 Violet 11 Magenta 12 Rose 13 Rose white 14 Warm white 15 Cool white
Med Lt Green	0	100	0	%	Medical light green intensity
Med Lt Red	0	100	0	%	Medical light red intensity
OTS Lt Blue	0	100	0	%	Out of Service light blue intensity
OTS Lt Bright	0	100	100	%	Out of Service light brightness

Table 10: CC & COP Lights					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
OTS Lt Color	0	15	0	color	Out of Service light Color 0 Based on parameters 1 Red 2 Orange 3 Yellow 4 Chartreuse 5 Green 6 Aquamarine 7 Cyan 8 Azure 9 Blue 10 Violet 11 Magenta 12 Rose 13 Rose white 14 Warm white 15 Cool white
OTS Lt Green	0	100	40	%	Out of Service light green intensity
OTS Lt Red	0	100	100	%	Out of Service light red intensity

Table 11: HC & IR Call Lights					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
HC Off Bright	0	100	20	%	Hall Call Light Off Brightness. Select the brightness for LED hall call button when button is NOT pressed. Used only with GAL serial hall button fixtures.
HC On Brght	0	100	100	%	Hall Call Light On Brightness for LED hall call buttons. Used only with GAL serial hall button fixtures.
HCDn Off Blue	0	100	50	%	Hall Call Light off blue intensity. Used only with GAL serial hall button fixtures.
HCDn Off Brght	0	100	20	%	Hall call light off brightness for LED hall call buttons. Used only with GAL serial hall button fixtures.
HCDn Off Color	0	15	15	color	Select what color LED to illuminate on hall call button when button is NOT pressed. Used only with GAL serial hall button fixtures. 0 Based on parameters 1 Red 2 Orange 3 Yellow 4 Chartreuse 5 Green 6 Aquamarine 7 Cyan 8 Azure 9 Blue 10 Violet 11 Magenta 12 Rose 13 Rose white 14 Warm white 15 Cool white
HCDn Off Green	0	100	100	%	Hall Call Light off green intensity. Used only with GAL serial hall button fixtures.
HCDn Off Red	0	100	62.5	%	Hall Call Light off red intensity. Used only with GAL serial hall button fixtures.
HCDn On Blue	0	100	50	%	Hall call light on blue intensity. Used only with GAL serial hall button fixtures.
HCDn On Bright	0	100	100	%	Hall Call Light on brightness for LED hall call buttons. Used only with GAL serial hall button fixtures.

Table 11: HC & IR Call Lights					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
HCDn On Color	0	15	15	color	Hall Call Down On Light Color. Select what color LED to illuminate on hall call button when button is pressed. Used only with GAL serial hall button fixtures. 0 Based on parameters 1 Red 2 Orange 3 Yellow 4 Chartreuse 5 Green 6 Aquamarine 7 Cyan 8 Azure 9 Blue 10 Violet 11 Magenta 12 Rose 13 Rose white 14 Warm white 15 Cool white
HCDn On Green	0	100	100	%	Hall Call Light on green intensity. Used only with GAL serial hall button fixtures.
HCDn On Red	0	100	62.5	%	Hall Call Light on red intensity. Used only with GAL serial hall button fixtures.
HCUp Off Blue	0	100	50	%	Hall Call Up Light Off blue intensity
HCUp Off Brght	0	100	20	%	Hall Call output off brightness for led (higher number is brighter)
HCUp Off Color	0	15	15		Hall Call Button Up Light Off Color 0 Based on RGB intensity parameters 1 Red 2 Orange 3 Yellow 4 Chartreuse 5 Green 6 Aquamarine 7 Cyan 8 Azure 9 Blue 10 Violet 11 Magenta 12 Rose 13 Rose white 14 Warm white 15 Cool white
HCUp Off Green	0	100	100	%	Hall Call Up Light Off green intensity
HCUp Off Red	0	100	62.5	%	Hall Call Up Light Off red intensity
HCUp On Blue	0	100	50	%	Hall Call UP Light On blue intensity
HCUp On Bright	0	100	0	%	Hall Call output Up on brightness for led (higher number is brighter)

Table 11: HC & IR Call Lights					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
HCUp On Color	0	15	15	color	Hall Call Button Up Light On Color 0 Based on RGB intensity parameters 1 Red 2 Orange 3 Yellow 4 Chartreuse 5 Green 6 Aquamarine 7 Cyan 8 Azure 9 Blue 10 Violet 11 Magenta 12 Rose 13 Rose white 14 Warm white 15 Cool white
HCUp On Green	0	100	100	%	Hall Call Up Light On green intensity
HCUp On Red	0	100	62.5	%	Hall Call Up Light On red intensity
IR Color Ctrl	0	1	0	-	IR light color control: 0=IR Color, 1=HC Color until IR activated
IRDn Off Blue	0	100	50	%	Hall Call IR Dn Light Off blue intensity
IRDn Off Brght	0	100	20	%	Hall Call IR Dn Light Off brightness
IRDn Off Color	0	15	15	color	Hall Call IR Dn Light Off color 0 Based on parameters 1 Red 2 Orange 3 Yellow 4 Chartreuse 5 Green 6 Aquamarine 7 Cyan 8 Azure 9 Blue 10 Violet 11 Magenta 12 Rose 13 Rose white 14 Warm white 15 Cool white
IRDn Off Green	0	100	100	%	Hall Call IR Dn Light Off green intensity
IRDn Off Red	0	100	62.5	%	Hall Call IR Dn Light Off red intensity
IRDn On Blue	0	100	50	%	Hall Call IR Dn Light On blue intensity
IRDn On Bright	0	100	20	%	Hall Call IR Dn Light On brightness

Table 11: HC & IR Call Lights					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
IRDn On Color	0	15	15	color	Hall Call IR Dn Light On color 0 Based on parameters 1 Red 2 Orange 3 Yellow 4 Chartreuse 5 Green 6 Aquamarine 7 Cyan 8 Azure 9 Blue 10 Violet 11 Magenta 12 Rose 13 Rose white 14 Warm white 15 Cool white
IRDn On Green	0	100	100	%	Hall Call IR Dn Light On green intensity
IRDn On Red	0	100	62.5	%	Hall Call IR Dn Light On red intensity
IRUp Off Blue	0	100	50	%	Hall Call IR Up Light Off blue intensity
IRUp Off Brght	0	100	100	%	Hall Call IR Up Light Off brightness
IRUp Off Color	0	15	15	color	Hall Call IR Up Light Off color 0 Based on parameters 1 Red 2 Orange 3 Yellow 4 Chartreuse 5 Green 6 Aquamarine 7 Cyan 8 Azure 9 Blue 10 Violet 11 Magenta 12 Rose 13 Rose white 14 Warm white 15 Cool white
IRUp Off Green	0	100	100	%	Hall Call IR Up Light Off green intensity
IRUp Off Red	0	100	62.5	%	Hall Call IR Up Light Off red intensity
IRUp On Blue	0	100	50	%	Hall Call IR Up On blue intensity
IRUp On Bright	0	100	100	%	Hall Call IR Up On brightness

Table 11: HC & IR Call Lights					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
IRUp On Color	0	15	15	color	Hall Call IR Up On color 0 Based on parameters 1 Red 2 Orange 3 Yellow 4 Chartreuse 5 Green 6 Aquamarine 7 Cyan 8 Azure 9 Blue 10 Violet 11 Magenta 12 Rose 13 Rose white 14 Warm white 15 Cool white
IRUp On Green	0	100	100	%	Hall Call IR Up On green intensity
IRUp On Red	0	100	62.5	%	Hall Call IR Up On red intensity

Table 12: CB, VIP & HSec Call Lights					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
CB Off Blue	0	100	100	%	Hall Call CB Light Off blue intensity
CB Off Bright	0	100	20	%	Hall Call CB Light Off brightness
CB Off Color	0	15	0	color	Hall Call CB Light Off color 0 Based on parameters 1 Red 2 Orange 3 Yellow 4 Chartreuse 5 Green 6 Aquamarine 7 Cyan 8 Azure 9 Blue 10 Violet 11 Magenta 12 Rose 13 Rose white 14 Warm white 15 Cool white
CB Off Green	0	100	0	%	Hall Call CB Light Off green intensity
CB Off Red	0	100	0	%	Hall Call CB Light Off red intensity
CB On Blue	0	100	100	%	Hall Call CB Light On blue intensity
CB On Bright	0	100	100	%	Hall Call CB Light On brightness
CB On Color	0	15	0	color	Hall Call CB Light On color: 0 Based on parameters 1 Red 2 Orange 3 Yellow 4 Chartreuse 5 Green 6 Aquamarine 7 Cyan 8 Azure 9 Blue 10 Violet 11 Magenta 12 Rose 13 Rose white 14 Warm white 15 Cool white
CB On Green	0	100	0	%	Hall Call CB Light On green intensity
CB On Red	0	100	0	%	Hall Call CB Light On red intensity
HC Sec Blue	0	100	100	%	Hall call light blue intensity when on security. Used only with GAL serial hall button fixtures.
HC Sec Bright	0	100	100	%	Hall Call Security Brightness for Secured Floors

Table 12: CB, VIP & HSec Call Lights					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
HC Sec Color	0	15	15	color	Select what color to illuminate the hall buttons when the system is on security. Used only with GAL serial hall button fixtures. 0 Based on parameters 1 Red 2 Orange 3 Yellow 4 Chartreuse 5 Green 6 Aquamarine 7 Cyan 8 Azure 9 Blue 10 Violet 11 Magenta 12 Rose 13 Rose white 14 Warm white 15 Cool white
HC Sec Ctl	0	7	0	-	Hall call button security light. 1 = invert security, +2 = flash security, +4=Master Security Enabled
HC Sec Green	0	100	0	%	Hall call light green intensity when on security. Used only with GAL serial hall button fixtures.
HC Sec Red	0	100	100	%	Hall call light red intensity when on security. Used only with GAL serial hall button fixtures.
Vip Off Blue	0	100	0	%	Hall Call Vip Light Off blue intensity
Vip Off Bright	0	100	20	%	Hall Call Vip Light Off brightness
Vip Off Color	0	15	0	color	Hall Call Vip Light Off color 0 Based on parameters 1 Red 2 Orange 3 Yellow 4 Chartreuse 5 Green 6 Aquamarine 7 Cyan 8 Azure 9 Blue 10 Violet 11 Magenta 12 Rose 13 Rose white 14 Warm white 15 Cool white
Vip Off Green	0	100	40	%	Hall Call Vip Light Off green intensity
Vip Off Red	0	100	100	%	Hall Call Vip Light Off red intensity
Vip On Blue	0	100	0	%	Hall Call Vip Light On blue intensity
Vip On Bright	0	100	100	%	Hall Call Vip Light On brightness

Table 12: CB, VIP & HSec Call Lights					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Vip On Color	0	15	0	color	Hall Call Vip Light On color 0 Based on parameters 1 Red 2 Orange 3 Yellow 4 Chartreuse 5 Green 6 Aquamarine 7 Cyan 8 Azure 9 Blue 10 Violet 11 Magenta 12 Rose 13 Rose white 14 Warm white 15 Cool white
Vip On Green	0	100	40	%	Hall Call Vip Light On green intensity
Vip On Red	0	100	100	%	Hall Call Vip Light On red intensity

Table 13: System Options					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Auto Fault Dpy	0	1	0	-	Automatic Fault Display. Enable to automatically display a fault on the LCD screen.
CAN Baud Rate	0	1	0	bps	CAN Baud Rate. Set to zero and do not change. Special jobs uitilize a different baud rate for CAN bus. All devices need to be reconfigured for new rate. Can Baud Rate, 0=115.2K, 1=57.6K
Can Sync Count	0	7	4	count	CAN Sync Count. Frequency to update CAN Bus devices. Units are 1/4 seconds. It sets Synchronization Count in 250 millisecond increments
COM 1 Baud Rate	0	9	6	bps	Com 1 User Interface Baud Rate. Selects the bit rate of the COM 1 serial port. 0=2400 bps, 1=4800 bps, 2=9600 bps, 3=19200 bps, 4=38400 bps, 5=57600 bps, 6=115200 bps, 7=219254 bps, 8=226562.5 bps, 9=234375 bps.
Com 1 Port Sel	0	7	6	-	Com 1 Port Select. Selects the operation of COM 1 port. 0=Comm Diag, 1=Comm Debug, 2=Galcom,3=DL20,4=Galcom Wireless, 5=Galcom Ethernet, 6=Galcom Wireless Flow Control, 7=Galcom Ethernet Flow Control
Com 2 Baud Rate	0	9	3	bps	COM 2 User Baud Rate. Selects the bit rate of the COM 2 serial port. 0=2400 bps, 1=4800 bps, 2=9600 bps, 3=19200 bps, 4=38400 bps, 5=57600 bps, 6=115200 bps, 7=219254 bps, 8=226562.5 bps, 9=234375 bps.
Com 2 Port Sel	0	7	0	-	Com 2 Port Select. Selects the operation of COM 2 port. 0=Comm Diag, 1=Comm Debug, 2=Galcom,3=DL20,4=Galcom Wireless, 5=Galcom Ethernet, 6=Galcom Wireless Flow Control, 7=Galcom Ethernet Flow Control
CPU Tim Output	0	7	0	-	CPU Timing Output. The CPU has three test point pins that outputs timing signals depending upon the setting of this parameter. These are 5 Volt signals that can be monitored by an oscilloscope. 0=Z6 LED 1 second pulse, 1=Inctime, 2=GrpIO, 4=10 msec.
Drive Baud Rate	0	3	0	bps	Drive Baud Rate. 0=19200 (HPV-900, DSD-412, HPV-600 and Quattro Drives). 1=38400, 2=57600, 3=11500. (KEB Drives)
Drive Modbus	0	5	0	-	Drive Modbus protocol. 0-5 = N1, N2, E1, E2, O1, O2 (Always 8 data bits, parity, stop bits). Used for Delta drive.
Drv Update Rate	0	2	0	-	Drive Command Update Rate. 0=10 msec (HPV-900, DSD-412, HPV-600 and Quattro Drives), 1=15 msec, 2=20 msec. Rate at which commands are sent to the drive.
EE Memory Type	0	1	0	-	EE Memory Type. Selects the type of memory chip used with the TS-5600 CPU. 0=STK16C88 1=STK16C68. Not used with GALX-1100AN CPU board
Encoder Baud	0	1	0	bps	Encoder CAN Open Baud Rate. 0=250K, 1=125K bits per second.

Table 13: System Options					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
Encoder Intrvl	1	5	3	-	Encoder Interval. Defines the intervals for sampling the encoder reads for calculating speed. Default value of 3 will work on most jobs. For cars with distance feedback from pulses on a tape selector, a value of 5 will work best..
Encoder NodeID	1	127	63	-	Encoder Node ID. Selects the Node ID for the CAN Open encoder. Must be set to for the specific vendor's encoder (also see encoder type): Turck = 63, Dynapar = 1, Wachendorff = 127. Not used when Encoder Type = 4 (Tape Selector)
Encoder Sample	2	10	10	-	Encoder Samples. Determines the samples used to calculate the speed from the encoder. Default values should work in all jobs.
Encoder Type	0	4	0	-	Encoder Type. Selects type of encoder feedback used. 0=cons file setting, 1 = Turck CAN Open Encoder, 2 = Dynapar CAN Open Encoder, 3 = Wachendorff CAN Open Encoder, 4 = Selector Tape
Exclusion FLT 1	0	Max Faults	0	fault	Exclusion fault 1: Set to fault code number. This prevents faults from being recorded in the fault log. It should only be set for nuisance and noncritical faults. Controller stills goes through all the logic for each fault code except, a call is not recorded in the fault log
Exclusion FLT 2	0	Max Faults	0	fault	Exclusion fault 2: Set to fault code number. This prevents faults from being recorded in the fault log. It should only be set for nuisance and noncritical faults. Controller stills goes through all the logic for each fault code except, a call is not recorded in the fault log
Exclusion FLT 3	0	Max Faults	0	fault	Exclusion fault 3: Set to fault code number. This prevents faults from being recorded in the fault log. It should only be set for nuisance and noncritical faults. Controller stills goes through all the logic for each fault code except, a call is not recorded in the fault log
Exclusion FLT 4	0	Max Faults	0	fault	Exclusion fault 4: Set to fault code number. This prevents faults from being recorded in the fault log. It should only be set for nuisance and noncritical faults. Controller stills goes through all the logic for each fault code except, a call is not recorded in the fault log
Exclusion FLT 5	0	Max Faults	0	fault	Exclusion fault 5: Set to fault code number. This prevents faults from being recorded in the fault log. It should only be set for nuisance and noncritical faults. Controller stills goes through all the logic for each fault code except, a call is not recorded in the fault log
Exclusion FLT 6	0	Max Faults	0	fault	Exclusion fault 6: Set to fault code number. This prevents faults from being recorded in the fault log. It should only be set for nuisance and noncritical faults. Controller stills goes through all the logic for each fault code except, a call is not recorded in the fault log

Table 13: System Options					
Field Variable	**Min**	**Max**	**Initial**	**Units**	**Description**
KEB Dpy Type	0	1	0	-	KEB Display Type. 0 = Standard Red LED Display, 1 = LCD Display. Power must be cycled for change in serial protocol.
Low Bat Cap Lev	0	101	50	%	For UPS systems, this is the battery level at which the controller will fault out due to Low Battery Capacity.
Low Door Volt	0	600	198	Vrms	Low Door Voltage. Settings for Line Voltage Monitor Board. It sets the value of voltage for "Door Low Voltage Fault" to be triggered.
Low Line Volt	0	600	198	Vrms	Low Line Voltage. Settings for Line Voltage Monitor Board. It sets the value of voltage for a 'Low Line Voltage Fault' to be triggered.
Password	0	9999	0	-	Password code to modify and adjust field variables
Pword Time-out	0	3200	300	sec	Password Time-out. The amount of inactive time for the LCD to lock out the field variables.
RS485 COM Baud	0	6	0	bps	RS485 COM Baud Rate. 0=2400, 1=4800, 2=9600, 3=19.2K, 4=38.4K, 5=57.6K and 6=115.2K bits per second.
Safe Test Day	1	31	0	day	Safety Test Day.
Safe Test Month	1	12	0	month	Safety Test Month.
Safe Test Year	2000	2999	0	year	Safety Test Year.
Service UPS	0	1	0	-	Service UPS mode. Turning this parameter disables UPS faults. It should only be used in Construction mode or while servicing the UPS
UPS Baud Rate	0	3	2	bps	UPS baud rate: 0=2400,1=4800,2=9600,3=19200
Video Time out	0	3200	0	sec	Video Time-out. Turn off the machine room video after this timer times out. This function is disabled when set to zero.

7.2 Safety Processor Adjustable Variables

Table 14: Safety Processor Adjustable Variables

Field Variables	Min	Max	Initial	Units	Description
Short Floor	0	3	0	-	Short Floor. This parameter informs the safety processor that the car can be on the second floor from the terminal landing while the terminal limits are active. 0=none, 1=Top, 2=Bot, 3=Both
2 Stop	0	1	0		2 Stop. Set to 1 if this car travels to only two landings. This parameter tells the Safety Processor that there are no middle door locks.
Buffer Type	0	1	0	-	Buffer Type. This parameter is set to 1 when there is a reduced stroke buffer and enables the use of the ETU and ETD verification limits. This parameter must match the jumper setting for the PAL on the 1102 board and the job configuration setting for reduced stroke buffer in the configuration file. If all three do not match, the car is not allowed to run.
Can Baud Rate	0	1	0	bps	Can Baud Rate. Set the baud rate for the CAN bus. 0=115.2K, 1=57.6K.
Comm Chk Dis	0	1	0	-	Communications Check. This parameter disables the Can Bus communications check. This is variable allows a new Safety Processor Board to be used on older GALaxy I or II controllers that did not use Can Bus communications. On GALaxy III controllers, the main CPU must have Can Bus communications.
Control Type	0	2	0	-	Control Type. Type of controller used. 0=Hydro, 1=Traction Non-Distance Feedback, 2=Traction Distance Feedback.
DT Count	0	10000	12	count	DT Count. Number of pulse count after the DT limit is hit where the slowdown velocity check is made. Not used for GALaxy IV.
DTS Velocity	0	1600	200	fpm	Down Emergency Terminal Slowdown Velocity. Maximum velocity to hit the down terminal slowdown limit. Hitting the limit at a higher velocity will cause the Safety Processor board to shut the car down from a velocity error. For cars with speeds greater than 200 fpm.
Encoder Dir	0	1	0	-	Encoder Direction. Determines if rotation for the up direction is clockwise or counterclockwise. 0 = CW, 1=CCW.
Encoder PPR	10	18000	2048	PPR	Encoder PPR. Pulses Per Revolution of the Encoder.
Encoder RPM	2.5	1800	105	RPM	Encoder RPM. Revolutions per Minute of the Encoder.
Encoder Type	0	4	0	-	Encoder Type. Type of feedback used by the Safety Processor to calculate the car’s velocity. 0=Tape, 1=Governor, Encoded Tape, 3=Governor Pulses, 4= Incremental Encoder.

Table 14: Safety Processor Adjustable Variables					
Field Variables	**Min**	**Max**	**Initial**	**Units**	**Description**
ETS Down Vel	0	1600	200	fpm	Emergency Terminal Slowdown Down (ETD) Velocity. Maximum velocity to hit the down terminal slowdown limit. Hitting the limit at a higher velocity than set by this parameter will cause the Safety Processor board to shut the car down from a velocity error. This limit is only used for Reduced Stroke Buffer.
ETS Setup Mode	0	2	0	-	ETS Setup Mode. 0 = Normal operation. The PAL parameters for ETS Up and Down Velocities cannot be modified. The ETSLD TST jumper on the 1102 board must match the ETS Setup Mode parameter for the car to run. 1 = PAL velocity setup mode. Parameters can be modified but the ETSLD TST jumper must also be place on 1102 board. 2 = Power up debug mode.
ETS Up Vel	0	1600	200	fpm	Emergency Terminal Slowdown Up (ETU) Velocity. Maximum velocity to hit the up terminal slowdown limit. Hitting the limit at a higher velocity than set by this parameter will cause the Safety Processor board to shut the car down from a velocity error. This limit is only used for Reduced Stroke Buffer
Insp Velocity	0	200	140	fpm	Inspection Velocity. Maximum velocity the car is allowed to run on inspection.
Leveling Vel	0	200	140	fpm	Leveling Velocity. Maximum velocity the car is allowed to run while leveling with the door open.
PAL ETS Dn Vel	0	1600	200	fpm	PAL ETSLD Down Velocity. When the car is setup with reduced stroke buffer, if the car hits the Down ETS limit at a velocity greater than this value, the PAL will drop the RUN and Brake contactors to stop the car. See also Buffer Type). Note: This value is entered in fpm but is recalculated in pulses per 30 msec for the PAL device. The value may be changed to the nearest valid fpm after entered.
PAL ETS Up Vel	0	1600	200	fpm	PAL ETSLD Up Velocity. When the car is setup with reduced stroke buffer, if the car hits the Up ETS limit at a velocity greater than this value, the PAL will drop the RUN and Brake contactors to stop the car. See also Buffer Type). Note: This value is entered in fpm but is recalculated in pulses per 30 msec for the PAL device. The value may be changed to the nearest valid fpm after entered.
Pulse Flt Tmr	1	10	2	sec	Pulse Count Fault Delay Time. Time delay to detect that the selector pulses have stopped.
Pulses Per Ft	1	3200	16	ppf	Pulses Per Foot. Number of pulses in one foot.
Rear Doors	0	1	0	-	Rear Door. Indicates that the car has rear doors and the Safety Processor should verify the rear door gate and locks.
Soft Stop Time	1	10	1	sec	Soft Start Timer. During a soft stop, the speed command is brought to zero, then the brake is dropped and finally the run outputs are turned off. This timer is used to keep the run outputs from timing out during a soft stop.

Table 14: Safety Processor Adjustable Variables					
Field Variables	**Min**	**Max**	**Initial**	**Units**	**Description**
Speed Chk Dis	0	1	0	-	Speed Check. If the car speed is 150 fpm or less, the Safety Processor Speed Check can be disabled from this variable. If the speed is greater than 150 fpm, the variable can still be set but the speed check is made anyway. The speed check function, verifies the car speed on inspection, in leveling with the door open and when the UT, DT, UTS and DTS limits are hit. The Safety Processor will also shut the car down if it stops getting pulses while the car is running (has an up or down run signal).
Top Speed	25	2000	200	fpm	Top Speed or contract speed of the car.
UMotion Ck Dis	0	1	0	-	Unintended motion check, 0=motion check 1=Disable unintended motion check
UT Count	0	10000	12	count	UT Count. Number of pulse count after the UT limit is hit where the slowdown velocity check is made. Not used for GALaxy IV.
UTS Velocity	0	1600	200	fpm	Up Emergency Terminal Slowdown Velocity. Maximum velocity to hit the up terminal slowdown limit. Hitting the limit at a higher velocity will cause the Safety Processor board to shut the car down from a velocity error. For cars with speeds greater than 200 fpm.
Vel Flt Timer	0.1	0.5	0.18	sec	Velocity Fault Delay Time. Time delay after a velocity fault to shut the car down.

7.3 NTS Processor Adjustable Variables

Table 14: NTS Processor Adjustable Variables					
Field Variables	**Min**	**Max**	**Initial**	**Units**	**Description**
Can Baud Rate	0	1	0	bps	Can Baud Rate. Set the baud rate for the CAN bus. 0=115.2K, 1=57.6K.
Debug Mode	0	1	0	-	Debug Mode
DT Velocity	0	1600	350	fpm	Down Terminal Slowdown Velocity. Maximum velocity to hit the down terminal slowdown limit. Hitting the limit at a higher velocity will cause the NTS Processor to the NTSD output to the drive. Removal of the signal will cause the drive to execute an emergency timed slowdown until the car reaches leveling speed. The car will stop when the terminal landing is reached.
DT1 Velocity	0	1600	450	fpm	Down Terminal 1-6 Slowdown Velocity. Maximum velocity to hit the down terminal slowdown limit. Hitting the limit at a higher velocity will cause the NTS Processor to the NTSD output to the drive. Removal of the signal will cause the drive to execute an emergency timed slowdown until the car reaches leveling speed. The car will stop when the terminal landing is reached.
DT2 Velocity	0	1600	550	fpm	Down Terminal 1-6 Slowdown Velocity. Maximum velocity to hit the down terminal slowdown limit. Hitting the limit at a higher velocity will cause the NTS Processor to the NTSD output to the drive. Removal of the signal will cause the drive to execute an emergency timed slowdown until the car reaches leveling speed. The car will stop when the terminal landing is reached.
DT3 Velocity	0	1600	650	fpm	Down Terminal 1-6 Slowdown Velocity. Maximum velocity to hit the down terminal slowdown limit. Hitting the limit at a higher velocity will cause the NTS Processor to the NTSD output to the drive. Removal of the signal will cause the drive to execute an emergency timed slowdown until the car reaches leveling speed. The car will stop when the terminal landing is reached.
DT4 Velocity	0	1600	750	fpm	Down Terminal 1-6 Slowdown Velocity. Maximum velocity to hit the down terminal slowdown limit. Hitting the limit at a higher velocity will cause the NTS Processor to the NTSD output to the drive. Removal of the signal will cause the drive to execute an emergency timed slowdown until the car reaches leveling speed. The car will stop when the terminal landing is reached.
DT5 Velocity	0	1600	850	fpm	Down Terminal 1-6 Slowdown Velocity. Maximum velocity to hit the down terminal slowdown limit. Hitting the limit at a higher velocity will cause the NTS Processor to the NTSD output to the drive. Removal of the signal will cause the drive to execute an emergency timed slowdown until the car reaches leveling speed. The car will stop when the terminal landing is reached.

Table 14: NTS Processor Adjustable Variables					
Field Variables	**Min**	**Max**	**Initial**	**Units**	**Description**
DT6 Velocity	0	1600	950	fpm	Down Terminal 1-6 Slowdown Velocity. Maximum velocity to hit the down terminal slowdown limit. Hitting the limit at a higher velocity will cause the NTS Processor to the NTSD output to the drive. Removal of the signal will cause the drive to execute an emergency timed slowdown until the car reaches leveling speed. The car will stop when the terminal landing is reached.
Encoder PPR	10	20000	2048	PPR	Encoder PPR. Pulses Per Revolution of the Encoder.
Encoder RPM	1	3000	1170	RPM	Encoder RPM. Revolutions per Minute of the Encoder.
Encoder Type	0	1	0	-	Encoder Type. Type of feedback used by the Safety Processor to calculate the car's velocity. 0=Tape, 1=Motor Encoder.
Top Speed	0	1600	350	fpm	Top Speed or contract speed of the car.
UT Velocity	0	1600	350	fpm	Up Terminal Slowdown Velocity. Maximum velocity to hit the down terminal slowdown limit. Hitting the limit at a higher velocity will cause the NTS Processor to the NTSD output to the drive. Removal of the signal will cause the drive to execute an emergency timed slowdown until the car reaches leveling speed. The car will stop when the terminal landing is reached.
UT1 Velocity	0	1600	450	fpm	Up Terminal 1-6 Slowdown Velocity. Maximum velocity to hit the down terminal slowdown limit. Hitting the limit at a higher velocity will cause the NTS Processor to the NTSD output to the drive. Removal of the signal will cause the drive to execute an emergency timed slowdown until the car reaches leveling speed. The car will stop when the terminal landing is reached.
UT2 Velocity	0	1600	550	fpm	Up Terminal 1-6 Slowdown Velocity. Maximum velocity to hit the down terminal slowdown limit. Hitting the limit at a higher velocity will cause the NTS Processor to the NTSD output to the drive. Removal of the signal will cause the drive to execute an emergency timed slowdown until the car reaches leveling speed. The car will stop when the terminal landing is reached.
UT3 Velocity	0	1600	650	fpm	Up Terminal 1-6 Slowdown Velocity. Maximum velocity to hit the down terminal slowdown limit. Hitting the limit at a higher velocity will cause the NTS Processor to the NTSD output to the drive. Removal of the signal will cause the drive to execute an emergency timed slowdown until the car reaches leveling speed. The car will stop when the terminal landing is reached.

Table 14: NTS Processor Adjustable Variables					
Field Variables	**Min**	**Max**	**Initial**	**Units**	**Description**
UT4 Velocity	0	1600	750	fpm	Up Terminal 1-6 Slowdown Velocity. Maximum velocity to hit the down terminal slowdown limit. Hitting the limit at a higher velocity will cause the NTS Processor to the NTSD output to the drive. Removal of the signal will cause the drive to execute an emergency timed slowdown until the car reaches leveling speed. The car will stop when the terminal landing is reached.
UT5 Velocity	0	1600	850	fpm	Up Terminal 1-6 Slowdown Velocity. Maximum velocity to hit the down terminal slowdown limit. Hitting the limit at a higher velocity will cause the NTS Processor to the NTSD output to the drive. Removal of the signal will cause the drive to execute an emergency timed slowdown until the car reaches leveling speed. The car will stop when the terminal landing is reached.
UT6 Velocity	0	1600	950	fpm	Up Terminal 1-6 Slowdown Velocity. Maximum velocity to hit the down terminal slowdown limit. Hitting the limit at a higher velocity will cause the NTS Processor to the NTSD output to the drive. Removal of the signal will cause the drive to execute an emergency timed slowdown until the car reaches leveling speed. The car will stop when the terminal landing is reached.
Velocity Dir	0	1	0	-	Velocity Direction. Used to invert the direction of the NTS velocity. 0=Normal, 1=Invert.

7.4 APS Selector Adjustable Variables

Table 15: APS Selector Adjustable Variables					
Field Variables	**Min**	**Max**	**Initial**	**Units**	**Description**
Top Speed	0	1600	200	Fpm	Top Speed or Contract Speed of Car.
Number Valid FL	2	Top Floor	2	-	Number of Valid Floors. The number of floors with openings that require a door zone.
Num of Limits	1	4	1	-	Number of Limits. The number of slowdown limits are dependent on the speed of the car. See the slowdown table below.
UT/DT Dist	0	32000	0	inches	UT/DT Dist. The UT and DT distance from the top and bottom floor, respectively in inches. When this value is set to zero, the slowdown table below is used.
UT1/DT1 Dist	0	32000	0	inches	UT1/DT1 Dist. The UT1 and DT1 distance from the top and bottom floor, respectively in inches. When this value is set to zero, the slowdown table below is used.
UT2/DT2 Dist	0	32000	0	inches	UT2/DT2 Dist. The UT2 and DT2 distance from the top and bottom floor, respectively in inches. When this value is set to zero, the slowdown table below is used.
UT3/DT3 Dist	0	32000	0	inches	UT3/DT3 Dist. The UT3 and DT3 distance

Table 15: APS Selector Adjustable Variables					
Field Variables	**Min**	**Max**	**Initial**	**Units**	**Description**
					from the top and bottom floor, respectively in inches. When this value is set to zero, the slowdown table below is used.
Can Baud Rate	0	1	0	-	Can Baud Rate for the SPCan Channel. 0 = 115.2K baud and 1 = 57.6K baud.
Debug	0	7	0	-	Debug Mode. This is a software parameter use to select programmed debug modes. This parameter does not change the operation of the device but allows software specific error codes.

Table 16: Velocity Slowdown Table				
FPM	**UT/ DT**	**UT1/ DT1**	**UT2/ DT2**	**UT3/ DT3**
50	5”			
75	9”			
100	12”			
150	21”			
200	30”			
250	45”			
300	25”	50”		
350	33”	65”		
400	41”	83”		
450	51”	102”		
500	56”	113”		
600	52”	105”	157”	
700	70”	140”	209”	
800	67”	135”	202”	269”
900	77”	153”	230”	306”

Section 8 - Quickstart

Appendix A – Quick Start Guide

Warning: When performing any of the following tests, the mechanic should follow the required precautions and procedures set forth in the local and national elevator codes.

Controller Setup

Check the power requirement and voltages according to the job schematics. Make the following jumper connections on the 1102 Main I/O board:

Left side of board	Right side of board
S10 – GOV	HSS – FFS
GOV – TF	FFS – CST
TF – BF	CST – UN
BF – PS	UN – DN
PS – HSS	DN – INS
RG7 – RG5	

Toggle Switches
Door Lock Bypass – Down (Bypassed)
Gate Bypass – Down (Bypassed)
Independent – Down
Auto Door – Down
Stop Switch – Up (Run)
Inspection – Down

Run Bug
Inspection Common – INS
Inspection Up – IU
Inspection Down – ID
Inspection Enable – IEN

Adjustable Variables->Car Motion
- Top Speed (set to contract speed)
- Inspect Speed (set to 25 fpm)
- Encoder PPR (Tape – set to 64 PPR, tapeless set to 10,000)
- Encoder RPM (Tape – set to the fpm value of contract speed and set Encoder Type = 4, Tapeless – set to governor rpm)
- Motor RPM (set to motor rpm)

Adjustable Variables->System Options
- Encoder Type = 4 (Tape Selector Feedback)

Adjustable Variables->Safety Processor
- Top Speed (contract speed fpm)
- Encoder RPM (Set to Motor RPM)
- Encoder PPR (Set to Motor Encoder PPR)
- Encoder Type (Set to 4 = Incremental Encoder)
- Control Type (Set to 2=Tract DF)
- 2 Stop (0 = Mult-Stop)
- Rear Doors (0=Front only, 1=Rear)
- UTS Velocity (Set to top speed)
- DTS Velocity (Set to top speed)
- Insp Velocity (Set to 140)
- Leveling Vel (Set to 140)
- ETS Up Vel(Set to top speed) (only used for reduced stroke buffer)
- ETS Down Vel (Set to top speed) (only used for reduced stroke buffer)
- Soft Stop Time (Set to 3)

Adjustable Variables->NTS Processor
- Top Speed (contract Speed)
- UT Velocity (top speed)
- DT Velocity (top speed)
- UT1 Velocity (top speed)
- DT1 Velocity (top speed)
- Encoder Type (Tape=0, Tapeless – set to 1=Motor Enc)
- Encoder PPR (Tape=0, Tapeless – Motor Encoder PPR)
- Encoder RPM (Tape=0, Tapeless – Motor RPM)

Quattro AC/PM Drive Quickstart

Drive A1 Submenu	
CONTRACT CAR SPEED	Contract ft/min
CONTRACE MTR SPEED	Nameplate Motor RPM
ENCODER PULSES	Encoder PPR
S-Curve A2 Submenu	
ACCEL RATE 0	7.99 fps^2
DECEL RATE 0	7.99 fps^2
ACCEL JERK IN 0	0.00 fps^3
ACCEL JERK OUT 0	0.00 fps^3
DECEL JERK IN 0	0.00 fps^3
DECEL JERK OUT 0	0.00 fps^3
DECEL RATE 4/NTSD DECEL	5.00 fps^2
DECEL JERK IN 4/NTSD JERK IN	6.00 fps^3
DECEL JERK OUT 4/NTSD JERK OUT	6.00 fps^3
Power Convert A4 Submenu	
INPUT L-L VOLTS	RMS Line-Line Voltage Applied to Drive
UV ALARM LEVEL	80
Motor A6 Submenu	
MOTOR ID	PM
RATED MTR POWER	Nameplate HP
RATED MTR VOLTS	Nameplate Voltage
RATED MTR CURRENT	Nameplate Amps
MOTOR POLES	Nameplate # of Poles
RATED MTR SPEED	Nameplate RPM
User Switches C1 Submenu	
SPD COMMAND SRC	SERIAL
RUN COMMAND SRC	SERIAL+EXTERN
SERIAL MODE	MODE 1
FAULT RESET	SERIAL
NTSD MODE	EXTERNAL
CONT CONFIRM SRC	EXTERNAL TB
Logic Inputs C2 Submenu	
LOGIC INPUT 1 TB1-1	CONTACT CFRM
LOGIC INPUT 2 TB1-2	CTR PWR SENSE
LOGIC INPUT 3 TB1-3	NO FUNCTION
LOGIC INPUT 4 TB1-4	DRIVE ENABLE
LOGIC INPUT 5 TB1-5	RUN UP
LOGIC INPUT 6 TB1-6	RUN DOWN
LOGIC INPUT 7 TB1-7	NTSD INPUT 1
LOGIC INPUT 8 TB1-8	NO FUNCTION
LOGIC INPUT 9 TB1-9	FAULT RESET
Logic Outputs C3 Submenu	
LOGIC OUTPUT 1 TB1-25	NOT FAULT
RELAY COIL 1	FAULT
RELAY COIL 2	SPEED REG RLS

Encoder Learn Procedure PM Machine:

(section 3.3.4 in GALaxy IV Manual)

- Set inspection speed to 0
- Lift one wire on main brake
- ROTOR ALIGN U10 ->
- ALIGNMENT METHOD -> AUTO ALIGN
- BEGIN ALIGNMENT -> ON RUN
- Inspection Up or Down Run

Motor Learn:

(Section 3.4.7 in GALaxy IV Manual)

- Inspection Speed to 0
- Lift one wire on main brake
- AUTOTUNE SEL U12 ->
- AUTOTUNE SELECT -> ON RUN
- Inspection Up or Down Run

Inertia Learn:

Car ***must be balanced*** and able to run high speed.

Overspeed:

See OVERSPEED MULT & OVERSPEED TEST in drive manual.

Mechanical Formulas:

Torque in lb/ft = HP x 5250 /RPM

HP = Torque x RPM /5250

RPM = 120 x Frequency / # of Poles

Synchronous Speed, Frequency & Number of Poles:

RPM = 120 x Freq /# of Poles

Freq =# of Poles x RPM /120

Poles = 120 x Freq /RPM

Horsepower, Torque & Speed:

HP = Torque x RPM /5250

Torque = 5250 x HP/RPM

RPM = 5250 x HP /Torque

Appendix B - Acceptance Testing

Learning Hoistway & Testing

Before learning the hoistway or attempting any tests you must make sure that the following velocities all match while on inspection:

Dmd Vel	CPU Demand Velocity
Enc Vel	Encoder Velocity
Drv Vel	Drive Velocity
SPB Vel	Safety Processor Velocity
NTS Vel	NTS Processor Velocity

These velocities can be monitored at “Elevator Status”->Enter->Scroll Up or Down until you find each of the following: DMD, VEL, SPB VEL and NTS VEL.

The Drive Velocity can be monitored in the Trace I/O Screen if you have a monitor or in drive parameter SPEED FEEDBACK D1.

It is useful to confirm the velocity readings by using a handheld tachometer on the machine.

The encoder pulses must also be verified. On the same screen where you see DMD & VEL (above) you will also see DP=, this number should rise as the car goes up and should decrease as the car goes down. If this is reversed then you must correct the phasing using the SA SB jumpers on the right side of the main board.

Warning: When performing any of the following tests, the mechanic should follow the required precautions and procedures set forth in the local and national elevator codes.

The following test procedures are written to show how to perform various tests but are not intended to circumvent any procedure mandated by the elevator code.

Inspect and prepare the car according to the “Elevator Industry Inspection Handbook.”

If there is any uncertainty about performing this tests with a GALaxy controller, please call G.A.L. toll free at 1-(877) 425-7778 for free technical assistance.

Learn Hoistway:

- “Elevator Setup”->”Learn Hoistway”, follow the prompts (AUTO is recommended).
- The hoistway must be learned with no faults.
- After the Hoistway Learn put the car on AUTO, the car will level down to the top floor and you can try some one floor test runs and then some high speed test runs.
- If the car is running satisfactorily please check the above velocities again but at high speed.

Learn Limit Velocities:

- Go to “Elevator Setup”->”Learn Limit Velocities” and follow the prompts.
- Be sure to press “Enter” when asked to Preset Limit Velocities, this will set all limits to contract speed before learning the limits. Failure to do so may prevent the limits from being learned properly.
- After the limits are learned please verify that they were learned properly, check the following:
    - “Elevator Setup”->DT/UT, DT1/UT1, DTS/UTS Slowdown Clamps.
    - “Adjustable Variables”->”NTS Proc Adj Vars”-> UT/DT/UT1/DT1 Velocities.
    - “Adjustable Variables”->”Safety Proc Adj Vars”-> UTS/DTS Velocity.
    - These values can be further adjusted manually if necessary.

Inertia Learn:

- Place balanced load in the car.
- Set the drive display to EST INERTIA D1.
- Run the car from the top floor to the bottom floor and then back to the top at 100% contract speed.
- Observe and record the value of EST INERTIA on both the up and the down run.
- Average the two values together and enter that value in the parameter INTERTIA A1.

NTS (Normal Terminal Stop) Test:

- Verify C1 NTSD MODE = EXTERNAL.
- Verify C2 LOGIC INPUT 7 TB1-7 = NTSD INPUT 1.
- Adjust DECEL RATE 4 (NTSD Deceleration), DECEL JERK IN 4 (NTSD Jerk In), DECEL JERK OUT 4 (NTSD Jerk Out) and the target speed NTSD TARGET SPD.
- Verify NTS actually works by running the car and tripping the NTSD signal from the controller LCD display. Go to “Elevator Setup”->”Normal Terminal SD Test”, hit Enter for NTS Trip and follow the directions on the display. This is only to verify proper operation prior to actual testing at the terminal limits of the hoistway.
- Position the car in the middle of the hoistway.
- Go to “Elevator Setup”->”Normal Terminal SD Test”->Select Up to run NTS test then select the run

direction (Select UP/DOWN). Press Enter to continue (elevator must be on inspection) and follow the prompts.

- If the car is not in the correct position, press “Enter” to position the car and then once the car is in position, press “Enter” to run the test.
- The car will run toward the terminal landing and will decelerate sharply and come to a stop when the limit is hit at high speed.
- If the car does not decelerate fast enough adjust parameter Adjust DECEL RATE 4 (NTSD Deceleration) and DECEL JERK IN 4 (NTSD Jerk In) in the drive and repeat the test.
- The NTS fault can be verified in the “Fault” menu.

ETS (Emergency Terminal Stop) Test:

- Position the car in the middle of the hoistway.
- Go to “Elevator Setup”->”Emergency Terminal SD Test”->Select UP/DOWN and press Enter to continue (elevator must be on inspection) and follow the prompts.
- If the car is not in the correct position, press “Enter” to position the car and then once the car is in position, press “Enter” to run the test.
- When the ETS limit is hit, the brake and the drive will be turned off and the car will stop quickly.
- The ETS fault can be verified in the “Fault” menu.

Normal Brake Test:

- Adjust the Top Speed parameter in “Car Motion” menu to select the speed of the car during the brake test.
- Go to “Elevator Setup”->”Normal Brake Test” and follow the prompts to activate the test and then select to run the test in the up or down direction.
- If the car is not in the correct position, press “Enter” to position the car and then once the car is in position, press “Enter” to run the test.
- This will accelerate the car to high speed and then drop the Normal Brake. The Emergency Brake will drop after 5 seconds. If the job has a Gripper it will stay up (open) and not drop at all.
- Reset the Top Speed parameter to contract speed if it had been modified.

Em Brake/Gripper Test:

- Jump RG5 & RG7
- Place jumper on TST1, to the right of the two brake terminal blocks (dead center of the bottom edge of the GALX-1102 main board).
- Adjust the Top Speed parameter in “Car Motion” menu to select the speed of the car during the brake test.
- Go to “Elevator Setup”->”Emergency Brake Test” and follow the prompts to activate the test and then select to run the test in the up or down direction.
- If the car is not in the correct position, press “Enter” to position the car and then once the car is in position, press “Enter” to run the test.
- This will accelerate the car to high speed and then drop the Emergency Brake / Rope Gripper. The main brake will drop after 5 seconds.
- Reset the Top Speed parameter to contract speed if it had been modified.

Ascending Overspeed (Governor Trip test):

- Position the car prior to the test far enough from the terminal landing to perform the overspeed without hitting the terminal landing.
- Set OVERSPEED MULT to 125% and OVERSPEED TEST to YES.
- Go to “Elevator Setup”->”Overspeed Test”. Start the overspeed test by selecting a direction to run. A call will be placed in the direction selected.
- Hit the “Mode” button to safely abort the test.
- The drive and the controller parameters are active for only one run.

Unintended Motion:

- Position the car prior to the test.
- The hoistway doors and car gate should be open, and the car must be on Inspection for this test.
- On the Brake Relay Board (GALX-1105AN) place both the BRK & RUN slide switches to TEST.
- Go to “Elevator Setup”->”Lift Brake On Inspect” and follow the prompts.

- The car will drift up if the car is empty at the bottom of the shaft, or drift down if the car is at the top with a full load.

Buffer Test

- Position the car in the middle of the hoistway.
- From the Controller's LCD display, select the "Elevator Setup" menu and then select "Car Buffer Test" or Counterweight Buffer Test".
- Follow the menu directions to place the car on inspection, turn off automatic door and turn on the Independent switch.
- The test also cannot be started from a terminal landing. If the car is at a terminal landing, the LCD display will show "To position the car press Enter". Pressing "Enter" will place a car call at the appropriate position in the hoistway. If the car is already positioned properly for the run, the display will give the option to position the car or the skip to the next step.
- Once the car is located in the correct starting position, select "Run Buffer Test". When the "Enter" button is pressed, the car's position will be modified internally to the top of the hoistway for a car buffer test or to the bottom of the hoistway for a counterweight buffer test. The car will then run high speed to the appropriate buffer.
- While the car is in motion, the LCD display will change to "Press Enter Button to Cancel Buffer Test". Pressing the "Enter" button will cause the car to execute an emergency slowdown.
- After the test is complete, place the car on inspection and inspect the car and buffer.
- **Remove load weights and untie the car or counterweight safeties if previously tied.**
- Return the car to automatic operation.

Appendix C – Reset Gripper Fault or Emergency Brake Fault

To reset a rope gripper fault, first verify that the cause of the rope gripper fault has been corrected and then follow the directions below:

1. Place the car on machine room inspection.
2. From the LCD Interface, select the Elevator Setup menu and press the enter button.
3. Use the up or down button to select the "Reset Rope Gripper" menu and press enter.
4. Follow the directions on the screen to press and hold the enter button to reset the gripper.

The enter button must be held for approximately 10 seconds. If the car moves unexpectedly within the 10 second delay time, releasing the enter button will cause the gripper to re-engage. When the gripper is fully reset the screen will display "Gripper is Reset".