

ES2 Manual (V1.03)

Hydraulic Controller



Higher | Faster | Smoother

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1. ES2 Hydraulic Controller

ES2 Hydraulic Controller is ESI's "higher-faster-smoother" controller designed to handle hydraulic applications.

The controller is designed for maximum reliability with minimum maintenance. A unique and robust CPU, coupled with a series of forced guided relays, provide all the functionality necessary to run the elevator.

- The **CPU unit** provides the control logic.
- **Indicator Lights:**
 - CPU module has red indicator lights for each input and green indicator lights for each output
 - All relays have an internal indicator light (a board mounted LED for board mounted relays) that illuminates when power is provided to the relay coil. This allows the status of all relays to be verified quickly.
- **Touch Enabled Screen** to indicate system status and operate the elevator controller.
- **Safety Circuits:** The safety circuits are controlled by both the CPU and relay structure for maximum reliability and redundancy in all modes of operation.
- **Soft Start:** Siemens/Sprecher + Schuh, and other customer specified soft starts .
- **Reverse Phase Relay:** A reverse phase relay on the board provides reverse phase protection to the controller.
- **Connecting the Controller:** A vertical terminal strip provides all interconnecting to the elevator's equipment.
- **Switches/Push Buttons/Slide Switches on ES2:**
 - **Toggle Switches (3):** Test mode, Hall button disconnect and Automatic Operation/Inspection Operations.
 - **Push button (3) :** Controller Inspection ENABLE, UP, DOWN.
 - **Slide Switches (2):** Car Door Bypass and Hatch Door Bypass.

ES2 achieves the consistency of legacy ES1 controller while adding valuable features like Touch Enabled Screen, Higher Speeds and Absolute Positioning System

1.1. ES2 Hydraulic Controller Components

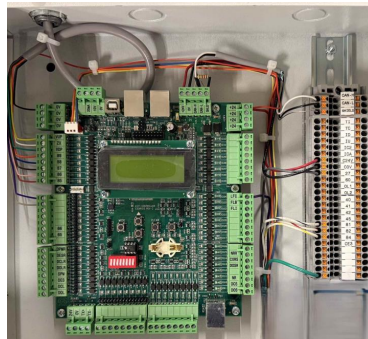
ES2 Hydraulic Controller: Main command center for the ES2 package ensuring smooth operation between COP/TOC/APS/Soft Start



ES2 Car Operating Panel Board (COP) : ES2 ECT Board (ES-CT-COP) is installed in the Car Operating Panel and is the default board to get all the Car Call Inputs and other inputs coming from the COP.



ES2 Top of Car Box (TOC) : ES2 TOC Box includes interface to the ES2 Controller/COP and APS system.



Absolute Position System (APS) : ELGO LIMAX Absolute Positioning System is installed in the hoistway to monitor elevator/car speed and position.

1.2. ES2 Accompanying Manuals and Documentation

ES2 Includes the following documentation for ease of installation:

- **ES2 Quick Start Guide**
- **ES2 User Manual:** Detailed step-by-step procedures on how to install/test/troubleshoot the controller.
- **ES2 Controller Parameter List:** ES2 Controller Parameter List which is created exclusively for each job
- **Optional Documentation, if following accessories ordered**
 - **ES2 Load Weighing Device:** consists of a detailed description on how to install and calibrate the Load Weighing Device (LWD).
 - **EMIS-100 :** In building/premise Monitoring

1.3. Controller Legacy Terminal Name to New Name Mapping

* ESI is transitioning from Legacy Terminal Names/Numbers to more user friendly Terminal names that define the function of the terminal more appropriately.

Controller Type	Legacy Terminal Name	New Terminal Name	Function
Both	#32	#GOV1	Governor Switch
Both	#32A	#GOV2	Governor Switch/Governor Switch Input
Both	#34	#DCB	Front Door Contact Bottom (Swing/Manual Doors Only)
Both	#34A	#DCBI	Front Door Contact Bottom-Intermediate
Both	#34AR	#DCBIR	Rear Door Contact Bottom-Intermediate
Both	#34D	#DCTI	Front Door Contact Top-Intermediate
Both	#34DR	#DCTIR	Rear Door Contact Top-Intermediate
Both	#34R	#DCBR	Rear Door Contact Bottom
Both	#35	#DCT	Front Door Contact Top/Front Door Contact Input
Both	#35R	#DCTR	Rear Door Contact Top/Rear Door Contacts Input
Both	#40	#CSC1	Car Safety Circuit
Both	#41	#CSC2	Car Safety Circuit/Safety Chain Input
Both	#42	#ICGS	In-Car Inspection Switch Input
Both	#43	#DLT	Front Door Lock Top/Front Door Locks Input
Both	#43A	#DLTI	Front Door Lock Top-Intermediate
Both	#43AR	#DLTIR	Rear Door Lock Top-Intermediate
Both	#43D	#DLBI	Front Door Lock Bottom-Intermediate
Both	#43DR	#DLBIR	Rear Door Lock Bottom-Intermediate
Both	#43R	#DLTR	Rear Door Lock Top/Rear Door Locks Input
Both	#44	#DLB	Front Door Lock Bottom
Both	#44R	#DLBR	Rear Door Lock Bottom
Both	#45	#GS	Front Gate Switch Input
Both	#45R	#RGS	Rear Gate Switch Input
Hydraulic	#65	#LW	Load Weighing 80% Input
Hydraulic	#66	#OLD	Load Weighing 110% Input
Both	#68	#OOS	Out of Service Key Switch Input
Both	#69	#CTL	Car to Lobby Key Switch Input
Both	#74	#OOSL	Out of Service Light Output
Both	#90	#AFR	Smoke & Heat Detector at Prime Floor Input
Both	#90B	#HFD	Hatch Smoke & Heat Detector Input
Both	#91	#FCOM	Fire Service Common
Both	#92	#PFR	Smoke & Heat Detector at All Floors Except Prime Floor Input
Both	#92B	#MFD	Machine Room Smoke & Heat Detector
Both	#93	#FR	Fire Reset/Bypass Input
Both	#94	#FLS	Fire Lobby Switch Input
Both	#97L	#LFI	Lobby Fire Light Output

Traction*	#BY	#PBS	Primary Brake Switch
Traction*	#BZ	#EBS	Emergency Brake Switch
Both	#HW	#PFS	Pit Flood Switch Input
Both	#IC2	#ICI	In-Car Inspection Input
Both	#ICA	#ACC	Access Input
Hydraulic	#OT	#OTS	Over Temperture Switch Input
Both	#PRS1	#OPS	Pressure Switch Input
Both	#SAB	#SABI	Sabbath Service Key Switch Input
Both	#SAL	#SABO	Sabbath Service Light Output
Both	#TC	#TCI	Top of Car Inspection Input
Both	#TPR4	#TOL	Motor Thermal Overload Input
Traction	#X10	#TRS1	TEERs Switch
Traction	#X11	#TRS2	TEERs Switch/TEERs Input

* On the Brake Terminals

1.4. Legacy COP I/O Names to New I/O Name Mapping

* ESI is transitioning from Legacy Input/Output Names/Numbers to more user friendly Input/Output names that define the function of the Input/Output more appropriately.

Input#	Legacy COP Input Name	New COP Input Name	Function
18	28H	DH	Front Door Hold Button
19	28HR	DHR	Rear Door Hold Button
20	62	SB	S-Button
21	70	ATTN	Attendant ON
22	71	ATTD	Attendant UP
23	72	ATTU	Attendant DN
24	73	ATTB	Attendant Bypass
25	24	DC	Front Door Close Button
26	28	DO	Front Door Open Button
27	50	IND	Independent Service
28	95	FC2N	Fire Phase II ON
29	100	FC2O	Fire Phase II OFF
30	96	FC2C	Fire Phase II Call Cancel
31	24R	DCR	Rear Door Close Button
32	28R	DOR	Rear Door Open Button

Output#	Legacy COP Output Name	New COP Output Name	Function
17	28H	DHL	Front Door Hold Light
18	N/A	HWL	High Water Light
19	28HR	DHLR	Rear Door Hold Light
20	N/A	OPEN	Open for future use
21	N/A	OPEN	Open for future use
22	5	ATBO	Attendant Buzzer
23	6	ATDL	Attendant Up Light
24	7	ATUL	Attendant Down Light
27	61	SPG	Stop & Passing Gong
28	97	FCL	Fire Light In Car
29	97B	FB	Fire Buzzer In Car
30	67	LWLB	Load Weighing Light & Buzzer

1.5. Legacy TOC I/O Names to New I/O Name Mapping

* ESI is transitioning from Legacy Input/Output Names/Numbers to more user friendly Input/Output names that define the function of the Input/Output more appropriately.

Input#	Legacy TOC Input Name	New TOC Input Name	Function
9	OL	DOL	Front Door Open Limit
11	28E	DES	Front Door Edge Sensor
13	ROL	DOLR	Rear Door Open Limit
14	DLR	DCLR	Rear Door Close Limit
15	28ER	DESR	Rear Door Edge Sensor
18	65	LW	Load Weighing 80%
19	66	OLD	Load Weighing 100%

Output#	Legacy TOC Output Name	New TOC Output Name	Function
9	OX	DOS	Front Door Open Signal for the Operator
10	CX	DCS	Front Door Close Signal for the Operator
13	OXR	DOSR	Rear Door Open Signal for the Operator
14	CXR	DCSR	Rear Door Close Signal for the Operator
22	97I	FLI	Fire Light Top of Car
23	97BI	FLB	Fire Buzzer Top of Car
24	LCP	LFC	Light & Fan Control

1.6. Pre Power Check Out

Prior to shipment, the controller is given a series of thorough tests to ensure proper operation. However, it is possible that components could have loosened or been damaged during shipment. Therefore, before applying power, it is a good idea to check the following:

- Check for loose components.
- Check that no components were damaged in shipping
- Make sure all plug in relays are fully inserted and seated.
- Check that all CPU terminal strips fully inserted
- Make sure all toggle switches are in the down position.
- CONFIRM input power supply. The input power supply specifications are printed near the terminals.

1.7. Initial Power Turn On/ES2 Ground Safety



CAUTION: High Voltage can cause serious and fatal injury. Extreme caution should be exercised when working on or near this controller. Only qualified personnel should attempt to start-up or troubleshoot this controller.

1. Connect the main power line to Terminal Block connectors L1, L2, and L3. Terminal Block is at the bottom of Controller.
2. Check the voltage across terminals #L1, #L2 and #L3. Verify that the voltage reading is what the controller is built for.
3. The Reverse Phase Relay (RPR) should be lit. If the RPR is not lit then reverse the #L1 and #L2 wires.
4. Typically, voltage across the Primary side of the control transformer should be 208VAC and the voltage across the Secondary side of the transformer should be 120VAC.
5. The Secondary side of the transformer ties into the RB board where power is routed to different parts of the controller.
6. Verify the following terminal pairs should have 120VAC present:
 - #27 - #60
 - #GOV1 - #60 (with CT Relay energized)
 - #91/FCOM - #60
7. Verify the following terminal pairs have 24vdc which is a feed from PS #2:
 - #31 - #22
 - #30 - #22 (with Hall Button Switch ON)
8. If job is using ESI Digital Position Indicators (DPI-XX)'s verify the following terminal pairs have 24vdc which is a feed from PS #2:
 - #1L - #2L

If all voltages are within range and all safety circuits are properly wired, running the car on Construction Mode with Top of Car Inspection should be done first. See the Construction Mode/sequence of operation for a full description of this procedure

1.8. Default Setup

ESI aims to deliver ES2 Controller based on specifications as given by customers. Please double check the controller configuration to ensure that specifications have not changed between when the controller was ordered and it being installed.

1.9. Conventions

This manual uses the following terms and conventions to indicate parts of the controller and operation:

- CPU – main processing board, that houses the touch enabled screen. The 'Brains' to the controller.
- I/O Board – Expansion boards that provide additional inputs and output to the controller.
- Energized – Power is applied to the relay coil, and the relay has operated.
- De-energized – Power is not applied to the relay coil, and the relay is at rest.
- Activated – A signal is applied to the input terminal on the CPU or CPU expansion board.
- De-activated – A signal is not applied to the input terminal on the CPU or CPU expansion board.
- Symbol – a letter or letter number code referring to a relay or terminal.

Example: PX

- Symbol number/number – A contact pair on a relay

Example: PX 1/7

- Symbol [number] – An input / output on the CPU board.

Example: Input [1] /Output [1]

- Symbol{number-number} – An input / output on an expansion board. The first number indicates which I/O board, the second indicates the terminal.

Example: Input [1-13]

- #symbol - A terminal on the connection terminal strip.

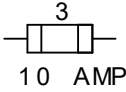
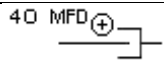
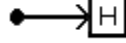
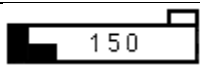
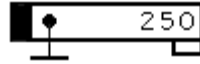
Example: #OF1

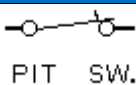
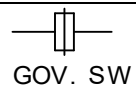
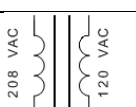
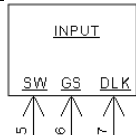
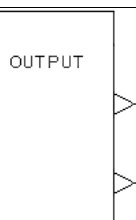
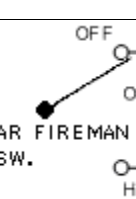
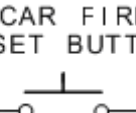
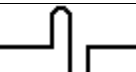
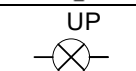
- #symbol to #symbol – Indicates an external electrical connection between two terminals.

Example: #27 to #28

1.10. Legend

Following Table outlines the symbols used in the ESI Drawings/Prints. Please refer to this table whenever you have any questions regarding symbols on the ESI Drawings/Prints.

Symbol	Symbol Name	Notes
	Fuse	Top Number represents the fuse number. Bottom Number represents the Amperage.
	Terminal	The Lettering (beginning with #) represents the terminal name.
	Normally Open Contact (Contactor)	The Lettering represents the Contactor Name (i.e. P) and the Number represents the Contact Number (i.e. 1)
	Normally Closed Contact (Contactor)	The Lettering represents the Contactor Name (i.e. P) and the Number represents the Contact Number (i.e. 6)
	Normally Open Contact (Relay)	The Lettering represents the Relay Name (i.e. Z) and the Numbers represents the Relay Terminals (i.e. 1 and 7)
	Normally Closed Contact (Relay)	The Lettering represents the Relay Name (i.e. I) and the Numbers represents the Relay Terminals (i.e. 5 and 8)
	Relay Coil	The Lettering represents the Relay Name (i.e. TC). The small circle to the right of the Relay represents the Right Terminal of the Coil.
	Resistor	The Lettering represents the resistor value (i.e. 15k Ω)
	Capacitor	The Lettering represents the capacitance value (i.e. 40 μ F)
	Diode	Represents a rectifier diode
	Switch	The Lettering represents the name of the switch (i.e. BOT FINAL). NOTE: Switch shown in Closed Position.
	Region	This symbol is used to refer to a different area on the drawing (i.e. Area Labeled H)
	Resistor	The Lettering represents the resistor value (i.e. 150 Ω)
	Resistor (Tapped)	The Lettering represents the resistor value (i.e. 250 Ω)

Symbol	Symbol Name	Notes
	Switch	The Lettering represents the name of the switch (i.e. PIT SWITCH). NOTE: <i>Switch shown in Closed Position.</i>
	Switch	The Lettering represents the name of the switch (i.e. GOVERNOR SWITCH). NOTE: <i>Switch shown in Closed Position.</i>
	Transformer	The Lettering on the Left Side represents the Primary Voltage (i.e. 208VAC) and the Lettering on the Right Side represents the Secondary Voltage (i.e. 120VAC).
	Switch	The Lettering represents the name of the switch (i.e. FX). NOTE: <i>Switch shown in Open Position.</i>
	CPU Inputs	The Lettering represents the Input name (i.e. SW, GS, and DLK). The Numbers represent the Input location. (i.e. SW = IN 5, GS = IN 6, DLK = IN 7).
	CPU Inputs	The Lettering represents the Input name (i.e. 38
	CPU Outputs	The Numbers represent the Output Number on the CPU (i.e. Drawing is showing Outputs 18 and 19).
	Dry Contact Outputs	The Lettering represents the Dry Contact Output name. The Number represents the Output Number (i.e. Dry Contact Output URP, Output number 2).
	Key Switch	The Lettering represent the Switch Name (i.e. IN CAR FIREMAN KEY SW) and the Pole Names (i.e. OFF, ON and HOLD). <i>Three position key switch shown.</i>
	Push Button	The Lettering represents the Button Name (i.e. IN CAR FIREMAN RESET BUTTON).
	Overload	Current Sensing Portion of the Overload Protection.
	Light	The Lettering represents the name of the Light (i.e. UP).
	Buzzer	The Lettering represents the name of the Buzzer (i.e. Door Delay Buzzer).
	Hall Lantern	Represents a directional lantern. Up lantern shown

Symbol	Symbol Name	Notes
	Board Connector	The Lettering represents the connector name (i.e. J1). The number represents the Pin (i.e. 5).
	Variable Timer Delay	Represents a delay-on circuit timer
IN/ CAR STOP SW. 	Switch	The Lettering represents the name of the switch (i.e. IN CAR STOP SWITCH). NOTE: <i>Switch shown in Closed Position.</i>

1.11. Relay Type and Locations

ES2 has Relay based redundancy to achieve optimal and safe elevator operations. Following list provides a ready reference for all the Mechanical relays on ES2

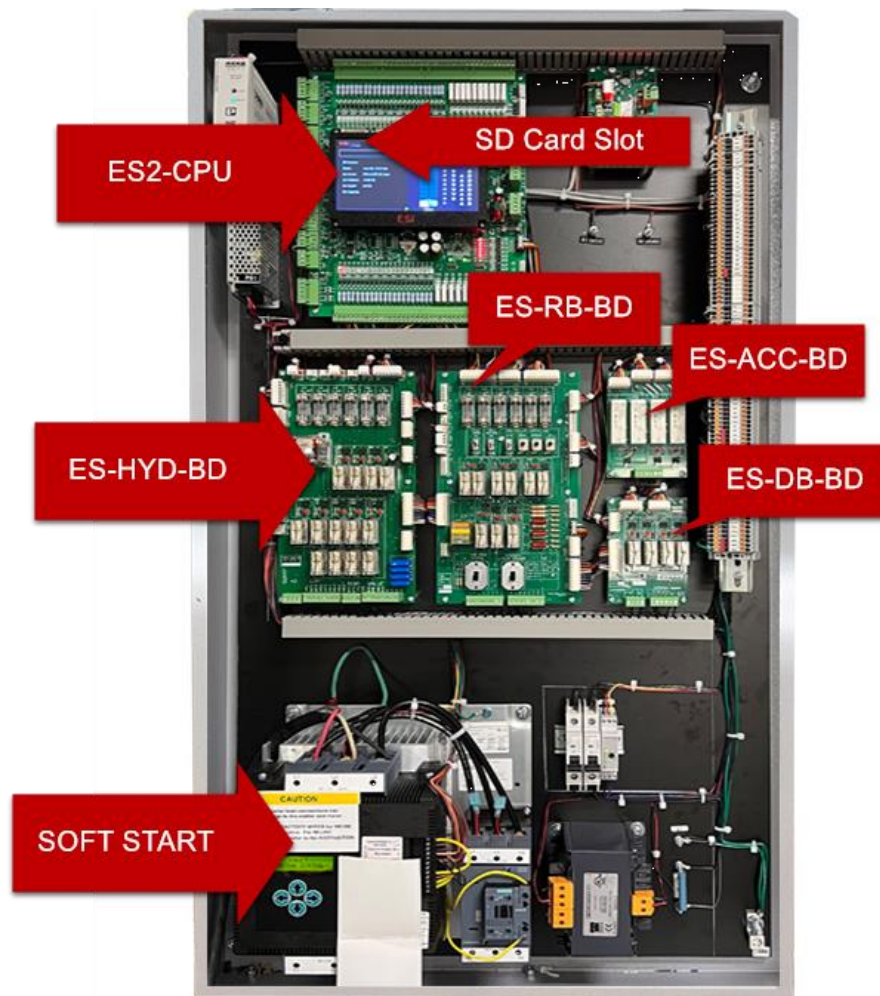
RELAY NAME	FUNCTION	TYPE	LOCATION
D/DX	Run Down	2 Pole Safety	ES-HYD-BD
HS	High Speed	2 Pole Safety	ES-HYD-BD
HSP	High speed Aux	2 Pole Safety	ES-HYD-BD
HSX	High speed Aux	2 Pole Safety	ES-HYD-BD
HSY	High speed Aux	2 Pole Safety	ES-HYD-BD
HSZ	High speed Aux	2 Pole Safety	ES-HYD-BD
JS	Jack Synchronization	2 Pole Safety	ES-HYD-BD
PF	Phase protection	KUP	ES-HYD-BD
PX	Running AUX	2 Pole Safety	ES-HYD-BD
R	Run Pump	2 Pole Safety	ES-HYD-BD
U/UX	Run Up	2 Pole Safety	ES-HYD-BD
UT	Up Delay Out	2 Pole Safety	ES-HYD-BD
I / IX	Inspection – Energized on automatic operation	2 Pole Safety	ES-RB-BD
IC1 / IC2	In Car Inspection – Energized on in car-insp.	2 Pole Safety	ES-RB-BD
ID	Inspection Down	2 Pole Safety	ES-RB-BD
IU	Inspection Up	2 Pole Safety	ES-RB-BD
LFI	Lobby Fire Light	2 Pole Safety	ES-RB-BD
CT	Cycle Test	4 Pole KUH	ES-RB-BD
SWB	Stop Switch Bypass	2 Pole Safety	ES-RB-BD
SWB2	Stop Switch Bypass Redundant	2 Pole Safety	ES-RB-BD
DL	Door Locks	2 Pole Safety	ES-DB-BD
GS	Gate Switch	2 Pole Safety	ES-DB-BD
VC	Leveling	2 Pole Safety	ES-DB-BD
Z	Door Zone	2 Pole Safety	ES-DB-BD
ACC	Hoistway Access	6 Pole Safety	ES-ACC-BD
ACX	Access Aux. Relay	6 Pole Safety	ES-ACC-BD
BAC	Access Bottom Control	6 Pole Safety	ES-ACC-BD
TAC	Access Top Control	6 Pole Safety	ES-ACC-BD

2. Hydraulic Controller : What's in the Package

2.1. ES2 Hydraulic Controller

ES2 Hydraulic Controller comes with the following boards pre-installed on all controllers

- Drive Board **ES-HYD-BD**: Board to communicate with the drive and enable safe operation of the elevator
- CPU with 8" Touch Screen **ES2-CPU**: Main Process Controller
- Relay Board **ES-RB**: Central Relay Board to ensure smooth communication between different controller components and has essential switches to setup different options
- Access Board **ES-ACC**: To ensure safe operations for different access operations
- Door Board **ES-DB**: Central Board to ensure smooth operation with door operators



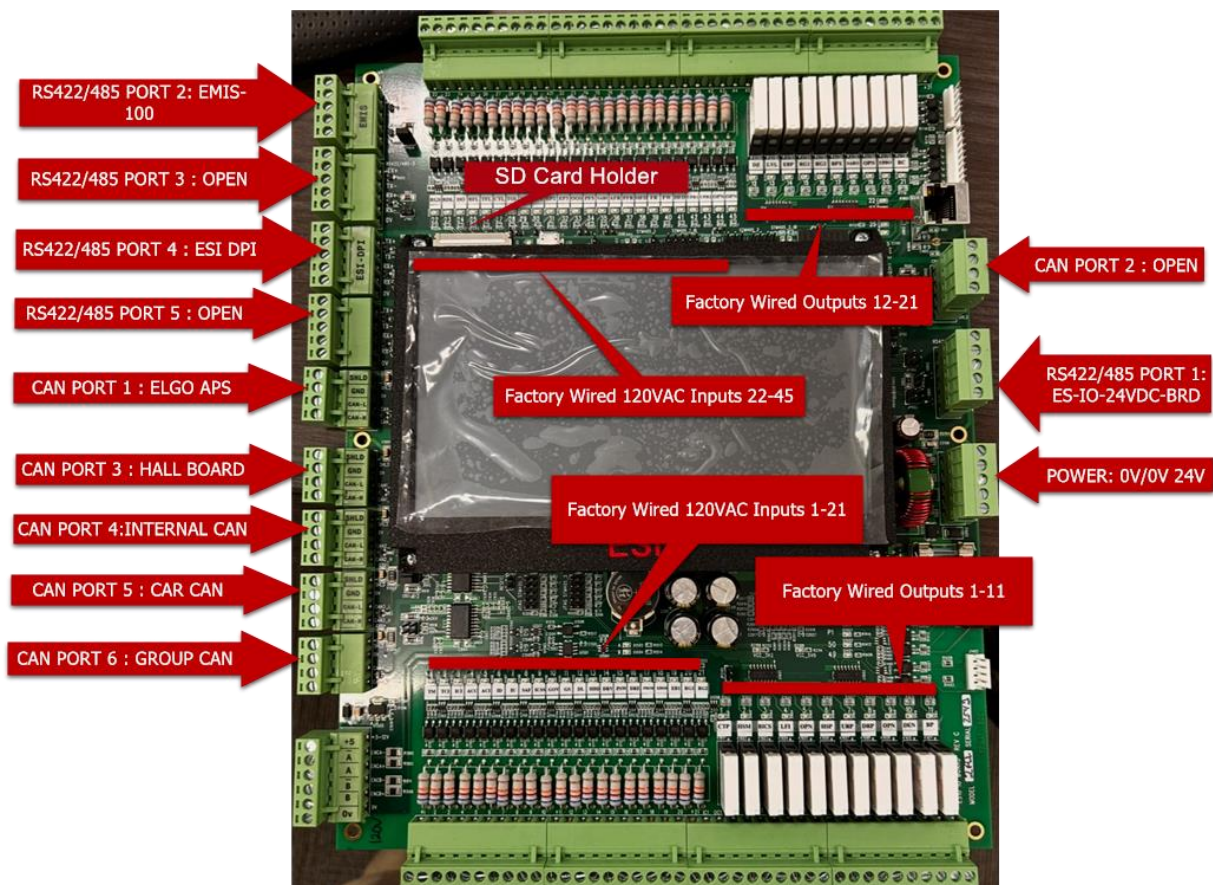
2.1.1. Boards on the Controller

2.1.1.1. CPU Board-(ES2-CPU)

CPU with 8" Touch Screen ES2-CPU

Main Process Controller is the "brains" of the controller and ensures safe operation of the elevator. **NO WIRING IS REQUIRED DIRECTLY INTO THE ES2 CPU. FOLLOWING INFORMATION ABOUT INPUTS/COMMUNICATION PORTS IS TO ASSIST IN TROUBLESHOOTING, IF NECESSARY.**

Key Components of ES2



With the ES2 architecture, Customers will always wire into the Terminals provided in the controller. This provides ES2 customers minimally invasive wiring.

THE TOUCH SCREEN SHOULD NEVER BE REMOVED BY ANYONE.

In case of damage or failure to the touch screen, the whole CPU Board should be returned to ESI for further disposition including repair.

2.1.1.1.1. CPU Inputs 1-22

***The input/output listing is standard version and may change for certain controllers based on customer requirements. Always refer to the final print to ensure everything is wired as per the print.**

* If the terminal input has a legacy name different than the ES2 Terminal Input name, both are being displayed for ease of transition from ES1 to ES2 (Old Name/New Name)

Input#	CPU Legacy Name	CPU Input Name	Abb# - Terminal Strip*	Default Condition	Function
1	N/A	TM	TM	On	Landing System Tape Tension Monitor
2	TC	TCI	TCI	On	Top of Car Inspection
3	IC	ICI	ICI	On	In Car Inspection
4	ICA/ACC	ACC	ACC	Off	Hoistway Access Mode
5	I	ACI	Not Available	On	Automatic or Controller Inspection Mode
6	ID	ID	ID	Off	Inspection Car Down Run
7	IU	IU	IU	Off	Inspection Car Up Run
8	SAF	SAF	CSC2	On	Safety Chain Monitoring for Car Safeties:- Fireman Safety Switch, Escape Hatch, Car Safety Switch, Top of Car Safety Switch, Slack Cable Switch
9	SW	ICSS	ICGS	On	In Car Stop Switch
10	N/A	GOV	GOV2	On	Governor Switch (Roped Hydros Only)
11	GS	GS	GS	N/A	Gate Switch
12	DL	DL	DLB	N/A	Slide doors: Input for Car Door Interlocks Manual/Swing Door: Input for Car Door Contacts
13	HBD	HCE	NOT AVAILABLE	On	Hall Call Enable: Internal ES2 Input to disconnect Hall Calls
14	DRV	DRV	NOT AVAILABLE	On	ES2 Safety Input : Means SAF input is high, GS/DL is High, DRV will be high OR SAF High, TOC/In Car Insp High and Bypass from RB is On, then DRV
15	N/A	PSW	PSW2	On	Pit Switch
16	PF	PF	NOT AVAILABLE	On	Power Fault: Input to make sure the controller is getting building power
17	N/A	BFL	BFL2	On	Bottom Final Limit
18	N/A	TFL	TFL2	On	Top Final Limit
19	DFI	GFI	NOT AVAILABLE	On	Group Feed Input(Group and Duplex only)
20	RDO	RHDC	RDCT	On	Rear Hatch Door Contacts (Swing and Manual)
21	N/A	OPN	NOT AVAILABLE	N/A	OPEN FOR FUTURE USE
22	RGS	RGS	RGS	N/A	Rear Door Gate Switch (if job has walk through doors)

2.1.1.1.2. CPU Inputs 23-45

***The input/output listing is standard version and may change for certain controllers based on customer requirements. Always refer to the final print to ensure everything is wired as per the print.**

* If the input has a legacy name different than the ES2 Input name, both are being displayed for ease of transition from ES1 to ES2

Input#	CPU Legacy Name	CPU Input Name	Abb# - Terminal Strip*	Default Condition	Function
23	RDL	RDL	RDLB	N/A	Slide doors: Input for Rear Car Door Interlocks Manual/Swing Door: Input for Rear Car Door Contacts (if job has walk through doors)
24	DO	HDC	DCT	N/A	Manual/Swing Doors Input for hatch door locks
25		OPEN	NOT AVAILABLE		OPEN FOR FUTURE
26	65	LW	LW	Off	Load Weighing 80%
27	66	OLD	OLD	Off	Load Weighing 110%
28	69	CTL	CTL	On	Car to Lobby Input
29	OT	OTS	OTS	Off	Oil Over Temperature Switch
30	EP	EPMS	EPMS	Off	Emergency Power Manual Select Key Switch
31	N/A	EPPT	EPPT	Off	Emergency Power Pre-Transfer Signal
32	N/A	EPCB	EPCB	Off	Emergency Power Contact
33	68	OOS	OOS	Off	Out of Service Input
34	HW	PFS	PFS	Off	Pit Flood Switch Input
35	SAB	SABI	SABI	Off	Sabbath Input
36	90	AFR	AFR	Off	Alternate Fire Recall Floor
37	92	PFR	PFR	Off	Primary Fire Recall Floor
38	92B	MFD	MFD	Off	Machine Room Sensors / Heat Detectors (Prime Return)
39	93	FR	FR	Off	Fire Control Lobby Switch (RESET)
40	94	FSW	FSW	Off	Fire Control Lobby Switch (ON)
41	90B	HFD	HFD	Off	Machine Room Smoke / Heat Detectors (Alternate Return)
42	FLT	FLT	FLT	FLT	Input for Fault on Soft Start for Dual Pumps
43	LO	LO	LO	Off	Low Oil
44	PRS	OPS	OPS	On	Oil Pressure Switch
45	TOL	TOL	TOL	On	Thermal Overload from the Machine

2.1.1.1.3. CPU Outputs

*The input/output listing is standard version and may change for certain controllers based on customer requirements. Always refer to the final print to ensure everything is wired as per the print.

Output#	CPU Legacy Name	CPU Output Name	Abb# - Terminal Strip*	Description
1	CT	CTP	NOT AVAILABLE	Cycle Test Output
2	JS	JS	NOT AVAILABLE	Jack Sync Output in case of Dual Jacks
3	SWB	BICS	NOT AVAILABLE	Bypass In-Car Stop Switch
4	RC	RC	NOT AVAILABLE	Retiring CAM (if Required)
5	DF	GFO	NOT AVAILABLE	GROUP FEED OUTPUT
6	HSP	HSP	NOT AVAILABLE	High Speed Pilot (Controls Speed for 51-200FPM)
7	74	OOSL	OOSL	Out of Service Light
8	97L	LFI	LFI	Lobby Fire Light Indicator
9	SAL	SABO	SABO	Sabbath Light Output
10	PP	PP	NOT AVAILABLE	Pick up the Valves
11	DRP	DRP	NOT AVAILABLE	Down Run Pilot
12	84	DZ	NOT AVAILABLE	Door Zone
13	VC	LVL	NOT AVAILABLE	Re-Level in the door zone
14		OPN		OPEN FOR FUTURE USE
15		OPN		OPEN FOR FUTURE USE
16		OPN		OPEN FOR FUTURE USE
17		OPN		OPEN FOR FUTURE USE
18		HSL	NOT AVAILABLE	High Speed Slowdown Limit (51-200FPM)
19		OPN		OPEN FOR FUTURE USE
20	URP	URP	NOT AVAILABLE	Up Run Pilot
21	RP	RP	NOT AVAILABLE	Run Pilot, Run Softstart

2.1.1.1.4. Communication Ports

ES2 CPU provides following Communication Ports for connectivity to ES2 and external components like Position Indicators, External Monitoring, Encoder etc:-

6 CAN Communication Ports

CAN-1	ELGO Absolute Position System
CAN-2	OPEN FOR FUTURE USE
CAN-3	Serial Hall
CAN-4	Internal CAN
CAN-5	Car CAN
CAN-6	Group Communication CAN

4 RS422/485 Communication Ports

RS422/485-1	Communication for I/O Expansion Board (ES-IO-24VDC-BD)
RS422/485-2	External Communication Gateway if required/ESI Setup
RS422/485-3	OPEN FOR FUTURE USE
RS422/485-4	ESI DPI's (DPI-XX)

1 Encoder Communication Port

2.1.1.2. SS Board-(ES-HYD-BD)

This board ensures backup redundancy for various drive operations. **NO CUSTOMER WIRING IS REQUIRED TO THIS BOARD.**

The board has following relays:-

1. 8A, 110 VDC replaceable Relays with Sockets marked JS, R, PX, UT, HSP, DX, D, HS, HSX, HSY, HSZ, UX, U : TOTAL 13
2. 10A, 250 VAC, KUP relay : PF

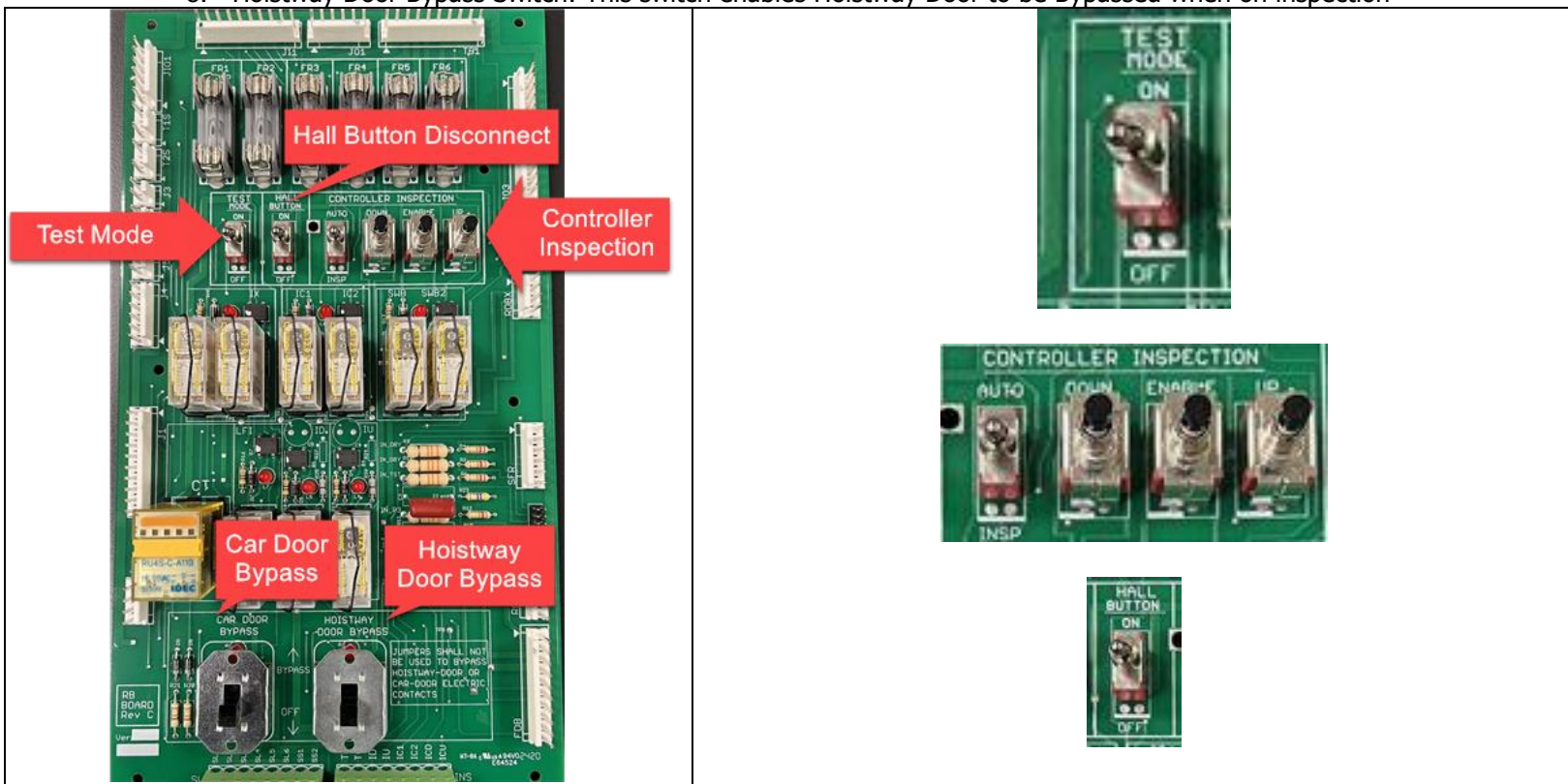


RELAY NAME	FUNCTION	TYPE
D/DX	Run Down	2 Pole Safety
HS	High Speed	2 Pole Safety
HSP	High speed Aux	2 Pole Safety
HSX	High speed Aux	2 Pole Safety
HSY	High speed Aux	2 Pole Safety
HSZ	High speed Aux	2 Pole Safety
JS	Jack Synchronization	2 Pole Safety
PF	Phase protection	KUP
PX	Running AUX	2 Pole Safety
R	Run Pump	2 Pole Safety
U/UX	Run Up	2 Pole Safety
UT	Up Delay Out	2 Pole Safety

2.1.1.3. Relay Board-(ES-RB-BD)

The Relay Board to ensure smooth communication between different controller components and has essential switches to setup different options. Key Components on the Relay Board

1. 2AMP GLASS FUSE marked as FR1, FR2, FR3, FR4, FR5, FR6: TOTAL 6
2. Test Mode ON/OFF Toggle Switch : Puts the elevator in Test Mode, when toggled to ON position. Elevator doors will not open automatically and Hall calls will be disabled when set to ON
3. Hall Button ON/OFF Toggle Switch: Disconnect all hall call buttons when toggled to OFF position. No Hall calls will be accepted when set to OFF. Setting the switch back to ON will enable all hall calls.
4. Controller Inspection Mode:
 - 4.1. Auto/INSP Toggle Switch: Toggle Switch on AUTO will put the Controller in Automatic Mode. Toggle Switch on INSP will put the controller in Controller Inspection Mode
 - 4.2. ENABLE/DOWN push buttons: To run the elevator DOWN while on Controller Inspection mode, Press ENABLE AND DOWN Button Together
 - 4.3. ENABLE/UP push buttons: To run the elevator UP while on Controller Inspection mode, Press ENABLE AND UP Button Together
5. 8A, 110 VDC replaceable Relays with Sockets marked I,IX, IC1, IC2, SWB, SWB2, LFI, ID and IU : TOTAL 9
6. 6A, 110 VAC Replaceable Relay with Socket Marked CT
7. Car Door Bypass Switch : The switch enables Car door to be bypassed when on inspection.
8. Hoistway Door Bypass Switch: This switch enables Hoistway Door to be Bypassed when on inspection



RELAY NAME	FUNCTION	TYPE
I / IX	Controller Inspection – energized on automatic operation	2 Pole Safety
IC1 / IC2	In car inspection – energized on in car insp.	2 Pole Safety
ID	Inspection Down Run	2 Pole Safety
IU	Inspection Up Run	2 Pole Safety
LFI	Lobby Fire Light	2 Pole Safety
CT	Cycle Test	4 Pole KUH
SWB	Stop switch bypass	2 Pole Safety
SWB2	Stop switch bypass Redundant	2 Pole Safety

2.1.1.4. Access Board-(ES-ACC-BD)

To ensure safe operations for different access operations. **NO CUSTOMER WIRING IS REQUIRED TO THIS BOARD.**

The board has following relays:-

1. 8A, 110 VDC non replaceable Relays marked as ACC, ACX, BAC and TAC : TOTAL 4



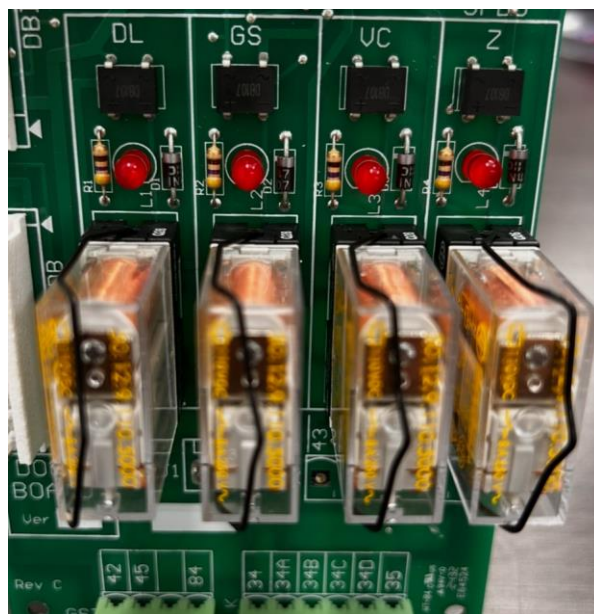
RELAY NAME	FUNCTION	TYPE
ACC	Access	6 Pole Safety
ACX	Access Aux. Relay	6 Pole Safety
BAC	Access Bottom Control	6 Pole Safety
TAC	Access Top Control	6 Pole Safety

2.1.1.5. Door Board-(ES-DB-BD)

Central Board to ensure smooth operation with door equipment. **NO CUSTOMER WIRING IS REQUIRED TO THIS BOARD.**

The board has following relays:-

1. 8A, 110 VDC replaceable Relays with Sockets marked DL, GS, VC and Z : TOTAL 4



RELAY NAME	FUNCTION	TYPE
DL	Door Locks	2 Pole Safety
GS	Gate Switch	2 Pole Safety
VC	Re-Leveling	2 Pole Safety
Z	Door Zone	2 Pole Safety
RDL*	Rear Door Locks	2 Pole Safety
RGS*	Rear Gate Switch	2 Pole Safety

* Only on the Walk Through Door Board

2.1.2. Optional Boards on the Controller

2.1.2.1. I/O Expansion Board-(ES-IO-24VDC-BD)

Expansion board used for Discrete Hall Calls, Additional Inputs (not accommodated on ES2-CPU, TOC, COP), Lockouts, Power Doors etc.

No Direct Wiring is required for this board. ES-IO-24VDC-BD could be used for the following:-

1. Discrete Hall Cars
2. Special Door Operators (Power Doors etc.)
3. Hall Lanterns
4. Lockouts for Machine Room

ES2 Print will clearly specify the purpose of the board and it's wiring.



2.1.2.2. CE Driver Board-(ES-CE-BD)

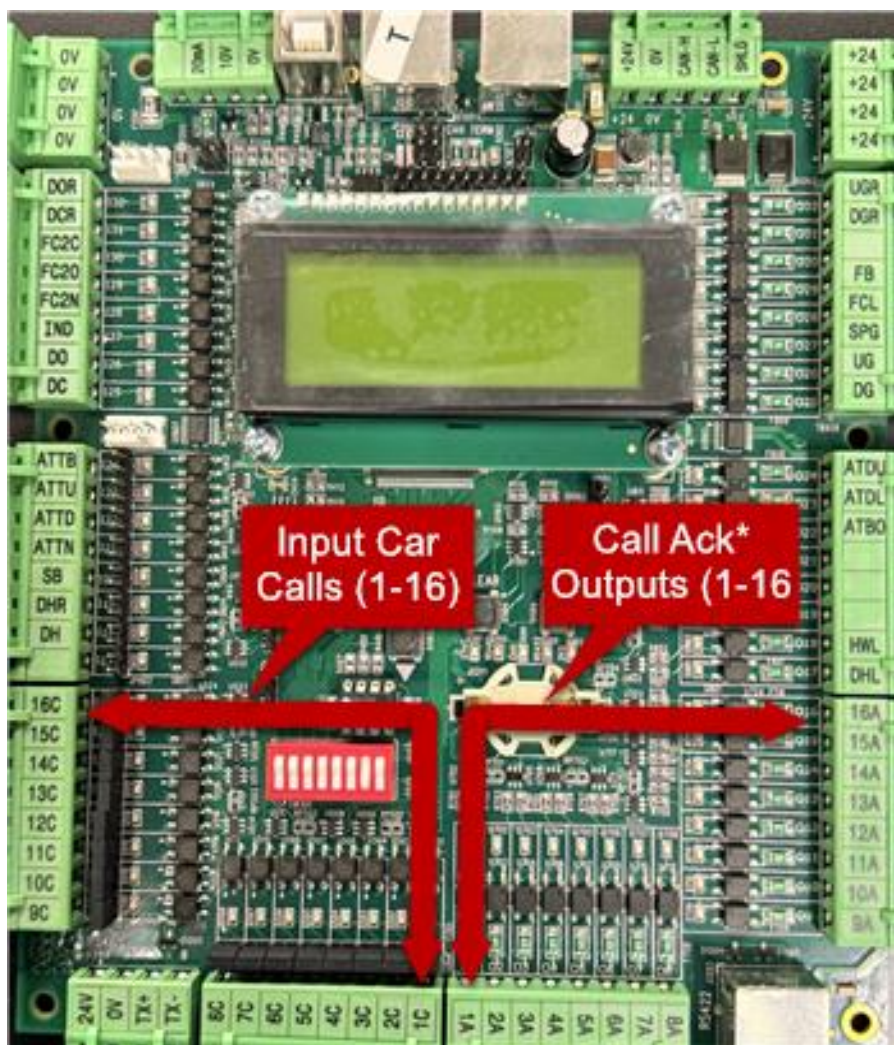
Special Interface Board to interact with CE Position Indicators. ESI provides this factory programmed for a seamless integration with CE Position Indicators.

No direct Customer wiring is required for this board



2.2. Car Operating Panel Board-(ES-CT-COP)

Standard ES2 controller architecture includes a ES-ECT-COP board. It can be shipped to the customer or our customer's COP manufacturer. This COP ECT will be wired to the car components/inputs/outputs. ES-ECT-COP connects to the ES-CPU via a CAN connection back to the controller. Standard ES-ECT-COP is setup for 16 floors. For additional floors, ES-ECT-COP's are provided in increments of 32 floors.



2.2.1. COP-Inputs & Outputs

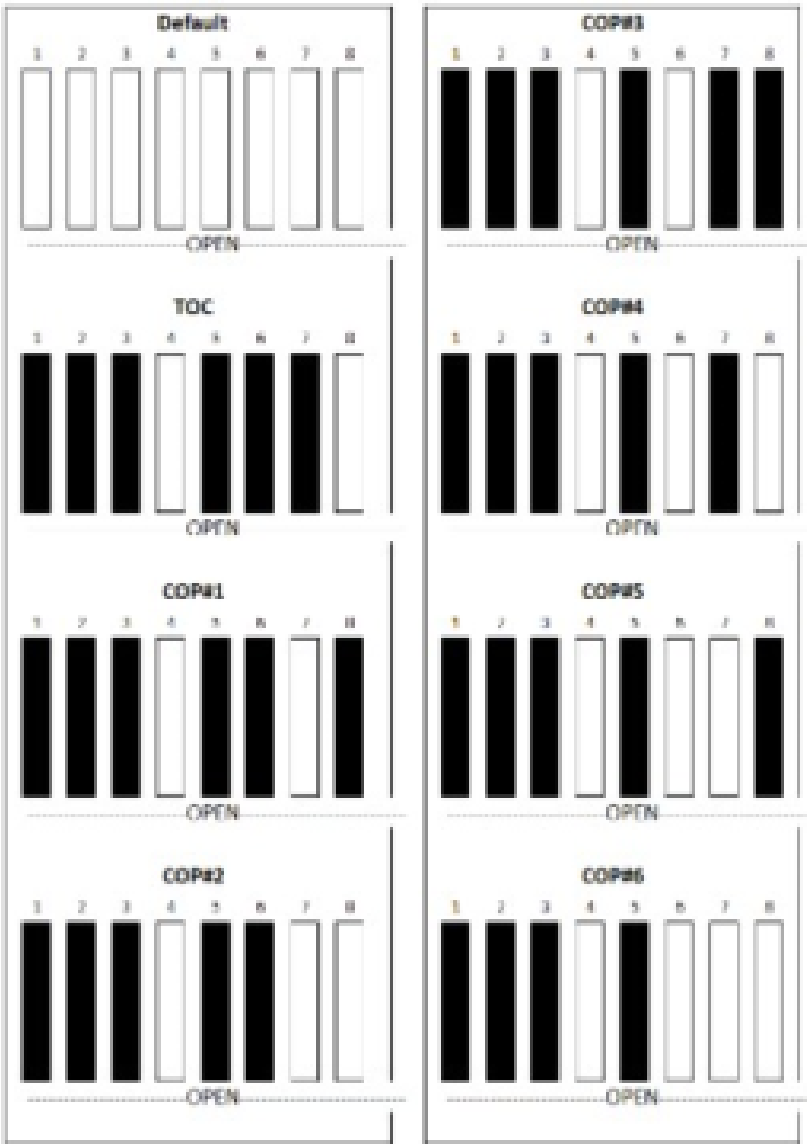
*The input/output listing is standard version and may change for certain controllers based on customer requirements. Always refer to the final print to ensure everything is wired as per the print.

Input#	Legacy Label/Label	Function	Output#	Legacy Label/Label	Function
1	1C	Car Call Floor 1	1	1A	Car Call Acknowledgment Light Floor 1
2	2C	Car Call Floor 2	2	2A	Car Call Acknowledgment Light Floor 2
3	3C	Car Call Floor 3	3	3A	Car Call Acknowledgment Light Floor 3
4	4C	Car Call Floor 4	4	4A	Car Call Acknowledgment Light Floor 4
5	5C	Car Call Floor 5	5	5A	Car Call Acknowledgment Light Floor 5
6	6C	Car Call Floor 6	6	6A	Car Call Acknowledgment Light Floor 6
7	7C	Car Call Floor 7	7	7A	Car Call Acknowledgment Light Floor 7
8	8C	Car Call Floor 8	8	8A	Car Call Acknowledgment Light Floor 8
9	1K	Floor 1 Lockout	9	OPN	OPEN FOR FUTURE USE
10	2K	Floor 2 Lockout	10	OPN	OPEN FOR FUTURE USE
11	3K	Floor 3 Lockout	11	OPN	OPEN FOR FUTURE USE
12	4K	Floor 4 Lockout	12	OPN	OPEN FOR FUTURE USE
13	5K	Floor 5 Lockout	13	OPN	OPEN FOR FUTURE USE
14	6K	Floor 6 Lockout	14	OPN	OPEN FOR FUTURE USE
15	7K	Floor 7 Lockout	15	OPN	OPEN FOR FUTURE USE
16	8K	Floor 8 Lockout	16	OPN	OPEN FOR FUTURE USE
17	CKO	Car Key Override	17	DHL	Door Hold Light
18	28H/DH	Door Hold Button	18	HWL	High Water Light
19	28HR/DHR	Door Hold Button Rear	19	OPN	OPEN FOR FUTURE USE
20	62/SB	S Button	20	OPN	OPEN FOR FUTURE USE
21	70/ATTN	Attendant Service On	21	OPN	OPEN FOR FUTURE USE
22	71/ATTD	Car Down Run on Attendant	22	5/ATBO	Attendant: Buzzer Output to tell the attendant that a hall call was pressed
23	72/ATTU	Car Up Run on Attendant	23	6/ATDL	Attendant Car Down Light Indicator
24	73/ATTB	Car Bypass/Non Stop on Attendant	24	7/ATUL	Attendant Car Up Light Indicator
25	24/DC	Door Open Button - Front	25	DG	Down Car Travel Lanterns - Front Doors
26	28/DO	Door Close Button - Front	26	UG	Up Car Travel Lanterns - Front Doors
27	50/IND	Independent Service	27	61/SPG	Stop/Pass Gong
28	95/FC2N	Fire Phase 2 - Fire Control Car Switch On	28	97/FCL	Fire Control Light
29	100/FC2O	Fire Phase 2 - Fire Control Car Switch Off	29	97B/FB	Fire Buzzer
30	96/FC2C	Fire Phase 2 - Fire Control Car Switch Cancel	30	67/LWLB	Load Weighing Light & Buzzer
31	24R/DCR	Door Close Button - Rear	31	DGR	Rear Down Travel Lantern
32	28R/DOR	Door Open Button - Rear	32	UGR	Rear Up Travel Lantern

2.2.2. ECT DIP SWITCH SETTINGS

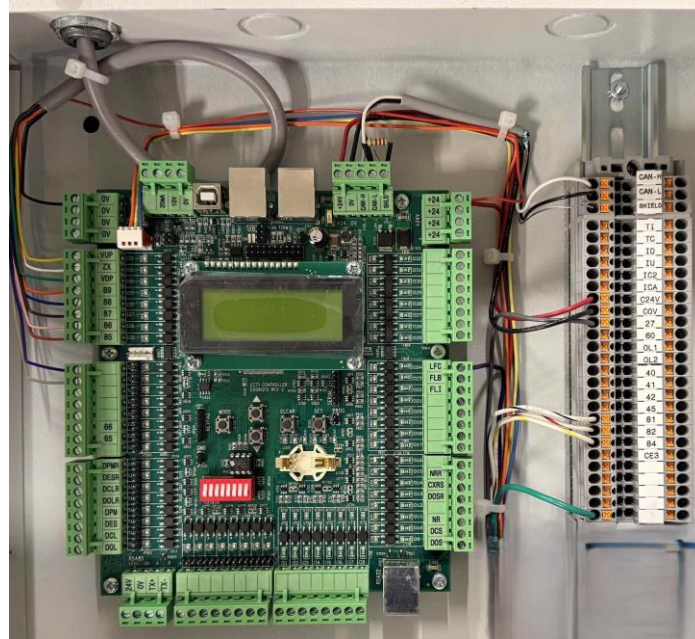
BUTTON SET TO OPEN

BUTTON SET TO CLOSE/NUMBER SCREEN PRINT



2.3. Top of Car Box-(ES-TOC-BOX)

ES2 Top of Car Box (TOC) : ES2 TOC Box includes interface to the ES2 Controller/COP and APS system. The Elevator Systems Serial TOC box will be the interface of the car and the controller. Top of car components will typically be wired into this box. The connection will be made on the terminal strip located on the right side of the TOC box as well as on the green connectors on the TOC ECT Board (see Figure 2). As shown, the serial link controller will require less than 25 traveler cables.



2.3.1. ES-TOC-BOX-Inputs & Outputs

Input #	Legacy Label/Label	Function	Output#	Legacy Label/Label	Function
1		OPEN FOR FUTURE USE	1		OPEN FOR FUTURE USE
2		OPEN FOR FUTURE USE	2		OPEN FOR FUTURE USE
3		OPEN FOR FUTURE USE	3		OPEN FOR FUTURE USE
4		OPEN FOR FUTURE USE	4		OPEN FOR FUTURE USE
5		OPEN FOR FUTURE USE	5		OPEN FOR FUTURE USE
6		OPEN FOR FUTURE USE	6		OPEN FOR FUTURE USE
7		OPEN FOR FUTURE USE	7		OPEN FOR FUTURE USE
8		OPEN FOR FUTURE USE	8		OPEN FOR FUTURE USE
9	OL/DOL	Open Limit Input:	9	OX/DOS	Output to open the door
10	DCL	Door Close Limit Input:	10	CX/DCS	Output to Close the Door
11	28E/DES	Door Edge Sensor : Input for any kind of door interruption sensor	11	NR	Closing the door slowly if 28E/DES triggers a reopen
12		OPEN FOR FUTURE USE	12		OPEN FOR FUTURE USE
13	ROL/DOLR	Open Limit Input, Rear Doors	13	OXR/DOSR	Output to open the door Master and Car Doors, Rear Doors
14	DLR/DCLR	Door Close Limit Input, Rear Doors	14	CXR/DCSR	Output to Close the Door. Master and Car Doors, Rear Doors
15	28ER/DESR	Door Edge Sensor, Rear Doors	15	NRR	Closing the door slowly if 28E/DES triggers a reopen, Rear Doors
16		OPEN FOR FUTURE USE	16		OPEN FOR FUTURE USE
17		OPEN FOR FUTURE USE	17		OPEN FOR FUTURE USE
18		OPEN FOR FUTURE USE	18		OPEN FOR FUTURE USE
19		OPEN FOR FUTURE USE	19		OPEN FOR FUTURE USE
20		OPEN FOR FUTURE USE	20		OPEN FOR FUTURE USE
21		OPEN FOR FUTURE USE	21		OPEN FOR FUTURE USE
22		OPEN FOR FUTURE USE	22	97I/FLI	Fire Light Indicator
23		OPEN FOR FUTURE USE	23	97BI/FLB	Fire Light Buzzer
24		OPEN FOR FUTURE USE	24	LCP/LFC	Light and Fan Control
25		OPEN FOR FUTURE USE	25	52	Bottom Slow Down Limit
26-31		OPEN FOR FUTURE USE	26-31		OPEN FOR FUTURE USE
32		OPEN FOR FUTURE USE	32	53	Top Slow Down Limit

2.4. ELGO Absolute Position System-(ES-APS-KIT)

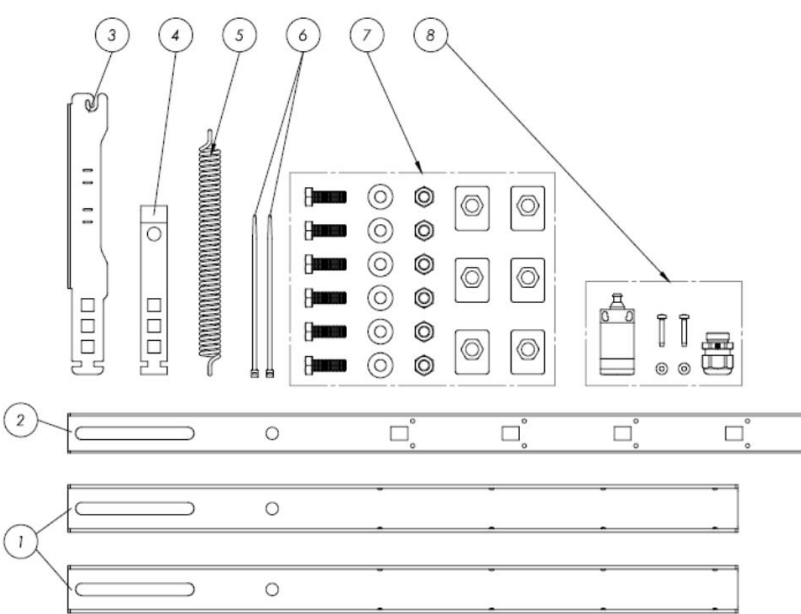
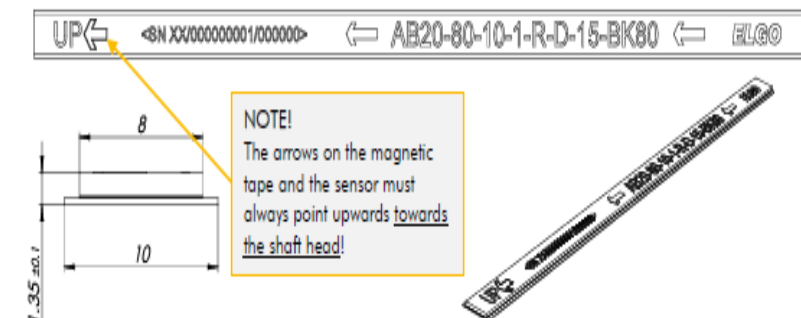
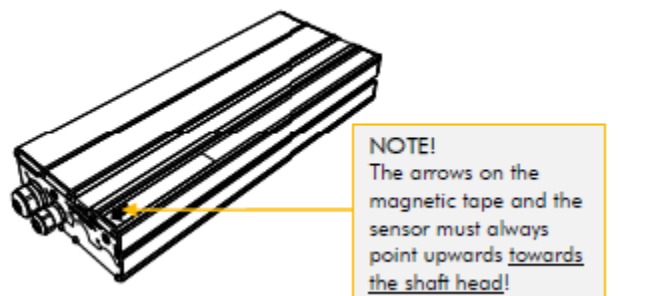
ES-APS-KIT

ELGO LIMAX Absolute Positioning System is installed in the hoistway to monitor elevator/car speed and position. The kit comprises of the following:-

1. Bracket Installation Hardware KIT
2. Sensor Installation Hardware KIT
3. Instructions for installation

2.4.1. ELGO Hardware Kit Components

ES-APS-KIT Bracket Mounting Kit

Bracket Installation Hardware 	Bracket Installation Hardware List <table><tr><td>①</td><td>Crossbeam (2x)</td></tr><tr><td>②</td><td>Crossbeam for safety position switch (1x)</td></tr><tr><td>③</td><td>Tape fixture for position switch (1x)</td></tr><tr><td>④</td><td>Tape fixture (1x)</td></tr><tr><td>⑤</td><td>Spring (1x)</td></tr><tr><td>⑥</td><td>Cable ties (2x)</td></tr><tr><td>⑦</td><td>Rail clips including screws and nuts (6x)</td></tr><tr><td>⑧</td><td>Position switch including screws and cable gland (1x)</td></tr><tr><td></td><td>Original description of position switch</td></tr></table>	①	Crossbeam (2x)	②	Crossbeam for safety position switch (1x)	③	Tape fixture for position switch (1x)	④	Tape fixture (1x)	⑤	Spring (1x)	⑥	Cable ties (2x)	⑦	Rail clips including screws and nuts (6x)	⑧	Position switch including screws and cable gland (1x)		Original description of position switch
①	Crossbeam (2x)																		
②	Crossbeam for safety position switch (1x)																		
③	Tape fixture for position switch (1x)																		
④	Tape fixture (1x)																		
⑤	Spring (1x)																		
⑥	Cable ties (2x)																		
⑦	Rail clips including screws and nuts (6x)																		
⑧	Position switch including screws and cable gland (1x)																		
	Original description of position switch																		
Magnetic Tape AB20-80-10-1-R-D-15-BK80 	LIMAX1R 																		
11. Sensor Mounting Kit 																			

2.4.2. ES-APS Installation Instructions

ES-APS Installation Safety Check

- **Function:** These mounting instructions provide all the information you need for mounting, commissioning, the safe operation and disassembly of the LIMAX S-RMS3. The mounting instructions must be available in a legible condition and complete version in the vicinity of the device.
- **Authorized Qualified Personnel:-** All operations described in these mounting instructions must be carried out only by trained specialist personnel, authorized by the elevator installation company.
- Please make sure that you have read and understood these mounting instructions and that you know all applicable prescriptions regarding occupational safety and accident prevention prior to installation and commissioning.
- **Explanation of the Symbols used**



Caution:
Failure to comply with this warning notice could lead to interferences or malfunctions.
Warning:
Failure to comply with this warning notice could lead to physical injury and/or damage to the machine.

- **General Safety Instructions:** The user must observe the safety instructions in these mounting instructions, the local installation standards as well as all applicable safety regulations and accident prevention rules. The information contained in these mounting instructions manual is provided without liability. The installation instructions are subject to technical modifications.
- **Exclusion of Liability:** ESI shall accept no liability for damage and malfunctions resulting from incorrect mounting or failure to comply with these mounting instructions. ESI shall accept no liability for damage resulting from the use of unauthorized spare parts or accessories.
- For safety reasons, invasive work on the device as well as arbitrary repairs, conversions and modifications to the device are strictly forbidden; ESI shall accept no liability for damage resulting from such invasive work, arbitrary repairs, conversions and/or modifications to the device.

2.4.2.1. Bracket Installation Instructions

ES-APS Bracket Installation Instructions from Steps 1-15

2.4.2.1.1. Steps 1-4

Bracket Installation Steps 1-4

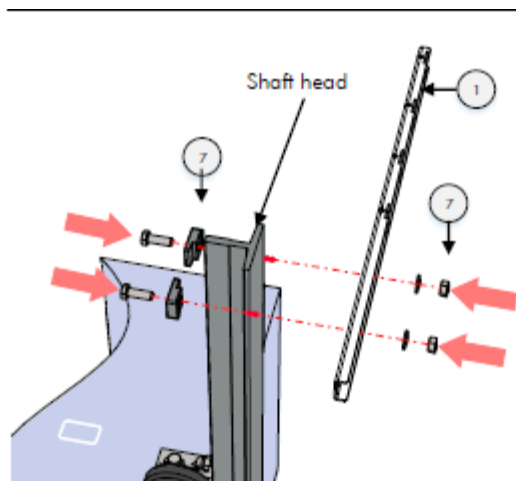


Fig. 1

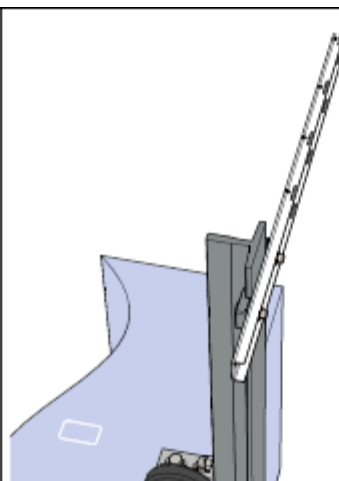


Fig. 2

Fig. 1 & 2:

Install one crossbeam (1) in the shaft head by using the rail clips (7). Make sure that the clips screws are well tightened (min. 45 Nm), so that the crossbeam does not move.

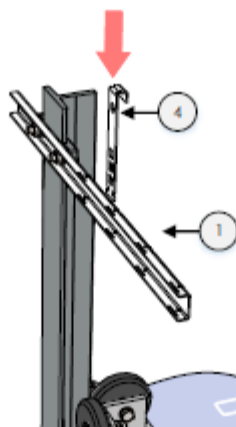


Fig. 3

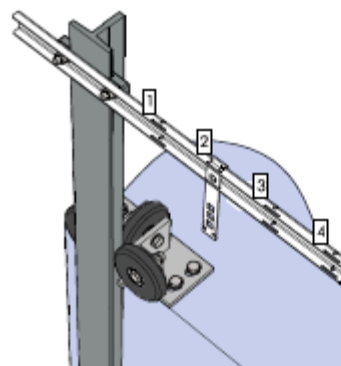


Fig. 4

Fig. 3 & 4:

Slide the tape fixation (4) into the crossbeam as shown. Use any of the slots provided depending on your specific space situation in the installation. A position as close to the guide rail as possible is advantageous. Memorize the used slot.

2.4.2.1.2. Steps 5-8

Bracket Installation Steps 5-8

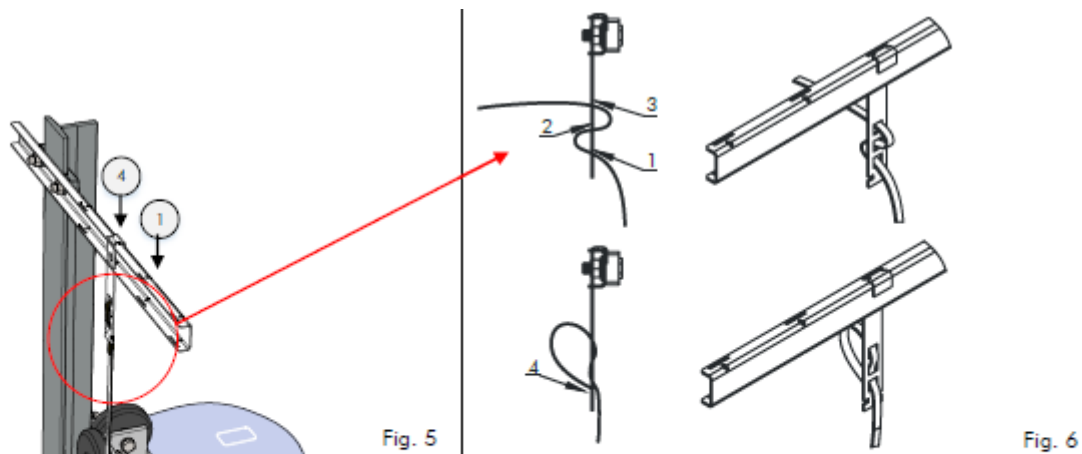


Fig. 5 & 6:

This step must be done with the tape fixture (4) inside the crossbeam (1). Thread the tape through the tape fixture (4) and back down, as shown (FIG 6). Mind the orientation of the tape (FIG 7) – the magnet side must face the sensor body later on. Basically, the fixture works like a self-locking belt. Leave at least 20 cm tape at the spare end. Press the loops flat in the clamp. There should be a break in the upper loop. In the end, secure the tape with a cable tie (6) at the bottom of the tape fixation (4).

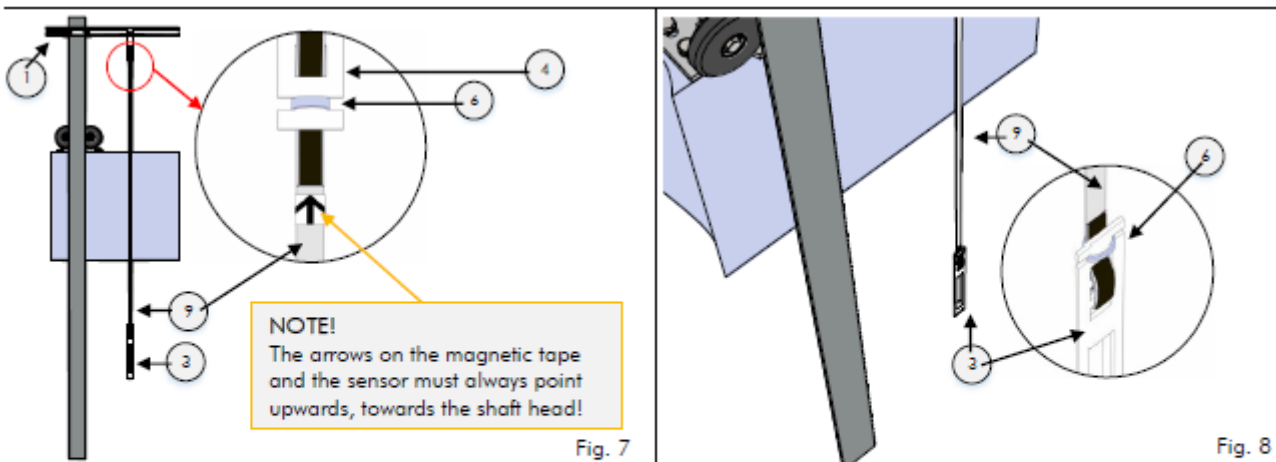


FIG 7 & 8

After the tape (9) has been installed in the shaft, fix the tape fixture (3) for the presence detector to the lower end of the tape. Leave at least 20 cm at the spare end and press the loop flat in the clamp. There should be a break in the lower loop. The end, secure the tape with a cable tie (6) at the top of the tape fixture (3).

2.4.2.1.3. Steps 9-11

Bracket Installation Steps 9-11

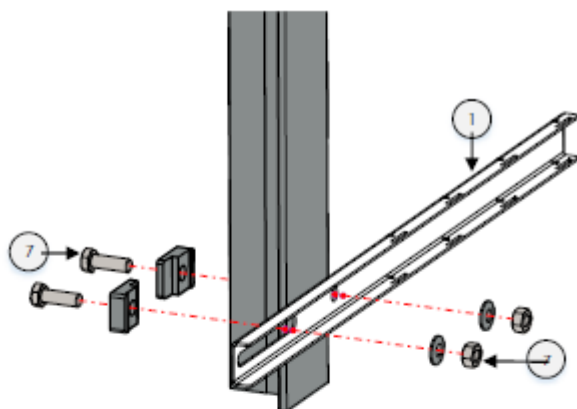


Fig. 9

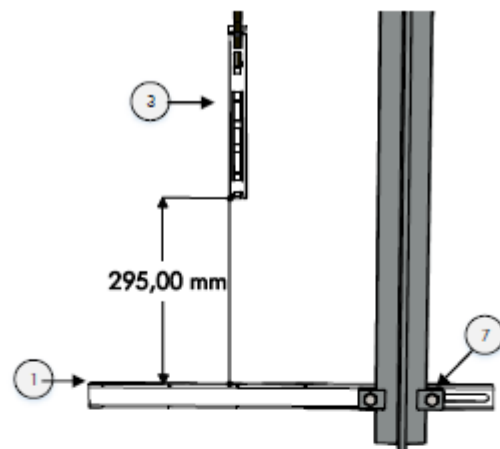


Fig. 10

Fig. 9 & 10:

Now install the second crossbeam (1) into the shaft bottom with a distance of 295 mm to the tape fixture for presence detector (3). Make sure that the screws (7) are well tightened with min. 20 Nm, so that the crossbeam (1) does not move.

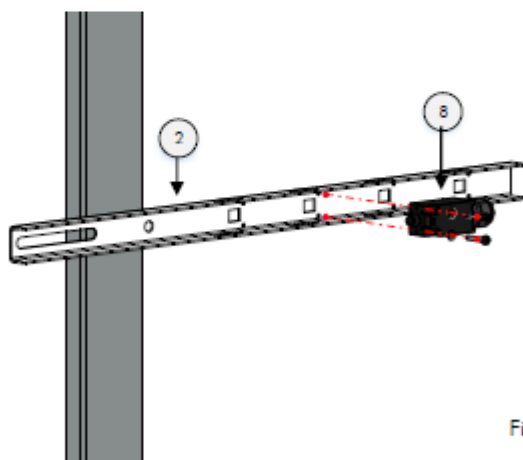


Fig. 11

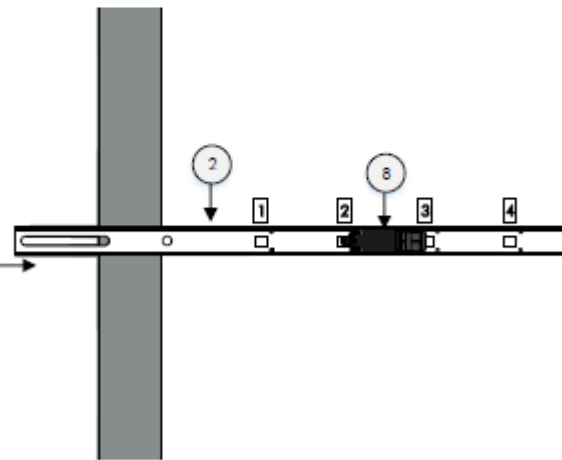


Fig. 11:

The crossbeam for the safety presence detector (2) should be pre-mounted for the installation later. Mount the cable screw connections (1 piece) to the presence detector. Align the presence detector (8) with the edge of the crossbeam (2). Then fasten the screws with 3 Nm. The presence detector should be positioned on the same slot, as you used during the assembly of the tape fixation (4) in the upper crossbeam (1) (see Fig. 3 & 4).

2.4.2.1.4. Steps 12-15

Bracket Installation Steps 12-15

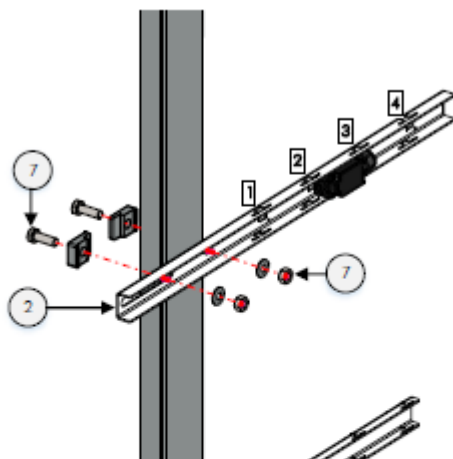


Fig. 12

Fig. 12:
Mount pre-installed crossbeam for the presence detector (2) to the elevator rail. Fasten the screws (7) only so tight that the crossbeam (2) can still be moved.

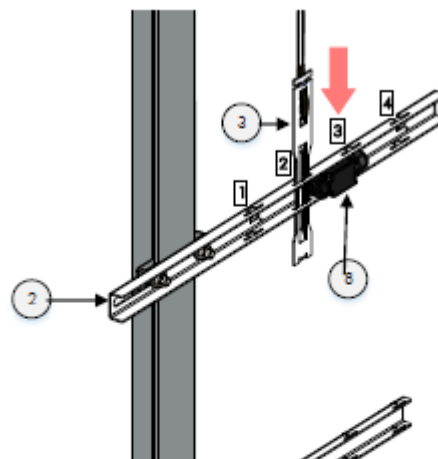


Fig. 13

Fig. 13:
Insert the tape fixture (3) into the crossbeam for the presence detector (2). Use the same slot, where the position detector (8) is positioned.

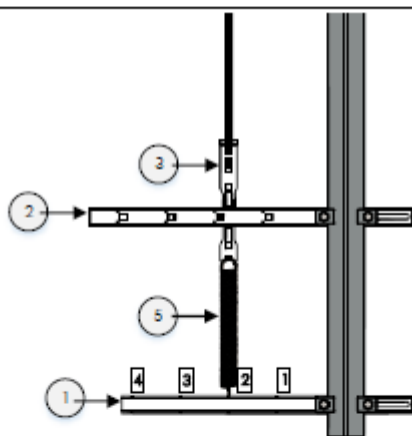


Fig. 14

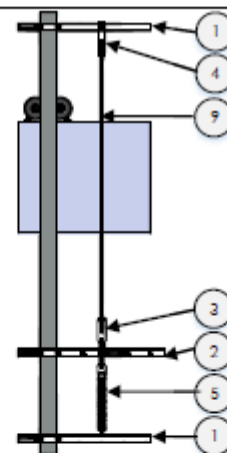


Fig. 15

Fig. 14 & 15:

Hook the tape fixture (3) into the spring (5). Make sure that the spring (5) is correctly placed in the drill hole of the lower crossbeam (1). The crossbeam for the presence detector (2) is positioned in such a way that only one marking on the tape fixture (3) can be seen towards both the top and the bottom. The crossbeam (2) must be mounted in a 90° angle to the elevator rail.

When the crossbeam (2) has been correctly positioned, the screws (7) are fastened with 20 Nm while making sure that the crossbeam (2) is not moved by accident.



ATTENTION!

Always use the same slot in all crossbars! The magnetic tape must hang vertically and parallel to the guide rail! We recommend noting down the number of the slot you used first.

2.4.2.2. Sensor Installation Instructions

ES-APS Sensor Installation Instructions from Steps 16-30

2.4.2.2.1. Steps 16-21

ES-APS Sensor Installation Instructions : STEPS 16 - 21

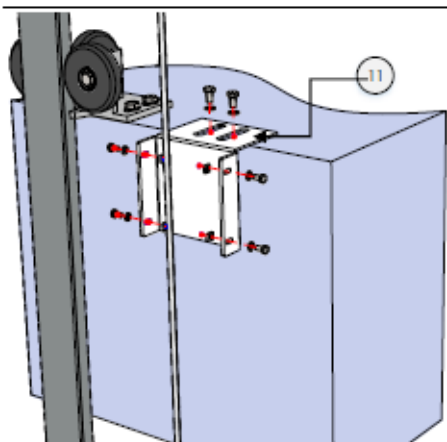


Fig. 16

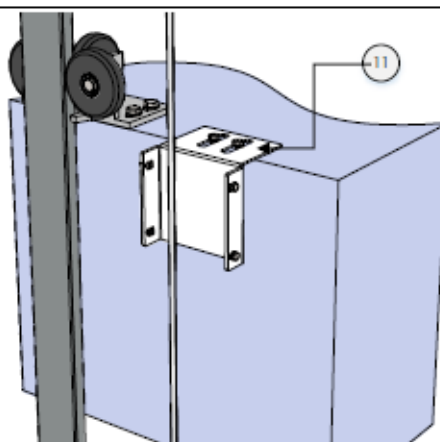


Fig. 17

Fig. 16 & 17: Installation of the mounting angle for LIMAX33 CP

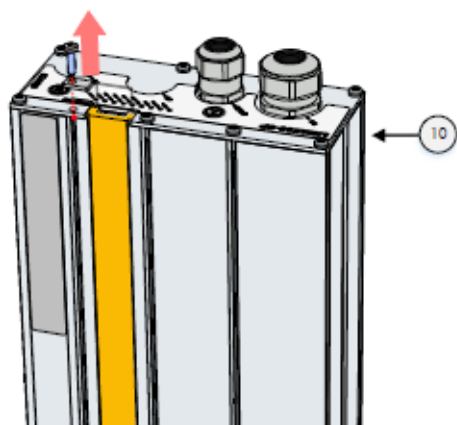


Fig. 18

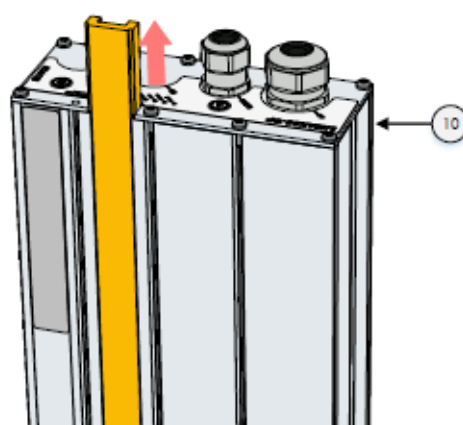


Fig. 19

Fig. 18: Remove the guide rail holding plate.

Fig. 19: Remove the guide rail.

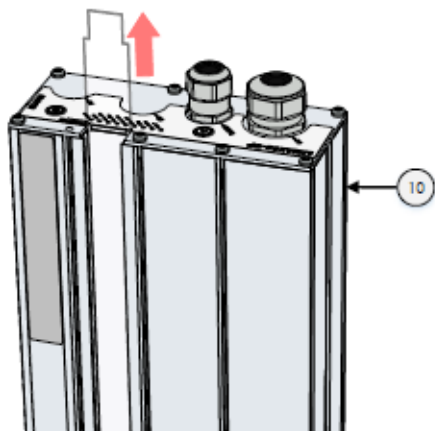


Fig. 20

Fig. 20: Remove the underlay.

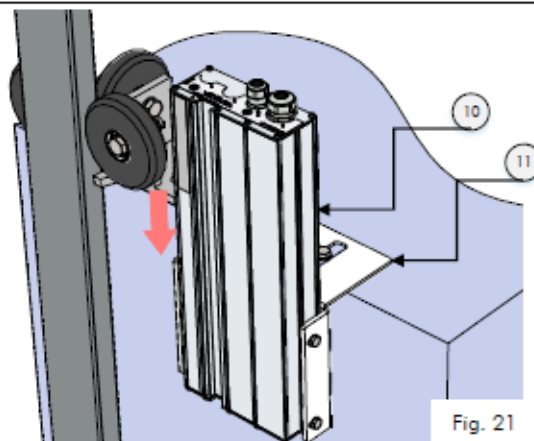


Fig. 21

Fig. 21: Move the LIMAX33 CP (10) to the center of the mounting angle (11) and fix it with the screws.

2.4.2.2.2. Steps 22-27

ES-APS Sensor Installation Instructions : STEPS 22 - 27

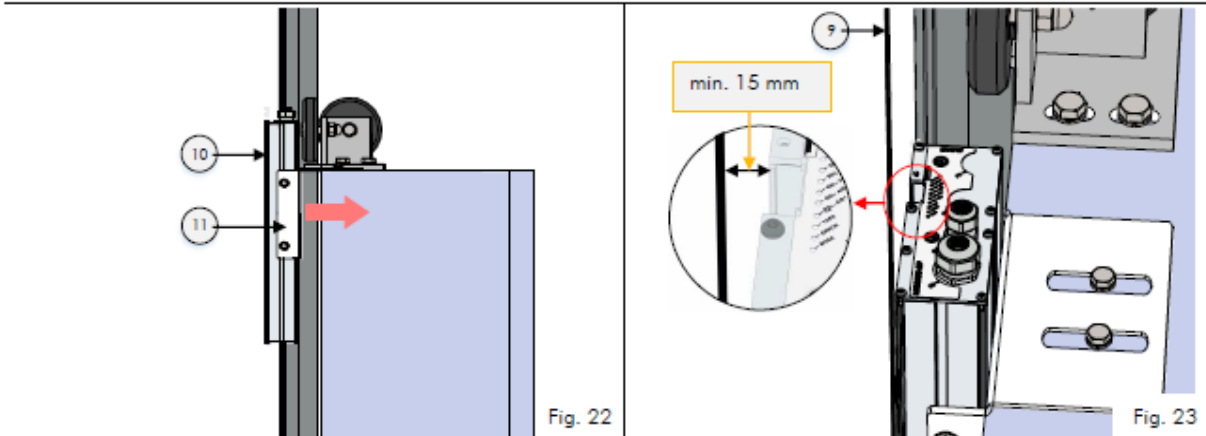


Fig. 22 & 23:
Move the MW (11) to the cabin till you reach a gap of minimum 15 mm between magnetic tape (9) and sensor (10)

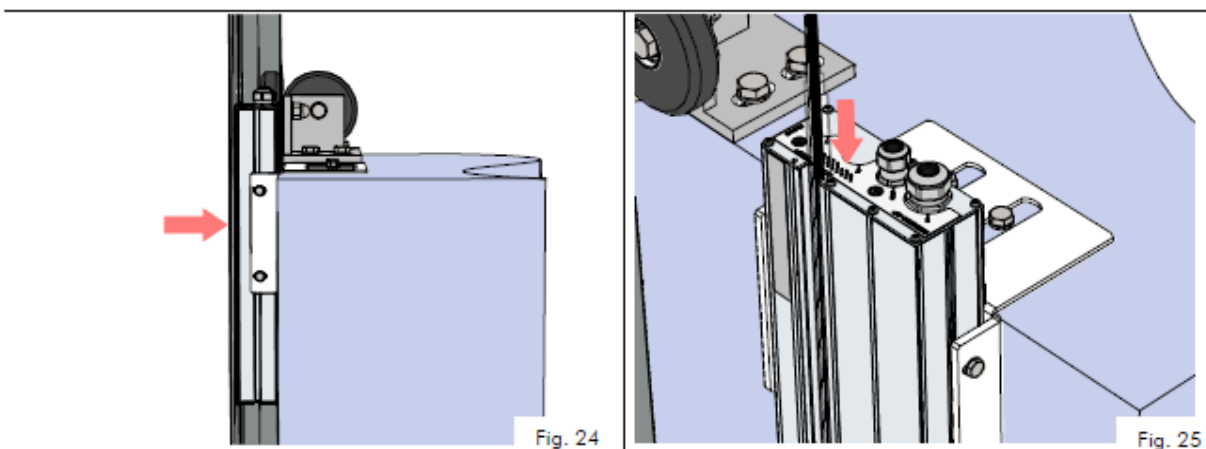


Fig. 24:
Insert the magnetic tape (9) in the guide rail of the sensor (10)

Fig. 25: Insert the underlay.

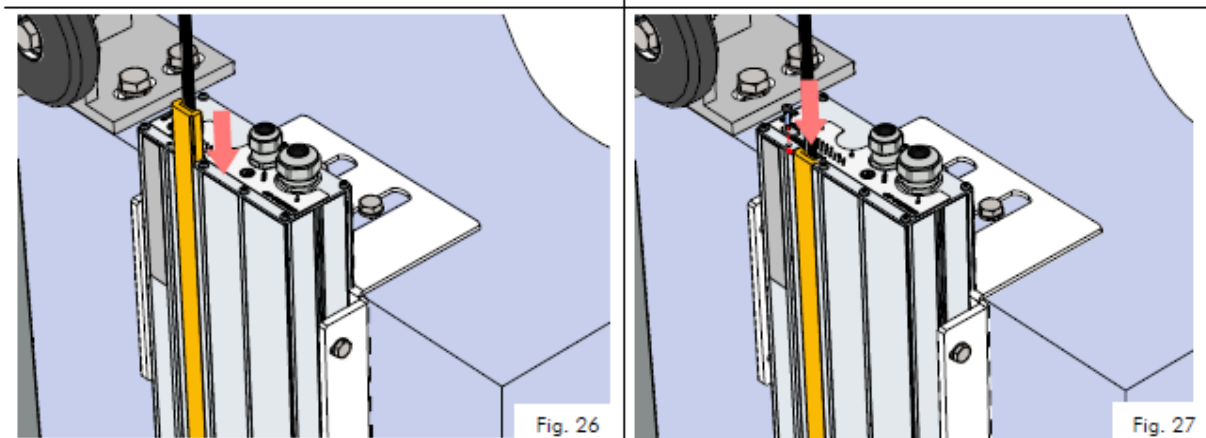
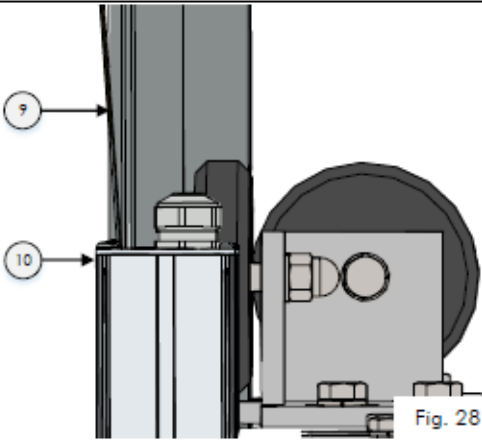
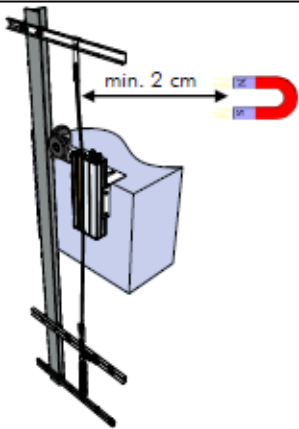


Fig. 26: Insert the guide rail.

Fig. 27: Fix the holding plate for the guide rail.

2.4.2.2.3. Steps 28-30

ES-APS Sensor Installation Instructions : STEPS 28 - 30

 Fig. 28: Enforced contact between steel tape and polymer guide.	 Fig. 29: External magnetic fields shall not exceed 64 mT (640 Oe; 52 kA/m), otherwise the magnetic coding will be damaged or destroyed.
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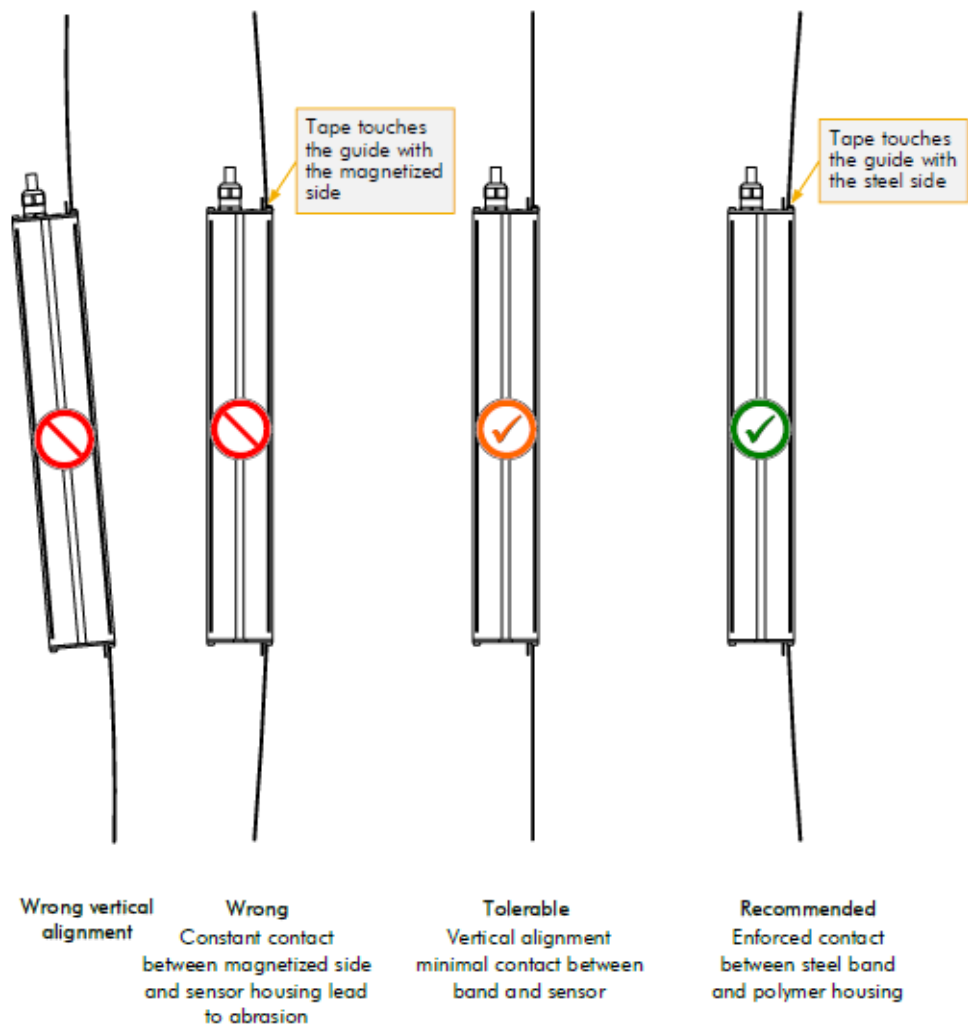
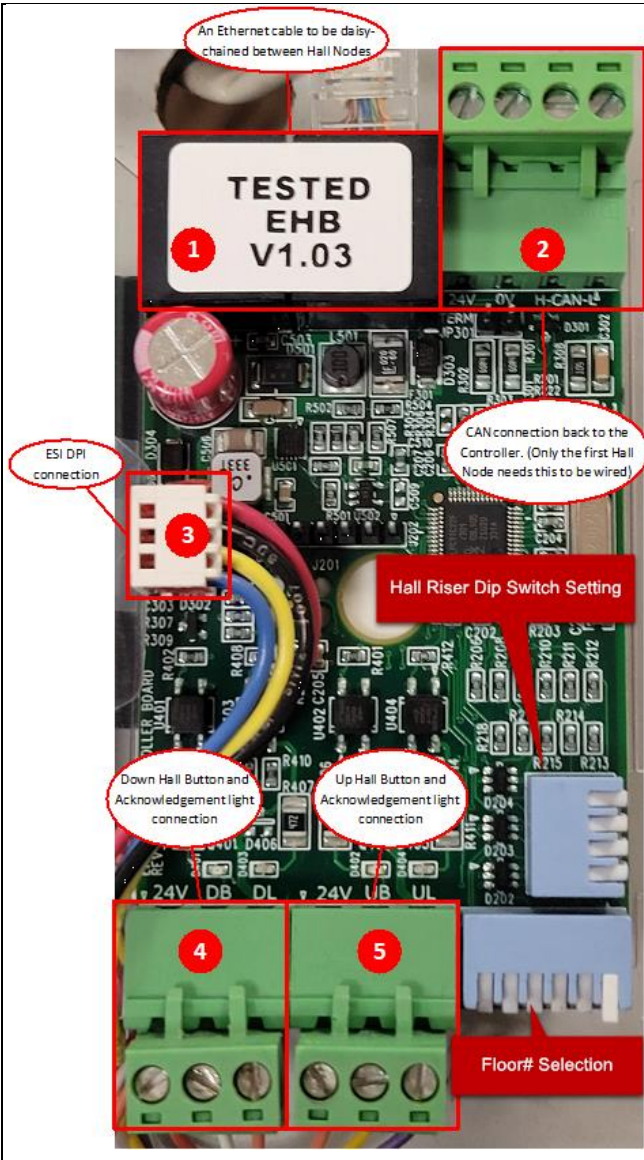


Fig. 30: Assessment of the magnetic tape offset (pretension)

2.5. Optional Add Ons

2.5.1. Hall Node Board (If Ordered)-(ES-EHB1)

Serial Hall Calls is an optional addition to the serial controller. Serial Hall Calls will reduce the number of hoistway wires. Typical discrete wiring would be two hoistway wire per hall button. Using Serial Halls Calls, the hall stations are daisy-chained to one another via Ethernet cables on the Hall Nodes, terminating with a CAN connection back to the controller. The Hall Board also has connections for ESI DPIs.



2. Ethernet connector used to daisy-chain each hall node to each other.

2. CAN connection from the first hall node to the controller, wired as followed:

Hall node	Controller
24V	#H24V
0V	#H0V
CAN_H	#HN_H
CAN_L	#HN_L

3. ESI DPI connection from the first hall node to the controller, wired as follower(if applicable):

Hall node	ESI DPI
24V (Red)	1L
0V (Black)	2L
A (Yellow)	3L
B (Blue)	4L

4. Down Hall Call Button connection, wired as followed:

Hall node	Hall Button
24V	Down Hall Call Button and Light Common
DB	Down Hall Call Button
DL	Down Hall Call Light

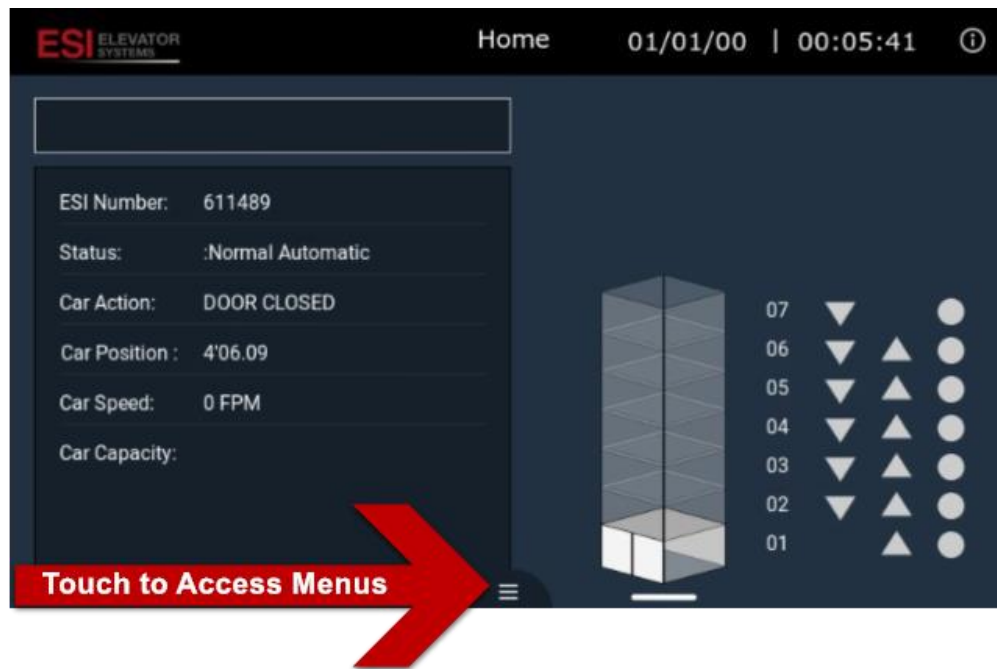
5. Up Hall Call Button connection, wired as followed:

Hall node	Hall Button
24V	Up Hall Call Button and Light Common
DB	Up Hall Call Button
DL	Up Hall Call Light

3. ES2 Touch Screen Menu Structure

ES2-CPU provides Full Setup and Troubleshooting of the Hydraulic Controller with a Resistive Touch Enabled Screen.

ES2-CPU provides access to the following Menus on click of the Menu Button at the bottom Center of the screen.

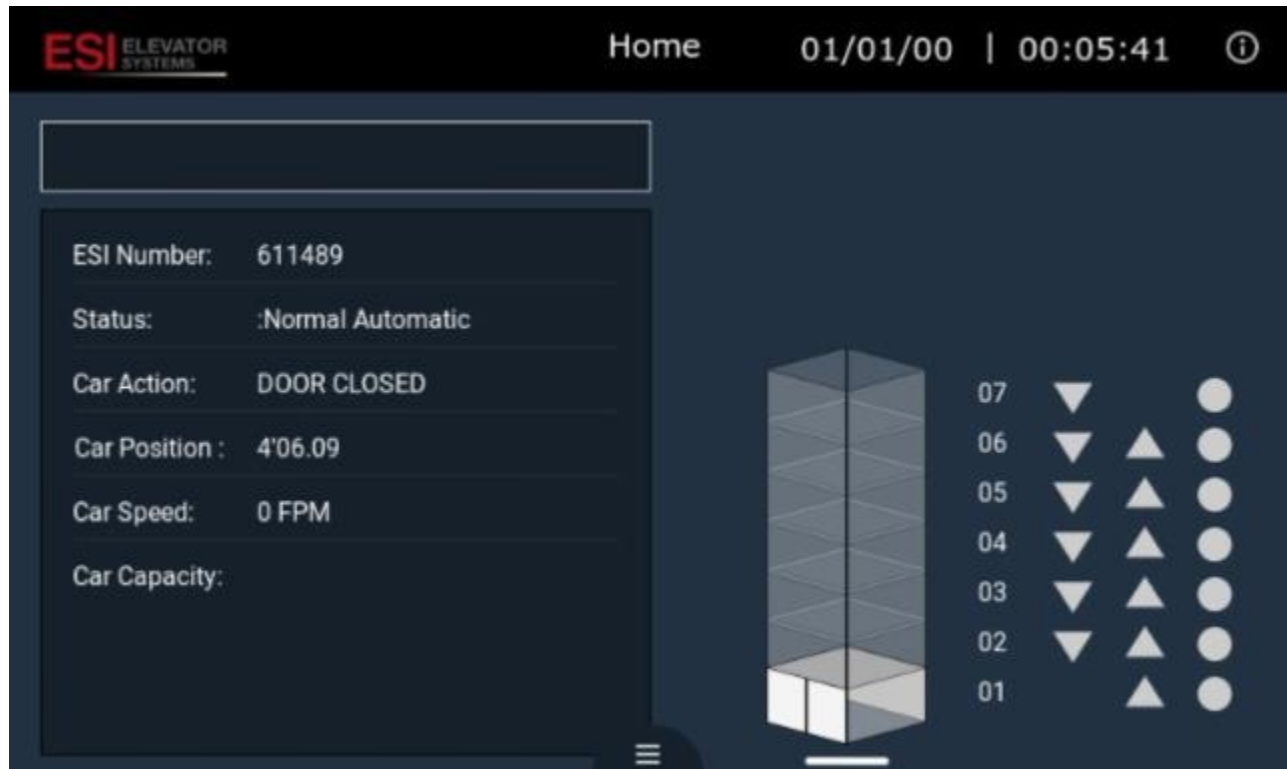


3.1. Home Screen

The **Home/Default** CPU screen shows the following information for the controller

- **Date and Time**
- **Job Address/Name**
- **ESI Number** : Unique number assigned to each controller
- **Car Status** : Combination of Inspection Status and Operation Status
- **Car Actions and Faults** : Shows the Current Car Action and Faults, if any
- **Car Position**
- **Car Speed**
- **Car Capacity**
- **Car Hoistway Rendering including ability to Place Car and Hall Calls**

Clicking on at the top right will provide additional information like Software version.



3.1.1. Car Status

Car Status : Combination of

- **Inspection Status** AND
- **Operations Status**



Inspection Status	Description
Access	Elevator is On TOP or BOTTOM ACCESS
Automatic	Elevator is in Automatic Operation
ByPass	Gate or Door Bypass Switch is in the Bypass position.
Controller Insp	Controller has been put in inspection mode from the Controller from ESI-RB-BD
In Car Insp	Controller has been put in the inspection mode from the COP
TOC Insp	Controller has been put in the Inspection mode from ES2 Top of Car Inspection Box or Similar Top of Car Inspection Box

Operation Status	Description
Attn Serv	On attendant Service, ES-CT-COP input location 21, [70]/[ATTN] is high
BackUpPWR	Car is on Backup Power (On UPS Backup Power, relay PF de-energized)
EMT Serv	On Emergency Medical Team Service
EMT InCar	On Emergency Medical Team Service in Car
EQ-Sem	Earth Quake-Seismic Trip only
EQ-Sem& CW	Earth Quake-Seismic & Counter Weight Trip
EQ-Cwt	Earth Quake Counter Weight Trip only
Emg Power	Car is on Emergency/Backup Power
Emg PR PK	On Back-up Power and Auto returning
FCF Prime	Car is on Fire Phase: Prime Floor/Return
FCF PII	Car is on Fire Phase 2 : Prime Floor/Return
FCF Alt	Car is on Fire Phase 1: Alternate Floor/Return
FCF AII	Car is on Fire Phase 2: Alternate Floor/Return
Ind Serv	Car is on Independent Service, ES-CT-COP input location 27, [50]/[IND] is high
Normal	Car is on Normal Service
OutOfServ	Car is out of Service, ES2-CPU input location 33, [68]/[OOS] is high

3.1.2. Car Actions and Fault Status

3.1.2.1. Codes 0-67

Home Screen additionally shows the Current Car Action and Faults, if any

Fault/Status Code	Fault	Type
13	Low Oil Time Out	Error/Fault
14	Emerg Power	Status
15	BackUP Power	Status
16	Attendant Service	Status
18	SAF Opened	Error/Fault
19	GOV OVS Opened	Error/Fault
24	CAR OverLoaded	Error/Fault
30	HS Stop DL	Error/Fault
31	HS Stop GS	Error/Fault
32	HS Stop RDL	Error/Fault
33	HS Stop RGS	Error/Fault
34	HS Stop DCL	Error/Fault
35	HS Stop RDCL	Error/Fault
36	HS Stop HDOOR	Error/Fault
37	HS Stop RHDOOR	Error/Fault
38	SD LIMIT Failure	Error/Fault
51	CYCLE TEST Fail P1	Error/Fault
52	CYCLE TEST Fail P2	Error/Fault
53	CYCLE TEST Fail P3	Error/Fault
60	DOOR OPEN TimeOUT	Error/Fault
61	DOOR OPEN TOS FAULT	Error/Fault
62	DOOR CLOSE TimeOUT	Error/Fault
63	DOOR CLOSE TOS FAULT	Error/Fault
64	REAR OPEN TimeOUT	Error/Fault
65	REAR OPEN TOS FAULT	Error/Fault
66	REAR CLOSE TimeOUT	Error/Fault
67	REAR CLOSE TOS FAULT	Error/Fault

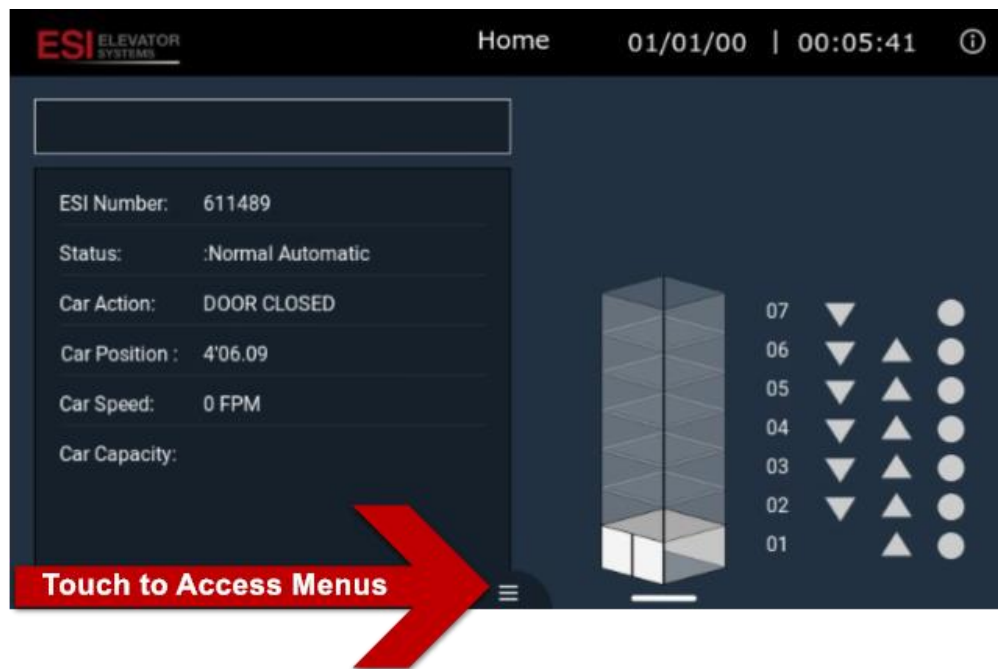
3.1.2.2. Codes 68-200

Home Screen additionally shows the Current Car Action and Faults, if any

Fault/Status Code	Fault	Type
69	GATE SW ON FAULT	Error/Fault
70	DOOR LOCK ON FAULT	Error/Fault
71	REAR GATE ON FAULT	Error/Fault
72	REAR LOCK ON FAULT	Error/Fault
74	CAR HELD TOS	Error/Fault
75	CAR HELD TOS-REAR	Error/Fault
77	RUN DELAY - GS	Error/Fault
78	RUN DELAY - DL	Error/Fault
79	RUN DELAY - RGS	Error/Fault
80	RUN DELAY - RDL	Error/Fault
81	RUN DELAY - DRV	Error/Fault
82	RUN DELAY-OLR/RPR/DC	Error/Fault
83	RUN DELAY - FAULT	Error/Fault
85	EQ - SEM	Error/Fault
90	PRESSURE SW Open	Error/Fault
100	APS Invalid data	Error/Fault
101	APS No Comm	Error/Fault
102	APS Error	Error/Fault
103	APS Valid	Error/Fault
104	Safety Proc No Com	Error/Fault
105	Safety Proc CRC	Error/Fault
106	Safety Proc Good	Error/Fault
122	Tape Monitor Open	Error/Fault

3.2. Menu Screen

ES2-CPU menu screen can be accessed by touching the Menu Button (3 Stacked Lines) at the bottom of the screen.

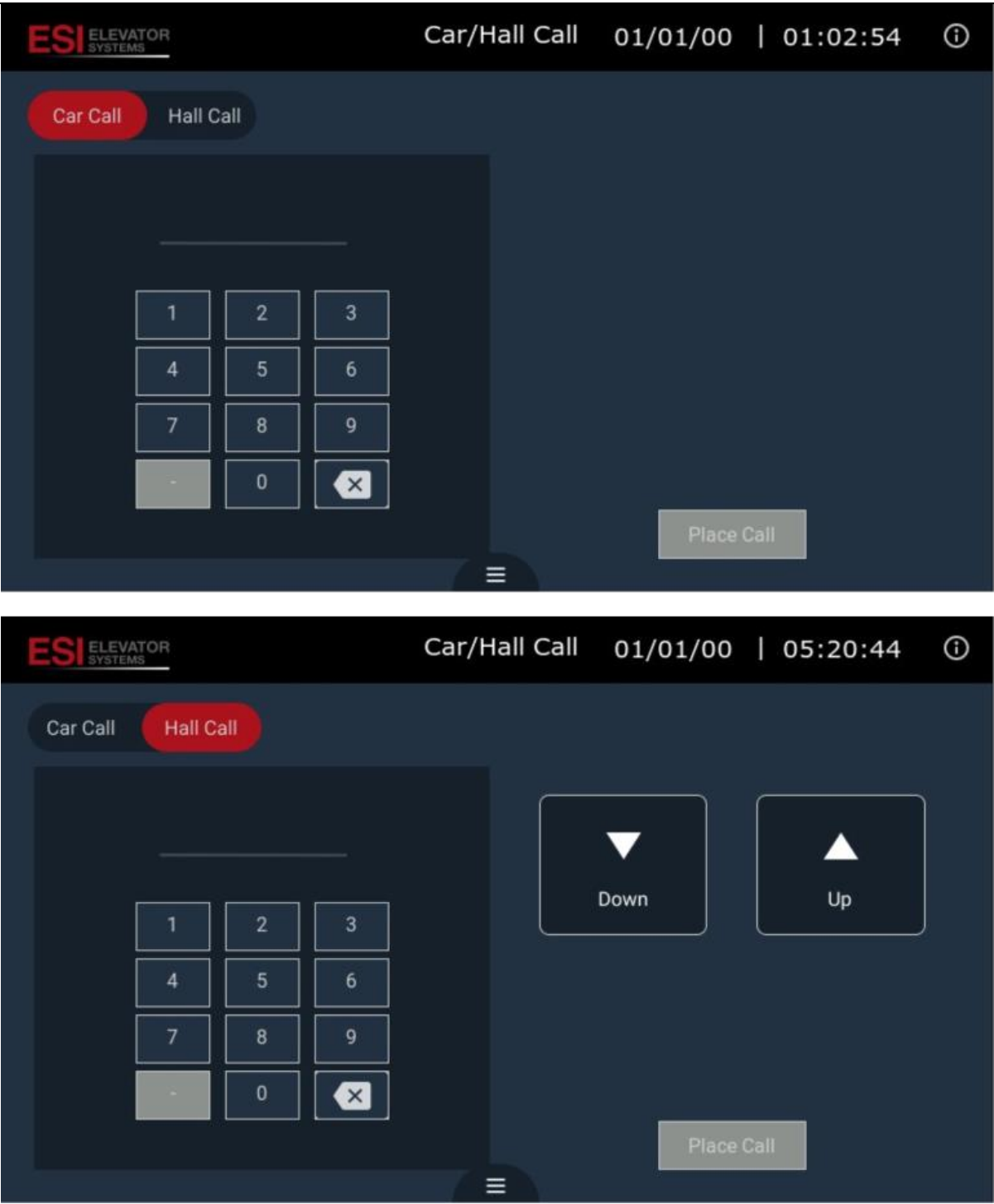


This will bring up the menu screen



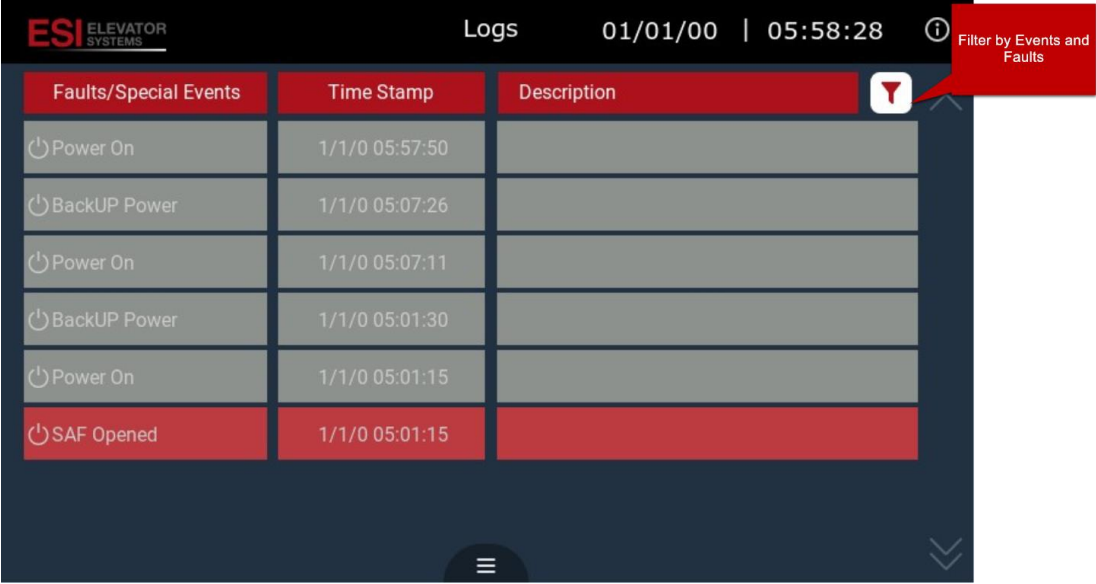
3.2.1. Calls Screen

Calls Screen lets Controller Users place car calls and hall calls



3.2.2. Logs Screen

Logs Screen lets user see last 100 events/Faults that have occurred on the controller to troubleshoot the elevator controller. Shows Faults/Events/TimeStamp and ability to Filter by Faults/Events



ESI ELEVATOR SYSTEMS

Logs 01/01/00 | 05:58:28 ⓘ

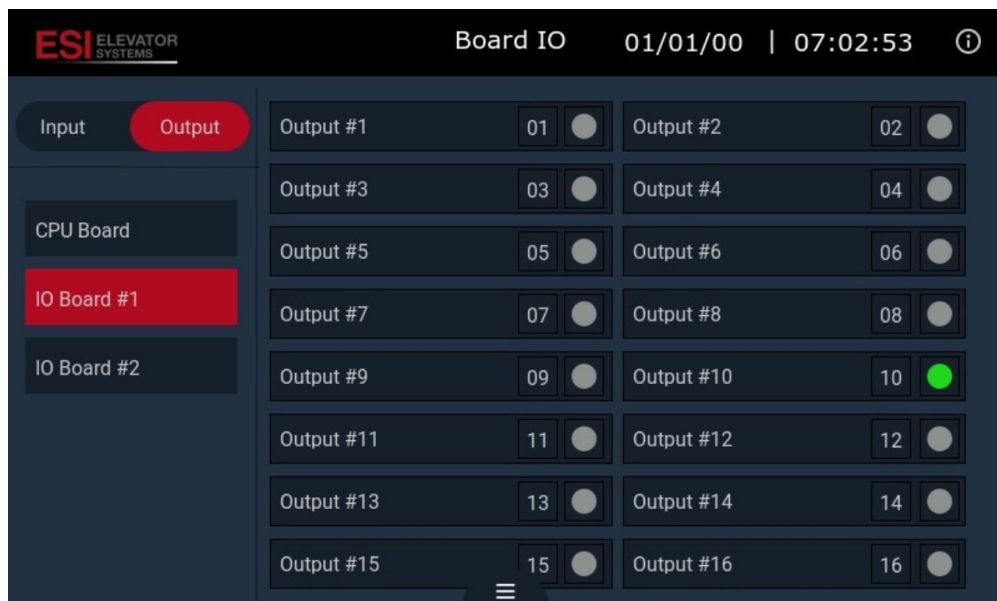
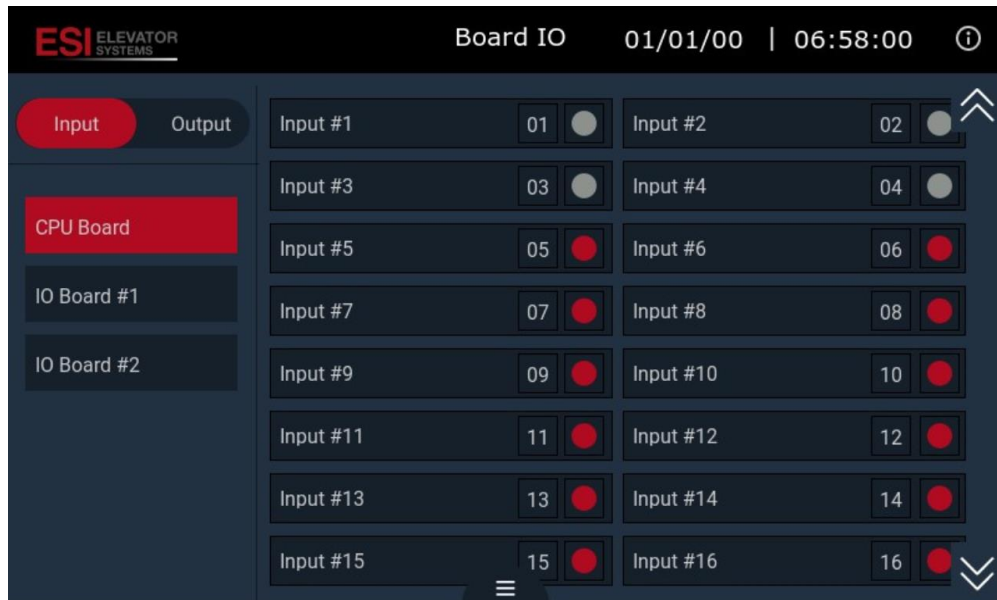
Filter by Events and Faults

Faults/Special Events	Time Stamp	Description
⏻ Power On	1/1/0 05:57:50	
⏻ BackUP Power	1/1/0 05:07:26	
⏻ Power On	1/1/0 05:07:11	
⏻ BackUP Power	1/1/0 05:01:30	
⏻ Power On	1/1/0 05:01:15	
⏻ SAF Opened	1/1/0 05:01:15	

3.2.3. I/O Screen

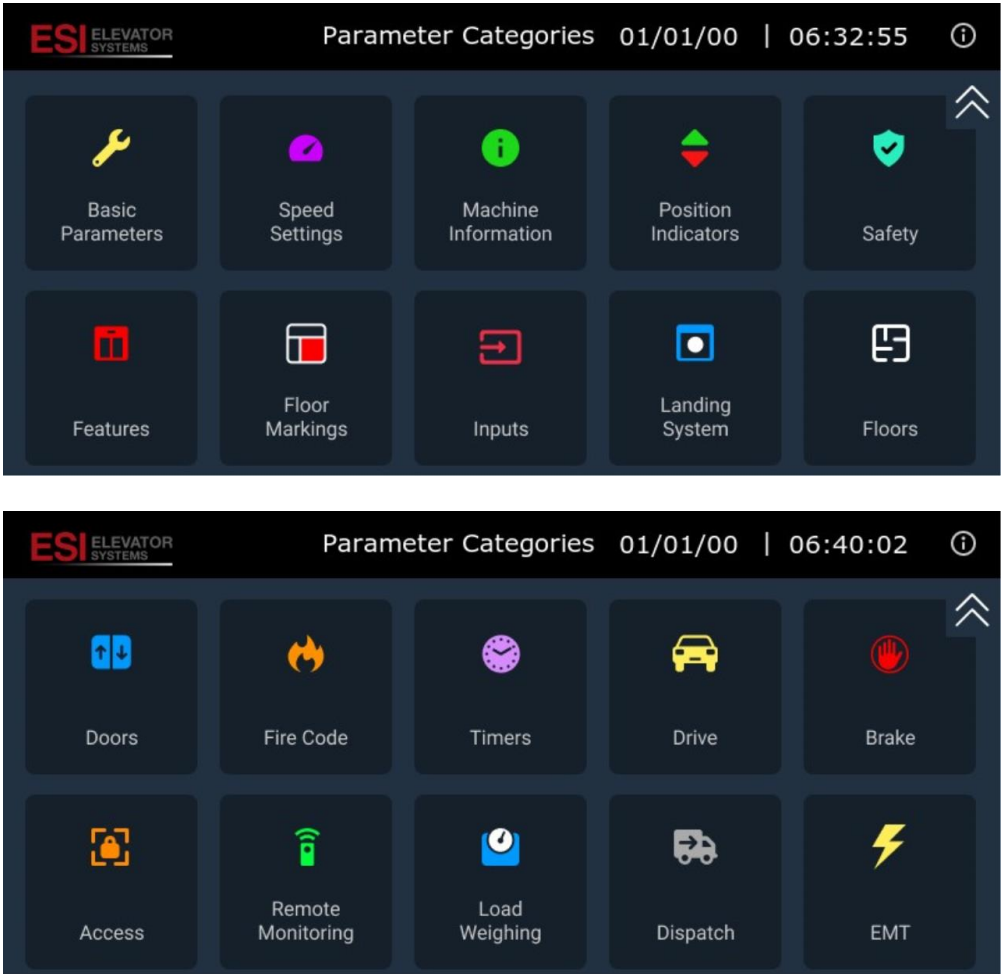
I/O Screen indicates the status of every input/output for the following boards

- ES2-CPU
- ES-CT-COP
- ES-TOC-BOX
- ES-IO-24VDC-BD (IF REQUIRED)



3.2.4. Parameters Screen

Parameter Screens various sub screens to setup Parameters for the the controller. Each ESI Controller is factory programmed to meet the customer jobs but may require change from time to time based on changing job requirements



3.2.4.1. Basic Parameters

Basic Parameters to setup following parameters for the the controller. Each ESI Controller is factory programmed to meet the customer jobs but may require change from time to time based on changing job requirements

Basic Parameters			
Parameter Name	Function	Values/Options	Default Value
Top Floor	Define/Identify the Top Floor Number for the Job	Job Based Value	2
Bottom Floor	Define/Identify the Bottom Floor Number for the Job	Job Based Value	1
Selector Type	Selector Type to be used for the job	1: APS 2: APS-ESI-TEST	APS
Controller Type	Select Controller Type	1: Hydraulic 2: Traction	Job BASED
Door Type	Door Type to be used on the Job	1: Master Doors 2: Car Doors 3: Manual Doors and Gates 4: Power Doors and Gates	1
Is Group	If the Car is Part of Duplex/Group Setup or Not	Yes or No	0
Car#	If Multiple Cars, enter the Car#	Job Based Value	1
# of IO Cards	Number of ES-IO-24VDC-BD	Job Based Value	2
I/O Type	Configure if the Car is Full Serial (Car and Hall), Car Serial Only and Hall Wiring is Discrete or Fully Discrete	Discrete Serial Car Serial Car+Hall	Serial Car
Operation	Elevator Operation Type	Selective Collective Down Collective Collective Single Auto Push Button	Selective Collective
BOT Access LimDist	Set the Bottom Distance for Access	(Value Between 24-360)	150
TOP Access LimDist	Set the Top Distance for Access	(Value Between 24-360)	120

3.2.4.2. Hydraulic Parameters

Hydraulic Parameters to setup parameters for the hydraulic hardware interaction with the controller. Each ESI Controller is factory programmed to meet the customer jobs but may require change from time to time based on changing job requirements

Basic Parameters			
Parameter Name	Function	Values/Options	Default Value
CX out on UPS-lower	Turns off the door close signal while UPS lowering is active to save UPS power.	0 - Do not override CX 1 - Override CX	0
Low Oil Time per flr	Time used to determine low oil. If the car does not attain the next floor in less time than this parameter, Low Oil will be flagged.	30 - 300 Seconds	45 Seconds
JackSync Dewell Time	Amount of time to allow the jacks to fully sync at the bottom of the Jack Sync operation.	10 - 600 Seconds	10 Seconds
JackSync Hour	Hour of the day when Jack Sync should run.	0 - 24	0
Jacksync Day	Day of the week when Jack Sync should run. Set to 8 if Jack Sync to run every day.	0 - 8	0
Viscosity RunTime	Determines how long the pump should run to cycle the hydraulic oil if the car has not run for time specified by Viscosity ON Delay parameter.	1 - 30 minutes	3 minutes
Viscosity ON Delay	Determines how long the car should be inactive before running the pump to cycle the hydraulic oil.	0 - 9999 minutes	0 minutes

3.2.4.3. Speed Parameters

Speed Parameters to setup following parameters for the controller. Each ESI Controller is factory programmed to meet the customer jobs but may require change from time to time based on changing job requirements

Speed Parameters			
Parameter Name	Function	Values/Options	Default Value
S/D #1 Distance OFR	Slow Down Distance One Floor Run (Values between 4-140 (inches))	If speed is less than 150, then S/D #1 Distance OFR = (Speed X 0.24) +4 • Else if speed is greater than 150 and less than 250 then S/D #1 Distance OFR = 42 • Else if speed is greater than 250 then S/D #1 Distance OFR = 46	42
Contract Speed	Contract Speed of the Car/Job	Job Based Value	200

3.2.4.4. Position Indicators

Position Indicator Parameters to setup following parameters for the controller. Each ESI Controller is factory programmed to meet the customer jobs but may require change from time to time based on changing job requirements

Position Indicator Parameters			
Parameter Name	Function	Values/Options	Default Value
Position Indicator Choice	Choose which Position Indicators will be used	NONE: No Position Indicators ESI: Using ESI DPI-XXX CE: CE position Indicators when controller is built with ES-CE-BD	None
Double Gong on Down Call	Enables the down gong double option.	Disable - 0 Enable - 1	Disable
Down Gong/Up Gong Options	Parameter to setup trigger for Down Gong/Up Gong (0: Down Gong/Up Gong to trigger when Door Open Limits are reached 1: When Car Arrives in Door Zone, 2: When Car is in slow down zone)	0-2	0
Position Indicator Messages and Buzzer Setup Option	Only to be used with ESI PI. Activates various Buzzers/Messages on ESI PI's. Buzzers on CAR PI only and Messages on both Car/Hall PI's: (0: No Buzzer, 1: Whenever the car passes Door Zone , 2: Door Delay: When Door is held for long time, 3: Option 1 and 2 are activated, 4: Activate Various Car Status Messages for 2 Digit PI, 5: Door Zone Plus Messaging on 2 Digit PI, 6: Option 4 + Option 2, 7: Option 1, 2, 4, 12: Messaging on Single Digit PI, 13: Option 12 + 1, 14: Option 12 + 2, 15: Option 12 + 3	0-15	3
Car Buzzer Setup Options	Parameter to Setup External Car Buzzer from Output Terminal #61(1: Whenever the car passes Door Zone , 2: Door Delay: When Door is held for long time, 3: Option 1 and 2 are activated)	1-3	3
PI or Car Buzzer Dwell Time	Parameter to Setup PI Buzzer or External Buzzer Dwell Time (Duration: Max 1 Second)	1-10 tenth of Seconds	5
Binary Position Indicator Outputs	Parameter to be activated only if CE or ESI Digitals Not Chosen. Need an IO	0-1	0

3.2.4.5. Safety Parameters

Various Safety Parameters for safety elements for the elevator and the controller. Each ESI Controller is factory programmed to meet the customer jobs but may require change from time to time based on changing job requirements

Safety Parameters			
Parameter Name	Function	Values/Options	Default Value
Motor Thermal Overload	Enable the Motor Thermal Overload input	Enabled/Disabled	Disabled
Traction Loss Per Floor	The Traction loss event will be logged if the car does not reach the next landing before the timer expires.	3 – 99 seconds	99
Enable/Disable Door Lock Monitoring	Enables door lock monitoring	0-Disable 1-Enable DOL, GS, DLK Sequence Check	Enable DOL, GS, DLK Sequence Check
DL/GS/DLK Fail Count	Sets the door close/gate switch/door lock fail count before controller generates an error	3 –99	4
Door Open Fail Count	Sets the door open fail count	3-99	99
OVFR Speed Trip Speed	Maximum Car Speed	50-999	999

3.2.4.6. Security Parameters

Various Security Parameters to be setup

Security Parameters			
Parameter Name	Function	Values and Options	Default Value
Key Switch In Hall	Key Switches in Car and which floors they cover. Preconfigured options provided by ES2. If key switches are on custom floors not indicated in the list, ES2 will be shipped with a SPECIAL SOFTWARE	None Lobby Floor Only Basement Only	None
Key Switch in Car	Key Switches in Car and which floors they cover. Preconfigured options provided by ES2. If key switches are on custom floors not indicated in the list, ES2 will be shipped with a SPECIAL SOFTWARE	None Basement All Except Lobby All Floors Second Landing Only Top and Bottom 1 and 2 Only Top Only 1,2 and 3 Only Top 3 Only	None
Card Reader Bypass Enable	Enable card reader bypass input	Enabled/Disabled	Disabled
Card Reader Bypass Input#	Assign Input for Card Reader Bypass Enable Input	0-99	0
Car to Lobby Key Enable	Enable a Key/Button to get the car to lobby	Enabled/Disabled	Disabled
Car to Lobby Key Input#	Assign input to Car to Lobby Key Enable Feature	0-99	0

3.2.4.7. Features Parameters

Various Feature Parameters to turn on Default Features provided by ES2. Each ESI Controller is factory programmed to meet the customer jobs but may require change from time to time based on changing job requirements

Controller Features Parameters			
Parameter Name	Function	Values/Options	Default Value
Attendant Enable	Enable the Attendant Feature	Enable/Disable	Disable
Anti-Nuisance Settings	Number of Trips/Floors traveled without somebody leaving or entering the elevators will trigger Anti-nuisance Feature. This feature will cancel all car calls after the number that has been setup on the controller. 0 Means feature is disabled	0-10	0
S-Button Enable	S-Button Enable. What do different values from 0-196 do	0-1	0
Sabbath Enable	Enable the Sabbath Input	Enable/Disable	Disabled
Sabbath Input#	Assign Input for Sabbath Service	0-99	0
Sabbath Output#	Assign Output for Sabbath Service	0-99	0
Quick Close Input#	Input to assign for Quick Close of Doors	0-99	0
Pit Flood Park Floor#	Floor where the car will be parked in case of flooding in pit	2-120 (job based)	2
Pit Flood Enable	Enable/Disable Pit Flood feature	Enabled/Disabled	Disabled
Pit Flood Input#	Assign input for Pit Flood Feature	0-99	0
Out of Service Enable	Enable/Disable Out of Service Input via key/button	Enabled/Disabled	Disabled
Out of Service Input#	Input for Out of Service Feature	0-99	0
Out of Service Light Output Enable	Enable/Disable Out of Service Output for a light/fixture	Enabled/Disabled	Disabled
Out of Service Light Output#	Assign Output for Out of Service Light Output	0-99	0
Car Light Fan Enable	Car Light Fan to be turned off based on no activity Feature	Enable/Disable	Disabled
Car Light Fan Output#	Car Light Fan Feature Output	0-99	0

3.2.4.7.1. Attendant Feature Setup

Various Attendant Parameters to turn on and setup Attendant Service. Each ESI Controller is factory programmed to meet the customer jobs but may require change from time to time based on changing job requirements

Attendant Features			
Parameter Name	Function	Values/Options	Default Values
Attendant Enable	Enable the Attendant Feature	Enable/Disable	Disabled
Attendant Buzzer Output#	Output for Attendant Buzzer to let the attendant know about service being required	0-99	0
Attendant Up Light Output#	Output for UP direction light when car is on attendant service	0-99	0
Attendant Down Light Output#	Output for UP direction light when car is on attendant service	0-99	0
Attendant Key Switch Input#	Input for Attendant Key Switch to turn on Attendant Service	0-99	0
Attendant Down Button Input#	Input for Running the car DOWN when on Attendant Service	0-99	0
Attendant Up Button Input#	Input for Running the car UP when on Attendant Service	0-99	0
Attendant Hall ByPass Key Switch Input#	Input for Hall ByPass Key Switch	0-99	0

3.2.4.7.2. Emergency Power Feature

Various Feature Parameters to turn on Default Features provided by ES2. Each ESI Controller is factory programmed to meet the customer jobs but may require change from time to time based on changing job requirements

Emergency Power Features			
Parameter Name	Function	Values/Options	Default Value
Emergency Power Enable	Enable Emergency Power Operations to run the elevator	Enabled/Disabled	Disabled
Emergency Power Input#	Assign Input for Car for Emergency Power	0-99	0
Emergency Power Car Select Input#	Assign Input for assigning a particular car to operate on Emergency Power in duplex/Group	0-99	0
Emergency Power Transfer Switch Input#	Pre-Transfer Switch Input# . : Emergency Power to Grid Power	0-99	0
Emergency Power Parking Floor	Setup Parking Floor where elevator will park when on emergency power	1-48	1

3.2.4.8. Floor Markings Parameters

Floor Markings Parameter Screen will let you put a Text/Numeric Value for Each of the Floors

ES2 controller supports up to 120 floors and each floor can be individually marked/named.

3.2.4.9. Landing System Parameters

Landing System Parameters lets user define parameters for the ELGO APS. These parameters should not be changed without consulting with ESI engineering support.

Landing System Parameters			
Parameter Name	Function	Values/Options	Default Value
High Level Speed Enable	Car Landing Behavior based on speed profiles: ESI Safety Parameter	0-7	0
Level Magnet Length	Legacy TS89 Parameters	4-12	6
Learn Floor Heights	Legacy TS89 Parameters	0-2	0
Re leveling Threshold	Distance defined in MM at which car will start to relevel when in stationary position (if car moves more than 5mm while stationary, it will attempt to relevel)	0-50	5
Low Speed Leveling threshold	Distance defined in MM at which car will send a zero speed command when car is approaching a floor at a slow speed (normally below 5 FPM)	0-50	5
High Speed Leveling threshold	Distance defined in MM at which car will send a zero speed command when car is approaching a floor at a high speed (normally above 5 FPM)	0-50	5
Leveling Hysteresis	Distance defined in mm at which the car is determined to be leveled at a landing. 3mm +/- which is default is about 8th of an inch from position defined in Floor Table	0-15	3
Learn Floor Height	Used to start the floor learn procedure. This process is only applicable for installations with TS-89 selectors and motor encoders. Consult the Quick Start Guide for the floor height learning process for installations with APS.	Enable/Disable	Disable

3.2.4.10. Floors Parameters

Floor Parameters lets user define parameters for the floor options in the ES2 controller.

Floor Parameters			
Parameter Name	Function	Values/Options	Default Value
Lobby Floor	Setup which floor will be the lobby floor	1-120	1
Parking Floor # 1	Parking Zone #1 should be same for all cars in the group	0-120	0
Parking Floor # 2	Parking Zone #2 should be same for all cars in the group	0-120	0
Parking Floor # 3	Parking Zone #3 should be same for all cars in the group	0-120	0
Parking Floor # 4	Parking Zone #4 should be same for all cars in the group	0-120	0
Parking Floor # 5	Parking Zone #5 should be same for all cars in the group	0-120	0
Parking Floor # 6	Parking Zone #6 should be same for all cars in the group	0-120	0
Parking Floor # 7	Parking Zone #7 should be same for all cars in the group	0-120	0
Parking Floor # 8	Parking Zone #8 should be same for all cars in the group	0-120	0

3.2.4.11. Door Parameters

Various Door Parameters to integrated Door Equipment correctly and safely with ES2. Each ESI Controller is factory programmed to meet the customer jobs but may require change from time to time based on changing job requirements

Door Parameters			
Parameter Name	Function	Values/Options	Default Values
Door Nudging Option	Enables the Door Nudging Option (1-3).	1 : will let the doors stay open as long as input 28E is ON and not sound the buzzer. 2 : will let the doors stay open as long as input 28E is ON and sound the buzzer. 3 : will let the doors nudge close , and sound the buzzer. After the time set in Timer Parameters screen (EDGE TIME OUT): Parameter #7 expires the buzzer will sound. Then the door close timer will expire and the door will nudge close with both CX and NR energized.	3
OX ON after OL:N/C NR (AT-400 Door Operation)	For AT-400 door operator. Open output will stay on after open limit falls out. NR, door nudging output, drops to put door into nudging mode	0-3	0
Power Doors Close when out of Door Zone	Power door close signal when out of the door zone. Required for some operators so the doors don't start to open.	Enabled/Disabled	Disabled
Door Options When Car Parked	Door Behavior when Car is Parked on the Parking Floor	0: Car Park with Door Closed, 1: Car Park with Door Open at Lobby Floor 2: Car Park with Door Open at Any Floor	0
Door Hold	Door Hold Enable or Disable	Enabled/Disabled	Disabled
Door Hold Input Front	Input Assigned for Door Hold Button Input Front Opening	0-99	0
Door Hold Input Rear	Input Assigned for Door Hold Button Input Rear Opening	0-99	0

Enable Door Open and Close while on Inspection	Enable or Disable Door Open and Close while on Inspection	Enabled/Disabled	0
F/R Opening 1-16	Setup Default	1-1	Front
F/R Opening 17-32			Front
F/R Opening 33-48			Front
F/R Opening 49-64			Front
F/R Opening 65-80			Front
F/R Opening 81-96			Front
F/R Opening 97-112			Front
F/R Opening 113-120			Front

3.2.4.11.1. Edit Door Openings

Touching/Clicking on the Edit Door Openings Menu (top right corner for Door Parameters) will let the user enable Front/Rear Openings for a job

3.2.4.12. Fire Code

Fire Code Menu is used to define various parameters based on Fire Code applicable to the region where the controller is being installed.

Fire Code Parameters			
Parameter Name	Function	Values/Options	Default Values
Fire Code Jurisdiction	Chose the jurisdiction for the FCF code	ANSI, NYC, Chicago, ANSI2000, MASS 2000	BASED ON JOB
Prime FCF Floor#	Setup which floor will act as Prime Floor In case of Fire	1-120	1
Alternate FCF Floor#	Setup which floor will act as Alternate Floor In case of Fire	1-120	2
Nudging on FCF 1	Allow Nudging on Prime Floor	Enabled/Disabled	Enabled
Prime FCF Door	Specify the Door opening for Prime FCF Floor	None, Front, Rear	Front
Alt FCF Door	Specify the Door opening for Alternate FCF Floor	None, Front, Rear	Front
Fire Buzzer Options	Parameter to setup Fire Buzzer	0:Only Fire Buzzer 1: Fire Buzzer and Door Delay Buzzer	0

3.2.4.13. Timers

Timer Menu is used to define various timer based parameters in ES2. All values are based on seconds, Except the parameters marked in blue cells

Timer Parameters			
Parameter Name	Function	Values/Options	Default Values
Max Time for Door Open/Close	Amount of time the controller will wait for the door to make a full open or close	15-90	15
Car Call Door Time	Time for doors to close after car call has been input	2-30	6
Hall Call Door Time	Time for doors to close after hall call has been input	2-30	10
Lobby Door Time	Time for doors to close while on the lobby Floor	2-30	10
Re-Open Door Time	Amount of Time in seconds that door will remain open if it is forced to reopen due to door edge being broken (if someone enters or leaves the elevator while doors are closing)	2-30	3
Edge Time Out	Sets the Door Edge Time out after which doors will close	10-900	25
Posiiton Indicator Shut Down Time	The amount of time that position indicators will on after after the car is idle. If position indicators are desired to be on all of the time, set this parameter to 0	0-900	180
Timer for car to switch from Attendant/Independent to Fire Phase	Amount of time in seconds after which the car will go into Fire Phase 1 if it is running in Independent/Attendant Mode.	1-60	15
Stuck Hall Button Time	Sets a timer used to determine if a Hall button is stuck	10-600	30
Parking Delay Time	Sets the delay before going to park.	2-900	30
Primary Parking Floor Refill Time	Another car will be called to park in the Emergency parking location when the Park Floor 1 refill time expires.	2-900	300
Alternate Parking Floor Refill Time	Another car will be called to park in the secondary parking location when the Park Floor 2 refill time expires.	2-900	300
Motor Thermal Overload Fault Clear Timer	Sets the time to clear the Motor TOL(Thermal Overload) fault after the TOL input falls.	10-1800	10

Door Hold Door Time	Sets the time the door remains open after door hold has been pressed. Also used for how long the door remains open while operating in Sabbath mode	2-600	45
Timer for Down/Up Output Delay on CPU	Time Measured in Tenth of Seconds to delay dropping the Up and Down Outputs on the CPU	3-20	3
Light and Fan Delay Timer	Sets the cab light delay on time	10-900	60
Car Call Button Timer	Time measured in tenth of a second for the duration for which the car Car Call Button has to be held to register a car call.	0-6	0
Maximum Time after which Car will Timeout for Running	Maximum Time after which Car will Timeout for Running	30-9999	60

3.2.4.14. Soft Start Parameters

Drive Menu is used to define various parameters to fine tune the Softstart on ES2 to the ES2 Controller

Drive Parameters			
Parameter Name	Function	Values/Options	Default Value
Delay High Speed Run in tenth of Seconds	Time Measured in Tenth of Seconds to delay the High Speed Run	0-20 tenths of a second	0

3.2.4.15. Remote Monitoring Parameters

If In building Remote Monitoring (EMIS-100) is purchased as an option for the controller, this menu would be used for setting/configuring the EMIS-100 features.

Remote Monitoring (EMIS-100) Parameters			
Parameter Name	Function	Values/Options	Default Values
EMIS REM Control Enable	Enable EMIS to do Hall Calls, Car Calls, Update Parameters, Remote Independent Service, Remote Car to Lobby	Enabled/Disabled	Disabled
Enable EMIS to lock Floors for Hall and Car Calls	Enable EMIS to lock Floors for Hall and Car Calls	Enabled/Disabled	Disabled
EMIS SEC Deny Enable	Enable EMIS to Disable certain Floors	Enabled/Disabled	Disabled
EMIS Car To Lobby Time Off	Setup time for how long the car will stay in Car To Lobby Mode, once parked at the lobby floor	10-999	30

3.2.4.16. Load Weighing

Load Weighing Menu is used to define various parameters to configure ES2 controller setting for the Load Weighing Device provided with the controller.

Load Weighing Parameters			
Parameter Name	Function	Values/Options	Default Values
Input# For Load Weighing	Configure Load Weighing Input on the controller	0-99	0

3.2.4.17. Group/Duplex Dispatching Parameters

Parameter for Group/Duplex jobs

Dispatch Parameters			
Parameter Name	Function	Values/Options	Default Values
Car Reassignment Penalty	Group Job Dispatching Parameter : To be used only with consultation with ESI	0-120	10
Pref Lobby DN call Car	Preferred car to assign down calls from the lobby.	0-8	0
Pref Lobby UP call Car	Preferred car to assign UP calls from the lobby.	0-8	0
Lobby Car Up Penalty	Group Dispatch Parameters for Calculating ETA for a car. This Parameter is used to calculate total ETA. This setting not recommended to be changed	0-120	10
Lobby Car Down Penalty	Group Dispatch Parameters for Calculating ETA for a car. This Parameter is used to calculate total ETA. This setting not recommended to be changed	0-120	0
Brake to Brake Time (tsec)	Group Dispatch Parameters for Calculating ETA for a car. This Parameter uses time between Brake Opening and Closing and adds to total ETA. This setting not recommended to be changed	1-250	80
High Speed Floor to Floor Time (tsec)	Group Dispatch Parameters for Calculating ETA for a car. This Parameter uses time required for High Speed Floor to Floor Runs and adds to total ETA. This setting not recommended to be changed	1-250	30
Door Open Close Time (tsec)	Group Dispatch Parameters for Calculating ETA for a car. This Parameter uses time required for doors opening and closing and adds to total ETA. This setting not recommended to be changed	1-250	30
Average Door Dwell Time (tsec)	Group Dispatch Parameters for Calculating ETA for a car. This Parameter uses time required for doors dwell time and adds to total ETA. This setting not recommended to be changed	1-250	340

3.2.4.18. EMT Parameters

Parameters to setup EMT/Code Blue Features provided by ES2

EMT/Code Blue Features			
Parameter Name	Function	Values/Options	Default Value
EMT Enable	Enables EMT Function for MA only	Enable/Disable	Disabled
EMT Floor	Setup EMT Floor for MA Only	1-120	1
EMT Door (FUTURE)	Setup EMT Door (for future: DO NOT USE)	0-50	0
EMT Hall Key Switch Input	Assign Input for the EMT or CODE BLUE Hall Key Switch	0-99	0
EMT Car Key Switch Input	Assign Input for the EMT or CODE BLUE Car Key Switch	0-99	0
EMT Buzzer Output	Assign Output for the EMTor CODE BLUE Buzzer	0-99	0
EMT Light Output	Assign EMT Light Output	0-99	0
EMT Delay OUT Time	Time for EMT mode to clear if the car has not moved while in EMT mode.	10-300	30
Code Blue Enable	Disable/Enable Code Blue	Enable/Disable	Disabled
Code Blue Call 1-32 Input	Assign Code Blue Calls for Floors 1-32, one for each floor	0-99	0

4. Elevator Modes

4.1. Construction Mode

Construction Mode

Assuming all the necessary steps have been taken as defined in Initial Power Turn On/ES2 Ground Safety, ES2 can now be put to construction mode:-

1. Following Terminals need to be Jumped for car to run in Construction Mode:-

Terminal #'s	Function
#DCB(#34) - #DCT(#35)	Door Contacts (Manual/Swing Doors only), Input [HDC]
#DLT(#44) - #DLB(#43)	Door Locks, Input [DL] and Relay "DL"
#37 to #39	Bottom Normal Limit
#38 to #39	Top Normal Limit
#GOV1(#32) - #GOV2(#32A)	Governor Switch
#TFL1- #TFL2	Top Final Limit
#BFL1 - #BFL2	Bottom Final Limit
#PSW1 - #PSW2	Pit Safety Switch
#CSC1(#40) - #CSC2(#41)	Car Safety Circuit - Escape Hatch, Safety Sw, TOC Stop Sw (input [SAF] ON)
#CSC2(#41) - #ICGS(#42)	InCar Stop Switch (input [ICSS] ON)
#ICGS(#42) - #GS(#45)	Car Door Contact (input [GS] ON and relay "GS" ON)

2. If job has walkthrough doors, jump the following terminals

Terminal #'s	Function
#DCBR(#34R) - #DCTR(#35R)	Rear Door Contacts (Manual/Swing Doors Only), Input [RHDC]
#DLTR(#44R) - #DLBR(#43R)	Rear Door Locks, Input [RDL] and Relay "RDL"
#ICGS(#42) - #RGS(#45R)	Rear Car Door Contact (input [RGS] ON and relay "RGS" ON)

3. If running construction mode with a Temporary Run Box, connect the Run Box to the following Terminals

#TI , #ID , #IU

4.2. Inspection Mode

Inspection Mode

Post Construction Mode, users are recommended to move to the next stage of Inspection Mode.

ESI Sets up the controller for Inspection at 50FPM.

Before going into Inspection Mode, all connections should be made between ES2-CPU and ES-CT-COP and ES-TOC-BOX. These wiring connections should be based on the Job Print that has been provided for that particular job.

Inspection has two standard modes:-

- **Controller Inspection**
- **Top of Car Inspection.**

4.2.1. Controller Inspection

Controller Inspection

Controller Inspection can be activated from ES-RB-BD

Turning the Toggle Switch to INSP mode on the ES-RB-BD will engage the Controller Inspection Mode.

With the Top of Car Inspection switch closed (Top of Car Inspection always has the highest priority) and the controller inspection switch in the INSP position, the controller can be run via the controller inspection buttons. You may run the car by pressing Enable and either Up or Down. The car will run on inspection speed up or down. The LCD will display "Up Slow Speed" or "Dn Slow Speed". The car will move up or down by energizing the IU or ID relay and its corresponding input.

Relays that must be energized: RPR and CT.

Relays that must be de-energized: ACC, ACX, I, and IX.

Inputs [ACC] should be OFF

Inputs that must be activated: [TM], [GOV], [SAF], [ICSS], [TCI] & [ICI].



4.2.2. Top of Car Inspection

Top of Car Inspection

Top of Car Inspection gets the highest priority and overrides the Controller Inspection or Hoistway Access Inspection.

If running construction mode with an ES-TOC-INSPECTION-Box, connect the Inspection Box to the following Terminals

- #TI
- #ID
- #IU

Relays that must be energized: RPR and CT

Relays that must be de-energized: ACC, ACX, I, IX, IC1, and IC2.

Input [TCI] should be off.

Inputs that must be activated: [TM], [GOV], [SAF], and [ICSS].

In order to move the car on Top of Car Inspection, constant pressure must be applied to the buttons. The buttons will allow voltage to flow from terminals #TI to #IU or #TI to #ID. The car will move up and down by energizing the IU or ID relay and its corresponding input.



CAUTION: Ensure that all personnel working on the elevator understand that the car will be moving during this procedure in both Up run and the Down run modes

Top of Car Inspection UP RUN

Pressing the Top of Car UP RUN and Safety button (#TI to #IU) will send a signal to the controller (via ES2-CPU-input 7-[IU]) that up motion is requested. Relay IU will pick, feed voltage to ES2-CPU-input 14-[DRV] via a N/Open contact and through N/Open "RPR" contacts to run circuit.

The CPU will turn ON following outputs. ES2-CPU-Output 20 [URP] energizing relay U. ES2-CPU-Output 21 [RP] energizing relay R. ES2-CPU-Output 10 [PP] energizing relay "PX". ES2-TOC-Output 10 [DCS] which will force the doors closed ("if applicable"). The pump will engage and the car will run up at inspection speed. The CPU display will read 'Up Slow Speed'. Releasing the switch will stop the car immediately.

Top of Car Inspection DOWN RUN

Pressing the Top of Car DOWN RUN and Safety button (#TI to #ID) will send a signal to the controller (via ES2-CPU-input 6-[ID]) that down motion is requested. Relay ID will pick, feed voltage to ES2-CPU-input 14-[DRV] via a N/Open contact and through N/Open "RPR" contacts to run circuit.

The CPU will turn ON following outputs. ES2-CPU-Output 11 [DRP] energizing relay D. ES2-CPU-Output 10 [PP] energizing relay "PX". ES2-TOC-Output 10 [DCS] which will force the doors closed ("if applicable"). The valves will engage and the car will run down at inspection speed. The CPU display will read 'Down Slow Speed'. Releasing the switch will stop the car immediately.

4.3. Test Mode

Test Mode

Set controller inspection switch to "TEST" on the ES-RB-BD.



Place the "TEST MODE" switch into the "TEST" position in order to run the car without Hall Calls enabled and without automatic door opening. The screen will read ":TEST Mode". Otherwise it should read ":Normal"

4.4. Hoistway Access Mode

Hoistway Access

The hoistway access mode is available only at the terminal floors (Top and Bottom) to moves the car to get access to the pit or the top of the hoistway. In order to activate Hoistway Access a key switch is used to enable Top or Bottom Access on the car. The car will only move if the doors are open.

In order to move the car on Access, constant pressure must be applied to the key switches. The key switches will allow voltage to flow from terminals #AC to either the ID relay or the IU relay via an ACC N/Open contact. Two other relays associated with Access are TAC and BAC. The TAC is energized by the Top Floor Access Key Switch, and the BAC is energized by the Bottom Floor Access Key Switch. The car will move up or down by energizing the IU or ID relay and it's corresponding input.

In addition, Bottom and Top Access Distance can be setup in basic parameters as listed here.

15	BOT Access LimDist	Set the Bottom Distance for Access	(Value Between 24-360)
16	TOP Access LimDist	Set the Top Distance for Access	(Value Between 24-360)

The GS N/Open contact is bypassed via "ACC" and either "BAC" or "TAC" N/Open contacts. The Bottom Hatch Door is bypassed via "ACX" and "BAC" N/Open contacts. The Top Hatch Door is bypassed via "ACX" and "TAC" N/Open contacts.

Relays that must be energized: RPR, CT, ACC and ACX.

Relays that must be de-energized: I, IX, IC1, and IC2.

Input [ICI] should be OFF.

Inputs that must be activated: [TM], [GOV], [SAF], [ICSS], [TCI], and [ACC].



CAUTION: Ensure that all personnel working on the elevator understand that the car will be moving during this procedure in both Up run and Down run modes

4.5. Automatic Mode

Set controller inspection switch to "AUTO" on the ES-RB-BD

In addition top-of-car inspection and in-car inspection switches should be closed.



When the controller is in automatic mode, the ES2 Screen will read "Automatic". If the word 'Automatic' is not displaying, the elevator is not in automatic mode. Automatic is the normal mode of operation for the elevator when it is in service.

AUTOMATIC UP RUN: Following is the sequence of Inputs/Outputs that trigger during an Automatic UP RUN

With the car level at the bottom terminal floor (First Floor), ES2-CPU-output 12 [DZ] should be ON. Pressing 2nd floor car button will activate ES2-COP-input [2C] and ES2-COP-output [2A] will acknowledge the call. If the doors are not closed, they will wait for the door close timer to expire. The hatch doors will close energizing relay DL and ES2-CPU-input 12 [DL]. The car door contacts will close energizing relay GS and ES2-CPU input 11 [GS]. The car will start and begin to accelerate to high speed. The CPU will slow the car down by de-energizing ES2-CPU-output 6 [HSP]. The point of slow down will be determined via the Absolute positioning system. The car will decelerate into the floor.

AUTOMATIC DOWN RUN

This is the same as above. However in the down direction, the CPU will slow the car down by de-energizing ES2-CPU-output 6 [HSP]. The point of slow down will be determined via the Absolute positioning system. The car will decelerate into the floor.

DETAILED RUNNING RELAY SEQUENCE

N/Open contacts from either relays D or U will energize U,UX, UT, R and PX (for up run) and D, DX and PX (for down run).

4.6. Independent Service

INDEPENDENT SERVICE

Independent service is initiated by the key switch wired into [50]/[IND] on the ECT-COP. While on Independent Service all hall calls are disabled and the car responds to only car calls. The doors remain open until a car call is registered. Continuous pressure of a car call button or the door close button will close the doors. If the doors reach full close, the car will run to the selected floor. Releasing the button prior to running causes the doors to reopen and remain open.

4.7. Sabbath Operation

Sabbath Operation

Sabbath can be turned on as a feature using a Key Switch that is using an Input designated by either ESI or the user.

In Sabbath operation, the car goes to each floor. The door will remain based on Door Hold Door Time Input that can be setup in the Door Menu Screen.

The car will exit Sabbath operation once the key switch is turned off.

Sabbath can be setup using the Feature Setup Menu Screen.

4.8. Attendant Operation

Various Attendant Parameters to turn on and setup Attendant Service. Each ESI Controller is factory programmed to meet the customer jobs but may require change from time to time based on changing job requirements

Attendant Features			
Parameter Name	Function	Values/Options	Default Values
Attendant Enable	Enable the Attendant Feature	Enable/Disable	Disabled
Attendant Buzzer Output#	Output for Attendant Buzzer to let the attendant know about service being required	0-99	0
Attendant Up Light Output#	Output for UP direction light when car is on attendant service	0-99	0
Attendant Down Light Output#	Output for UP direction light when car is on attendant service	0-99	0
Attendant Key Switch Input#	Input for Attendant Key Switch to turn on Attendant Service	0-99	0
Attendant Down Button Input#	Input for Running the car DOWN when on Attendant Service	0-99	0
Attendant Up Button Input#	Input for Running the car UP when on Attendant Service	0-99	0
Attendant Hall ByPass Key Switch Input#	Input for Hall ByPass Key Switch	0-99	0

5. Emergency Modes

5.1. Earthquake Operation

EarthQuake Operation

When earthquake feature is enabled, the controller will land at the nearest floor and open the doors for passengers to exit. The doors will remain open until the earthquake status on the controller is reset.

Earthquake Reset Operation

After inputs [CWE] & [SEM] are off, put car on controller inspection.
On the Setup and Utilities screen, press the Earthquake Reset Button.

5.2. Fire Phase 1/2

Fire Emergency Setup and Operation

Fire Phase 1 and Phase 2 is used to setup the behavior of the Elevator/Elevators when a fire situation is detected.

1. **Fire Phase 1:** When a smoke/fire detector/sensor is detected an input into the controller turns on Fire Phase 1 automatically. Alternatively, it can be turned on manually using a key switch. ES2 will move the car(s) to the primary Fire Phase 1 Floor/Door as setup in the Fire Parameter Settings. In case, the fire is detected on the primary landing floor, ES2 will move car to the Alternate Fire Floor/Door, as defined in Fire Parameter Settings. In both cases, the doors will remain open on the landing floors.
2. **Fire Phase 2:** Car can be put on Fire Phase 2 ONLY manually with a key switch. In Fire Phase 2, Elevator is under full control of fire fighters and/or emergency crews to control the operations of the elevator from inside the car.

5.3. Emergency Power

Various Feature Parameters to turn on Default Features provided by ES2. Each ESI Controller is factory programmed to meet the customer jobs but may require change from time to time based on changing job requirements

Emergency Power Features			
Parameter Name	Function	Values/Options	Default Value
Emergency Power Enable	Enable Emergency Power Operations to run the elevator	Enabled/Disabled	Disabled
Emergency Power Input#	Assign Input for Car for Emergency Power	0-99	0
Emergency Power Car Select Input#	Assign Input for assigning a particular car to operate on Emergency Power in duplex/Group	0-99	0
Emergency Power Transfer Switch Input#	Pre-Transfer Switch Input#. : Emergency Power to Grid Power	0-99	0
Emergency Power Parking Floor	Setup Parking Floor where elevator will park when on emergency power	1-48	1

6. Floor/Hoistway Learn

6.1. Floor Learn Trip

This procedure is specifically for APS applications performed from the COP (in the car) , or TOC (TOP OF CAR) while in Inspection Mode. .

1. Parameter [2], Top Floor, must be set before running this procedure
2. Terminals #37 and #38 must be jumped to #39. While these jumpers are in place, the car will not be stopped by the virtual normals.
3. Set Parameter [20] = 8 (this allows floor heights to be written to Memory)
4. Keep pressing MODE Button until the Setup/Utilities Menu is visible. Enter the Setup/Utilities Menu



5. Press UP ARROW until "LEARN FLOOR TABLE" is displayed



6. Press set, LEARN Floor Hgts will be displayed



7. RUN Car to Landing "1"
8. Press SET, repeat SET to confirm



9. Repeat the process for each Landing
10. Once each Landing position has been learned, the controller will ask for the CWT position.
11. Move the car to the desired position and press Set to Save and Set to Confirm.
12. Slow down distances and position of the virtual normal limits are then automatically calculated.
13. Remove Jumpers from Terminals #37 and #38 that were jumped to #39
14. At the end of this procedure, the controller will train the safety processor in the TOC

6.2. Floor Height Final Adjustments

After Initial Learn Trip, following process is used to do final adjustments to fine tune the floor height table.

1. Set Parameter [20] = 8
2. Keep Pressing MODE Button until the Setup/Utilities Menu is visible



3. Press UP ARROW until "View Flr Hgt Table" is displayed



4. Press Set to View the table



5. Press up and down arrows to cycle through the rows of the floor height table
6. Press Set to Edit the floor height



7. The cursor will show which number will be changed. Press Mode to move the cursor between the characters. Use up and down arrows to adjust the number. Press Set to save OR Press clear to cancel.

7. ES2 Testing Procedures

ES2 provides industry standard Testing Procedures to pass various elevator Safety Tests

1. NTS Testing

7.1. NTS Testing

NTS Testing

NTS (Normal Terminal Slowdown) testing is a crucial procedure performed on elevators before they are put into service to ensure proper operation of the slowdown and stopping mechanisms at the top and bottom of the hoistway. This test verifies that the elevator will safely slow down and stop at the terminal landings using the designated normal virtual limit.

CAR SHOULD BE IN AUTOMATIC MODE FOR THIS TEST TO BE CONDUCTED.

Car will Enter SPECIAL TEST MODE and all calls and normal operations will be disabled. The NTS Test is to be performed after the initial Floor Learn Trip has been completed.

With ES2, NTS can be performed either with an Automated Test or a Manual Test.

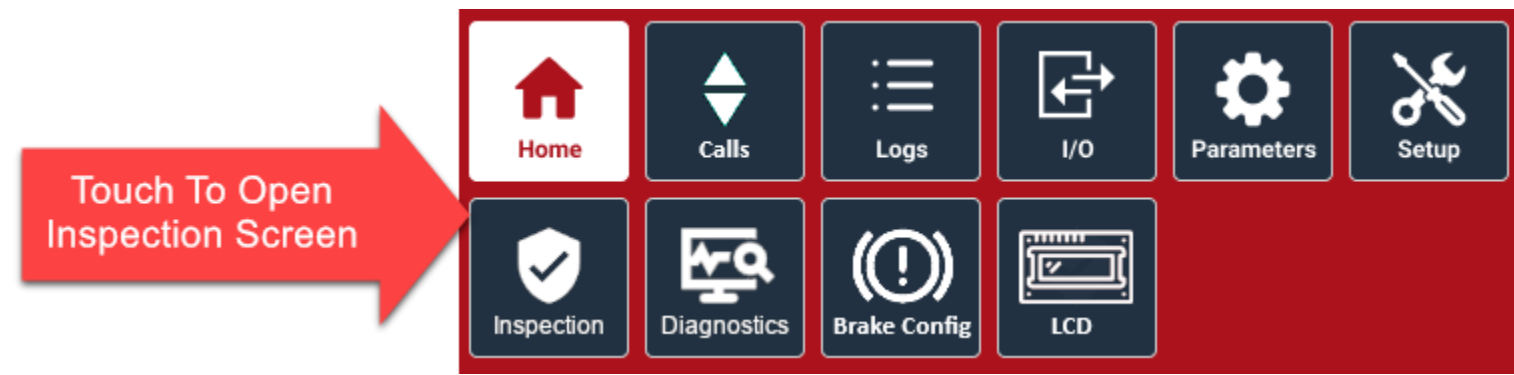
1. Automated Test
2. Manual Test

7.1.1. NTS Automated Testing Procedure

CAR SHOULD BE IN AUTOMATIC MODE FOR THIS TEST TO BE CONDUCTED.

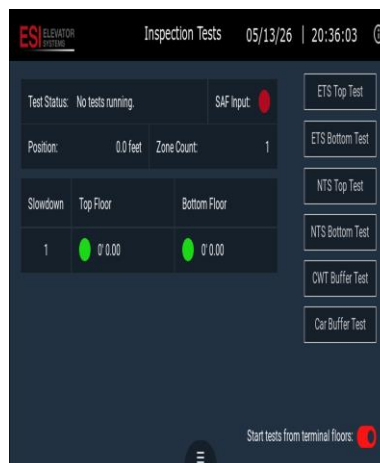
Car will Enter SPECIAL TEST MODE and all calls and normal operations will be disabled. The NTS Test is to be performed after the initial Floor Learn Trip has been completed.

Automated Testing Procedure



The following screen provides automated wizards to perform the inspection tests. Car will move during these tests.

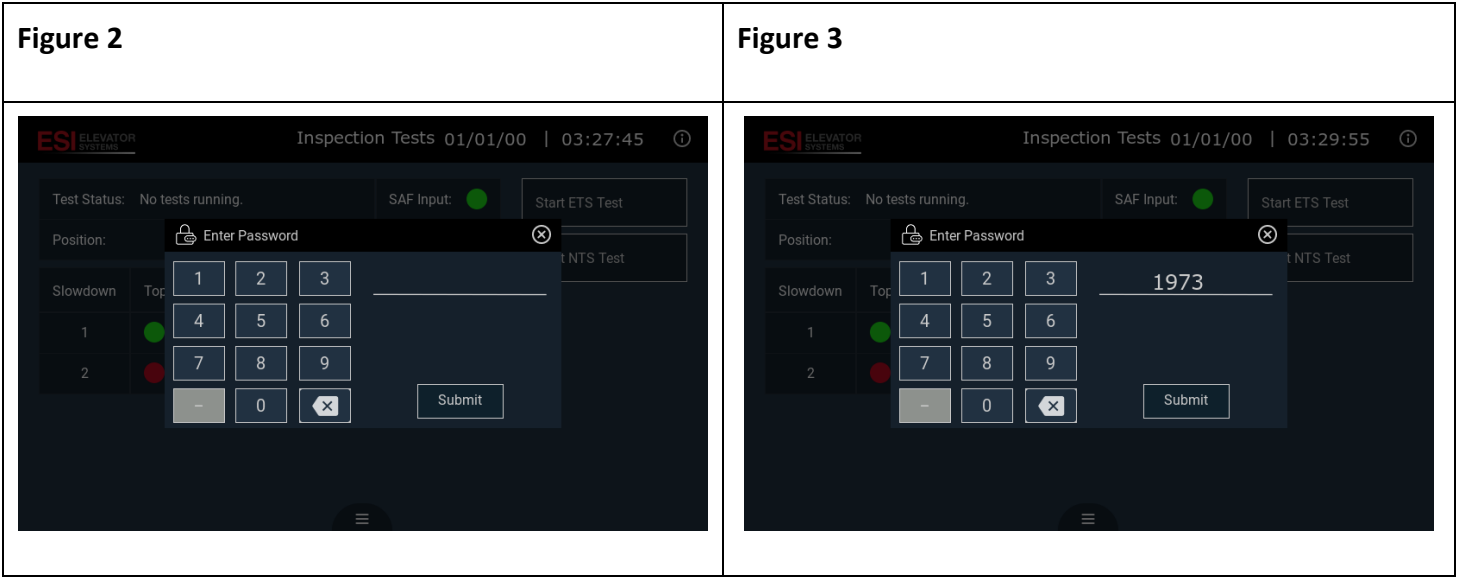
- 1) Select the NTS Top Test button to start the test and follow the on screen prompts.
- 2) Once NTS Top Test is completed, Select the NTS Bottom Test button to start the test and follow the on screen prompts.



In case during inspection it is desired to run the NTS test starting from terminal floors, toggle the START TESTS FROM TERMINAL FLOORS to ON position. It will turn Green and will conduct automated testing from Terminal Floors.

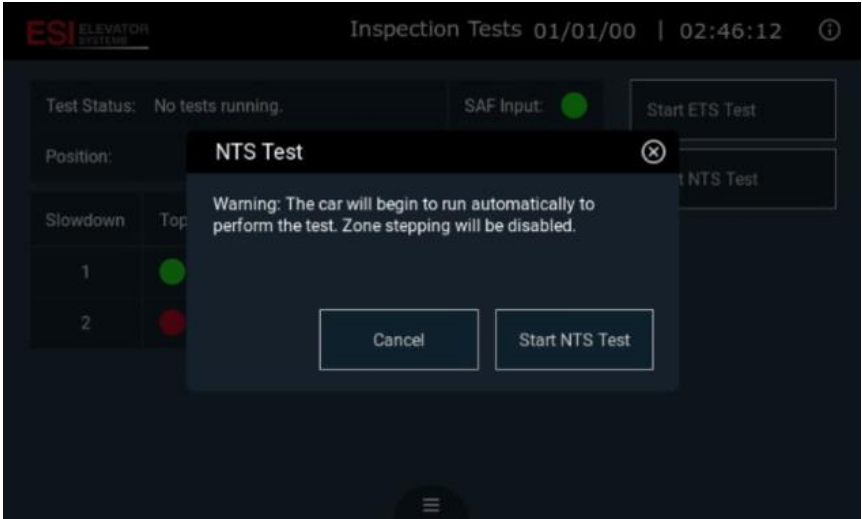
(NTS TEST STEP 1)

Press one of the NTS TEST buttons. Screen will prompt for a password. Default Password is 1973. Enter the Password.



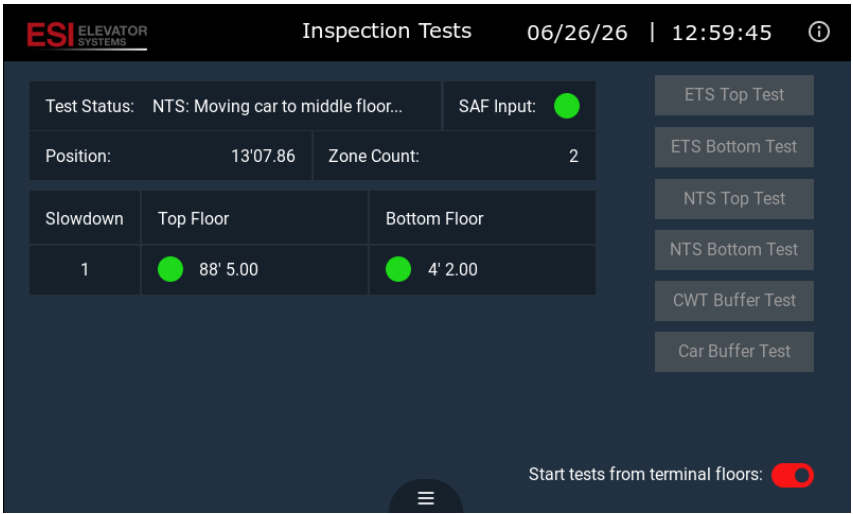
(NTS TEST STEP 2)

After Entering the password, Screen will display the following Prompt. Press the Start NTS Test button



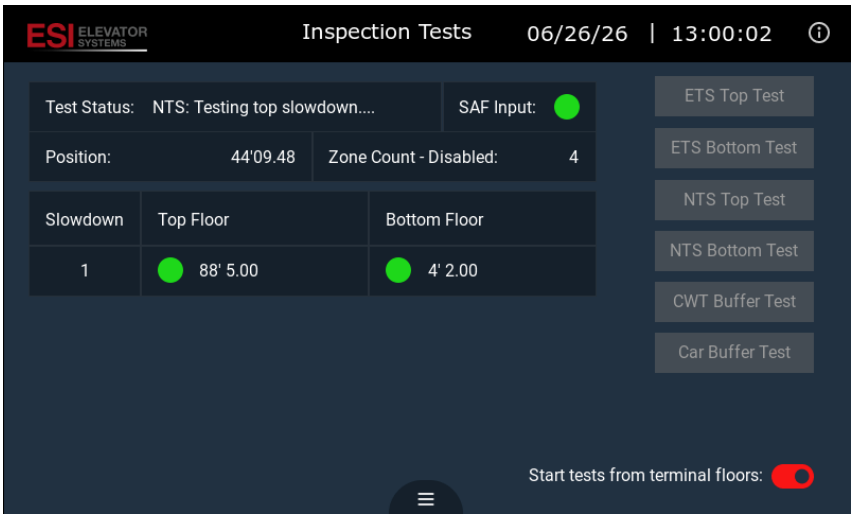
(NTS TEST STEP 3)

Car will Move to middle floor to start the Test Process.

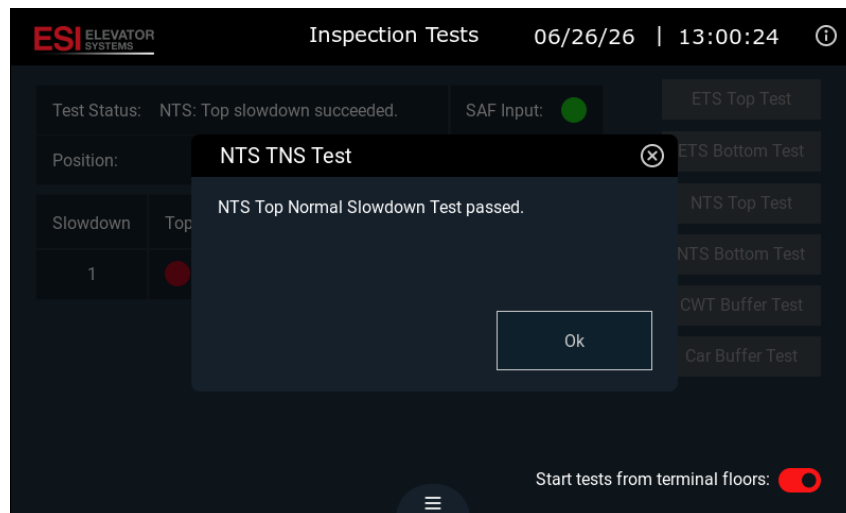


(NTS TEST STEP 4)

Car will then test the slowdown limit that was selected. (Automatically: No USER INPUT required). Zone Count is disabled which means that zone count will during the test procedure, only reflect the middle floor.



The car will slow down via the slow down limit and stop at the normal limit.



(NTS TEST STEP 5)

End of NTS Testing.

Cycle the Inspection Switch on the ES-RB (Relay Board) to return to Automatic Mode.

7.1.2. NTS Manual Testing Procedure

CAR SHOULD BE IN AUTOMATIC MODE FOR THIS TEST TO BE CONDUCTED.

Car will Enter SPECIAL TEST MODE and all calls and normal operations will be disabled. The NTS Test is to be performed after the initial Floor Learn Trip has been completed.

STEP 1

Place Car Level at a landing in the middle of the shaft.

STEP 2

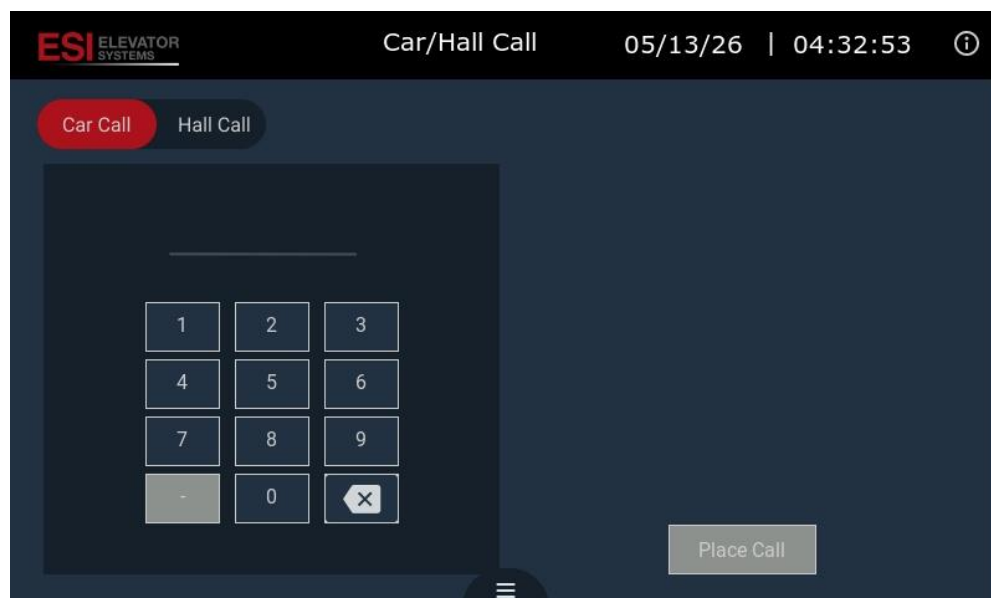
Use ESI LCD Screen Menu to Setup the following Parameter Values

- Set Parameter [20] to 8 and Parameter [30] to 1.



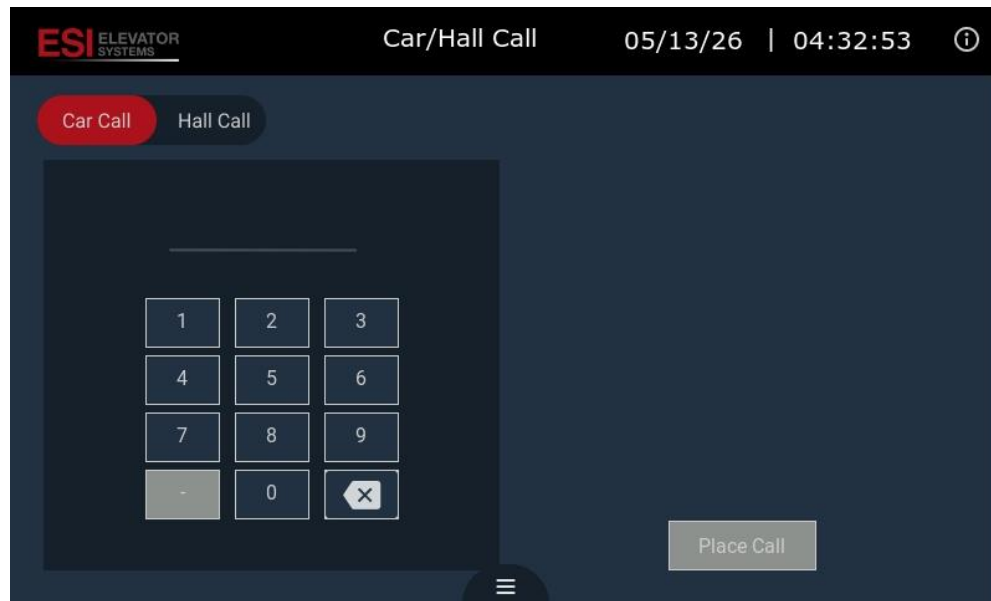
STEP 3

PLACE A CAR CALL from the Controller Screen for the BOTTOM LANDING. The car will slow down via the bottom slow down limit(s) then stop on the Bottom Normal Limit.



STEP 4

PLACE A CAR CALL from the Controller Screen for the TOP LANDING. The car will slow down via the top slow down limit(s) then stop on the Top Normal Limit.



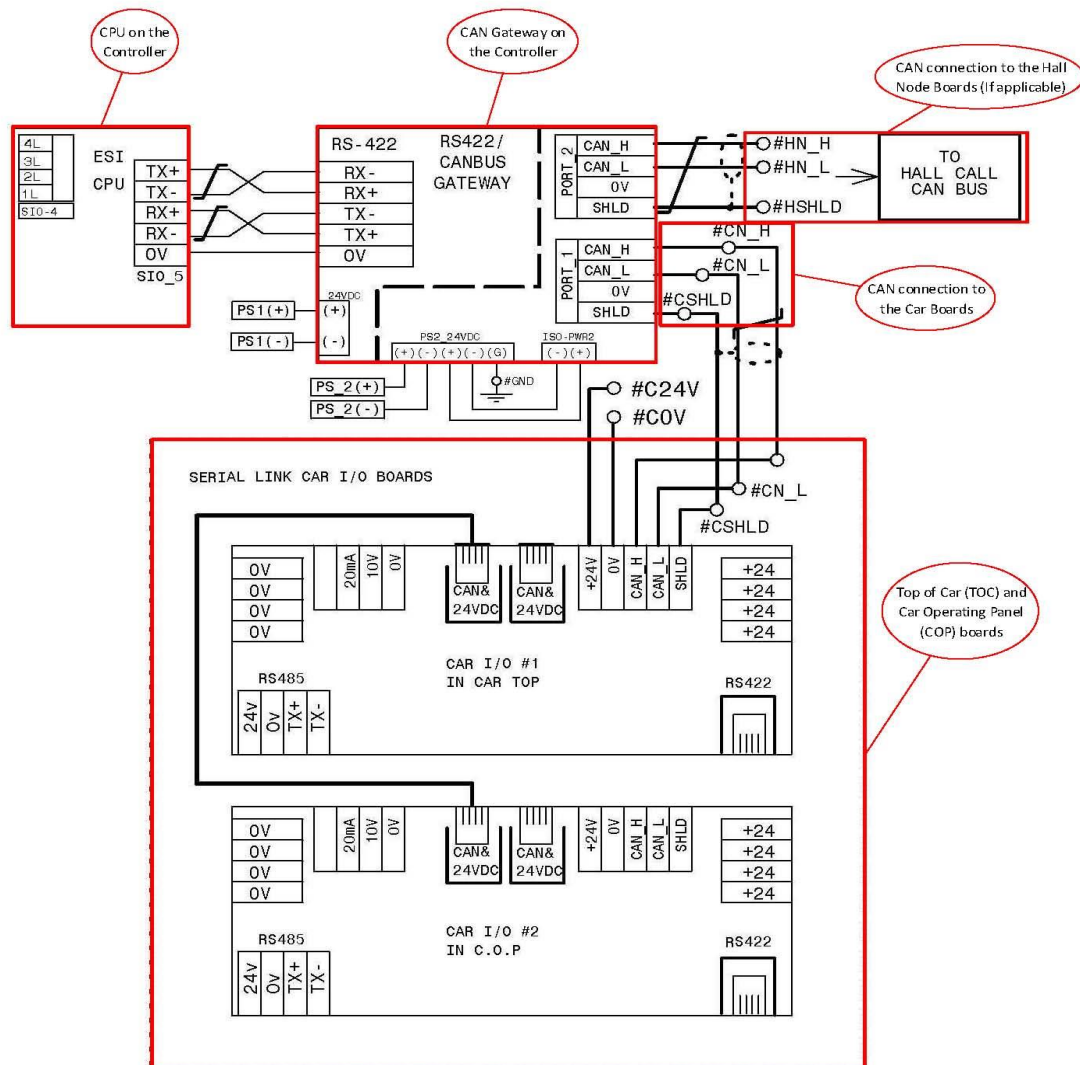
STEP 5

Using ES2 LCD Screen, Set Parameter [20] to 8 and Parameter [30] to 0.

8. Hall Network

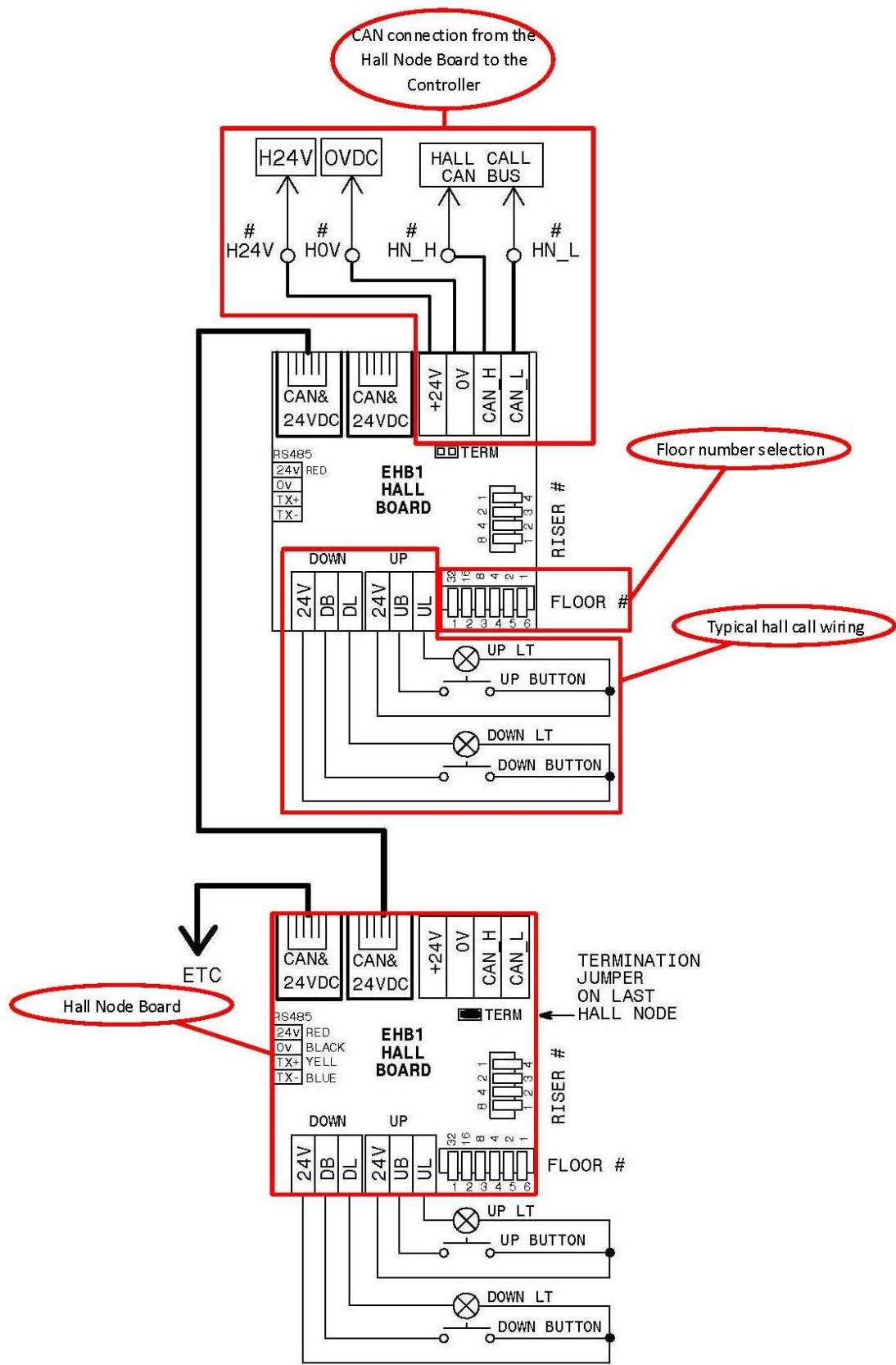
Serial/Hall Network

Elevator Systems Serial Controller does away with most discrete connections from the elevator car, and optionally hall stations (Hall Nodes), to the controller to the controller. This includes car calls and acknowledgments, car key switches, door operator signals, various in car buzzers and lights/lanterns, tape selector signals, and optionally hall calls and acknowledgments. The Serial Controller will require less than 25 traveler cables regardless of the number of landings. These signals are replaced with a single CAN connection back to the controller. If opting for the optional serial hall, hall calls and acknowledgments will be replaced with an additional CAN connection back to the controller.



8.1. Hall Board Wiring

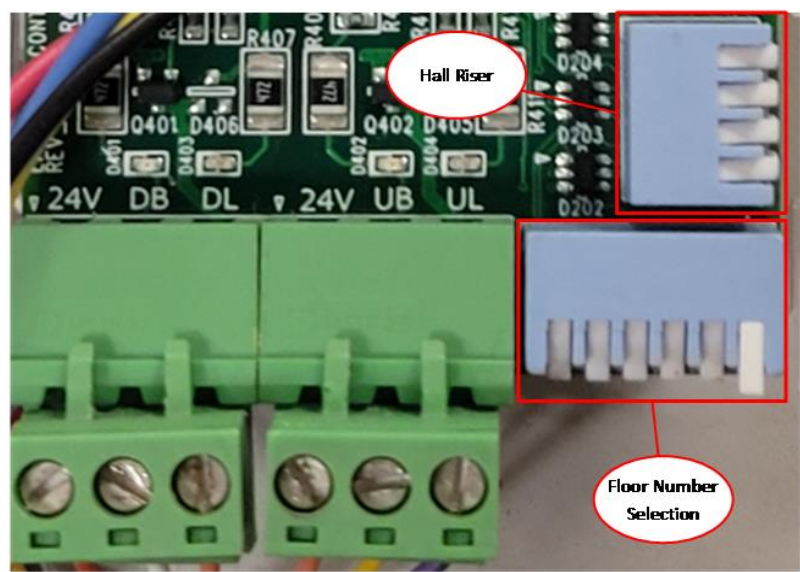
Hall Board Wiring



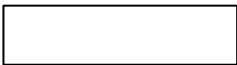
8.2. Hall Board Dip Setting-Front/Rear

Setting Hall Node Floor and Riser

Each Hall Node needs to be set based if it is front or rear and the floor number. The Hall Riser dip switches will set that floor's Hall Node for either the front or rear side of the car. The Floor Number Selection dip switches will set the floor where that Hall Node is located. Follow the charts below to set the Hall Riser and Floor Number Selection dip switches.



Dip Switch is in the Up Position

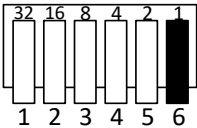
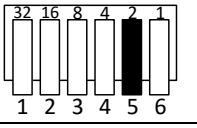
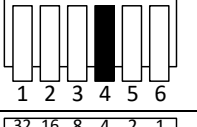
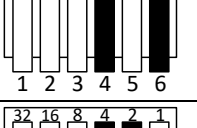
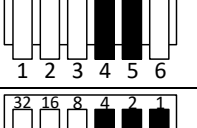
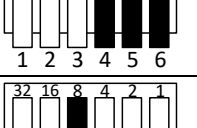
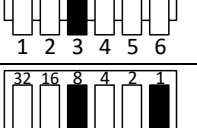
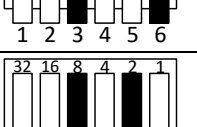
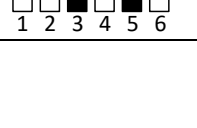


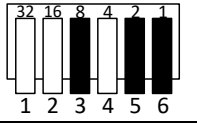
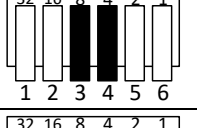
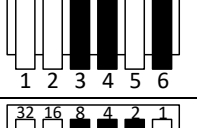
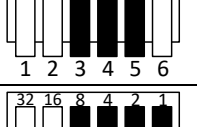
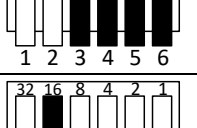
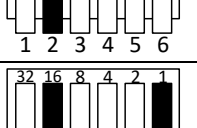
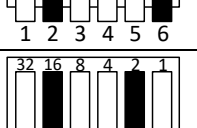
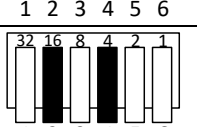
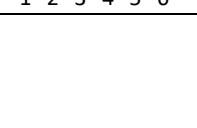
Dip Switch is in the Down Position

Hall Riser Dip Switch Setting	
Side	Hall Riser Setting
Front	4 3 2 1
Rear	4 3 2 1

9. Hall Board DIP Setting Floors

9.1. Floors 1- 20

Floor Number Dip Switch Setting	
Floor Number	Floor Number Setting
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Floor Number Dip Switch Setting	
Floor Number	Floor Number Setting
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

10. Debug & Troubleshooting

Following are some of the error codes that controller may experience and suggested troubleshooting guidelines:-

10.1. Fault Codes 0-39

Following are some of the error codes that controller may experience and suggested troubleshooting guidelines:-

Fault Code	Fault	Troubleshooting
13	LowOil Time Out	• Try increasing Parameter 48 to 60 secs • If the problem continues then: (i) Is it an actual 'Low Oil' condition; (ii) Is it a high usage car that results in oil over-heating and causing low oil density; (iii) Check voltage between #VC & #ULS when running HS Up • If no voltage, then check TT1 - TT2 connections • Else, replace HSZ and HSY relays.
17	Thermal OVLD Trip	• The Motor Thermal OVLD Trip "TOL" opened • Check the status of TOL input on CPU board, verify the input TOL should be ON
18	SAF Opened	• SAF Input lost due to a break in the Safety String • Check voltage between #60 and each terminal in the string (OVS1, OVS2, RGC1, RGC2, 32, 32A, 33, 40, 41) • Usually a bad contact or switch.
19	Gov OVS Opened	• The Governor Sw input "OVS" opened • Check the status of OVS/GOV input on CPU board, verify the input OVS/GOV should be ON
24	CAR OverLoaded	• Overload condition in Car as determined by the load-weigher module • If not an actual overload condition, check for faulty contact connected at 66.
30	HS Stop DL	• Front Door Lock opened in flight • Check Door lock mechanism (at the floor specified in fault) for any adjustments that may be needed.
32	HS Stop RDL	• Rear Door Lock opened in flight • Check Door lock mechanism (at the floor specified in fault) for any adjustments that may be needed.
33	HS Stop RGS	• Check Rear Gate Switch OPENED while car is in flight
34	HS Stop DCL	• Front Door Close Limit Closed in flight • Check limit switch.
35	HS Stop RDCL	• Check Rear Door Lock OPENED while car is in flight
38	SD Limit Failure	• Both Up and Down Slow-down limits are open • Check 52 and 53 limits switches.
39	FloorPosition Reset	• Check the Binary Zone Inputs (B1,B2,B4,B8) are updated properly or not when the car stops

10.2. Fault Codes 52-63

Following are some of the error codes that controller may experience and suggested troubleshooting guidelines:-

Fault Code	Fault	Troubleshooting
52	CYCLETEST Fail P1	• If "P1" is not on, remove connector cover ACC on the RB Board (the board with the switches on it).
53	CYCLETEST Fail P2	• If "P2" does not come on, check to see that inputs "SAF", "SW", "DLK" and "GS" are not lit • If any
54	CYCLETEST Fail P3	• If P3 is not on, check to see if there is 120 VAC from #60 to the BR 6 or EB 6 (aux contact on the right side, top of relay BR/EB) • If not, check the N/Closed contacts on P, PB, and BR feed from VF Drive board connector REL pin[5] • If present, check for 120vac from #60 to pin J1[6] on the RB board • If not present, replace relays DU, DUX, DEN, PX, B and DBE one at a time until P3 comes on • Again, you may use the LFI relay, as it is not part of the cycle test • Be sure to replace LFI relay with a new one if needed • If 120vac is present at pin J1[6], contact ESI for further assistance.
60	DoorOpen TimeOut	• When Opening, Door Open Limit did not break within the time set in Parameter 40 • Adjust Parameter 40 • Check Door Open limit Switch • Check for mechanical friction.
61	DoorOpen FAULT	• Door Open TimeOut's Count exceeded parameter 141, without a successful Open • Check the doors why not opening.
62	DoorClose TimeOut	• When Closing, Door Close Limit did not break within the time set in Parameter 40 • Adjust Parameter 40 • Check Door Close limit Switch • Check for mechanical friction.
63	DoorClose FAULT	• Door Close TimeOut's Count exceeded parameter 140, without a successful Close • Check the doors why not closing.

10.3. Fault Codes 64-72

Following are some of the error codes that controller may experience and suggested troubleshooting guidelines:-

Fault Code	Fault	Troubleshooting
64	RearDoorOpen TimeOut	• When Opening, Rear Door Open Limit did not break within the time set in Parameter 40 • Adjust Parameter 40 • Check Door Open limit Switch • Check for mechanical friction.
65	RearDoorOpen FAULT	• Rear Door Open TimeOut's Count exceeded parameter 141, without a successful Open • Check the rear doors why not opening.
66	RearDoorClose TimeOut	• When Closing, Rear Door Close Limit did not break within the time set in Parameter 40 • Adjust Parameter 40 • Check Door Close limit Switch • Check for mechanical friction.
67	RearDoorClose FAULT	• Rear Door Close TimeOut's Count exceeded parameter 140, without a successful Close • Check the rear doors why not closing.
69	GS ON Fault	• GS Input is ON while Doors are Open/Door Open Limit (48) is OUT • Isolate wires at Gate Switch (42, 45) and check for voltage - these should be 0V to GND • Also, check that the Door Open Limit is wired correctly.
70	DL ON Fault	• DL Input is ON while Doors are Open/Door Open Limit (48) is OUT • Isolate wires at Hatch Door Interlocks (34, 34A, 34D, 35) and check for voltage - these should be 0V to GND • Also, check that the Door Open Limit is wired correctly.
71	RGS ON Fault	• RGS Input is ON while Doors are Open/Door Open Limit (48R) is OUT • Isolate wires at Gate Switch (42, 45R) and check for voltage - these should be 0V to GND • Also, check that the Door Open Limit is wired correctly.
72	RDL ON Fault	• RDL Input is ON while Doors are Open/Door Open Limit (48R) is OUT • Isolate wires at Hatch Door Interlocks (34R, 34AR, 34DR, 35R) and check for voltage - these should be 0V to GND • Also, check that the Door Open Limit is wired correctly.

10.4. Fault Codes 74-90

Following are some of the error codes that controller may experience and suggested troubleshooting guidelines:-

Fault Code	Fault	Troubleshooting
74	TOS-CarHeld	• Car cannot run due to Front Door being held open • 28 (Door Open), 28S (Safety Edge) or 28E (Electric eye) is on • Check if any of these is bad.
75	TOS-CarHeld REAR	• Car cannot Run due to Rear Door being held opened • Check rear door open signal (28R) or rear door edge signal (28ER) or rear door hold button (28HR) are being stuck or being closed all the time.
77	RUN DELAY-GS	• Car cannot RUN • Doors Closed but Front Gate Switch input (GS) is not ON within 10 seconds • This is most likely a physical door contact issue • Check contact.
78	RUN DELAY-DL	• Car cannot RUN, Front Doors Closed, but Front Door Lock DL input is not ON within 10sec.
79	RUN DELAY-RGS	• Car cannot RUN • Doors Closed but Rear Gate Switch input (RGS) is not ON within 10 seconds • This is most likely a physical door contact issue • Check contact.
80	RUN DELAY-RDL	• Car cannot RUN, Rear Doors Closed, but Rear Door Lock RDL input is not ON within 10sec
82	RUN DELAY-OLR/RPR	• Car cannot RUN, Doors Closed, but Input #15 (OV) is not ON within 10sec • Check RPR (Reverse Phase Relay) is tripped or not.
84	EQ-CWT	• Earthquake Service CWT trip • Vibration detected due to earthquake or bad CWE relay contact.
85	EQ-SEM	• Check EarthQuake Service Seismic Switch (input SEM) if it is activated
89	PIT Flood SW ON	• PIT flood condition • If not true, then check PIT flood switch.
90	Pressure SW Open	• Check Pressure Switch (input PRS) if it is de-activated

10.5. Cycle Test and Troubleshooting

CYCLE TEST

The Cycle Test is controlled by the CPU ES2-CPU-output 1 [CTP]. The [CTP] output controls the CT relay, whose N/Open contacts control the voltage feed to the Critical Circuits. The Cycle Test is sequenced at the end of every run. N/Closed contacts from the forced guide safety relays I, IX, IC1, IC2, SWB1, SWB2, ID, IU, GS, DL and VC feed proving ES-CPU-input [P2]. Relays BAC, TAC, ACC, ACX, HS, HSX, HSY, HSZ feed ES2-CPU input [P1]. JS, D, DX, UX, , U, PX, UT, R feed ES2-CPU-input [P3]. With the elevator at rest in automatic operation, inputs [P1] and [P3] are lit. When the car stops, the CT relay is cycled. All three proving should flash ON. This verifies that all forced safety relays are working appropriately. Output [CTP] will then turn back on. [P3] will stay lit. [P1] and [P2] will light depending on the mode of operation. If the cycle test fails and all three proving input do not come ON, the CPU LCD screen will display "CYCLE Test Failure".

CT TROUBLE SHOOTING

If the cycles test fails. Proving inputs [P1], [P2] and [P3] must be trouble shot. [P1], [P2] and [P3] are feed through various relays and passes through fuse FR2. See sheet #1 area H-24 on the prints.

If [P1] is not ON, remove connector cover ACC on the ES-RB Board (the board with the switches on it). Check for 120vac from terminal #60 to pin ACC[5]. Note, the triangle symbol next to connector indicates pin[1]. If not replace relay HS, HSX, HSY AND/OR HSZ. If present, check for 120vac from #60 to ACC[6]. If not replace ACCESS Board. If present, contact ESI for further assistance.

If [P2] is not ON, check to see that inputs [SAF], [ICSS], [DL] and [GS] are not lit. If any are lit remove the CT relay. If [SAF] goes out replace the CT relay. If [SAF] does not go out when CT is removed look for 120vac entering the safety circuit from someplace other than the CT point at area A-1 on sheet #1. If all is ok, check to see if there is 120vac from #60 to connector FDB pin[6] on the RB board. If not try replacing relays I,IX,IC1,IC2,SWB,SWB2,ID and IU one at a time. You may use the LFI relay, as it is not part of the cycle test. When 120vac from #60 to connector FDB pin[6] on the RB board is present, check pin FDB[7] to #60 for 120vac. If not, try replacing relays DL,GS and VC one at a time. If [P2] is still out, contact ESI for further assistance.

If [P3] is not ON, , substitute relays JS, D, DX, UX, , U, PX, UT, R one at a time until P3 comes on. Again, you may use the LFI relay, as it is not part of the cycle test. Be sure to replace LFI relay with a new one if needed. If 120vac is present at pin J1[6] and [P3] is still out, contact ESI for further assistance.

10.6. Door Operation

DOOR OPERATION

On master door jobs, ES2-CPU outputs [DCS], [DOS], and [NR] control door operation.

Door Close Button: The door close button will close a fully open door immediately.

Door Open Button: The door open button will open the door.

Door Safety Edge: The Safety edge as well as the DoorEdge / ElectricEye will immediately open a closing door.

Door Nudging

Door Nudging Parameter under the Door Parameter Screen control the various mode of nudging control available. Depending on this setting, the door can be made to nudge close, sound the in/car buzzer or simply stay open all day long.

With input [DES] ON, setting the above parameter to:

"1" : will let the doors stay open as long as input [DES] is ON and not sound the buzzer.

"2" : will let the doors stay open as long as input [DES] is ON and sound the buzzer.

"3" : will let the doors nudge close, and sound the buzzer. After the time set in Timer Parameters screen (EDGE TIME OUT): Parameter #7 expires the buzzer will sound. Then the door close timer will expire and the door will nudge close with both [DCS] and [NR] energized.

11. Utilities

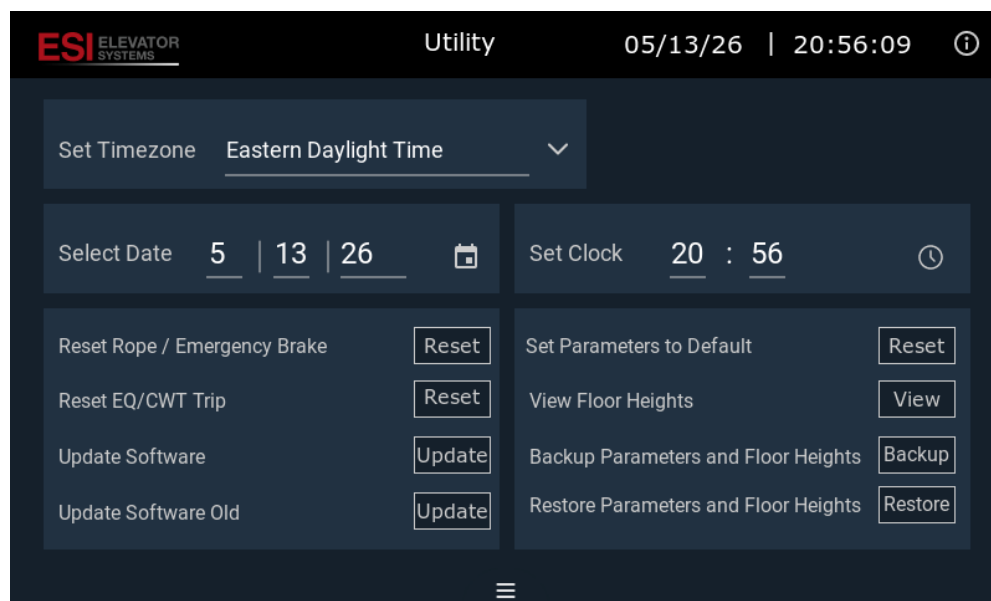
11.1. Backup and Restore Parameters

SD Card required. Saving and restoring parameters and floor height tables is only possible if there is an SD Card installed. If there is no SD Card installed, please install the SD card and reset the controller.

To Backup or Restore Parameters and Floor Height tables:

STEP 1

Go to Utilities Screen.



STEP 2

To create the Backup, select Backup. A backup will be created on the SD Card.

To restore a previously created Backup, select Restore. Parameters and Floor Height Tables will be restored into the controller. The controller must be reset after this process is finished to complete the restore.

11.2. Software Update

CAR SHOULD BE IN INSPECTION MODE TO SAFELY UPDATE SOFTWARE.

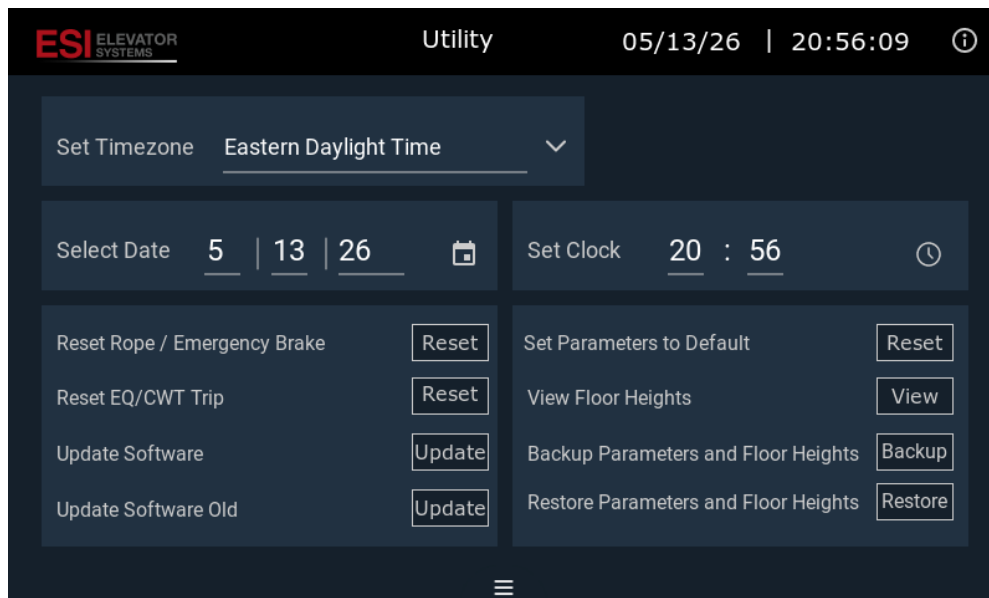
Software update could take up to 30 minutes to update all controllers in the system. Depending on the contents of the software update, it normally will take about 5 minutes. Please consult with ESI to determine the contents of the update.

STEP 1

Copy the new software file (xxx.zip) received from ESI to an SD Card. Insert the SD Card to the SD card slot.

STEP 2

Go to the Utilities Screen. Backup parameters and floor height tables.

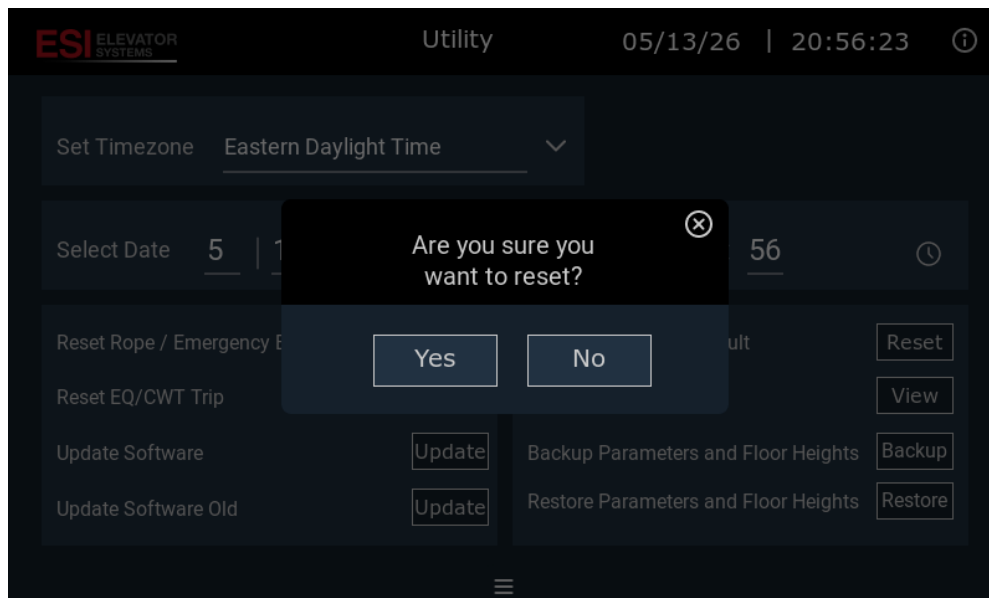


STEP 3

Select Update Software. Update Software Old can be used to revert software back to the previous version.

STEP 4

Confirm software update. Please be sure car is out of service and in a safe location.



STEP 5

Controller will automatically reboot into the boot loader. The screen will reflect the current status of the update. This may take up to 30 minutes to complete. Please be patient.

STEP 6

When update is complete, the controller will automatically reboot into the application.

12. UPS Battery Lowering

Based on customer choice, ESI provides Battery Lowering with UPS for hydraulic controllers. With this feature, in case of a power loss, the elevator will use an UPS (either provided by ESI or by Customer) to bring the car down to the next floor to evacuate any passengers.

Operation:

If power is lost to the controller or a phase reversal occurs the normally open contact RPR 1/8 will open. This will de-energize the PF and PFX relays.

The following will occur:

- PF normally opened contacts 3/9 and 1/7 will open. This will disconnect the controller from the AC line.
- PF normally opened contacts 2/8 will open. This will cut off power to the Soft start.
- PF normally closed contact 5/8 will close, signaling the CPU that a power loss has occurred via !PF (input-16) going high.
- PFX normally opened contacts 2/8 will open. This will cut off power to the input of the UPS. (i.e. stop the UPS from charging when in UPS Battery Lowering)
- PFX normally closed contact 5/8 will close. This will connect the controller to the UPS power supply.
- The elevator will travel in the down direction only, and will stop at the lobby floor, or the bottom floor. The doors will operate, allowing passengers in the elevator to exit. When power is restored, RPR 1/8 will close, energizing PF, and restoring normal operation automatically.

Terminals #P10 and #P11 are for an auxiliary pole in the controller's power disconnect switch. This prevents the UPS from operating, allowing power to be completely removed from the controller.

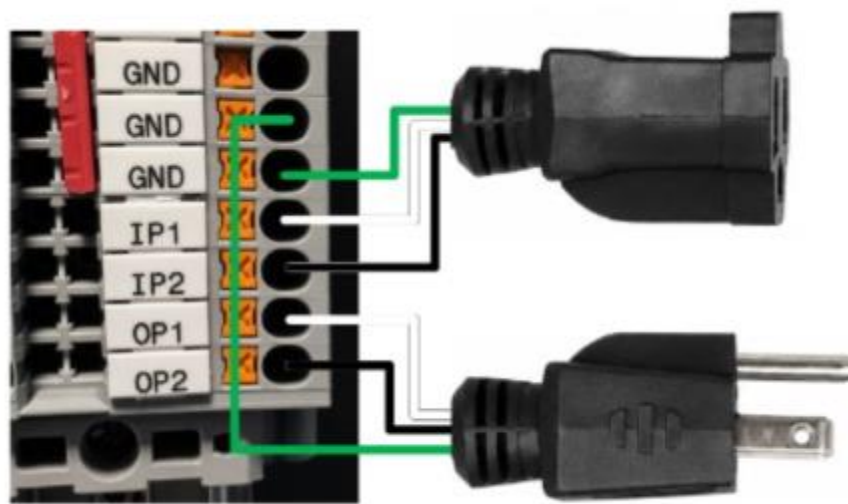
12.1. Wiring UPS To Controller

UPS requirements:

- 825VA or larger
- Single Phase 120 V AC Input
- Single Phase 120 V AC Output

At the bottom of the controller's terminal strip will be terminals #GND, #IP1, #IP2, #OP1, and #OP2. Wired to the field side of these terminals will be a 3-prong male plug and 3-prong female receptacle (This will be prewired by ESI).

NOTE: DO NOT CONNECT THE PLUG AND RECEPTACLE INTO ONE ANOTHER. DOING SO MAY CAUSE DAMAGE TO THE CONTROLLER



The 3-prong male plug and 3-prong female receptacle are to be connected to the UPS



13. Legal Disclaimers

Third-Party Product Reference Notice

This manual may reference third-party products, components, software, or trademarks solely for the purpose of identifying equipment that may interface with or be used in conjunction with the ESI controller.

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