

3L-SP
Supervising Panel
For
Liquid Leak
Locating System

User's Guide

ELSA: 3L-SP Supervising Panel for Liquid Leak Locating System User's Guide

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1. 3L-SP Control Panel – Turning ON

- Check all power supply cable, communication cable, dry contacts all are properly connected (**see all detail wires connection indication under section 2.0**).
- Switch ON AC Power to 3L-SP.
- Check 3L-SP in TEST mode or self initialization:
 - An audible alarm/buzzer sound.
 - “**POWER**” LED turn on as **GREEN** when power supply is in normal condition.
 - “**LEAK**” LED turn off when all sensing cable connected to SLAVE units (3L-DP, 3L-AP or 3L-LP) do not detect any liquid leakage.
 - “**LEAK**” LED will turn to **RED** when leak occur at any SLAVE unit.
 - “**TROUBLE**” LED turn off when all wires are properly connected (wires for communication and at SLAVE units are well connected).
 - “**TROUBLE**” LED will turn to **YELLOW** when communication cable is not well connected or cable break occur at any SLAVE unit.
- Check LCD displays “**ELSA ADV. SYSTEMS SUPERVISION <ON>**” after self initialization has completed and all are under normal condition.
 - “**Time**” is display on the top left of the LCD.
 - “**Date**” is display on the top right of the LCD.

3L-SP Outlook



2. All wires connection terminals:



(Refer to the above picture with terminal connectors from left to right)

- **Output (To Panels):** Connect RS485 communication cable to Elsa locating panels (any combination of 3L-DP, 3L-AP or 3L-LP refers to as SLAVE units). Connect up to 100 units of any combination of Elsa leak locating panels (referred to as SLAVE).
- **Modbus (To BMS):** Connect RS485 communication cable to Building Management Systems (BMS).

This terminal is also use to **program NAME (up to 35 Characters) for each SLAVE unit and PASSWORD** (default password: 12341234) change by using ONLY ELSA PC software.

- **Trouble Relay:** Sensing cable break or loss of RS485 communication between 3L-SP and SLAVE units (3L-DP, 3L-AP or 3L-LP) will activate this Trouble Relay.

Number of Trouble Relays: 1 unit, Double Pole Double Throw (DPDT).

- **Leak Relay:** Any leak occur at the SLAVE units (3L-DP, 3L-AP or 3L-LP) will activate this Leak Relay of 3L-SP.

Number of Leak Relays: 1 unit, Double Pole Double Throw (DPDT).

- **230 VAC:** 230 VAC input power supply. (12 VAC or 12 VDC is available upon request). Battery Back-UP option is also available.

3. Operation of 3L-SP

On the front face of 3L-SP panel, there are 5 touch buttons.

- “1” - “▲” up arrow touch button or represent as “1”.
- “2” - “√” tick touch button as “OK” or represent as “2”.
- “3” - “▼” down arrow touch button or represent as “3”.
- “4” - “Menu Logo” touch button as Setup or represent as “4”.
- “5” - “Silence Bell” touch button as Alarm/Buzzer sound OFF or represent as “5”.

- Press “Menu Logo” or “4” button and **System Menu** will display as follows:

(3L-SP Panel default password: **12341234**).

- **Event Log Display**

- To display leak or trouble faults up to 896 events.

- **Sound ON/OFF Setup**

- To permanently turn ON/OFF on Alarm/Buzzer.

- **System Setup** (Modbus Interface, Supervised Panels and Time/Date Setup)

- **Modbus Interface**

- Interfacing with Building BMS, assign # 1 – 247 is possible.

- **Supervised Panels**

- Total number of Slave Panels (3L-DP, 3L-AP or 3L-LP) in connection with 3L-SP.

- Up to 100 units of SLAVE units are possible (Slave number set at 3L-DP, 3L-AP or 3L-LP always start from number 1 and onward).

- **Time/Date Setup**

- Set time and date.

4. RS485 Modbus Communication Protocol

RS485 Communication Protocol: Modbus parameters of 3L-SP

- Serial port configuration:** 9600 B, 8 data bits, 1 stop bit, no parity.
- Communication protocol:** MODBUS, functions 3 or 4.
- Slave no.:** Set-up in a configuration menu on panel.
- Maximum no. of words to read per request:** 40, 32 recommended to avoid unnecessary loading of communication lines.

Addresses (3 zones of 200 bytes each):

Alarms/Troubles on Slave (100 words / 200 bytes, spacing of 2 bytes between slaves):

- Slave # 1: 0000h (**xxx0** – no leak, **xxxF** – leak; **x0xx** – no break, **xFxx** – break;
0xxx – no loss in serial comm, **Fxxx** – serial comm lost with Slave device);
- Slave # 2: 0002h (**xxx0** – no leak, **xxxF** – leak; **x0xx** – no break, **xFxx** – break;
0xxx – no loss in serial comm, **Fxxx** – serial comm lost with Slave device);
- Slave # 3: 0004h (**xxx0** – no leak, **xxxF** – leak; **x0xx** – no break, **xFxx** – break;
0xxx – no loss in serial comm, **Fxxx** – serial comm lost with Slave device);
-
-
-
- Slave # 99: 00C4h (**xxx0** – no leak, **xxxF** – leak; **x0xx** – no break, **xFxx** – break;
0xxx – no loss in serial comm, **Fxxx** – serial comm lost with Slave device);
- Slave #100: 00C6h (**xxx0** – no leak, **xxxF** – leak; **x0xx** – no break, **xFxx** – break;
0xxx – no loss in serial comm, **Fxxx** – serial comm lost with Slave device);

Example:

Leak on SLAVE # 1, Break on SLAVE #2, communication lost on SLAVE #3, no alarms on SLAVE #4:

Addresses: 0000h – **000Fh**; 0002h – **0F00h**; 0004h – **F000h**; 0006h – **0000h**;

LEAK LOCATION OF SLAVE DEVICE (100 words / 200 bytes, spacing of 2 bytes between slaves):

Slave # 1: 0100H (0 - NO LEAK ON SLAVE DEVICE; >0 - LEAK LOCATION IN METERS);
 Slave # 2: 0102H (0 - NO LEAK ON SLAVE DEVICE; >0 - LEAK LOCATION IN METERS);
 Slave # 3: 0104H (0 - NO LEAK ON SLAVE DEVICE; >0 - LEAK LOCATION IN METERS);
 •
 •
 Slave # 99: 01C4H (0 - NO LEAK ON SLAVE DEVICE; >0 - LEAK LOCATION IN METERS);
 Slave #100: 01C6H (0 - NO LEAK ON SLAVE DEVICE; >0 - LEAK LOCATION IN METERS);

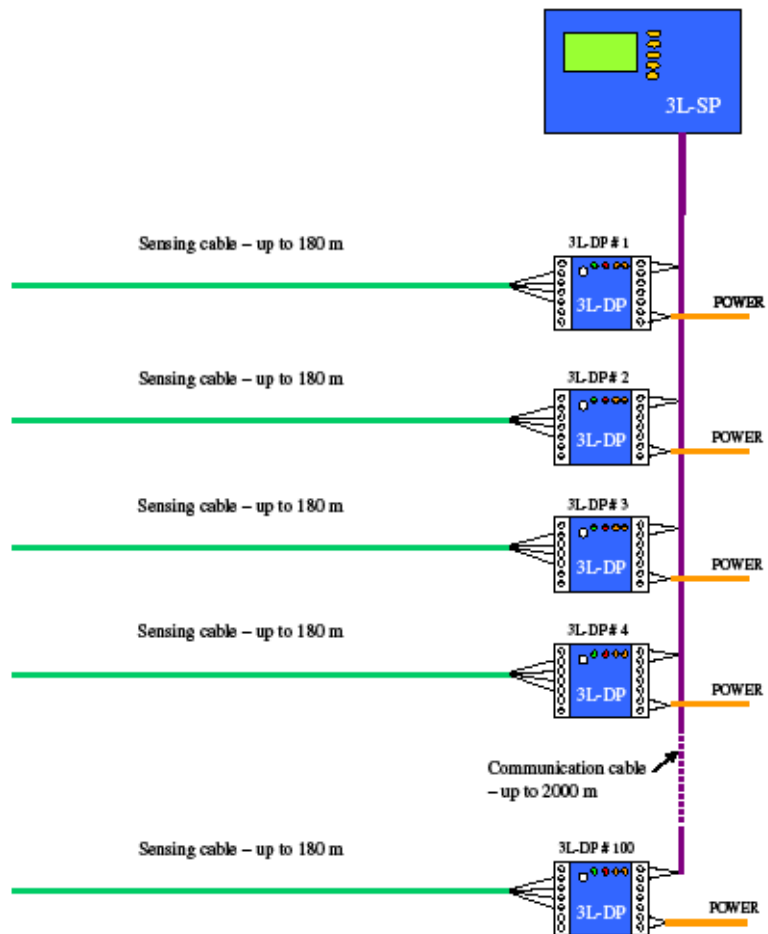
Length of sensing cable of Slave devices (100 words / 200 bytes, spacing of 2 bytes between slaves):

Slave # 1: 0300h (0 - no slave connected; >0 - length in meters);
 Slave # 2: 0302h (0 - no slave connected; >0 - length in meters);
 Slave # 3: 0304h (0 - no slave connected; >0 - length in meters);
 Slave # 4: 0306h (0 - no slave connected; >0 - length in meters);
 Slave # 5: 0308h (0 - no slave connected; >0 - length in meters);
 Slave # 6: 030Ah (0 - no slave connected; >0 - length in meters);
 •
 •
 Slave # 99: 03C4h (0 - no slave connected; >0 - length in meters);
 Slave #100: 03C6h (0 - no slave connected; >0 - length in meters);

- The RS485 polarisation shall be ensured by the supervising station.
- The transmission line shall be terminated by a 120 Ohms/1W resistor at the end of the RS485 link (the last panel of the link).
- The shield of the data transmission cable should be connected to the supervisor’s ground.

5. Typical Application Block Diagram: 3L-SP + 3L-DP x 100 units.

ELSA System Layout
3L-SP with 3L-DP's



6. Troubleshooting (3L-SP + 3L-DP/3L-AP/3L-LP)

- In case lost of PASSWORD at 3L-SP panel, contact ELSA office for master PASSWORD.
- Liquid leakage is detected when there is no obvious liquid presence. The possible reasons are as follows (it is highly recommended to replace the affected section):
 1. The sensing cable was badly contaminated by some chemical for unknown reason.
 2. The sensing cable was coated with glue, epoxy and paint accidentally.
 3. The 2 black sensing wires are in contact or not isolated properly.
- Use a bright led torch light to identify the location of the physical liquid leakage area which is more visible by naked eye. Some leakage is difficult to be observed due to very small volume of liquid presence and the environment is too dark.
- Cable break is detected where no visible wire cut externally is observed:
 - Check the 4 wires continuity by a multi-meter.
 - Check the 4 connection points of the leader cable to the control panel are secured properly.
- If leak location is not accurate:
 - This may probably due to small amount of liquid still exists at different points on the sensing cable.
 - Also, it can be due to some contamination with electrostatic dust, transparent chemical or glue deposited on the cable.
 - Check the cable with naked eye and clean the cable with dry cloth.

7. Maintenance

- It is recommended to conduct quarterly check on ELSA leak detection system performance by authorized ELSA distributors/installers.
- During quarterly checking and maintenance:
 - Re-initialize 3L-SP panels & all SLAVE units (3L-DP, 3L-AP or 3L-LP) to check total sensing cable length detected versus the actual sensing cable installed at sites.
 - Conduct check list as per page 11 – 14 (Testing & Commissioning Check List).
 - Check physically on the sensing cable surface cleanliness and free from any chemical contact.
- For any parts replacement or extension, ELSA local distributors offer ex-stock and will provide an immediate turnaround service to meet the requirements.

8. Manufacturing product information and contact

- www.elsaadv.com
- enquiry@elsaadv.com

9. Testing & Commissioning Check List

Test & Commissioning Check List

Project name : _____

Location or site name: _____

Customer name: _____

ELSA product model: _____

Installer completion date: _____

Installer company name: _____

Installer name & designation: _____

Installer signature: _____

Approval Conducted By:

Customer's Representative: _____

Representative name & designation: _____

Representative signature: _____

Check and approve date: _____

Remark: _____

Function Testing:

- Turn ON all panels for 3L-SP (Supervising Panel) + (3L-DP, 3L-AP and/or 3L-LP) and conduct self-test mode.

Functioning Approved

		Functioning	Approved
1.	Check buzzer sound and audible level.		
2.	Check "Leak" & "Trouble" LEDs switch-on for ONLY 1 second on 3L-SP as test.		
3.	Check total length of the sense cable and communication cable are all well connected.		
4.	Check Dry Contacts activate.		
5.	Check the system is operating normally (under no fault condition). LCD display is in normal condition for 3L-SP & 3L-AP. LED light up for 3L-DP & 3L-LP.		
6.	Check Hold down clip fixed properly and no glue attached to sense cable. Also check Tag/Label is installed and marking precisely with distance on the sensing cable.		

Remarks: _____

Leak simulation:

- Place about 20mm to 200mm (depend on sensitivity level adjustment) of water in continuous contact on the sense cable.

Functioning Approved

1.	Check LCD on the panel display Leak Alarm & Distance.		
2.	Check "Leak" LED switch to RED on 3L-SP.		
3.	Check Buzzer sound, acknowledge it with Silence Button.		
4.	Check LCD display leak location accuracy against Tag/Label marking.		
5.	Check Leak Relay/Dry contact activated.		

- Remove and dry the water on the sense cable by dry cloth.

Functioning Approved

1.	Check LCD display is back to normal (no fault) condition.		
2.	Check "LEAK" LED switch off on 3L-SP.		
3.	Check Leak Relay/Dry contact de-activated.		
4.	Check & simulate leak at different points on the sense cable. If necessary, adjust the leak sensitivity to meet the site requirement.		

Remarks: _____

Cable Break simulation:

- Disconnect one or two wires connection at the sensing cable connection points of the control panel unit (3L-DP, 3L-AP or 3L-LP).
- Alternatively, disconnect a pair or all 4 wires on the sensing cable end point if end-termination method is in use.

Functioning Approved

1.	Check LCD on 3L-SP panel displays Cable Break message.		
2.	Check "Trouble" LED switch to Yellow on 3L-SP.		
3.	Check Buzzer sound, acknowledge it with Silence Button.		
4.	Check Cable Break Relay/Dry contact activated.		

- Re-connect back all the sensing cable connection points which were previously disconnected.

Functioning Approved

1.	Check LCD display is back to normal (no fault) condition.		
2.	Check "Trouble" LED switch off on 3L-SP.		
3.	Check Cable Break Relay/Dry contact de-activated.		

Remarks: _____

~ END ~