ST-774 Porta-Panel Ultra-Low Dissolved Oxygen Analyzer User Manual

Table of contents

1. Specifications

Please reference the ST-774 operation manual for the full specifications on the ultra-low dissolved oxygen sensor.

1.1. ST-774 Porta-Panel Overview

Product Description

The ST-774 Porta-Panel (P/N-42096) is a prefabricated panel ideally suited for those desiring to use the ST-774 Ultra-Low DO sensor with local display and data acquisition in a portable fashion for oxygen measurement (ie. deaerator performance studies). The Porta-Panel is pre-mounted on an easy-carry self-standing 316L stainless-steel panel with the ST-774 sensor,flow-cell and appropriate water sample/calibration gas flow hardware. The panel comes equipped with an integrated UC-50 Display/Data Logging Terminal for connected to the ST-774 via RS-485 Modbus offering live data display, calibration interface and data logging of the sensor. The UC-50 offers 1x contact relay output and has RS- 485 Modbus and 1x 4-20mA outputs for passing the sensor value onto another device.

Product Features

- Ideal for Dissolved Oxygen Studies
- Portable Free-Standing Panel – 316L SS
- Fully Integrated Plumbing + Flow Cell
- Measurement of Water Sample or Calibration Gas
- Premounted ST-774 Ultra-Low DO Sensor
- 0.0-2,000 µg/L measurement range
- 0.1 µg/L Lower Limit of Detection
- Built-in temperature and pressure sensors
- Premounted UC-50 Data Logger + Display Panel
- Direct RS-485 Modbus Connection to UC-50 Display
- Fully Integrated Zero + Slope Calibration Interface
- Simple Zero Calibration with Catalyzed Sulfite
- Integrated 4-20mA + RS-485 Output
- 1x Contact Alarm Relay and USB Data Logger
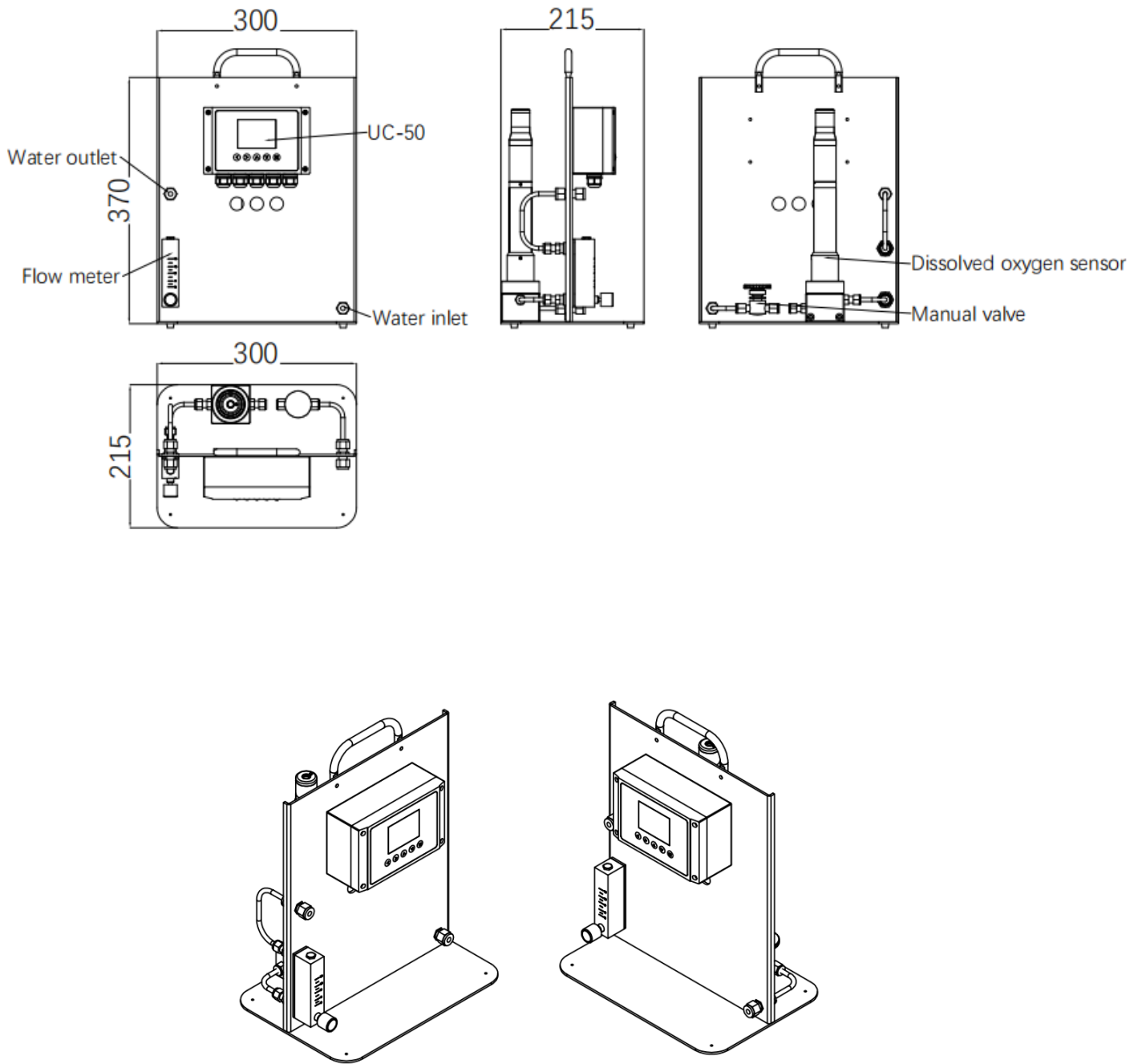
ST-774 Porta-Panel Diagram (mm)

Figure 1 - ST-774 Porta-Panel (P/N-42096)

ST-774 Description

The Pyxis ST-774 is an ultra-low range dissolved oxygen (DO) sensor with a lower limit of detection 0.1 ppb (µg/L). It is design is based on the principle of fluorescence quenching to determine the partial pressure of the dissolved oxygen in water and incorporates Pyxis' advanced technology in the field of fluorescence detection. The Pyxis ST-774 offers the robustness associated with optical DO sensor technology while achieving the ultra-low detection limit compatible to an amperometric DO sensor. The ST-774 measures the oxygen partial pressure that is at equilibrium with the dissolved oxygen in water governed by Henry's law *(DO/ppb = K PO₂)*. The embedded process control board within the ST-774 uses the latest USGS equations to convert the built-in partial pressure and temperature measured to a DO value in ppb (or µg/L).

The ST-774 offers an easily replaceable, front loading DO membrane cap (DCC-02) that has been independently developed by Pyxis Lab, with atypical service life of up to two years. The flat front-end design of the ST-774 makes this platform less prone to contamination or fouling and is very easy to clean. The sensor body is composed of 316L stainless steel and is well suited for aggressive industrial application use. The ST-774 sensor is connected via RS-485 Modbus output when packaged on the ST-774 Porta-Panel (P/N 42096) portable dissolved oxygen analyzer.

Figure 2
ST-774 DO Sensor
w/Flow Cell

ST-774 Sensor Specifications

Item	ST-774
P/N	53715
Measuring Range	0.00 - 2,000 µg/L (ppb)
Limit of Detection (LOD)	0.1 µg/L (ppb)
Resolution/Repeatability	0.1 µg/L (ppb)
Accuracy	± 0.3 µg/L (ppb) or ± 1%, whichever is greater
Light Source	Blue Light Exc / Red Light Emm
Response Time (90%)	<30s Liquid Phase / <10s Gas Phase
Operational Temperature	0 °C – 50 °C (32 - 122° F)
Operating Voltage	22 – 26V DC, Power 0.6W
Signal Output	4-20mA analog output / RS-485 digital output
Dimension (L x D)	300 x 60mm (11.8 x 2.36 inches)
Sensor Weight	2150 g (4.74 lb) cable excluded
Total Panel Weight	7257 g (16 lb)
Suggested Flow Range	50 – 500 mL/Minute
Sample Connection Format	Sample Line & Inlet Stainless Steel with Compression Fitting
Material	316L stainless steel
Working Pressure	145psi (10Bar)
Wet Material	316L stainless steel / PVC and polycarbonate
Calibration	In field Using Calibration Gas or Sulfite
DCC-02 Cartridge Life	Up to 2 years
Protection / Regulation	IP-67 / IP-68 / CE / RoHS

UC-50 Description

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 or 4-20mA 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 24 VDC alarm relay output for connection to additional controllers, PLC or DCS systems. The UC-50 is premounted as part of the ST-774 Porta-Panel Dissolved Oxygen Analyzer.

Figure 3
UC-50 Display + Data
Logging Terminal

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/10Watt Maximum
Data Storage	32M 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

Order Information	P/N
ST-774 Porta-Panel *(Portable Panel Mounted ST-774 w/Flow Cell + UC-50 Data Logger)*	42096

Optional Accessories Information	P/N
ST-774 Flow Cell Assembly *(316L Flow Cell w/SwageLok For Spare Use or Replacement)*	53718
DCC-02 *(Replacement Dissolved Oxygen Membrane Cap for ST-774)*	53716
Sulfite ZERO Calibration Kit *(Includes Calibration Cap and 10mL Sulfite Powder)*	16019
Replacement Catalyzed Sodium Sulfite Powder in 10mL vial	SO3-VIAL
ST-774 SERVICE SWAP PROGRAM – ANNUAL	ST-774-SWAP
UC-50 *(UC-50 Micro Display + Data Logging Terminal)*	43007

NOTE - PO# must be issued for ST-774 Service-Swap Program. Pyxis Ships New/Reconditioned ST-774 Sensor Only. Client Ships Their Sensor to Pyxis for Even Exchange. 30-days to Ship Old Sensor or Pyxis Bills for full value of New ST-774

2. Unpackaging

The package includes the following items mounted on the panel

- ST-774 Porta-Panel Dissolved Oxygen Analyzer System (P/N 42096)
    - 316L Portable Panel with ¼" SS Tubing Swagelok and Micro Rotameter
    - ST-774 DO Sensor with DCC-02 Cap Installed with flow cell
    - Premounted – Prewired – Preconfigured UC-50 Display/Data Logging Terminal
    - Sulfite Zero Calibration Kit (P/N 16019)

3. UC-50 TERMINAL BOARD WIRING DIAGRAM

Please refer to the wiring terminal diagram below for the UC-50 display/data logger. ***NOTE*** – the UC-50 terminal board provides two prewired pigtail cables with adapters. The 7-Pin output pigtail offers a male adapter. This pigtail cable is designed to be connected to the loose flying lead cable with female adapte and open wires that is provided with the panel. This 7-pin output enable 1x RS-485, 1x 4-20mA output as well as 1x 24-VDC (10Watt) Relay output to pass onto another device. Output wiring details can be found in the next section of this manual. The 8-pin pigtail cable is desgined for direct connection to the ST-774 sensor.
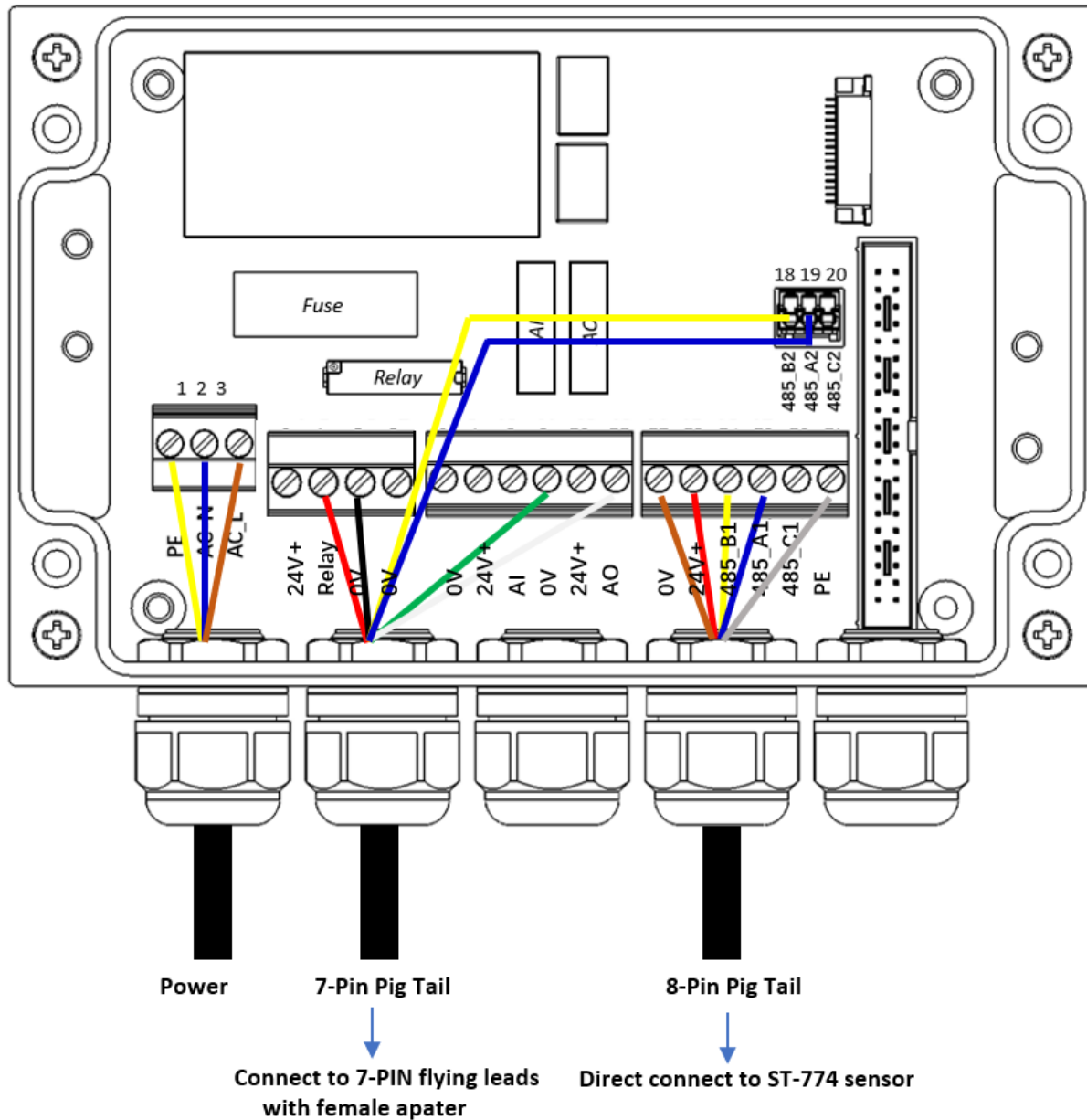

Figure 4. UC-50 TERMINAL BOARD WIRING DIAGRAM

3.1 UC-50 OUTPUT SIGNAL/RELAY WIRING DETAILS AND 4-20mA RANGES.

As mentioned in the previous section, the UC-50 internal terminal board is prewired with two pigtail cables. The 8-Pin input cable (male adapter) is to be terminated the ST-774 sensor. The 7-Pin output cable (male adapter) is to be terminated to the loose flying lead cable provided with the panel and allows 1x 4-20mA as well as 1x RS-485 signal of UC-50 to be <u>PASSED-THROUGH</u> to another receiving device. Additionally , the prewired 7-pin output cable offers a 24VDC (10Watt) relay for operation of alarm, light, buzzer or other device based on the user relay settings in the UC-50 itself.

The flying lead section of the loose shipped output cable may then be landed to the input terminal of "ANOTHER DEVICE". Please refer to the wiring table below for proper wiring of 7-pin output cable provided with each UC-50.

Output Wire-Color	Designation
Red	Relay+ (24V+)
Black	Relay- (0V)
Blue	485A for DCS
Yellow	485B for DCS
Green	4-20mA+ for Dissolved Oxygen
White	4-20mA-

The UC-50 4-20mA output is programmed for disolved oxygen as a default from the Pyxis factory and users can alter this output scaling, please refer to section 5.9.

UC-50 4-20mA output scaling		
Unit of Measure	4mA Value	20mA Value
Dissolved Oxygen	0 µg/L (ppb)	2,000 µg/L (ppb)

4. Sample and Calibration Gas Connection

4.1. Sample Water Connection

Connect the sample to the water inlet port via a ¼ Swagelok tubing fitting and operate at a flow of 50-500mL/minute for optimum accuracy. To ensure a sample free of oxygen ingress, only compression style fittings (ie. Swagelok) and stainless steel sample tubing should be used. Never use plastic tubing for the sample line or threaded fittings or oxygen ingress may occur. With proper installation using stainless steel sample lines and thoroughly tightened compression fittings, the ST-774 should stabilize to a low level within a few hours after startup. Once this has occurred, you may proceed with the oxygen study/evaluation. If stabilization of the sensor takes a longer period of hours or days, please evaluate your installation for oxygen ingress into the sample line and other on-site application parameters (ie. deaerator operating temperature, pressure, feedwater flow rates, loss of oxygen scavenger feed etc.)

Tightly connect the cooled sample water inlet to the bottom sample in line. Connect the outlet flow line to drain. Note, the outlet flow line can utilized poly tubing if desired. Ensure the pre-inlet valve is in the open position. Slowly open the inlet valve allowing cooled sample to enter the inline rotameter. Adjust inlet sample flow to a range of 50-500mL/minute on the rotameter.   Allow your ST-774 sensor to stabilize by observing the display value on the UC-50 display/data logging terminal.   Your ST-774 comes precalibrated from the Pyxis production facility and should not need calibration or maintenance for a period of up to one year with proper use.

4.2. Calibration Gas Connection

For users desiring to calibrate the ST-774 sensor with calibration gas, prior to connecting the calibration gas to the sample inlet port on the bottom right of the panel via a ¼ inch Swagelok fitting, be sure to open the pre-sensor valve to allow gas flow to drain. Adjust rotameter to the open position allowing calibration gas to pass by the ST-774 sensor.

Ultrapure nitrogen gas (Pyxis DCC-3 P/N 42059) may be used for the zero calibration. The slope calibration requires 0.02% to 0.1% (or 200 to 1000 ppm) oxygen in nitrogen gas (Pyxis DCC-4 P/N 42060). Portable standard calibration gas cylinders can be purchased from Pyxis if desired in the United States only, or are commonly available on the open market. See Section 5.4.2 and 5.4.3 for details. *NOTE* Pyxis does not provide the C-10 regulating valve for gas cylinders.

For low pressure applications users may also conduct ZERO calibration of the ST-774 sensor with 5% cobalt catalyzed sodium sulfite solution. See Section 5.4.1 for details.

As an alternative and far faster/easier option, Pyxis Lab offers **ST-774 SERVICE SWAP** (P/N ST-774 SWAP). This service provides the user with a new or reconditioned ST-774 sensor calibrated and ready for service in exchange for the unit in need for calibration/service removed from the system. Contact Pyxis Lab for details at service@pyxis-lab.com .

5. UC-50 Operation

5.1. Main Screen

The UC-50 is configured to read and display measurement data from the Pyxis ST-774 dissolved oxygen probe. 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 that the controller is operating normally. On the bottom of the screen, the analog input (AI) value, the analog output (AO) value, and the relay status are shown.
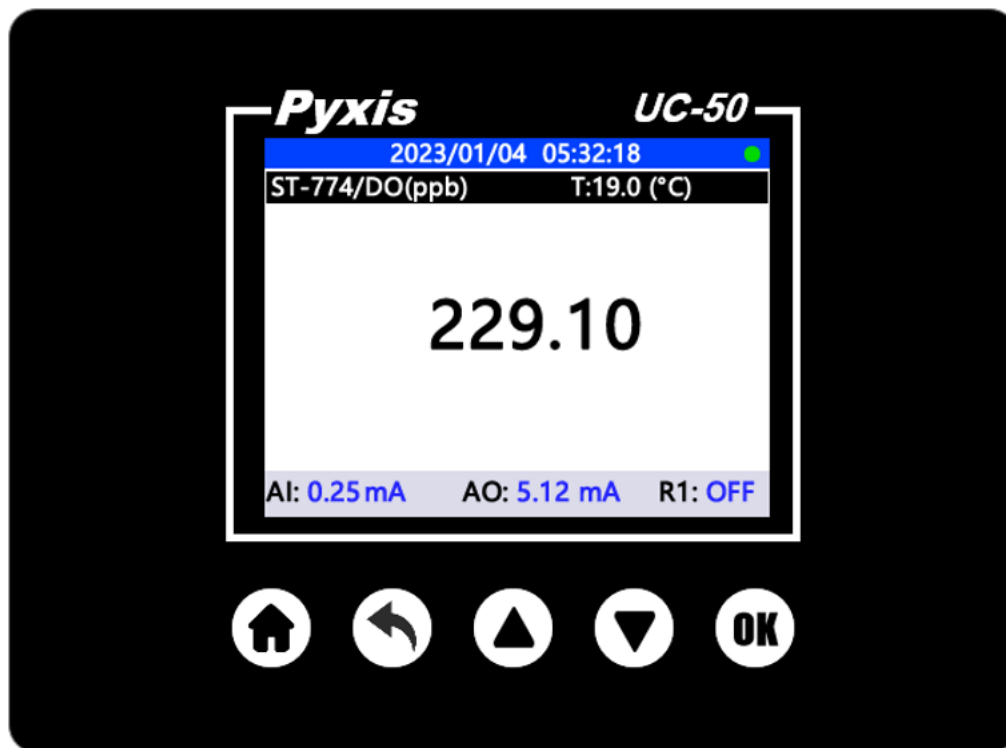

Figure 5. Main Screen

5.2. Button Functions

The house button on the left is for returing to the main screen from any screens. The left arrow button (second from the left) is for returing 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 descrease the numerical value in the selected input fields. The OK button is for the selection confirmation, like the enter key on a computer keyboard.

5.3 Real-Time Trend Chart

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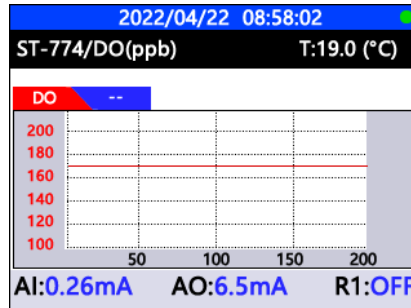

Figure 6. Trend Chart

5.4 Set Date &Time On UC-50 Dispaly

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.

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.
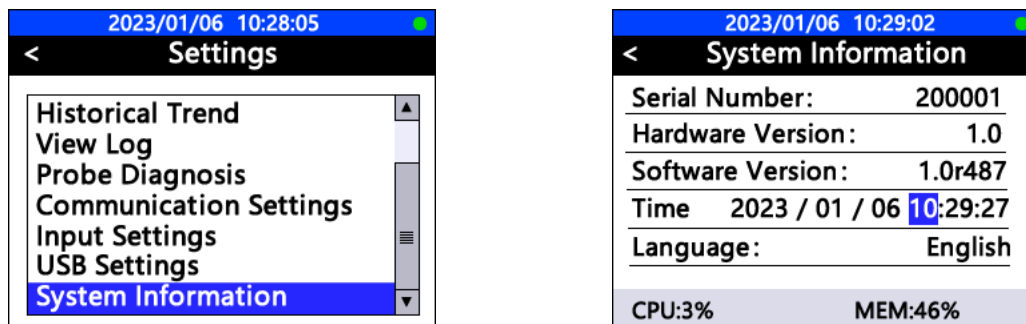
Figure 7. System Information Screen

5.5 TEMPERATURE UNIT of MEASURE SETUP PROCEDURE

The display unit of temperature is Celsius by default. Users can switch the temperature unit as desired in **Temp Units** notification box. From the **Probe setting menu**, select **Temp Units**. Here you can change the temperature measurement unit to Fahrenheit.
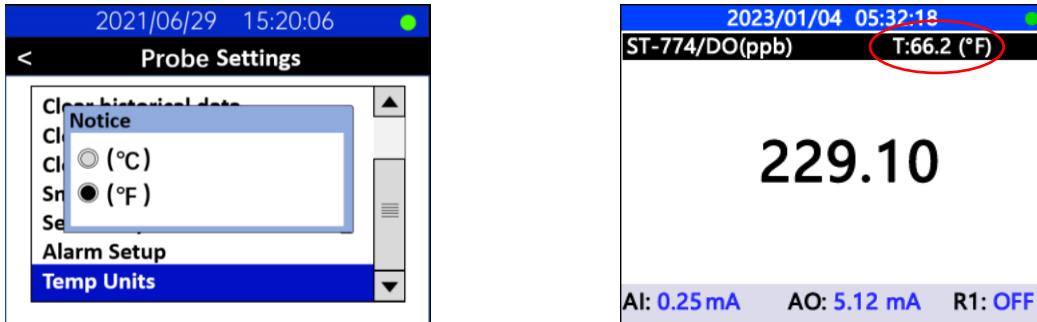

Figure 8. Setting the temperature unit

Return to the **Home** page by pressing 🏠. On the Home page the temperature reading will be displayed in the upper right corner of the screen in the units of measure selected.

5.6. UC-50 Relay Configuration

The UC-50 is equipped with relay output (24V, 10w) which is designed for alarm relay activation or may be used as desired. The UC-50 relay offers 5 modes of operation. The number of adjustable parameters will differ depending on the mode the user selects.

1.   DISBABLE RELAY MODE
 When setting **[Disable]** mode, the relay does not accept any functions or allow any actions.
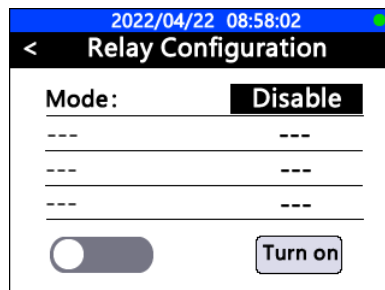

Figure 9

2. **MANUAL RELAY MODE**

When setting **[Manual]** mode, you need to press ▼ to move the cursor to the button, then press **OK** to turn on the relay manually. You will note the "Turn OFF" button activated at bottom of page when in Manual Mode with a GREEN color-coded button to left indicating the relay is currently ON. When pressing the "Turn OFF" button, you will deactivate the relay. Press again to activate.
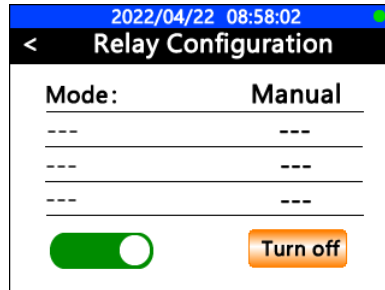

Figure 10

3. **TIME RELAY MODE**

When setting **[Time]** mode, the relay will repeat the activation metering according to the timing period (hr) and hold time (min) programmed by the user. EXAMPLE - The Parameters displayed below represent the relay turning on every 24 hours, for a duration of 60 minutes.
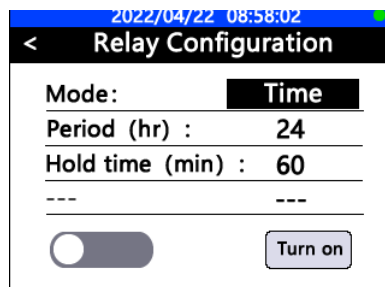

Figure 11

4. ALARM (LL) or ALARM (HL) MODES

The **Turn ON** and **Turn OFF threshold** values are constantly compared with the <u>primary measurement of the sensor</u>. In the case of ST-774-UC-50-Porta-Panel, the primary measurement is disolved oxygen(DO).

Security time is used to set the activation time of the relay in a range of 0 ~ 99999 seconds. <u>If user does not want to limit the activation time of the relay, the **security time** should be set to " 0 ".</u>

- In **Alarm LL** (Alarm Low Limit) mode, once the DO value falls below the **Turn ON threshold value**, the UC-50 will turn the relay on. Once the measurement value exceeds the **Turn OFF threshold**, the UC-50 will turn the relay off.

- In **Alarm HL** (Alarm High Limit) mode, once the DO value exceeds the **Turn ON threshold value**, the UC-50 will turn the relay on. Once the measurement value falls below the **Turn OFF threshold**, the UC-50 will turn the relay off.
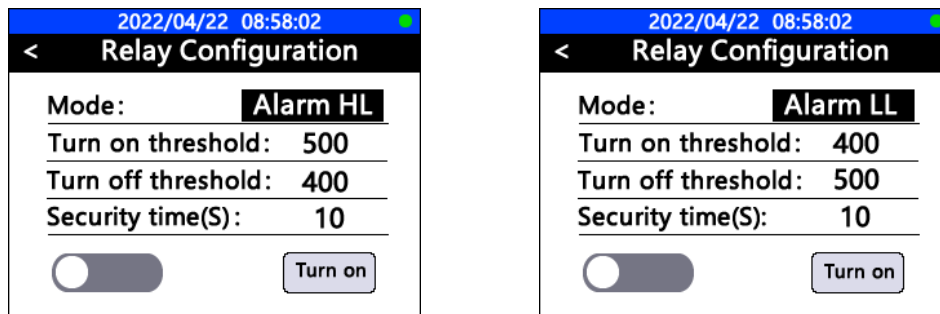

Figure 12

NOTE - If the user program security time has been reached but the alarm Lower limit or alarm higherlimit have not been met, the main screen DO measurement values will turn RED. Users need to manually clear the RED alarm in the following two ways:
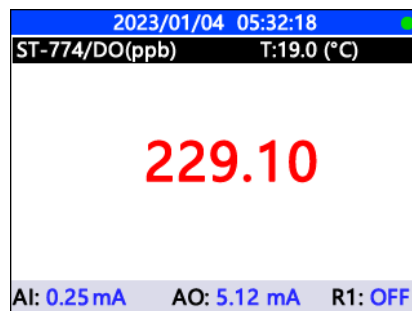1. Set new security time.
2. Set new threshold.

Figure 13

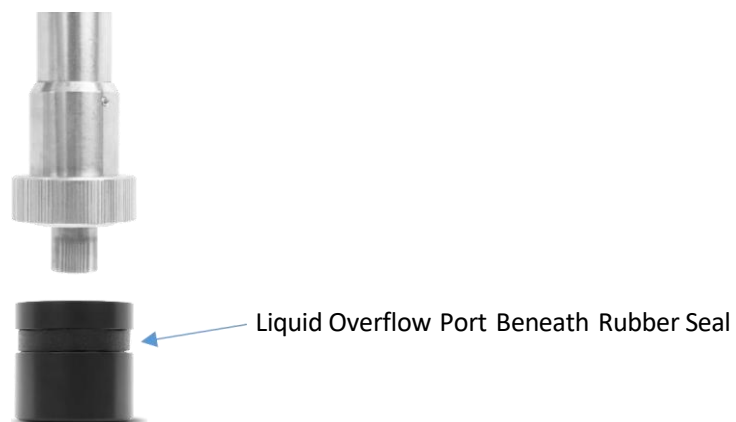**5.7. Calibration**

5.7.1. Zero Calibration Using Sulfite ZERO Calibration Kit (P/N 16019)

1) Unscrew the lid from the 10mL vial containing catalyzed sodium sulfite powder (P/N - SO3 VIAL).

2) Fill the vial with DI water to the 10mL mark

3) Screw the lid on the vial and gently shake for 10 seconds.

4) Remove the Sulfite Zero Calibration Cap from packaging.

5) Unscrew the lid from the 10mL vial and pour the solution into the calibration cap.

6) Rotate the calibration cap slowly over the front of the sensor. *NOTE* *any excess calibration fluid will flow out from the overflow port.*

Liquid Overflow Port Beneath Rubber Seal

7) Place sensor in upright position with calibration cap at the bottom.

8) Select **Probe Calibration** from the Settings menu. Then select **Zero cal** as shown in Figure 14.

Figure 14. Zero Calibration

9) Select **Zero Cal** button and press OK to start the zero calibration on the UC-50.

IMPORTANT NOTE - *Allow the sensor with calibration cap / sulfite solution stand for up to 12 hours for best results.*

10) After the 12-hour period, remove the calibration cap from the ST-774 sensor and rinse the sensor tip with DI water and insert sensor back into the ST-774 Flow Cell Assembly for service.

Flow Cell Assembly
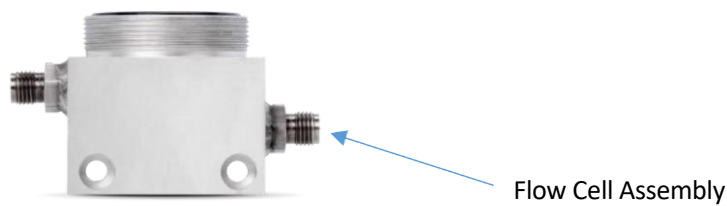
5.7.2. Alternative Zero Calibration Using Pure Nitrogen Calibration Gas (99.999% or better)

A depressurized nitrogen gas source can be connected to the sample cell through the 1/4" OD stainless tubing for the zero-point calibration. The gas flow rate should be regulated between 2 and 10 liter per minute. *NOTE* Ensure the stainless-steel compression fittings are very tight and always use stainless steel OD tubing.

1) Ensure the ST-774 is tightly installed into the ST-774 Flow Cell Assembly.

2) Turn on a nitrogen gas flow and adjust flow to recommended rate of 2-10 Liters per minute.

3) Allow the gas flow and the temperature to be stabilized for 15 minutes. *NOTE* Zero calibration using pure nitrogen gas at proper flow rates with tight fittings is more rapid that using catalyzed sulfite solution.

4) Once the displayed oxygen and temperature values are stable, press Zero Cal to perform a zero calibration of the probe.

5) If the calibration is successful, the interface will return a message "Calibration Succeeded". If the calibration fails, press Zero Cal again and repeat.

5.7.3. Slope Calibration

Select Probe Calibration from the setting menu. Using the same techniques as outlined for zero gas calibration, establish an oxygen containing calibration gas (Pyxis DCC4 = 99.9% Nitrogen / 0.1% Oxygen Gas Cylinder) flow for 15 minutes or until the ppb reading has stabilized. Select High Cal and press OK to start the slope calibration. Use the UP/DOWN buttons and OK button to enter the specific 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 15 is the oxygen percentage in the calibration gas, not the dissolved oxygen concentration in ppb or ppm. The ST-774 probe will automically 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.
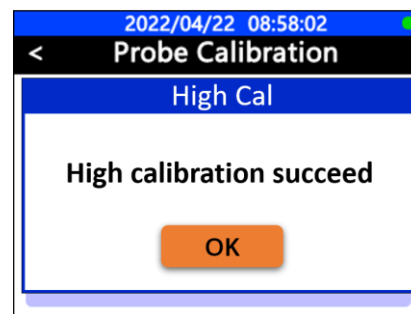

Figure 15. High (slope) Calibration

Figure 16. Calibration Succeed

5.7.4. Restore Factory Parameter

If the abnormal reading of the probe is caused by improper calibration, you can select the **Restore initial parameters function i**n the probe setting interface of the UC-50 controller to restore the internal parameters of the ST-774 probe to the factory parameters.
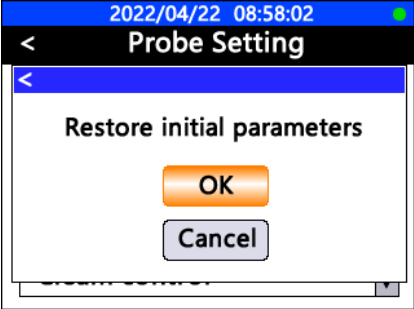

Figure 17. Restore intial parameter

5.8 Probe Diagnosis

The UC-50 controller supports displaying the diagnostic data of the ST-774 in use. This feature may be used for technical support when communicating with service@pyxis-lab.com. Selecting the Probe Diagnosis in the setting interface of UC-50 controller will display the internal original diagnosis data interface.

Figure 18. Probe Diagnosis

5.9. UC-50 4-20 mA Output Setting

UC-50 display/data logger supports one extra 4-20mA output of any sensor measurement parameter to be user defined for units <u>with serial # 220018 and after</u>. For ST-774-UC-50-Porta-panel, this will be programmed for disolved oxygen as a default from the Pyxis factory and referred to the previous section this output is<u> internally connected to the **white** wire of 7-pin output pigtail table</u>.
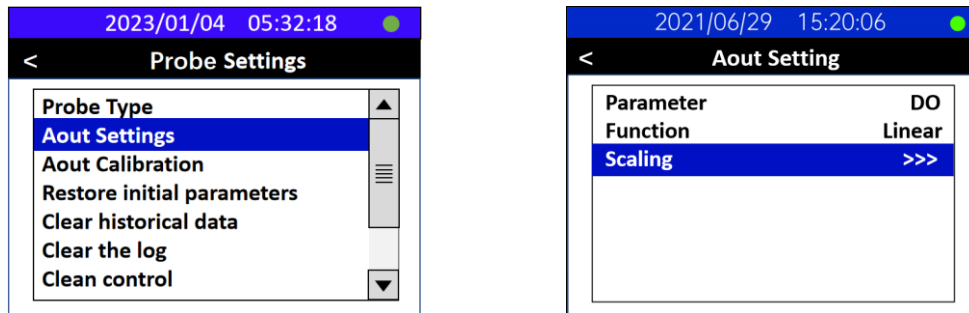

Figure 19. Probe Setting

Click **Scaling** option to enter the 4-20mA span interface. You can change disolved oxygen value corresponding to the 20mA output to <u>the same or lower default value</u> as seen in the figure below. Click the **OK** button when complete.
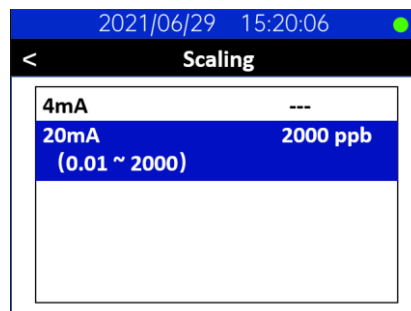

Figure 20. Setup 4-20 mA output scale

5.10. Historical Data and Historical Trend

Select **Historical Data** on the setting interface of the UC-50 controller, shown in Figures 21. The data types from left to right are dissolved oxygen (DO), no sense, temperature and 4-20mA input value. UC-50 controller stores measurement data of ST-774 every 60-seconds. *This time period may be adjusted if desired by the user, see Section 5.11.3 for details.*

Select **Historical Trend** on the setting interface of the UC-50 controlle, shown in Figures 22. You can view the historical measurement data saved by the UC-50 controller in the form of a trend graph. Use the up and down keys and the confirm key to select to view the data of the last day, week or month.

NOTE *The Historical 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 as outlined in Section 5.11.1*

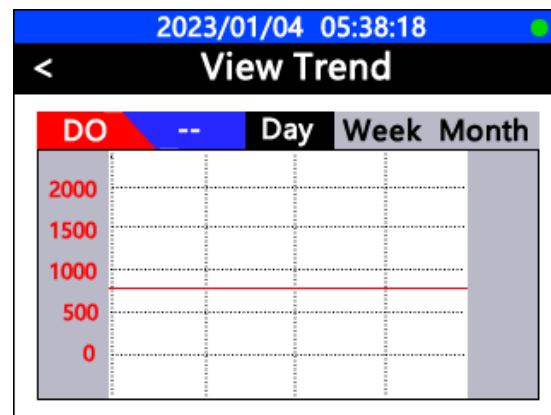Figure 21. Recorded Historical Data

Figure 22. Historical Trend Chart

5.11. 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 should <u>have no existing files on it</u> and be FAT-32 formatted with a storage capacity between 8 and 64GB *Gigabytes.*

5.11.1.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.
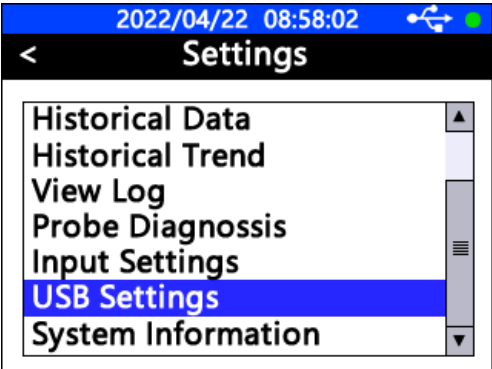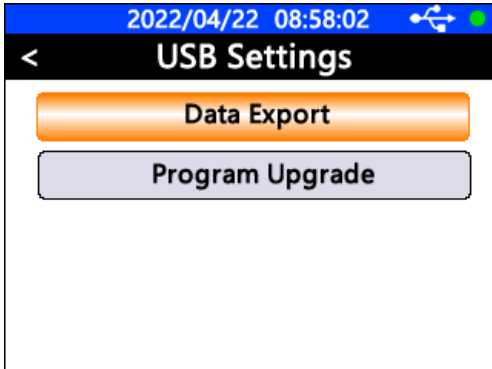

Figure 23. Select USB Settings

Figure 24. 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. ***NOTE*** the date range for data upload should not exceed 12 months, otherwise, all data must be exported.
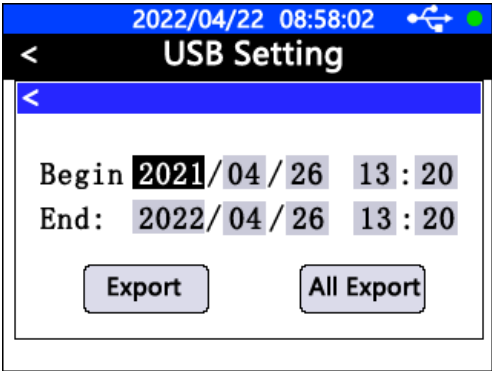

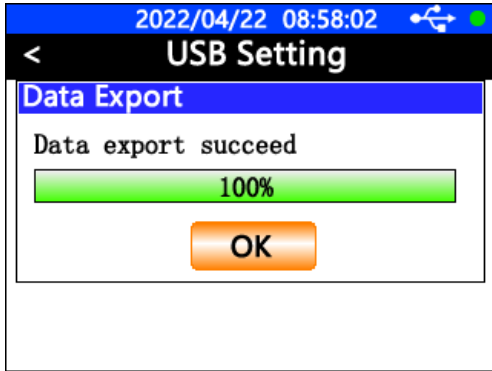Figure 25. Specify Date & Time Range

Figure 26. Export Historical Data

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

5.11.3. Adjust Historical Data Log 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. As seen in Figures 27 and 28, the UC-50 allows cutomer to adjust historical data interval to

1) Reduce exported historical data file size if high resolution data is not required

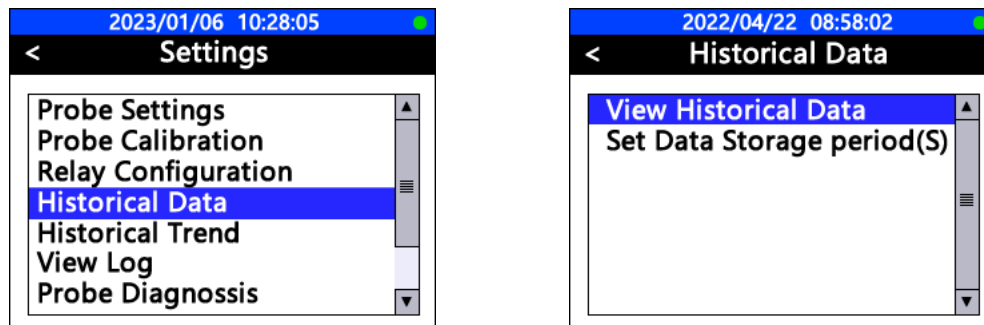2) Capture high resolution data if sensor value changes rapidly

Figure 27. Adjusting Set Data Storage – Steps 1 and 2
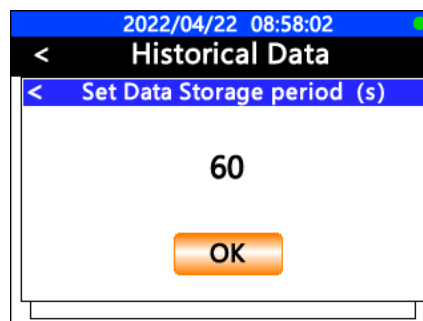

Figure 28. Adjusting Set Data Storage (Data Log Frequency in Seconds)

6. Modbus RTU

The UC-50 controller is configured as Modbus slave device. Users can view the sensor measured values via a **Modbus RTU** connection. *Refer to Section 3.1 for DCS connection.*

UC-50 Default Communication Parameters	
Device Address	20
Baud Rate	9600
Word Length	8
Parity	None
Stop Bits	1

Modbus RTU Protocol

Register Address Model	Address Base 1
Byte Order	CDAB Little Endian Byte Swap

UC-50 Default Communication Parameters – (Writeable)

Register address	Type	Byte order	Register definition
42001	Unsigned int 16	AB	Device Address
42003	Unsigned int 16	AB	Parity 0=None Parity 1=Odd Parity 2=Even
42004-42005	Unsigned int 32	CDAB	Baud Rate

UC-50 Register Address of Measured Parameters – (Read-Only)

Register address	Type	Byte order	Register definition
46001-46002	float	CDAB	Disolved Oxygen
46005-46006	float	CDAB	Temperature
46007-46008	float	CDAB	UC-50 4-20mA input

NOTE *If the base address is 1, such as PLC system, access directly according to the register address. If the base address is 0 system, the register address is reduced by 1 after access*

7. Contact us

Contact us if you have questions about the use or maintenance of the ST-774 Porta-Panel:

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