

# UC-50 & LSP-X01 Series

## Startup Guide



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Pyxis Lab Inc.  
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## Catalog

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## 1. UC-50 & LSP-X01 Series Overview

The Pyxis UC-50 is a universal and preconfigured micro-display and data logging terminal that can connect any Pyxis sensor via RS-485. The UC-50 requires minimal user configuration when connected to Pyxis sensors. When Pyxis sensors are landed via RS-485 Modbus, the UC-50 allows the user to select the Pyxis sensor through a pre-programmed drop-down menu. Once the user has selected the Pyxis sensor from the menu, the UC-50 immediately recognizes the sensor for live sensor value, color trend charts as well as sensor diagnostics and calibration interface while logging data for USB download. The UC-50 provides RS-485 and 1x 4-20 mA outputs as well as one 24VDC Relay output for connection to additional controllers, PLC or DCS systems.

The Pyxis LSP Series are pressure based submersible level sensors offered in 316L (LSP-101), PVC (LSP-201) and PVDF (LSP-301) formats for a variety of liquid level applications. All LSP-Series sensors provide continuous level measurement up to 393-inch (32.8-ft. or 10-meter) with a 4-20mA & RS-485 output with integrated Bluetooth® for those desiring the configure via the Pyxis **uPyxis**® mobile or desktop app.

**\*NOTE\*** This manual uses the Pyxis LSP-301 level sensor as an example to describe the UC-50 functions and features.

## 2. Specification

Item	UC-50
P/N	43007
Power	110/220VAC 50/60 Hz, 0.6A
Display	2.8" Color 320 x 240 Resolution
Output	1 x 4-20 mA / RS-485 Modbus-RTU
Input	1 x 4-20 mA / RS-485 Modbus-RTU
Relay Output	One channel relay output, 24VDC – 10 Watt Maximum
Data Storage	32 M Flash
USB	1 x USB host for data downloading
Dimension	6.3 inch L x 3.9 inch W x 2.6 inch D
Weight	4.6 lbs / 2.1 kg
Operation Temperature	32 – 122 °F (-0 – 50 °C)
Storage Temperature	-4 – 158 °F (-20 – 70 °C)
Humidity	5 – 95% No Condensation
Protection	IP-65
Regulation	CE, RoHS

Item	LSP-101	LSP-201	LSP-301
P/N	54012	54013	54014
Power Supply	24 VDC, 2W		
Output	4-20 mA / RS-485		
Bluetooth	Bluetooth 5.0, 32 ft. (10 Meters) Line of Sight for uPyxis Configuration only		
Submersion Cable Length	32.8 ft. (10 m)		
Range	0 – 393 inches H2O (0 – 10 m H2O)		
Resolution	0.02 inch (0.5 mm)		
Accuracy	±0.2% of the range		
Stability	±0.2% URL / year		
Measurement Interval	Continuous		
Installation	1-inch NPT Display Threading / 1.5" NPT Transducer Diameter		
Weight	3.1 lbs (1400 g)		
Enclosure Material	Polycarbonate (PC)		
Transducer Material	<b>LSP-101</b> = 316L Stainless Steel Transducer <b>LSP-201</b> = PVC Transducer <b>LSP-301</b> = PVDF Transducer		
Cable Material	PTFE		
Temperature	Working: 14 - 140°F (-10 - 60 °C) / Storage: -4 - 158°F (-20 - 70 °C)		
Enclosure Rating	IP-66		
Transducer Rating	IP-68		
Regulation	CE / RoHS		

\*As Pyxis technology is continuously updated, this technical parameter may change at any time without notice.

### 3. Unpackaging & Sensor Connection

The UC-50 is provided as one item with no loose wiring or power cord. The internal power supply terminal input allows users to install in a hard-wired format for safety. For users desiring to power the UC-50 via outlet, a NEMA-5 power supply with plug should be utilized. Each Pyxis Lab LSP series level sensor is provided with a 10-foot lead with 7-pin waterproof adapter. The flying lead cable should be landed to the UC-50 terminal board and adapter end of the cable should be connected to its respective LSP series sensor. Extension cables are available as an optional accessory for longer distance installations. Contact [order@pyxis-lab.com](mailto:order@pyxis-lab.com) for details.



## 4. Dimension

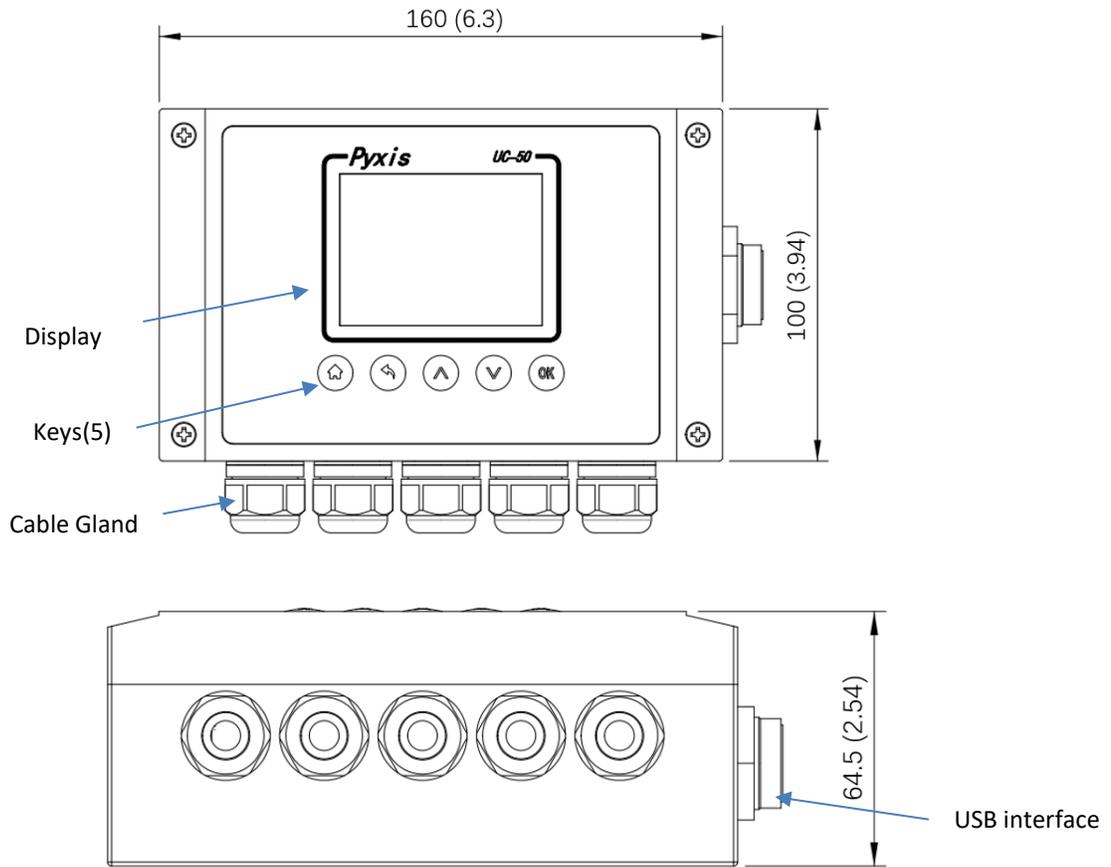


Figure 1. Dimensions, unit: mm(inch)

## 5 Electrical Connection

### 5.1 LSP-301 wiring

Follow the wiring table below to connect the LSP-301 to the UC-50.

Wire Color	Designation
Red	24 V +
Black	Power Ground
Blue	RS-485 A
Yellow	RS-485 B

### 5.2 UC-50 TERMINAL BOARD WIRING DIAGRAM

**⚠ WARNING** Any wiring of the UC-50 should only take place while the device is de-energized. Please refer to the wiring terminal diagram below for the UC-50 display/data logger. The flying lead cable should be landed to the UC-50 terminal board and brush bulkhead cable will attach to the flying lead cable via the provided adapters. The four LSP-301 sensors should be connected to one single RS485 bus. After UC-50 is power on, please refer to chapter 6.3.3 to assign the specified Modbus address for each LSP-301.

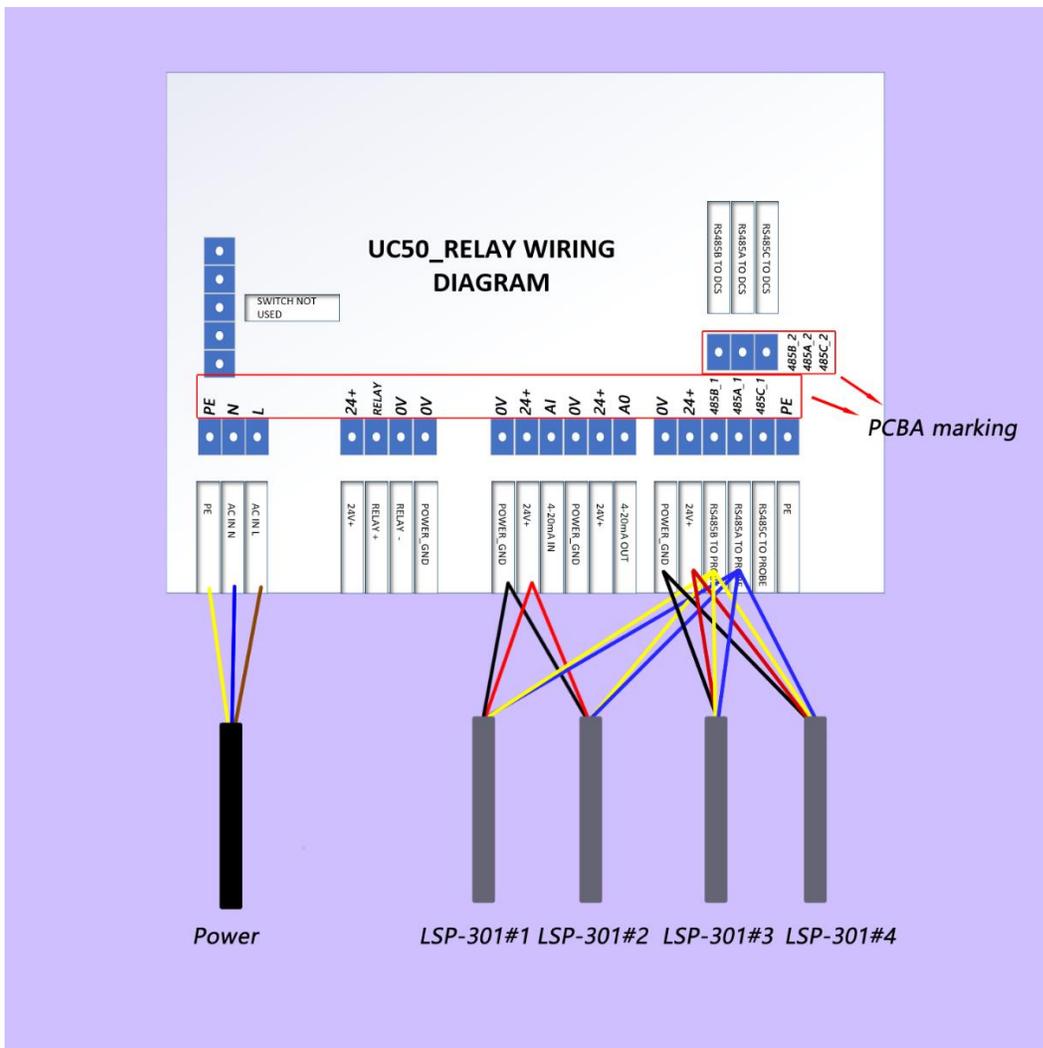


Figure 2. AC-Power Supply and Input/Output Wiring

## 6. UC-50 Operation

### 6.1 Main Screen

The UC-50 may be configured to connect to LSP-301 sensor by default when it leaves the Pyxis factory if ordered with the LSP-301 sensor. Alternatively, the user may select the sensor name through the menu interface. After the UC-50 is turned on, the main interface of the UC-50 will display the current liquid level and temperature value. The green dot in the upper right corner of the UC-50 main interface indicates that the UC-50 is operating normally. If used, the 4-20mA input signal, 4-20mA output signal and relay output states are displayed at the bottom of the UC-50 main interface.

The UC-50 supports connection of up to four LSP-301 sensors and displays four channel measure values at the same time, each LSP-301 can be set individually. Press  to set the corresponding channel sensor. Press  to the UC-50 setting menu.



Figure 3. Main Screen

**\*Note\*** If UC-50 fails to connect to the sensor, measurement values will not be displayed. There may be two reasons for this situation.

- **Electrical Connection Error** – Please check electrical connection refer to section 5.2
- **Modbus Address Error** – Please refer to section 6.3.3 to assign the Modbus address for the sensor.

### 6.2 Button Function

-  **Main key**-Return to the main screen from any interface
-  **Back key**-Return to the last displayed screen or open the setting menu
-  **Up / Down key**-Select different settings or adjust parameters
- OK key** -Confirm to enter a settings page or confirm parameters

## 6.3 Configuring the LSP-301 Sensors

### 6.3.1 Enter the Density (kg/m<sup>3</sup>) of Liquid

**Main Screen**  

The LSP Series sensor measures the hydrostatic pressure created by the liquid level in the tank. Converting this measured pressure value to other parameters such as the tank level requires the density of the liquid. Highlight the **Density (kg/m<sup>3</sup>)** field (highlighted field is black), then press **OK** for editing (edit mode is blue), press the ▲ or ▼ until the desired value is selected.

**\*NOTE\*** - For UC-50 density settings users are required to convert to kg/m<sup>3</sup>.

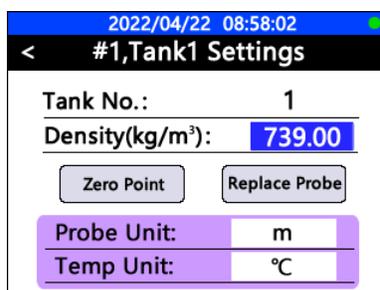


Figure 4. Sensor Setting Screen

### 6.3.2 Zero-Point Adjustment

Due to the installation location of the LSP-301 sensor, there may be a shift in the measured value so when the container is empty, the measured value does not display zero. Users may correct this zero-point shift by the following steps.

1. Place the LSP-301 sensor in the air.
2. From the main page, select  to the sensor setting screen and press **Zero Point**.
3. Measured value (after zero adjust) will display 0m.

### 6.3.3 Assign the Specified Modbus Address for each LSP-301

Please assign the specified Modbus address for each LSP-301 sensor according to the following steps (e.g., prepare a probe and connect it to channel 1):

1. Connect only one LSP-301 sensor at a time to UC-50.
2. From the main page, select  to the sensor setting screen for channel 1 and press **Replace Probe**. The UC-50 will assign the specified Modbus address to the LSP-301.
3. Press  to the main screen. If the connection is successful, channel 1 will display the sensor reading.
4. Disconnect channel 1 sensor and repeat the steps to set the second sensor, until four LSP-301s are set successfully.

### 6.3.4 Set Temperature & Probe Units of Measure on Main Display

The default unit of temperature display is Celsius, and default unit of probe display is meter. In **Sensor Setting Page**, user can switch the display units of these two measurement parameters as needed.

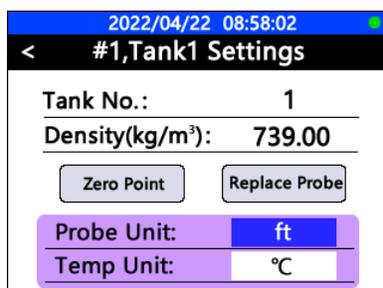


Figure 5. Set Probe unit as ft



Figure 6. Set Temp unit as °F

Press  back to the main page to view the temperature and probe unit of measure selected on the main display.

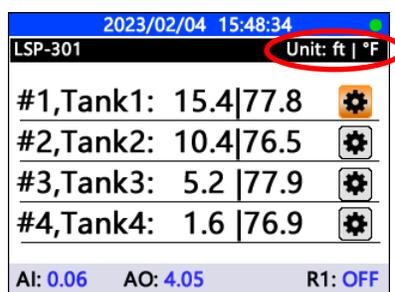


Figure 7. Main Page

### 6.4 Trend Chart

**Main Screen**  

From the main screen, Press  or  until you arrive at **Trend Chart** screen (Figure 8). Measured values will be displayed as a line graph to show the real-time trend. Press  or  to return to the main screen.

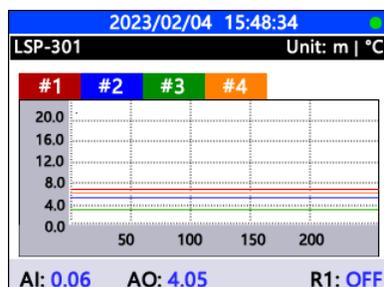


Figure 8. Trend Chart

### 6.5 View Historical Data & Set Data Storage Period

**Main Screen** → [Left Arrow] → [Up Arrow] or [Down Arrow] → **[Historical Data]** → **OK** → **[View Historical Data] or [Set Data Storage Period]** → **OK**

UC-50 controller stores measurement data of LSP-301 every 60-seconds. This time period may be adjusted if desired by the user. You can browse the data of different time periods with the ▲ and ▼ keys. The data types from left to right are the liquid level values from channel 1 to channel 4.

Time	---
2023/02/05 14:47	3.8/3.2/0.5/1.7
2023/02/05 14:46	3.8/3.1/0.5/1.7
2023/02/05 14:45	3.7/3.2/0.4/1.5
2023/02/05 14:44	3.6/3.0/0.4/1.5
2023/02/05 14:43	3.6/3.2/0.4/1.5
2023/02/05 14:42	3.6/3.2/0.3/1.3
2023/02/05 14:41	3.4/3.2/0.3/1.1
2023/02/05 14:40	3.3/3.2/0.3/1.1
2023/02/05 14:39	3.3/3.2/0.3/1.1
2023/02/05 14:38	3.1/3.2/0.3/1.0

Figure 9. Historical Data

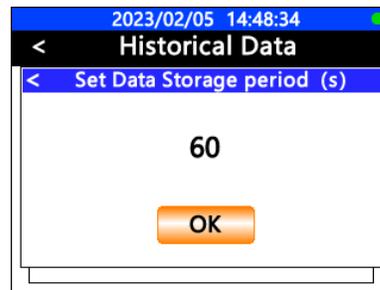


Figure 10. Set Period

### 6.6 USB Operation

UC-50 has a built-in USB interface to support historical data export and firmware upgrade function. Before accessing USB functions, please make sure USB thumb drive is properly plugged into UC-50 USB interface.

**\*NOTE\*** For data download and upload to the UC-50 a USB device with a storage capacity between 8 and 64GB is recommended.

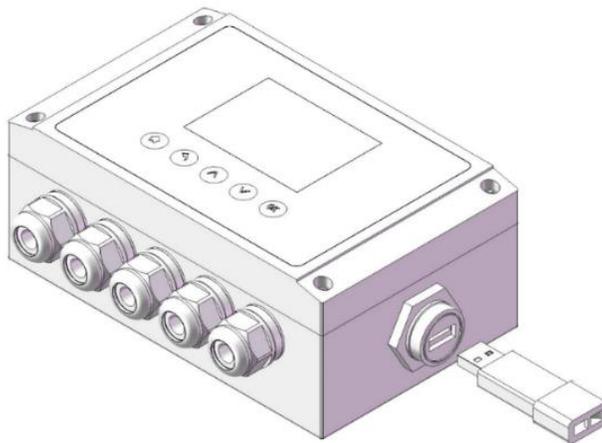


Figure 11. Insert USB Thumb Drive

### 6.6.1 Export Historical Data

Main Screen → [Back] → [Up] or [Down] → [USB Settings] → OK → [Data Export] → OK

Further select the historical data date and time range or simply choose All Export to export all historical data. Once data export is 100% completed, you can safely unplug the USB thumb drive.



Figure 12. Specify Date & Time Range



Figure 13. Export Historical Data

### 6.6.2 Upgrade UC-50 Firmware

Main Screen → [Back] → [Up] or [Down] → [USB Settings] → OK → [Program Upgrade] → OK

Copy the target UC-50 firmware file (.bin) to the root directory of USB thumb drive, plug the thumb drive to UC-50 USB interface (figure 11), UC-50 will automatically start firmware upgrading procedure and reboot itself once the procedure completed.

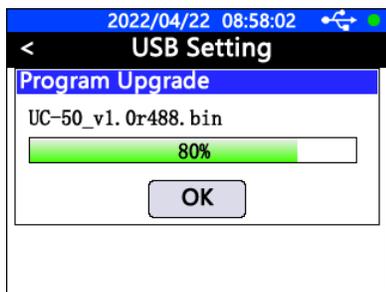


Figure 14. Updating

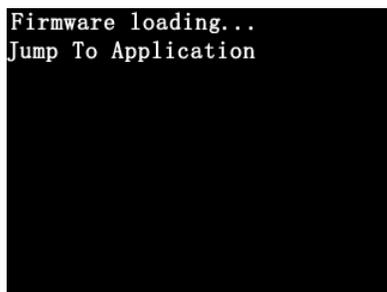


Figure 15. Jump To App

### 6.7 Adjusting the Date & Time



From the **system information screen**, use the ▼ button to highlight the **Time** field (highlighted field is black), then press **OK** for editing (edit mode is blue), press the ▲ or ▼ until the desired value is selected. Once setting, Hit the **OK** Key to confirm the new desired value.

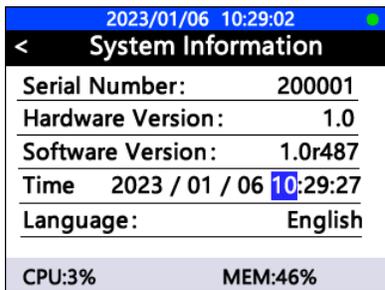


Figure 16. Set Date & Time

### 6.8 Set Language

From the **system information screen**, use the ▼ button to highlight the **Language** field (highlighted field is black), then press Home + OK keys in the same time, a dialog box for language options will display.



Figure 17. Set Language

## 7. Methods to cleaning LSP Series Transducer

For best performance, following the steps below to clean the submersible pressure transducer if necessary:

- 1) Hold the body of the transducer with one hand and carefully remove the protective nose cap by simply unscrewing it from the transducer body. Do not touch the sensor diaphragm and do not dry the inside portion of the transducer, as you risk damaging the pressure sensor.
- 2) Place the transducer in a vertical position with the sensing end facing downward in a bowl containing Pyxis ST Series Sensor Cleaner (P/N: SER-01) for approximately 1 minute.
- 3) Place the protective nose cap in the same solution for approximately 1 minute.
- 4) Rinse the bowl with clean water and wipe dry the external casing of the transducer and the protective nose cap.
- 5) Screw the protective nose cap back into place on the transducer body.



Figure 18. Pyxis Probe Cleaning Solution Kit (P/N: SER-01)

## 8. Order Details

### Order Information

	P/N
UC-50 ( <i>UC-50 Display &amp; Data Logging Terminal-Single Channel</i> )	43007
LSP-301 ( <i>Pressure Level Sensor with PVDF Transducer</i> )	54014
MB-LSP-100 ( <i>LSP Series Wall Mount Bracket</i> )	50770
10' LS/LSP Series Waterproof Cable-7Pin Adapter w/Flying Leads	50774
25ft Waterproof Extension cable	50775
50ft Waterproof Extension cable	50776
100ft Waterproof Extension cable	50777

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