

Smart POD User Guide

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BLUE i
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Contents

Safety Instructions	5
1 Introduction	7
1.1 General Overview	7
1.2 Method of Operation.....	8
1.3 System Components	9
1.4 Ordering Information.....	10
2 Installation	11
2.1 Unpacking the Analyzer	11
2.2 Environmental Considerations.....	12
2.3 Site Location.....	12
2.4 Wall Mounting	13
2.5 Plumbing Connections	14
2.6 Electrical Connections.....	15
2.7 Wiring.....	16
3 First-Time Operation	17
3.1 Installing Free Chlorine Electrode.....	17
3.2 Installing pH, Redox, and Temperature Electrodes	18
3.3 Supplying Water.....	19
3.4 Powering On	20
4 Remote Operation Using Blue I SMART NET Server	23
4.1 Setting up Remote Communication.....	23
4.2 Modbus Connection via External RS485 Connection	23
4.3 Troubleshooting Communication Issues	24
4.4 Logging On	25
4.5 Editing Unit Details	27
4.6 Monitoring Measurements.....	28
4.6.1 Selecting parameters to display on the Dashboard.....	28
4.6.2 Detailed Parameters View	29

4.6.3	Editing Measurement Value	30
4.6.4	Viewing Alarms	30
4.7	Calibrating Parameters	32
4.8	Viewing Historical Data.....	32
4.9	Creating Graphs	34
4.10	Generating Reports.....	36
5	Maintenance	37
5.1	Chlorine Electrode	37
5.1.1	Cleaning the Sensor	37
5.1.2	Refilling the Electrolyte.....	38
5.1.3	Replacing the Membrane Cap.....	38
5.1.4	Storing the Chlorine Electrode.....	38
5.2	pH and Rx Electrodes	39
5.3	Cleaning the Flow Cell.....	40
5.4	Cleaning the Turbidity Flow Cell	40
5.5	Cleaning the Filter.....	40
6	Troubleshooting	41
6.1	Issues and Workarounds.....	41
6.2	Unable to Solve an Issue	42
7	Appendix A – Specifications	43
8	Appendix B – Sensors Details	45
8.1	OCS140 and OCS141 Free Chlorine Electrode	45
8.2	Smartsens OPS31 pH Electrode	47
8.3	Smartsens OPS32 ORP Electrode.....	47
8.4	Industrial Pressure Transmitter PT124B-213.....	48
8.5	PT 100 for Acrylic Cell Temperature Sensor	48
	Declaration of Compliance	49
	Warranty	50

Safety Instructions

General Safety Precautions



Use this product only in the manner described in this manual. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Utiliser ce produit uniquement de la manière décrite dans ce manuel. Si l'équipement est utilisé d'une manière non spécifiée par le fabricant, la protection fournie par l'équipement peut être altérée.



Smart POD control board unit should not be opened except for initial installation and troubleshooting, and should only be opened by a trained and approved technician.

Le tableau de commandes de l'Smart POD ne doit en aucun cas être ouvert si ce n'est lors de l'installation initiale et en cas de dépannage – auquel cas son ouverture ne doit être effectuée que par un technicien ayant reçu la formation adéquate et dûment habilité.



Only properly trained and licensed electricians should attempt to wire or service the electronic components of the analyzer/controller.

Attention! Seuls des électriciens qualifiés ayant reçu la formation adéquate peuvent entreprendre le branchement, l'entretien ou la réparation des composants électroniques de l'analyseur/du contrôleur.

There is an Electrical Shock Hazard when servicing this system.

Il existe un risque de choc électrique lors de l'entretien de ce système.

Always verify that all electrical power source(s) are off before opening the analyzer/controller unit or attempting to service electronic components or wiring.

Ayez soin de toujours vérifier que la ou les source(s) d'alimentation électrique est ou sont bien déconnectée(s) avant d'ouvrir l'unité ou d'entreprendre toute opération de service technique et tout branchement des composants électroniques.



Extreme caution should be used when installing, operating, and maintaining the Smart POD controller. Only properly trained technicians are authorized to install and maintain the analyzer/controller.

Il y a lieu d'agir avec une extrême prudence lors de l'installation, de la mise en œuvre et de la maintenance du contrôleur Smart POD. Seuls des techniciens dûment formés à cet effet sont autorisés à effectuer l'installation et la maintenance de l'analyseur/du contrôleur.



Only properly trained and licensed operators should attempt to make any changes to chemical dosing levels.

Seuls des opérateurs qualifiés ayant reçu la formation adéquate sont habilités à modifier les dosages des produits chimiques utilisés.



Always follow local health and safety regulations when performing any service on the analyzer/controller unit or when changing chemical dosing settings.

Conformez-vous sans exception aux consignes locales de santé et de sécurité lorsque vous effectuez toute opération technique sur l'analyseur/le contrôleur, ou lorsque vous modifiez les paramètres de dosages chimiques.

Proper Handling of the Electrodes



Do not touch or damage the electrodes. The electrolyte is sensitive to oxidation: Always keep the electrolyte bottle closed after use.

Do not transfer the electrolyte to other containers.

The electrolyte should not be stored for more than one year and should be clear (not yellow) in appearance (for use by date, see label).

Ne touchez pas ni n'abîmez les électrodes. L'électrolyte est sensible à l'oxydation. Maintenez la bouteille contenant l'électrolyte toujours fermée après utilisation. Ne transvasez pas l'électrolyte dans d'autres récipients. L'électrolyte ne doit pas être conservé plus d'un an et doit garder une apparence claire (pas jaunâtre) (pour la période d'utilisation, voir l'étiquette).

Introduction

Accuracy, reliability, compact, and cost-effective make Smart POD the leading choice for amperometric chlorine measurements in municipal applications.

1.1 General Overview

The Smart POD analyzer is a continuous water quality analyzer for municipal applications that utilizes the proven amperometric chlorine measurement.

▶ **Compact Footprint**

Smart POD can measure up to four parameters, including free or total chlorine, pH, temperature and turbidity within its compact design. All sensors are designed within 278 X 188 X 130 mm (11.0 X 7.4 X 5.0 inch) casing, to allow for a minimal installation footprint.

▶ **Quick Installation**

The Smart POD installation is straightforward, simply mount the casing on the wall, connect the feed and drain and calibrate the sensors.

▶ **Protect Better, Operate Better, Know Better, Connect Better**

The Smart POD can be easily connected to the Blue I secured online data-center via Ethernet, Wi-Fi, GPRS, or GSM giving the operator full remote access to the measured data as well as to the analyzer's operation and maintenance interface. When Smart POD is connected to the Blue I data-center, the operator can access real-time assistance and troubleshooting from an authorized representative to ensure optimal service of the analyzer.

1.2 Method of Operation

The Smart POD water quality analyzer is designed to measure a water sample at pre-configured intervals. A water sample is captured in the flow cell where the sample is measured.

The cycle workflow is as follows:

- A.** Water source from main line, reservoir, or surface is fed to the Smart POD system.
- B.** Water flows to the Acrylic measuring cell that includes free chlorine, ORP or pH, and temperature electrodes.
- C.** The solenoid valve at the Turbidity flow cell opens at regular pre-configured intervals (0.5 – 10 minutes), allowing water to enter the cell.
- D.** The valve closes automatically capturing the water in the Turbidity flow cell and a mixer piston is activated to eliminate bubbles inside the cell.
- E.** A light source is activated at a 90-degree angle.

Turbidity measurement is determined as a function of the detected illumination intensity.

- F.** A light source is again activated at a 180-degree angle to obtain a baseline measurement based on the color of the sensed illumination.

1.3 System Components

The Smart POD water quality analyzer features an IP 65 enclosure designed for wall mounting in outdoor installation.



The system includes the following components:

1 – Controller

Includes the display panel and electronic cards.

2 – Modem

External modem provides connectivity to Blue I Smart NET Server via Wi-Fi, GPRS, or GSM.

3 – Turbidity Flow Cell

Specifically designed to hold the turbidity sensor and features automatic cleaning.

4 – Acrylic Flow Cell

Includes the proximity flow switch, and the ports for temperature sensor, pH electrode, and Redox (ORP) electrode.

5 – Float Sensor

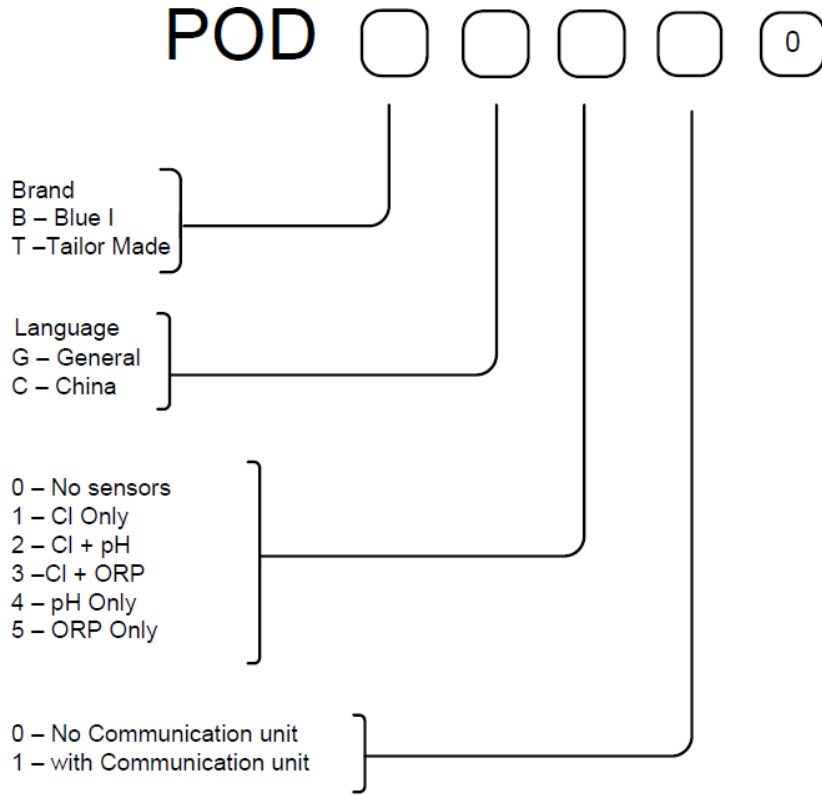
Located at the bottom of the enclosure, detects water rising inside the enclosure indicating a water leak. Depending on settings, the sensor can send alerts via MSG or email and close the main valve.

Filter – a 130-micron disc filter providing filtered water to the Acrylic flow cell.

Pressure Regulator – the pressure regulator maintains constant pressure and flow into the Acrylic flow cell required for stable chlorine measurements.

1.4 Ordering Information

Temperature and turbidity measurements are provided by default.



Installation

2.1 Unpacking the Analyzer

The Smart POD analyzer is shipped in a cardboard carton, secured with foam packing material. A packing list is included in each shipping carton. Check the components in the shipping carton against the items on the packing list and inspect for any damage. If any part is missing or damaged, contact your distributor.



The following table details the Smart POD installation kit.

Note:

The packing list depends on the ordered configuration and may be different than the packing list for your analyzer. The following list is used for demonstration purposes in this guide.

Part Number	Description	Quantity
POD	Installation Kit for Smart POD	
970-000-4000	Filter Assembly for HG	1
972-000-0069	Pressure reducer gauge	1
NGE010	3G/4G Antenna	1
970-210-0204 / 970-210-0205	pH electrode / Redox electrode	1
970-210-0302	Free Chlorine electrode	1
970-110-8092	Signed Warranty Certificate	1

2.2 Environmental Considerations

The Smart POD enclosure environmental rating is IP 65 and enables both indoor and outdoor installation. The system working environment is as follows:

Pollution Degree: 2

Installation Category: 2

Altitude: 2,000 m

Humidity: 20% to 90% RH (up to 90% humidity at 40° C / 104° F)

Temperature: 2° to 50° C (35.6° to 122° F)

2.3 Site Location

Consider the following when selecting an installation location:

- **Convenient access** – install the system where you can easily view and operate it.
- **Away from chemicals** – many water treatment chemicals can be corrosive to the system's electronic circuitry. It is highly recommended that the unit is not installed adjacent to a storage area for chemicals or the dosing systems themselves.
- **Minimal distance from supply pipe** – the water sampling line that is connected to the main pipe that feeds the system should be as short as possible. A long sample line creates unnecessary delay between water supply and measurement. In any case, water sampling line should not exceed 10 meters (30 feet).
- **Drainage** – the system's location should allow the drain outlet sufficient grade for gravity flow, without creating an obstacle (no pipe across walkway).
- **Freezing and changing temperatures** – select a location that is not susceptible to freezing temperatures because parts may be damaged due to expansion when ice forms. Avoid installing in a location that is exposed to extreme temperature fluctuations. In addition, sudden water temperature changes can affect readings.

2.4 Wall Mounting

The Smart POD is wall mounted. It is recommended to mount the base of the unit at least 60 cm (24") above the floor, preferably at eye level, to allow easy viewing and operation.

The unit is shipped without mounting screws. The installer must provide screws that can hold the weight of the unit. The screws must be compatible with the wall type on which the unit is mounted.

1. Use appropriate mounting brackets as guidelines for marking drilling holes from each side of the system. Drill the holes using an 8-mm drill.
2. Fasten the enclosure to the wall using appropriate mounting brackets.

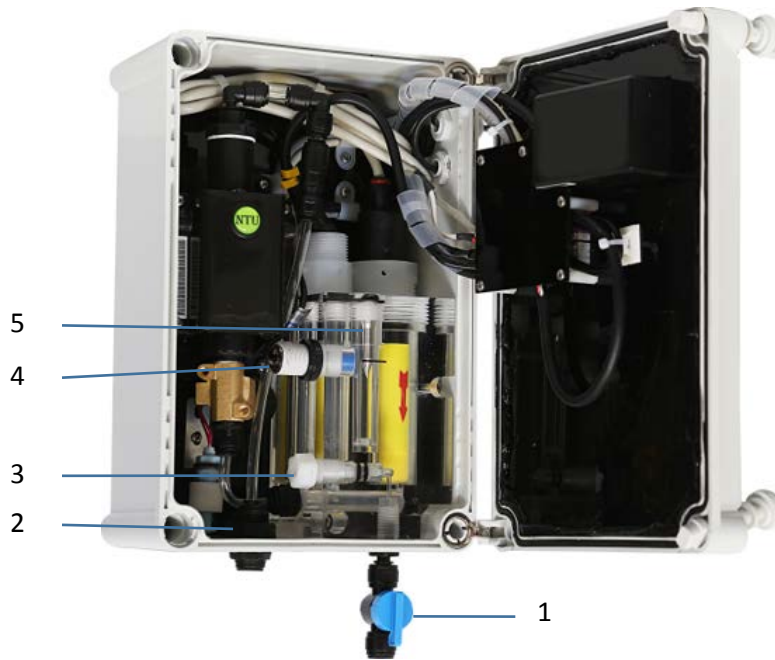


3. Verify that the unit is installed at upright position, 90° vertical to the ground. Any sideways or back/forward tilt may impair the function of the system.
4. Connect the modem cables to the provided detached modem and place on top of the unit or affix it to the wall using appropriate screws.

2.5 Plumbing Connections

The Smart POD is shipped with a water filter and a pressure regulator. The analyzer requires a pressurized water supply of 0.35 to 1 Bar (5 – 14.5psi) and a steady water flow of at least 35 l/h (9 – 16 GPH) to the flow cell.

Length of the water inlet line should not exceed 10 meters (30 feet) and preferably as short as possible to minimize the time water reach the flow cell. It is recommended to connect the water inlet pipe at the bottom of the main line to minimize air entering the system.



- 1 – Water inlet
- 2 – Water outlet
- 3 – Flow regulating valve
- 4 – Proximity flow switch
- 5 – Metal float

► To connecting the water inlet and drain

1. Use the provided fitting for 8-mm (1/4") pipe to connect a valve and install the Filter Assembly (P/N 970-000-4000) between the main line and the analyzer.
2. Close the valve and connect a Pressure Reducer valve (P/N 972-000-0069) to the Filter outlet.
3. Lead an 8-mm pipe from the pressure reducer valve to the analyzer water inlet.



4. Connect a 10-mm pipe to the flow cell outlet and lead it out through the fitting at the bottom of the enclosure.

The outlet pipe must have a constant downward slope to prevent backflow.



2.6 Electrical Connections

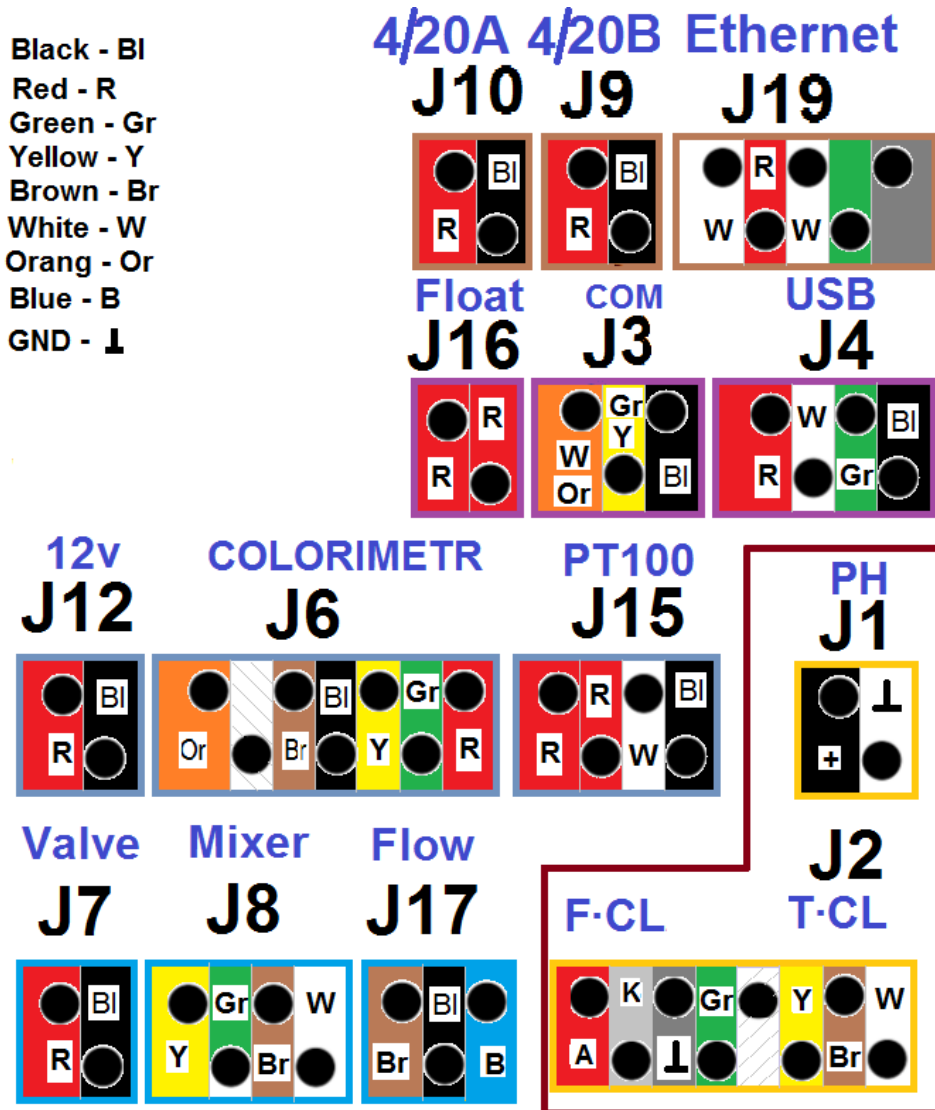


The electrical connections described in this section are a recommendation only. All electrical connections must comply with National Electrical Code (NEC) and all local regulations.

The Smart POD analyzer is power supplied by 100 – 240VAC 50/60Hz, using the provided power cord.

2.7 Wiring

The following image details the wiring scheme on the electronics card.



First-Time Operation

Setting up the system includes the following steps: installing electrodes, supplying water to the system, and powering on.

3.1 Installing Free Chlorine Electrode

Free chlorine is defined as the sum of Hypochlorous acid (HOCL), hypochlorite ions (OCI-) and Cl₂, and the proportion of the different free chlorine species is pH and temperature dependent. The hypochlorous acid (HOCL) contained in the medium diffuses through the sensor membrane and is reduced to chloride ions (Cl-) on the gold cathode. On the silver anode, silver is oxidised to silver chloride. The electron release of the gold cathode and electron acceptance on the silver anode result in a current flow which is proportional to the HOCL concentration in the medium under constant conditions. Since the concentration of hypochlorous acid in the medium depends on the pH value, pH must be measured to perform an accurate compensation and present a free chlorine value.

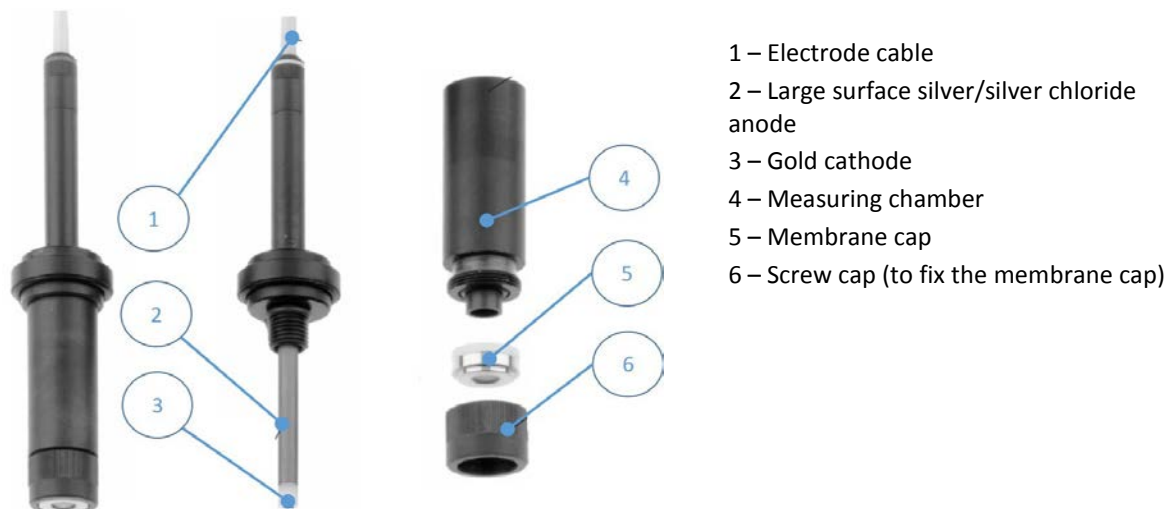


Do not swallow the electrolyte. Avoid electrolyte contact with skin or eyes. In case of accidental contact, wash with a lot of cold water. In case of eye inflammation, contact a doctor immediately.

Wear safety glasses and gloves when working with the electrolyte solution.



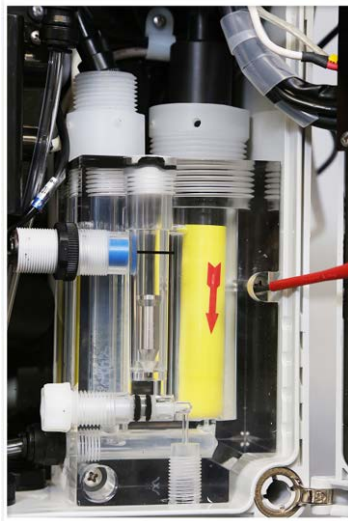
Do not touch or damage the electrodes. The electrolyte is sensitive to oxidation: Always keep the electrolyte bottle closed after use.



► To install chlorine electrode:

The free chlorine electrode is shipped from the factory wet and pre-filled with electrolyte. There is no need to fill electrolyte before using.

1. Remove the electrode from the acrylic flow cell and pull off the yellow protection cap.



2. Verify that the electrode is full of electrolyte and the membrane is not damaged.
For information about refilling electrolyte or replacing the membrane, see “Chlorine Electrode” on page 37.
3. Install the electrode back into its port in the acrylic flow cell and hand-tight.
4. Route the wires (if not already wired) to the electronics card. Connect wire K to CL-K terminal, wire A to CL-A terminal and the unmarked wire (ground) to the ground terminal.
See “Wiring” on page 16 for more information.

3.2 Installing pH, Redox, and Temperature Electrodes

1. **pH electrode:**

The pH electrode is shipped from the factory in its original packaging.

- a. Remove the pH electrode from its packaging, remove the silicon cap and install the electrode into its port in the acrylic flow cell and hand-tight.
- b. Connect the cable labeled **pH** to the top of the electrode and hand-tight.
- c. Connect the center wire to the pH (+) terminal block.
- d. Connect the clamp onto the outside of the wire being sure that the wire mesh is in contact with the metal plate on the electronics card.
- e. The pH (-) terminal block will remain empty.

The pH electrode cable is shipped connected to the electronics card. For more information about wiring the pH electrode, see “Wiring” on page 16.

2. Redox electrode:

- a. Remove the Redox electrode from its packaging, remove the silicon cap and install the electrode into its port in the acrylic flow cell and hand-tight.
- b. Connect the cable labeled **Rx** to the top of the electrode and hand-tight.

The Redox electrode cable is shipped connected to the electronics card. For more information about wiring the Redox electrode, see “Wiring” on page 16.

3. Temperature sensor:

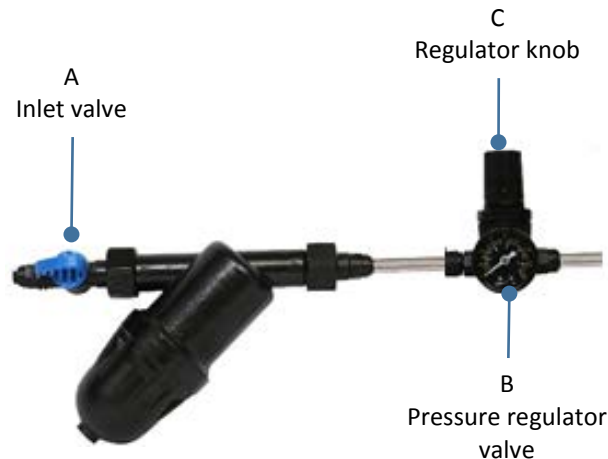
The temperature sensor is shipped from the factory installed inside the acrylic flow cell and wired to the electrodes card.

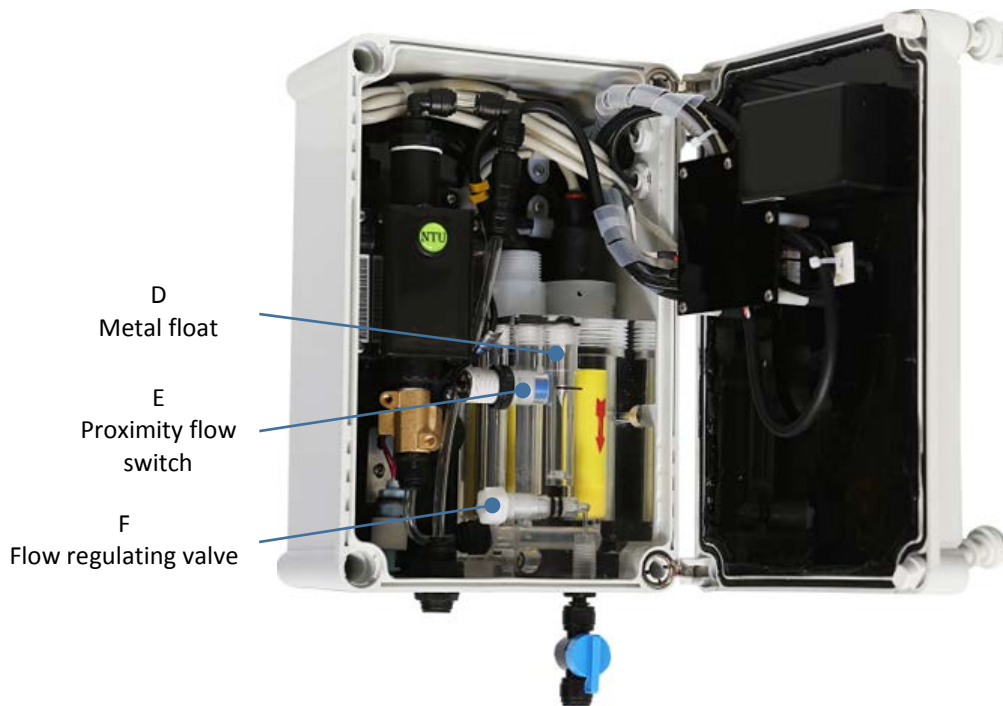
- a. Connect the Black wire to the connection labeled Black.
- b. Connect the White or Yellow wire to the connection labeled Yellow.
- c. Connect the Red wires to the connections labeled Red. Either Red wire may go to either connection.

The temperature sensor cable is shipped connected to the electronics card. For more information about wiring the temperature sensor, see “Wiring” on page 16.

3.3 Supplying Water

1. While water flows to the system, use the pressure regulator valve (**B**) to adjust the water pressure to 0.35-1 bar (5 – 14.5 psi) by gently pulling the knob up (**C**). Once pressure is stabilized, push the knob back to lock it.
2. Adjust the water flow within the flow cell: verify that the metal float (**D**) is aligned with the proximity flow switch (**E**). Adjust the flow using the flow cell valve (**F**).





3.4 Powering On

To turn the analyzer on, connect the power cord to a power socket. Allow the analyzer to operate for several hours before proceeding to calibration.

The analyzer's screen displays current measurements in addition to the information detailed below.



The information line at the top of the screen refreshes every 5 seconds. The information is displayed in the following order in an endless loop:

- Measurement threshold value exceeded (only if occurred):
 - Chlorine low/Chlorine high
 - PH low/PH high
 - Turbidity low/Turbidity high
 - Temperature high/Temperature low
- System error. Only the first encountered error is displayed:
 - **No flow** – indicates insufficient water flow through the Acrylic flow cell.
 - **Check led** – indicates that no current was detected in turbidity measurement LED.
 - **Check piston or high pressure** – indicates that the piston coils are not connected properly, the coil is damaged, or the pressure is too high (above 1 bar).
 - **Check NTU connection** – indicates that the digital connections between the turbidity measurement unit and the main board is not working properly.
- **System flood** – water is flooding the enclosure. This message is displayed only when a flood is detected.
- **Smart POD #121 Ver 1.32 online 09/08/2017 18:14:**
 - #121 – serial number of the unit.
 - Ver 1.32 – software version.
 - Online – indicates the Smart POD is connected to a server.
- The following information is displayed only when a Modbus server is connected to the Smart POD and communicating at least once every two seconds.
 - Modbus OK – displayed as long as the Modbus server is not sending server status to the controller.
 - Modbus OK, Server OK, speed 3 – displayed when the Modbus server is sending server status and indicates that the connection is OK, and the connection speed is high (1-low, 4-highest).
 - Modbus OK, Server fault – indicates that the server is not connected.

Remote Operation Using Blue I SMART NET Server

The Smart POD analyzer supports two-way communication with Blue I SMART NET server. This enables monitoring measurement results, historic data, and alerts remotely via a web application. In addition, operators can use the web application to modify system settings, perform calibrations, and generate reports remotely.

4.1 Setting up Remote Communication

The detached Modem unit enables you to connect and operate the Smart POD analyzer. Available communication options are: TCP/IP LAN, 3G/4G GSM (USB dongle), or Wi-Fi (internal).

► To set up Wi-Fi, GSM, or LAN connection:

1. For a **LAN connection**: connect an Ethernet cable to the Ethernet port located on the enclosure right side.
2. For **GSM or Wi-Fi connection**: locate the USB port on the back of the touch screen display and insert the provided GSM dongle.
If you use GSM, place a SIM card with data plan into the dongle.
3. Connect the antenna cable from the display unit to the antenna connector.
4. Outside the enclosure, unscrew the antenna connector cap and connect the provided antenna.
5. Attach the antenna to a metal object or place it on top of the controller.
Position the antenna away from signal obstructions in front of the antenna.

4.2 Modbus Connection via External RS485 Connection

1. Connect an RS485 cable to the external RS485 terminal block.
Register 40193 (holding 193) holds the Modbus address for RS485 connection only and does not affect the USB or PI connection. It is possible to change this address from 1 to 127 as required.
2. Setup the connection settings to 115200 bps, no parity, no handshake, 1 parity bit.
3. Refer to the controller Modbus mapping to read data from the controller.

4. For basic use, read the first 14 input registers from Device address 1, registers address 30001 – 30014 to get calibrated readings. See the Modbus mapping for further details.

4.3 Troubleshooting Communication Issues

Follow these guidelines and instruction if you encounter connectivity issues with Blue I SMART NET server.

For more information about troubleshooting modem issues, see the video tutorials at <http://blueitechnologies.com/video-tutorials>.

▶ Are you using a 3G/4G modem?

Unplug the modem and connect it to a laptop. You should get plug and play connectivity using the Huawei GSM dongles. If you there's no connectivity while connected to a laptop, consult Blue I support or the SIM card provider.

If you are using an HSPA hotspot dongle, make sure to define it as Wi-Fi internal using the SSID and password provided by Blue I (the factory setting password is overwritten), see "Setting up Remote Communication" on page 23.

▶ Are you using Internal or External Wi-Fi?

Make sure that you have type in the correct password in the Define Communication screen. After resetting, the correct IP address should be displayed when tapping **Show IP** in the Admin screen.

IP addresses is displayed for wlan0 for Internal Wi-Fi dongles, and wlan1 for External Wi-Fi dongles.

▶ Are you using LAN/Ethernet connection?

Use the same cable to connect to your laptop. If you are unable to connect on your laptop, consult your IT department for setting DHCP for your network.

Tap **Show IP (Advanced)** in the Admin screen, an IP address is displayed under ETH.

▶ Verify that definitions are being read correctly from the device

Open the About screen, verify that you see your controller unique ID.

Open the Hardware Configuration screen, verify that your unit settings are configured correctly: **POD** for Smart POD.

▶ Verify that the unit clock is set

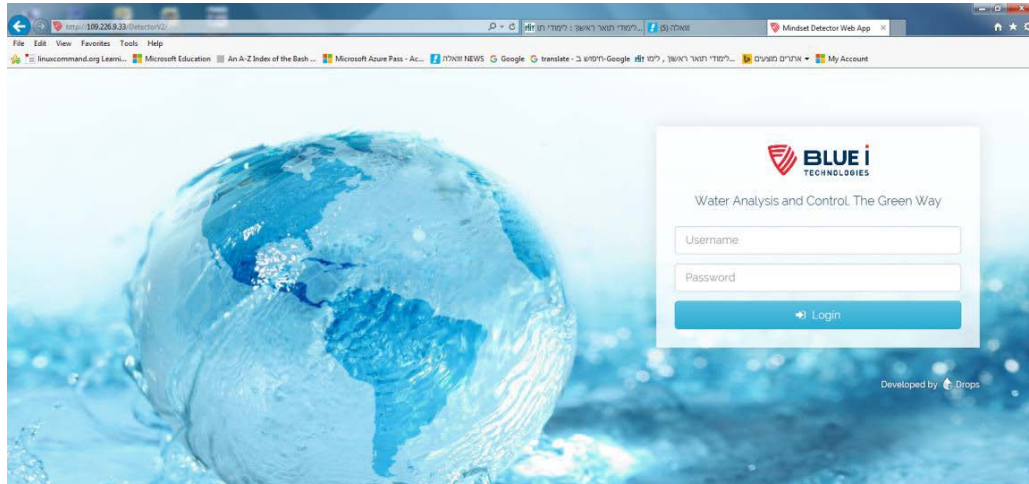
Make sure the unit clock is set correctly via the Localization menu.

▶ If the unit is behind a firewall

Verify that your network communication is open for FTP/SFTP/FTPS access.

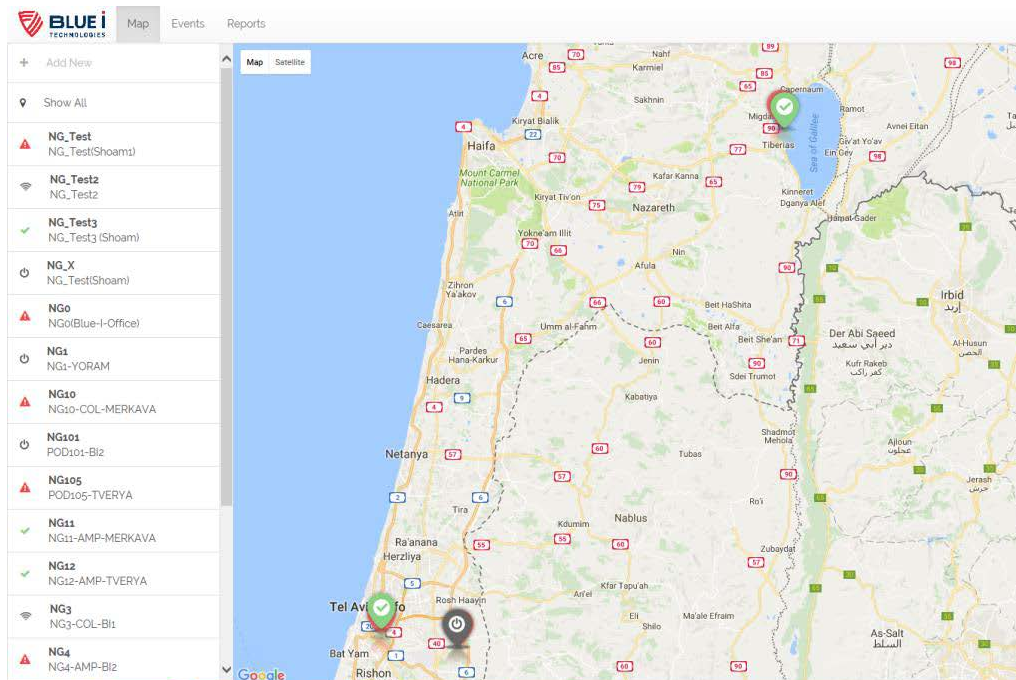
4.4 Logging On

1. In your Internet browser, type in the following address: www.blueiwt.com.
The Login page is displayed.



2. Type in your user name and password, and click **Login**.
Your assigned privileges determine the type of access to the system:
 - Admin – full control in the system
 - Engineer – modify system settings, except maintenance
 - Viewer – viewing rights only

The main screen is displayed.



The Left pane displays a list of your Smart POD installations grouped by geographical location. Expanding each installation opens the unit properties: Dashboard, Charts, Parameters, History, Calibration, and Reports.

The main area displays three tabs:

- **Map** – display the units and their status on a map.
- **Events** – displays events properties. Events properties is available if you installed the EDS option.
- **Reports** – opens the reports page.

Unit Statuses:



Idle – unit is not in working mode



Warning – a low level alert



Alert – a high level alert



Communication – unit has not reported status/date for more than 15 minutes

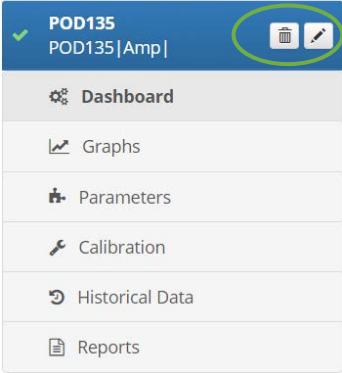


OK – unit is working and reporting OK

4.5 Editing Unit Details

You can edit general properties of each unit.

- 1. Select a unit in the left pane.



- 2. Click the Pencil icon to edit the unit's properties:

A screenshot of a dialog box titled 'Edit POD135' with a close button (X) in the top right corner. The dialog contains several input fields: 'Description:' with the value 'POD135|Amp|', 'GIS longitude:' with the value '34.8819237', 'GIS latitude:' with the value '32.4322472', 'DOMAIN:' with a dropdown menu showing 'HEDERA' and a 'DOMAINS' dropdown arrow, 'ALERTING_MAIL:' with the placeholder text 'Enter ALERTING_MAIL', and 'ALERTING_TEL:' with the placeholder text 'Enter ALERTING_TEL'. At the bottom right of the dialog are two buttons: 'Close' and 'Save'.

- 3. Click **Save** to save and close the Edit window.

4.6 Monitoring Measurements

You can get an overview of each unit measurements by accessing the unit Dashboard.

To access the unit Dashboard, select a unit on the left and click **Dashboard**.

Dashboard: POD149 (6192), pod1 |Amp

LOGGEDIN_USER: Nelson | Last update time: 2017-08-27 16:37:04

Set Parameters to Display

Parameter	Current Value	Units	Low	High
ChlorineAmp OCS140	0.032	ppm	0	1.5
pH	7.093	pH	6.5	8.5
Temperature	27.06	C	5	35
Turbidity	0.733	NTU	0	1

Sensor Alarms | System Alarms

For each parameter, the system displays current measurement, low threshold, and high threshold. For additional details on each parameter, see [“Detailed Parameters View”](#) on page 29.

4.6.1 Selecting parameters to display on the Dashboard

1. In the Dashboard page, click **Set Parameters to Display**.
2. Select the parameters you want to display for this unit by dragging the control to the right. You can display up to eight parameters at the same time.

Parameters	Display
FreeChlorine	<input type="checkbox"/>
TotalChlorine	<input checked="" type="checkbox"/>
ChlorineAmp	<input checked="" type="checkbox"/>
pH	<input checked="" type="checkbox"/>
Redox	<input checked="" type="checkbox"/>
Temperature	<input checked="" type="checkbox"/>
Turbidity	<input checked="" type="checkbox"/>
Conductivity	<input checked="" type="checkbox"/>
Pressure	<input checked="" type="checkbox"/>
Flow	<input type="checkbox"/>
NTC_Chlor_Compen	<input type="checkbox"/>
NTC_Cond_Compen	<input type="checkbox"/>

Close Save

3. Click **Save**.

4.6.2 Detailed Parameters View

In addition to the Dashboard view, you can monitor parameters values in detail by accessing the unit's Parameters page.

► To view detailed parameters values:

1. Select a unit on the left and click **Parameters**.

ID	Category	Name	Units	DB Value	Last Update Date	Operation
1	Measurements	FreeChlorine	ppm	0.00	2017-01-14 13:47:46	🔒
2	AdditionalMeasurements	TotalChlorine	ppm	0.00	2017-01-14 13:47:46	🔒
3	AdditionalMeasurements	ChlorineAmp	mA	0.00	2017-01-14 13:47:46	🔒
4	Measurements	pH	pH	6.53	2017-01-14 13:47:46	🔒
5	Measurements	Redox	mV	849.50	2017-01-14 13:47:46	🔒
6	Measurements	Temperature	C	25.39	2016-11-02 10:48:05	🔒
7	Measurements	Turbidity	NTU	0.07	2017-01-14 13:47:46	🔒
8	Measurements	Conductivity	uS	1902.00	2017-01-14 13:47:46	🔒
9	Measurements	Pressure	Bar	1.20	2017-01-14 13:47:46	🔒
10	Measurements	Flow	m³/h	0.00	2017-01-14 13:47:46	🔒
11	AdditionalMeasurements	NTC_Chlor_Compen	C	0.00	2017-01-14 13:47:46	🔒
12	AdditionalMeasurements	NTC_Cond_Compen	C	19.40	2017-01-14 13:47:46	🔒

The following data is available for each parameter:

Value	Description
ID	Index number of the parameter
Category	The category group of the parameter
Name	Parameter name.
Units	Engineering units.
DB Value	Parameter's value currently stored in the database.
Last Update Date	Time stamp of the last update of the parameter's value in the database.
Operation	<ul style="list-style-type: none"> • Lock icon – parameter's values can be modified from the field unit only. • Pencil icon – parameter's values can be modified from the server by clicking the icon.

2. To filter the Parameters page, click the **All Parameters** list on the left and select a filter:
 - **All Parameters** – displays the complete list of parameters
 - **Low/High Limits** – displays low/high alarm limits
 - **Measurements** – displays parameters from group 0,1 that can be displayed on the Dashboard
 - **Parameters** – displays the unit's meta parameters
 - **Versions** – displays software components and hardware versions

4.6.3 Editing Measurement Value

You can manually update measurement values for parameters that a Pencil icon appears in their **Operation** column.

1. Click the Pencil icon.

2. Type in the new value in the New Value field and click **Save**.

4.6.4 Viewing Alarms

Alarms are triggered when a parameter measurement exceeds the low or high thresholds set for this parameter. To set alarms thresholds, you need Engineer privileges.

When alarms are triggered, the **Sensor Alarms** at the bottom of the Dashboard page become active.



Click **Sensor Alarms** or **System Alarms** to view active alarms.

The system displays the following alarms:

Alarm	Description
Chlorine Low	Chlorine Electrode value- Low Alarm
Chlorine High	Chlorine Electrode value- High Alarm
pH Low	pH Low Alarm
pH High	pH High Alarm
Turbidity Low	Turbidity Low Alarm
Turbidity High	Turbidity High Alarm
Temperature High	Temperature High Alarm
No flow!	No sufficient water flow through the acrylic cell.
Check LED!	No current was detected flowing through the turbidity measurement LED
Check piston or high pressure!	The piston coils are not connected well, the coil is damaged, or the pressure is too high (above 1bar)

Check NTU connection!	The digital connections between the turbidity measurement unit and the main board is not working well
System flood	Water is flooding the Pod
Online	Indicated if the Pod is connected to the server.
Modbus OK, Server OK, speed 3	The connection with the server is ok, and the communication speed with the server is high. The speed can be 1 to 4. 1 is low. 4 is high.
Modbus OK, Server fault	The server is not connected, check modem


4.7 Calibrating Parameters

The Blue-I server enables you to calibrate the Smart POD parameters remotely. Calibration is a process in which sensors reading are adjusted based on actual field measurements. Calibration may set the offset of a sensor, its gain, or both. By default, the calibration page displays all calibrations performed in the last six months. This can be changed by setting a different date range.

► To calibrate parameters:

1. In the left pane, expand a unit and select **Calibration**. The Calibration page is displayed.

ID	Parameter	Analyzer #1	Reference #1	Analyzer #2	Reference #2	Gain / Offset	TimeStamp
28	FreeChlorine	1.56	0.72	⊖	⊖	Offset	2017-01-12 16:38:26
27	FreeChlorine	1.70	0.72	⊖	⊖	Offset	2017-01-12 16:37:30
26	TotalChlorine	2.27	0.87	⊖	⊖	Offset	2017-01-12 16:36:57
21	FreeChlorine	4.00	5.00	5.00	5.00	Gain + Offset	2016-07-21 11:15:00
24	FreeChlorine	1.00	1222222.00	⊖	⊖	Offset	2016-07-21 11:00:00
23	Pressure	4.00	4.00	⊖	⊖	Gain	2016-07-21 00:00:00
22	FreeChlorine	4.00	5.00	5.00	5.00	Gain + Offset	2016-07-20 11:15:00
11	Redox	55.30	54.20	2.09	54.20	Gain + Offset	2016-07-19 00:00:00

2. Click  to edit an existing calibration, or click **New** to add a new calibration.
3. In the Add New Calibration Entry, type in the calibration data:
 - **Parameter** – select the parameter you want to calibrate.
 - **Analyzer #1** – enter the unit's parameter measurement
 - **Reference #1** – enter the parameter external measurement
 - **Analyzer #2, Reference #2** – if you use two-points calibration, enter unit measurement and external measurements for the second point.
 - **Gain/Offset** – select the calibration type: Gain, Offset, or both
4. Click **Save** to save the new calibration.

4.8 Viewing Historical Data

The Historical tab enables you to browse through historical data. By default, the order of the records is from current time to past. On the lower left side, you can set the number of records to display per page and move through the pages.

- To view historic data, expand a unit on the left, and click **Historical Data**.

- To export the data to CSV or Excel file, click  at the top right corner.


Dashboard | Graphs | Parameters | Calibration | **Historical Data** | Reports

Historical Data: NG_Test, NG_Test(Shoam1)

All Parameters | 2017-01-07 15:00 | to | 2017-01-14 15:00 | Go!

ID	TimeStamp	Turbidity	pH	Free Chlorine	Conductivity	Redox	Pressure	Flow	Temperature
232167	2017-01-14 15:00:39	0.41	8.01	0.40	600.00	300.10	1.05	7.00	25.06
232166	2017-01-14 14:59:39	0.40	8.00	0.40	603.00	300.80	1.05	7.00	25.03
232165	2017-01-14 14:58:39	0.41	8.01	0.40	604.00	300.20	1.08	11.00	25.08
232164	2017-01-14 14:57:39	0.41	8.00	0.40	604.00	300.50	1.00	12.00	25.09
232163	2017-01-14 14:56:38	0.41	8.01	0.40	605.00	300.30	1.05	14.00	25.04
232162	2017-01-14 14:55:38	0.40	8.00	0.40	606.00	300.90	1.04	11.00	25.05
232161	2017-01-14 14:54:38	0.41	8.01	0.40	608.00	300.20	1.04	8.00	25.01
232160	2017-01-14 14:53:38	0.40	8.00	0.40	604.00	300.80	1.08	14.00	25.04
232159	2017-01-14 14:52:38	0.41	8.00	0.40	601.00	300.70	1.05	13.00	25.03
232158	2017-01-14 14:51:38	0.40	8.00	0.41	609.00	300.50	1.01	10.00	25.05

Showing 1 to 10 of 10051 rows | 10 records per page | 1 2 3 4 5 ... 1006



4.9 Creating Graphs

Graphs enable you to display historical data graphically. Three types of graphs are available:

- **Time series** – displays up to four different parameters on both left and right vertical axis and time labels on the horizontal axis
- **Histogram** – shows the frequency of measurement values over a specified time.
- **X-Y Chart** – displays the correlation between two parameters.

► **To create a graph:**

1. Expand a unit on the left and click **Graphs**.
2. In the Graphs page, select the graph you want to create from the list.
3. Depending on the selected graph, specify the following information:
 - a. **Time Series:**

Select the parameters, specify a time range and click **Go**.



Note

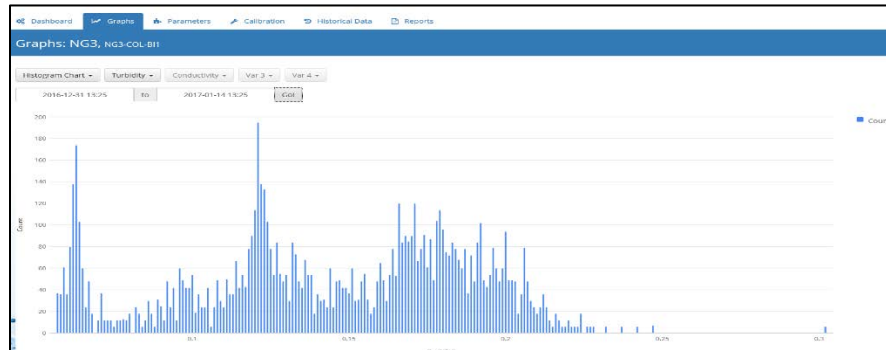
Time interval is one minute when the range is less than a week.

Time interval is 10 minutes when the range is more than a week, but less than two weeks.

Time interval is one hour when the range is more than two weeks.

The time interval is displayed at the top of the graph.

- b. **Histogram:** select a parameter from the list, specify a time range, and click **Go**.



The horizontal axis displays values measured for this parameter during the selected period. The vertical axis displays the number of records for each value.

- c. **X-Y Chart:**

Select two parameters from the lists, specify a time range, and click **Go**.



The first parameter is displayed on the horizontal axis. The second parameter is displayed on the vertical axis. Each axis is displayed with the relevant units.

4.10 Generating Reports

You can generate reports based on the data saved in the database for each unit. The following reports are available:

- Device configuration – a list of the unit’s parameters and their values
- Alarms history – a list of all alarms generated
- Alarm time distribution – distribution of alarm length time
- List of events – history of events
- Display log files – a list of the unit’ log
- Current open alarms – a list of open alarms

► To generate a report:

1. Expand a unit on the left and click **Reports**.
2. In the Reports page, select the required report from the list, specify the time range, and click **Go**.

The following image shows an example of the Device Configuration report.

Logical Name	Units	Description	Last Value	Last Update
FreeChlorine	ppm	Free Chlorine	0.0	2017-01-14 15:20:45
TotalChlorine	ppm	Total Chlorine	0.0	2017-01-14 15:20:45
ChlorineAmp	mA	Chlorine Amperometric	0.507	2017-01-14 15:20:45
pH	pH	pH	7.2010000000000005	2017-01-14 15:20:45
Redox	mV	Redox	827.0	2017-01-14 15:20:45
Temperature	C	Temperature	19.61	2017-01-14 15:20:45
Turbidity	NTU	Turbidity	0.711	2017-01-14 15:20:45
Conductivity	uS	Conductivity	345.0	2017-01-14 15:20:45
Pressure	Bar	Pressure	1.57	2017-01-14 15:20:45
Flow	m³/h	Flow	0.0	2017-01-14 15:20:45
NTC_Chlor_Compen	C	NTC Chlorine Compensation	0.0	2017-01-14 15:20:45
NTC_Cond_Compen	C	NTC Conductivity Compensation	19.3	2017-01-14 15:20:45
Input1	*	First 4-20mA Input	0.752	2017-01-14 15:20:45
Input2	*	Second 4-20 mA Input	64.652	2017-01-14 15:20:45
NOCALIB_FreeChlorine	*	Free Chlorine	0.0	2017-01-12 13:41:29
NOCALIB_TotalChlorine	*	Total Chlorine	0.0	2017-01-12 13:41:29
NOCALIB_ChlorineAmp	*	Chlorine Amperometric	0.362	2017-01-14 15:20:45
NOCALIB_pH	*	pH	7.563	2017-01-14 15:20:45
NOCALIB_Redox	*	Redox	827.0	2017-01-14 15:20:45
NOCALIB_Temperature	*	Temperature	22.31	2016-12-11 09:31:28
NOCALIB_Turbidity	*	Turbidity	0.723	2017-01-14 15:20:45

Maintenance

5.1 Chlorine Electrode

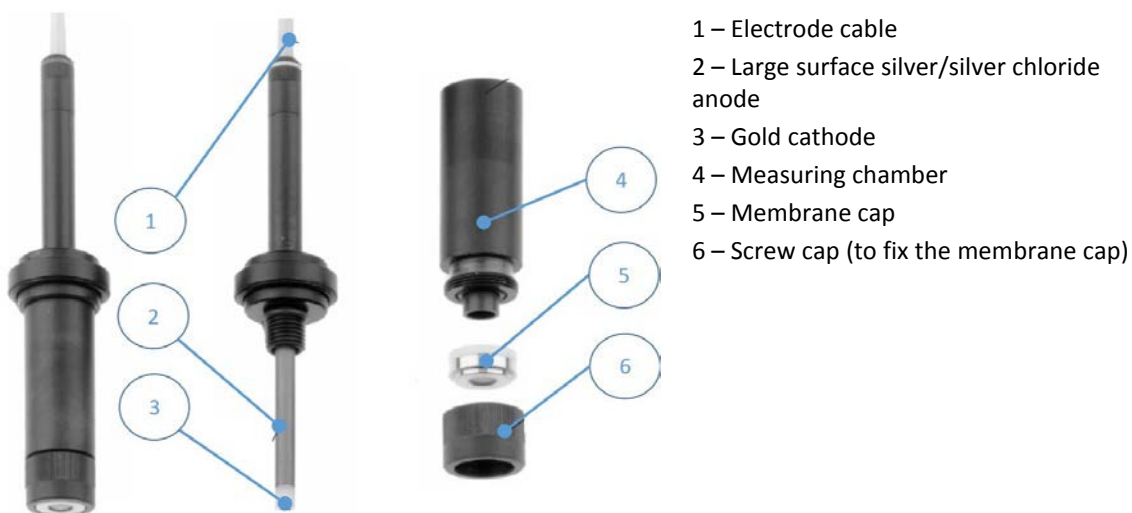
Perform sensor maintenance whenever any of the following conditions are met:

- When the membrane is visibly soiled, clean the sensor.
- Refill the sensor with electrolyte once per season or every 12 months. Depending on the water quality and chlorine level, this period can be reduced or extended.
- Calibrate the sensor when necessary (see “**Error! Reference source not found.**” on page **Error! Bookmark not defined.**).

5.1.1 Cleaning the Sensor

Caution: Do not use chemicals that reduce the surface tension. When using hydrochloric acid, observe all the safety regulations.

1. Remove the electrode from the acrylic flow cell.



2. Clean the membrane cap with a gentle water jet or swirl in a solution of 2% hydrochloric acid (no other additives).
3. If the membrane cap is still visibly soiled, replace the membrane cap, see “Replacing the Membrane Cap” on page 38.

5.1.2 Refilling the Electrolyte

Refill the electrolyte every three to six months or when unstable or when too-low values are displayed. If unstable or too-low values are still measured, replace the membrane cup, see “Replacing the Membrane Cap” on page 38.



Do not swallow the electrolyte. Avoid electrolyte contact with skin or eyes. In case of accidental contact, wash with a lot of cold water. In case of eye inflammation, contact a doctor immediately.

Wear safety glasses and gloves when working with the electrolyte solution.



Do not touch or damage the electrodes. The electrolyte is sensitive to oxidation: Always keep the electrolyte bottle closed after use.

Do not transfer the electrolyte to other containers.

The electrolyte should not be stored for more than one year and should be clear (not yellow) in appearance (for use by date, see label).

Avoid forming air bubbles when pouring the electrolyte into the measuring chamber.

1. Unscrew the measuring chamber from the shaft.
2. Hold the measuring chamber at an angle and fill approximately 7 to 8 ml (0.24 to 0.27 fl.oz) electrolyte up to 1 centimeter under the top edge.
3. Tap the filled chamber several times on a flat surface to remove air bubbles.
4. Screw the electrode shaft into the measuring chamber vertically making sure that all the air inside is let out.
5. As soon as the inserted o-ring begins to seal, tighten slowly until it stops.

5.1.3 Replacing the Membrane Cap

Replace the membrane cap once a year or when unstable and too-low measurements are displayed. If the sensor continues displaying unstable or too-low measurements, perform reconditioning of the sensor.

1. Unscrew the measuring chamber from the shaft.
2. Unscrew the front screw cap holding the membrane.
3. Remove the old membrane and replace with a new membrane.
4. Refill the measuring chamber with electrolyte.

5.1.4 Storing the Chlorine Electrode

The free chlorine electrode can remain in the flow cell for a short period, as long as the flow cell is not drained. For longer periods where the flow cell is likely to be drained, remove the electrode from the flow cell and place the yellow protection cap on top of the electrode to keep it wet. Make sure that the inner sponge inside the yellow protection cap is wet.

5.2 pH and Rx Electrodes

Regular cleaning of the electrodes ensures its long-term operation. The cleaning frequency depends on the water source being tested. As general guidelines, clean the electrodes whenever there is significant visible dirt, when the measurement accuracy is affected, or before calibration.

▶ To clean the electrodes:

1. Close water flow to the flow cell and remove the electrode.
2. Wash the electrode under a stream of water to remove dirt.
3. Use a soft cloth to remove any additional dirt and oil.
4. Replace the electrode and resume water flow.

5.3 Cleaning the Flow Cell

Over time, the flow cell can accumulate dirt and stains on their walls. This may affect the accuracy of measurement. Regular cleaning of the flow cell ensures long-term operation of the system. As general guidelines, clean the flow cell once a year or when the cell is visibly stained.

▶ To clean the flow cell:

1. Close the water flow to the and close all water outlet valves.
2. Remove the electrodes and unscrew the connectors.
3. Through one of the electrode connectors, fill the cells with the Blue I cleaning solution up to the marked line.
4. Allow the material to rest for 40 minutes in the cells.
5. When the cells are clean, open the water outlet and let the material drain from the system.
6. Close water outlet, reconnect the sensors, and resume water flow.

5.4 Cleaning the Turbidity Flow Cell

1. Close the water supply to the analyzer.
2. Using an adjustable wrench, open the flow cell cap.
3. Insert cotton swabs deep into the cell and clean the inside of the cell.

5.5 Cleaning the Filter

The analyzer's filter must be cleaned regularly. The frequency of cleaning depends on water quality of the water system.

1. Turn off water supply to the analyzer by closing the water inlet valve.
2. Unscrew the filter's cup and remove the discs.
3. Separate the discs and wash them under running water.
4. Place the discs back, close the filter's cup, and turn on water supply to the analyzer.

Troubleshooting

6.1 Issues and Workarounds

Description	Cause	Possible Solution
Water is dripping from the controller	Leakage from pipe connectors.	Check all pipe connectors and hand-tighten as required. If necessary, use Teflon to improve sealing.
No data is received from the controller	<ul style="list-style-type: none"> • Modem disconnected from power. • Antenna disconnected. • SIM card not installed. • SIM card not installed properly in the socket. 	<ul style="list-style-type: none"> • Verify the modem is connected to power: LEDs blinking. • Verify antenna is connected properly and is placed outside the controller at a high spot. • Insert a SIM card Error! Reference source not found..
Unable to connect to the server	<ul style="list-style-type: none"> • SIM card no open. 	<ul style="list-style-type: none"> • Verify that the SIM card is open and defined for 3G/4G. • Verify that the antenna is properly connected.
One or more parameters do not display data	Electrode fault. Electronic board fault	Check the relevant electrode and replace if necessary. Verify that LEDs on the Electronic board are flashing. Check the wiring from the electrode to the electronic board.

6.2 Unable to Solve an Issue

If you cannot solve the issue, contact your Support representative and make sure you have the following information:

- Detailed description of the issue
- Model Number
- Serial Number (the serial number can be found on the main label of the box and on the sticker on the right side of the Smart POD.)
- Purchase Date
- Purchased from
- Application (potable water, industrial treatment, pool/spa)

Appendix A – Specifications

MEASURED PARAMETERS	
Flow Cell	FCL or TCL, PH or ORP & Temp
External connection	Turbidity
FREE CHLORINE (FC) MEASUREMENT	
Free Chlorine Electrode	Passive-operated Chlorine sensor with gold cathode & silver/silver chloride anode
Measuring Range	0.05-20ppm (standard) 0.01- 5 ppm (optional)*
Accuracy	± 2 % or ± 0.01 ppm whichever is greater
Minimum Detection Limit	0.03 ppm
Resolution	0.01 ppm
Repeatability	1% span
Response time	approx. 2 min
pH operation range	4 to 8
Body material	PVC
Membrane material	PTFE
Membrane cap material	PBT (GF30), PVDF
pH MEASUREMENT	
Electrode	Ceramic diaphragm and gel filling
Measurement Range	0 to 14
Input impedance	0.5 x 1.12k Ω
ORP (REDOX) MEASUREMENT	
Sensor	Ceramic diaphragm and gel filling
Measurement range	0 to 2000 mV

MECHANICAL DATA & DIMENSIONS	
Dimensions (controller) (L x W x D)	278 x 188 x 130 mm (11" x7.4" x 5.0")
Weight (approx.)	4 kg (8.8 lbs.)
Display	5.5" RGB Display
Cable entries	PG 9 cable Glands
Enclosure rating	IP 65 (Polycarbonate)
OPERATIONAL REQUIREMENTS	
Sample and drain connection	Pressurized sample inlet and gravity drain
Inlet Pressure	0.35-1 bar (5-14.5 psi)
Measuring cell flow rate	35-60 l/h (9-16 gph)
Ambient temperature	2°C to 50°C (35.6°F to 122°F)
Sample temperature	1°C to 45°C (33.8°F to 113°F)
DATA OUTPUT	
Digital communication	Modbus RS 485
Local I/O	2 Standard 4-20 mA outputs or 24V 2 Channel
DATA LOGGING	
Memory	16 MB
Lines	31,000
Recording Interval	1-1000 min
Event logging	Yes
Total relay on time	Yes

TEMPERATURE MEASUREMENT	
Sensor	PT-100
Measurement range	0°C to 100°C (32°F to 212°F)
ANALYZER FLOW MONITORING	
Flow sensor	Inductive proximity flow switch
ELECTRICAL CONNECTION	
Power supply	100 – 240VAC 50/60Hz
Power consumption	Approx. 70 W
Power supply for RTC	3.6V Lithium Battery memory (CR2032)

* 8 Amp max apply for new universal I/O card.

Appendix B – Sensors Details

8.1 OCS140 and OCS141 Free Chlorine Electrode

The concentration of free chlorine is determined according to the amperometric measuring principle. The hypochlorous acid (HOCl) contained in the medium diffuses through the sensor membrane and is reduced to chloride ions (Cl⁻) on the gold cathode. On the silver anode, silver is oxidized to silver chloride. The electron release of the gold cathode and electron acceptance on the silver anode result in a current flow which is proportional to the free chlorine concentration in the medium under constant conditions. The concentration of hypochlorous acid in the medium depends on the pH value. This dependence can be compensated by measuring the pH value in the flow assembly.

The transmitter transforms the current signal into the measuring unit concentration in mg/l.

Property	Description
Range	OCS140 (for industrial water, pool water): 0.05 ... 20 mg Cl ₂ /l (25 °C / 77 °F, pH 7.2) OCS141 (for drinking water applications): 0.01 ... 5 mg Cl ₂ /l (25 °C / 77 °F, pH 7.2)
Depolarization current	OCS140: approx. 25 nA per mg Cl ₂ /l (25° C / 77 °F, pH 7.2) OCS141: approx. 80 nA per mg Cl ₂ /l (25 °C / 77 °F, pH 7.2)
Response time	T ₉₀ < 2 min, T ₉₉ < 5 min in applications involving mainly active chlorination
Polarization time	OCS140: First polarization: 60 min Repolarization: 30 min OCS141: First polarization: 90 min Repolarization: 45 min
Drift	< 1.5 % per month
Temperature range	OCS140: 10 ... 45 °C / 50 ... 113 °F OCS141: 2 ... 45 °C / 36 ... 113 °F
pH Range	OCS140: 4 ... 8 pH OCS141: 4 ... 8.2 pH

Property	Description
Pressure	Medium in the OCA250 assembly: max. 1 bar (14.5 psi)
Flow	min. 30 l/h / 7.92 US gal/h
Flow velocity	min. 15 cm/s / 0.5 ft/s
Electrolyte service life	Typically, 12 months

8.2 Smartsens OPS31 pH Electrode

Gel-filled reference system with ceramic diaphragm, supports up to 4 bar (60 psi) absolute pressure.

The pH value is used as a unit of measurement for the acidity or alkalinity of a liquid medium. The membrane glass of the electrode supplies an electrochemical potential which is dependent upon the pH value of the medium. This potential is generated by the selective penetration of H⁺ ions through the outer layer of the membrane. An electrochemical boundary layer with an electric potential, forms at this point. An integrated Ag/AgCl reference system serves as reference electrode.

The transmitter converts the measured voltage into the corresponding pH value using the Nernst equation.

Property	Description
Range	0 – 12
Operating Temperature	above -15° C (5° F)
Process Temperature	15 – 80° C (5 – 176° F)
Process Pressure	1 – 4 bar (15 – 60 psi), absolute
Conductivity	≥ 100 µS/cm

8.3 Smartsens OPS32 ORP Electrode

The redox potential is a unit of measurement for the state of equilibria between oxidizing and reducing components of a medium. Redox potential is measured similarly to the pH value. A platinum or gold electrode is used instead of pH-sensitive membrane glass. Analog to the pH measurement, an integrated Ag/AgCl reference system is used as a reference electrode.

Property	Description
Range	1500 – 1500 mV
Operating Temperature	above -15° C (5° F)
Process Temperature	15 – 80° C (5 – 176° F)
Process Pressure	1 – 4 bar (15 – 60 psi), absolute
Conductivity	≥ 100 µS/cm

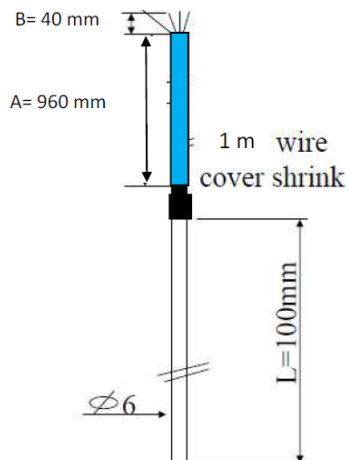
8.4 Industrial Pressure Transmitter PT124B-213

PT124B-213 adopts ceramic or diffused silicon sensor chip, with stainless steel encapsulation, smart figure. This series is especially suitable in the occasion where Installation space is restricted and has the feature of wide range temperature compensation, high accuracy, non-calibration, and wide range.

Property	Description
Range	-1~0~160MPa
Accuracy	0.5% Full Scale
Nonlinearity	0.2% Full Scale
Reliability	0.2% Full Scale
Output	4-20mA (2 Wire) ,0-5V, 0.5-4.5V
Input voltage	24 (8-36V) DC
Operating Temperature	-20 ~ 80° C
Compensated temperature	0 ~ 75° C
Overload pressure	150% Full Scale
Medium material	316 stainless steel
Electric connector	Min DIN, M12, Bendix connector, cable
Process connector	G1/4, G1/2, 1/2NPT, 1/4NPT, M12*1.5 Customer design

8.5 PT 100 for Acrylic Cell Temperature Sensor

RTD PT 100, single element with three wires system and GND.



Property	Description
Range	1° to 50° C (35° to 122° F)

Declaration of Compliance

We hereby declare that all products are tested and inspected before leaving the factory and are checked to meet our specifications according to the accepted procedures.



Daniel Cohen Khallas

Daniel Cohen Khallas
Quality Control Manager

Warranty

Please retain proof of purchase.

Please keep a record of the product in the form below to be sent to Blue I Water Technologies in the event of a warranty claim.

Blue I Water Technologies warrants this product and its parts against defects in materials or workmanship for eighteen (18) months from date of installation or twenty-four (24) months from date of shipment from Blue I Water Technologies, whichever is earlier.

- 2-year warranty on electronic cards
- 1-year warranty on all other components
- The warranty does not cover consumable parts, such as electrodes.

Blue I Water Technologies' responsibility includes repair or replacement, **at the sole discretion of Blue I Water Technologies**, of the whole product or part of it, when the defect is due to faulty functioning and/or defective materials.

For your records:

*The serial number can be found on the main label of the box and on the sticker on the right side of the Smart POD.

Blue I Water Technologies accepts no responsibility for damage caused by:

- a. Use/operation not consistent with operating instructions
- b. Improper installation
- c. Exposure to conditions that are not in accordance with Blue I's specifications, e.g., pressure/flow/temp
- d. Damage during shipment (submit claim to the carrier)
- e. Disasters such as fire, flood, lightning or improper electric current
- f. If the equipment is modified or if non-Blue I Water Technologies' reagents or replacement parts are used

Completion of the RMA procedure and return of defective component(s) to Blue I Water Technologies, Ltd. Is required for all warranty items.

User manuals and datasheets can be downloaded from our website www.blueitechnologies.com and by scanning this QR code:



Warranty Claim

Please fill in the information below and retain with proof of purchase

Model Number: _____

Serial Number: _____

Purchase Date: _____

Purchased from: _____

Application: _____ (e.g., potable water, industrial treatment, pool/spa)

In case of submitting a warranty claim, send this form along with proof of purchase to:

Blue I Water Technologies

18 Hamelacha St.

Afek Industrial Park

Rosh Ha'ayin 4809148

ISRAEL

