UC-50 & ST-772

Startup Guide

Pyxis Lab Inc.
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Catalog

1. UC-50 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 no user configuration when connected to Pyxis inline 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.

NOTE *This manual uses the Pyxis ST-772 dissolved oxygen 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

**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 sensor is provided with a short flying lead/adapter cable and bulkhead cable. The flying lead cable should be landed to the UC-50 terminal board and sensor bulkhead cable will attach to the flying lead cable via the provided adapters.

4. Dimension

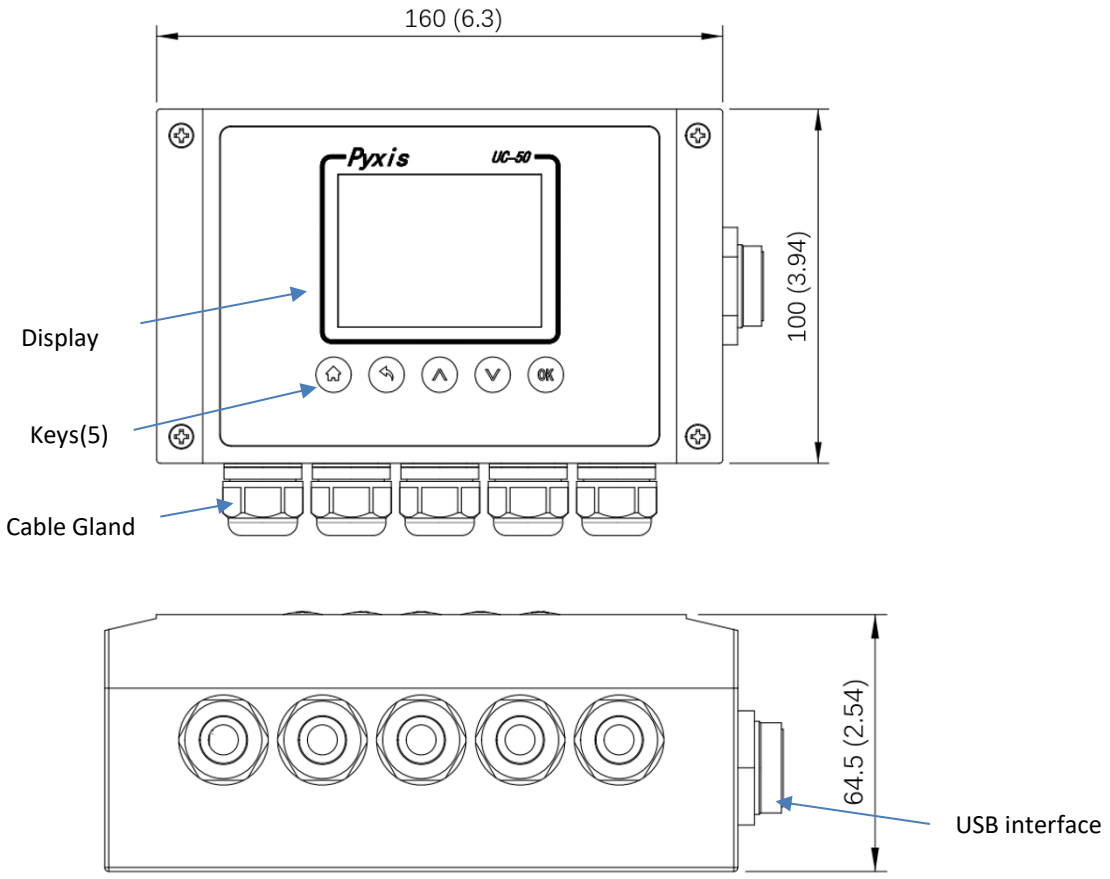


Figure 1. Dimensions, unit: mm(inch)

5. Electrical Connection

5.1 ST-772 wiring

Follow the wiring table below to connect the ST-772 series sensor to the UC-50.

Wire Color	Designation
Red	24 V +
Brown	Power Ground
White	1#4-20 mA+ for DO
Pink	2#4-20 mA + for Temperature
Gray	4-20 mA –
Blue	RS-485 A
Yellow	RS-485 B
Green	RS-485C
Black	Earth Ground

NOTE *The negative 24V power terminal (power ground) and the negative 4–20mA terminal on the ST-772 Series sensor are internally connected. It is unnecessary to connect the 4–20mA negative wire (Gray)to the 4–20mA negative terminal in the controller.*

5.2 UC-50 TERMINAL BOARD WIRING DIAGRAM

Please refer to the wiring terminal diagram below for the UC-50 display/data logger.

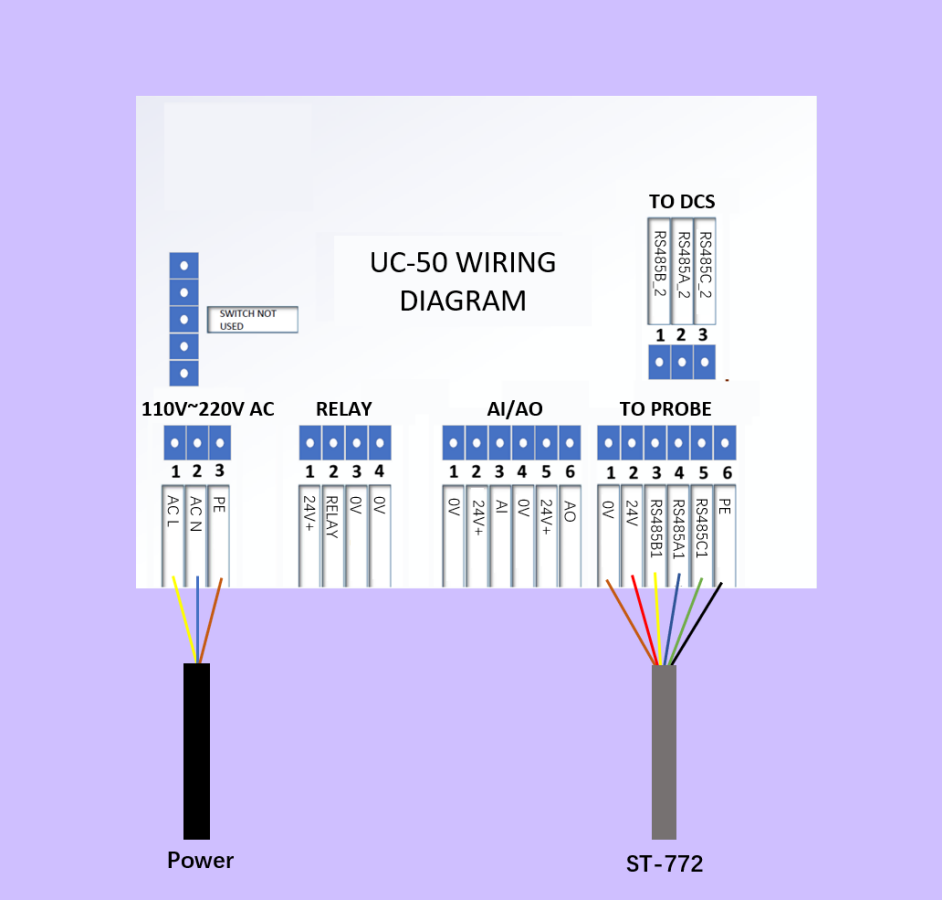


Figure 2. AC-Power Supply and Input/Output Wiring

6. UC-50 Operation

6.1 Main screen

The UC-50 may configured to connect to ST-772 probe by default when it leaves the Pyxis factory if ordered with the ST-772 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 dissolved oxygen (DO) and temperature value of the tested solution. The green dot in the upper right corner of the UC-50 main interface indicates that the communication between the UC-50 and ST-772 probe is normal. 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.

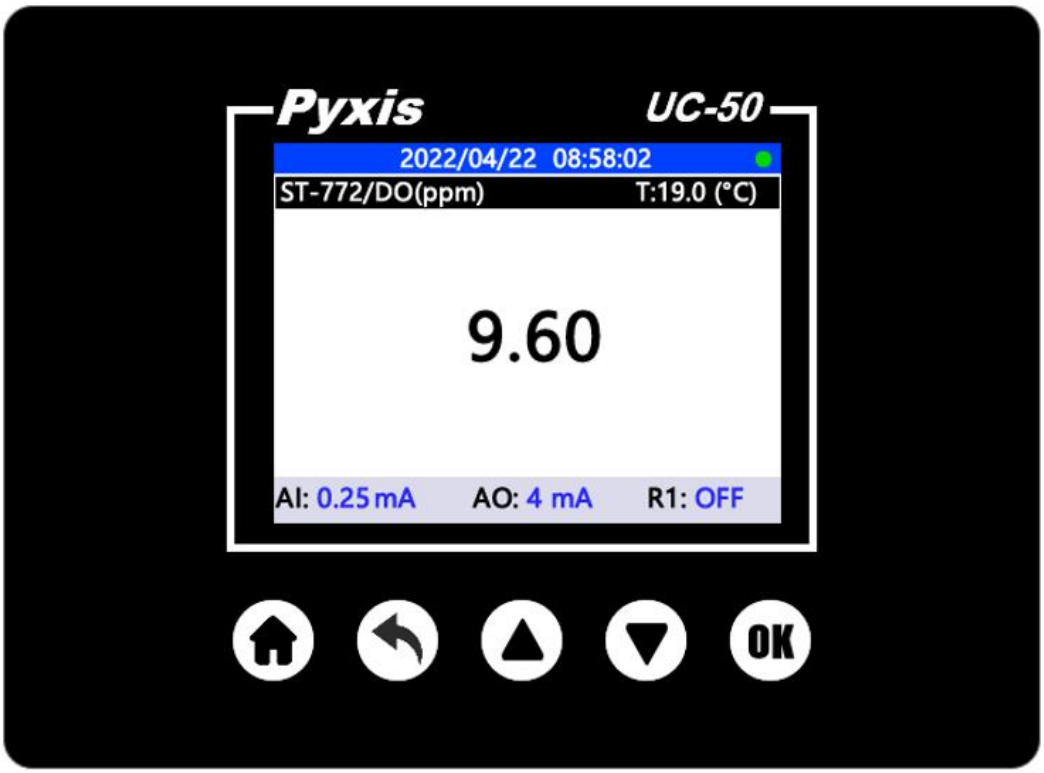


Figure 3. Main Screen

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 Trend Chart

Main Screen ⇨ ▲ or ▼

Measured values will be displayed as a line graph to show the real-time trend. Press ▲ or ▼ to return to the main screen.

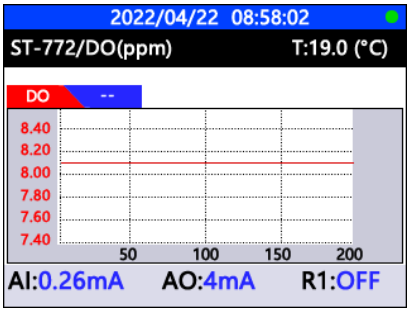


Figure 4. Trend Chart

6.4 System Information

Main Screen ⇨ ↰ ⇨ ▲ or ▼ ⇨ ***[System Information]*** ⇨ **OK**

The UC-50 serial number, the hardware version and software version are shown in the System Information screen (Figure 5).

6.4.1 Set Time

Use the down button to highlight the Time field (highlighted field is black), then press **OK** for editing (edit mode is blue). press the ▲ or ▼ to adjust the date and time.

6.4.2 Set Language

Use the down button to highlight the Language field (highlighted field is black), then press 🏠↰ **OK**, a dialog box for language options will display.

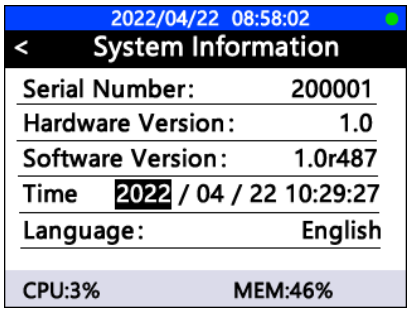


Figure 5. Set Time

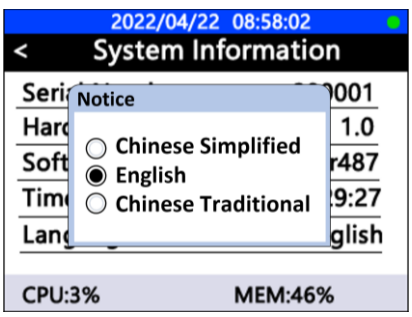
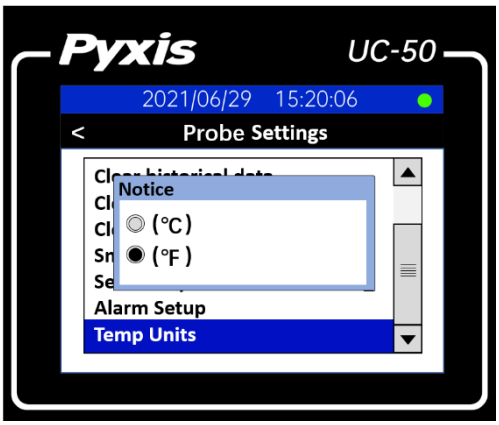


Figure 6. Set Language

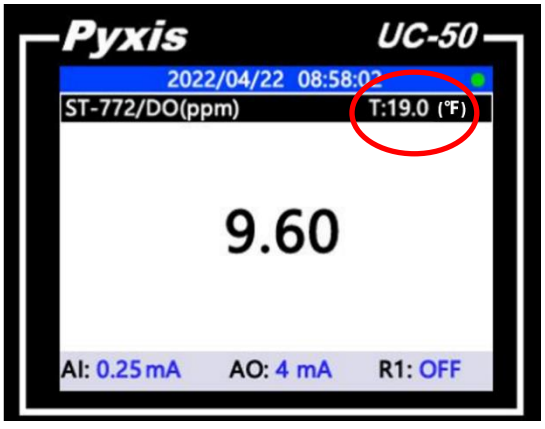
6.4.3 Set Temperature Units of Measure (C to F) on Main Display

The display unit of temperature is Celsius by default .Users can switch the temperature unit as needed in **Temp Units** notification box of the main display screen by following the steps below.

home page ⇨ ↰ ⇨ *[Probe Setting]* ⇨ **OK** ⇨ ▲ ⇨ *[Temp Units]* ⇨ **OK**



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



6.5 Calibration

Main Screen ⇨ ↰ ⇨ ▲ or ▼ ⇨ ***[Probe Calibration]*** ⇨ **OK**

The sensor is thoroughly calibrated at the factory and should not need calibration unless in special situations of extended no use or after replacement of the DCC-1 cartridge. Before calibrating, remove the ST-772 Series sensor from the water and wipe it with a damp cloth to remove debris and any biofouling. If there is water on the membrane, dry it with a soft cloth, taking special care not to damage the membrane.

6.5.1 Zero Calibration

After cleaning the sensor thoroughly, place the sensor tip into a beaker containing 5% or greater Sodium Sulfite solution. (ie. Chlorine/Oxygen Scavenger) Let the ST-772 Series sensor stand for a minimum of 15 minutes. Observe the values being displayed on the **Calibration** screen. Once the displayed oxygen and temperature values are stable, press **Zero Cal** to perform a zero calibration. If the calibration is successful, the interface will return a message ”Zero calibration succeed”. If the calibration fails, press **Zero Cal** again and repeat the process.

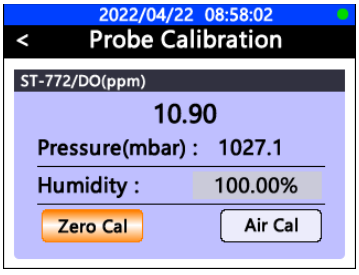


Figure 7. Zero Calibration

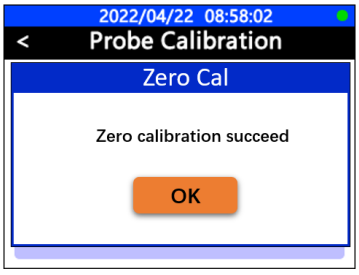


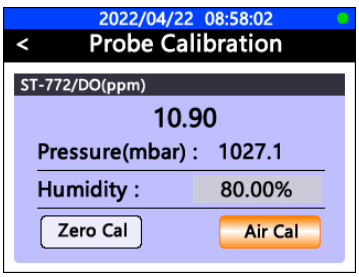
Figure 8. Calibration Success

6.5.2 Air (Slope) Calibration

Place the ST-772 Series sensor in the atmospheric air with a stable temperature or in air-saturated water. Let the ST-772 Series sensor stand for a minimum of 6 minutes. Observe the values being displayed on the **Calibration** screen.Once the displayed oxygen and temperature values are stable, enter the humidity value and press **Air Cal** to perform an air (slope) calibration.

- If you are using air for calibration, you will need to enter the real-time (current) humidity value.
- If you are using air-saturated water for calibration, you will need to enter a humidity value of ”100%”.

If the air (slope) calibration was successful, the interface will return a message ”Air calibration succeed”. If the calibration fails, press **Air Cal** again and repeat.



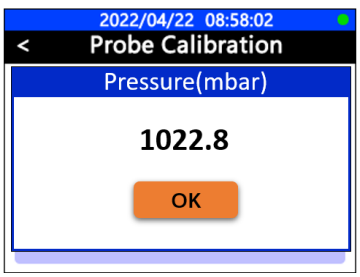


Figure 9. Air Calibration

Figure 10. Enter Pressure

6.6 View Historical Data & Set Data Storage Period

Main Screen ⇨ ↰ ⇨ ▲ or ▼ ⇨ ***[Historical Data]*** ⇨ **OK** ⇨ ***[View Historical Data] or [Set Data Storage Period]*** ⇨ **OK**

UC-50 controller stores measurement data of ST-772 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 dissolved oxygen (DO), no sense, temperature and 4-20mA input value.

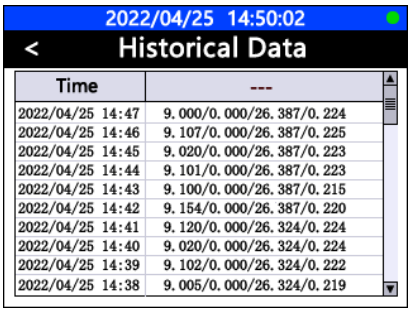


Figure 11. Historical Data

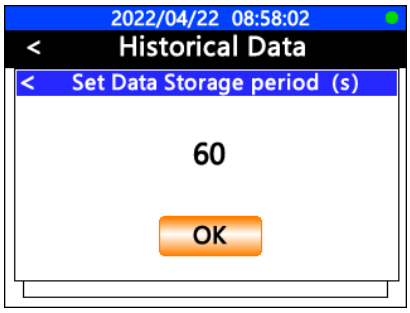


Figure 12. Set Period

6.7 Probe Diagnosis

Main Screen ⇨ ↰ ⇨ ▲ or ▼ ⇨ ***[Probe Diagnosis]*** ⇨ **OK**

The UC-50 controller supports displaying the diagnostic data of the ST-772 in use. To help troubleshooting possible issues with the probe please save images of these data when the probe is respectively placed in the atmospheric air, in a zero oxygen water sample, and in an air saturated water sample. Email the images to service@pyxis-lab.com for technical support.

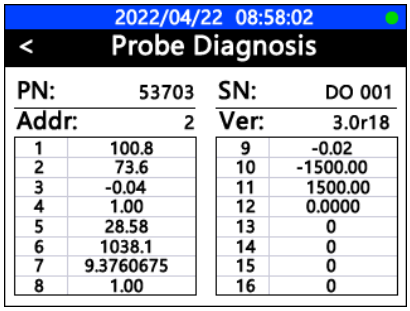


Figure 13. Set Language

6.8 Restore Initial Parameters

Main Screen ⇨ ↰ ⇨ ***[Probe Setting]*** ⇨ **OK** ⇨ ▼ ⇨ ***[Restore initial parameters]*** ⇨ **OK**

If the abnormal reading of the probe is caused by improper calibration users can restore the probe to the factory parameters by using the **Restore initial parameters** function.

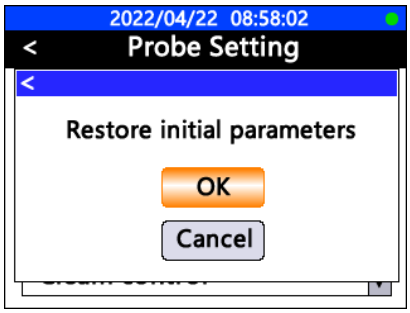


Figure 14. Restore Initial Parameters

6.9 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.

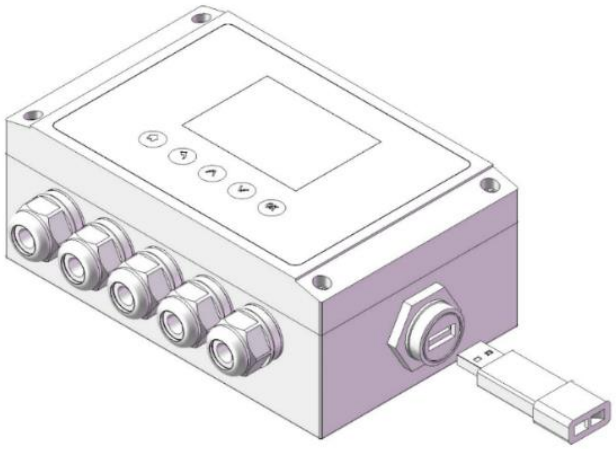


Figure 15. Insert USB Thumb Drive

6.9.1 Export Historical Data

Main Screen ⇨ ↩ ⇨ ▲ or ▼ ⇨ ***[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 100% completed, you can safely unplug the USB thumb drive.

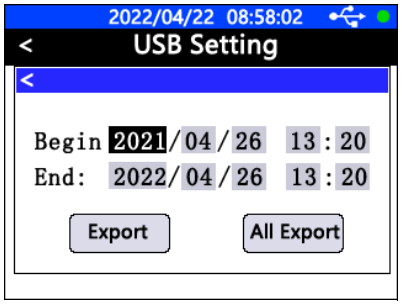


Figure 16. Specify Date & Time Range

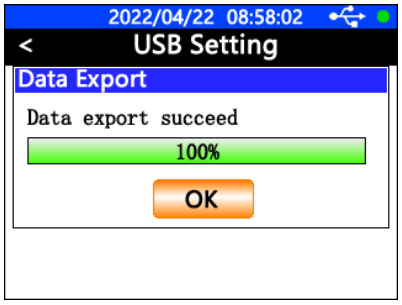


Figure 17. Export Historical Data

6.9.2 Upgrade UC-50 Firmware

Main Screen ⇨ ↩ ⇨ ▲ or ▼ ⇨ ***[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 UC-50 will automatically start firmware upgrading procedure and reboot itself once the procedure completed.

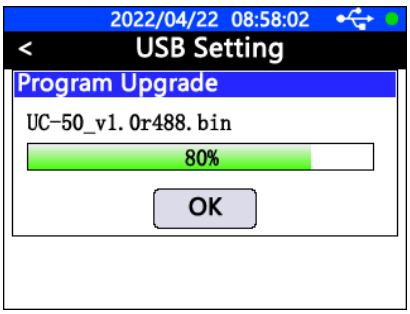


Figure 18. Updating

Figure 19. Jump To App

7. Cleaning the ST-772

The ST-772 sensor is designed to provide reliable and continuous dissolved oxygen readings even in moderately polluted industrial water. Without proper sensor maintenance and cleaning severe dirt or fouling can and will prevent oxygen from reaching the sensor. This can result in lower readings and a higher probability of being inaccurate. Pyxis Lab recommends a consistent frequency of sensor cleaning and calibration as needed to ensure the highest degree of accuracy. The design of the ST-772 sensor makes it easy to disassemble, inspect and clean (if necessary). Severely contaminated waters may require more frequent cleanings. Clean water sources that are less polluted may not need to be cleaned for months.

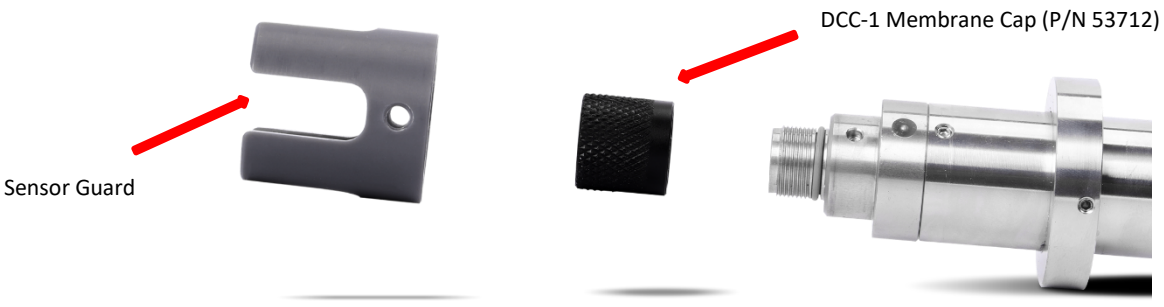
The surface of the DCC-1 (P/N 53712) dissolved oxygen membrane cap can be cleaned with a cotton swab. Please do not use sharp instruments to clean the membrane cap. In addition, the Pyxis Probe Cleaning Solution Kit (Figure 20) may also be used to removal of heavy deposits, especially inorganics.

Remove the ST-772 sensor and the DO membrane cap from the water in use, wipe it with a damp cloth to remove debris and growing organisms, and use a cotton swab dipped in water to clean up the dirt on the membrane surface. Remove the membrane cap, check whether the inside of the ST-772 sensor flashes blue and red light; after the inspection, install the DO membrane cap back onto the sensor.

Figure 2. Pyxis Probe Cleaning Solution Kit (P/N: SER-01)

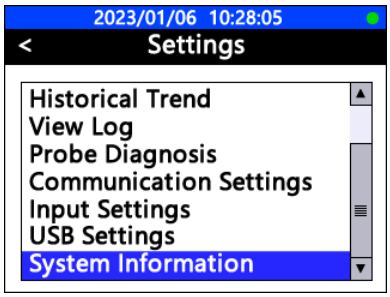
8. Replacing the DCC-01 Membrane Cartridge on ST-772

Remove the sensor guard by loosening the Allen screws. Once guard is removed, slowly unscrew the DCC-1 Membrane Cap from the ST-772 sensor. Gently clean the sensor eye and install the new replacement DCC-1 Membrane Cap onto the ST-772 sensor. Reinstall the sensor guard and tighten the Allen screws snugly. Your sensor is now ready for service for another year of operation.

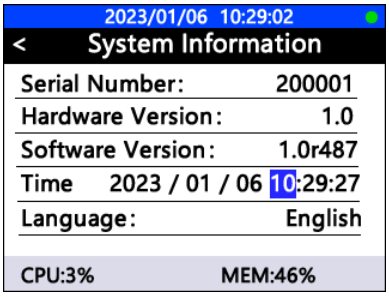


9. Adjusting the Date & Time

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.



10.Order Details

Order Information	P/N
UC-50 *(UC-50 Display & Data Logging Terminal-Single Channel)*	43007
ST-772 *(Submersible Dissolved Oxygen Sensor 0-20ppm)*	53703
DCC-1 *(Replacement Membrane Cartridge Assembly for ST-772)*	53712
Sulfite ZERO Calibration Kit *(Sulfite Zero Calibration Kit for Pyxis Dissolved Oxygen Sensors)*	16019
MA-150-1 *(Floating Submersion Adapter Kit for Pyxis Sensors)*	53705

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