

# UC-50 Display/Data Logger User Manual



June 2021

## Catalog

<b>1. UC-50 Overview .....</b>	<b>- 1 -</b>
<b>2. Specifications .....</b>	<b>- 3 -</b>
<b>3. Pyxis Sensors Supported .....</b>	<b>- 3 -</b>
<b>4. Unpackaging .....</b>	<b>- 3 -</b>
<b>5. Dimension and Mounting.....</b>	<b>- 3 -</b>
<b>6. AC Power to UC-50.....</b>	<b>- 3 -</b>
<b>7. 4-20mA Output Wiring from UC-50.....</b>	<b>- 3 -</b>
<b>8. UC-50 Operation .....</b>	<b>- 4 -</b>
8.1. Button Functions.....	- 4 -
8.2. Main Screen .....	- 4 -
8.3. Sensor Type Selection .....	- 7 -
8.4. System Information .....	- 7 -
8.5. Calibration .....	- 7 -
8.5.1. Zero Calibration .....	- 7 -
8.5.2. Slope Calibration .....	- 8 -
8.6. 4-20 mA Output Setting .....	- 8 -
8.7. Historical Data and Historical Trend .....	- 9 -
8.8. USB Operation.....	- 10 -



## 1. UC-50 Overview

The Pyxis UC-50 is a preconfigured push-button color micro-display and data logging terminal that can connect any Pyxis sensor via RS-485, 4-20mA or BlueTooth 5.0 connectivity. This microprocessor-based display requires no configuration when connected to Pyxis inline sensors. When Pyxis sensors are landed via RS-485 modbus, 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 Relay output for connection to additional controllers, PLC or DCS systems.

**\*NOTE\*** This manual uses the Pyxis ST-774 ultra-low dissolved oxygen as an example to describe the UC-50 functions and features.

## 2. Specifications

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
BlueTooth	BlueTooth 5.0 - Capable of Reading Pyxis Bluetooth Sensors
Regulation	CE, RoHS

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



### 3. Pyxis Sensors Supported

The table below lists the currently supported Pyxis sensors for use with the UC-50 in RS-485 user guided interface. When a UC-50 is ordered, any Pyxis sensor can be specified in the order. If the sensor is not covered in the table below, the Pyxis service term will enable the sensor type requested in the order before shipping.

Sensor Name	Unit(s) of Measure	Output Range(s)
ST-500	PTSA (ppb)	0 – 300 ppb
ST-525	Fluorescein (ppb)	0 – 60 ppb
ST-525-HR	Fluorescein (ppb)	0 – 500 ppb
ST-588	PTSA (ppb) / Tagged Polymer (ppm)	0 – 300 ppb / 0 – 20 ppm
ST-600	Chlorine in Bleach (%)	0 – 16 %
ST-601	CIO <sub>2</sub> in Solution (%)	0 – 0.35 %
ST-604	Chlorine in Bleach (%)	0 – 2.0 %
ST-710	pH	0 - 14 pH
ST-711	ORP (mV)	+1,500 mV
ST-712	pH + ORP (mV)	0 – 14 pH / ±1,500 mV
ST-720	Temp + Conductivity	1 - 100,000 µs/cm
ST-725	Temp + Conductivity	0.02 - 200 µs/cm
ST-726	Temp + Conductivity	10 - 300,000 µs/cm
ST-730	Turbidity (NTU)	0 – 100 NTU
ST-730B	Turbidity (NTU)	0 - 1,000 NTU
ST-735	Turbidity (NTU)	0 – 10,000 NTU
CR-300	LPR Corrosion	0-995 MPY / 0-100 Pitting
CR-301	High Temperature LPR Corrosion	0-995 MPY / 0-100 Pitting
LT-736	Ultra-Low Turbidity – White Light	0.001 – 1,000 NTU
LT-736B	Ultra-Low Turbidity - InfraRed	0.001 – 1,000 NTU
LT-737	Ultra-Low Turbidity – White Light	0.001 – 5 NTU
LT-737B	Ultra-Low Turbidity - InfaRed	0.001 – 5 NTU
LT-739	Ultra-Low Turbidity – White Light	0.001 – 40 NTU
LT-739B	Ultra-Low Turbidity - InfraRed	0.001 – 40 NTU
ST-765	Free Chlorine + pH	0 – 5 ppm / 0 – 14 pH
ST-772	Dissolved Oxygen (ppm)	0.004 - 20 ppm
ST-774	Ultra-Low Dissolved Oxygen (ppb)	0.4 – 2,000 ppb
LS-200	Ultra-sonic Level (distance/volume)	0 - 106 inches
LSP-101	Pressure Tranducer – Stainless	0 – 10 meters H <sub>2</sub> O
LSP-201	Pressure Tranducer – PVC	0 – 10 meters H <sub>2</sub> O
LSP-301	Pressure Tranducer – PVDF	0 – 10 meters H <sub>2</sub> O
LSP-301P	Pressure Transducer - PVDF	0 - 40 meters H <sub>2</sub> O

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

## 4. Unpackaging

The package includes the following item

- UC-50
  - NEMA 5 power cord not included with UC-50. Customer provided.

If the UC-50 is ordered with a Pyxis sensor, the short cable that can be connected to the sensor may have been installed to the UC-50 terminals.

## 5. Dimension and Mounting

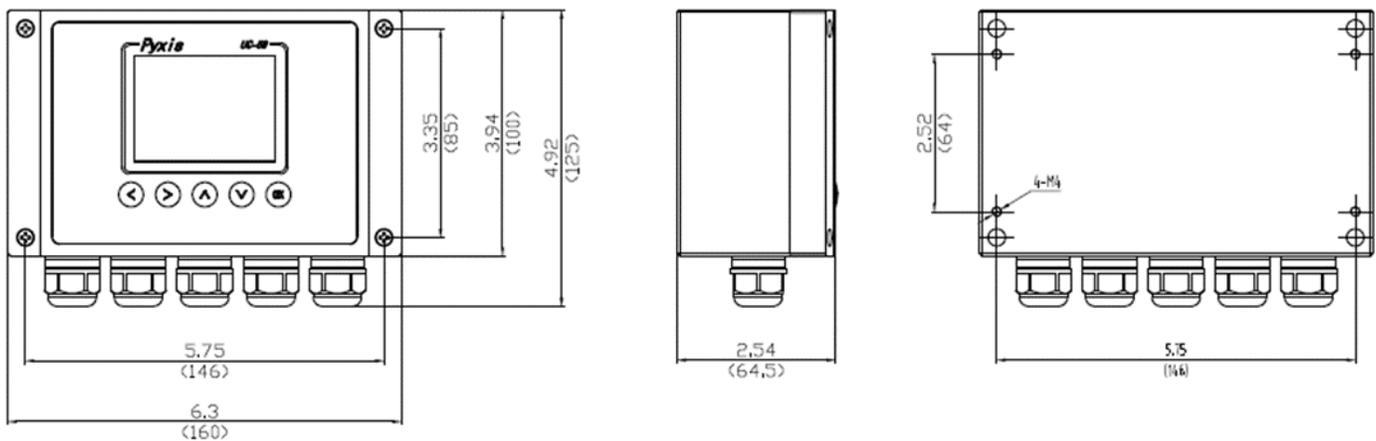


Figure 1. Dimensions / Mounting Dimensions

## 6. AC Power to UC-50

Wire an AC power cord to the power terminals on the left (Figure 2) according to the terminal designations **PE** (Earth ground), **N** (Neutral), and **L** (Hot).

## 7. 4-20mA Output Wiring

Wire the 4-20mA output according to the wiring information shown in Figure 2.

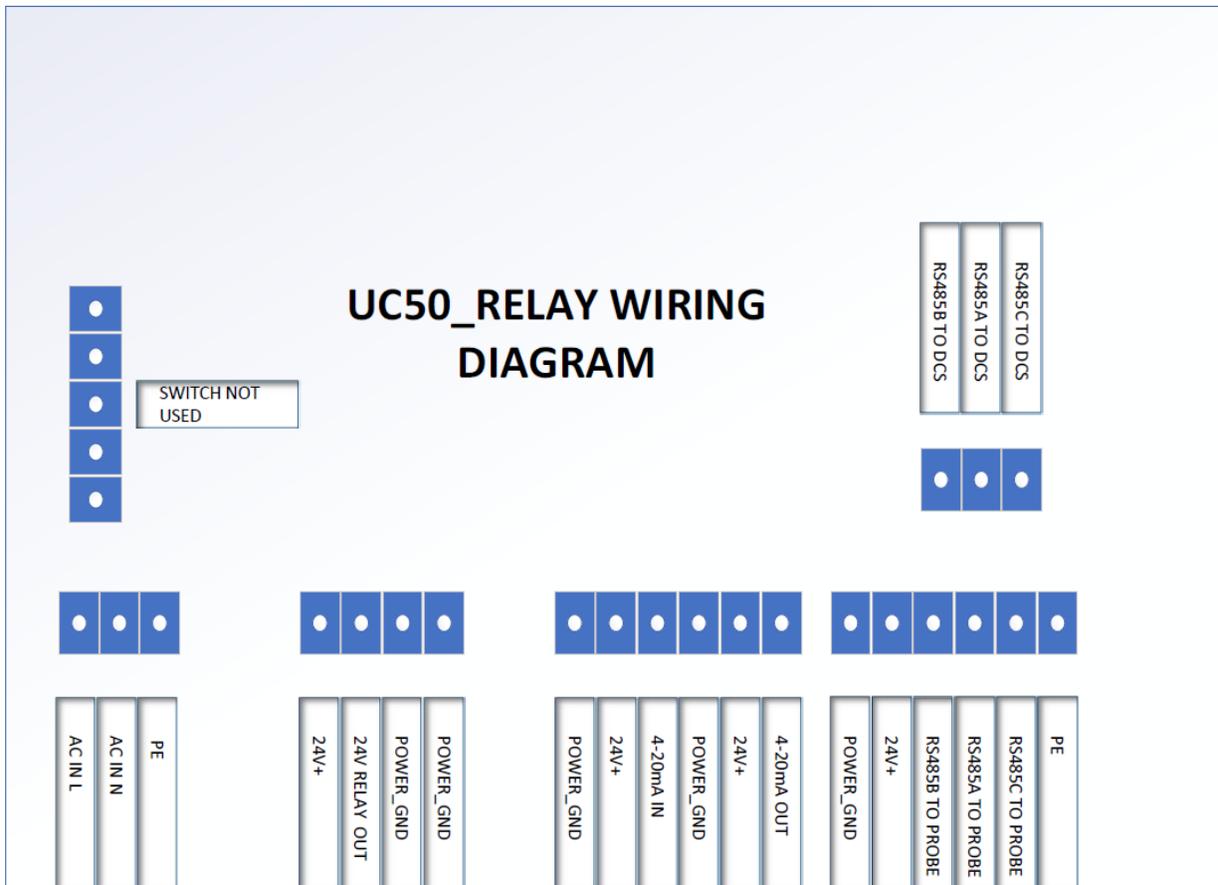


Figure 2. AC-Power Supply and Input/Output Wiring

## 8. UC-50 Operation

### 8.1. Button Functions

The house button on the left is for returning to the main screen from any screens (Figure 3). The left arrow button (second from the left) is for returning to the previous screens. The up and down buttons are for selecting items on the screen by moving the selection focus up, down, left, or right. The up and down buttons are also used to enter a numerical input. Single click or hold on these two buttons will increase or decrease the numerical value in the selected input fields. The OK button is for the selection confirmation, like the enter key on a computer keyboard.

## 8.2. Main Screen

For representation purposes, this manual demonstrates interace with the Pyxis ST-774 dissolved oxygen sensor. The UC-50 is configured to read and display measurement data from the Pyxis ST-774 dissolved oxygen sensor and many other digital sensors (see table in Pyxis Sensors Supported Section 3.0).

The system time, ST-774 DO ppb reading and the sample temperature measured by the ST-774 are displayed on the main screen. The green dot on the upper right of the screen indicates normal communication between the UC-50 and the ST-774 probe. In the bottom of the screen, the analog input (AI) value, the analog output (AO) value, and the relay status (R1) are shown. The UC-50 contains only one contact relay output which may be assigned to upper and lower values of any sensor input as determined by the user. **\*NOTE\*** This display is a representative example of how other digital Pyxis sensors will appear in the UC-50 interface via RS-485 modbus communication.

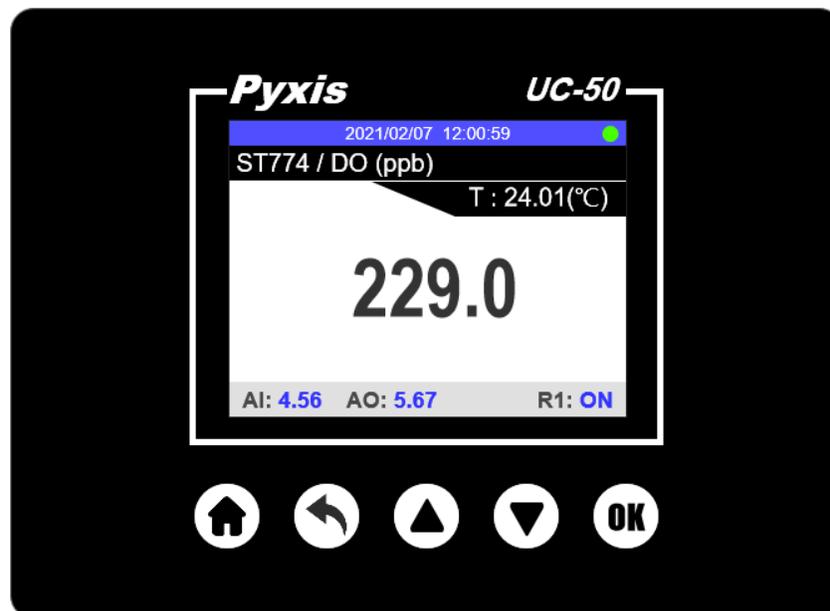


Figure 3. Main Screen

## 8.3. Sensor Type Selection

Click the left arrow key to launch **Settings** screen from the main screen. Click **Probe settings** to launch **Probe Settings** screen (figure 5). Click **Probe Type** to show the probe dropdown selection list (Figure 5).

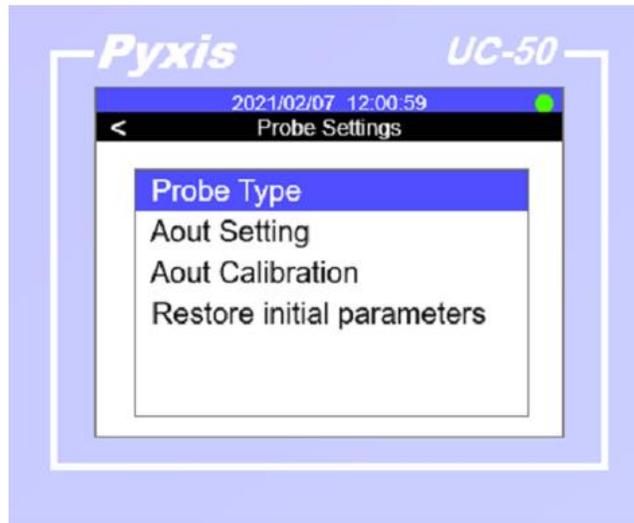


Figure 4. Probe Type Selection

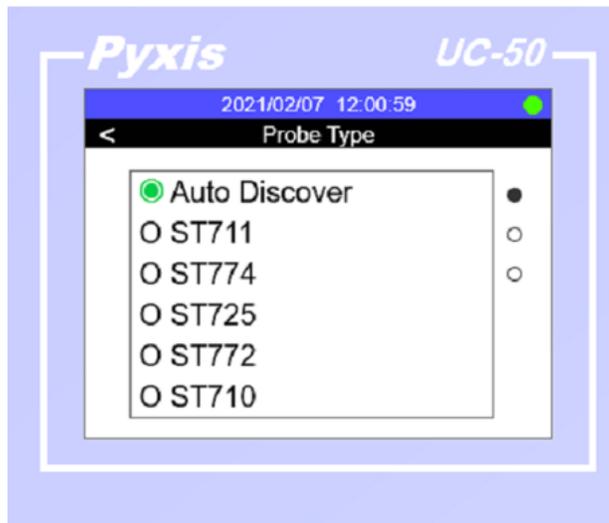


Figure 5. Selecting a Pyxis Sensor Type from Drop-Down List

Use the **Up** and **Down** key to select a sensor type and Click **OK** to confirm the selection.

### 8.4. System Information

Click the left arrow button to launch the system settings screen. Use the down button to select **System Information**. The UC-50 serial number, the hardware version and software version are shown in the System Information screen. Use the down button to highlight the Time field. Reset date or time if necessary.

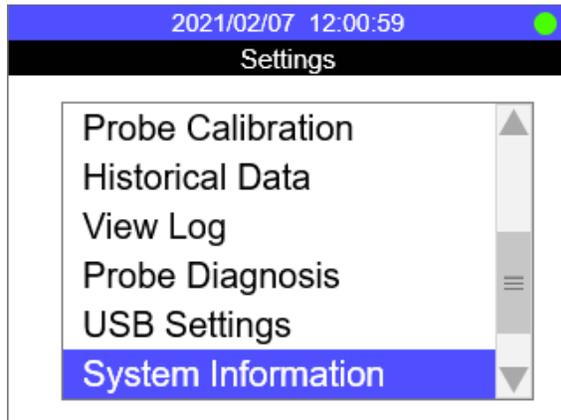


Figure 6. Settings

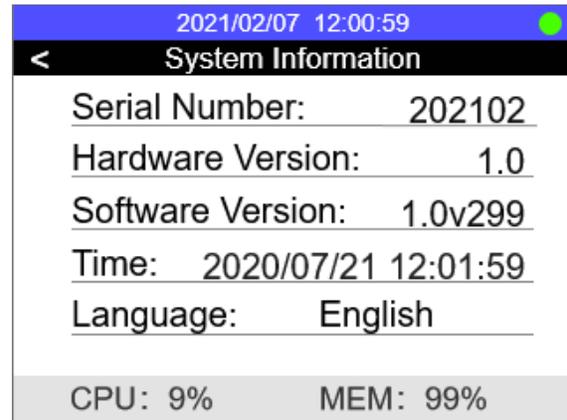


Figure 7. System Information

### 8.5. Calibration

#### 8.5.1. Zero Calibration

Select **Probe Calibration** from the screen shown in Figure 6. Select **Zero Cal**. Establish the zero-calibration gas flow for 15 minutes or until the ppb reading is stabilized. **\*NOTE\*** in the case of other Pyxis sensors, please follow the UC-50 prompt messages or specific sensor operation manual for proper ZERO calibration if required. Press OK button on the **Zero Cal** page to start the zero calibration. If the zero calibration is complete, a calibration succeed message will be prompted.

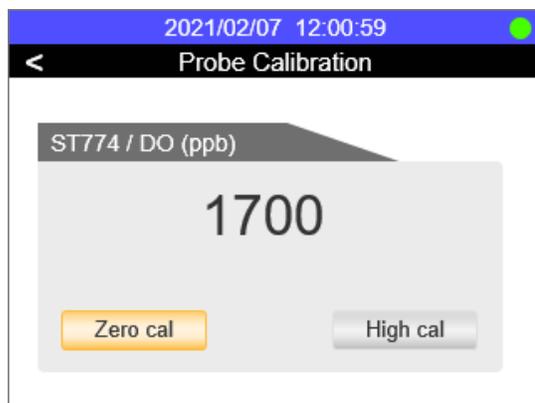


Figure 8. Zero Calibration

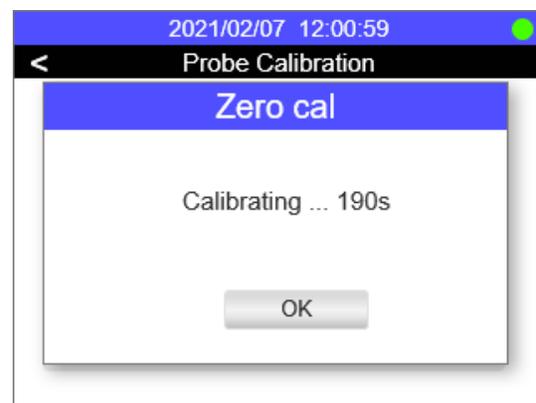


Figure 9. Zero Calibration Waiting

### 8.5.2. Slope Calibration

Select **Probe Calibration** from the screen shown in Figure 6. Select **High Cal**. Establish an oxygen containing calibration gas flow for 15 minutes or until the ppb reading has stabilized. Press OK on the **High Cal** to start the slope calibration. Use the up/down button and OK button to enter in the oxygen percentage value. Use the up and down button to change this value to the oxygen percentage concentration in the calibration gas being used. If the slope calibration is complete, a “calibration succeed” message will be prompted.

**\*NOTE\*** The value shown in Figure 10 is the oxygen percentage in the calibration gas, not the dissolved oxygen concentration in ppb or ppm. The ST-774 probe will automatically convert the oxygen percentage concentration along with the measured barometric pressure and temperature to the precise dissolved oxygen concentration in ppb or ppm during the calibration process.

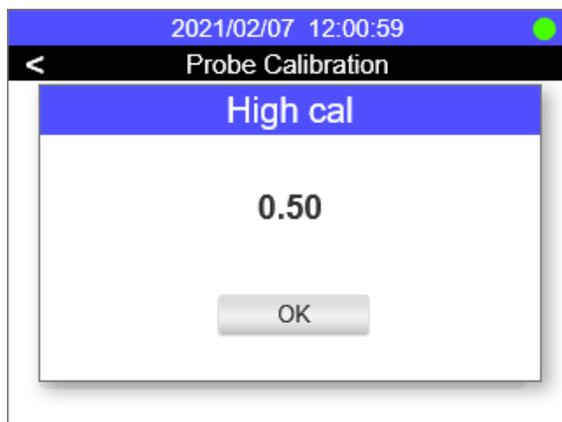


Figure 2. High (slope) Calibration

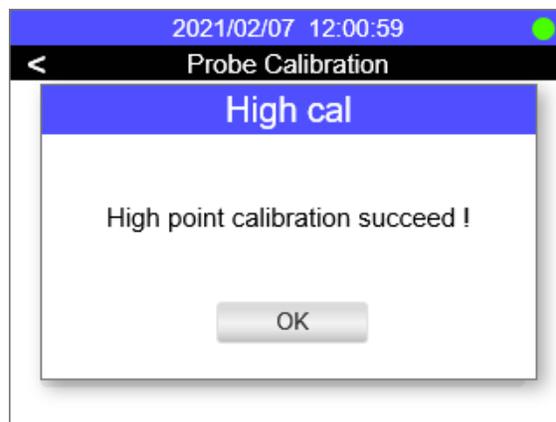


Figure 3. Calibration Succeed

### 8.6. 4-20 mA Output Setting

Select Probe Settings from the Settings screen. Change the 4-20 mA scale via interface shown in Figure 12. The unit for DO is ppb ( $\mu\text{g/L}$ ).

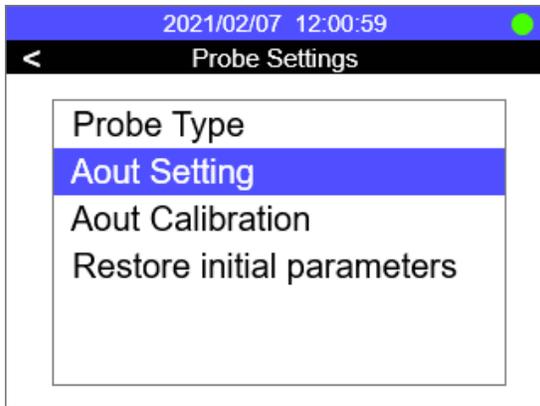


Figure 4. Probe Setting

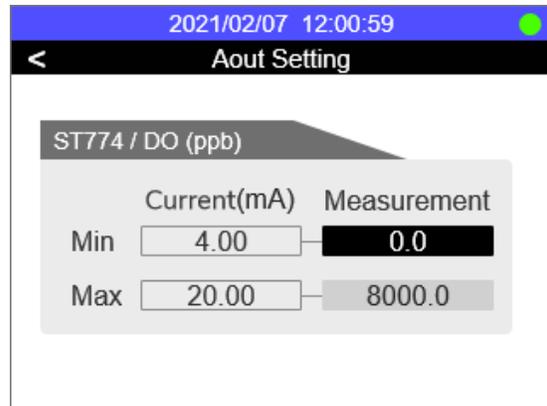


Figure 5. Setup 4-20 mA Output Scale

### 8.7. Historical Data and Historical Trend

Use the left arrow button to launch the Settings screen. Select Historical Data or Historical Trend to view screen shown in Figures 14 and 15. The historical data is recorded by the UC-50 internally every minute. The Trend chart is not in real-time. When the trend chart screen is launched, the recorded data is charted with a 6-minute delay. The historical data can be uploaded to a USB driver in CSV format.

Time	DO(ppb)
2021/02/07 12:59	1234.56
2021/02/07 12:58	1234.55
2021/02/07 12:57	1234.56
2021/02/07 12:56	1234.55
2021/02/07 12:55	1234.56
2021/02/07 12:54	1234.55
2021/02/07 12:53	1234.56
2021/02/07 12:52	1234.55
2021/02/07 12:51	1234.56

Figure 6. Recorded Historical Data

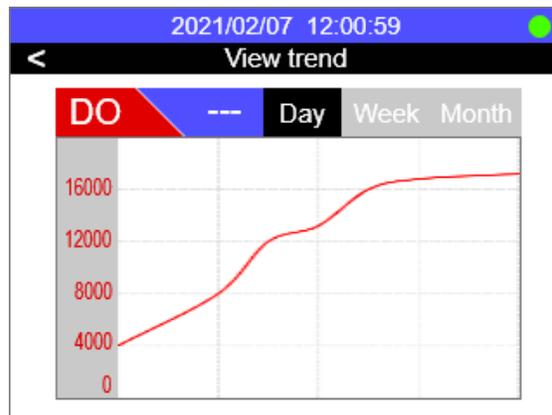


Figure 7. Historical Trend Chart

The ppb range (scale) of the trend chart may be configured via interface shown in Figures 16 and 17.

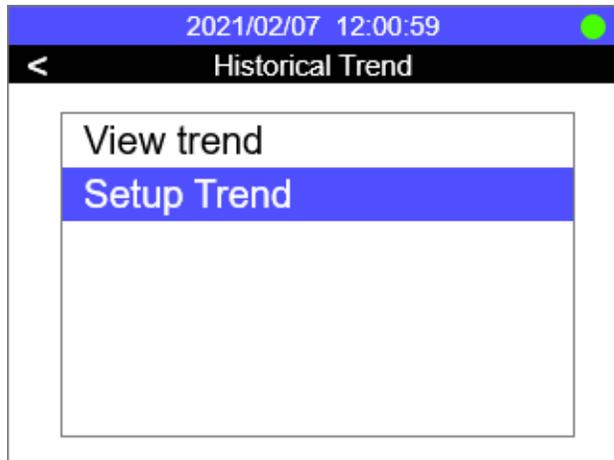


Figure 8. Trend Chart Setup

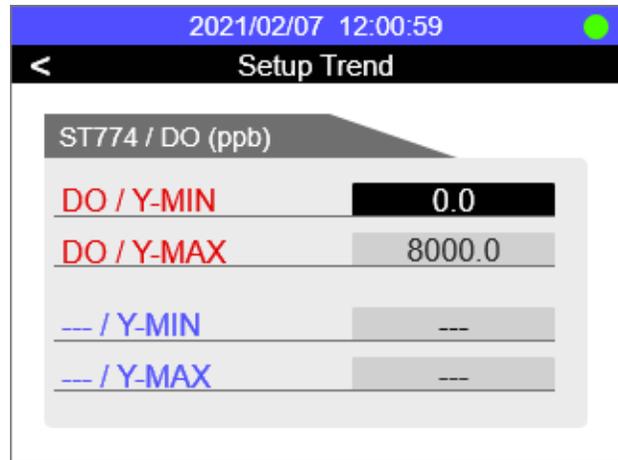


Figure 9. Y-Axis Range Setup

## 8.8. 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.

### 8.8.1. Export Historical Data

Select USB Settings from the Settings screen. In the USB settings screen, historical data can be downloaded to a USB thumb driver by selecting Data Export function. Make sure a USB thumb drive is plugged into UC-50 before exporting historical data.

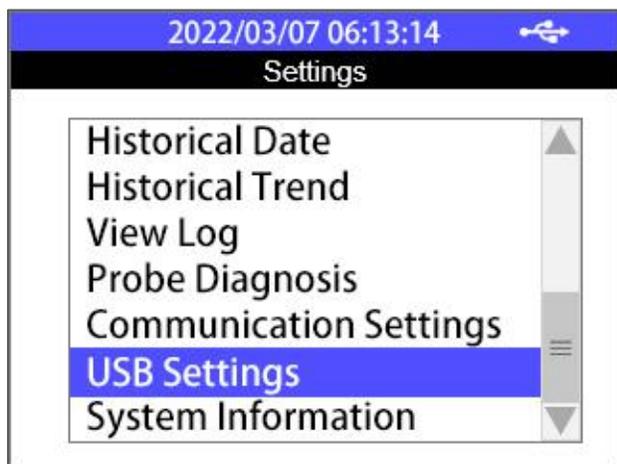


Figure 10. Select USB Settings



Figure 11. Select Data Export

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



Figure 12. Specify Date & Time Range



Figure 13. Export Historical Data

### 8.8.2. Upgrade UC-50 Firmware

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, select USB Settings in Settings page and select Program Upgrade function in USB Settings page. UC-50 will automatically start firmware upgrading procedure and reboot itself once the procedure completed.

### 8.8.3. Adjust Historical Data Interval

By default, UC-50 will save sensor value every 60 seconds to its internal data storage, if an application requires 3 months historical data export, UC-50 will generate over 10,000 lines of historical data if the historical data interval is set to 60 seconds. However, UC-50 allows customer to adjust historical data interval to

- 1) Reduce exported historical data file size if high resolution data is not required
- 2) Capture high resolution data if sensor value changes rapidly

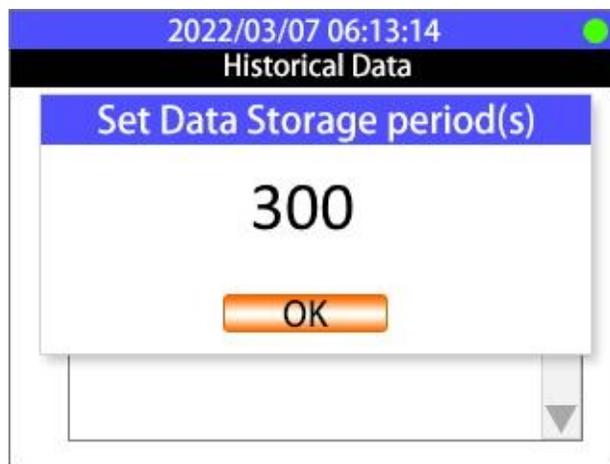
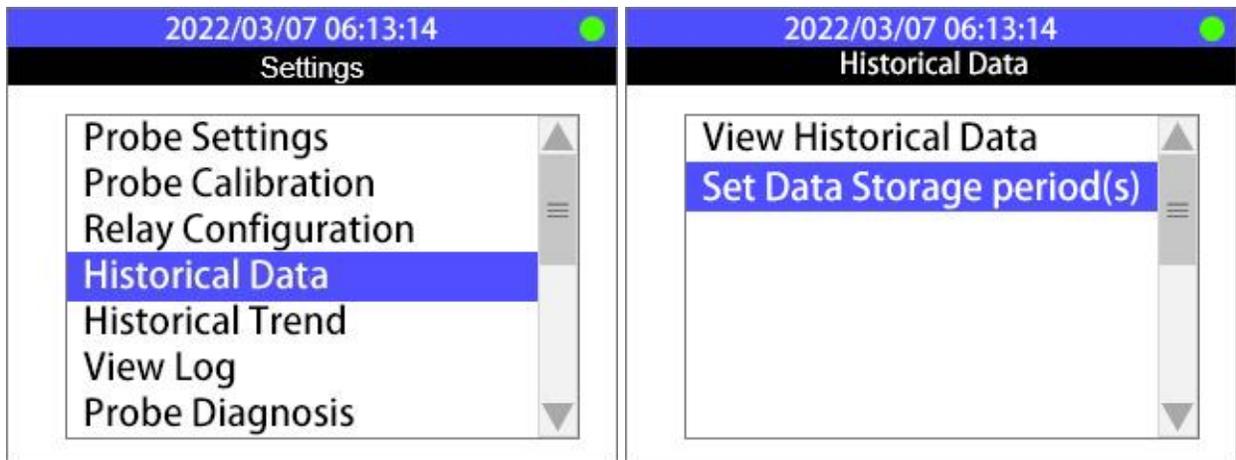
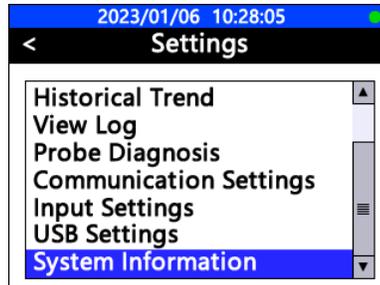


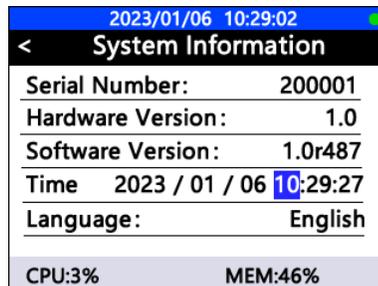
Figure 14. Adjusting Set Data Storage (Data Log Frequency in Seconds)

## 8.8.4. Adjusting Date & Time

1. Hit the **Main** Key
2. Hit the **Up** or **Down** Key until “System Information” is highlighted.
3. Hit the **OK** Key to enter the System Information Screen.
4. Hit the **Down** Key until the desired parameter is highlighted.
5. Hit the **OK** Key to select the desired parameter. The highlight should turn blue.



6. Push the **Up** or **Down** Key until the desired value is selected.
7. Hit the **OK** Key to confirm the new desired value.
8. Hit the **Main** Key to go back to the main screen.



## Contact us

Contact us if you have questions about the use or maintenance of the UC-50.

### Pyxis Lab, Inc.

1729 Majestic Dr. Suite 5  
Lafayette, CO 80026 USA  
1-866-203-8397  
[www.pyxis-lab.com](http://www.pyxis-lab.com)  
[service@pyxis-lab.com](mailto:service@pyxis-lab.com)