xylem
Let's Solve Water

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User Guide

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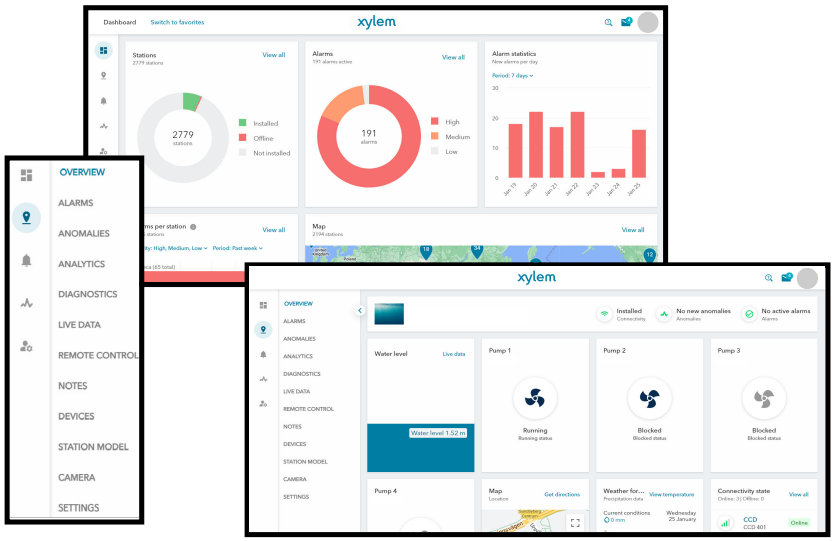

Avensor

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1 Product overview

1.1 About Avensor

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Avensor is a cloud application for monitoring stations and devices.

The following features are available in the application:

- Station and device management
- Data management and analytics
- Alarm management

To know more about Avensor, go to *https://www.xylem.com/avensor-support*.

1.2 Compatible devices

1.2.1 I/O devices

The I/O devices connect to the Flygt CCD 401 gateway through signal leads.

Device	Maximum number of connected devices for Flygt CCD 401
Analog input	2
Digital input	4
Digital output	2

1.2.2 Devices with a CCD gateway connection

The Flygt CCD 401 gateway is compatible with the following devices:

Device	Connection	Maximum number of connected devices for the gateway
Evoqua ATG UV	RS-485 or Ethernet	• RS-485: 8 • Ethernet – Flygt CCD 401: 4
Evoqua DEPOLOX Pool Compact	Ethernet	4
Flygt APP 411	RS-485 or Ethernet	1 Supports up to 4 pumps.
Flygt APP 412	RS-485 or Ethernet	1 Supports up to 8 machines.
Flygt APP 521/541	RS-232	1
Flygt DCM 711	RS-485 or Ethernet	1
Flygt FGC 313/323	RS-232	1
Flygt FGC 401/411/421	RS-232 or RS-485	1
Flygt FPG 411/412/413/414/415	RS-485 or Ethernet	• RS-485: 8 • Ethernet – Flygt CCD 401: 4
Flygt MagFlux	RS-485	8
Flygt MAS 711	RS-485	8
Flygt MAS 801	RS-485	4
Flygt MyConnect	RS-232 or RS-485	1 Supports up to 2 pumps.
Flygt SmartRun gateway	RS-232 or RS-485	1 Supports up to 3 pumps.

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Device	Connection	Maximum number of connected devices for the gateway
Flygt SRC 311	RS-485	8
Flygt PS 220	RS-485 or Ethernet	• RS-485: 8 • Ethernet – Flygt CCD 401: 4
Godwin PV102P	RS-485	8
Lowara EPX Plus mobile heater	RS-485	1
Lowara Hydrovar HVL	RS-485	8
Lowara Hydrovar X	RS-485	4
PSMEGA 2	RS-485	1
Sanitaire Digital Pressure Monitor	Ethernet	1
Sanitaire Taron	RS-485 or Ethernet	1
Sanitaire TurboLIGHT	RS-485 or Ethernet	1
Sanitaire TurboMAX Dual Core	RS-485 or Ethernet	1
Sanitaire TurboMAX Single Core	RS-485 or Ethernet	1
SENECA Z-8AI	RS-485	8
SENECA Z-D-IN	RS-485	8
SENECA Z-10-D-IN	RS-485	8
Wedeco EcoTouch	RS-485	1
Xylem Aquavar IPC	RS-485	4
Xylem XAM 912	RS-485 or Ethernet	1 Supports **Nexicon** system up to 4 pumps and 2 I/O modules.

It is possible to retrieve data from more than one device in a system even if the maximum number of connected devices is one:

- The Concertor XPC system includes one APP 411 and up to three FPG 414. When the APP 411 connects to the gateway, Avensor retrieves data from all devices in the system.
- The Adaptive mixer ADC system includes one APP 412 and up to seven FPG 415. When the APP 412 connects to the gateway, Avensor retrieves data from all devices in the system.

1.2.3 Devices with other connectivity types

Device	Maximum number of devices for each station
Flygt ATU	1
Xylem optimyze	10
Xylem Remote Inspection Kit	1

1.2.4 Custom devices

Devices that are not on the list of compatible devices can be added as custom devices. The user defines the device type and the data points. Avensor uses the information about the data points for analytics and to visualize the data from the device.

Connection	Maximum number of connected devices for each gateway
RS-232	8
RS-485	8
Ethernet	Flygt CCD 401: 4

1.2.5 Requirements

- All devices that connect to the gateway with one of the following options must use the same communication interface:
  - RS-232
  - RS-485
  - Ethernet
- All connected devices must be of the same type.
  - This requirement does not apply to I/O devices.
  - It is possible to have different SENECA devices connected to the same gateway. It is not possible to have a SENECA device and a device of a different type connected to the same gateway.

2 Function description

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2.1 User roles

User role	Description
Customer administrator (CA)	The user can manage stations and users that belong to the customer.
Service personnel (SP)	The user can manage stations that belong to the customer.
Service personnel read only (SPRO)	The user can do the following things for stations that belong to the customer: • Monitor the stations. • Create station notes. • Be in a call list. • Acknowledge alarms.

2.2 Station and device management

The user can manage information about the stations and devices:

- Change the station or device names.
- Enter the location.
- Enable or disable the following services for the station:
  - Alarm monitoring
  - Automatic location update
  - Network outage detection

2.2.1 Custom device type

Data model

The data points must be accurately defined for Avensor to show the data correctly.

Parameter	Description
Data type	• **Dynamic data** – Live data from the device, for example the water level or input current This data is visible on the **Live data** page. • **Static data** – Static data, for example the serial number or software version This data is visible on the **Device configuration** page. • **Alarm** – Alarms from the device
Category	The data that is read from the data point, for example, speed, level, or power
Subcategory	The type of data, for example, maximum, reference, or input
Target	The source of the data, for example, the device, a machine, or an input on the device

The following table shows examples of configurations for different data points.

Data point	Parameter	Value
Pump running	Data type	Dynamic data
	Category	Status
	Subcategory	Current level
	Target	Pump
High level alarm	Data type	Alarm
	Category	Level
	Subcategory	High
	Target	Input

Data source

The data source is six numbers that represent the Modbus object type and location. The first number represents the object type.

Number	Object type
0	Coil
1	Discrete input
3	Input register
4	Holding register

The remaining five numbers represent a location from 1–65 535. If the location has less than five numbers, then zeroes are added before the location so that the data source has six numbers in total.

When the data source is an individual bit, the data source uses the format register:bit, where the bit location is a number from 0–15. For example, 400102:0 is the bit in position 0 in the holding register 102.

2.3 Data management and analytics

Avensor shows live data and connectivity status for the connected devices.

- The application stores the data.
- Trend graphs are shown for analysis of the data over time.
- The user selects which charts to show.
- It is possible to export the data for further analysis outside the application.

Exported data	Available file formats	Data scope
Charts	– PNG – JPG – SVG – PDF – CSV	Data for the selected time period and resolution
Raw data	– Excel – CSV	All the data for the selected time period

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1. Data point
2. Data source
3. Compare charts
4. Select period
5. Chart settings
6. Full-screen mode
7. Export chart
8. Select resolution
9. Select period
10. Change chart size

2.3.1 Avensor API

The Avensor application programming interface (API) gives the external systems access to the Avensor data. The following information is accessible through the APIs:

- Alarms data
- Live data
- Station data
- Device data
- Customer data
- User data

The Avensor APIs are only used to receive the data. The user cannot control the devices or edit data through the Avensor APIs.

2.3.2 AvensorOPC

The AvensorOPC functionality enables software with an OPC Unified Architecture client, for example a SCADA system, to read the data and alarms from Avensor. The AvensorOPC follows an OPC Unified Architecture machine to machine communication protocol for industrial automation. AvensorOPC can work with any OPC UA compliant client.

The following information is available through the AvensorOPC:

- The stations and devices data
- Alarms data from connected devices
- Operational data from connected devices

2.4 Events

The events monitor the status of a pumping station. The following table describes the types of events.

Event type	Description	Notifications	Acknowledgement
Alarm	A warning of danger that needs a user action	SMS, email, and in-app notifications, dependent on the alarm priority level Some alarms show in the data charts in the station analytics.	Yes

Event type	Description	Notifications	Acknowledgement
Anomaly	A deviation from the expected value or trend, or an event that deviates significantly from the normal behavior	In-app notifications	No
Incident	An unexpected event that may have a significant influence on the data values	— The incidents show in the data charts in the station analytics.	No

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2.4.1 Alarm management

Avensor shows alarm notifications from the connected devices.

- There are individual alarms for each device and station in the system.
- All alarms have a default priority level for each device. It is possible to change the priority level of each alarm in the system.
- It is possible to create a call list to notify users when there is an alarm.
- There are several options to acknowledge an alarm.
- All alarms are recorded in the alarm log.

Alarm description

Description	Priority level	Alarm icon
Unacknowledged alarm A	**High**	Flashing red
Acknowledged alarm A	**High**	Red
Unacknowledged alarm B	**Medium**	Flashing orange
Acknowledged alarm B	**Medium**	Orange
Alarm C	**Low**	Gray

Alarm priority

Priority level	Alarm notification	Description
High	• The application shows an alarm icon • The application sends a message to the user	• The application monitors the alarm • Notifications are active • The alarm is saved to the log file
Medium		
Low	The application shows an alarm icon	
Off	–	The application does not monitor the alarm

Alarm delay

Delay	Description
Notification delay [minutes]	The notification delay is the time between the alarm is triggered and the first notification is sent to the user. The notification is only sent if the alarm stays active during the specified notification delay.
Alarm activation delay [seconds]	When an alarm activation delay is set, Avensor waits to trigger the alarm for the specified period.
Alarm deactivation delay [seconds]	When the deactivation delay is set, Avensor waits to cease the alarm for the specified period.

Alarm acknowledgement

The alarms are acknowledged through the following methods:

- In the web application
- In the mobile application
- Through an SMS

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Disable alarm notifications

1. Go to **Stations**.
2. Select a station.
3. Go to **Settings**.
4. Go to **Services**.
5. Disable the **Alarm monitoring**.

   When the **Alarm monitoring** is disabled, the application does not monitor the alarms and send the alarm notifications for the specified time period.

   It is not advisable to disable the alarm monitoring indefinitely. If this option is disabled indefinitely, the user must manually enable it.

Change the priority of an alarm

1. Go to **Stations**.
2. Select the station for which to change the alarm priority.
3. Go to **Alarms**.
4. Click the ⚙ button.
5. Select the alarm.

   Detailed information about the alarm is shown.
6. Select a priority level in the drop-down list.
7. Click the **Update priority** button.

The priority of the alarm is changed for the selected device and station.

Call list

The call list is a list of users that are notified when there is an alarm. The users are notified in order of priority and with a time delay between each notified user. The priority order and time delay are configured in the application.

Users receive alarm notifications through SMS or email. If a user acknowledges the alarm, then the next user in the call list does not receive a notification. Users can set a weekly schedule to specify which days and times they receive notifications.

Multiple stations can use the same call list.

2.4.2 Anomaly management

Avensor shows anomaly notifications from the connected devices.

- Anomaly types are specific for the type of station.
- If any anomaly type is applicable to the station when the station is created, the anomaly detection service is enabled by default.
- Anomaly types apply to different devices dependent on which data points the devices give.
- For a station, it is possible to disable the following items:
  - The overall anomaly detection service
  - The detection of a specific anomaly type
- Users are notified of anomalies through in-app notifications.
- The notifications can be marked as read or unread.
- The notifications are automatically marked as read after 180 days.

Enable or disable the anomaly detection service

The information is applicable when these conditions are fulfilled:

- The user has permission to enable or disable the anomaly detection service.
- There is minimum one anomaly type that is applicable to the station.

1. Go to **Stations**.
2. Select a station.
3. Go to **Settings**.
4. Go to the **Services** tab.
5. Click the **Anomaly detection** switch.

   The anomaly detection service is enabled or disabled.

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2.5 Outage notification

This setting replaces the **Lost contact with station** alarm notifications with a single outage notification when there is an outage in the telecommunication network. All users in the call list receive the outage notification. The system does not send the **Lost contact with station** alarm notifications, but the alarms are visible in the application.

This setting is disabled by default.

2.6 Station model

The station model is an automatically created model that shows the machines and devices that are connected to the station. The model also shows live data from the station. It is possible to configure the model to show or hide different parts.

The model is available for stations that have pumps connected to the controller. If no pump is connected, the illustrated station model does not appear.

2.7 Decreased pump capacity detection

Decreased pump capacity detection is a function for wet well pumping stations. The function notifies users when there is a decrease in capacity for one or several pumps in the station. The function distinguishes between sudden and gradual losses of capacity. The capacity loss can be a result of issues with the pump or with the surrounding equipment, for example, pipes, couplings, and valves. The function suits pumps that run in cycles between constant start and stop levels, with regular stops.

The function needs the following data:

- Pump status
- Analog water level

The function calculates the capacity of a pump once each pump cycle. The calculation adjusts for inflow to the wet well during the pump cycle. If a pump cycle starts more than one pump, then the function cannot calculate the pump capacity.

There are two alarms and two graphs for each pump. The alarms and graphs show information about two measurements:

Measurement	Description	Possible cause
Short-term decreased pump capacity	This measurement detects sudden decreases in pump capacity.	• Clogged pump hydraulics or non-return valve • Malfunctioning non-return valve • Leaking coupling on the delivery pipe
Long-term decreased pump capacity	This measurement detects slow decreases in pump capacity. The user sets a checkpoint, for example when the pump is installed or overhauled. The checkpoint is the starting date for the time period that the function uses as reference for capacity loss.	• Worn pump hydraulics • Gradual clogging of the pump hydraulics or the delivery pipe • Issues with the non-return valve

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The alarms activate when the capacity is lower than the configured threshold. The thresholds are a percentage value of the average pump capacity. It is possible to change the threshold values in the settings.

The sales representative can enable this function. This function does not support variable frequency drive pumps.

3 System setup and operation

3.1 Special device connection

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WARNING: Electrical Hazard

Risk of electrical shock or burn. A certified electrician must supervise all electrical work. Comply with all local codes and regulations.

For information about generic connections, see the Installation, Operation, and Maintenance Manual for the gateway.

The following devices needs a special connection to connect to the gateway.

- APP 521/541
- FGC 313/323
- FGC 401/411/421

1. Cut one end of the VGA cable.
2. Connect the cut end of the VGA cable to the gateway according to the table.

CCD terminal	Connector pin
Tx	2
Rx	3
GND	5
-	7/8 connected together

3. Connect the uncut end of the VGA cable to the RS–232 port on the device.

3.2 Set up a station

1. Create a station.
2. Add the connected devices.
3. Create a call list.
4. Add the call list to the station.

3.3 Create a station

It is recommended to create a call list before adding a station. It allows the selection of the call list during the station setup process.

For instructions refer to *Create a call list* on page 16.

1. Go to **Stations**.
2. Click **Add station**.
3. Type the station details.
4. Click **Next**.
5. Add a device:
   a) Click **Add device**.
   b) Select a device type.
   c) If the device needs a gateway, type the gateway serial number and click **Add gateway**.
      The gateway is added to the station.
   d) Type the device parameters and click the **Add device** button.

The device is added to the station.

e) To add another device, click the **Add device** button and repeat the step 5.

6. Click **Next**.
7. For each station service, click the switch to enable or disable the service.
8. Click **Next**.
9. Review the preview:
   - To edit any detail, select the applicable step in the stepper.
   - To confirm the details, click **Finish**.

   A new station is created.

3.4 Manage devices

3.4.1 Add a device

1. Go to **Stations**.
2. Select a station.
3. Go to **Devices**.
4. Click the button **Add device**.
5. Select the device type.
6. Fill in the required text boxes.
7. Click **Add device**.

   The device is added to the station.

3.4.2 Add a digital input device

1. Go to **Stations**.
2. Select the station.
3. Go to **Devices**.
4. Click the button **Add device**.
5. Select the device type **Digital input**.
6. Do the following steps for each port:
   a) Type the name of the data point.
   b) Set the option **Mode** to **Enabled**.
   c) Define the data point.
   d) If an alarm is connected to the data point, then configure the alarm settings in the tab **Alarm mode**.

      The tab is only visible for some configurations of the data point.
   e) If applicable, configure the unit and scaling of the input value in the tab **Unit and scaling**.

      The tab is only visible for some configurations of the data point.
   f) Click the **Save** button.
7. Click the **Add device** button.

   The device is added to the station.

3.4.3 Add a digital output device

1. Go to **Stations**.
2. Select the station.
3. Go to **Devices**.
4. Click the button **Add device**.
5. Select the device type **Digital output**.
6. Type the number of the digital output port on the gateway that the device is connected to.

7. Select the initial value of the digital output.
8. Click the button **Add device**.
   The device is added to the station.

3.4.3.1 Change the status of a digital output device

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This function is available when the **Remote control** service is enabled for the related station.

1. Go to **Stations**.
2. Select a station.
3. Go to **Live data**.
4. Click the settings icon for the digital output device.
5. Select the status of the digital output device.

3.4.4 Create a custom device type

1. Go to **Admin** > **Device types** > **Add device type**.
2. Define the device type.
   The following parameters are required:

Parameter	Description
Name	The name of the device type
Machine type	The type of machine that is connected to the device
Motor type	The motor type of the machines that are connected to the device
Customer	The customer name

3. Click the **Save** button.

3.4.4.1 Add a data point to a custom device type

For more information, see *Custom device type* on page 6

1. Go to **Admin** > **Device types**.
2. Select the device type.
3. Go to **Data points** > **Add data point**.
4. Define the data type.
   a) When the dynamic or static data type is selected.
      1. Set the **Category**[1].
      2. Set the **Subcategory**[2].
      3. Set the **Target**.
      4. Go to the **Source** tab.
      5. Set the data source.
      6. Go to the **Unit and scaling** tab.
      7. Set the scaling of the data.
      8. Select the unit. The available units are limited based on the category of the data point.

      When the category **Status** and the subcategory **Running** is selected, leave the **Detailed name** blank to show the pump in the station model.

      If none of the predefined categories are applicable for both data points, select **Other** in the drop-down for category and add a **Detailed name**.
   b) When the alarm data type is selected.

[1] The category of a data point describes the type of the data that the data point reflects.
[2] The subcategory is a refinement of the category.

1. Set the **Activation level**.
2. Set the **Alarm priority**.
3. Set the **Target**.
4. Add a **Detailed name**. It is mandatory to enter a detailed name.
5. Go to the **Source** tab.
6. Set the data source.

5. Click the **Save** button.

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3.5 Manage call lists

3.5.1 Create a call list

1. Go to **Admin** > **Call lists**.
2. Click the **Add call list** button.
3. Fill in the required text boxes.
4. Click the **Save** button.

The call list is created.

3.5.2 Add a user to a call list

1. Go to **Admin** > **Call lists**.
2. Select the call list which to add the user to.
3. Go to the **Priority user list** tab.
4. Click the **Add user** button.
5. Click the **User** text box.
   A list of users opens.
6. Select a user from the list.
7. Select the type of notification that the user receives.
8. Click the **Save** button.

The user is added to the call list.

3.5.3 Remove a user from a call list

1. Go to **Admin** > **Call lists**.
2. Select the call list from which to remove the user.
3. Go to the **Priority user list** tab.
4. Click the **Delete** button to remove the user.

The user is removed from the call list.

3.5.4 Add a call list to a station

1. Go to **Stations**.
2. Select the station.
3. Go to **Settings**.
4. Click **Edit**.
5. In the **Customer call list** field, type the name of the call list.
6. Select the call list.
7. Click the **Save** button.

3.5.5 Configure the notification schedule

1. Go to **Admin** > **Call lists**.
2. Select the call list.
3. Go to the **Notification schedule** tab.

4. Click **Edit**.
5. In the setting group for the alarm notifications schedule, set the **Allow notifications** setting to **Custom**.
6. Select the time zone.

   It is important to select the correct time zone. It allows the user to receive the notifications in the local time zone, not the default UTC time zone.
7. Select the days and times that Avensor can send alarm notifications to the call list.

   To allow notifications for an entire day, set the time from 0:00 to 0:00.
8. Click **Save**.

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3.5.6 Configure the settings for on call users

A user that is on call receives notifications regardless of the notification schedule.

1. Go to **Admin** > **Call lists**.
2. Select the call list.
3. Go to the **Notification schedule** tab.
4. Click **Edit**.
5. In the setting group for on call users, set the **Allow notifications** setting to the correct alarm priority level.

   Users that are on call only receive notifications for alarms with the configured priority levels.
6. Click **Save**.
7. Go to the **Priority user list** tab.
8. For each user that is on call, do the following steps:
   a) Click **Edit**.
   b) Select **On call**.
   c) Click **Save**.

3.6 Manage remote control

3.6.1 Enable remote control for a customer

Only Xylem personnel can enable this service.

1. Go to **Admin** > **Customers**.
2. Select a customer.
3. Click **Edit**.
4. In the **Services** section, check the **Remote control** option.
5. Click the **Save** button.

   Avensor makes the service available for the stations that are related to the customer.

3.6.2 Allow Xylem to control devices remotely

This setting is available when the **Remote control** service is enabled for the related customer.

1. Go to **Admin** > **Customers**.
2. Select a customer.
3. Go to the **Xylem control** tab.
4. Click the **Remote control** switch.
5. Click the **Save** button.

   Avensor allows Xylem to control devices remotely.

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3.7 Add notes to a station

1. Go to **Stations**.
2. Select the station.
3. Go to **Notes**.
4. Click the **Add note** button to add a note.
5. Fill in the **Title** and the **Description** field.
   Click the **Add** button to upload an image or a PDF file to the note.
6. Click the **Save** button.

The size limit for the file is 10 MB. PNG, JPG, and PDF are the supported file formats.

3.8 Configurations

3.8.1 Configure APP 411/APP 412

Use the FOP 315 or FOP 402 HMI to configure the APP 411/412 device.

Pump 1 or Mixer 1 must be on node 1, Pump 2 or Mixer 2 must be on node 2, and so on.

1. Go to **Settings** > **Communication**.
2. Select **TCP/IP settings** or **Modbus RTU settings**.
3. Set the communication parameters.

Parameter	Setting
Default gateway	0.0.0.0
IP address	10.10.10.10
Subnet mask	255.0.0.0
Slave address	The Modbus address in the network.
Baud	9600
Stop bits	1
Parity	None
Port	502

3.8.2 Configure APP 521

For information about the connection between the device and the gateway, see *Special device connection* on page 13.

The communication module must be installed in the operator panel. For more information, see the Installation Manual of APP 521.

1. Go to parameter 16, **Show more menus**.
2. Click **Yes**.
3. Go to **Settings** > **Communication** 13_ menu.
4. Set the communication parameters.

Parameter submenu	Parameter name	Setting
13_1	**Station no./id**	1–247
13_10	**Communication COM1**	**RS232 FDX**
13_13	**Speed COM1**	1200–115200 bps
13_14	**Parity COM1**	**Even**
13_15	**Protocol COM1**	**Modbus fixed**

5. Press **Ok**.

3.8.3 Configure APP 541

For information about the connection between the device and the gateway, see *Special device connection* on page 13.

The communication module must be installed in the operator panel. For more information, see the Installation Manual of APP 541.

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1. Go to parameter 18, **Show more menus**.
2. Click **Yes**.
3. Go to **Settings** > **Communication** 15_ menu.
4. Set the communication parameters.

Parameter submenu	Parameter name	Setting
15_1	**Station no./id**	1–247
15_10	**Communication COM1**	**RS232 FDX**
15_13	**Speed COM1**	1200–115200 bps
15_14	**Parity COM1**	**Even**
15_15	**Protocol COM1**	**Modbus fixed**

5. Press **Ok**.

3.8.4 Configure Aquavar IPC

On the Aquavar IPC device, press menu button and use the up and down keys to navigate the submenus.

Set the following communication parameters.

Parameter	Parameter description	Parameter setting
8-30	**Protocol**	**[2] Modbus RTU**
8-31	**Address**	1
8-32	**Baud Rate**	**[2] 9600 Baud**
8-33	**Parity/Stop Bits**	**[2] No Parity, 1 Stop Bit**

3.8.5 Configure ATU

No configurations are needed for the ATU. The device has already been configured with the use of the software OPTWin.

To add the unit in Avensor, prepare the following data.

Parameter	Location in the software OPTWin
IP address	Hardware Definition > Network > Network selection: GPRS Primary
Number of ports for each port type	I/O Configuration
Data point related to each port	I/O Configuration
For each port type: • Modbus base address • Function code	Hardware Definition > Modbus > Output Addressing
Input range for each analog data point	Lower: I/O Configuration > Scale Low Upper: I/O Configuration > Scale High

3.8.6 Configure DCM 711

1. Go to **Settings** > **Communication settings**.
2. Select **Ethernet**.
3. Set the communication parameters.

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Parameter	Setting
Local IP address	10.10.10.10
Subnet mask	255.0.0.0
Default gateway	Flygt CCD 401: 10.10.10.2
Modbus TCP – Slave address	The Modbus address in the network

3.8.7 Configure EcoTouch

The unit is connected to this device with RS–485 through the following terminals.

Terminal	Description
ST5 pin 5/6	RS–485(A)
ST5 pin 7/8	RS–485(B)
ST5 pin 3/4	GND
ST5 pin 9/10	Termination (120R)

Termination must be activated by a wire jumper between ST5 pin 9/10 and ST5 pin 7/8.

1. On the EcoTouch screen, go to **Menu > I/O Setting, page 3**.
2. Click **Avensor Mode**.
3. Select **OFF** or **Monitor only** or **Monitor & Control**
4. Press **Enter**.
5. Set the communication parameters.

Parameter	Setting
Modbus Device Address	1
Baud rate	9600
Parity	None
Stop bits	1

3.8.8 Configure EPX Plus mobile heater

The EPX Plus mobile heater comes with an in-built CCD 401 and ready to communicate with Avensor. Check the following connections during the initial setup.

CCD 401	EPX Controller RS-485-1
A	+
B	-
GND	GS

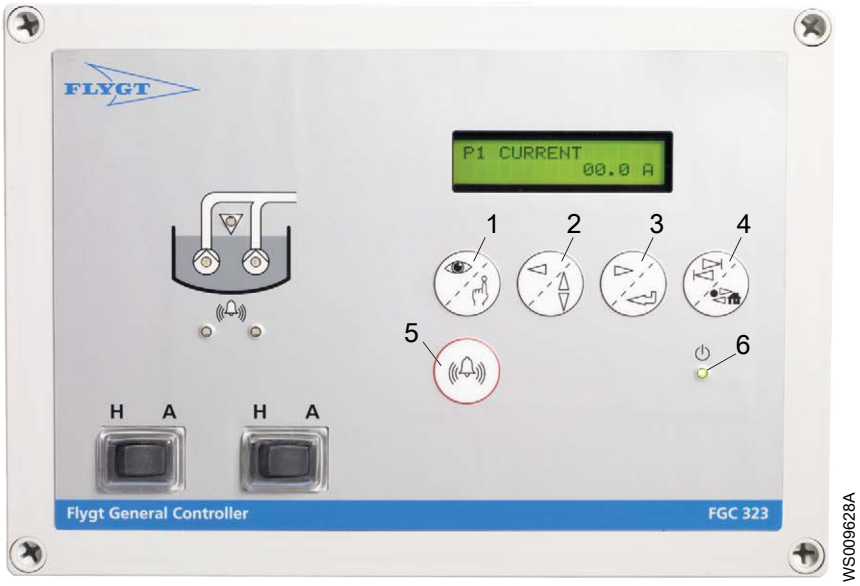
No configurations are needed for the EPX Plus mobile heater. The user must enter the following values while adding the device in the Avensor application.

Parameter	Value
Address	1
Data bits	8
Stop bits	1
Parity	None
Baud Rate	38400

3.8.9 Configure FGC 313/FGC 323

For information about the connection between the device and the gateway, see *Special device connection* on page 13.

EN



1. Read/Write
2. Left/Up-Down
3. Right/Enter
4. Step group/Home
5. Reset

1. Open the configuration mode.
   a) Press **Right/Enter** repeatedly to go to **PARAMETERS**.
   b) Press **Read/Write** to go to the edit mode.
   c) Press **Left/Up-Down** to change to **Yes**.
   d) Press **Right/Enter** to save the value.
2. Open the service menu.
   a) Browse to parameter 13, **SERVICE**.
   b) Change the setting to **Yes**.
      This setting enables the communication parameter changes.
3. Set the communication parameters.

Parameter number	Parameter name	Setting
18_	COMMUNICAT. COM1	RS232 FDX or RS232 HDX
18_1	Speed COM1	9600 bps
18_2	Protocol COM1	Modbus fixed

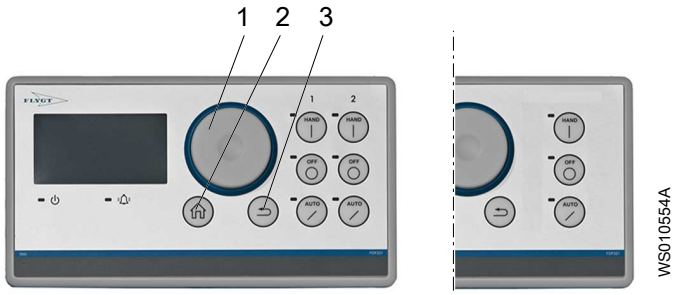
4. Change the controller identity.
   a) Browse to parameter 12_7, **Station no./id**.
   b) Set the identity to a number between 00001 and 00255.
      The identity number for the pump controller is the same as the unique number of the station in the system.
5. Complete the configuration.
   a) Browse to parameter 13, **SERVICE**.
   b) Change the setting to **No**.
      The communication parameter changes are locked now.

The pump controller can communicate with the modem now.

3.8.10 Configure FGC 401/FGC 411/FGC 421

For information about the connection between the device and the gateway, see *Special device connection* on page 13.

EN



Number	Part	Description
1	Jog wheel	The jog wheel is used for navigation and selection in the menus. • Rotate it to navigate. • Press it to select.
2	Home button	The home button is used to return to the **Home** menu.
3	Back button	The back button is used to return to the previous menu.

1. Press the **Home** button.

2. Go to  and press to select all the menus.

3. Select **Settings**.
4. Select **Communication**.
5. Set the communication parameters.

Parameter	Setting
Protocol	**Modbus Slave**
Channel type	**RS232**
Slave address	The controller address in the network
Channel configuration	– **Baud** = 9600 – **Parity** = None

6. Turn off the pump controller and start it again.

The pump controller can communicate with the modem now.

3.8.11 Configure FPG 411/FPG 412

1. Press the **Home** button.
2. Go to  and press to select all the menus.
3. Go to **Settings** > **Communication**.
4. Select **RS-485 RTU Port** or **Ethernet Port**.
5. Set the communication parameters.
   - RS-485 RTU Port

Parameter	Setting
Protocol	**Modbus Slave**
Protocol Settings	The Modbus address in the network.
Channel settings	– **Baud** = **9600** – **Parity** = **None**

   - Ethernet Port

Parameter	Setting
Protocol	**Modbus Slave**
Protocol Settings	The Modbus address in the network.
Channel settings	– **IP address** = 10.10.10.20 – **Subnet mask** = 255.0.0.0 – **Port** = 502

3.8.12 Configure FPG 413/ FPG 414/FPG 415

Use the FOP 315 or FOP 402 HMI to configure the FPG 413, FPG 414, or FPG 415 device.

1. Go to **Settings** > **Communication**.
2. Select **Modbus RTU** or **Modbus TCP**.
3. Set the communication parameters.

Parameter	Setting
Default gateway	The settings for communication over Ethernet.
IP address	10.10.10.10
Subnet mask	255.0.0.0
Slave address	The Modbus address in the network.
Baud	9600
Stop bits	1
Parity	**None**
Port	502

3.8.13 Configure Hydrovar HVL

On the Hydrovar HVL device, the up and down key must be pressed to change the submenus.

1. Go to **M1200 RS-485 INTERFACE**.
2. Set the following parameters.

EN

ID	Parameter	Setting
P24	ENABLE DEVICE	Enabled
P105	MODE	Controller or Cascade
P202	SOFTWARE	V2.0 or higher
P210	INVERTER	All
P1203	PROTOCOL	Modbus RTU
P1205	ADDRESS	1
P1210	BAUD RATE	9600
P1215	FORMAT	8, N, 1
P1310	PUMP ADDR.	1
P1321	AUTO-START	ON
P1323	ADDRESS	1

3.8.14 Configure Hydrovar X

On the Hydrovar X device, the up and down key must be pressed to change the submenus.

1. Go to the communication settings at M08.
2. Set the following parameters.

ID	Parameter	Setting
P08.0.02	Com 2 Function	1-Modbus
P08.1.01	Address	1-127
P08.1.02	Baudrate	115200 bps
P08.1.08	RTU Format	8, N, 1 Format = 8 bits Parity = None Stop bits = 1

3.8.15 Configure Magflux

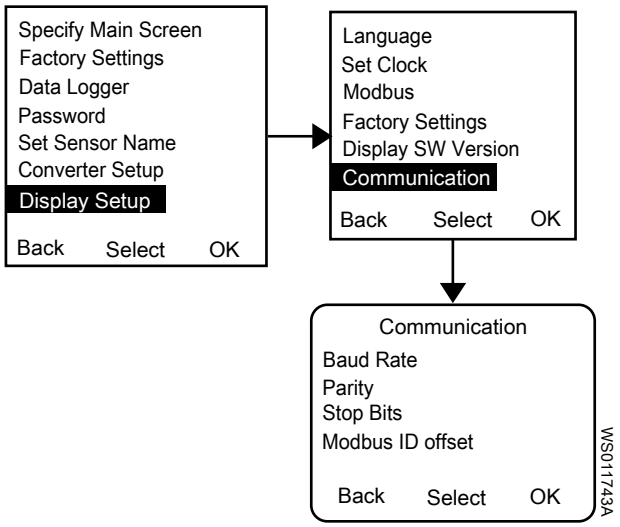
The modbus communication module must be installed on the Magflux flowmeter.

For more information, see Modbus and RS 485 Communication Module manual.

To prevent noise, disturbance, or traffic into bus line, the **Termination** switch must be set to **ON**.

1. On the Magflux screen, go to **Setup > Display Setup > Modbus COM module/ Communication**.

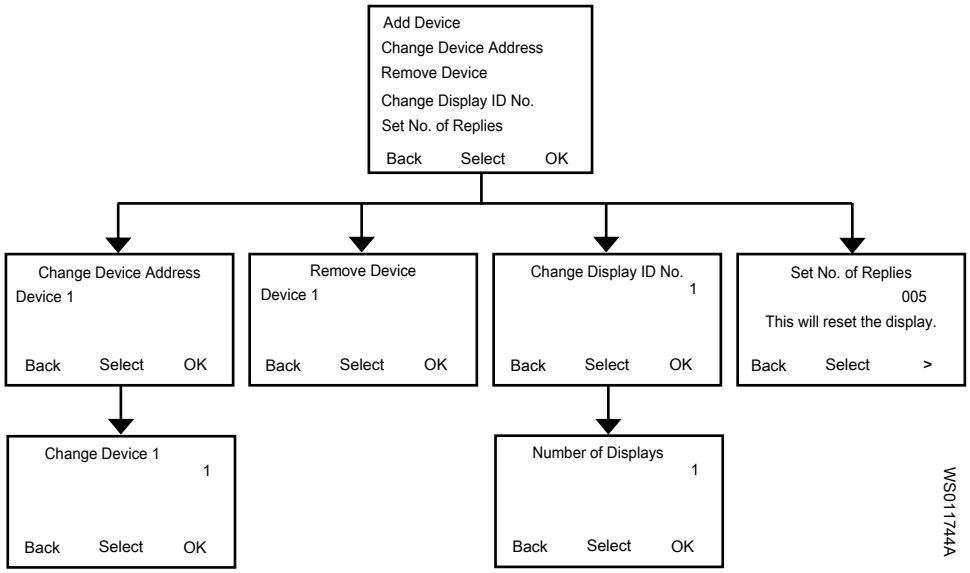
   The **Modbus COM module/Communication** setting is available when a communication module is connected.



2. Set the communication parameters.

Parameter	Setting
Baud rate	9600
Parity	Even
Stop bits	1
Modbus ID offset	000

3. Click **OK**.
4. Go to **Setup** > **Display Setup** > **Network/Modbus**.



5. Click **Add device**.
6. Select **Device 1** or **Device 2**.
7. Click **OK**.
8. Click **Change Device Address**.
9. Select **Device 1** or **Device 2**.
10. Set the address.
11. Click **OK**.
12. Click **Change Display ID No.**.
13. Set the number.

14. Click **Number of Displays**.
15. Set the number.
16. Click **OK**.
17. Click **Set no. of Retries**.
18. Increase the number by 1.
19. Click **OK**.
20. Change the Modbus speed to low.

EN

3.8.16 Configure MAS 711

The unit is connected to this device through the following terminals:

Terminal	Description
41	Ext. 1, RS-485 (A)
42	Ext. 1, RS-485 (B)

1. Click **Settings** > **General configuration** > **RS485/ Modbus**.
2. In **Higher level controller (External 1)** group, set the following parameters:

Parameter	Setting
Activate	Active
Baudrate	9600 or 19200
Modbus protocol	MAS Modbus revision 3
Address (MAS Modbus ID)	1 to 247

3. Click **Update**.
4. Click **Restart** to execute the settings.

3.8.17 Configure MAS 801

The modem is connected to this device through the following terminals:

CCD 401	MAS 801
RS-485 A	Modbus A-
RS-485 B	Modbus B+

1. Go to **Settings**.
2. In the **Modbus RTU** group, set the following parameters:

Parameter	Setting
Enable	Enabled
Baudrate	19200
Parity	None
Stop bits	2

3. Click **Save**.

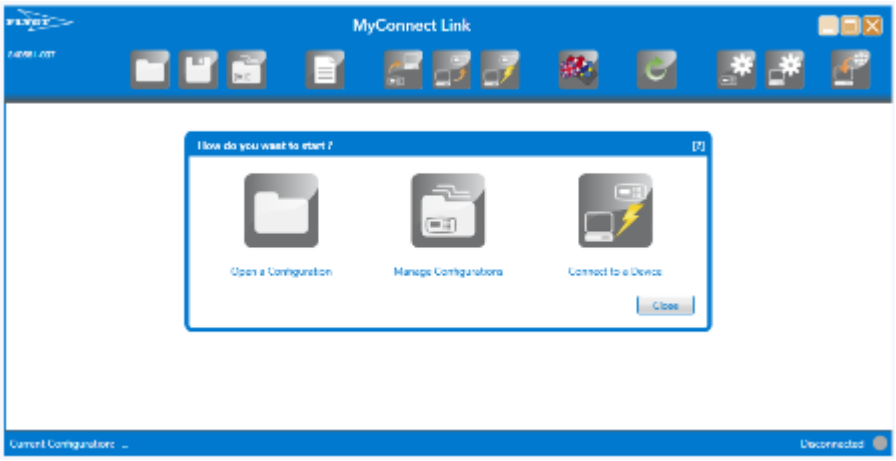
One MAS 801 device must be added in Avensor for each pump. The Modbus ID in Avensor must correspond to the Modbus ID in the MAS 801 device. The **Modbus id mapping** group in the MAS 801 device shows the Modbus ID of each pump.

3.8.18 Configure MyConnect or SmartRun Gateway

Use the Flygt MyConnect Link application to configure the MyConnect or SmartRun Gateway device.

1. Start the Flygt MyConnect Link application on the computer.

The following dialog box opens.



2. Click the **Open a Configuration** icon.
3. Select the **Open Default Configuration** option.
4. Click **OK**.
5. Go to **Connect "MyConnect"** > **System Setup** > **Communication**.
6. Enter the **Connect ID**.
   The connect ID is same as Modbus address.
7. In the **ID Sensitiv** list, select **Yes**.
8. In the **Master or Slave** list, select **Slave**.
9. Set the master ID number to 1.
10. Go to **Connect "MyConnect"** > **System Setup** > **SCADA Setup**.
11. In the **SCADA System** list, select **SYSTEM 2000 60 COMMAND**.

3.8.19 Configure optimyze

No configurations are needed for optimyze. The user must enter the following data while adding the device in the Avensor application.

Parameter	Description
Device type	optimyze
Name	A name for the device
Serial number	The serial number that is located below the QR code on the device, and in the optimyze mobile application

3.8.20 Configure PS 220

The user can choose between TCP or RTU Modbus communication.

Modbus TCP:

The FMBT-21 device must be installed in the slot 2.

Set the following parameters.

Parameter	Parameter name	Setting
50.1	**FBA A ENABLE**	**[2] Option slot 2**
74.01	**START/STOP**	**[6] Fieldbus**
74.05	**SPEED OVERRIDE**	**[6] Fieldbus**
74.06	**SPD OVERRIDE**	**[3] Fieldbus**
51.01	**FBA A type**	[128] **Ethernet**

EN

Parameter	Parameter name	Setting
51.02	Protocol/Profile	[1] MB/TCP/ ABB E
51.03	Commrate	[0] Auto
51.04	IP configuration	[0] Static IP
51.05	IP address 1	10
51.06	IP address 2	10
51.07	IP address 3	10
51.08	IP address 4	20
51.09	Subnet CIDR	24
51.22	Word order	1 = HILO
51.23	Address mode	[1] Mode 1
51.27	FBA A par refresh	[1] Refresh

Modbus RTU:

The FSCA-module must be installed in the slot 2.

Set the following parameters.

Parameter	Parameter name	Setting
50.1	FBA A ENABLE	[2] Option slot 2
74.01	START/STOP	[6] Fieldbus
74.05	SPEED OVERRIDE	[6] Fieldbus
74.06	SPD OVERRIDE REF	[3] Fieldbus
51.01	FBA A type	[485] FSCA
51.02	Protocol/Profile	[1] MB/TCP ABB E
51.03	Station ID	1
51.04	Baud	9600
51.05	Parity	None
51.25	Protocol	[1] Modbus
51.27	FBA A par refresh	[1] Refresh

3.8.21 Configure Remote Inspection Kit

When the device is added to Avensor, then fill in the required fields:

Parameter	Values	Description
Device type	Remote Inspection Kit	The device type
Name	—	A name for the device
MAC address	—	The MAC address on the back of the gateway
Installed PAN units	0–3	The number of installed PAN units in the station
Pumps: Pump data	Enabled	Avensor shows the pump data.
	Disabled	Avensor does not show any pump data.
Level sensor	Enabled	Avensor shows the level data from a sensor that is connected to the gateway.
	Disabled	Avensor does not show any level data from a sensor that is connected to the gateway.
Level sensor: Model	– 4-20 mA – LTU 403	The model of the level sensor

Parameter	Values	Description
Level sensor: **Unit**	– **m** – **ft**	The unit of measurement
Level sensor: **Range min**	—	The minimum range of the level sensor
Level sensor: **Range max**	—	The maximum range of the level sensor
Camera	Enabled	A camera is included.
	Disabled	No camera is included.
Camera: **Serial number**	—	The serial number on the back of the camera The letters must be capitalized.
Camera: **Name**	—	A name for the camera
Camera: **Position**	– **Aimed at the wet well** – **Unspecified**	The position that the camera has in the station

Set a threshold for pump running status

1. Go to **Devices**.
2. Select **Remote Inspection Kit**.
3. Go to the tab **Data point thresholds**.
4. For each pump, set a power threshold.

   The threshold means that the pump is running. It is recommended to set the value to 10% of the rated power of the pump.
5. Click **Save**.

Turn on the camera stream

1. Go to **Camera**.
2. Next to **Camera off**, click the switch.
3. Go to **Devices** > **Camera** > **Configure device** to configure the camera stream.

3.8.22 Configure SENECA Z-8AI

The module must be turned off before it is configured.

1. Configure the Modbus settings by using the SW1 DIP switch.
   a) Set the baud.

DIP switch position		Baud
1	2	
_	_	9600
_	On	19200
On	_	38400
On	On	57600
_	_	EEPROM

   b) Set the address.

DIP switch position						Address
3	4	5	6	7	8	
_	_	_	_	_	On	1
_	_	_	_	On	_	2
_	_	_	_	On	On	3
_	_	_	On	_	_	4

EN

DIP switch position						Address
3	4	5	6	7	8	
_	_	_	_	_	_	- - -
On	On	On	On	On	On	63
_	_	_	_	_	_	EEPROM

c) Set the status of the RS-485 terminator.

DIP switch position	Status
10	
_	Disabled
On	Enabled

2. Set all SW2 DIP switches to ON to set all input ports to measure current.

   Avensor only supports the SENECA Z-8AI module when it is used as an input for a 4–20 mA current.

DIP switch position	Mode
1–8	
_	Voltage
On	Current

3. Configure the inputs.
   a) Download the Seneca Easy Setup tool from the SENECA home page.
   b) Install the Seneca Easy Setup tool on a computer.
   c) Connect the SENECA Z-8AI module to the computer through a USB cable.
   d) Use the Seneca Easy Setup tool to configure the inputs.

Parameter	Setting
Start scale	4000 uA, converted to 4000
Stop scale	20 000 uA, converted to 20 000
Sampling speed	120 ms

3.8.23 Configure SENECA Z-D-IN/Z-10-D-IN

The module must be turned off before it is configured.

Configure the communication settings by using the DIP switch.

a) Set the baud.

DIP switch position		Baud
1	2	
_	_	9600
_	On	19200
On	_	38400
On	On	57600
_	_	EEPROM

b) Set the address.

DIP switch position						Address
3	4	5	6	7	8	
_	_	_	_	_	On	1

DIP switch position						Address
3	4	5	6	7	8	
_	_	_	_	On	_	2
_	_	_	_	On	On	3
_	_	_	On	_	_	4
_	_	_	_	_	_	- - -
On	On	On	On	On	On	63
_	_	_	_	_	_	EEPROM

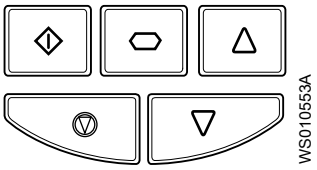
c) Set the status of the RS-485 terminator.

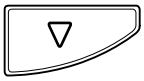
DIP switch position	Status
10	
_	Disabled
On	Enabled

3.8.24 Configure SRC 311

The connection between the SRC 311 and the gateway uses one of the following cables.

Cable	Description	Additional information
RS–485 communication cable	Connects the SRC 311 device to the gateway	For part number information, see the extra parts section in the Installation, Operation, and Maintenance Manual for the gateway.
Ethernet cable	Connects the SRC 311 device to the gateway Connect the pins as below: • Pin 3: ground • Pin 7: RS-485– • Pin 8: RS-485+	Cat 6 **Ethernet** cable is preferred.



Button	Name	Description
	Navigate	The button is used to enter/exit (2 seconds) the menu and to confirm selection/change (< 2 seconds).
	Up	The button is used to increase a value or selection in the submenu.
	Down	The button is used to decrease a value or selection in the submenu.

1. Go to the advanced parameters.
   a) Press the button and hold it down for a few seconds.

The main menu shows **P1–01**.

b) Use the up button to go to **P1–14**.

c) Press the navigate button to go to the submenu.

d) Use the up button until the screen shows the value, **505**.

Press down the up button to make it go faster.

e) Press the navigate button to accept the value.

EN

Advanced parameter number	Parameter name	Setting
P5–01	Drive fieldbus address	The communication address for the controller is the same as the pump ID in the system.
P5–03	Modbus or BACnet baud rate	9.6
P5–04	Modbus or BACnet data format	0 – 1

2. Set the address.
   a) Press the up button to go to **P5–01** .
   b) Press the navigate button to go to the submenu.
   c) Use the up and down buttons to set a communication address for the unit.
   d) Press the navigate button to accept the address.
3. Set the baud.
   a) Press the up button to go to **P5–03**.
   b) Press the navigate button to go to the submenu.
   c) Use the up and down buttons to set the baud.
   9.6 = 9600 baud
   d) Press the navigate button to accept the baud.
4. Set the data format.
   a) Press the up button to go to **P5–04**.
   b) Press the navigate button to go to the submenu.
   c) Use the up and down buttons to set the correct parity and stop bits.
   0 – 1 = no parity bit and 1 stop bit.
   d) Press the navigate button to enter the value.

3.8.25 Configure TurboLIGHT

Modbus TCP connection

1. Go to **Control**.
2. Set **MB_OFFSET_ADDR** to 0.

The IP address of the blower must be the same in TurboLIGHT and Avensor. The IP address is shown in the **Settings** menu in TurboLIGHT.

Modbus RTU connection

1. Go to **Control**.
2. Set the Modbus address of the blower in the **MB_SLAVE_NUM** parameter.
3. Go to **Settings**.
4. Set the baud in the **Modbus 485** parameter.

The Modbus address and baud must be the same in TurboLIGHT and Avensor.

3.8.26 Configure XAM 912

Enable the **Modbus RTU** or **TCP** protocol in the Setup Wizard to allow communication.

RS-485 RTU port

1. Go to **Settings** > **Communication** > **Modbus** > **Modbus server**.
2. Set the communication parameters.

Parameter	Setting
Server ID	1
Baud	19200
Stop bits	1
Parity	Even
LED off delay	60 s

EN

Ethernet

1. Go to **Settings** > **Communication**> **Modbus** > **Modbus server** > **TCP/IP**.
2. Set the communication parameters.

Parameter	Setting
IPv4 address	Use the IP address set on TCP/IP. For XAM 912 port, the default value is 10.10.20.10.
Port	Default value: 502 The user can choose a value between 500–65535.

4 Troubleshooting

EN

4.1 Alarms

Avensor-specific alarm	Description	Remedy
Device communication error	Avensor can communicate with the gateway, but the gateway fails to communicate with the device.	1. Check the following items: – The device works. – The cables are not broken. – The cables are connected correctly. – The communication parameters in the device are set correctly. For more information, see *Configurations* on page 18. – The communication parameters in Avensor and the parameters in the device are set identically. 2. Install the device again.
Lost external power to gateway	The gateway has no external power.	If there is no power outage, check that the cables for the power supply are not broken.
Lost contact with station	Avensor fails to communicate with the gateway. There is an issue with one of the following things: • The gateway power • The connection to the mobile network	If there is no power outage and no mobile network outage, move the gateway to a location with a better reception.

4.2 Error messages

Message in Avensor	Description	Remedy
Validation of the desired configuration did not complete within the time limit	The communication between Avensor and the gateway timed out before Avensor received a validation of the configuration.	1. Check that the gateway is turned on and functional. 2. If possible, move the gateway to a location with a better reception. 3. Try the original action again.
The device configuration is already completed	Avensor received the same request multiple times.	No action is needed.
The gateway could not communicate with the device	The gateway failed to communicate with the device. There is an issue with one of the following things: • The device configuration • The connection between the gateway and the device	1. Check the following items: – The device works. – The cables are not broken. – The cables are connected correctly. – The communication parameters in the device are set correctly. For more information, see *Configurations* on page 18. – The communication parameters in Avensor and the parameters in the device are set identically. 2. Install the device again.
Not installed	Avensor failed to install the device.	
Not configured	Avensor failed to update the device.	

4.3 System issues

Description	Remedy
The application does not work with Internet Explorer.	Use a different web browser. For optimal performance, use Google Chrome.
The mobile application does not work.	Update the mobile device to the latest software version.

Xylem |’zīləm|

1) The tissue in plants that brings water upward from the roots;
2) a leading global water technology company.

We’re a global team unified in a common purpose: creating advanced technology solutions to the world’s water challenges. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. Our products and services move, treat, analyze, monitor and return water to the environment, in public utility, industrial, residential and commercial building services settings. Xylem also provides a leading portfolio of smart metering, network technologies and advanced analytics solutions for water, electric and gas utilities. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise with a strong focus on developing comprehensive, sustainable solutions.

For more information on how Xylem can help you, go to www.xylem.com

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