# CONFIGURATION GUIDE





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# About this guide

This guide provides instructions on how to configure the Octave water meter using the Arad Smart Meters software.

Arad Smart Meters is the software used to configure all Arad's water meters in the Arad ultrasonic water product line. The interface is simple, yet comprehensive; it provides all the options needed to customize Octave ultrasonic water meter measurements to the exact requirements, including configuration of the data to output.



# Version compatibility

Configuration abilities are dependent on the match of the meter's software to the configuration software. The meter's version is indicated in the Meter Info tab's Software section. The Arad Smart Meters version is indicated in both the top-left corner of the login page, and in the Advanced options About tab. The following table provides the information for checking version compatibility.

Octave meter version	Compatible Arad Smart Meters versions
4.2.16	1.0.0.24
4.02.09	4.0003.57   1.0.0.13   1.0.0.24
4.01	4.0003.14   4.0003.57
4.00	4.0003.14   4.0003.40  4.0003.57
3.17	4.0003.14   4.0003.40
3.16	4.0003.14   4.0003.40   4.0003.57
3.15	4.0003.14   4.0003.57

NOTE: Current Arad Smart Meters versions are backward compatible with older Octave meter versions up to version 3.16.

Arad Smart Meters version 1.0.0.24 does not support Octave meter version 3.15.



# Conventions in this guide

### **Notices**

IMPORTANT: alerts you to a condition that might cause problems.

NOTE: emphasizes important information.

# Typographical conventions

- **Bold** typeface indicates an interface element or dialog box name.
- > indicates the click sequence, e.g., "Click Advanced > LCD Test means you tap the Advanced tab then choose LCD Test from the menu.
- *Italics* are used to denote file names, file paths and user input.
- Quotes are used for indicating values that can be chosen, usually options in drop-down menus, for example "Forward".

#### Terminology

Forward flow in this document is the equivalent of upstream flow in other documentation, and reverse flow in this document is the equivalent of downstream flow or backward flow in other documentation.

Due to the prevalence of PCs with touchscreens, the verb "tap" was chosen to indicate a physical selection action – the equivalent of a mouse click.



# **2** Getting Started

# **Prerequisites**

Make sure before you install the Arad Smart Meters application that you have the required equipment and that the computer meets the minimum requirements for using the application:

- PC installed with Windows 7 or later
- Arad Smart Meters application
- NFC reader kit (P/N 70000093)
- Octave Configuration Guide (this guide)

NOTE: There is an option to purchase separately an RS-232 module for communicating with the meter (*P*/N 96500819). See RS-232 Connection for information on setting up this module to work with Arad Smart Meters.

### Arad Smart Meters installation

- 1. A link for downloading the Arad Smart Meters application will be forwarded to you by your local distributor. Download the file to the computer you will use to configure Sonata Pulse water meters.
- 2. Arad IT personnel will perform the installation of the application by remote.
- 3. After Arad Smart Meters is installed on the computer, the Arad Smart Meters shortcut is added to the computer's desktop.





# Connecting the NFC reader

To set up communication between the Arad Smart Meters application and the Sonata Pulse water meter, you need to attach the NFC reader.

IMPORTANT: When the NFC reader and the meter are in a connected state, meter output is disabled. Therefore, initial configuration of the meter should be completed before the meter is installed.

1. Fasten the NFC reader to the plastic adapter (A) and clasp the adapter + NFC reader to the Octave display (B).



2. Double-click the Arad Smart Meters shortcut on the desktop to start the software.



3. Log in. See Logging in to Arad Smart Meters.

IMPORTANT: Before removing the NFC reader from the meter always tap **Disconnect**. Otherwise the meter remains in a connected state. When the meter is in a connected state, meter output is disabled.



# Logging in to Arad Smart Meters

IMPORTANT: The logged in user should be an administrator user with full permissions to all folders.

1. Connect the USB end of the NFC reader to a PC which has Arad Smart Meters installed on it. The Link led will be lit (green).



2. Start the Arad Smart Meters application. Do so by double-clicking the Arad Smart Meters desktop shortcut. Alternatively, find the Arad folder in the Start menu and tap Arad Smart Meters.

The application opens to the Please Login page.





3. If this is the first time you are logging in, tap **Settings** (bottom-right) and in the **Connection** tab select the **NFC** check box.

- P	Connection	
Connection	Changes are effective on next connection	
Graph	₩ NFC	
	NFC Connection	
REC	Reader Serial Number:	
Recording	NFC Debug Registers	
Configuration Files		
	Demonstration mode	Back

- 4. Tap Back to return to the log in page.
- In the **Password** box enter the password that was provided to you by Arad IT personnel when installing the application, and then tap Login. The application opens.

The left panel provides tabs for reaching the various configuration options.



The tabs are arranged in the logical configuration sequence. The meter is supplied with configuration defaults, which you may need to change per your specific setup.

In the following chapters we describe the various configuration options provided in each of these tabs.



# 3 Meter Info

# Overview

The Meter Info tab presents the Octave water meter's ID and version information. It also presents the pipe standard this meter supports.

the ID:	-			
V Version:	Meter			
eter Date: 31-Jan-15 Meter Time: 05:15	Meter ID:		•	
	HW ID:		•	
Meter Info	Calibration Date:	0		
-	Software			
💭 Display Settings	Version:	4.2.14	Checksum (0x): 7511F4D5	
G→ Output Settings	ASIC Version:	2.1.19	Compilation Date: Feb 14 2019	
Alarm Thresholds	Pipe Standard			
Meter Logs	Type:	ISO		
Advanced				
-				

#### Meter

Meter ID - the meter's unique ID.

HW ID - the meter's board ID.

Calibration Date - the date the meter was calibrated (table 3).

#### Software

Version - the meter's embedded firmware version.

Checksum (0x) - the firmware's checksum value.

**ASIC Version** - the version of the application-specific integrated circuit embedded in the meter's board.

Compilation Date - the date the meter's firmware was compiled.



**Pipe Standard** 

Type - the pipe standard the meter complies with. The options are either ISO or AWWA.



# **4** Display Settings

# Overview

The Display Settings tab is for configuring the Octave meter's display (LCD). Here you set the meter's display units, number of digits following the decimal point and mode, and also determine whether the meter's display settings are applied to the output stream of the connected module.

	🔅 Display Settings		
Meter ID: HW Venior:	Display		
Ment use: 31-38-15 Ment Ime: 05:15	Units:	Flow Rate: m <sup>a</sup> / h - Volume: m <sup>a</sup>	
	Update Modules Units:		
Meter Info	Volume Resolution (Digits):	2	
🔅 Display Settings	Display x 1000:	Disable	
G→ Output Settings	Mode:	Forward Volume 💌	
Alarm Thresholds	Temperature		
Meter Logs	Mode:	Celsius (%C)	
O Advanced			
	Record		Revert Save

# Display

**Units** - set the meter's flow rate measurement units. The available flow rate-volume unit combinations are:

- Flow Rate: m<sup>3</sup>/h Volume: m<sup>3</sup>
- Flow Rate: Lt / s Volume: m<sup>3</sup>
- Flow Rate: GPM Volume: GAL
- Flow Rate: GPM Volume: Ft<sup>3</sup>
- Flow Rate: GPM Volume: A.F.
- Flow Rate: IGPM Volume: IGAL
- Flow Rate: GPM Volume: A.I.



- Flow Rate: BPM Volume: Barrel
- Flow Rate: Lt / m Volume: m<sup>3</sup>

Refer to the Glossary for unfamiliar abbreviations.

**Update Modules Units** - select this check box to synchronize the units of the meter's connected module output to the units set for the meter's display.

**Volume resolution (Digits) -** set the display resolution, which is the number of digits after the decimal point. The maximum value is "5".

In the following examples we show you how 789 liters (cubic meters) are presented per the value you enter in this field.

Entering "0" uses a 1000 liter resolution, therefore as 789 is less than 1000 liters nothing will be shown in the display:



Entering "1" uses a 100 liter resolution, and as there are 7 hundreds in 789 liters, "7" will be shown in the display:



Entering "2" uses a 10 liter resolution, and as there are 78 tens in 789 liters, "78" will be shown in the display:

8,8,8,8,8,8,8,8,8	<b>3,8</b> , <sup>18</sup> , <sup>m3</sup>
8.8.8.	FWD FWD





Entering "3" uses a 1 liter resolution, and as there are 789 liters, "789" will be shown in the display:

Display x 1000 - not yet implemented. (Keep the default of "Disable".)

Mode - select the meter's accumulated volume display mode:

- "Forward Volume" the display presents only the measure of forward flow (FWD).
- "Net Signed Volume" the display presents the result of the forward flow minus reverse flow calculation, indicating reverse flow with a minus symbol, e.g. - 789.
- "Alternate (Forward/Reverse volume)" the display alternates between presenting forward flow (FWD) and reverse flow (BCK).
- "Net Unsigned Volume" the display presents the result of the forward flow minus reverse flow calculation using zero as a reference point.
   Reverse flow will be indicated by counting backwards from zero. For

example 1 liter of reverse flow will be 0.999 when the **Volume Resolution** is set to 3 digits.

Forward flow will count from zero forwards, for example 1 liter of forward flow will be 0.001 if the **Volume Resolution** is set to 3 digits.

Alternate Timer (sec) - when the selected mode is "Alternate (Forward/Reverse volume)", set the time for displaying each direction's measurement. The default value is "2", i.e. every two seconds the display alternates the flow direction.

#### Temperature

**Mode** - determine whether water temperature measurements are presented on the display or not, and if yes – which temperature scale to use.

- "Off" no temperature measurement is displayed.
- "Celsius (°C)" display measured temperature in Celsius degrees
- "Fahrenheit (°F)" display measured temperature in Fahrenheit degrees



NOTE: Tap **Save** to keep your changes. Tap **Revert** to return the display settings to the last saved configuration.

After tapping Save you will be prompted with the following message:

Please Conf	ìrm	×
?	Logs will be erased! Continue?	
	No Yes	

Tap **Yes** to apply your changes. All data preceding these changes will be purged from the data logger.

Tap No to continue without applying any changes to the display settings.

If needed, tap **Record** to create a manual output file per the recording configuration in Application Settings.



# The Octave display



\* Legend of output mode display values:

[Blank]	Pulses
4-20 mA	4-20 mA
AMI TYPE: 0	Encoder and Extended Encoder
AMI TYPE: 1	Mbus
AMI TYPE: 2	Modbus
AMI TYPE: 3	CZ Module



# **5** Output Settings

### Overview

The Output Settings tab is for configuring the output per the target output module.

This chapter describes the configuration settings per the target output types and modes as follows:

- No Output
- Pulses
- 4-20 mA
- 4-20 mA & Pulse (only 4-20 mA, or 4-20 mA & Pulse)
- Encoder (only encoder, only pulses, or encoder + pulse)
- Extended Encoder (only encoder, only pulses, or encoder + pulse)
- CZ Module
- Modbus (only Modbus, or Modbus + pulse)
- Mbus (only Mbus, or Mbus + pulse)

At the bottom of the page for each type of output configuration there are three controls: **Save**, **Revert** and **Record**.

After you complete output configuration, tap **Save** to keep your changes. Tap **Revert** to return the output settings to the last saved configuration.

And if needed, tap **Record** to create a manual output file per the recording configuration in Application Settings.



# No Output

Select when there is no readout device connected to the water meter and no output is needed; information is read directly from the meter's display.

This output type may be the default if the meter was ordered with no specific configuration prerequisites and no attached module. The technician will configure the meter afterwards per the module assigned to it.





#### **Pulses**

The focus of the Pulses output type is on volume output.

A pulse is feedback for the system of how much water passed, per the calculation of measurement units, pulse width and resolution.

The Pulses module can output data of two pulses. Both pulses measure volume, but you can split the pulse output to two channels and apply a different output mode to each of these pulse measurements.

G Output Settings			
Type: Pulses	•		
Pulses			
Units:	mª 💌	Pulse Max Flow $(m^3 / h)$ :	150.000
Pulse 1			
Mode:	Forward •		
Resolution (m <sup>9</sup> /Pulse):	0.1 💌		
Width (ms):	100		
Pulse 2			
Mode:	Reverse 💌		
Decelution (m3/Dulca)	n1 -		
Record			Revert Save

IMPORTANT: The Pulse module must be connected to the Octave meter (if it is not already connected) within 60 seconds of disconnecting Arad Smart Meters in order to reset the module's bit to zero for proper pulse measurements.

Units - Set the measuring units for the meter's pulses:

- m<sup>3</sup> cubic meters
- GAL gallons
- Ft<sup>3</sup> cubic feet
- A.F. acre feet
- IGAL imperial gallon
- A.I. acre inch
- Barrel



Pulse Max Flow (per the set display units) – Limit the flow to a value that ensures reliable pulse detection.

When the meter is connected to a 3/4'' pipe and the units are cubic meters, the recommended value is 8 m<sup>3</sup>/h. When the meter is connected to a 1"pipe and the units are cubic meters, the recommended value is 12 m<sup>3</sup>/h.

#### Pulse 1

Mode - Set the pulse's accumulated volume output mode:

- "Disable" output is disabled
- "Net" pulse output is a measure of forward volume minus reverse volume
- "Forward" pulse output is a measure of forward volume
- "Reverse" pulse output is a measure of reverse volume
- "Forward & Reverse" pulse output includes a measure of both forward volume and reverse flow for control devices that support input of two pulse data streams through a single input channel

**Resolution (unit)** - Set the pulse resolution, i.e. the volume per one pulse, for the selected measurement unit:

- 0.001
- 0.01
- 0.1
- 1
- 10
- 100
- 1000
- 10000

NOTE: The available resolution values are influenced by the value set for the **Pulse Max Flow** parameter.



Width - set the width of the pulse in milliseconds. This will communicate a pulse for each passed width count.

For example, if you have set the resolution to 1 liter per pulse and the pumping flow rate is 3.6 cubes per hour, the result will be one pulse per second. The calculation is the total liters divided to the number of minutes, divided to the number of seconds in a minute:

$$\frac{(3600/60)}{60}$$

This is how a pulse with a 100 ms width would look like in that context:



If the velocity was twice as much (7.2 m<sup>3</sup>/h), two pulses would fit in one second:



#### Pulse 2

The fields for configuring pulses are the same, see the "Pulse 1" section for information on each of these fields. (There is no "Forward & Reverse" mode for Pulse 2 as the idea of configuring a second pulse is when the pulse output is split to two separate channels, and you would not use an alternating output mode in this scenario.)



#### **Pulses Alarms**

Mode - set whether alarm information is included in the output.

- "Off" alarm information is not included
- "On" alarm information is included

Alarms Period (sec) - when alarm information is included in the output, set the alarm signaling pattern that matches your diagnostic & billing device as follows:

- 1 second issues 9 successive pulses
- 2 seconds issue 18 successive pulses
- 3 seconds issue 27 successive pulses
- 4 seconds issue 36 successive pulses
- 5 seconds issue 45 successive pulses

Alarm Repeat Time (hr) – when alarm information is included in the output, set the interval between logging the alarm in the output (if the reason for triggering the alarm was not resolved within this interval).

**Alarms** – select the check boxes of those conditions that will trigger alarms (via the meter's output that reaches the control center):

- Low Battery meter's battery power is low. Alarm will be triggered when there is about a month of power left in the battery.
- Measurement Fail failure in collecting the data required for calculating water flow.
- Leakage when a given start time passes with the flow above the configured threshold (see Alarm Thresholds).
- Flow Rate Alarm when the flow rate exceeds the top threshold (see Alarm Thresholds).



#### 4-20 mA

In the 4-20 mA output type, output flow-rate data is indicated by electric current.

This type is commonly used when Octave flow-rate measurements serve as input for pump controllers. The pump controller matches the flow-rate values to the pump's set points to ensure the pump engine is working efficiently. The pump controller prevents a situation in which the measurements will deviate from the allowed range set in Octave. Per the measured input from Octave it instructs the pump to either accelerate or slow down its pace to work within the range of the optimal set points (minimum and maximum limits).

When using this output type, you will set the minimum and maximum flow rate limits that correspond to the standard range 4 mA minimum to 20 mA maximum respectively.



Measurement units are based on the units set for the meter's Display.

Minimum - set the minimal flow rate for the 4 mA set point.

Maximum - set the maximal flow rate for the 20 mA set point.



#### 4-20 mA & Pulse

In the 4-20 mA & Pulse output type, in addition to using output flow-rate data indicated by electric current as a measuring element in a feedback cycle (for example as input for a pump controller), there is also an option of measuring the volume of water passing through per the set direction of the pulse.



#### 4-20 mA

Select to output flow rate data as indicated by electric current. Set the minimum and maximum flow rate limits that correspond to the standard range 4 mA minimum to 20 mA maximum respectively.

Minimum - set the minimal flow rate for the 4 mA set point.

Maximum - set the maximal flow rate for the 20 mA set point.

#### Pulse

IMPORTANT: Only in this output type (4-20 mA & Pulse), the pulse is a 'spread pulse', i.e., the number of pulses are spread evenly throughout the entire set width. See following illustrations.

Units - set the measuring units for the meter's pulses:

- m<sup>3</sup> cubic meters
- GAL gallons
- Ft<sup>3</sup> cubic feet
- A.F. acre feet
- IGAL imperial gallon
- A.I. acre inch



Barrel

**Pulse Max Flow (per the set display units)** – limit the flow to a value that ensures reliable pulse detection.

When the meter is connected to a 3/4 '' pipe and the units are cubic meters, the recommended value is 8 m<sup>3</sup>/h. When the meter is connected to a 1 '' pipe and the units are cubic meters, the recommended value is 12 m<sup>3</sup>/h.

Mode - set the pulse's accumulated volume output mode:

- "Disable" output is disabled
- "Net" pulse output is a measure of forward volume minus reverse volume
- "Forward" pulse output is a measure of forward volume
- "Reverse" pulse output is a measure of reverse volume

**Resolution (unit/Pulse)** – set the pulse resolution, i.e. the volume per one pulse, for the selected measurement unit:

- 0.001
- 0.01
- 0.1
- 1
- 10
- 100
- 1000
- 10000

NOTE: The available resolution values are influenced by the value set for the **Pulse Max Flow** parameter.



Width – set the width of the pulse in milliseconds. This will communicate a pulse for each passed width count.

For example, if you have set the resolution to 1 liter per pulse and the pumping flow rate is 3.6 cubes per hour, the result will be one pulse per second. The calculation is the total liters divided to the number of minutes, divided to the number of seconds in a minute:

$$\frac{(3600/60)}{60}$$

This is how a spread pulse with a 100 ms width would look like in that context:



If the velocity was twice as much (7.2  $m^3/h$ ), two pulses would fit in one second with an even spread:





### Encoder

The Encoder output type supports a commonly-used AMR/AMI interface protocol (UI-1203), which outputs the meter ID and volume. When needed, you can use this module to also output the count of pulses to the encoder's counter.

Mode - choose which mode you will be using for Encoder output:

- "Encoder" output only the standard encoder data (meter ID and volume)
- "Pulses" output only the count of pulses
- "Encoder + Pulse" output both standard encoder data and pulse count

Encoder	<ul> <li>Mode: Encode</li> </ul>	er + Pulse 💌	
oder			
AMR Serial Number:	1234567890123456	Units: Flow	v Rate: mª / h - Volume: mª 🔹 💌
Num of Digits:	8	Resolution:	0.001 💌
CounterType:	Forward •		
Update Mode:	Period 💌	In Minutes:	5
se			
Mode:	Disable 💌	Units:	m* •
Width (ms):	50	Resolution:	1 *

#### Encoder

**AMR Serial Number** – the meter's auto-detected serial number (Automatic Meter Reading).

**Units** – set the output units. The available flow rate-volume unit combinations are:

- Flow Rate: m<sup>3</sup>/h Volume: m<sup>3</sup>
- Flow Rate: Lt/s Volume: m<sup>3</sup>
- Flow Rate: GPM Volume: GAL
- Flow Rate: GPM Volume: Ft<sup>3</sup>
- Flow Rate: GPM Volume: A.F.
- Flow Rate: IGPM Volume: IGAL
- Flow Rate: GPM Volume: A.I.



- Flow Rate: BPM Volume: Barrel
- Flow Rate: Lt/m Volume: m<sup>3</sup>

Refer to the Glossary for unfamiliar abbreviations.

**Num of Digits** – set the number of digits left of the decimal point that will be sent as the read water volume. The protocol supports up to 8 digits.

For example, if the Octave reading is 123456789.125 m<sup>3</sup> and the Encoder output is set to 8 digits the transferred reading will be: 23456789. If the Encoder output is set to 3 digits the transferred reading will be: 789.

**Resolution** – set the flow rate resolution, i.e. the number of digits after the decimal point.

- 0.0001
- 0.001
- 0.01
- 0.1
- 1
- 10
- 100
- 1000
- 10000

Counter Type - set the identifying type for the counted volume

- "Net Unsigned" data of the net flow, i.e. forward flow minus reverse flow, using zero as a reference point to indicate whether the net volume is forward flow or reverse flow (reverse flow counts from zero backwards: 0.999, 0.998....)
- "Forward" data of forward flow measurements
- "Backward" data of forward flow measurements

 $\ensuremath{\textbf{Update}}$   $\ensuremath{\textbf{Mode}}$  – set the intervals between marching data out of the meter to the reading system.

- "Period" the data will be marched out the meter every n minutes, per the interval you set the interval between in the In Minutes field.
- "Once" the data will be marched out the meter once a day per the time you set in the **First** field.
- "Twice" the data will be marched out of the meter twice a a day at the times you set in the **First** and **Second** fields.



#### Pulse

Mode - set the pulse's accumulated volume output mode:

- "Disable" output is disabled
- "Net" pulse output is a measure of forward volume minus reverse volume
- "Forward" pulse output is a measure of forward volume
- "Reverse" pulse output is a measure of reverse volume

Units - set the measuring units for the meter's pulses:

- m<sup>3</sup> cubic meters
- Ft<sup>3</sup> cubic feet
- GAL gallons
- IGAL imperial gallons
- A.F. acre feet
- A.I. acre inch
- Barrel

**Resolution** – set the pulse resolution, i.e. the volume per one pulse, for the selected measurement units:

- 0.0001
- 0.001
- 0.01
- 0.1
- 1
- 10
- 100
- 1000
- 10000



Width (ms) – set the width of the pulse in milliseconds. This will communicate a pulse for each passed width count.

For example, if you have set the resolution to 1 liter per pulse and the pumping flow rate is 3.6 cubes per hour, the result will be one pulse per second. The calculation is the total liters divided to the number of minutes, divided to the number of seconds in a minute:

$$\frac{(3600/60)}{60}$$

This is how a pulse with a 100 ms width would look like in that context:



If the velocity was twice as much (7.2 m<sup>3</sup>/h), two pulses would fit in one second:



#### **Encoder + Pulse**

In this mode both flow-rate data and pulse is output data via the AMR/AMI interface protocol.

See the preceding Encoder and Pulse sections for a description of each of the parameters to configure.



# **Extended Encoder**

Extended encoder type output provides in addition to the standard Encoder output options a **Message Type** field.

/pe:	Extende	d Encoder	<ul> <li>Mode:</li> </ul>	Encoder +	Pulse 🔻			
Extende	d Encode	er						
AMR S	erial Numbe	r.	1234567890	0123456	Units:	Flow Rate: m <sup>a</sup> /	h - Volume: mª	*
Num o	f Digits:		8		Resolution:		0.001	•
Counte	erType:		Forward	•				
Update	Mode:		Period	•	In Minutes:		5	;
Messaj	ge Type:		Extended	•				
Tempe	rature Units		Celsius (\$C)	•	Pressure Units		BAR	•
Send Fi	lags:	□ Alarms ✓ Volume		Units Current Flow	Pressu Nax. 1	ire Value Flow	Temperature	Value

**Message Type** – select the format in which the data is marched out of the meter:

- "Standard" only meter ID and volume data is included in the output.
- "Extended" the output can include alarm data, pressure values, and temperature values, in addition to the standard meter ID and volume information.

**Temperature Units** – when the selected message type is "Extended", determine whether water temperature measurements are included in the message output or not, and if yes – which temperature scale to use.

- "Off" no temperature measurement is included in the message.
- "Celsius (°C)" temperature measurements are in Celsius degrees
- "Fahrenheit (°F)" temperature measurements are in Fahrenheit degrees

**Pressure Units** – when the selected message type is "Extended", set which pressure units will be included to indicate pressure measurements in the message output:

- "BAR"
- "PSI"



**Send Flags** – when the selected message type is "Extended", set which data will be included in the message output:

- Alarms for example, leakage and measurement fail
- Units the unit values of the flow rate and volume
- Pressure Value the measured pressure
- Temperature Value the measured temperature
- Volume the total measured volume
- Current Flow the current flow measured
- Max. Flow the maximum flow measured



# **CZ** Module

The Contazara (CZ) module is available for customers in Spain. If you need to configure Octave to use this module, set the output type to "CZ Module" in Arad Smart Meters and tap **Save**.

G• Output Settings		
Type: CZ Module	•	
Record		Revert Save

This will enable the option of configuring Contazara module output afterwards, using its dedicated, standalone Contazara configuration interface.

Please contact your Arad distributor in Spain for more information.



### Modbus

When using the Modbus protocol to output data, specify the communication settings that match your environment. There is an extensive range of data that can be marched out the meter using this protocol.

Mode - select the mode that suits your requirements:

- "Modbus" the output will include meter readings only
- "Modbus + Pulse" the output will include pulse data as well

Mo	dbus	<ul> <li>Mode:</li> </ul>	Modbus + Pu	ilse 🔹			
odbus							
AMR Serial No	imber:	102030405060708	19	Units:	Flow Rate: m <sup>a</sup>	h - Volume: m*	•
Slave Address		1		Flow Resolutio	m:	1	•
Baud Rate:		9600	•	Volume Resolu	ition:	1	•
Parity:		Even	•	Stop Bit:		1 Stop Bit	•
Working Mod	e:	Polling	•	Polling Period	(min):	6	:
Alarms:	Low Batter	y 🗆 Mea:	surement Fail	Leakage		Flow Rate Alarm	
ılse							
Mode:		Disable	•	Units:		mi	

#### Modbus

**AMR Serial Number** – the meter's auto-detected serial number (Automatic Meter Reading).

**Units** – set the output units. The available flow rate-volume unit combinations are:

- Flow Rate: m<sup>3</sup>/h Volume: m<sup>3</sup>
- Flow Rate: Lt / s Volume: m<sup>3</sup>
- Flow Rate: GPM Volume: GAL
- Flow Rate: GPM Volume: Ft<sup>3</sup>
- Flow Rate: GPM Volume: A.F.
- Flow Rate: IGPM Volume: IGAL
- Flow Rate: GPM Volume: A.I.
- Flow Rate: BPM Volume: Barrel
- Flow Rate: Lt / m Volume: m<sup>3</sup>


Refer to the Glossary for unfamiliar abbreviations.

Slave Address – set the slave address used for the Octave meter in the range of 1 to 247.

Flow Resolution - set the resolution for the transferred flow-rate output.

**Baud Rate** – specify the maximum data transfer speed (bits per second) your serial communication channel supports, per the speeds Octave supports:

- 2400
- 4800
- 9600

Volume Resolution - set the resolution for the transferred volume output.

Parity - select the parity scheme to apply for detecting single-bit errors.

- Odd
- Even
- None

Stop Bit - keep the default of "1 Stop Bit".

**Working Mode** – set what triggers data transfer from Octave to the master device:

- "By Request" Octave sends specific data in response to a specific request from the master device
- "Polling" Octave sends all data in response to periodic polling by the master device

**Polling Period (min)** – when the working mode is "Polling", set the polling interval in minutes. The value should be an effective choice that considers the time it takes for data to change, thu s optimizing battery use.

Alarms – select the check boxes of those conditions that will trigger alarms (via the meter's output that reaches the control center):

- Low Battery
- Measurement Fail
- Leakage
- Flow Rate Alarm



#### Pulse

Mode - set the pulse's accumulated volume output mode:

- "Disable" output is disabled
- "Forward" pulse output is a measure of forward volume
- "Reverse" pulse output is a measure of reverse volume
- "Net" pulse output is a measure of forward volume minus reverse volume

Units - set the measuring units for the meter's pulses:

- m<sup>3</sup> cubic meters
- GAL gallons
- Ft<sup>3</sup> cubic feet
- A.F. acre feet
- IGAL imperial gallon
- A.I. acre inch
- Barrel



#### Mbus

When using the M-Bus protocol to output data, specify the communication settings that match your environment.

Mode - select whether the M-Bus output should include Pulse data

- "Mbus" only M-Bus supported data is included in the output string.
- "Mbus + Pulse" both M-Bus and Pulse data is included in the output string.

Mbus	•	Mode:	Mbus + Pulse	•			
ous							
AMR Serial Nurr	iber:	10203040506070	89	Units:	Flow Rate: m <sup>a</sup>	/ h - Volume: mª	•
Slave Address:		1		Flow Resolutio	in:	1	•
Baud Rate:		2400	•	Volume Resolu	ition:	1	•
Working Mode:		By Request	•	Polling Period	(min):	6	
Device ID:		00000000					
Data Telegram:	Alarms Forward Volu Flow	Supp Supp Sack	lier Info ward Volume	<ul> <li>Tempera</li> <li>Net Sign</li> </ul>	ture G ed Volume G	RTC Meter	lume
Alarms:	Low Battery	🗆 Mea	surement Fail	🗆 Leakage		Flow Rate Alarm	

#### Mbus

**AMR Serial Number** – the meter's auto-detected serial number (Automatic Meter Reading).

**Units** – set the output units. The available flow rate-volume unit combinations are:

- Flow Rate: m<sup>3</sup>/h Volume: m<sup>3</sup>
- Flow Rate: GPM Volume: GAL
- Flow Rate: GPM Volume: Ft<sup>3</sup> (cubic feet)

Refer to the Glossary for unfamiliar abbreviations.

Slave Address – set the slave address used for the Octave meter in the range of 1 to 247.

Flow Resolution – set the resolution for the transferred flow-rate output.



**Baud Rate** – specify the maximum data transfer speed (bits per second) your serial communication channel supports, per the speeds Octave supports:

- 300
- 2400
- 9600

Volume Resolution - set the resolution for the transferred volume output.

**Working Mode** – set what triggers data transfer from Octave to the master device:

- "By Request" Octave sends specific data in response to a specific request from the master device
- "Polling" Octave sends all data in response to periodic polling by the master device

**Polling Period (min)** – when the working mode is "Polling", set the polling interval in minutes. The value should be an effective choice that considers the time it takes for data to change, thus optimizing battery use.

**Device ID** – a number assigned to the Octave device that the master uses to identify this meter's ordinal position relative to other slave devices.

Data Telegram - select the data to be included in the reply-to-master telegram:

- Alarms data per the selected alarm types (see below)
- Supplier Info the meter's serial number (AMR Serial Number)
- Temperature water temperature data
- RTC Meter the time stamp of when the meter's measurements were read
- Forward Volume data of forward flow measurements
- Backward Volume data of reverse flow measurements
- Net Signed Volume data of the net flow, i.e. forward flow minus reverse flow. Reverse net flow is indicated with a preceding minus sign (-)
- Net Unsigned Volume data of the net flow, i.e. forward flow minus reverse flow, using zero as a reference point to indicate whether the net volume is forward flow or reverse flow (reverse flow counts from zero backwards: 0.999, 0.998....)
- Flow flow data, i.e., flow resolution and measurement units



Alarms – select the check boxes of the alarm conditions that will be included in the telegram, if the Alarms check box was selected.

- Low Battery
- Measurement Fail
- Leakage
- Flow Rate Alarm

#### Pulse

Mode - set the pulse's accumulated volume output mode:

- "Disable" output is disabled
- "Forward" pulse output is a measure of forward volume
- "Reverse" pulse output is a measure of reverse volume
- "Net" pulse output is a measure of forward volume minus reverse volume

Units - set the measuring units for the meter's pulses:

- m<sup>3</sup> cubic meters
- Ft<sup>3</sup> cubic feet
- GAL gallons
- IGAL imperial gallons
- A.F. acre feet
- A.I. acre inch
- Barrel



Width (ms) – set the width of the pulse in milliseconds. This will communicate a pulse for each passed width count.

For example, if you have set the resolution to 1 liter per pulse and the pumping flow rate is 3.6 cubes per hour, the result will be one pulse per second. The calculation is the total liters divided to the number of minutes, divided to the number of seconds in a minute:

$$\frac{(3600/60)}{60}$$

This is how a pulse with a 100 ms width would look like in that context:



If the velocity was twice as much (7.2 m<sup>3</sup>/h), two pulses would fit in one second:





**Resolution** – set the pulse resolution, i.e. the volume per one pulse, for the selected measurement units:

- 0.001
- 0.01
- 0.1
- 1
- 10
- 100
- 1000
- 10000
- 10000
- 10000

NOTE: The available resolution values are influenced by the value set for the **Units** parameter.





#### Overview

Alarm thresholds determine which conditions trigger alarms. In Octave the alarms are presented on the meter's display and are logged in the meter's logs.

Octave Disconnect	🚽 Alarm Threshold	is		
Meter ID: HW Vesion:	Configuration			
	Activation Quantity (m <sup>3</sup> ):	10587		
Carabon GROUP	Flow Rate Alarm			
	Threshold (m <sup>3</sup> / h):	22.712		
Wieter Into	Start Duration (sec):	3	End Duration (sec):	3
Display Settings	Leakage			
G→ Output Settings	Threshold (m <sup>3</sup> / h):	0.025		
Alarm Thresholds	Start Duration (hrs):	24	End Duration (min):	1
Meter Logs				
Advanced				
	Record			Revert Save

#### Configuration

Activation Quantity (the volume unit selected for the meter's display) – set the volume of measured water after which alarm detection will be active. This prevents triggering false alarms before the meter is in full operational state.



#### **Flow Rate Alarm**

NOTE: Flow rate alarms are not indicated on the meter's LCD. They are indicated only in the logs.

Threshold (the flow rate unit selected for the meter's display) – set the minimum value for activating the flow rate alarm. When the flow rate is above this threshold the alarm is triggered after a given start time passes.

NOTE: The threshold value needs to be equal or above the minimum value the device can measure.

Start Duration (time unit) – set the number of minutes/seconds (whether it's minutes or seconds depends on the selected display units) that must pass with a flow rate above the threshold to trigger the alarm. If the flow rate decreases to below the threshold within this period, the start duration count will start anew.

End Duration (time unit) – set the number of minutes/seconds (whether it's minutes or seconds depends on the selected display units) that must pass with a flow rate below the threshold value to stop the alarm. If the flow rate increases and exceeds the threshold within this period, the end duration count will start anew.

#### Leakage

**Threshold (selected unit)** – set the minimum value for activating the leakage alarm. When the detected leakage is above this threshold the alarm is triggered after a given start time passes.

NOTE: The threshold value needs to be equal or above the minimum value the device can measure.

**Start Duration (hrs)** – set how many hours must pass with a flow rate above the threshold to trigger the alarm. If the flow rate decreases to below the threshold within this period, the start duration count will start anew.

**End Duration (min)** – set the number of minutes that must pass with a flow rate below the threshold value to stop the alarm. If the flow rate increases and exceeds the threshold within this period, the end duration count will start anew.



**Pipe Burst** 

Currently unavailable.

**Reverse Flow** 

Start Alarm (m<sup>3</sup>) - set the minimum value for activating the reverse flow alarm.

NOTE: Tap **Save** to keep your changes. Tap **Revert** to return the alarm threshold settings to the last saved configuration.

If needed, tap **Record** to create a manual output file per the recording configuration in Application Settings.



### 7 Meter Logs

#### Overview

Meter logs provide information for tracing the meter's activity. These logs are useful for technical troubleshooting and for checking water consumption when customers file disputes.

Octave Misconnect	Meter Logs				
Meter ID: HW Venior:	Meter Logs				j
Week Case: 12-30-19 Meek Line: 21:19	Path:		Browse		
	💽 First Logs		Download	Meter Time	
Meter Info	<ul> <li>Second Logs</li> <li>Elow Events</li> </ul>			© Local Time	
🔅 Display Settings	System Events		Clear		
G→ Output Settings	Configuration				
Alarm Thresholds	First Logs:	Enable •	Duration (minutes):	1	
Meter Logs	Second Logs:	Enable •	Duration (hours):	60 🛟	
	Alarms Logs				
• Advanced	System:	⊻ Measurement Fall ⊻ Low Batter	ry Critical Change	Tamper Detection	
	Record			Revert	Save

#### **Meter Logs**

**Path** – tap **Browse** to browse to an existing folder, or create a new folder for the meter's log files on the connected computer.

First Logs - select to log data in minute intervals.

Second Logs - select to log data in hourly intervals.

**Flow Events** – select to include flow events (e.g. flow rate, leakage, reverse flow) in the log file.

**System Events** – select to include system events (e.g. watchdog, critical change, low battery) in the log file.

**Download** – tap to download a log file to the folder destination you specified in the **Path** field.

Clear - tap to purge all traces, i.e. clear all logs.



**Meter Time** – before downloading the log file, select to apply the meter's set time to the logged entries. (See Clock Settings.)

**Local Time** – before downloading the log file, select to apply the PC's set time to the logged entries.

#### Configuration

First Logs - enable or disable this minutely logging option.

**Duration (minutes)** – if first logs are enabled, set the logging frequency in minutes, e.g. entering "3" will log data every three minutes.

Second Logs - enable or disable this hourly logging option.

**Duration (hours)** – if second logs are enabled, set the hourly frequency, e.g. entering "3" will log data every three hours.



#### **Alarms Logs**

Per the selected event types (system and flow), specify which events will be included in the logged data.

#### **System**

Measurement Fail - select this check box to log measurement failure data.

Low Battery - select this check box to log low battery alarm data.

Critical Change – select this check box to log critical change data.

Tamper Detection - N/A

#### Flow

Leakage – select this check box to log leakage alarm data.

Flow Rate Alarm - select this check box to log flow rate alarm data.

Reverse Flow - select this check box to log reverse flow alarm data.

Pipe Burst - select this check box to log pipe burst alarm data.

Dry Pipe - N/A

NOTE: Tap **Save** to keep your changes. Tap **Revert** to return the meter logs settings to the last saved configuration.

If needed, tap **Record** to create a manual output file per the recording configuration in Application Settings.



### 8 Advanced

#### Overview

Advanced settings provide options beyond the basic configuration of the water meter and its output.

Tapping the Advanced tab presents a fly-out menu from which you can choose any of the following options:

- Clock Settings
- LCD Test
- Totalizer Data
- Special Functions
- Flow Simulation
- Application Settings
- About
- Exit





#### **Clock Settings**

💮 Clock Sett	ings	
RTC Date Time		
Date:	4         July, 2010         ▶           Sai Mo Tai War Thi Fr Sai         3         1         6         6           7         1         2         1         6         6           7         1         2         1         1         6           7         1         2         1         1         6         1           14         2         10         1	
Time: Day Light:	21:50	
Shabbat		
Off Enable Comm Communication In	unication terval (hr): 4	
Record		Revert Save

#### **RTC Date Time**

The meter comes preconfigured with a date and time that does not necessarily match the date and time in the location where the meter is installed and working.

**Date** – set the meter's real-time date, i.e. the current date for the location in which the meter is installed.

**Time** – tap the field and enter the meter's current time for the location in which the meter is installed. Separate the hour from the minutes with a colon.

**Day Light** – determine whether the meter's clock should apply DST (daylight saving time) by selecting the applicable zone from the list:

- "US Zone"
- "EU Zone"

Otherwise, keep the default of "Disable".



#### Shabbat

Indicates whether Octave was configured in the factory with Shabbat settings, which are based on Jewish religious directives for observing the Sabbath.

- "Off" the meter was not configured with Shabbat settings
- "On" the meter was configured with Shabbat settings (there is usually a sticker affixed on the meter's display to indicate this as well, but the sticker may have been peeled off intentionally or unintentionally)

**Enable Communication** – this check box indicates whether communication will be established per the configured interval.

**Communication Interval (hr)** – the interval in hours between transmitting the output during the Sabbath. For example, if the value is "4" the output will be sent every four hours.

NOTE: Shabbat settings apply only during the Sabbath. The meter exits Shabbat mode automatically when the Sabbath ends and resumes operation per its regular settings.



#### LCD Test

This tool lets you check that the LCD is fully functional.

Targeting specific segments in the LCD is useful for pinpointing issues when needed.

est			
	Nor	mal	
	All On	Odd	
	All Off	Even	

**Normal** – tap to bring the LCD to its normal state, i.e. that state in which it reflects the meter's Display configuration.

- All On tap to light up all the LCD segments.
- All Off tap to dim all the LCD segments.
- Odd tap to light up all the odd LCD segments.
- Even tap to light up all the even LCD segments.



#### **Totalizer Data**

Use for reading the aggregated volume data from the meter.

💮 Totalizer	Data	
Volume Totali	zer	
+ (m <sup>3</sup> ):		
- (m³):		
	Read	
Record		Revert Save

#### **Volume Totalizer**

Read - tap to apply the read request.

- +(m<sup>3</sup>) total forward volume read from the meter.
- -(m<sup>3</sup>) total reverse volume read from the meter.



#### **Special Functions**

Special functions are intended for supervising technicians only.





#### **Flow Simulation**

Simulating flow lets you check that the meter works properly. In flow simulation you can see on the display whether the meter detects forward and reverse flow.

Flow Simulation		×
Off	•	
Flow (Lt / m):	36.00000	
Pos. Volume (m³):	1.00000	
Neg. Volume (m³):	10.00000	Get Set

NOTE: If you are interested in checking Pulse functionality you will need to add a pulse counter.

#### Simulating flow

- 1. Accessing Flow Simulation requires a password. Contact support to obtain a password for this advanced option.
- 2. In the **Flow** [units] either keep the default value or enter a different value to simulate. Higher values will issue quicker results.
- 3. In the **Pos. Volume** [volume units] either keep the default value of forward volume, or enter a different value to simulate. Supports up to five digits after the decimal point. To see this on the LCD, adjust the Display Settings accordingly.
- 4. In the Neg. Volume [volume units] either keep the default value of reverse flow, or enter a different value to simulate. Supports up to five digits after the decimal point. To see this on the LCD, adjust the Display Settings accordingly.
- 5. Tap **Set** to apply the flow simulation settings, or tap **Get** to get the last saved values.
- 6. Select **On** and then tap **Set** to start the simulation.
- 7. Select Off and then tap Set to stop the simulation.
- 8. Tap the close icon in the top-right corner of the Flow Simulation pop-up window to close it.



#### **Application Settings**

#### Graph

Feature not available for current access level.

#### Recording

Recording output strings are for support purposes. It is recommended to keep the default settings.

()	Recording				
Graph	Mode			Туре	
<b>_</b>	Mode	Manual	•	✓ Output Stream	
Recording	Stops After	5	Minutes	Communication Sniffer	
				Debug Trace	
infiguration Files	Output Folder	C:\Octave\Recording	Browse		
	Base File Name	Output			
	Output Stream Ev	ery 1	Outputs		
	Storage Size Lim	its			
	Max. File Size	1	мв		
	Max. Folder Size	100	MB		

#### Mode

Mode - select the recording mode:

- "Manual" enables manual recording. The recording is stopped by tapping Stop Recording, or will stop automatically after the number of minutes you entered in the Stops After setting.
- "Auto" select this option when the recording should stop automatically after a set number of minutes.

**Output Folder** – recorded output string files are saved in the location specified here.

To change the default output folder, browse to the desired destination folder.

**Base File Name** – each recorded file name is based on the structure of <br/>
base file name> + <time> + <date> and .txt suffix, for example:<br/>
Output 15 23 48 13 06 2019 1.txt. Only if needed, change the base file

Output\_15\_23\_48\_13\_06\_2019\_\_1.txt. Only if needed, change the base file name.

**Output Stream Every [1] Outputs**- keep the default of "1". This field is intended for the use of supervising technicians only.



#### Storage Size Limits

Define the size of each recorded file by setting the maximum file size. During the recording session, when the recorded file reaches this maximum size, it is saved (and closed) and a new recording file is opened.

Define also the maximum size for the folder. When the recording folder reaches this size, recording is stopped.

#### Туре

- "Output Stream" by default this check box is selected. This records basic-level information in the recorded output file.
- "Communication Sniffer" select this check box if you are requested to do so by Support to include communication sniffer information in the recorded output file sent for analysis.
- "Debug Trace" select this check box if you are requested to do so by Support to include debugging traces in the recorded output file sent for analysis.



#### **Configuration Files**

When the Octave water meter connects to Arad Smart Meters, the meter's current settings are read and saved in a file. The file name is composed of the base file name, which by default is "CurrentConfig", and a time stamp. For example, if you connected to the meter on the 1<sup>st</sup> of September 2019 at 8:30 PM, the configuration file saved in the output folder would be named CurrentConfig\_20\_30\_1\_9\_2019.txt.

It is recommended to keep the default settings.

0	Configuration Files	
Graph eeording	Save Configuration Output Folder	
onfiguration Files	Base File Name CurrentConfig	

Output Folder - configuration files are saved in the location specified here.

To change the default output folder, browse to the desired destination folder.

**Base File Name** – to change the default base file name, enter a new base file name.



#### About

In the About page you see the version of this software that you are using to configure the water meter.

About		
Version:	1.0.0.24	



#### Exit

Disconnects and closes the Arad Smart Meters application.



## **9** Troubleshooting

#### **Error messages**

Error Message	Description	Remedial Action
Action: Connection Error: Send Command to Meter	Error issued when trying to log into Arad Smart Meters.	<ul> <li>Retry the connection action, i.e. try logging in again.</li> <li>Position the NFC reader correctly using the adapter.</li> </ul>
Action: Start MSI Mode Error: Send Command to Meter	Error issued when trying to connect to the water meter using the RS-232 communication module and in other unsuccessful communication scenarios.	<ul> <li>Check your communication settings in Arad Smart Meters.</li> <li>The physical connection (NFC reader, RS-232 cable) may be faulty: check that the cable or reader are not damaged.</li> <li>Check that the PC recognizes the connected device in the Windows Device Manager.</li> <li>Make sure you are not in Demonstration mode</li> <li>When using RS-232 connection make sure that the port number is correct.</li> </ul>
Action: Connection Error: Illegal Input Value	Error issued when trying to log into Arad Smart Meters.	Make sure the NFC reader's USB cable is connected to the PC.
Action: Start MSI Mode Error: Time out Response	Error issued when trying to connect to the water meter using the RS-232 communication module and in other unsuccessful communication scenarios.	Verify that the communication module is attached correctly (matching groove and protrusion).



Error Message	Description	Remedial Action
Error There are invalid values. Please fix them and try again	Error issued when trying to enter a value that is not in the range of supported values for that parameter.	If there is no tooltip with information on the expected range or type of values, lookup the description of the parameter in this document.
Failed to Start Recording	Error issued when tapping the <b>Record</b> button.	Disconnect and reconnect.
Error: Download Logs Failed	Error issued when tapping <b>Download</b> in the Meter Logs page.	Check that the logged in user has full permissions to all folders, as generating logs requires access to system folders.



#### **Possible issues**

#### Meter values not updated

Even though you have saved the configuration, you do not see them applied.

- 1. In the log-in page tap Settings (bottom-right).
- 2. In the **Connection** tab make sure the **NFC** check box is selected and the **Demonstration mode** check box is not.

- P	Connection	
Connection	Changes are effective on next connection	
Graph	NFC     NFC Connection	
Recording	Reader Serial Number:	
	NFC Debug Registers	
Configuration Files		
	Demonstration mode	Back

#### **Display and output mismatch**

The settings you have applied and see on the display are not applied to output.

There is a short interval (~ 60 seconds) between saving the meter's configuration and activating the output module with these settings.

#### **Unintended disconnect**

For example when the connection cable is pulled out unintentionally from the PC, or the NFC reader detaches from the adapter.

- 1. Plug back in the connection cable to the PC / reattach the NFC reader to the adapter and make sure all is correctly positioned.
- 2. In Arad Smart Meters, which remained open, tap **Disconnect**. This step should not be skipped!
- 3. Log in again to re-establish connection and resume use.



### **10** RS-232 Connection

#### Overview

You can order an Octave RS-232 communication module if needed. This module connects to the meter's module connection port on the one side, and ends in a female DB-9 serial connector that connects to your PC's corresponding male serial port on the other side.

If you have no serial port on your PC, you can use a USB-to-Serial converter and connect the Octave RS-232 communication module via this converter to a USB port.

The Octave RS-232 communication module is supplied with an Allen wrench, screws and a tamper-proof sealing plug for installing the communication module, and re-attaching the protective shield or output module afterwards.



To use this module, the meter should be configured to work with serial connection and you will need to verify that Arad Smart Meters settings have the correct port set. How to do so is described in the following sections.

NOTE: The RS-232 communication module occupies the output module connection port, effectively disabling output.



#### Removing the tamper-protective shield

The Octave water meter is supplied with either an output module installed, or if no output module was requested, a tamper-proof protective shield on the connection port.

As noted above, the Octave RS-232 communication module uses the same port the output module uses, so you will need to remove either the factory-installed output module, or the tamper-proof protective shield. In both cases the procedure is the same.

To do so:

1. Remove the tamper-proof sealing plug by piercing it with a slotted screwdriver and pulling it out.





2. Use the supplied Allen wrench to remove the two Allen screws.



3. Detach the protective shield, or output module.





Connecting the communication module to the water meter

 Connect the Octave RS-232 communication module's connector (A) to the Octave water meter port's connector (B) by matching the groove in the communication module to the narrow protrusion in the meter's port connector.



2. Press the connectors together to ensure the communication module is fully connected to the Octave water meter.





### Connecting the communication module to the PC (Windows 7/10)

NOTE: The Octave RS-232 communication module should be already connected to the water meter.

- 1. Connect the Octave RS-232 communication module to your computer:
  - If the computer has a DB-9 male serial port, connect the Octave RS-232 communication module to the serial port.
  - If the computer does not have a serial port, connect a USB-to-Serial converter to the Octave RS-232 communication module and insert the USB end to an available USB port on the computer. If the connected USB-to-Serial converter is not detected automatically, install its driver manually.
- 2. Enter "Device Manager" in the Windows search box to access this tool.
- In the Device Manager, expand Ports (COM & LPT) and check which port number is assigned to the device.
   In the example below, we used a USB-to-Serial converter to connect the Octave RS-232 communication module to our computer, and the assigned

port number was "3" (COM3).



4. Note the assigned port number as you will soon use it to configure Arad Smart Meters serial connection settings.



Arad Smart Meters serial connection settings

- 1. Start the Arad Smart Meters application (see Getting Started).
- 2. In the Login page, tap Settings (bottom-right).





- 3. In the Connection tab, clear the **NFC** check box (if selected) to display the Serial Connection options.
- 4. In the **COM Port** field select from the list of detected communication port numbers the COM Port number the computer uses for the Octave communication module.

This is the number you noted when checking this detail (see Connecting the communication module to the PC (Windows 7/10).

<i></i>	Connection
Connection	Changes are effective on next connection
Graph	NFC Serial Connection
Recording	COM Port: 6 Refresh Baud Rate: 6 V
Configuration Files	
	Demonstration mode

5. Tap Refresh.

This will apply the port setting.

- 6. Tap Back.
- 7. Log in.

#### Attaching the tamper-free shield

Re-attach the tamper-protective shield, or the output module as follows:

- 1. Match the groove in the protective shield's female connector to the narrow protrusion in the meter's port male connector and press firmly to attach the parts.
- 2. Insert the two Allen screws in the screw holes and tighten them gently with the Allen wrench.
- 3. Insert the sealing plug in the bottom screw hole and press until it is firmly lodged.



# **Glossary**

#### Units used in Arad Smart Meters

Term	Definition
A.F.	Acre feet
A.I.	Acre inch
ВРМ	Barrel per minute
Ft <sup>3</sup>	Cubic feet
GPM	Gallon per minute
IGAL	Imperial gallon
IGPM	Imperial gallon per minute
Lt	Liter
Lt/h	Liters per hour
Lt/m	Liters per minute
Lt/s	Liters per second
m <sup>3</sup>	Cubic meter
m <sup>3</sup> /h	Cubic meters per hour




