

# LABEL



## eSIL USER MANUAL

### Electronic selector for lifts

## 1 – PRODUCT DESCRIPTION AND TECHNICAL DATA

The eSIL selector is an electronic board which is able to count the elevator floors, it can perfectly replace our old best seller SIL selector. eSIL replicates both size and electric characteristics of SIL selector.

eSIL can replace any kind of electromechanic selector or older systems. The microprocessor logic will allow you to fit the selector to any kind of installation with a wide range of voltages; eSIL can manage elevators till 12 stops and integrates the maximum travel time control and the thermistors (PTC) control. This will allow you to reduce the number of external components needed. Also, there 12 relay outputs for position signalling and one relay output for alarms (maximum travel time and PTC).

## 2 – ELECTRIC FEATURES

Supply voltage	from 35 to 85 VDC
Power consumption	15 W @ 85 VDC
Working temperature	+0° .....+70° C
Storage temperature	-40° .....+120° C
Allowed voltage on optocoupled inputs	from 35 to 140 VDC
Position and alarm relay electrical data	5 A @ 30 VDC / 230 VAC
Direction relay electrical data	12 A @ 24 VDC / 230 VAC – varistor protected
Supply voltage / PTC alarm resistance	2,5 V / 2,0 kΩ
Microprocessor	PIC32MX – 40 MHz
Parameters / position memory	FRAM / 4 Kbit

## 3 - ELECTRICAL CONNECTIONS - NEW/OLD SELECTOR

New eSIL Terminal	FUNCTION	Old SIL Terminal
A+	Positive power supply	Not present
A-	Negative power supply	Not present
T1	PTC Input power supply (+24 V)	Not present
T2	PTC Input	Not present
-	Reed sensors negative common	Negative Coil terminal
+▲	Up counter input	Up coil
+▼	Down counter input	Down coil
C1	Floor 1 input (lowest)	Floor 1 input (lowest)
C2 – C11	Floor 2 -11 input (middle)	Floor 2 -11 input (middle)
C12	Floor 12 input (upper)	Floor 12 input (upper)
L1 – L12	Position signalling floor 1 – 12	Position signalling floor 1 – 12
AL1 – AL2	Alarm contact for max. travel time and/or PTC	Not present





## 6 - IMPORTANT TECHNICAL NOTES

**6.1** The eSIL selector has to be powered with a permanent power with the meaning of the supplied red and black cable. For instance, you can use the safety circuit voltage with a maximum measured value of 85V DC and a minimum measured voltage of 48V DC. The selector cannot work with alternate current!

In any case, when the selector is powered-off, the current position and parameters are kept in memory.

If the control panel doesn't have a suitable voltage, it is possible to use the external ESILALI switching power supply which is sold separately.

**BEWARE!! A supply voltage greater than 85V DC can destroy the selector.**

**6.2** It's important to know if the old SIL selector has **two or one impulse**; this setting can be made in the parameter P3; if you experience a wrong floor counting please check this parameter as first.

**6.3** The eSIL selector has to be powered with DC current; it can't work with AC current. The same applies for the C-C11 floor inputs and the counter +▼ +▲ inputs. All the inputs must be positive, it cannot work with negative input.

In case of AC inputs or negative DC inputs please contact our LAB.El technicians

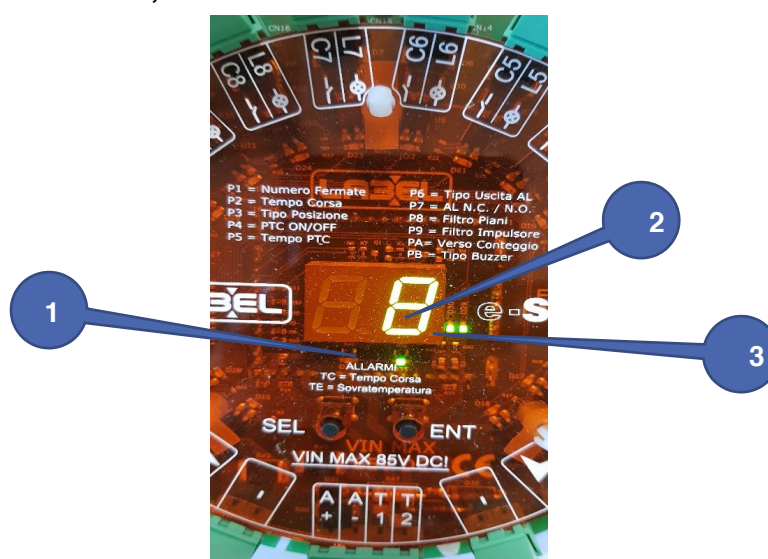
**6.4** The eSIL selector comes out of the factory with default parameters: i.e. the number of floors (P1) is set to 12; it is important to make this parameter match the elevator number of stops otherwise you can experience some wrong counting and the selector can't be able to correctly reset it's position.

Please program all the parameters following the **chapter 7 PROGRAMMING TABLE** before making the selector work.

## 7 – USER INTERFACE

**7.1** The eSIL user interface is composed by two 7 segments display, the SEL and ENT pushbuttons and two green LEDs which are located under the 7 segments displays. From now on, we will call these LEDs LS (left LED) and LD (Right LED). At the right of the displays there are other two LEDs (3 picture 1); these leds indicates the presence of the 24V voltage and 3,3V voltage

**WHEN eSIL IS POWERED ON, THESE TWO LEDS MUST BE ALWAYS LIT.**



Picture 1

## 7.2 • POWER ON

When powered on, the selector checks the FRAM data and some peripherals; in the meantime the writing “LAB.EL”. Scrolling text is showed for about two seconds.

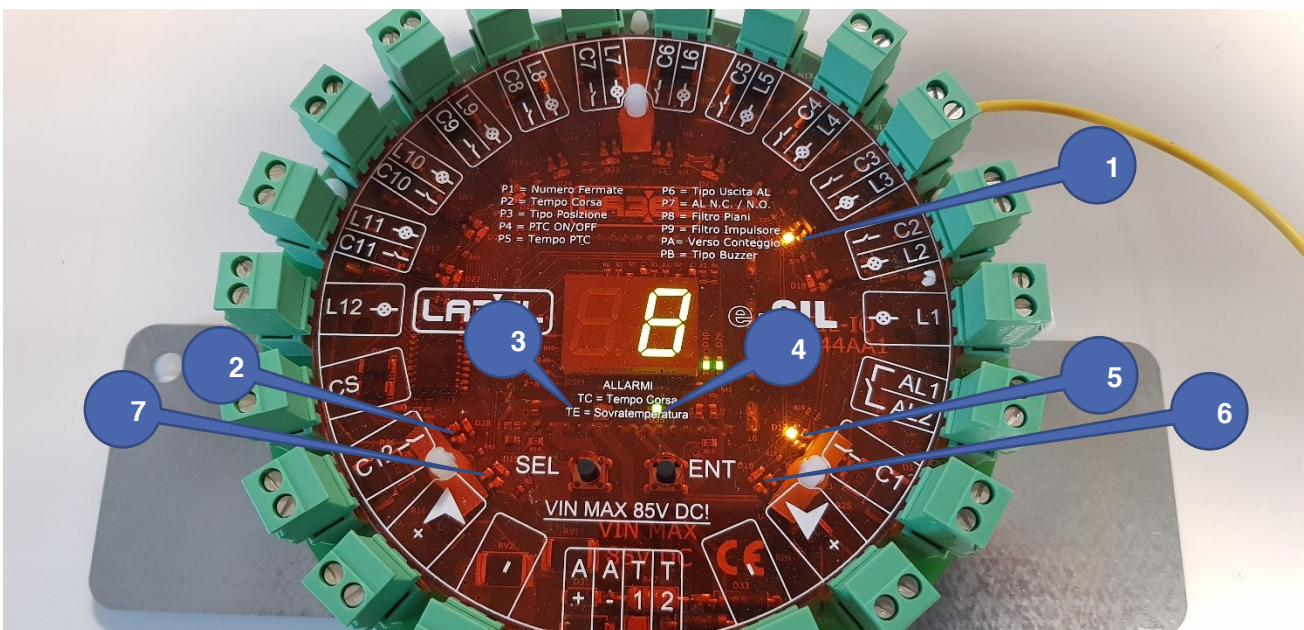
## 7.3 • FOUR WORKING MODES ARE POSSIBLE:

- Normal working mode
- Alarms mode
- I/O check mode
- Manual mode

### 7.3.1 • NORMALWORKING MODE

Along the normal working mode, with the elevator waiting at floor, the eSIL display shows the current floor; the first stop is indicated as “0”, the second as “1” and so on.

When a floor input is activated(in the picture 2 the second floor is powerd which corresponds to C3 terminal, C2 is the floor 1 and C1 is the floor 0) the corresponding orange led is lit (1 picture 2), if the selector commands a direction the corresponding led is lit: C1 (5 picture 2) for the down direction, C12 (2 picture 2) for the up direction.



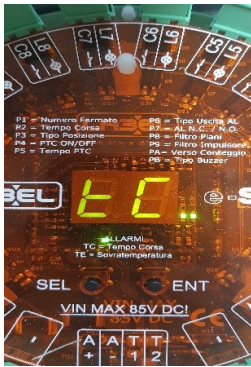
Picture 2

The LD led (4 picture 2) located under the displays indicates that the car is in the zone of the floor level. The LS led (3 picture 2) will blink during the travel only if the maximum travel time is different to “0”.

During the travel, when the reed is closed, the led up (7 picture 2) or down (6 picture 2) led is lit accordingly to the travel direction.

### 7.3.2 • ALARMS

If the selector triggers an alarm, the display shows the related alarm code and the LS led start to flash fast: the alarms are the following:



**MAXIMUM TRAVEL TIME EXPIRED tC** If the value of the P2 parameter is different from 0 then the maximum travel time is enabled for the set value. The value of P2 parameter is the time in seconds.

When the eSIL commands a direction (up or down) the travel timer starts to count, if the timer has expired all the direction output are switched off and the alarm relay is switched on. The alarm relay has to be connected in series to the safety chain and the P6 parameter has to be set to 0 or 2 and the parameter P7 must be set to 0.

The alarm reset can be done keeping the SEL pushbutton pressed for two seconds even after a power failure.



#### THERMISTOR tE:

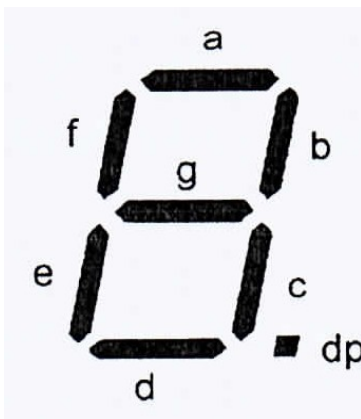
If the P4 parameter is set to 1 the selector can control the motor PTC which has to be connected to T1 and T2 terminals. If the PTC is open or its value is greater than 2,0kΩ the elevator reaches the floor and, after the P5 time, it activates the alarm relay (AL1,AL2). The alarm reset itself when the resistance between T1 and T2 terminals lowers back under 2,0 kΩ.

When the car is not in the floor zone the alarm is displayed but the relay is not activated.

### 7.3.3 • I/O CHECK MODE

In normal working mode and without any alarm, keeping pressed the SEL pushbutton for more than 2 seconds, you can enter in the I/O check mode; in this mode you can monitor the position relays status, the alarm relay status and the direction relay status according to the following table:

Segments meaning table



SEGMENT	LEFT DISPLAY	RIGHT DISPLAY
a	Position relay 6	Position relay 0
b	Position relay 7	Position relay 1
c	Position relay 8	Position relay 2
d	Position relay 9	Position relay 3
e	Position relay 10	Position relay 4
f	Position relay 11	Position relay 5
g	Up relay	Down relay
dp	Alarm relay	Alarm relay

To exit from the I/O check mode press **ENT**.

#### 7.3.4 • MANUAL MODE

The manual mode will allow you to make the selector to count till the desired position during the normal mode. To enter the MANUAL MODE press and keep pressed at least 2 seconds both **SEL** and **ENT** pushbuttons; the display will start to blink showing the current floor, at this point release the pushbuttons

Each pressure on **SEL** pushbutton has the same effect as an impulse to the +▼ terminal; each press on **ENT** pushbutton has the same effect as an impulse to the +▲. In this way you can place the selector counter in the exact point you wish it to start from.

Keeping pressed for more than 2 seconds the **SEL** pushbutton will reset the selector to the top floor according to the number of stops programmed in P1 parameter. Keeping pressed for more than 2 seconds the **ENT** pushbutton will reset the selector to the bottom floor (0).

To exit from this mode briefly push both **SEL** and **ENT** pushbuttons.

## 8 – PROGRAMMING

To access the programming mode press and keep pressed the **ENT** pushbutton, the display will show the first parameter (P1) and both LD and LS LEDs will start to blink fast. Every press of the **SEL** pushbutton will advance to the next parameter starting from P1 till SV in a round trip way.

Once you've selected the desired parameter, press **ENT** to show the current value of the parameter and, after that, press **SEL** to modify the current value. If you keep the **SEL** pushbutton pressed the value will start to increment till the limit of the possible value; pressing **ENT** the value of the selected parameter will be temporarily saved; to save the value in the memory you have to reach **SV** and press **ENT**.



## 9 – PROGRAMMING TABLE

MENU	FUNCTION	DESCRIPTION	RANGE	DEFAULT
P1	NUMBER OF STOPS	NUMER OF STOPS OF THE ELEVATOR	2-12	12
P2	MAX. TRAVEL TIME	MAXIMUM TRAVEL TIME BEFORE STOPPING THE ELEVATOR	0-60 s	0
P3	COUNTER AND POSITION INDICATION TYPE	SET THE COUNTER MODE AND THE KIND OF POSITION INDICATION 0 = STANDARD COUNTER; NO POSITION OUTPUT BETWEEN FLOORS <ul style="list-style-type: none"> <li>• 1 = STANDARD COUNTER WITH POSITION OUTPUT BETWEEN FLOORS</li> <li>• 2 = COUNTER WITHOUT ONE PULSE AT TOP&amp;BOTTOM FLOORS; NO POSITION OUTPUT BETWEEN FLOORS</li> <li>• 3 = COUNTER WITHOUT ONE PULSE AT TOP&amp;BOTTOM FLOORS; POSITION OUTPUT BETWEEN FLOORS</li> </ul>	0-3	1
P4	PTC ON/OFF	MOTOR PTC: <ul style="list-style-type: none"> <li>• 0 = PTC DISABLED</li> <li>• 1 = PTC ENABLED</li> </ul>	0-1	0
P5	PTC TIME	AFTER THE PTC ALARM IS TRIGGERED AND THE ELEVATOR WAITS AT FLOOR, THIS TIME WILL ACTIVATE THE ALARM RELAY	0-99 s	5
P6	ALARM OUTPUT	ALARM OUTPUT BEHAVIOR: <ul style="list-style-type: none"> <li>• 0 = ONLY MAX TRAVEL TIME ALARM</li> <li>• 1 = PTC ALARM</li> <li>• 2 = MAX TRAVEL TIME AND PTC ALARM</li> </ul>	0-2	2
P7	ALARM NO/NC	ALARM RELAY CONTACT TYPE <ul style="list-style-type: none"> <li>• 0 = NC CONTACT WITH NO ALARM</li> <li>• 1 = NO CONTACT WITH NO ALARM</li> </ul>	0-1	0
P8	FLOOR INPUT FILTER TIME	DIRECTION ACTIVATION DELAY	5-99 ms	20
P9	FLOOR REED FILTER TIME	COUNTER REED PULSE DELAY	5-99 ms	45
PA	COUNTING SENSE	COUNTING SENSE: <ul style="list-style-type: none"> <li>• 0 = STANDARD (C1 = C1 AND C12 = C12)</li> <li>• 1 = INVERTED (C1 = C12 AND C12 = C1)</li> </ul>	0-1	0
Pb	BUZZER TYPE	BUZZER SOUNDS: <ul style="list-style-type: none"> <li>• 0 = DISABLED</li> <li>• 1 = ONLY ON SEL AND ENT PRESSING</li> <li>• 2 = ON SEL AND ENT PRESSING AND REED PULSES</li> </ul>	0-2	2
Su	DATA SAVING	SAVE ALL THE PARAMETERS TO THE FRAM MEMORY		

**P1:** This parameter will set the number of the elevator's stops. The factory default value is 12. It is important that this parameter is set accordingly to the elevator's stops.

**P2:** If needed, with this parameter you can set the maximum travel time alarm (in seconds): if it is set to 0 the control is disabled otherwise an alarm is raised if the time specified in P2 expires. The timer starts to count when a direction relay is activated (up or down direction). If the P2 is set to 1, the LS led will flash during the travel otherwise it will stay always lit.

**Beware!! The timer has to be set in a way that the elevator is able to complete a complete travel from bottom to top floor plus some seconds more.**

This alarm is stored in the FRAM memory, to reset it you have to keep pressed the **SEL** pushbutton at least 2 seconds.

**P3:** With this parameter you can set the following two options: the first one is related to the counting method: the old SIL selector could have one or two pulse at the terminal floors; with one pulse set P3 to 0 or 1, with two pulses set P3 to 2 or 3.

The second option is related to the type of position indicator: the old SIL, during the floor switching had an "empty" signal; this mean that between floors there was no position indication. With P3 set to 0 or 2 the new eSIL act exactly as the old SIL otherwise, with P3 set to 1 or 3 the position will always stay active till the next floor switching.

**P4:** If you want to connect a PTC thermistor to T1-T2 terminals, set the P4 parameter to 1. If you don't need this function set P4 to 0. With P4 set to 1, if the PTC resistance is greater than 2 k $\Omega$  or opened the **tE** alarm will be showed on the display. If the car is moving, the alarm relay will not be triggered, when the car stops at one floor the alarm relay will be triggered after the P5 time is expired.

**P5:** When the PTC exceed the 2 k $\Omega$  value or it is open and the car has reached the floor, the time set in P5 can be useful to wait for the controller to open the door before triggering the alarm relay. Would be useful to set this time in a way that the elevator, after reaching the target floor, can have the time to fully open the door and only after that it can be put in out of service with the meaning of the alarm relay contact of the selector. If you don't use the travel time supervision, you can connect the alarm relay to the photocell circuit to prevent a next start until the motor is cooled down.

**P6:** This parameter will allow you to choose when the alarm relay is triggered: 0 means that the relay will never be triggered, 1 means that the relay will be triggered only with a PTC alarm, 2 means that the relay will be triggered with PTC and travel time errors.

**P7:** This parameter will allow you to set the alarm relay contact output: with 0 the AL1-AL2 contact is normally closed without any alarm and opened if an alarm is triggered, with 1 the AL1-AL2 contact is normally open without any alarm and closed if an alarm is triggered.

**P8:** This parameter will set a small filter time on the C2-C11 inputs, it is sometimes useful to prevent some electrical noises. This time doesn't have any effect on the upper and lower floors. The default value is 20 milliseconds (0,02s). **We recommend not to change this time if not strictly necessary.**

**P9:** This parameter will set a small filter time from the command of a direction count input + ▼  
or + ▲

The select comes out of the factory with the same reaction times of the old SIL, this time can be useful to compensate some mechanical delays which could have been born during the time in the old selector. The default value is 45 milliseconds (0,045s), lowering this time can make the selector to experience multiple triggering due to the reed bouncing. **We recommend not to change this time if not strictly necessary.**

**PA:** With this parameter you can chose the counting sense of the selector: in some SIL installations, the two coils were “inverted” and the same applies to the floor inputs. To determine the counting sense, look at the old SIL coils where there are two arrows: ( ▼ ▲ ) if the left one is the up counting coil then the sense is “standard” (PA = 0) , if the left one is the down counting coil the sense is “inverted” (PA = 1).

**Pb:** This parameter sets the buzzer sound; you can set it to sound only when you press the **SEL** or **ENT** pushbuttons (1) or when there is a reed pulse (2) or mute it (0).

**Su:** With this parameter showed, pressing the **ENT** pushbutton the data are saved and, after that, the selector will show you the current floor; pressing the **SEL** pushbutton will bring you to P1 again.

## 11 RETURN TO DEFAULT FACTORY SETTINGS

In case for any reason you need to reload the factory default settings follow this procedure: power off the selector, press and keep pressed the **SEL** and **ENT** pushbuttons together, power on the selector.

At this point a flashing **dE** will appear on the display, release both **SEL** and **ENT** pushbuttons and, after few seconds, the selector will show 1. All default settings are now loaded according to the chapter 7 PROGRAMMING TABLE (DEFAULT column).

## 12 – TROUBLESHOOTING

THE SELECTOR DISPLAY DOESN'T SHOW ANYTHING:	Check that the power supply between the A+/A- terminals is correct according to the selector's data.
THE SELECTOR NEVER RESET TO THE CORRECT FLOOR AFTER A COMPLETE TRAVEL :	Check that the programmed number stops (P1) match the elevator's stops. Check that the uppermost floor is connected to C12 disregarding the number of stops.
THE SELECTOR COUNTS WRONG:	Check the correct number of magnets at terminal floors (check P3 parameter)
THE ELEVATOR DOESN'T COUNT CORRECTLY OR MAKE A TRAVEL ONLY TO THE TERMINAL FLOORS:	Check that the counter reed pulses are correct with the help of the direction leds (look at 5.3.1 picture 2 part 6 and 7), check that the polarity of the coils is correct.
THE POWER SUPPLY OF THE SELECTOR'S CIRCUIT IS AC ONLY	The eSIL selector is not suitable for this kind of application. For the correct changes to make please contact <a href="mailto:LAB.EL">LAB.EL</a>
THE INPUTS OF THE SELECTOR ARE NEGATIVE (-)	<u>The eSIL selector is not suitable for this kind of application, the C1-C12 inputs needs a positive voltage as input. For the correct changes to make please contact <a href="mailto:LAB.EL">LAB.EL</a></u>
THERE IS NO SUITABLE VOLTAGE FOR THE SELECTOR'S POWER SUPPLY, THERE ARE ONLY VOLTAGES GREATER THAN 85V DC:	In this case you have to use the ESILALI kit to give to the selector the correct power supply voltage. Regarding the C1-C12 inputs you can use a maximum voltage of 140V DC.



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