Schindler 3300 Control System Training

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<u>**Section 1 – Overview**</u>

1.1 – System Overview

The 3300 control system is a low-rise, low speed Machine Room Less (MRL) elevator system that utilizes special belts in place of hoist ropes. The motor, brakes, and drive, as well as other components are located in the hoistway. See picture below of the machine and drive in the hoistway:

Equipment at the Top of the Hoistway

The motion controller for the system is all contained in the drive, but at the top floor landing there is what is referred to as an "inspection and test panel." Schindler refers to the panel as the "LDU", or Landing Door Unit.

NOTE: *The LDU will only be located in a different location if the top floor is not available, in which case it will be located at the floor below the top. There is an option for a free standing controller located in a closet or machine space, but this is rarely seen.*

1.1.1 – Inspection and Test Panel 'LDU'

An inspection and test panel is required by ASME Code, and must be located outside of the hoistway. It is used for testing, inspection, and diagnostic purposes. This unit is called the Landing Door Unit, or the LDU. See picture of the LDU with the cover removed below:

The Inspection and Test Panel, referred to as the 'LDU'

Effectively, the LDU is the system's controller, and is referred to as that throughout this document. When referring to the drive, or motion controller, it will be described as the drive.

1.1.2 – Speed, Capacity, and Openings

The 3300 elevator system is limited to 150 ft/min (.75 m/s), but is also available at 100 ft/min (.5 m/s).

The 3300 elevator system is limited to 3500 lbs. capacity. The amount of counterweighting is dependent upon the capacity of the elevator, and there is no standard percentage of counter balancing. It ranges from 30% to 43%.

The 3300 elevator system is limited to a maximum of 8 stops, and can handle up to 15 openings.

1.1.3 – Belts

Depending on the speed and capacity of the elevator, 3 or 4 belts may be used. See pictures below:

4 & 3 Belt Installations with Neoprene Belts (on left) and Older Rubber Belts (on right)

The belts have a life cycle of 15 years or 1,000,000 bend cycles. The processor on the system keeps track of how many bend cycles have occurred as well as the manufacture date of the belts. For further information on belt monitoring refer to Section 5.6.1.

There are 2 types of belts available. The first generation of belts are black and are constructed of rubber over steel cables. The belts are 30 mm, and the outside surface is smooth, while the inside surface has multiple v-grooves. The v-grooves prevent the belt from walking from side-to-side, and provide additional traction.

The second generation of belts are gray, and are constructed of neoprene instead of rubber. These belts provide much more traction than the rubber belts, and when the system uses these belts additional hardware is required to detect an over-traction condition.

NOTE: *If belt replacement is required and the black belts were originally installed on the job, a retrofit must be performed if upgrading to gray belts.*

See pictures of belts below:

Rubber Belts (on left), Neoprene Belts (on right) with Cables Visible

1.1.4 – Fixtures

The car station and landing calls on the 3300 use specilized fixtures, and no options are available for vendor fixtures. See pictures of typical fixtures below.

Car Station and Hall Call Fixtures

1.1.5 – Special Features

Lockouts and a number of special key switches or inputs can be added to the system. There are approximately 5 available input signals in the car station that can be assigned via software, and addidtional signals can be added to the control system by adding an I/O expansion board called the BIOGIO (Buidling I/O, Group I/O) board.

NOTE: *The 3300 does not have any special software, and therefore no special features are available. Standard features such as Car and Hall Call Lockouts, Medical Emergency, Earthquake, etc. are available and configured through software.*

1.2 – Control System Overview

As previously mentioned, the 3300 control system is a Machine Room Less (MRL) elevator system. The 'controller' for the system is called the Landing Door Unit (LDU) and is typically located in the top floor door jamb.

To access the LDU, locate the cover at the top floor. In units with side slide doors it will be located in the strike jamb. On center opening doors it could be on either side of the opening.

A special key is required to remove the cover. The key can be purchased from Adams Elevator Equipment and is part number 51519298 (KONE part number KM51275259). It looks like this:

LDU Access Key

Locate the locking mechanism at the top of the LDU cover. It looks like a button or a barrel key, and the access key will fit into it. See picture below.

LDU Lock in Top Floor Door Jamb

Insert the key and rotate it counter-clockwise. Continue to hold counter-clockwise pressure on the lock and push the cover up. It will slide up about ¾ of an inch, and the bottom should pop out slightly. Pull the bottom out further and the top of the cover will clear the top of the door jamb, allowing the cover to be removed. There may be a grounding wire on the bottom of the cover that prevents you from moving it too far, but the cover can be set aside.

1.3 – Required Keys

The most commonly seen key switches use the following standard keys which are available from Adams or KONE Spares:

Function	Key Number	KONE Part #
Independent	J200	US513514
Access in Car	J222	KM51261829
Access at Landing	501CH	KM51261815

Less commonly seen, the following keys are used on older cars:

Function	Key Number	KONE Part #
Independent	OC01	KM51261829
Access in Car	OC04	KM51261828
Access at Landing	501CH	KM51261815

1.3.1 – Escape Hatch Key

The escape hatch on the car top was shipped with 2 keys tie-wrapped to the lock. See picture below:

Escape Hatch Keys – Remove and Store in a Safe Location

NOTE: *These keys need to be kept in a safe location, as if the elevator shuts with a drive or motor issue at the top floor, the only way to access the equipment in the hoistway is through the escape hatch. There is not a standard key for the escape hatch, so the keys need to remain on site in a safe location.*

1.4 – Special Tools and Equipment

No special tools or diagnostic equipment are required to work on the 3300 system. The User Interface (Diagnostic Display) is unlocked, and is not possible to be password protected. There are no special diagnostic tools available, as everything necessary to inspect, test, and maintain the system is available through the User Interface.

There are 2 special plug connectors that are required for CAT5 testing purposes. These plugs are inserted into the control panel and will each pick one of the brakes so the other brake can be tested to ensure that it will hold 125% of the elevator's rated capacity. These plug connectors are attached to a red flag, and should be stored with the wiring diagrams. See picture below of the plug connectors.

Test Plugs to Lift Brakes Individually for Performing 125% Load Test

The landing buttons and hall lanterns require a special tool to remove them from the landing door frame. This tool is nothing more than a 2" plastic putty knife with a notch cut into the blade. The putty knife is slipped behind the top of the landing button or lantern, and applying downward pressure forces the plastic tabs holding the button or lantern assembly to the door jamb to release. See picture below.

LOP/LIN Removal with Notched Putty Knife

While pressing down on the putty knife, gently pull the top of the button or lantern assembly away from the door frame.

When reinstalling the assembly, place the bottom tabs into the door frame and push the top into the door frame. The tool is not required to reinstall the button or lantern, as it will snap into place.

Section 2 – Service Considerations

2.1 – Training

The 3300 control system is unlike any other control system that is presently in production, and therefore it is critically important that anyone working on or maintaining the system receives training on it. There are many processes and procedures that are very different on this system from a traditional elevator system, and therefore KONE requires that any Technicians maintaining this equipment or answering calls on it **MUST** be trained.

NOTE: *Refer to KONE's policy regarding training for Technicians performing maintenance, testing, or answering service calls on the 3300 control system before taking this equipment under contract.*

2.2 – Software and Parameter Access

It is possible on the 3300 control system that access to the software and parameters may be locked. If this is the case, it will severely impact the ability to successfully maintain and troubleshoot the system. In order to determine if the software is open and accessible follow the steps outlined below.

Remove the cover from the LDU at the top floor landing door.

Locate the diagnostic display on the CANMB (CAN Mother Board) and the keypad immediately below it. It will look like this:

Diagnostic Display

Refer to Section 4 for further information on the diagnostic display, keypad, and menus. You should be somewhat familiar with the display and the keypad before proceeding.

The display may be dark, as the back light will turn off after several minutes of inactivity. To get the back light to turn on, press the escape button, which is the button on the left side of the keypad.

To check if the menus and parameters are accessible, press the enter button which is located all the way on the right. The information on the bottom of the screen should change, and you should see the number 10 appear on the left side. See picture below:
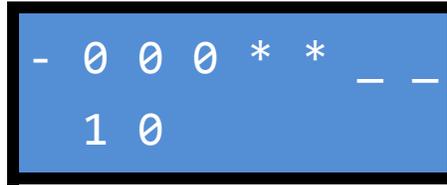
```
-  0   0   0   *   *   _   _
      1   0
```

This screen lets you know that you are now in the parameters menu and are currently at the 10 menu. Pressing the up or down arrow will scroll through the different menus. The menus are as follows:

        10 – Special Commands
        20 – Acceptance Tests
        30 – Status & System Info
        40 – Configuration
        50 – Diagnostics (Error/Event Log)
        60 – Statistics

If any of these menus are not available by pressing the up or down arrow the software is not fully unlocked. Contact Technical Support for further assistance.

2.3 – Software Backup

As soon as possible after getting any 3300 control system on service, the software and parameter file **MUST** be backed up. Failure to do this could result in a lengthy reprograming procedure, and will require weights to set up the load weigh device. Refer to Section 6.3 for information regarding these procedures.

2.4 – Belt Life and Replacement

Before taking any 3300 under contract it is important to determine how much life is left in the belts. As previously mentioned, the belts are good for 15 years or 1,000,000 trips. The belts are only available from Adams and are rather costly, so if replacement is required it will have a tremendous impact on the profitability of a job. To determine the life expectancy of the belts you will need to access the control system in the top floor door jamb and document the number of bend cycles of the belts. Refer to Section 1.2 and remove the cover to access the diagnostic display. Press the escape button (first button on the left on the keypad located immediately below the display) so the display illuminates. Press the escape and down buttons simultaneously and a number will appear in the bottom row on the right side of the display. This number is the number of bend cycles. You will need to determine how long the unit had been in service so you can get an idea as to how much use the elevator gets annually. If it seems to be relatively high use, or close to or in excess of 67,000 trips per year, the belts will need to be replaced before their 15 year life expectancy is reached. You can determine on what date the processor calculates that the belts will need to be replaced based on the current amount of use by accessing parameter 6302. Refer to Section 5.6.1 for further information.

2.5 – Batteries

The control system uses 2 batteries for back up in case of a power failure. The batteries not only back up the processor in the event of a power loss, but they are also used to move the elevator to a floor in the event of a power loss. If power is lost to the disconnect, the control

system detects this loss of power and if the elevator is not at a floor, after about 15 seconds it will move it to the nearest floor in the direction of the load in the elevator. If the car is near empty, since the counterweights are heavier, it will run the elevator up to the nearest floor and open the doors. If the car is heavier than the counterweight it will run the elevator down to the nearest floor and open the doors.

NOTE: *Since the load weigh device is necessary to determine how much weight is in the elevator for evacuation purposes, the system cannot be run on Automatic Operation with the load weigh device disabled. Also, if the batteries are not fully charged or are failing, the control system will detect this and not allow the elevator to run on Automatic Operation.*

The batteries are located in the hoistway in a steel box mounted near the top floor and attached to the counterweight rail. This box is called the TSU, or Transfer Switch Unit, and looks like this:

Transfer Switch Unit (TSU)

There is a thumb screw located on the top of the box that secures the front cover. Loosening this thumb screw allows the cover to swing down, revealing the equipment inside the TSU and the batteries. The batteries are located at the bottom of the TSU under the inverter (converts DC power to AC to feed the drive in the event of a power loss) and look like this:

Batteries in TSU

These batteries are commercially available and do not need to be ordered through Adams.

Section 3 – Hardware and Circuit Boards

3.1 – Hoistway Equipment

3.1.1 – Machine

As previously mentioned, the machine on the 3300 system is mounted in the hoistway. There are several items on the machine that are important to note.

3.1.1.1 – Brakes

There are 2 brakes mounted at the end of the 3300 machine. One brake is the main brake, and the other brake is the emergency brake. Both brakes operate together and are the same type of device, but the emergency brake has a label on it. See picture of the brakes below.

3300 Machine Brakes

Each brake has a 'rubber band' around it. The band is used to quiet the noise of the brake operation, and it also prevents dirt and debris from falling into the gap between the brake coil housing and the brake pad pressure plate. See picture below of a brake with the rubber band moved to the side.

Brake with Band Removed

3.1.1.2 – Brake Microswitches

There is a microswitch on each brake. The microswitches are monitored by the control system in order to determine if the brakes are operating properly. The microswitches can be adjusted if they are not operating properly, but before any adjustments are made you must make sure that the brake pad check is performed to verify that the pads are not worn excessively. Refer to

Section 8.2.2.1 for the procedure to check the brake pad wear. See picture of one of the brake microswitches below.

Brake Microswitch

NOTE: *If the brake contacts are not operating properly the car will not run, even on Inspection Operation. To run the car on Inspection Operation so the machine can be accessed to adjust the brake contacts, place the car on open-loop operation (Parameter 102). This will allow the car to be moved to a location where the brake can be checked and the contacts can be adjusted.*

3.1.2 – Drive Cabinet

The drive cabinet on the 3300 is mounted in the hoistway. There are several different boards inside the drive cabinet to interface it to the motor and the rest of the control system.

3300 Drive Cabinet

3.1.2.1 – CANIVF Board & Yaskawa L7 Drive

The drive is a Yaskawa L7, and has a special interface board so it can communicate over the control system's CAN network. The board is called the CANIVF, and plugs into the drive's communication port to convert the control system's CAN communication to RS485 for the drive.

CANIVF Board

3.1.2.2 – BCMC Board

Also in the drive enclosure is the BCMC board. This is the Brake Control/Motor Control board. It interfaces the drive to the brake and motor hardware. There are several relays on the BCMC board, and the brakes and the brake microswitches are wired to the board.

BCMC Board

3.1.3 – Transfer Switch Unit (TSU)

The Transfer Switch Unit is mounted at the top of the hoistway on the counterweight guide rail. As previously mentioned, there are two batteries in the Transfer Switch Unit that are used for automatic passenger evacuation in the event of a power failure, and for PEBO (Pulse Emitted Brake Operation) to remove passengers in the event that the control system cannot move the elevator.

The Transfer Switch Unit is used to transfer power from the building supply to the backup batteries. In addition to the batteries inside the TSU, there is a reverse phase relay to monitor the incoming power, and several relays that are used to open the feed from the building supply and connect the backup power source to supply the drive. The backup power source is created by taking the output of the batteries and feeding it into an inverter. The inverter creates a two-

phase, 230 VAC supply to the drive, which is enough power to run the elevator at low speed to the nearest floor.

See picture of TSU below.

Transfer Switch Unit Mounted to Counterweight Guide Rail

3.2 – Landing Door Unit (LDU) Equipment

The Landing Door Unit (LDU) is typically located at the top floor. It is basically the controller for the elevator system, but is referred to as the inspection and test panel that is required by ASME Code.

To access the LDU, refer to Section 1.2 and locate the release in the top floor door jamb. Remove the cover with the special key to access the LDU.

There are several PC boards and other devices in the Landing Door Unit.

3.2.1 – CANMB

The CANMB (CAN Mother Board) is the board that has the diagnostic display (user interface). There are also a number of pushbuttons and LED's on the CANMB. The CANMB acts as the interface for the system's processor, and is used to diagnose and configure the control system. See picture of CANMB below.

CANMB Board

3.2.1.1 – CANMB Buttons

The first row of buttons on the CANMB is used for the user interface. The user interface is explained in greater detail in Section 4.3.

Below the user interface buttons there are several other pushbuttons on the CANMB. Not all of these buttons are used in North America. See picture of the buttons below.

CANMB Pushbuttons

The function of the buttons is as follows:

RESET – Processor reset (do not push unless you are sure of you are doing and why a reset is required, as it may cause the system to stop operating)
DBV – Governor set (for testing)
DUEISK-A – Circuit breaker for safety circuit
DRECA – Not used in North America

3.2.1.2 – CANMB LED's

There are also a number of LED's on the CANMB. There are 5 LED just to the left of the display. Not all of these LED's are used in North America. See picture of LED's below:

CANMB LED's

The Function of the LED's is as follows:

LREC – Not used in North America
LREAC-A – Not used in North America
KNET – Not used in North America
24V – 24 VDC to CANMB present
ERR – System error (fault, etc.)

There is another light that is just above the display. This light is blue, and is labeled LUET. This LED is illuminated when the elevator is in the door zone. See picture of the LUET LED below:

LUET (Door Zone) LED

3.2.2 – CM11 Board

The CM11 board is plugged into the CANMB. The CM11 is the processor for the system. It usually has a label on it with the installed version of software, but the label may not be accurate, as the software can be downloaded via a USB drive. See picture below of the CM11 board:
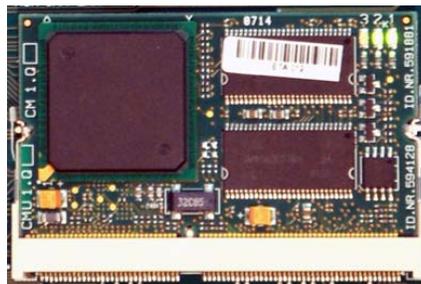
CM11 Board

3.2.3 – WDPNA Board

The WDPNA (Wiring Distribution Panel, North America) board plugs into the bottom of the CANMB. It has the majority of the field wiring connections to the LDU. See picture of the WDPNA board below.

WDPNA Board

The Hoistway Door and Car Door Bypass switches are located on the WDPNA board. Also on the WDPNA is a USB port. The USB port can be used to download software to the system, and also archive the software and parameter configuration.

The connectors on the WDPNA are as follows:

Connector	Description
ACC1	Top & bottom hoistway access switches
KSK	Smoke detectors
CANL	Connection point of CAN Bus to other boards in LDU
FF	Fire Phase 1 switch & indicator in hall
ESE	Controller inspection station
LOP	CAN network for hall fixtures (LOPs and LINs)
SKS	Safety circuit bottom of hoistway
SKSK	Safety circuit top of hoistway
KS	Auxiliary safety devices (water in pit, slack belt, & governor tension sheave switches)
CANC	CAN network to car
VF	Drive connections
KBV	Governor connections
SKC	Traveling cable connections (some are on terminal block)
ACCT	Top hoistway access switch
SKT2	Interlocks for rear doors
ACCB	Bottom hoistway access switch
SEM	SEMNA board plug connector

Note that the #1 terminal on all of the connectors are not in the same position. The connectors on the WDPNA board are arranged as follows:
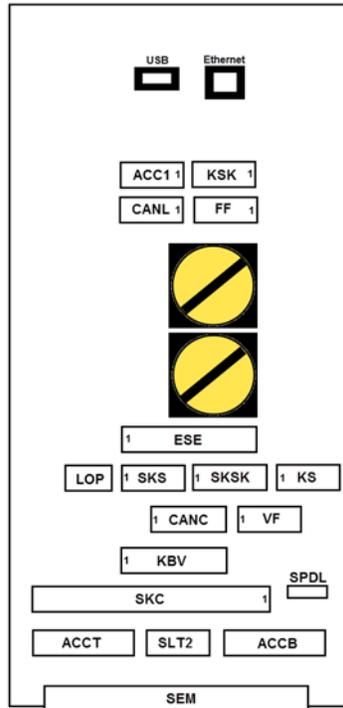
WDPNA Connectors

3.2.4 – CLSD Board

The CLSD (Communication and Line Switching Device) board is the modem board for the system. It is plugged into the WDPNA board just to the left of the door bypass switches. It shares the phone line for use by the in-car emergency phone and the control system's remote monitoring. This board should usually be removed in order to prevent errors from filling up the log when the system cannot communicate with Schindler's Remote Monitoring Center.
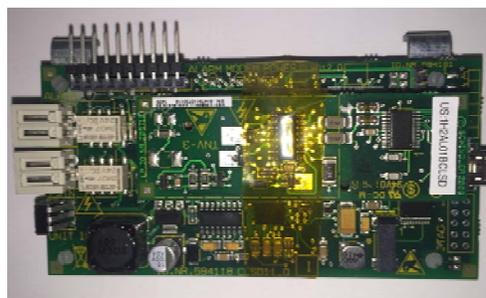
CLSD Board

3.2.5 – SEMNA Board

The SEMNA (Service Evacuation Module, North America) board plugs into the bottom of the WDPNA board. The SEMNA board serves 2 primary functions. First, it is used to drift the elevator by lifting the brake in order to evacuate passengers in the event that the motor or the controller is not able to move the car. The switches at the top of the board are used to pulse the brake (PEBO, or Pulse Emitted Brake Operation) to allow the elevator to drift. For instructions

on how to move the elevator with PEBO operation, see the sticker on the back of the LDU cover.

The SEMAN board is also used to move the elevator at slow speed to the nearest floor in the direction of the load if a power failure occurs. This operation occurs automatically, and is a standard feature on the 3300 control system.

SEMNA Board

The batteries in the hoistway are wired to the SEMNA board at the DCAC connector.

NOTE: *If the controller is going to be powered down for more than 24 hours, unplug the DCAC connector so that the batteries do not drain. The system will not run if both batteries are not charged, and if the batteries are aging draining them can cause them not to charge.*

3.2.6 – JHS Circuit Breaker

The JHS circuit breaker is used to protect and disconnect the 208 VAC supply to the LDU. The breaker will open if an overcurrent occurs, but it is primarily used to remove power while working in the LDU. See pictures of the two different styles of JHS breaker below.
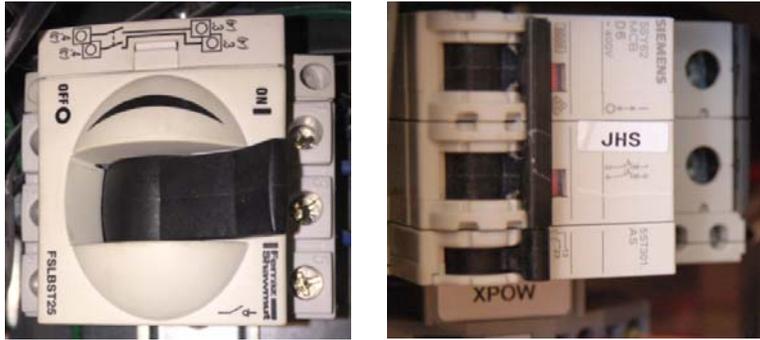
JHS Circuit Breaker (Old Style on Left)

NOTE: *The auxiliary contact on the old style of JHS breaker (on left in picture above) was prone to failure. Frequently, after it had been turned off, the contact would not close. This results in the SEMNA board not picking the 'SH' relay in the TSU, causing a communication fault to the drive (Error 3620).*

3.2.7 – Terminal Block Assembly

Beneath the JHS circuit breaker is a terminal block assembly. The terminal block is used for various connections in the control system.

3.2.8 – 24V-NGL Power Supply

The 24V-NGL power supply is wired to the output of the JHS circuit breaker, and creates the 24 VDC that the control system uses for its logic and safety circuits.

24V-NGL Power Supply

3.2.9 – SPDLIM2 Board

The SPDLIM2 (Speed Limiter 2) board Is installed in the very bottom of the LDU. It is used to monitor the speed of the elevator to ensure that it does not exceed 150 ft/min while on inspection operation or with the doors open. This monitoring of the car speed is required by the ASME A17.1 Code, and the board is only installed on systems that are 150 ft/min. It uses feedback from the motor encoder to determine car speed, and is connected to the WDPNA at the SPDL connector.

SPDLIM2 Board

3.3 – Car Top Devices & Circuit Boards

3.3.1 – Car Top Box (CCU)

The box on top of the elevator is referred to as the CCU, or Car Control Unit. This box is located immediately behind the car top inspection station, and is covered with a metal cover with handles. Removing the cover allows access to the devices inside the CCU. See picture of CCU below.
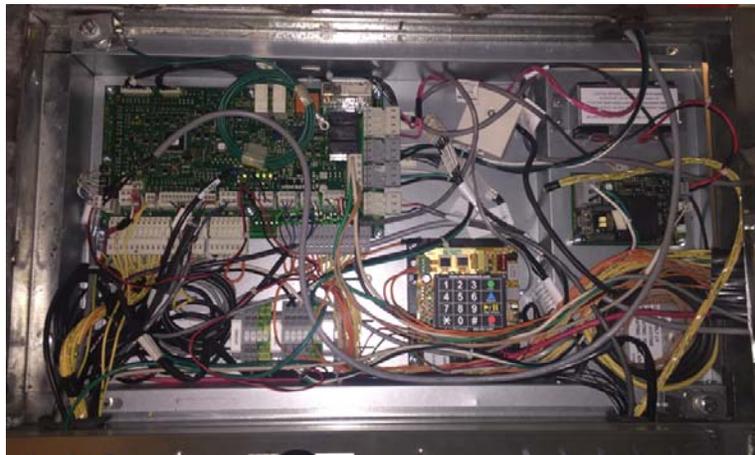
CCU with Cover Removed

Inside the CCU are several different devices. There is a 24 VDC power supply for the car equipment, the emergency phone, the battery for the emergency light and alarm bell, and the CANCNA circuit board.

3.3.2 – CANCNA Board

The CANCNA (CAN Car Node, North America) board is the primary processer for the elevator car equipment. It is communicating via the control system's CAN network with the LDU, and controls car functions and interfaces the car equipment with the rest of the control system.
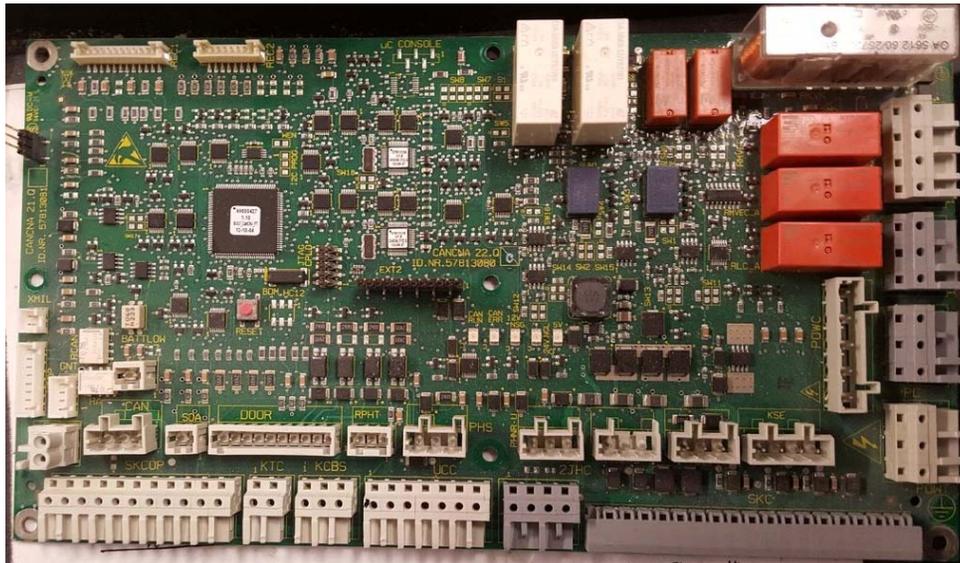
CANCNA Board

The traveling cables are terminated at the CANCNA board, as well as the wiring for the various car top equipment (inspection station, door operator, leveling unit, load weigh sensor, terminal slowdown switches, gate switch(es), etc.).

There are 2 different versions of the CANCNA board. The first version is used for single sided cars, and another version is used when rear doors are present.

3.3.2.1 – NXSDI Board

If the elevator has rear doors there is a board piggybacked on the CANCNA board to interface it with the rear door equipment. This board is called the NXSDI (NX Second Door Interface) board. It has connectors for the rear door operator, detector edge, gate switch, and leveling unit.
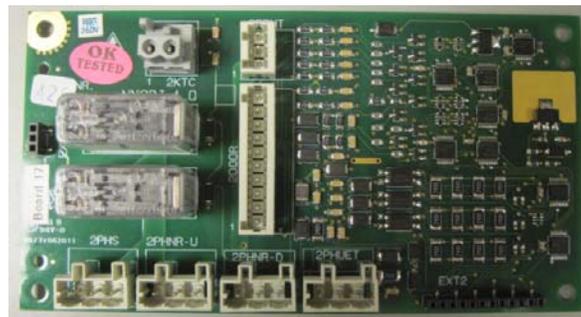
NXSDI Board

3.3.3 – Door Operator & Door Equipment

The 3300 control system uses a door operator manufactured by Fermator. The operator is **NOT** serial linked to the control system, but instead uses discreet signals from the CANCNA board for the open, close, and nudging commands. Likewise, the door open and door close limit signals to the control system are discreet wires between the operator and the CANCNA board.

3.3.3.1 – Door Operator Control (Drive)

The operator control box is mounted to the back of the car door header. To access it, you must remove the metal cover located over the inspection station (front door side). The control box is shown below.
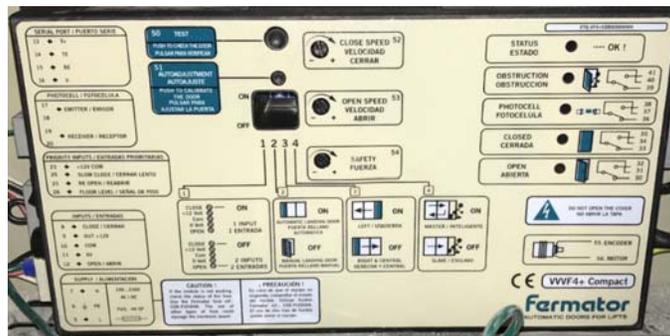
Fermator Door Operator Drive

There are several adjustment pots on the door operator drive, "Safety", "Open Speed", and "Close Speed". These pots set the overall speed of the doors for nudging (Safety), open, and close. To adjust the door speed, turn the pot in the desired direction (CCW=slower, CW=faster). The speed of the door can then be observed on Automatic Operation.

NOTE: *If any adjustments to the door speed are made, cycle power to the operator. The pots will change the overall speed, but the door speed at the limits will need to be learned. Cycling power to the door operator initiates the learn procedure.*

If power is cycled to the door operator, the first opening and closing operation of the doors will be at slow speed. The door operator learns the distance the doors travel by using an encoder that is integral to the door motor.

There are 2 buttons on the door drive.

- The top button is the "TEST" button. Pressing this button will cause the doors to open and close at normal operating speed.
- The lower button is the "AUTO ADJUSTMENT" button. This button is used to set up the operator so it learns the open and close limits and the distance that the door travels. To learn the doors, make sure the car doors is coupled to a hoistway door, as if it is not the setup will not be correct. Pressing the button will cause the doors to open and close, and the operator will learn the open and close limits of travel, and the distance of travel.

3.3.4 – Leveling Unit and Floor Vanes

The leveling unit uses 4 optical sensors to determine the door zone and exact floor position. Each floor has a leveling vane with two lanes mounted to the landing door header. The first lane of sensors is for leveling, and the up sensor (PHNR-U) and down sensor (PHNR-D) are only activated if the middle sensor (PHS) is on the vane. The second lane of the leveling unit has the door zone sensor (PHUET), and it is only activated if either the PHNR-U, or PHNR-D, **AND** the PHS sensors are activated. This way the PHS sensor is a redundant door zone signal, and multiple sensors would need to fail to give the control system an erroneous door zone signal. When the car is level with a floor, all of the sensors are activated.
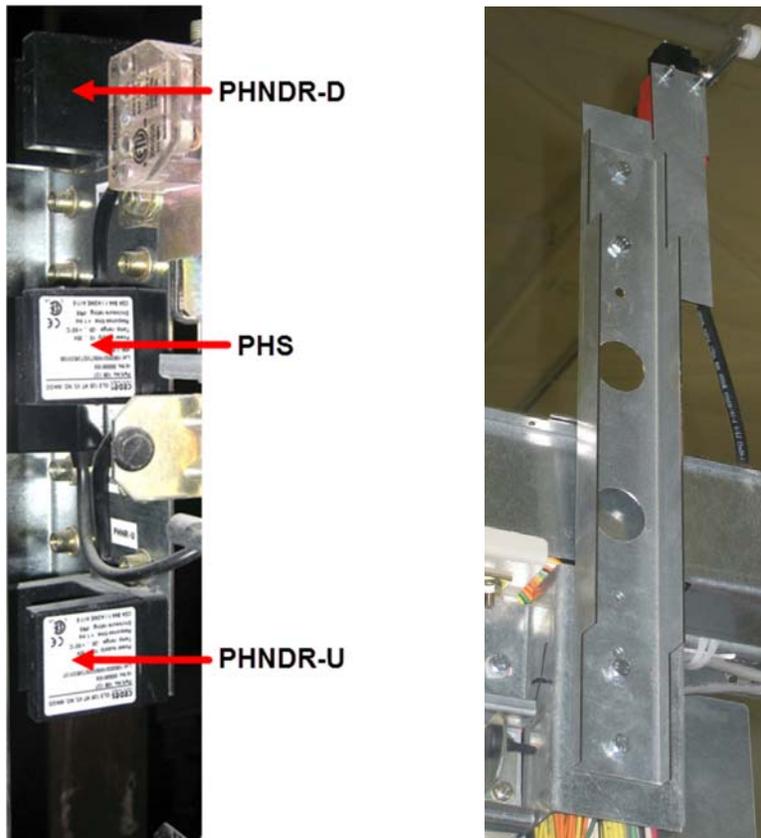
Leveling Unit (PHUET not visible) and Floor Vane with Top Final Limit

Since the sensors are optical, dust may cause faulty operation. If the elevator is installed in a dusty or dirty environment the sensors will need to be wiped down periodically.

NOTE: *If you wipe the sensors down with the control system powered up you will cause several faults to occur, preventing the elevator from running on Automatic Operation.*

3.3.5 – Terminal Slowdown Device

The terminal slowdown device uses two switches, KSE-U and KSE-D mounted on the car top. These switches are memory reed switches. When the switch passes a magnet in one direction it opens, and when it passes the magnet in the opposite direction it closes. The switches are normally closed when the elevator is not near a terminal floor, and will open when the car is within 1250 mm of the top or bottom floor.

NOTE: *The 1250 mm measurement is very critical, as if the magnets are not within 20 mm of 1250 the control system will declare a fault. This may not be detected during normal operation, but the elevator will fail the learn trip if it is trying to learn the hoistway.*

Terminal Slowdown Sensors & Magnets

3.4 – Car Operating Panel Equipment

There are two different versions of car operating panels use in North America. The first phase used fixtures with two rows of buttons. See picture below of phase one car station.

Phase One Car Operating Panel

The second phase of car operating panel used three rows of buttons. See picture of phase two car operating panel below.

Phase Two Car Operating Panel

To open the car station, there are two metric Allen head screws located at the top and bottom edges of the car station. Remove these screws, and the panel will swing open.

3.4.1 – SCOPM – Position Indicator

There are several PC boards in the car operating panel. The top board in the panel that has the position indicator is called the SCOPM (Schindler Car Operating Position Module). The SCPM board is connected to the CAN network, and derives the position information from the network. See picture of SCOPM below.
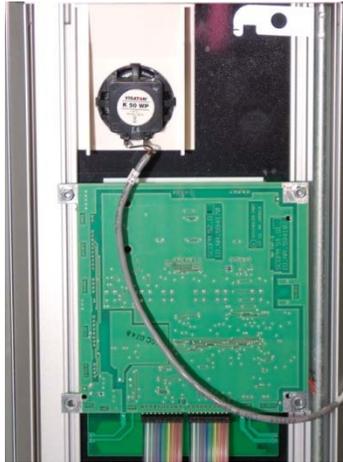
SCOPM Board in Car Station

3.4.2 – SCOPNA Car Station Processor

The board in the lower part of the car station that is visible with the panel open is called the SCOPNA (Schindler Car Operating Panel, North America). This board is the processor for the car station, and is tied to the rest of the control system through the CAN network. See picture of SCOPNA below.

SCOPNA Board in Car Station

The SCOPNA board interfaces the I/O in the car with the control system. There are several additional inputs available on the SCOPNA that may be used for car call lockouts, etc. These signals are assignable through the user interface.

3.4.3 – SCOPBNA Button Board

There are three ribbon cables that connect SCOPNA board to the push buttons. The pushbuttons are on a circuit board called the SCOPBNA (Schindler Car Operating Panel Button Board, North America). The SCOPBNA is not visible, as it is installed behind the SCOPNA and a metal plate. There are no replaceable parts on the SCOPBNA, and if there is a problem with the SCOPBNA board it must be replaced completely. See picture of SCOPBNA board below.
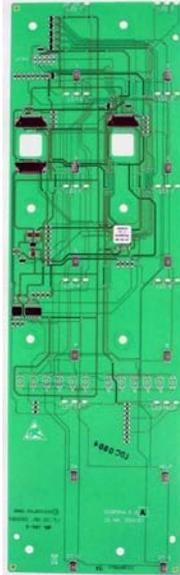
SCOPBNA Button Board

3.5 – Landing Calls, Lanterns, and Additional I/O

Each landing has a LOP (Landing Operating Panel) board and may have a LIN (Landing Indicator Panel). These boards are removable by using a 2" plastic putty knife with a notch cut into the blade. The putty knife is slipped behind the top of the LOP or the LIN, and downward pressure forces the plastic tabs holding the LOP or LIN assembly to the door jamb to release. See picture below:

Notched Putty Used to Release LOP/LIN

3.5.1 – Landing Operating Panel (LOP) Buttons

The LOP is the hall call push button board. They are connected to the control system's CAN network at the "LOP" connector on the WDPNA board. The LOPs are addressed through software, and are not specific for any floors. There are two versions of LOP board, one with two calls for intermediate floors and one with a single call for terminal floors. See picture of LOP below.

LOP Board Removed from Jamb

The LOP boards can be locked out by connecting pin 4 of the XBIO connector to pin 1. This can be done through a key switch or card reader, and only locks out that landing's hall calls.

3.5.2 – Landing Indicator (LIN) Lanterns & PI

The LIN is the hall lantern, and is connected to the LOP via 2 cables. One cable provides communication with the CAN network, and the other cable ties the LIN to the LOP for addressing.

On each LIN there is a volume pot for the gong volume. See picture of LIN below, and note the volume pot toward the top right side of the LIN.

LIN Lantern Board (Note Volume Pot)

There are two different versions of LIN; one with an integral position indicator, and the other version without the position indicator. There is no difference between the interface for either device, as the position indicator will derive the position information from the CAN network.

3.5.3 – BIOGIO Board

The BIOGIO (Building I/O, Group I/O) board is used to add additional inputs and outputs to the control system. These inputs and outputs are signals that are related to special functions or services in the building such as a card reader system, emergency power operation, earthquake operation, etc. There may be more than one BIOGIO board, depending on the job site conditions. The BIOGIO board(s) are usually mounted in an enclosure at the top of the hoistway. See picture of BIOGIO board below.

BIOGIO Board

There are two DIP switches on the BIOGIO board that configure which board number it is. The I/O for the BIOGIO boards is generally fixed, but it may be programmable depending on the setting on the setting of the DIP switches. Refer to the wiring diagrams for the setting of the BIOGIO configuration switches and the I/O available. See picture of the configuration switches below.
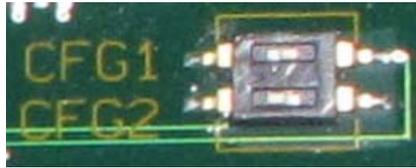
BIOGIO Board Configuration Switch

Section 4 – Diagnostic Display & User Interface

4.1 – Diagnostic Display

The diagnostic display on the 3300 control system is located on the CANMB (CAN Mother Board) in the control system in the top floor door jamb. The display gives information on the status of the system, and also provides access to diagnostic information and configuration parameters. Refer to the image below for a representation of the diagnostic screen:

In the upper row of the diagnostic screen, the arrow indicates that the elevator is currently moving in the up direction. If it were moving in the down direction a down arrow would be present. When the car is stopped a minus sign (-) is displayed.

The next characters (075) indicate the present speed of the elevator in cm/s. 75 cm/s equals approximately 150 ft/min. As a rule of thumb, double the speed seen on the display to obtain the car speed in ft/min.

The 4 asterisks (sometimes called 'snowflakes') on the right side of the screen in the top row are different points in the safety circuit.

- The first asterisk indicates that the circuit breaker that supplies the safety circuit "DUEISK-A" is closed.
- The second asterisk indicates that the car is **NOT** on inspection operation.
- The third asterisk indicates that the car and hoistway doors are closed.
- The fourth asterisk indicates the safety circuit in the hoistway and on the car (final limits, governor, pit stop, car top stop switch, escape hatch, plank switch, etc.) is closed.

NOTE: *With the elevator parked at a floor on Automatic Operation with the doors closed, only the first 2 asterisks will be displayed. This is because the hoistway door locks do not close until power is applied to the door motor, retracting the clutch. The doors can be opened from the hoistway just by applying pressure to open the landing doors.*

In the bottom row, the "4" indicates that the car is at or near the 4th landing.

The next items on the bottom row of the display are the status of the front and rear doors. The front is displayed first, followed by the rear. In the image above the doors are closed and locked. The following door statuses may be seen:

Doors Closed | Doors Closed & Locked | Doors Closing | Doors Opening | Doors Opened | Door Status Unkown | Doors Stopped

The last character in the bottom line is the present control status. "01" indicates that the car is on automatic operation and available for passenger travel.

4.2 – Control States

The control status information on the bottom right side of the display indicates the present state of the elevator system. Refer to the chart below for common states that may be seen.

State	Description
00	Out of Service
01	Automatic Operation
02	Independent Operation
03	Fire Phase I
04	Fire Phase II
05	Emergency Power Operation
06	Earthquake Operation
07	Code Blue Operation
09	Water in pit sensor active
11	Automatic Operation with load weigh disabled (parameter 107 active)
36	Emergency Power Halt
37	Stop switch in car open
38	Stop switch in FF panel open
39	Elevator is overloaded
40	Invalid configuration (see note below)
41	Invalid hoistway image (must perform learn trip)
42	Invalid load weigh configuration
45	Belt life exceeded
51	Installation travel (parameter 105 active)
52	Configuration (parameter 40 active)
53	Controller Inspection Operation
54	Car Top Inspection Operation
56	Hoistway Access Operation
57	Test Travel Operation (parameter 104 active)
58	Acceptance Test mode
59	Hoistway Learn
70	Recovery mode (elevator recovering after power loss, etc.)
72	Position recovery (elevator recovering after position loss)
74	Low backup battery power
80	Stop switch in hoistway pressed
81	Stop switch on car top pressed
82	Stop switch on controller pressed
88	Safety circuit open
89	Bypass (car door and/or hoistway door) switch activated

90	System status invalid (will attempt to recover when on automatic operation)
91	Power up
95	Power lost to controller
97	Out of service but available for inspection operation (check error log for cause)
98	Out of service & **NOT** available for inspection operation (check error log for cause)
99	Out of service – must perform 101 reset to operate
W!	Warning – belt life has exceeded 80%

NOTE: *Status 40 indicates that the software configuration has become corrupted. Refer to Section 6.4 for further information.*

Status 98 and 99 will not allow the elevator to run on inspection operation. Status 98 may be cleared by performing a 101 reset at the controller or by a 'soft reset' from the car top or controller inspection run box. Status 99 must be cleared by performing a 101 reset. Refer to Section 5.1.2 for further information on the 101 reset.

4.3 – Diagnostic Screen, User Interface & Menu Navigation

There are 4 buttons located directly below the diagnostic screen. These buttons are used to navigate through the menus and change parameter values. See picture below:

Diagnostic Display Pushbuttons

Starting at the left side, the first button is the escape button. It will back you out of a parameter or menu that you are viewing.

NOTE: *It is always safe to hit the escape button, and if you're not sure where you are in the menu tree, hitting the escape button several times will bring you back to the main diagnostic screen.*

The next 2 buttons are up and down. They are used to scroll through the menus, or parameters in a menu, and are used to increase or decrease parameter values.

The right hand button is enter. It is used to enter the parameter menus, look at parameter values, and program parameters. Do not hit the enter button unless you are sure of what you are doing, as there is no confirmation (for example "Are you sure?") before a value is entered into the system.

4.4 – Navigation into Menu Tree

To access the menus from the main diagnostic screen just press the enter button. The information on the bottom of the screen will change, and you will see the number 10 appear on the left side. See picture below:

```
- 0 0 0 * * _ _
  1 0
```

You are now in the parameter menus and at menu 10. To enter the 10 menu and view or modify the parameters in that menu, press the enter button again. The 10 will change to 101, letting you know that you are now at parameter 101. See picture below:

```
- 0 0 0 * * _ _
  1 0 1
```

Using the up or down arrows will allow you to scroll to the different parameters in the 10 menu. Pressing the enter button will show you the current value of that particular parameter.

While viewing a parameter value, the escape button will bring you back to the parameter number, and hitting escape again will bring you back to the top of the parameter menus where you will see 10 on the lower left of the screen.

While at the top of the parameter menus (where you see 10 on the lower left side) you can access the different menus by pressing the up or down button to get to the other menus. The menus are as follows:

> 10 – Special Commands
> 20 – Acceptance Tests
> 30 – Status & System Info
> 40 – Configuration
> 50 – Diagnostics (Error/Event Log)
> 60 – Statistics

Section 5 – Software Functions

5.1 – Menu 10 – Special Commands

The following items are available in the 10 menu. Do not activate these commands unless you are sure of what you are doing, as some of them may necessitate a reprograming of the system.

Command	Function
101	System reset (See information about 101 reset)
102	Run drive open loop (no encoder feedback, brake switches ignored)
104	Test Operation (car runs for calls, but no door operation)
105	Construction mode (only use if hoistway image is invalid)
107	Load weigh disable (car will only run on automatic operation for 2 hours)
109	Enhanced service function (enables enhanced error monitoring)
110	Enter car calls (shortcut from any other screen by pressing escape and enter buttons)
111	Enter hall calls
112	Open door (car must be in door zone)
113	Close door
114	Clear remote monitoring out of service
115	Reset earthquake operation
116	Learn trip **DO NOT ATTEMPT UNLESS DIRECTED BY TECHNICAL SUPPORT!**
117	Technician on site (car does not call out to remote monitoring for errors)
121	Copy/install software (see information later regarding backing up software)
125	Reset governor electrical trip
126	Start test phone call to remote monitoring
127	Reset unintended movement
128	Detect remote monitoring type
129	Enable/disable remote monitoring (not used in North America)
131	Reset water in pit trip
133	Enter STM (belt) reference key
134	Set STM (belt) trip counter
190	Enable one-time configuration change
199	Enable/disable move around operation (random calls)

NOTE: *Initiating a learn trip will erase the present hoistway image. If the learn trip does not complete successfully the car will have not have a valid hoistway image and will be out of service.*

5.1.1 – Performing a Soft Reset

To perform a soft reset, place the elevator on inspection operation either on the car top or on the controller. Activate (open) the stop switch. Press and hold both the up and down buttons simultaneously for at least 5 seconds (do not press the enable button). Release the buttons. The reset will take approximately 1 minute.

Status 99 must be reset by performing a 101 reset at the controller. Status 97 and 98 may also be cleared by performing the 101 reset. Refer to information on performing the 101 reset.

5.1.2 – 101 Reset

NOTE: *On the back of the controller cover there are instructions for performing a 101 reset. You may use those instructions or the ones below.*

When the control system detects an event that requires a Technician to investigate the casue of the event, the control system will declare a status of 97, 98, or 99 depending on the severity of the event. The elevator will be removed from Automatic Operation for all of these states, and will be removed from Inspection Operation for 98 and 99. A status of 98 can be reset via a soft reset on the car top or on the controller, but a status 99 can only be reset by performing a 'hard reset' via parameter 101.

When the controller removes the car from operation and declares a status of 99 the screen will look similar to this:

```
-000**__
4████ 99
```
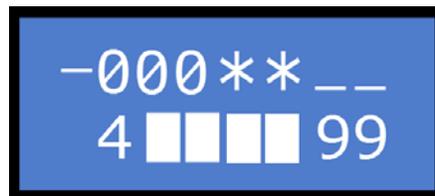
The 99 shown on the bottom right side of screen indicates that the controller is in the 99 state.

To perform the 101 reset you must leave the main diagnostic screen and access the menus. To do this, use the keypad and press the enter key. This is the far right button on the CANMB PC board and is marked ↵.

After hitting the enter key, the number 10 will appear at the bottom left side of the screen. This lets you know that you are now in the parameters menu, and are currently at the 10 menu. See below.

```
- 0 0 0 * * _ _
  1 0
```

Press the enter key again and the 10 will change to 101. This lets you know that you are now at parameter 101. See below.

```
- 0 0 0 * * _ _
  1 0 1
```
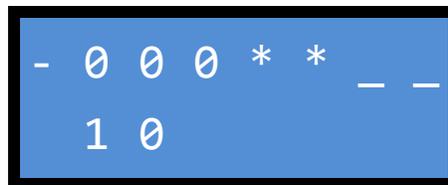
Press the enter button again and the number 0 will appear on the bottom right of the screen as shown below.

```
- 0 0 0 * * _ _
  1 0 1   0
```
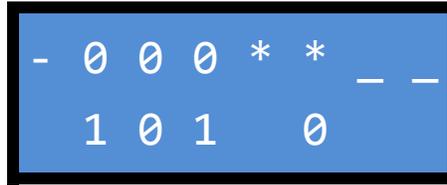
Press the up arrow (second button from the left) and the 0 on the screen will change to a 1 as shown below.

```
- 0 0 0 * * _ _
  1 0 1   1
```

Press the enter button again and the 101 reset will be performed. Press the escape button (first button on the left) several times to get back to the main screen.

5.2 – Menu 20 – Tests

Refer to the CAT1 and CAT5 testing procedure for the functions in this menu.

5.3 – Menu 30 – Status & System Information

The 30 menu is used to display the status of various functions, I/O signals, software versions etc.

To determine the version of software, access the 30 menu and press enter. The diagnostic screen will display 301. Press enter again and the screen will display 3011. Press enter again and the version number of the software will be displayed.

5.3.1 – Function 301 – Display Software Version

In the 30 menu, item 301 allows you to view the version of software that is installed in each of the network PC boards. At item 301, press <ENTER>, and using the <UP> and <DOWN> buttons you can scroll through the different parameters that allow you to view the installed software. Press <ENTER> at the desired parameter to view the software version. See table below for a description of the parameters.

301 Item	Information
3011	CPU software version
3012	CANCNA software version
3013	CDI software version
3014	CPU software version
3015	COP software version
3017	CANMB software version
3018	CLSD software version

5.3.2 – Function 302 – Display Hardware Version

In the 30 menu, item 302 allows you to view the version of hardware that is installed for each of the network PC boards. At item 302, press <ENTER>, and using the <UP> and <DOWN> buttons you can scroll through the different parameters that allow you to view the installed hardware. Press <ENTER> at the desired parameter to view the hardware version. See table below for a description of the parameters.

302 Item	Information
3021	CPU hardware version
3022	CANCNA hardware version
3023	CDI hardware version
3024	CPU hardware version
3025	COP hardware version
3027	CANMB hardware version
3028	CLSD hardware version

5.3.3 – Function 303 – Display Door Type

In the 30 menu, item 303 allows you to view the type of door that is present. At item 303, press <ENTER>, and the door type will be displayed.

5.3.4 – Function 305 – Display I/O Status

In the 30 menu, item 305 allows you to view the status of the various inputs and outputs in the system. At item 305, press <ENTER>, and using the <UP> and <DOWN> buttons you can scroll through the inputs and outputs. The name of each signal will be displayed, and pressing enter will show the location of the signal. Pressing enter again will display the current status of the signal. The signal names can be found in the wiring diagrams.

5.3.5 – Function 306 – Drive and Monitoring

In the 30 menu, item 306 allows various functions and information to be displayed and monitored. Press <ENTER> at 306, and use the <UP> or <DOWN> arrows to access the desired information.

306 Item	Information		
306_1	Actual elevator speed (cm/s)		
306_2	Linear speed (cm/s)		
306_6	Motor current		
306_8	Motor temperature		
306_10	Motor frequency		
306_16	Maximum motor current		
306_17	Position (mm)		
306_18	Distance of upcoming run (mm)		
306_19	Stopping distance from last trip (mm)		
306_23	SF, SF1, & Evacuation State		
306_23 Value	Evacuation Mode	SF1 State	SF State
0	0	0	0
1	1	0	0
2	0	1	0
3	1	1	0

4	0	0	1
5	1	0	1
6	0	1	1
7	1	1	1
306_24	LUET (PHS & PHUET), KB, & KB1 State		
306_24 Value	KB1 State	KB State	LUET State
0	0	0	0
1	1	0	0
2	0	1	0
3	1	1	0
4	0	0	1
5	1	0	1
6	0	1	1
7	1	1	1
306_25	Output SF/SF1, MGB, & MVE State		
306_25 Value	MVE State	MGB State	SF/SF1 State
0	0	0	0
1	1	0	0
2	0	1	0
3	1	1	0
4	0	0	1
5	1	0	1
6	0	1	1
7	1	1	1

5.3.6 – Function 307 – Display BUS Node Status

In the 30 menu, item 307 allows you to view the status of each of the nodes that are installed on the network. At item 307, press <ENTER>, and then use the <UP> or <DOWN> arrows to view the desired node.

5.3.7 – Function 308 – Remote Monitoring Information

In the 30 menu, item 308 allows you to view the status of the remote monitoring system. As the CLSD (modem) board is to be removed, this menu is not used.

5.3.8 – Function 309 – Display Group ID

In the 30 menu, item 309 allows you to view the group number.

5.3.9 – Function 3010 – Display Shaft Distance Deviation

In the 30 menu, item 3010 allows you to view the deviation distance of the installed position of the KNE-U and KNE-D magnets. At item 3010, press <ENTER>, and then use the <UP> or <DOWN> arrows to access the desired parameter to view the top or bottom deviation distance.

3010 Item	Information
3010_1	Top deviation (mm)
3010_2	Bottom deviation (mm)

5.4 – Menu 40 – Configuration

The 40 menu is used to configure the controller settings and parameters.

NOTE: *Unless you are sure of what you are doing, do not make any changes in this menu!*

Common functions in the 40 menu are:

> Configure hall call fixtures (Landing Operating Panels, or 'LOPs')
> Configure floor position names (for example 'L' instead of 1 for 1st floor)
> Configure drive parameters
> Load weigh calibration/set up

5.4.1 – Entering/Exiting Configuration Mode

When entering the configuration menu the car will be placed into the configuration mode. To place the elevator in this mode, access the 40 menu and press enter. On the bottom right side of the screen a 0 will appear. See picture below:

```
-  0  0  0  *  *  _  _
   4  0           0
```
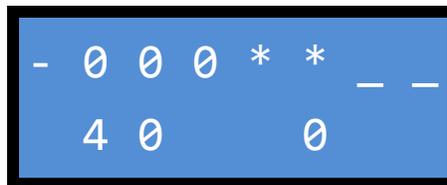
Press the up button to change the 0 to 1, and press enter. The 1 will begin to flash and the elevator will travel to the configuration floor (the floor where the LDU is located) and open the doors so you can confirm that no one is in the elevator. The 1 will stop flashing after the doors open. The elevator is now in the configuration mode.

To exit the configuration mode press the escape button until "40" appears on the bottom left side of the screen and "1" is on the bottom right. Press the down button and the 1 will change to a 0. Press enter to change the configuration status to 0 and exit the configuration mode.

5.4.2 – Configuration of Hall Calls Buttons

The hall call push buttons are on a serial link to the controller and are connected to the WDPNA at the LOP connector. The controller needs to know the component identification number for each board so the elevator will respond to the correct floor when a hall call is pressed.

To configure the hall call boards, enter the configuration mode as described in Section 5.4.1 above. With the elevator in the configuration mode and at the configuration floor the screen should look like this:

```
-  0  0  0  *  *  _  _
   C  F  0  0
```
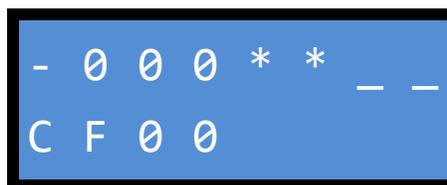
This screen lets you know that you are in the configuration menu and at configuration parameter 00 (CF00). If you press the up button, CF00 will change to CF01, CF02, etc. to scroll through the various configuration parameters.

With CF00 (landing button configuration) displayed, press the enter button. The display will change to LE - - to confirm that you are now in the learn mode at configuration parameter 00. See below:

```
- 0 0 0 * * _ _
L E - -
```
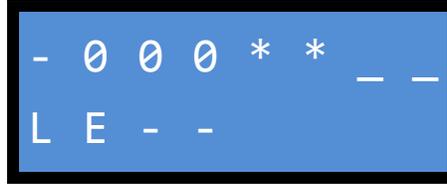
Press enter again to enter the hall button configuration mode. The screen will change back to CF00 and a 1 will appear on the lower right side of the screen to confirm that the control system is now in the hall button configuration mode. See below.

```
- 0 0 0 * * _ _
C F 0 0         1
```

Enter the elevator and enter a car call for the desired floor. Generally, you should start at the bottom floor and work your way back up to the top floor where the LDU is loacted. The elevator will run to the desired floor and open the doors. When the doors open completely, the position indicator will start counting down from 12 to 0. Within the 12 seconds that the countdown takes, press and hold the up button on the hall call pushbutton fixture. The car station chime will beep to confirm that it has seen the hall call.

Press the car call button for the next floor and duplicate the procedure for each floor. At the top floor, since there is no up hall call button, press and hold the down button.

Once all calls have been programed, return to the diagnostic screen. Press the escape button several times to get back to the top of the 40 menu. Press enter to get back to CF00. Press enter again to enter configuration parameter 00, and the screen will show LE - -. See below:

```
- 0 0 0 * * _ _
L E - -
```
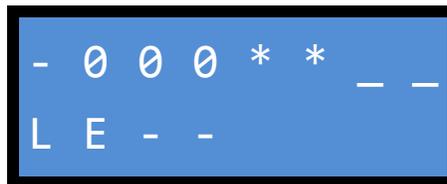
Press the up button and the screen will change to LE00. Press enter and the screen will change to LC with a rotating slash (windmill) on the lower right side. This lets you know that the system is storing the information on the button identification numbers. Once this has been completed the rotating slash will go away.

Press the escape button several times to get back to the top of the 40 menu, and change the 1 to a 0 to leave the configuration mode and return the car to service.

5.4.3 – Configuration of Floor Names

To configure the floor names, enter the configuration mode as described above in Section 5.4.1. With the elevator in the configuration mode and at the configuration floor the screen should look like this:

```
- 0 0 0 * * _ _
  4 0       1
```

Press enter again, and the screen will change to that seen below.

```
- 0 0 0 * * _ _
C F 0 0
```

This screen lets you know that you are in the configuration menu and at configuration parameter 00 (CF00). If you press the up button CF00 will change to CF01, CF02, etc. to scroll through the various configuration parameters.

Navigate to CF01 (floor name configuration) and press the enter button. The screen will change to PA01, which is indicating that you are now at the value for the first floor. Press enter to edit this value, or use the up arrow to scroll to the value that you wish to change.

> PA01=1st floor
> PA02=2nd floor
> PA03=3RD floor
> etc.

When you press enter you will see the present value for that floor. There are 2 characters available, and you can edit the first character using the up and down buttons. To get to the second character, press enter. After editing both characters press the escape button to leave the editing screen and save the value.

When you are done editing the floor names press the escape button several times to get back to the top of the 40 menu. Change the 1 to a 0 to leave the configuration mode and return the car to service.

5.4.4 – Configuration Parameters

Menu	Parameter	Function
CF00		Configure landing call boards
	LE - -	Learn hall call buttons
	LE00	Store node list
CF01		Floor name configuration
	Floor #	Floor name values
CF02		Floors and service configuration
	01	Main floor – fire recall
	02	Main floor – lobby
	03	Parking Floor (Version 4.04 and later only)
	04	Park delay time (Version 4.04 and later only)
	05	0=No parking, 1=Lift parking, 2=Group parking (Version 4.04 and later only)
	06	Alternate fire recall floor
	07	Configuration floor/door (where the LDU is located)
	09	Door hold open timer after fire recall (0=always open)
	11	Preferred door side – independent operation (which door opens on independent)
	12	Security enabled/disabled on independent
	15	Out of service recall floor
	16	Water in pit parking floor
	17	Technician on site timeout
	20	Parking door open time (Version 4.04 and later only)
	21	Emergency power recall floor/door.
	22	EMT floor/door
CF03		Door times
	01	Hold open time for boarding
	02	Hold open time for exiting
	03	Minimum door time
	04	Minimum time after open limit
	05	Car and hall call coincidence time
	08	Door locking failure time
	09	Door open time after reopen
	14	Maximum open time to reach limit
	15	Maximum closing time to reach limit
CF04		Time/date configuration
	01	Elevator number
	02	Time
	03	Time zone
	04	Daylight savings time active
	05	Date
CF05		SCOPNA board inputs
	01 – 06	Key1 through Key6 input signals
	11, 12	Out1 and Out2 output signals
CF06		COP configuration
	03	Minimum time to enter car call after lock has been disabled
	06	Buzzer volume
	13	Arrival gong volume
CF07		Hall lantern configuration
	02	Lantern time
	03	Arrival gong volume
	12	Arrival gong delayed on time
CF08		Car configuration
	01	Rated load (kg)
	02	In car lighting timeout
	04	Minimum load
CF14		Emergency power parameters

		04	Maximum elevators in service on Emergency Power operation
		05	Emergency Power recall failure timeout
		07	Delay recall start time
		08	Automatic return sequence
CF16			Drive configuration
		01	Leveling speed cm/s (Default = 20)
		02	Inspection speed cm/s (Default = 25)
		03	Rated low speed cm/s (Default = 50)
		04	Evacuation speed cm/s (Default = 10)
		05	Hoistway learn speed cm/s (Default = 30)
		06	Overspeed cm/s (Default = 80)
		07	Acceleration rate #1 cm/s^2 (Default = 50)
		08	Deceleration rate #1 cm/s^2 (Default = 50)
		10	End distance mm (half the length of the PHS vane) (Default = 120)
		11	Position correction limit mm (Default = 60)
		13	Counterweight % (BOD data)
		14	Encoder direction (Default = 1 – change to 0 of encoder direction is wrong)
		15	Phase sequence (Default = 1 – change to 0 if motor runs in wrong direction)
		16	Starting torque top (set during learn trip)
		17	Starting torque bottom (set during learn trip)
		18	Hoistway speed time .01 s (Default = 25)
		19	Hoistway service time .01 s (Default = 25)
		20	Hoistway service speed limit cm/s (Default = 30)
		24	Brake drop timeout .01s (Default = 80)
		25	Brake pick timeout .01s (Default = 80)
		28	Maximum releveling distance mm (Default = 75)
		33	System Inertia (BOD data)
		34	Encoder PPR (BOD data)
		35	Rated speed cm/s (BOD data)
		36	Rated motor voltage V (BOD data)
		37	Rated motor frequency Hz (BOD data)
		38	Rated motor speed RPM (BOD data)
		39	Rated motor current I (BOD data)
		40	Motor cos phi (BOD data)
		41	Motor magnetizing current (BOD data)
		42	Rated motor power kW (BOD data)
		43	Motor stator impedance .001 ohm (BOD data)
		44	Gear ratio (BOD data)
		45	Roping factor (BOD data)
		47	Traction sheave diameter mm (BOD data)
		48	Motor temperature limit degree C (BOD data)
		49	Drive software version
		50	Drive commissioning number (BOD data)
		51	P gain acceleration % (Default = 100)
		52	P gain constant speed % (Default = 100)
		53	P gain deceleration % (Default = 100)
		60	Speed edge % (Default = 25)
CF21			Remote monitoring configuration
		01	Servitel ID
		03	Module number
		05	Telephone number
		08	Modem type
		09	Modem flow control
		10	Modem baud rate
		11	Modem data byte length
		12	Modem parity type
		13	Modem stop bit number
		15	Initialization string

		16	Country string
		20	Maximum number retries
		21	Redial timeout
		22	Maximum connect time – Call Center to Remote
		23	Maximum idle time – Call Center to Remote
		24	Maximum connect time – Remote to Call Center
		25	Maximum idle time – Remote to Call Center
		27	Interval for periodic calls
		30	Number of trips until Remote Monitoring logs "Normal Operation" (BOD data)
		33	Modem country value (BOD data)
		34	Volume ring tone
		36	Hoistway ID Elevator #1
		37	Hoistway ID Elevator #2
CF27			Hoistway access configuration
		01	Hoistway access zone bottom distance mm
		02	Hoistway access zone top distance mm
CF28			Belt data configuration
		02	Residual strength warning limit
		03	Residual strength service limit (BOD data)
		04	Manufacture date – each belt
		05	Installation date
		06	Commission number
		07	Aging time warning limit
		08	Aging time service limit (BOD data)
CF30			Double door configuration
		01	Evacuation door side
		02	Door control mode 0=selective 1=simultaneous 2=in car parallel 3=sequential
CF40			BIO Bus Configuration
			Contact Technical Support for further information
CF94			Clear all nodes
		00	Set to 1 to clear all nodes
CF95			Actual car load (kg)
		1	Car load in kg
		2	Car load in % of load
		3	Car load frequency (from load cell)
CF96			Load weigh values (read only)
		1	Zero load frequency
		2	Reference load frequency
		3	Reference load weight in kg
CF97			Load weigh configuration
		1	Zero load frequency
		2	Reference load frequency
		3	Reference load weight in kg
CF98			Load weigh recalibration
			Press "Enter" with empty car to zero load cell
CF99			Load weigh set up
			Refer to Section 8.4

5.5 – Menu 50 Error/Event Log

Menu 50 contains the systems error/event log. The log holds 30 events, and as newer events are recorded the older ones will be moved backwards or deleted. Refer to Section 5.5.1 for further information.

Menu 50 also allows the event log to be cleared. Refer to Section 5.5.2 for further information.

NOTE: *Not all events in the log are errors. There are a number of events that are recorded for information purposes, but do not shut the elevator down.*

5.5.1 – Viewing the Error/Event Log

The error log on the 3300 can be found at parameter 501. To access this, use the keypad and press the enter key. This is the far right button on the CANMB PC board and is marked ⏎.

After hitting the enter key, the number 10 will appear at the bottom left side of the screen. This lets you know that you are now in the parameters menu, and are currently at the 10 menu. See below:

```
- 0 0 0 * * _ _
   1 0
```

Press the up arrow (second button from the left) several times to change the 10 to a 50. The screen will now look like this:

```
- 0 0 0 * * _ _
   5 0
```

Press the enter button and the 50 will change to 501 as shown below:

```
- 0 0 0 * * _ _
   5 0 1
```

Press enter again and the first error or event will be displayed. See picture below:

```
- 0 0 0 * * _ _
 0 1 E    3 6 1 0
```
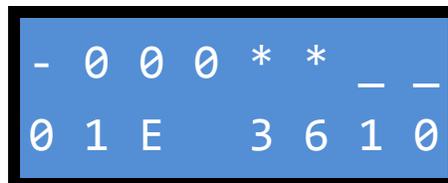
When looking at an error or event, the first number indicates where you are in the log. For example, 01 indicates it is the first event in the log, and therefore the most recent. As newer events are recorded the older ones will be moved backwards, making 01 the most recent. The log holds 30 events, and if more than 30 events occur the oldest will be overwritten.

The next character indicates what type of event is recorded:

- E = Error
- I = Information

- S = Status

The number on the lower right side of the screen indicates the event code. In the picture shown above, a 3610 error was recorded. Refer to the documentation regarding error and event codes for further information regarding specific codes.

While looking at an event, pressing the enter button will display any extra information that is available for that event. Pressing enter again will show the time that the event occurred, and pressing enter again will show the date.

NOTE: *Dates are displayed in the European format:* DD.MM.YY.

While looking through the event log, pressing the up button will scroll to the previous error or event. Likewise, the down arrow will scroll to newer events.

5.5.2 – Clearing the Error/Event Log

To clear the event log access you must parameter 505. If you are viewing an event in the log, hit the escape button until 501 is displayed. Once 501 is displayed, press the up arrow until 505 is shown. This is parameter 505, and it clears the event log. See below:

```
- 0 0 0 * *  _ _
  5 0 5
```
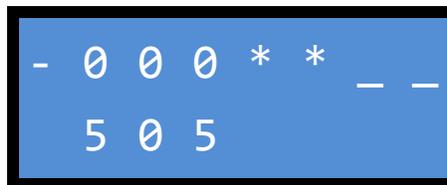
Press enter. A 0 will be displayed on the lower right of the screen, indicating that the present value is 0. See below:

```
- 0 0 0 * *  _ _
  5 0 5     0
```
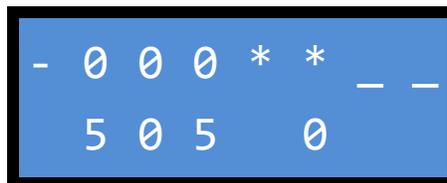
See Press the up button to change the 0 to a 1. See below:

```
- 0 0 0 * *  _ _
  5 0 5     1
```
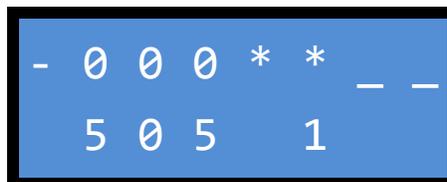
Pressing enter sets parameter 505 to a 1 which will clear the error log. There is no reason to change it back to a 0, as it does this automatically after the log is cleared.

5.5.3 – Parameter 504 – Upload Parameters

Parameter 504 allows you to upload the current setting of all system parameters. This feature is very helpful in the event that the CPU is changed or the data becomes corrupted. For more information regarding this feature refer to Section 6.3.

5.6 – Menu 60 – Statistics

The 60 menu lets you see the amount of trips the elevator has taken, the number of door cycles, the number of hours the system has been in service, as well as see the number of bend cycles for the belts (Schindler calls them "Suspension Traction Media" or STM). The belts are rated for 15 years from the date of manufactured or 1,000,000 bend cycles. The processor on the system counts the number of bend cycles, and this information can be displayed at parameter 6301. Also, there is a shortcut to the bend cycle count by pressing the escape and down buttons simultaneously.

Other information available in menu 60:

Command	Function
601	Trip counter
602	Hours in service
610	Door cycles – front door
611	Door cycles – rear door
6301	Belt bend cycle monitor
6302	Expected end of life date for belts (dd-mm-yy format)

5.6.1 – Belt Monitoring and End of Life for Belts

The life of the belts is monitored by counting the number of bend cycles as well as their age. They have a life cycle of 15 years or 1,000,000 bend cycles. This information can be viewed by accessing parameter 6301. The value of this parameter is the current number of bend cycles.

NOTE: *The number of bend cycles can be viewed from any screen via the shortcut of pressing the escape and down buttons simultaneously. See picture below of screen displaying the number of bend cycles:*

Parameter 6302 displays the expected end of life date for the belts. This value is determined by the present amount of usage and the anticipated date that the belts will have 1,000,000 bend cycles, or if they will not reach 1,000,000 cycles before they are 15 years old, the date that the belts will need to be replaced due to age.

NOTE: *Dates are displayed in the European format:* DD:MM:YY.

Section 6 – Special Procedures and Functions

6.1 – Resetting Unintended Movement Trip

If the system detects an unintended movement fault it will declare error 4305. The car will not be able to be run on Automatic or Inspection Operation.

To reset an unintended movement fault the car must be placed on hoistway access operation inside the car. After the car is on hoistway access, access the menu screens on the diagnostic display. From the main screen press the enter key.

After hitting the enter key, the number 10 will appear at the bottom left side of the screen. This lets you know that you are now in the parameters menu, and are currently at the 10 menu. See below:

```
- 0 0 0 * * _ _
  1 0
```

Press the enter key again and the 10 will change to 101. This lets you know that you are now at parameter 101. See below:

```
- 0 0 0 * * _ _
  1 0 1
```
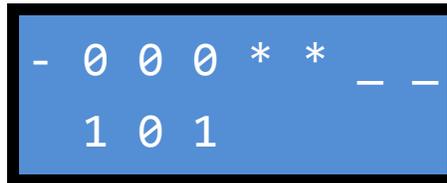
Press the up arrow to get to parameter 127. With 127 displayed, hit enter and the number 0 will appear on the bottom right of the screen as shown below:

```
- 0 0 0 * * _ _
  1 2 7   0
```

Press the up arrow to change the 0 to a 1 and then press enter. The error has now been reset. Return to the main diagnostic display by pressing escape several times.

NOTE: *Always verify what triggered the unintended movement fault before returning the elevator to service. There may also be other faults present, and a 101 reset may be required before the car will run on automatic operation.*

6.2 – Disabling Remote Monitoring

The 3300 control system utilizes remote monitoring. To disable this function, all that has to be done is to remove the modem board. The modem board is called the CLSD (Communication & Line Switching Device) and is located in the control panel immediately to the left of the Car and Hoistway Door Bypass switches. It is plugged into the WDPNA board (Wiring Distribution Panel, North America) and secured with 2 Philips-head screws. See pictures below;

To remove the CLSD board, remove power to the controller by opening the disconnect or opening the JHS breaker in the control panel.

Unplug the 2 connectors at the top of the board. One connector is the phone line from the building, and the other connector is from the traveling cable going to the Rath phone on the car top.

Tie the wires from the 2 connectors together, pin 1 from the phone line to pin 1 for the traveling cable, and pin 2 from the phone line to pin 2 for the traveling cable.

Using a long Philips-head screw driver, carefully remove the screws holding the CLSD board. Be careful not to drop the screws, as they are not secured to the CLSD board.

After removing the CLSD board, tuck the phone line into the space where the board used to be located. The system can be powered up and the elevator returned to service.

NOTE: *To program the emergency phone in the elevator, follow the instructions printed on the Rath phone on the car top. The Rath phone is a standard emergency phone, and no special procedures are necessary other than the instructions from the manufacturer.*

6.3 – Software and Parameter Backup

The software on the 3300 control system can be archived by loading it onto a thumb drive. Also, the current parameters can be archived as well. In the event of a failure of the 3300 processor (CM11 board) the software can be reloaded from the thumb drive, and the parameters can be viewed to re-program the system.

6.3.1 – Preparation

In order to back up the data, a thumb drive that is **8 GB or less** must be used. A larger drive will not be recognized by the system. The thumb drive is plugged into the "USB" slot on the WDPNA PC board. The WDPNA board is located immediately below the board that has the LCD display (CANMB board), and they are connected by a plug. See picture below:
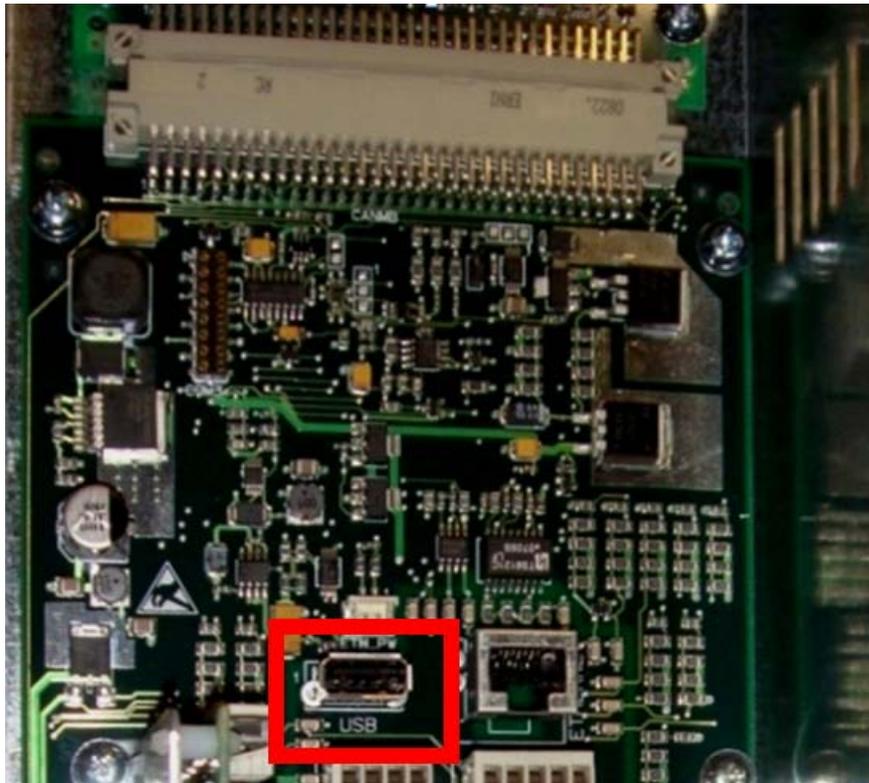
WDPNA USB Slot

6.3.2 – Archiving Parameters

NOTE: *Before attempting to upload the software or archive the parameters the elevator must be placed on controller inspection, and the stop button in the control panel pressed. The upload will not occur if the control system is not disabled in this manner.*

With the thumb drive plugged in, you will need to access the parameters menu. To do this, use the keypad and press the enter key. This is the far right button on the CANMB PC board and is marked ↵.

After hitting the enter key, the number 10 will appear at the bottom left side of the screen. This lets you know that you are now in the parameters menu, and are currently at the 10 menu. Press the up button several times to change the 10 to a 50. See below:

```
- 0 0 0 * *  _ _
    5 0
```
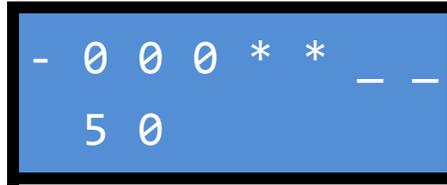
Once 50 is displayed, press enter and the 50 will change to 501. See below:

```
- 0 0 0 * *  _ _
    5 0 1
```

Press the up key (second from the left) several times to get to parameter 504. See below:

```
- 0 0 0 * *  _ _
    5 0 4
```
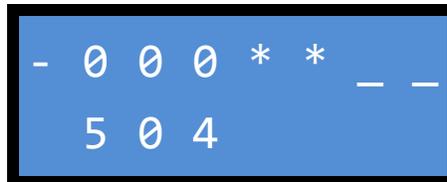
Press the enter key and a 0 will appear on the lower right side of the screen. Press the up button to change the 0 to 1. See below:

```
- 0 0 0 * *  _ _
    5 0 4   1
```
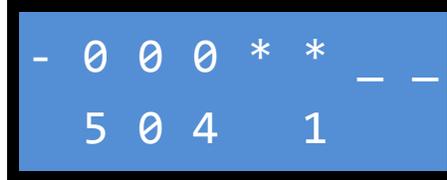
Once the 1 is displayed, press enter.

A rotating slash or 'windmill' will start rotating on the lower right corner of the screen to let you know the system is writing to the thumb drive. Once it completes writing the windmill will disappear. The parameters are now backed up on the thumb drive.

6.3.3 – Archiving Software

Hit the escape button several times to make sure that you are at the main diagnostic screen.

Press the enter button.

After hitting the enter key, the number 10 will appear at the bottom left side of the screen. This lets you know that you are now in the parameters menu, and are currently at the 10 menu. See below:

```
- 0 0 0 * * _ _
  1 0
```

Press the enter key again and the 10 will change to 101. This lets you know that you are now at parameter 101. See below:

```
- 0 0 0 * * _ _
  1 0 1
```

Press the up button (second from the left) to get to parameter 121. See below:

```
- 0 0 0 * * _ _
  1 2 1
```

Press the enter key and a 0 will appear on the lower right side of the screen. See below:

```
- 0 0 0 * * _ _
  1 2 1    0
```
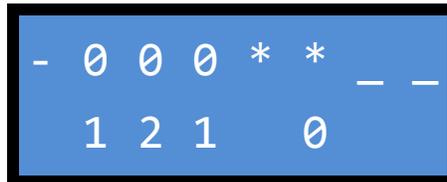
Press the up button twice to change the 0 to a 2. See below:

```
- 0 0 0 * * _ _
  1 2 1    2
```

Once the 2 is displayed press enter.

A rotating slash or 'windmill' will start rotating on the lower right corner of the screen to let you know the system is writing to the thumb drive. Once it completes writing the windmill will disappear. The software is now backed up on the thumb drive.

NOTE: *The thumb drive must be removed before you can exit parameter 121.*

6.3.4 – Saving the Archived Files

Once the software and parameters have been saved to the thumb drive they will need to be stored in a safe location. The files can remain on the thumb drive, but if you archive the data from any other car it may overwrite the older data with the newer files.

During the archiving process, 2 folders are created under the root directory of the thumb drive. One folder is a string of numbers, which is the serial number for the elevator. This folder contains the archived parameters. The second folder is called "upload" and contains the archived software. See picture below:

Name	Date modified	Type	Size
4413967	6/14/2016 12:14 PM	File folder	
upload	6/14/2016 12:13 PM	File folder	

Create a new folder on the thumb drive and name it with the job name and car number. Move the folders from the archive process into the new folder. The thumb drive can then be used to archive other data.

6.4 – Status 40 Recovery

It is extremely important to perform the backup procedures in Section 6.3 because if the software or parameters become corrupted it will make it easier to restore the software and parameters and return the elevator to service. Without the backup files the load weigh will need to be readjusted with weights. If the backup has been performed, the load weigh values are archived, and they can be read and re-entered into the system. A **TEMPORARY** set up of the load weigh values is detailed in Section 6.5. These values will allow the car to run until weights can be brought to the job site and the load weigh set up can be performed.

NOTE: *If the software and parameters have not been archived, follow the procedures at **Section 6.3.3 – Archiving Software** to download the software file from the control system. This will download the corrupted software file, but the parameter data is irretrievable so you will need to figure out the correct values for the various parameters listed below. This will prolong the reprograming process and will result in additional work.*

6.4.1 – Preparation

Before beginning the restoration process a **USB flash drive (thumb drive) of 4 GB or less** must be located. A larger flash drive will not be recognized by the system.

A computer will be required, and a Technician that is familiar with computers and basic computer skills such as naming files, moving files, etc. must perform the restoration process.

NOTE: *If the Technician does not have a computer or is unfamiliar with basic computer skills this operation will not be successful.*

If the software has been archived you will need to locate the file called "nx-config.xml". To locate this file, open the folder that is named with the installation number (usually a 7 digit number) and then open the folder that is named starting with the date the backup was performed. Open this

folder and there will be several other folders. Open the folder named "configuration" to find the nx-config.xml file. See picture below for typical file names:
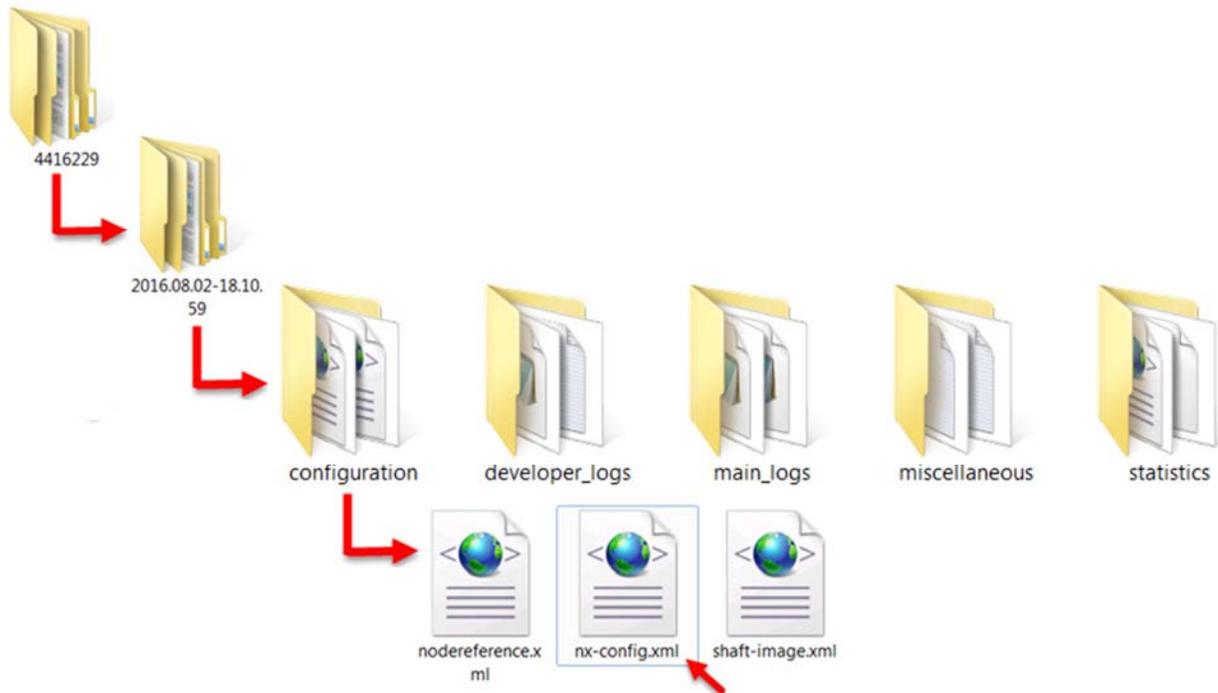
Double click on the nx.config.xml file. Internet Explorer should open and allow you to view the file. Scroll down and located the follow parameters and record their values:

```
<param value="0" type="UINT16" key="MotorPhaseSequence"/>
<param value="1" type="UINT16" key="MotorEncoderDirection"/>
<param value="2000" type="INT32" key="HoistwayAccessZoneTop"/>
<param value="2200" type="INT32" key="HoistwayAccessZoneBottom"/>
<param value="16758" type="UINT16" key="ZeroCarLoadFrequency"/>
<param value="1000" type="UINT16" key="ReferenceCarLoadWeight"/>
<param value="15758" type="UINT16" key="ReferenceCarLoadFrequency"/>
```

The value to be recorded is the number immediately after "param value=".

After recording these values, skip to Section 6.4.3. If the job software has not been archived, proceed to Section 6.4.2.

6.4.2 – Recording Values from Controller

If the software has not been archived you will need to access the Configuration menu and try to retrieve the stored values. This operation is not usually successful, and even if it is, there are rarely any values available for the load weigh parameters.

Access the Configuration menu (40) as described in Section 5.4. Navigate to the following parameters and record their values:

CF16   PA14   Motor Encoder Direction
CF16   PA15   Phase Sequence

CF27   PA01   Hoistway Access Zone Bottom
CF27   PA02   Hostway Access Zone Top
CF96   PA01   Zero Car Load Frequency
CF96   PA02   Reference Car Load Frequency
CF96   PA03   Reference Car Weight

NOTE: *It is unlikely that any values will be found for the load weigh parameters at Configuration menu CF96. If there are no values and the software has not been archived it will be necessary to get weights to the job site to perform the final set up. Refer to Section 6.5 for a **TEMPORARY** set up of the load weigh values.*

6.4.3 – Restore Software

1. Unplug the "LOP" connector from the WDPNA board. This plug is located to the left and slightly below the Car Door and Hoistway Door Bypass switches. See picture below:

WDPNA LOP Plug

2. Place the car on inspection and press the stop switch located on the inspection run box in the LDU.

3. Insert a USB flash drive that is **4 GB or less** into the USB port on the WDPNA board. See picture below:
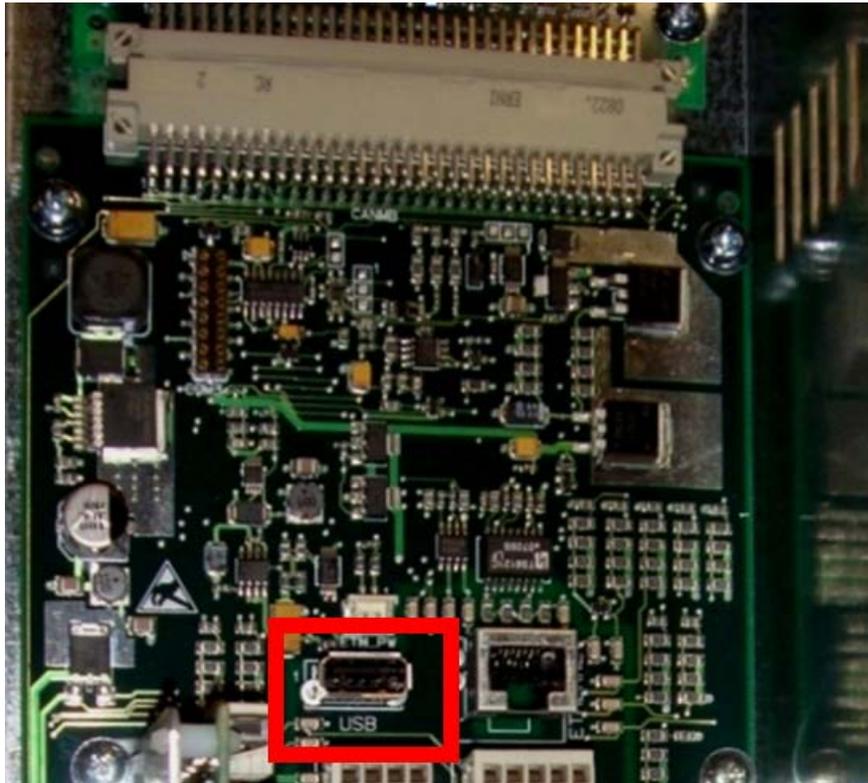
WDPNA USB Plug

4. Access the 10 menu, and press enter.

5. Press the up arrow to navigate to parameter 121. Press enter.

6. A 0 will appear at the lower right part of the screen. Press the up button to change the 0 to a 2. Press enter.

7. A rotating slash with appear at the bottom right part of the screen. This indicates that the system is writing the file to the USB flash drive. When the process is complete a 1 will appear at the lower right part of the screen. The flash drive can now be removed from the system.

   NOTE: There are several errors that may occur while attempting to write the file to the flash drive. They are:

4501	The stop button on the inspection station is not pressed.
4502	The flash drive is not seen. Make sure the LOP plug has been removed, and that the flash drive is 4 GB or less.
4505	The information on the flash drive is not configured correctly. Make sure that "2" was entered in step 6 above, and that the flash drive is 4 GB or less.

8. Insert the flash drive into a computer. Open Windows Explorer and view the flash drive.

9. There will be a folder named "upload" on the flash drive under the root directory. Rename this folder "BOD".

10. Open the newly named "BOD" folder. There will be several files in this folder, and one of them is named "0.xml". Rename the "0.xml" file to "bod.xml". Remove the flash drive from the computer.

11. Insert the flash drive into the USB port on the CLSD board.

12. Press the enter button to access the menus if the screen is not there already. Access the 10 menu and navigate to parameter 121. Press enter and a 0 will appear at the lower right part of the screen.

13. Press the up arrow to change the 0 to a 3. When 3 is displayed, press enter.

14. A rotating slash with appear at the bottom right part of the screen. This indicates that the system is loading the file from the USB flash drive. When the process is complete a 1 will appear at the bottom right part of the screen.

15. Remove the flash drive from the system.

16. Install the LOP plug that was removed in step 1 above.

17. Press enter, and the system should reboot.

The system has now been reloaded with the software file, and will need to be reprogrammed.

6.4.4 – System Reprogramming

1. After rebooting, access the Configuration Menu at 40 as described in Section 5.4.

2. Navigate to the following parameters and enter the values that had previously been recorded:

    CF16   PA14   Motor Encoder Direction
    CF16   PA15   Phase Sequence
    CF27   PA01   Hoistway Access Zone Bottom
    CF27   PA02   Hostway Access Zone Top

3. Navigate to CF16 PA99 and press enter. A 0 will appear at the bottom right of the screen. Press the up arrow to change the 0 to a 1, and press enter. This sends the parameters to the drive.

4. Exit the 40 menu as described in Section 5.4.

5. If the car is near the top of the hoistway you will need to run it down so it doesn't roll back into the overhead. If it is away from the top floor go to step 9.

6. Access the 10 menu, and navigate to parameter 102. Press enter. A 0 will appear at the bottom right part of the screen. Press the up arrow to change the 0 to a 1. Press enter. This puts the drive into open loop mode, and will allow the car to run on inspection without pretorque activated.

7. Using the inspection station in the controller, run the car down to a point away from the top floor.

8. Access parameter 102 and press enter. A 1 should appear at the bottom right of the screen. Press the down arrow to change the 1 to a 0. Press enter. The 0 should shift slightly to the right, indicating that it has been saved.

9. The load weigh now needs to be disabled. Go to the 10 menu and access parameter 107. Press enter. A 0 will appear at the bottom right of the screen. Press the up arrow to change the 0 to a 1. Press enter. The 1 will shift slightly to the left indicating it has been accepted. The load weigh is now disabled.

10. If the car is on inspection on the controller inspection bank return it to Normal Operation. If the stop switch is pressed, return it to normal.

11. Access the 10 menu and navigate to parameter 116. Press the enter button, and a 0 will appear at the bottom right part of the screen. Press the up arrow to change the 0 to a 1, and press enter. The elevator should start performing a learn trip, as indicated by a rotating slash at the bottom right part of the screen. The learn trip is fully automated and should take several minutes to perform. The car will run up and down several times during the learn trip. If any errors are logged during the learn trip they will flash at the bottom left part of the screen.

12. If the learn trip has been successful a 1 will appear at the bottom right of the screen. Hot the escape button several times to get back to the main diagnostic screen. The status of the elevator (shown at the bottom right of screen) should now be either 11 or 42. This indicates that the car has an invalid load weigh set up (status 42) or is on load weigh disable operation (status 11).

13. Access the menus by pressing enter. Access the 10 menu and navigate to parameter 107. Press enter. A 1 will appear at the bottom right of the screen. Press the down arrow to change the 1 to a 0. Press enter. The 0 will shift slightly to the left indicating it has been accepted. The load weigh is now enabled.

14. Use the up arrow to navigate to menu 40. Press enter and a 0 should appear at the bottom right of the screen. Press the up arrow to change the 0 to a 1, and press enter. The elevator is now in Configuration mode and will run to floor where the controller is and open the doors. Once the doors open the 1 at the bottom right of the screen will stop flashing and CF00 will appear. Press the down arrow to navigate to CF97. Press enter and PA01 will appear.

15. Press enter and PA01 will disappear and a number will be displayed, probably 0. Press enter and the number will start flashing. Use the arrow buttons and enter the value one digit at a time that was previously recorded for "Zero Load Frequency". After entering the last digit, press the escape button.

16. Press the up arrow to change PA01 to PA02. Press enter. PA02 will disappear and a number will be displayed, probably 0. Press enter and the number will start flashing. Use the arrow buttons and enter the value one digit at a time that was previously recorded for "Reference Car Load Frequency". After entering the last digit, press the escape button.

17. Press the up arrow to change PA02 to PA03. Press enter. PA03 will disappear and a number will be displayed, probably 0. Press enter and the number will start flashing. Use the arrow buttons and enter the value one digit at a time that was previously recorded for "Reference Car Load Weight". After entering the last digit, press the escape button.

18. Press the escape button several times to get back to the top of the 40 menu. A 1 will be displayed at the bottom right of the screen. Press the down arrow to turn the 1 to a 0, and press enter. The 0 will shift slightly to the left indicating it has been accepted.

19. Press the escape button several times to get back to the main diagnostic screen. The status (displayed on the bottom right of the screen) should be 01, indicating it is on automatic operation. If not, refer to Section 4.2 to determine what mode of service the elevator is in.

The elevator is now reprogrammed and will run on Automatic Operation.

NOTE: If there are additional I/O signals wired to any BIOGIO boards they will need to be reprogrammed. Contact Technical Support for assistance programming the BIOGIO boards.

6.5 – Temporary Set Up of Load Weigh

If the load weigh settings are lost they can be adjusted for temporary operation by estimating several values.

NOTE: The following set up will allow for **<u>TEMPORARY</u>** operation of the elevator, but may cause the car to fault or go into the pit if it is loaded. This procedure should only be used if the correct values are lost and the control system parameters were not backed up. Refer to Section 6.3 for the archiving procedure.

1. Access the menus by pressing enter. A 10 should appear on the lower part of the screen. Use the up arrow to navigate to menu 40. Press enter and a 0 should appear at the bottom right of the screen. Press the up arrow to change the 0 to a 1, and press enter. The elevator is now in Configuration mode and will run to floor where the controller is and open the doors. Once the doors open the 1 at the bottom right of the screen will stop flashing and CF00 will appear. Press the down arrow to navigate to CF97. Press enter and PA01 will appear.

2. Press enter and PA01 will disappear and a number will be displayed, probably 0. Press enter and the number will start flashing. Use the arrow buttons and enter the value "16700" one digit at a time. After entering the last digit, press the escape button.

3. Press the up arrow to change PA01 to PA02. Press enter. PA02 will disappear and a number will be displayed, probably 0. Press enter and the number will start flashing. Use the arrow buttons and enter the value "15700: one digit at a time. After entering the last digit, press the escape button.

4. Press the up arrow to change PA02 to PA03. Press enter. PA03 will disappear and a number will be displayed, probably 0. Press enter and the number will start flashing. Use the arrow buttons and enter the value "1000" one digit at a time. After entering the last digit, press the escape button.

5. Press the escape button until the display shows CF96. Press the up arrow to navigate to CF98 and press enter. The screen will change to show the present load in the car in kilograms (kg).

6. Press enter again to start the recalibration procedure. The recalibration procedure takes about 1 minute. The CPU will take five readings from the load weigh device and adjust the load values accordingly.

7. After the five readings are complete, press the enter button. The display should read CF98.

8. Press the escape button to get back to the top of the 40 menu. Change the 1 to a 0 to leave the configuration mode.

9. Press the escape button several times to get back to the main diagnostic screen. The status (displayed on the bottom right of the screen) should be 01, indicating it is on automatic operation.

6.6 – System Reprogramming after Replacement of Belts

After new belts have been installed, the system must be reprogrammed with the information from the new belts and the trip counter must be reset.

Start the following procedure with the car on inspection operation in the controller and the stop button pressed.

1. From the main diagnostic screen, press <ENTER> to access the menus. 10 will appear in the bottom of the display. Press <ENTER> again and the "10" will change to "101".

2. Press the <DOWN> button to navigate to parameter 190 (one-time configuration change).

3. Press <ENTER>. A "0" will appear on the bottom right side of the display. Press the <UP> arrow to change the 0 to a1. Press <ENTER> to accept this value acknowledging a one-time configuration change.

4. Press the <ESCAPE> button several times until the bottom of the display shows "10".

5. Press the <UP> arrow several times until the "10" changes to a "40".

6. Press <ENTER>. A "0" will appear at the bottom right side of the display. Press the <UP> arrow to change the "0" to a "1". Press <ENTER> and the display will show "CF00". This means that you are now in the Configuration menu and at Configuration Function 00.

7. Press the <UP> arrow to navigate to "CF28". CF28 is the belt configuration function.

8. Press <ENTER> and the display will change to PA02. Press the <UP> arrow to navigate to PA04. PA04 is the manufacture date of the new belts.

9. Press <ENTER> and the display will show #1. This is where you will enter the manufacture date of the first belt. Press <ENTER>.

10. Locate the data tags that were supplied with the new belts. On the data tag there will a week and year that the belt was manufactured. See example below:
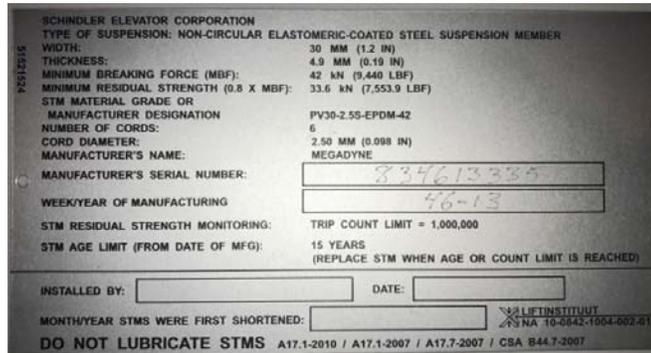
11. The value that will be programmed into the system requires the manufacture date to be in the format of "DAY (1-7), WEEK (01-53), YEAR (00-99)." The data tag will not show a day, so just program it as "1". For the example shown in the picture above, the value that needs to be programmed will be "14613".

12. To enter the value, press <ENTER> and the first digit will start flashing. This indicates that this digit can be edited. Press the <UP> or the <DOWN> arrow to change it to the a "1", and press <ENTER> to accept it. The next digit will begin flashing, indicating that it can be edited. Press the <UP> or <DOWN> arrow to change it to the desired value, and press <ENTER> to accept it. Continue this to program the remaining numbers.

13. After pressing <ENTER> to accept the last digit, the number will stop flashing. Press <ESCAPE> to exit the date programming for belt #1, and the display will show "#1". Press the <UP> arrow and the display will show "#2". Press <ENTER> to program the manufacture date for belt #2 in the same way that was just done for belt #1 in step 12.

14. After programming belt #2, program the manufacture dates for belts #3 and #4.

15. After completing the programing of belt #4, press the <ESCAPE> button and the display will change to "PA04". Press the <UP> arrow to change this to "PA05". Press <ENTER>.

16. Value PA05 is the installation date of the belts, and will be set to the current date. The date is in the European format of DD-MM-YY. Press the <ENTER> button and the first digit will start flashing, indicating that it can be edited. Press the <UP> or the <DOWN> button to set it to the correct value, and press <ENTER> to accept the value. The next digit will start flashing, indication that it can be programmed. Program the rest of the date, and after hitting <ENTER> once the final digit was set, all values will stop flashing. This indicates that the date has been set.

17. Press the <ESCAPE> button and the display will show "PA05". Press the <UP> button to change this to "PA06" and press <ENTER>.

18. PA06 is the job (commission) number. This value has previously been programmed and should not need to be edited, but you must enter it again into the system. Press <ENTER> and the first digit will begin flashing. Press <ENTER> again and the second digit will begin flashing. Press the <ENTER> button again for all remaining digits, and after programming the final digit a "1" will appear on the bottom right side of the display. This indicates that the new data for the belts has been accepted, and the trip counter has been reset.

19. Press the <ESCAPE> button several times until the bottom of the display shows "40" with a "1" at the right side. Press the <DOWN> arrow to change the "1" to a "0" and press <ENTER>. This will exit the Configuration mode. Press the <ESCAPE> button several times to exit the parameter menu and get back to the main diagnostic screen.

20. Take the car off inspection in the controller and pull the stop button. The elevator should return to service.

    NOTE: *If power was removed from the system for an extended period of time during the belt replacement process it may need to run to the bottom floor to recover its position.*

21. Press the <ESCAPE> and <DOWN> buttons simultaneously to display the trip counter. Confirm that the trip counter has been reset and it is a 0 or a 1.

The system reprogramming with the new belt information and reset of the trip counter is now complete, and the car can be returned to service.

Section 7 – Troubleshooting

7.1 – Diagnostic Screen and States

The key to troubleshooting the system is to first determine what state the elevator is in. To do this, look at the main screen on the diagnostic display. The display is described in Section 4.2.

Look at the present status of the elevator on the lower right part of the diagnostic screen. A status of 01 indicates that the car is on automatic operation and available for passenger travel. Any other status indicates that the system is not on automatic operation. Refer to the chart below for common states that may be seen.

State	Description
00	Out of Service
01	Automatic Operation
02	Independent Operation
03	Fire Phase I
04	Fire Phase II
05	Emergency Power Operation
06	Earthquake Operation
07	Code Blue Operation
09	Water in pit sensor active
11	Automatic Operation with load weigh disabled (parameter 107 active)
12	Passenger release operation (power lost, moving to closest landing on battery power)
14	Emergency power recall
29	Move around operation (parameter 199 active)
36	Emergency Power Halt
37	Stop switch in car open
38	Stop switch in FF panel open
39	Elevator is overloaded
40	Invalid configuration (see note below)
41	Invalid hoistway image (must perform learn trip)
42	Invalid load weigh configuration
43	Invalid drive configuration
44	Out of service from remote
45	Belt life exceeded
51	Installation travel (parameter 105 active)
52	Configuration (parameter 40 active)
53	Controller Inspection Operation
54	Car Top Inspection Operation
55	In car inspection operation (not present in North America)
56	Hoistway Access Operation
57	Test Travel Operation (parameter 104 active)
58	Acceptance Test mode
59	Hoistway Learn
70	Recovery mode (elevator recovering after power loss, etc.)
71	Recovery from over/under temperature
72	Position recovery (elevator recovering after position loss)
74	Low backup battery power
80	Stop switch in hoistway pressed

81	Stop switch on car top pressed
82	Stop switch on controller pressed
88	Safety circuit open
89	Bypass (car door and/or hoistway door) switch activated
90	System status invalid (will attempt to recover when on automatic operation)
91	Power up
92	Subsystem firmware downloaded
95	Power lost to controller
97	Out of service but available for inspection operation (check error log for cause)
98	Out of service & **NOT** available for inspection operation (check error log for cause)
99	Out of service – must perform 101 reset to operate
W!	Belt life warning – belt life has exceeded 80%

NOTE: *Status 40 indicates that the software configuration has become corrupted. Refer to Section 6.4 for further information.*

Status 98 and 99 will not allow the elevator to run on inspection operation. Status 98 may be cleared by performing a 101 reset at the controller or by a 'soft reset' from the car top or controller inspection run box.

7.2 – Check Error/Event Log

As described in Section 5.5.1, view the event log to see what faults or events have been logged. These events are time stamped, so it is possible to determine when the event occurred. As previously mentioned, not all information in the log is an error, and many events are logged to assist in determine what has happened with the elevator.

7.3 – Common Error/Event Codes

The following is list of common error or event codes.

Code	Description
Status Messages	
0019	Watchdog reset. Processor problem has been detected and processor restarted.
0033	Start up. The system was reset and the processor restarted.
0040	Manual reset (101) commanded by user.
0041	Earthquake mode reset by user.
0042	Governor overspeed contact reset by user.
0043	Unintended movement reset by user.
0044	Water in pit reset by user.
0050	Recall trip (fire, earthquake, etc.) started.
0051	Recall trip complete.
0052	Recall trip interrupted. Car stopped trip due to other condition (inspection, etc.)
0053	Recall trip destination changed.
0055	Processor start up failed. Refer to other error for possible cause.
0056	Processor start up recovery successful. Processor recovered from a startup failure.
0060	Counterweight derailment.
0061	Speed too fast at terminal landing.
0062	Backup battery insufficient charge.
0063	Backup battery insufficient charge.

0064	Control system power on.	
0065	Control system power removed.	
0066	Control cabinet excessive heat.	
0067	Control cabinet excessive heat recovery successful.	
0068	Drive reduced error mode (parameter 102) active.	
0069	Drive reduced error mode (parameter 102) complete.	
0070	Technician on site (parameter 117) active.	
0071	Technician on site (parameter 117) complete.	
0072	Car light/alarm bell battery insufficient charge.	
0083	24-NGL power supply failure.	
0086	Node list invalid.	
Door Errors		
0301	Door closing timeout.	
0302	Door opening timeout.	
0350	Door position signal invalid.	
0351	Door position recovery successful.	
0352	Door position recovery failure.	
0353	Door unavailable.	
0354	Door availability recovered.	
Invertor (Drive) Errors		
0430	Brake switch(es) do not match commanded state of brake.	
0431	Brake switch(es) do not match commanded state of brake, fatal.	
0432	Brake contactor contacts do not match commanded state. Check auxiliary contacts.	
0433	Main contactor contacts do not match commanded state. Check auxiliary contacts.	
0435	Motor overtemperature.	
0436	Motor temperature recovery successful.	
0437	Drive dynamic braking resistance overtemperature.	
0438	Drive dynamic braking resistance temperature recovery successful.	
0439	Drive overtemperature.	
0440	Drive temperature recovery successful.	
0441	Drive overtemperature.	
0444	Trip timeout. Car did not reach desired floor within the maximum amount of time.	
0445	Drive trip preparation data from control system invalid.	
0446	Drive trip start failure. Drive commanded start, but no car movement.	
0447	Excess encoder position deviation. May be slipping belts, loose motor encoder, etc.	
0448	Drive inverter controller failure. Internal drive failure.	
0449	Drive output power failure. Drive commanded run, but detected no output.	
0450	Elevator releveling failure. Overshot floor, level distance exceeded, or leveling sensor bad.	
Load Weigh Device Errors		
1105	Load weigh device needs to be calibrated.	
1109	Load weigh device needs to be calibrated.	
1110	Load weigh device needs to be calibrated.	
1112	Load weigh device needs to be calibrated.	
1119	Load weigh device signal unstable.	
1120	Load weigh signal missing.	
1121	Load weigh signal out of range.	
1123	Load weigh zero calibration successful.	
1125	Load weigh reference load calibration successful.	
1126	Load weigh recovery successful.	

1127	Load weigh device disabled (parameter 107 set to 1)
1128	Load weigh enabled.
1130	Load weigh disabled.

Drive Errors

1501	Drive overcurrent.
1502	Drive overvoltage.
1503	Drive ground fault. Check motor stator resistance and check for grounded stator.
1505	Drive charging contactor fault. DC bus unstable. May be bad contactor, capacitors, etc.
1509	Drive DC bus low voltage.
1510	Drive AC input fault. 1 or more phases of AC input not present.
1511	Drive output current fault. Low current to 1 or more motor phases.
1512	Drive DC bus braking IGBT failure.
1515	Motor stalled.
1517	Motor current too low.
1531	Motor encoder signal fault. 1 or more encoder channels bad or missing.
1533	Speed differential fault. Excessive difference between motor speed and commanded speed.
1567	Motor movement during standstill.
1589	Safety signal opened while drive is active.
1599	Internal drive fault. Refer to extra information for further details.

Learn Trip Errors

2004	Number of detected floors does not agree with configuration (BOD file) data.
2013	Learn trip aborted due to higher priority function (inspection, safety circuit open, etc.).
2061	Learn trip detected incorrect door zone length.
2078	Learn trip terminal slowdown signal distance incorrect.
2081	Learn trip adjacent floors incorrect distance (too close or too far apart).

Leveling Zone Signal Errors

2138	Leveling zone signal invalid.

Safety Circuit Errors

3552	Safety circuit not closed at IKTC (car door contact not closing).
3556	Safety circuit not closed at IKTS (shaft door contact not closing)
3561	Safety circuit **NOT** opened at IKTC (jumper detected on car door contact).
3563	Safety circuit **NOT** opened at IKTS (jumper detected on shaft door contact).
3572	Safety circuit opened unexpectedly at IKTC (car door contact open).
3574	Safety circuit opened unexpectedly at IHC (plank switch, etc.) open.
3575	Safety circuit opened at IUSK (DUEISK-A circuit breaker open).
3576	Safety circuit opened unexpectedly at IKTS (shaft door contact open).
3577	Safety circuit opened unexpectedly at IHW (pit safety circuit open).
3578	Safety circuit opened unexpectedly at IC (car top exit switch open).
3580	Safety circuit power supply not present (power to circuit prior to DUEISK-A breaker).
3581	Safety circuit power supply overcurrent (power to circuit prior to DUEISK-A breaker).
3596	Safety circuit failure recovery successful.
3599	Safety circuit failure recovery at door **NOT** successful.

Communication Errors

3610	No communication to LOP. See extra information for further details.
3611	Communication to LOP reestablished (recovery from 3610).
3612	No communication to LOP. See extra information for further details.
3613	Communication LOP reestablished (recovery from 3612).
3614	No communication to I/O node. See extra information for further details.
3615	Communication to I/O node reestablished (recovery from 3614).

3616	No communication to I/O node. See extra information for further details.
3617	Communication to I/O node reestablished (recovery from 3616).
3618	No communication to car CANCNA. See extra information for further details.
3619	Communication to CANCNA reestablished (recovery from 3618).
3620	No communication to drive.
3621	Communication to drive reestablished (recovery from 3620).
3622	No communication to car SCOPNA.
3623	Communication to SCOPNA reestablished (recovery from 3622).
3624	No communication to load weigh system.
3625	Communication to load weigh system reestablished (recovery from 3624).
3626	No communication to main board. See extra information for further details.
3627	Communication to main board reestablished (recovery from 3626).
3630	Node list stored successfully.
3631	Node list **NOT** stored successfully.
3633	Node incompatibility.
Acceptance Test Status Messages	
4000	Current test failed.
4001	Current test completed successfully.
4002	Current test completed, but the system was unable to determine if it was successful due to another safety device opening.
4003	Current test canceled by user.
4004	Current test aborted – higher priority function (safety circuit opened, etc.).
4005	Current test aborted – missing user input.
4006	Current test aborted – speed not reached.
4007	Current test aborted – load not present.
4008	Current test aborted – brake dropped unexpectedly.
4021	Trip time monitor test started.
4022	Ascending car overspeed test started.
4023	Unintended movement test – down direction started.
4024	Unintended movement test – up direction started.
4025	NTS test – down direction started.
4026	NTS test – up direction started.
4027	Normal brake stopping test – down direction started.
4028	Normal brake stopping test – up direction started.
4029	Counterweight balancing test started.
4032	Car safety test started.
4033	Emergency brake stopping test – down direction started.
4034	Emergency brake stopping test – up direction started.
4036	Car safety actuation test started.
4037	Car low speed limit device (SPDLIM board) started.
4039	Overspeed monitor test – down direction started.
4040	Overspeed monitor test – up direction started.
4041	Traction media residual strength test started.
4042	Traction media aging test started.
4043	Normal stopping half brake down direction at rated load test started.
4044	Normal stopping half brake down direction at overload test started.
4045	Brake test, overload in down direction started.
4046	Unintended movement test – down direction opposite side of LDU started.
4047	Unintended movement test – up direction opposite side of LDU started.

Building Status Messages	
4100	Earthquake mode active.
4101	Earthquake mode reset.
4102	Machine room smoke signal active.
4103	Machine room smoke signal reset.
4104	Fire Service active.
4105	Fire Service reset.
4106	Water in pit active.
4107	Water in pit reset.
Hoistway Information Errors	
4201	KSE_U or KSE_D signals missing or incorrect distance.
4202	Door zone signal invalid.
4203	Door zone signal position invalid. Vane not at learned position.
4204	Position lost, synch trip required.
4205	KSE_D o KSE_D signals do not agree with car direction.
Safety Device Errors	
4304	SPDLIM detected speed exceeded .75 m/s while on inspection operation.
4305	Unintended movement detected. Refer to reset procedure to clear.
4330	Car door contact fault. Car door contact not opening when Door Open Limit active.
4331	Hoistway door contact fault. Door locks not opening when Door Open Limit active.
4350	Unintended movement signal not operating. Check door zone signal.
4351	SPDLIM board error. Missing feedback, etc.
4352	Jumper detected on safety circuit.
4390	Car door bypass device (hoistway access) not operating properly.
4391	In car stop switch bypass device (Fire Phase I) not operating properly.
4392	Hoistway door bypass device (hoistway access) not operating properly.
4393	Overtraction detected. Slack belt switches activated.
4394	Governor tension sheave switch open.
Redundancy Errors	
4401	Fire Service signals invalid, do not agree.
4402	Top of car inspection signals invalid, do not agree.
4403	Machine room (LDU) inspection signals invalid, do not agree.
4404	Hoistway access switch signals invalid, do not agree.
4405	Run commanded from car top inspection station while not on car top inspection operation.
4406	Run commanded from controller inspection station while not on controller inspection.
4407	Run commanded from access switch at landing while not on access operation.
Software Errors	
4501	Software download rejected.
4502	Software on USB not found.
4503	Software on USB incompatible.
4504	Software on USB corrupt.
4505	Files missing on USB.
4506	Node firmware data from software download is invalid.
4510	Software download successful
4511	Software download **NOT** successful.
4512	Configuration download successful.
4513	Configuration download **NOT** successful.
4514	Main control board firmware download successful.
4515	Main control board firmware download **NOT** successful.

4516	Car firmware download successful.
4517	Car firmware download **NOT** successful.

STM (Belts) Errors/Messages

4600	Slack belt switch activated.
4601	Belt life nearing limit.
4602	Belt life limit reached.
4603	Belt life monitor reset.
4604	Belt life monitor warning limit changed.
4605	Belt life monitor maximum limit changed.
4606	Belt life monitor clock failure.
4607	Belt age nearing limit.
4608	Belt life limit reached.
4609	Belt life monitor configuration failure.
4610	Belt life monitor data location empty (new CM11 or CANIVF board installed).
4611	Belt life monitor data mismatch (belt data on CM11 and CANIVF do not agree).
4612	Belt life monitor data mismatch (bend cycle data on CM11 and CANIVF do not agree).
4615	Belt life data recovered successfully.
4616	Belt life data **NOT** recovered successfully.
4617	Belt installation data entered.
4618	Belt bend cycle data count entered successfully.
4619	Belt life aging clock recovered successfully.
4620	Belt life aging clock **NOT** recovered successfully.

Remote Monitoring Errors/Messages

5002	Remote monitoring fault. Remove CLSD board.
5003	Remote monitoring fault. Remove CLSD board.
5004	Remote monitoring fault. Remove CLSD board.
5005	Remote monitoring fault. Remove CLSD board.
5006	Remote monitoring fault. Remove CLSD board.
5007	Remote monitoring fault. Remove CLSD board.
5008	Remote monitoring fault. Remove CLSD board.
5009	Remote monitoring fault. Remove CLSD board.

State Messages

9000	Out of Service
9001	Automatic Operation
9002	Independent Operation
9003	Fire Phase I
9004	Fire Phase II
9005	Emergency Power Operation
9006	Earthquake Operation
9007	Code Blue Operation
9009	Water in pit sensor active
9011	Automatic Operation with load weigh disabled (parameter 107 active)
9036	Emergency Power Halt
9037	Stop switch in car open
9038	Stop switch in FF panel open
9039	Elevator is overloaded
9040	Invalid configuration (see note below)
9041	Invalid hoistway image (must perform learn trip)
9042	Invalid load weigh configuration

|	
9045	Belt life exceeded
9051	Installation travel (parameter 105 active)
9052	Configuration (parameter 40 active)
9053	Controller Inspection Operation
9054	Car Top Inspection Operation
9056	Hoistway Access Operation
9057	Test Travel Operation (parameter 104 active)
9058	Acceptance Test mode
9059	Hoistway Learn
9070	Recovery mode (elevator recovering after power loss, etc.)
9072	Position recovery (elevator recovering after position loss)
9074	Low backup battery power
9080	Stop switch in hoistway pressed
9081	Stop switch on car top pressed
9082	Stop switch on controller pressed
9089	Bypass (car door and/or hoistway door) switch activated
9090	System status invalid (will attempt to recover when on automatic operation)
9091	Power up
9095	Power lost to controller
9097	Out of service but available for inspection operation (check error log for cause)
9098	Out of service & **NOT** available for inspection operation (check error log for cause)
9099	Out of service & **NOT** available for inspection operation (check error log for cause)

Section 8 – Maintenance Checks & Adjustments

8.1 – Door Operator

The 3300 control system uses a door operator manufactured by Fermator. The operator is not serial linked to the control system, but instead uses discreet signals from the CANCNA board for the open, close, and nudging commands. Likewise, the door open and door close limit signals to the control system are discreet wires between the operator and the CANCNA board.

8.1.1 – Door Operator Control (Drive)

The operator control box is mounted to the back of the car door header. To access it, you must remove the metal cover that has the inspection station (front door side). The control box is shown below.
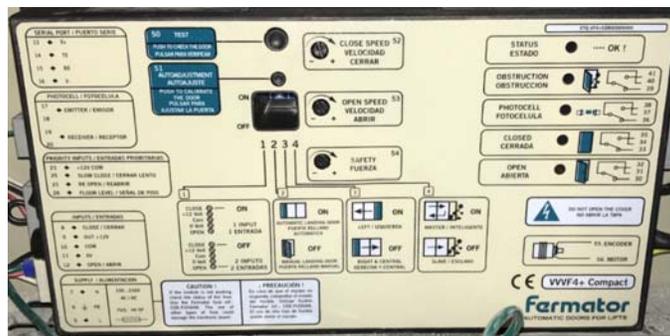
Fermator Door Operator Drive

There are several adjustment pots on the door operator drive, "SAFETY", "OPEN SPEED", and "CLOSE SPEED". These pots set the overall speed of the doors for torque (SAFETY), open, and close. To adjust the door speed, turn the pot in the desired direction (CCW=slower, CW=faster). The speed of the door can then be observed by pressing the "TEST" button. The doors will open and close automatically.

NOTE: *If any adjustments to the door speed are made, cycle power to the operator or press the "AUTOADJUSTMENT" button. The pots will change the overall speed, but the door speed at the limits will need to be relearned. Cycling power to the door operator or pressing the "AUTOADJUSTMENT" button initiates the learn procedure.*

If power is cycled to the door operator, the first opening and closing operation of the doors will be at slow speed. The door operator learns the distance the doors travel by using an encoder that is integral to the door motor.

8.1.1.1 – Door Learn/Auto Adjustment

If the door operator belt is moved or a new control box or motor is installed the door operator must be relearned. To perform this operation, place the car in the door zone at any floor so the car door clutch is engaged with the landing door.

NOTE: *Do not attempt to relearn the door operator without the car and landing doors coupled. This will result in improper door operation.*

Press the "AUTOADJUSTMENT" button on the door operator control box. See picture of button below:
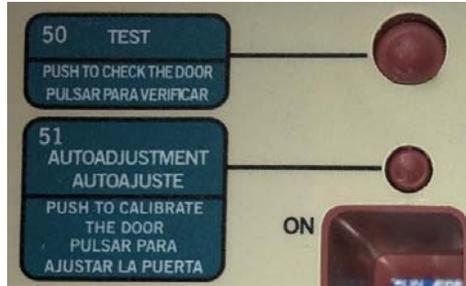
Door Operator Control Box Buttons

The doors will open and close automatically and learn the travel distance and the open and close limit positions.

After learning the door operator, pressing the "TEST" button will cause the doors to open and close automatically. This will allow you to observe the operation of the doors in order to determine if any adjustments to the open or close speed are required.

8.1.1.2 – Door Operator DIP Switches

There are 4 DIP switches on the Door Operator Control Box. These DIP switches configure the operation of the Control Box. See picture of DIP switches below:
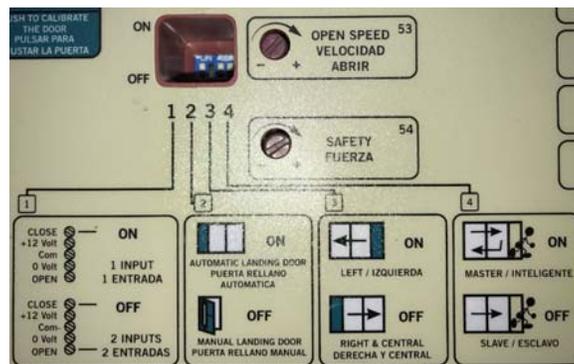
Door Operator Control Box DIP Switches

The switch settings are as follows:

SW	1	2	3	4
ON		■		
OFF	■			■

The black shading in the table above signifies the position of the switch. Switch 3 is set based on the hand of the door operator. It is set to "ON" for a left hand operator, and "OFF" for a right hand or center opening operator.

8.1.2 – Door Operator Clutch Maintenance and Adjustment

The clutch mechanism on the car door requires closing power to retract it. When the car is parked at a floor with the doors closed and no close command is given to the operator, the

hoistway door lock will be open. Pushing on the hoistway door when the car is parked there will allow the doors to be opened from outside the hoistway. See picture of clutch below.
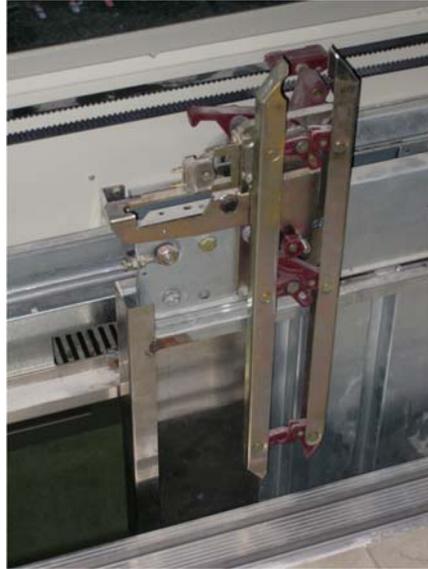
Clutch Mechanism, Side Slide Doors

NOTE: *The software on the 3300 system will maintain the close command to the operator if the hall call is locked at the floor where the car is parked. This prevents someone from pushing the doors open to access the elevator.*

Generally no maintenance is needed on the clutch other than removing any buildup of dust or dirt. If the clutch becomes 'sticky' and is not dropping out properly, inspect it for signs of wear and lubricate the pivot points.

There is a purple hook on the car door that keeps the doors closed when running. The clearance between the hook on the car door and stationary one of the header should be set from to 2-3 mm. See picture below.

Purple Hook Clearance

8.1.3 – Landing Door Equipment

The landing door locks on the 3300 control system are manufactured by Fermator as well. The vanes on the clutch ride between the release rollers on the door locks, and with no closing power applied to the operator the clutch releases, forcing the interlock release mechanism to drop down and open the interlock contact. See picture below of landing door interlock release mechanism.
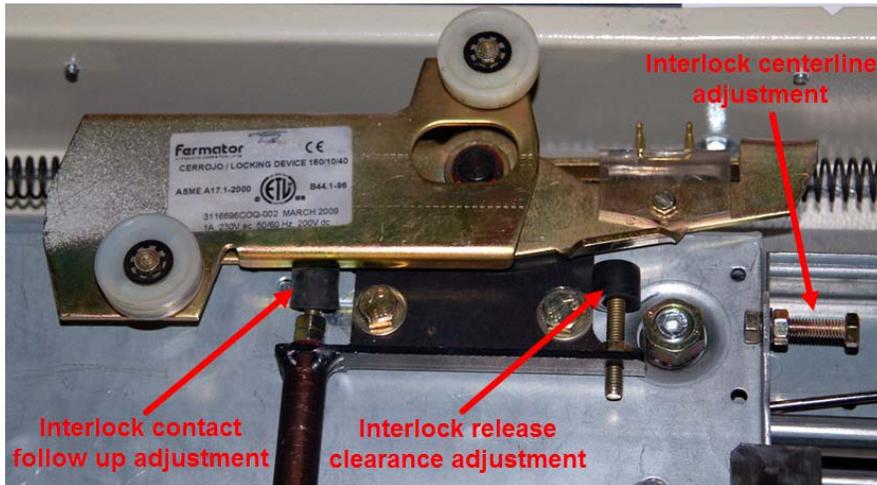
Interlock Release, Side Slide Doors

The rubber bumpers at the bottom of the interlock release are used to adjust the lock release clearance (right side bumper in the picture above) and the lock contact follow up (left side bumper in the picture above). The centerline of the interlock release is moved from side to side by adjusting the door panel with the adjustment bolt on the leading edge of the door panel, which can be seen on the right hand side in the picture above.

A tool is available for aligning the landing door locks. This tool is Adams part number 56302399, and is shown below.
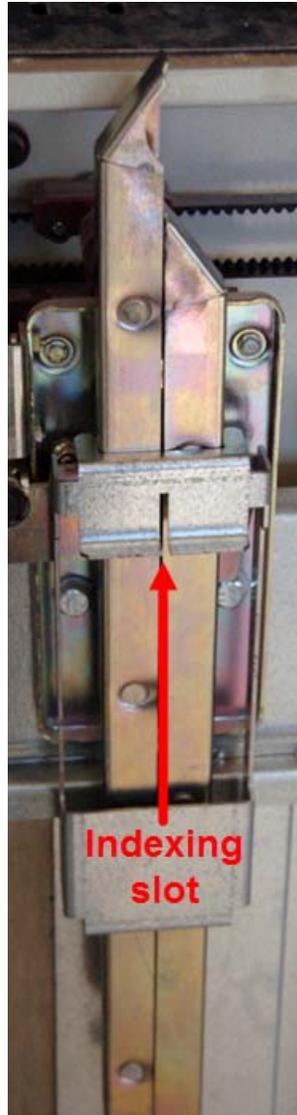

Interlock Alignment Tool

To use the tool, remove the fascia from the landing door headers on any floors where the interlock needs to be set up. Move the car so it is just above the floor that you are working on so the clutch on the car door extends above the header on the landing door.

With the car doors closed, squeeze the clutch together and place the tool on the clutch so that it holds the clutch retracted. There is a slot on the tool, and it should be installed on the clutch so

that it is at the top of the clutch. See picture below, and note the indexing slot at the top of the tool.

Interlock Alignment Tool Installed on Clutch

Slide the alignment tool down so the indexing slot rests on the landing door header. Using a marker, make a line on the landing door header in the center of the indexing slot. This mark will be used to align the landing door interlock release.

Remove the indexing tool from the clutch, and run the elevator down so the landing door interlock is accessible.

Install the alignment tool between the rollers on the landing door as seen below with the indexing slot facing up and toward the hoistway wall.

Alignment Tool Installed on Landing Door Interlock Release Rollers

Slide the tool down so that the indexing slot is resting on the top edge of the header. Move the tool so that it opens the interlock, and note the position of the mark on the header. With the interlock released, the tool should be roughly plumb vertically, and the mark on the header should be aligned with the indexing slot. If not, adjust the interlock release bumper so that the tool is vertically plumb, and the contact clears the interlock electrical contact with sufficient clearance. If the tool is still not aligned with the mark on the header, adjust screw on the leading edge of the door panel so that the indexing slot on the tool is aligned with the mark.

Perform the above procedures for any other door locks, as required.

8.2 – Machine & Brakes

8.2.1 – Machine Mounting Bolt Safety Wires

There are 2 bolts under the machine that secure it to the steel support structure in the hoistway. These bolts each have a safety wire to ensure that they do not loosen. While performing maintenance on the machine, verify that the safety wire is installed and not broken. See picture below of the safety wire on the machine mounting bolts.

Machine Mounting Bolt Safety Wire

8.2.2 – Brakes

8.2.2.1 – Brake Pad Wear Check

To measure the brake pad wear, access the car top and run the car to the top of the hoistway where the machine is accessible. Move the rubber band around each brake to side so that the gap between the brake coil housing and the brake pad pressure plate is visible.

NOTE: *The following checks are performed without the brakes being energized. There is no need to lift the brake to measure wear.*

In the picture below, note that there is a yellow dot. The yellow dot marks the location where the thickness of the brake pad material should be measured.


Brake with Band Removed

To measure the brake pad wear, **without power applied to the brakes**, try to insert a .45 mm (.018") feeler gauge into the gap by the yellow dot. If the feeler gauge goes into the gap, try inserting a .55 mm (.022") feeler gauge in the gap.

- **If the .55 mm feeler gauge fits in the gap, the elevator must be taken out of service until the brakes are replaced.**

- **If the .45 mm feeler gauge fits in the gap, the elevator can remain in service, but replacement of the brakes must be scheduled.**

There is a label attached to the brakes that provides this information. See picture of label below.
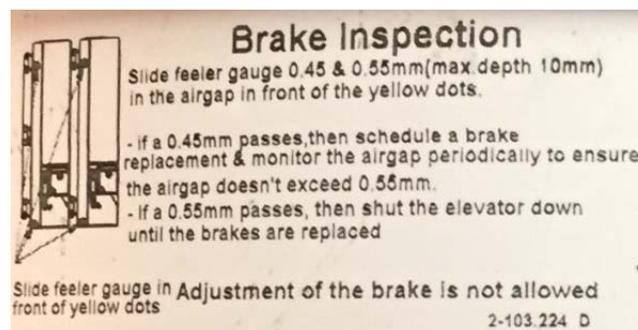
Brake Pad Check Information Label

8.2.2.2 – Brake Microswitches

There is a microswitch on each brake. The microswitches are monitored by the control system in order to determine if the brakes are operating properly. The microswitches can be adjusted if they are not operating properly, but before any adjustments are made you must make sure that the brake pad check is performed to verify that the pads are not worn excessively. See picture of one of the brake microswitches.
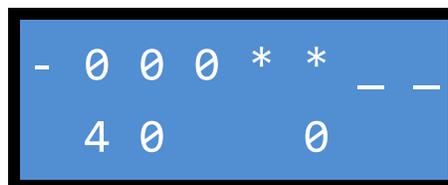

Brake Microswitch

NOTE: *If the brake contacts are not operating properly the car will not run, even on Inspection Operation. To run the car on Inspection Operation so the machine can be accessed to adjust the brake contacts, place the car on open-loop operation (Parameter 102). This will allow the car to be moved to a location where the brake can be checked and the contacts can be adjusted.*

8.3 – Recalibration of Load Weigh

If rollback or a 'bump' is observed at the start of motion when the brake is released the load weigh may need to be recalibrated. No weights are required to perform this operation.

Enter the configuration mode by accessing the parameters menu and navigating to the 40 menu. Press enter. On the bottom right side of the screen a 0 will appear. See picture below:

Press the up button to change the 0 to 1, and press enter. The 1 will begin flashing and the elevator will travel to the configuration floor (the floor where the controller, or LDU is located) and open the doors so you can confirm that no one is in the elevator. The 1 will stop flashing after the doors open. The elevator is now in the configuration mode, and CF00 will be displayed.

Press the down button to navigate to CF98 and press the enter button. The screen will change to show the present load in the car in kilograms (kg). Press enter again to start the recalibration procedure. The recalibration procedure takes about 1 minute. The CPU will take 5 readings from the load weigh device and adjust the load values accordingly. Press enter again, and the screen will change to CF98.

Press the escape button to exit CF98 to get back to the top of the 40 menu. Change the 1 to a 0 to leave the configuration mode and return the car to service.

8.4 – Set Up of Load Weigh

The load weigh data will need to be reentered if it is lost due to Status 40 and it was never archived, or if the replacement of the load sensor is necessary, etc. In order to set up the load weigh, weights that are approximately 75% of the car's rated load will be required.

Enter the configuration mode by accessing the parameters menu and navigating to the 40 menu. Press enter. On the bottom right side of the screen a 0 will appear.

Press the up button to change the 0 to 1, and press enter. The 1 will begin flashing and the elevator will travel to the configuration floor (the floor where the controller, or LDU is located) and open the doors so you can confirm that no one is in the elevator. The 1 will stop flashing after the doors open. The elevator is now in the configuration mode, and CF00 will be displayed.

Press the down button to navigate to CF98 and press the enter button. The screen will change to show the present load in the car in kilograms (kg). Press enter again to start the recalibration procedure. The recalibration procedure takes about 1 minute. The CPU will take 5 readings from the load weigh device and adjust the load values accordingly. Press enter again, and the screen will change to CF98. This calibrates the zero load setting.

Load approximately 75% of the car's rated load onto the car.

Press the up button to navigate to CF99 and press the enter button. The display will change to rL_xxx. "xxx" is the reference load, or the amount of weights (in kg) that are in the elevator. Set this value to the load that is in the elevator and press enter.

The display will change to "ld_xxx", and xxx will equal the amount of load that the system believes is in the elevator. This value may not be equal to the actual load, as it has not yet been calibrated.

Press enter again, and five load measurements will be taken. The display will count down from 5 to 1, and when it is complete it should display "ld_xxx" and xxx should be equal to the load in the elevator. Press enter again, and the display will change to CF99. The load calibration is complete, and the weights can be removed.

If the display does not show the correct value an error has occurred. Repeat the above steps.

Press the escape button to exit CF99 to get back to the top of the 40 menu. Change the 1 to a 0 to leave the configuration mode and return the car to service.