UC-100S for use with ST-772 Series Dissolved Oxygen Sensors

User Manual

December 20, 2020

Rev. A

Pyxis Lab, Inc.
1729 Majestic Dr. Suite 5
Lafayette, CO 80026 USA
www.pyxis-lab.com

Pyxis

Table of Content

1. Specifications

Item	UC-100S	UC-100G
P/N	43047	43045
Power	110/220VAC 50/60 Hz, 30W	
Display	7inch - 4 Wire Resistance Color Touch, 800 x 400 Resolution w/PLC	
Output	2x 4-20 mA / RS-485 Modbus-RTU / Modbus TCP	
Input	2 x 4-20 mA / RS-485 Modbus / 4 x Digital	
Relay	2x Channels Relay Dry Contact – 5 Amps Each Maximum	
Internet	RJ-45 socket, Modbus-TCP	
Data Storage	4G, up to 1 million data entries or events	
USB	1 x USB host, for data downloading and screen upgrade	
Dimension (WxHxD)	15.7 in W x 11.8 in H x 6.7 in D	
Weight	5 kg	
Operation Temperature	32 – 122°F	
Storage Temperature	14 – 140°F	
Humidity	10 – 90% No Condensation	
Protection	IP65	
Regulation	CE / RoHS Marked	
Pyxis 4G CloudLink™	NA	Included
Bands Supported	NA	Global *(B1/2/3/4/5/7/12/13/14/20/28/66/7)*
Protocols Supported	NA	IP/TCP/UDP/HTTP/HTTPS/Modbus
Data Server	NA	*Optional Global Sim Card & AWS Cloud Service Contact - Pyxis Lab for Details*

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

2. Unpackaging

The package includes the following items:

- Power cord with connector to UC-100S

3. System Layout and Features

The Pyxis UC-100S is a fully functional PLC, customizable color touch panel display and data logging terminal that can connect to up to 6 Pyxis sensors via RS-485, including the Pyxis ST-772 series dissolved oxygen sensors.

The UC-100S requires customized coding prior to shipment and should be purchased as a package with Pyxis sensors. The UC-100S provides live sensor value trend charts for each sensor input as well as sensor

calibration interface while logging data for of all inputs for USB download. It can output an alarm relay and timer-based control relay.

The UC-100S also comes equipped with two extra 4-20 mA inputs that can be used to log data from non-Pyxis analog sensors. In addition, the UC-100S provides a wide array of output options including Modbus-RTU, Modbus-TCP, 2x 4-20 mA and 2x Relay outputs.

The UC-100G version offers identical capability to that of UC-100S but is also provided with Pyxis 4G CloudLink™ Gateway and enables live mobile APP trend view, data download and reporting via Cloud Data management services.

4. Dimension and Mounting

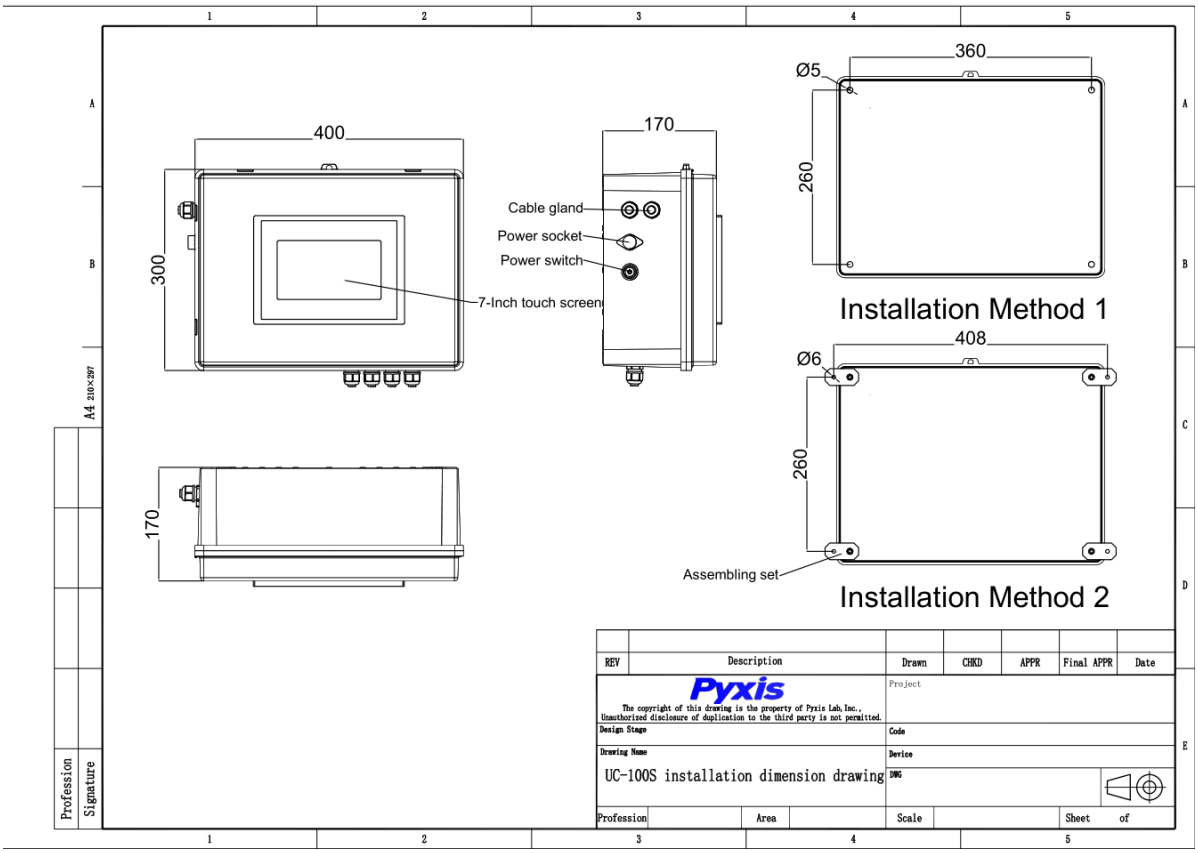

Figure 1. Mounting dimensions

5. Electric Power Connection

Before connecting the power supply cord included in the package to the power socket on the left side of the controller enclosure, remove any packaging material inside the enclosure. Once terminated, plug the

cord into a 110 – 240 VAC outlet. Switch the three power circuit switches to the on position, shown in the upper left of Figure 2.

Figure 2. Wiring terminal and power circuit breakers

6. Terminal Wiring

Wire the 4-20 mA and Modbus output according to the table below. Please note that the 4-20 mA output is not loop powered. It does not require DC power to the loop. It simply carries DC current, proportional to the DO concentration measured. The 4-20 mA span and RS-485 Modbus communication parameters can be configured through the touch panel operations.

Wire Function	Terminal
24 V + for sensor 24 V+	XT6
24 V ground for sensor power ground	XT1
RS-485A (+) from sensor	XT13
RS-485B(-) from sensor	XT18
4-20 mA + output	XT23
4—20 mA output return (-)	XT24
RS-485A (+) for Output	XT39
RS-485B (-) for Output	XT40
Contact Relay OUT1 output	XT31
	XT32

Contact Relay OUT2 output	XT33
	XT34

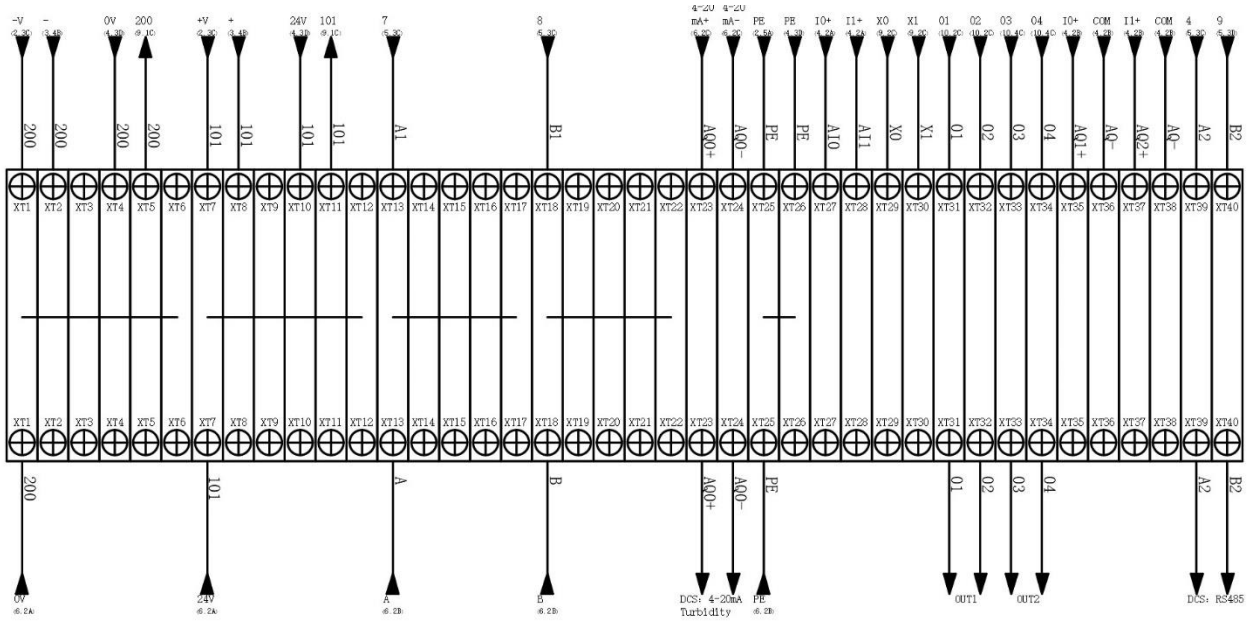

Figure 3. Terminal wiring information

7. Touch Screen Operations

7.1. Main Screen

Click **Enter** button on the initial screen to launch the real-time monitoring screen, where the measured dissolved oxygen (DO) value in ppm (mg/L), % saturation, partial pressure (mbar), temperature of the water sample, and the trend chart are displayed. The status of the two relays is also shown. Press on an area of the trend chart for 3 seconds and release, an interface will be launched. The Y-range can be adjusted in the interface. See Figure 4.

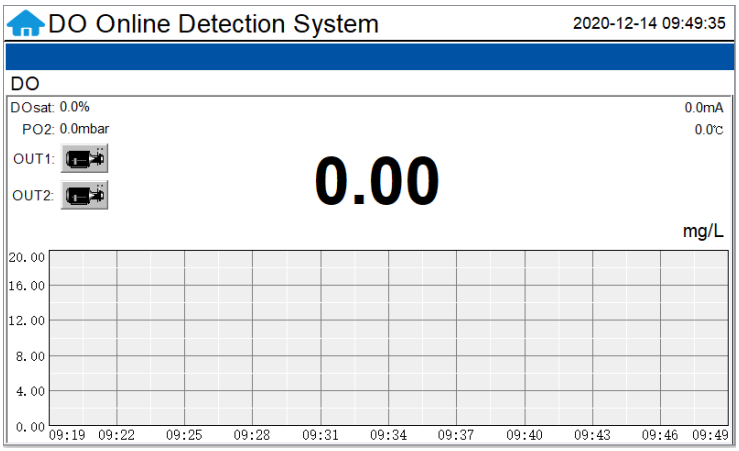

Figure 4. Main Screen

7.2. Menu Bar

Click the "  " button in the upper left corner of the screen to enter the system menu interface, where the user can choose to enter the desired operation interface. The user must log in to be able to change parameters and carry out calibrations.

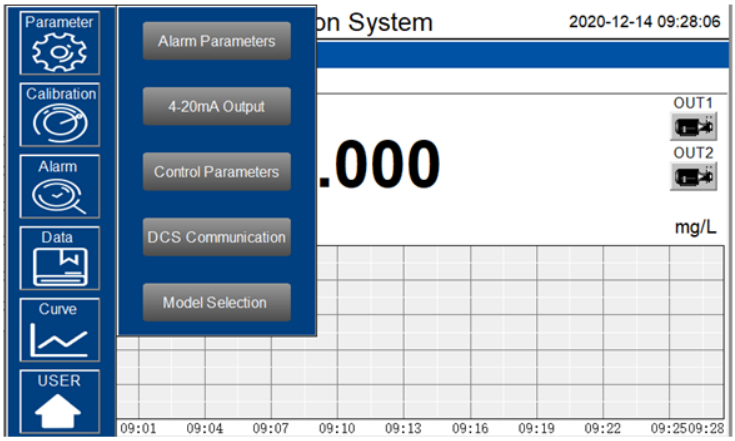

Figure 5. Menu Bar

7.3. User Login

After powering on the system, the user must log in with the username and password to be able to change system settings. Click the "User Login" button, select the user "**pyxis**", enter the password: "**888888**" in the user password field. A new user can be added via "User Management" in interface of the menu. See 7.8 for details.

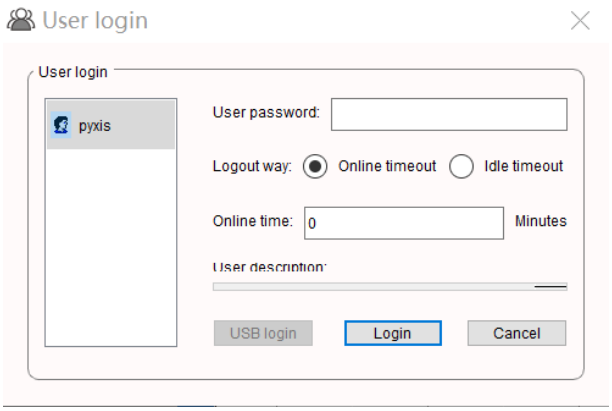

Figure 6. User login interface

7.4. Configurable Parameters

Press on **Parameter** icon to launch the parameter dropdown selection shown in figure 5. The procedure and the menu interface to set up parameters are self-explanatory in the subsequent screens.

7.4.1. 4-20 mA Setup

The default 4-20 mA setup is 4 mA = 0.0 ppm and 20 mA = upper limit of the sensor range. The user can set up the 4-20 mA span in the screen shown in Figure 7.

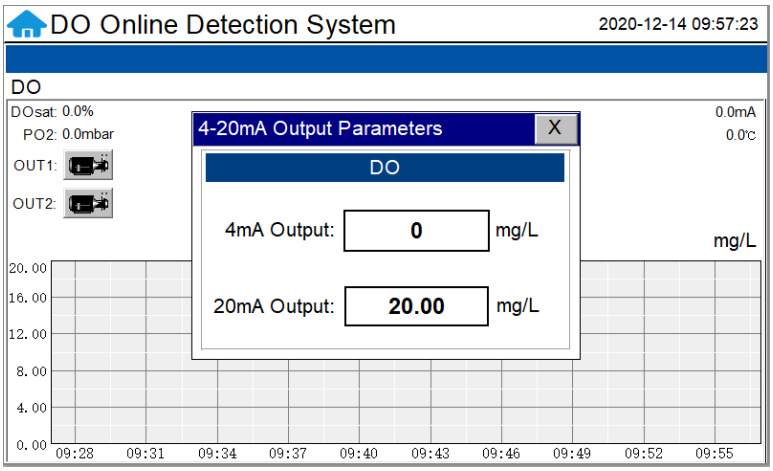

Figure 7. 4-20 mA span setup

7.4.2. Calibration

The interface shown in Figure 8 can be used to calibrate the sensor. Reference the ST-772 Series sensor manual for detailed calibration procedures.

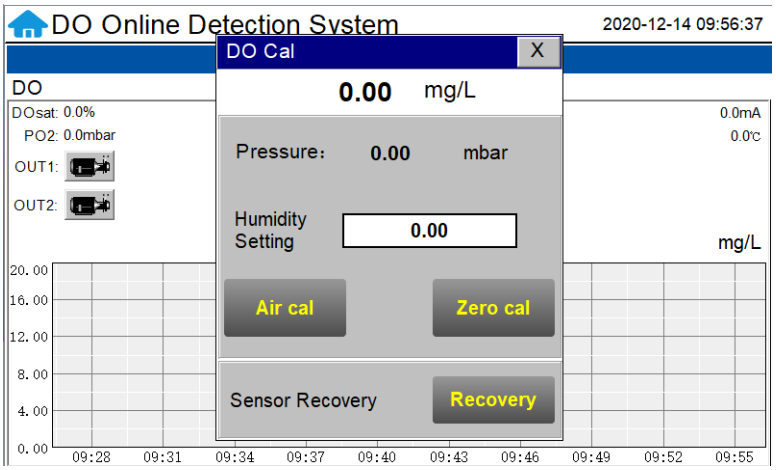

Figure 8. Calibration interface

7.5. Alarm and Control Relay Setup

Press **Control Parameters** icon in the menu bar (Figure 5) to launch the interface shown in figure 9 to set up relay OUT1 and relay OUT2. Relay OUT1 can be set up for the DO alarm output. Relay OUT2 is a timer-based relay. It can be turned on or off periodically by setting the stop period and the running period.

Press the OUT1 or OUT2 icon in the main screen to toggle the relay control between Auto and Manual (Figure 10). In the manual mode, the relay can be turned on or off manually by sliding the Pump control bar. Only in the Auto mode, are the relays controlled by the parameters set up in Figure 9.

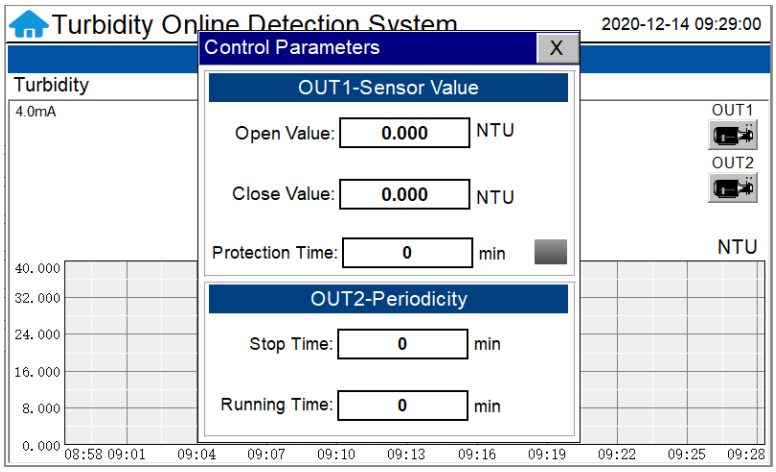

Figure 9. Relay setup

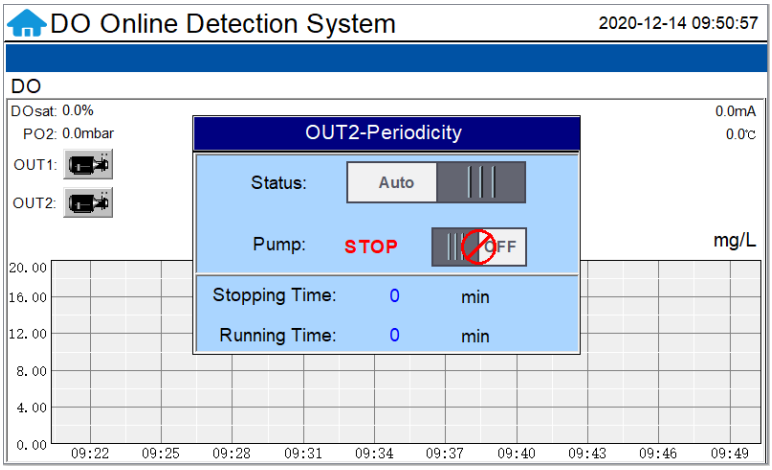

Figure 10. Relay enabled in auto mode

7.6. Historical Data

Click the "Historical Data" button in the menu bar to enter the data report interface.

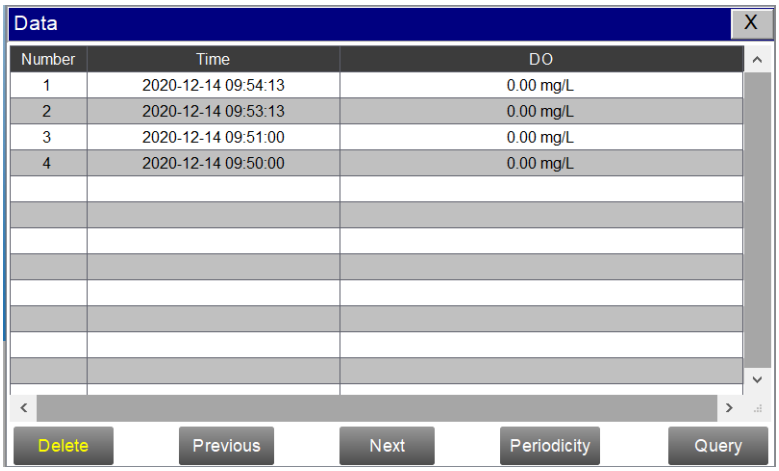

Figure 11. Historical data interface

In the data report, the user can view the stored data of all parameters. The system records sensor readings every 4 seconds by default but this can be edited by the user if desired. Drag the scroll bar on the right to slide up or down or click "Previous" and "Next" to view historical data records. The data record can save up to 100,000 data entries. New data will overwrite the previously saved data after recording 100,000 data entries.

The user can click the “Periodicity” button to change the data recording time interval.

Click “Delete” in the lower left corner. After entering the retention time, click the “Delete” button to clear all historical data within the retention time range.

Click the “Query” in the lower right corner, enter the start time and end time, and then click the “Query” button. Note that the start time and end time must be filled in exactly and completely according to the system time format.

Insert a USB disk behind the screen and enter the time range of the data to be exported in the query area. click on the “Data Export” to download data to the USB disk. The data quantity will be shown as a positive number if data export is successful. If the data export was not successful, please check whether the time format is correct.

7.7. Historical Data Curve

Click the "Historical Curve" button in the menu bar to enter the trend curve interface. You can click the buttons below the X-axis to browse and view the values in different time range. Click on Y-axis Range to change the minimum and maximum Y-axis values for a proper range.

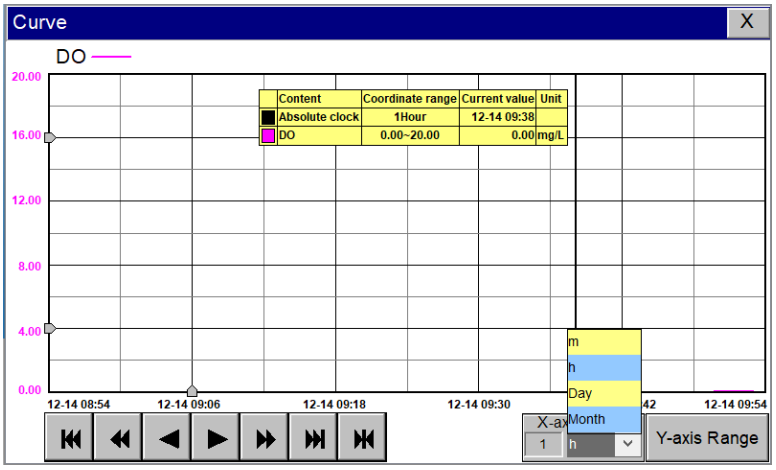

Figure 12. Trend chart

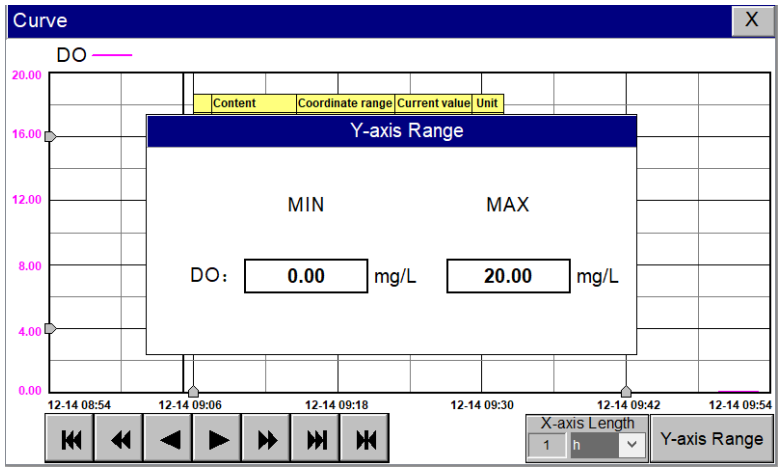

Figure 13. Y axis range change

The curve will scroll back (to the left of the X-axis) one page
The curve will scroll back (to the left of the X-axis) half the page of the curve
The curve will scroll backward (to the left of the X-axis) to a position where the main line is drawn
The curve will scroll forward (to the right of the X-axis) to a position where the main line is drawn
The curve will scroll forward (to the right of the X-axis) half the page of the curve
The curve will scroll forward (to the right of the X-axis) one page
A dialog box will pop up to reset the starting time of the curve

Figure 14. Time range button functions

7.8. User Management

Click the "User Management" button on the menu bar to edit user information. The user can log out of the system. A new user can only view the real-time reading before login.

Click “Admin” to enter the user management interface, new users can be added, and password can be modified.

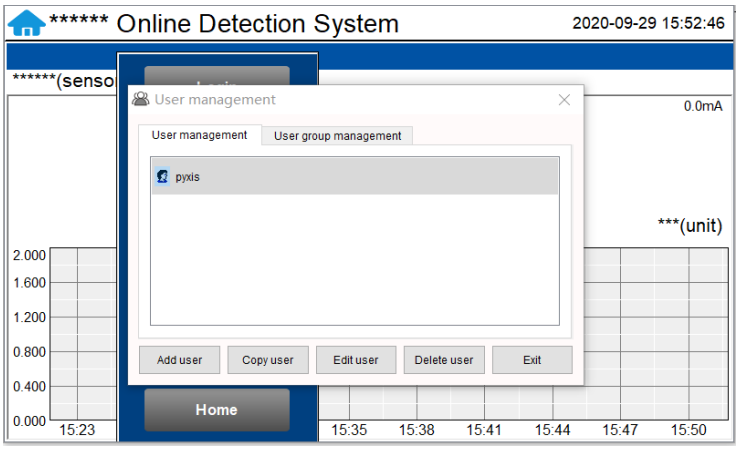

Figure 15. User management interface

8. Modbus Register Information

The default RS-485 communication parameters are listed in the bottom of this table. Different communication parameters can be assigned through the communication setup screen (Figure 16).

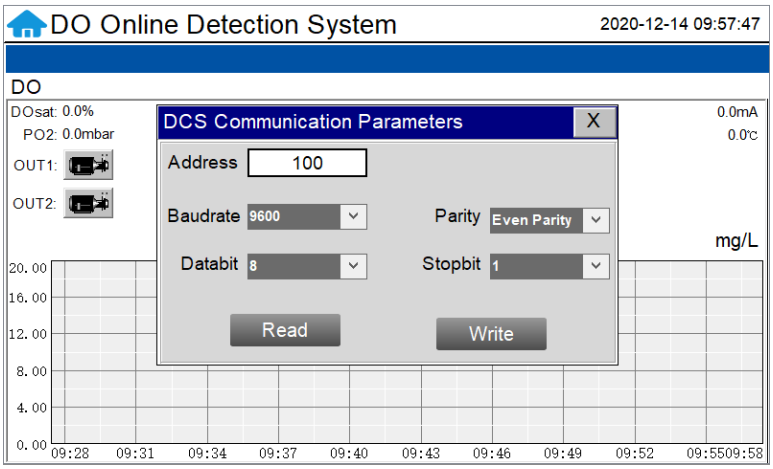

Figure 16. Modbus communication setup

	Parameter	Address	Format	Mode	Unit	Note
1	DO	1	Float	Read only	mg / L	ABCD
2	DO Upper Limit Alarm	3	UINT	Read only		0 = Normal 1= Alarm
3	DO Lower Limit Alarm	4	UINT	Read only		0 = Normal 1 = Alarm
4	DO Sensor Communication	5	UINT	Read only		0 = Normal 1 = Error
Default Communication Parameters						
Protocol: Modbus RTU						
Baud Rate: 9600; Data bit: 8; Stop bit: 1; Parity: Even Modbus Address: 100 All configurable via interface (Figure 16)						

9. Modbus TCP Setup and Register Information

Turn the system power on and Press and Hold the touch screen during the powering up phase to enter the system setup interface as seen in Figures 17 and 18. Select the System Setting. In the TPC setting interface, check Enable DHCP to enable the local network DHCP server to assign an IP address to the touchscreen.

The register information is listed below:

Client address	1
Port	502
Address 1	Temperature (°C), float (ABCD format), read only
Address 2	DO (ppm), float (ABCD format), read only

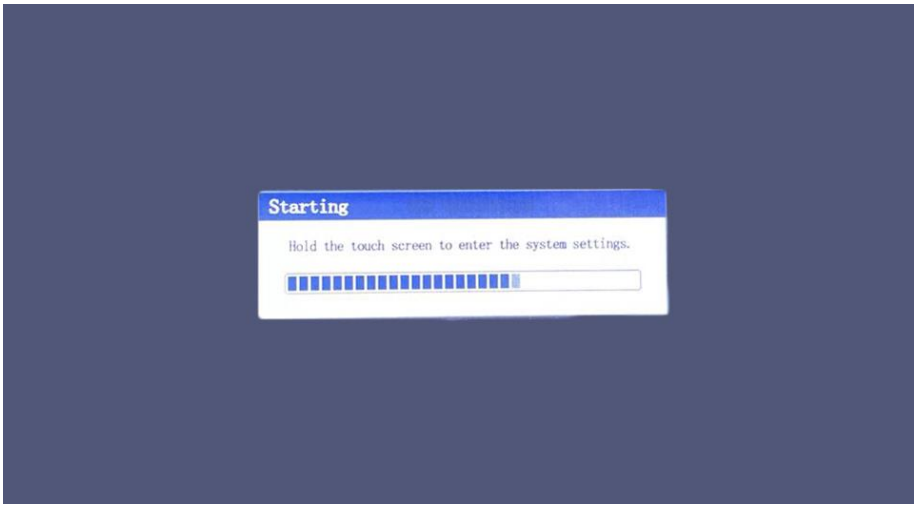

Figure 17. Press and Hold the screen to enter the system setup interface

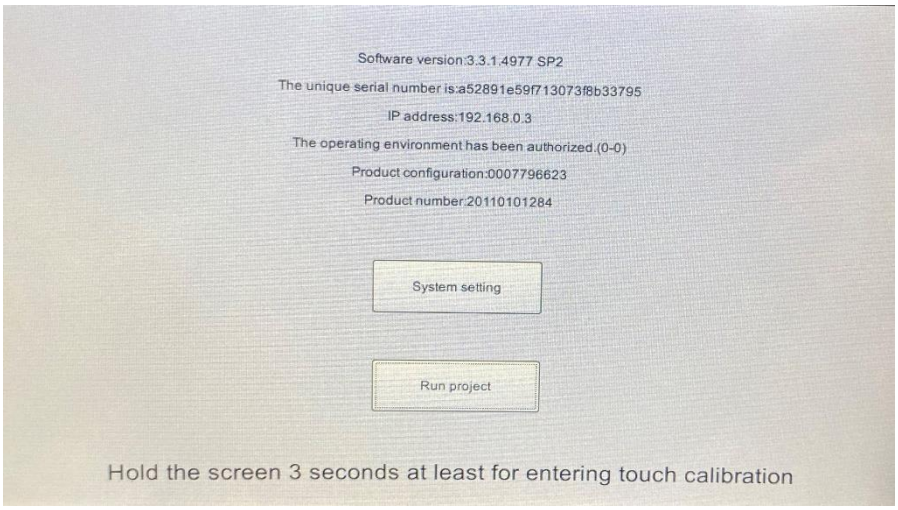

Figure 18. System setting

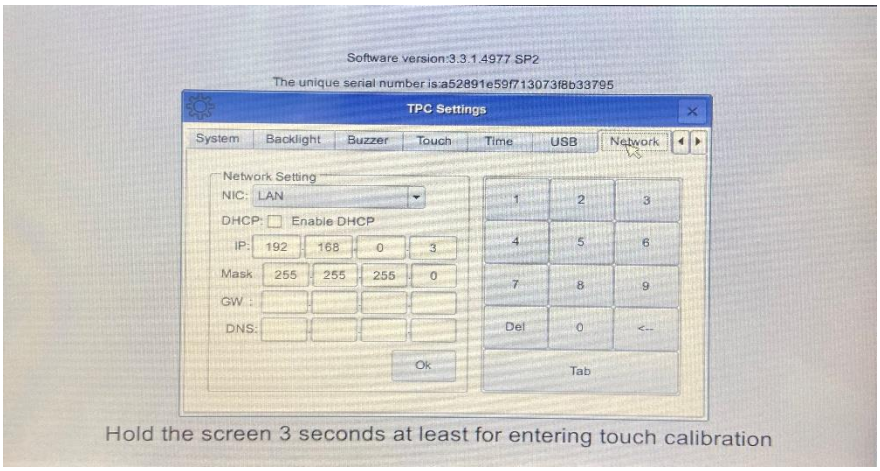

Figure 19. Enable DHCP

10. **Contact Us**

Contact us if you have questions about the use of the UC-100S:

Pyxis Lab, Inc.

1729 Majestic Dr. Suite 5

Lafayette, CO 80026 USA

1-866-203-8397

www.pyxis-lab.com

service@pyxis-lab.com