



# MANUAL FOR PERSEUS PLATFORM

*For firmware version 0.8.8*

# Safety warning

The device has been tested and is in good working condition, meeting the standards required in the Czech Republic.

To keep it working properly, it's important to follow the safety and maintenance guidelines listed below. If the device is used improperly, it may not work safely.

Also, make sure that the power socket or the point where the device can be unplugged from the power supply is easy to reach.

Do not use the device if:

- It looks damaged
- It's not working properly
- There are loose parts inside
- It was exposed to moisture or water for a long time
- Someone who is not authorized tried to repair it
- The power adapter or its cable looks damaged
- You're using the device in a way that's not recommended, which may compromise its safety features
- The switch, fuse, and other power surge protection features must be part of the device's overall construction.

The manufacturer is only responsible for the device if it's being powered by an approved or supplied power source.

If you experience any difficulties with installing or starting up the device, please don't hesitate to reach out to our technical support team for assistance.

HW group s.r.o.

<http://www.hw-group.com>

email: [support@HWg.cz](mailto:support@HWg.cz)

Rumunská 26/122

Prague, 120 00

Phone: +420 222 511 918

*Before contacting technical support, prepare a precise model of your device (on the manufacturing label and the firmware version (see below), if you know it.*

# Contents

<b>Safety warning</b> .....	<b>2</b>
Perseus Monitoring 150 & 155 .....	6
Perseus Monitoring 140 & 145 .....	7
Perseus Energy 240 .....	8
Perseus products comparison .....	9
Perseus 155 usage scheme (example) .....	11
Basic features .....	12
Application and usage .....	12
Technical parameters (shared) .....	13
Perseus Monitoring 150 .....	15
Perseus Monitoring 155 .....	15
Perseus Monitoring 140 .....	16
Perseus Monitoring 145 .....	16
Perseus Energy 240 .....	17
<b>First start-up</b> .....	<b>18</b>
1) Cable connection .....	18
2) The setting of the IP address - HWg-Config .....	18
3) How to open the device website .....	20
<b>Introduction into Perseus monitoring units</b> .....	<b>22</b>
Features common to all products in the Perseus family .....	23
Basic differences between Poseidon2, Damocles2, HWg-PWR, Ares vs. Perseus platform .....	26
1st Generation and 2nd Generation Sensors .....	27
Meter vs variable vs value .....	28
Licensing change .....	30
Third-party templates and sensors (meters) .....	31
Template repository .....	31
<b>Architecture of the Perseus platform</b> .....	<b>33</b>
Alarms .....	36
Types of meters of the Perseus platform .....	36
Types of Perseus platform variables .....	36
Meter States, Variables, and Conditions .....	37
<b>Hardware Specifications</b> .....	<b>38</b>
Ethernet .....	38

Power .....	38
PowerOut .....	38
1-Wire/1-Wire UNI.....	38
RS-485.....	38
Inputs .....	38
Outputs.....	39
Alarm/Setup LED .....	39
LED Status.....	39
LED Modem .....	39
DIP1/DIP2 System Switches .....	39
WLD .....	39
Default button.....	40
<b>Connecting Sensors .....</b>	<b>42</b>
1-Wire Bus (RJ11) sensors.....	42
<b>WWW interface of Perseus platform .....</b>	<b>43</b>
Menu structure.....	43
Home.....	44
Monitoring .....	45
Menu Monitoring / Meters .....	46
Local .....	46
1-Wire .....	48
Modbus/RTU .....	51
Modbus/TCP .....	54
HTTP XML.....	56
Virtual .....	59
MQTT .....	61
SNMP .....	63
Menu Monitoring / Variables.....	66
Variable .....	67
Menu Monitoring / Conditions.....	71
Condition Editing .....	72
Menu Control / Action .....	74
Menu Control / Targets.....	79
Menu Control / Scheduler .....	80
Menu Control / SMS .....	82
SMS Template List.....	83

SMS Output Queue .....	84
SMS Input Queue .....	84
Menu Control / Email .....	85
Email Template List .....	86
Menu Control / Scripts.....	87
Menu General / Identification .....	89
Menu General / Web Server .....	90
Menu General / Time.....	92
Menu General / Meter Templates .....	93
Template assignments .....	93
Menu Services / Portal .....	95
Menu Services / SNMP.....	98
Menu Services / MQTT.....	100
Menu Services / Modbus TCP.....	102
Menu Network / Ethernet.....	103
Menu Network / WiFi.....	105
Menu Security / Radius.....	107
Menu Security / Users .....	108
User Editing .....	108
Menu Modem .....	110
Menu System .....	112

# Perseus Monitoring 150 & 155

**Perseus Monitoring 150 & 155 are a complex 1U solutions for a 19" rack remote monitoring system (data centers, AV installations).**

Connect external physical sensors ( $^{\circ}\text{C}$ , %RH, A, V, ...), Detectors (relay / dry contact) or WLD (Water Leak Detection) sensing cable. 3rd party meters (sensors) can also be connected via LAN or Modbus/RTU. LTE backup connectivity allows the device to stay operational in case of an Ethernet outage for models with modem.

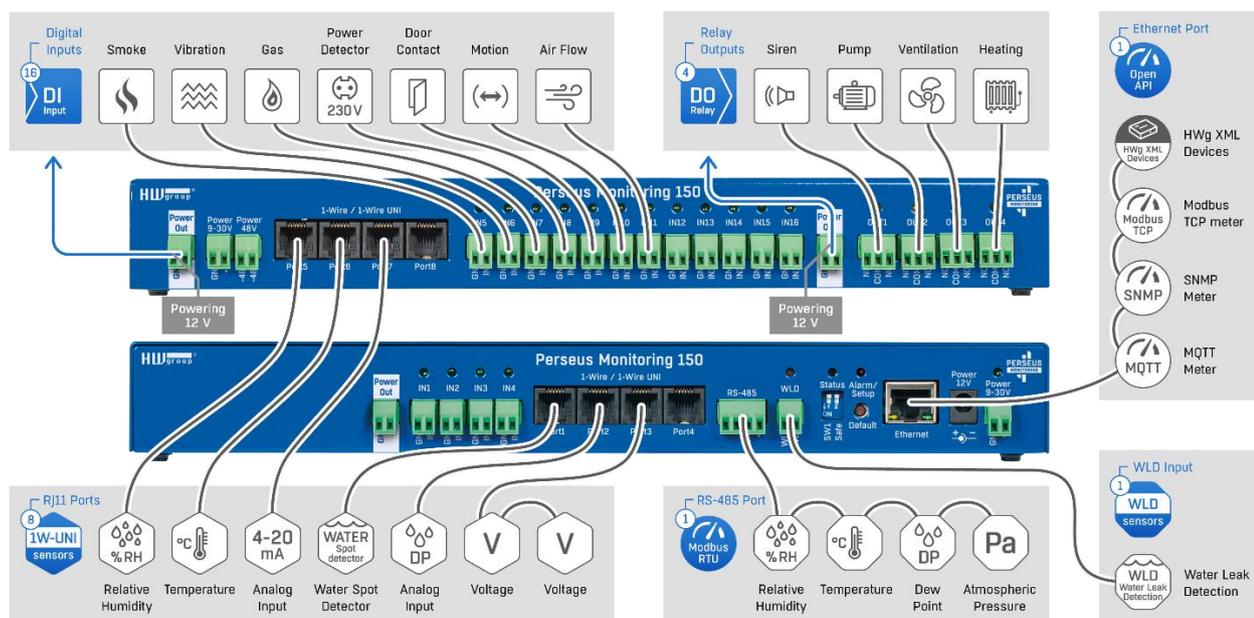
Perseus 150 combines data from external physical sensors / detectors with data from other HWg devices connected via LAN. Local conditions, Lua scripting, calendar or periodic scheduler help to analyze the measured data.

Email or SNMP Trap alert can be sent from the Perseus device. Measured values are available via Open API (XML, Modbus/TCP, MQTT).

Perseus Monitoring 150 can be connected to the Portal (SensDesk technology). Together with the Portal it's a powerful solution for professional applications.

A unique feature of Perseus products is the Meters API. Perseus can read over LAN sensor values from other devices (e.g. STE2 R2) and use this data for analysis or alerting.

## Perseus Monitoring 150: Interfaces



# Perseus Monitoring 140 & 145

**Perseus Monitoring 140 & 145 is a solution for remote monitoring on site with LAN and LTE (only Perseus Monitoring 145).**

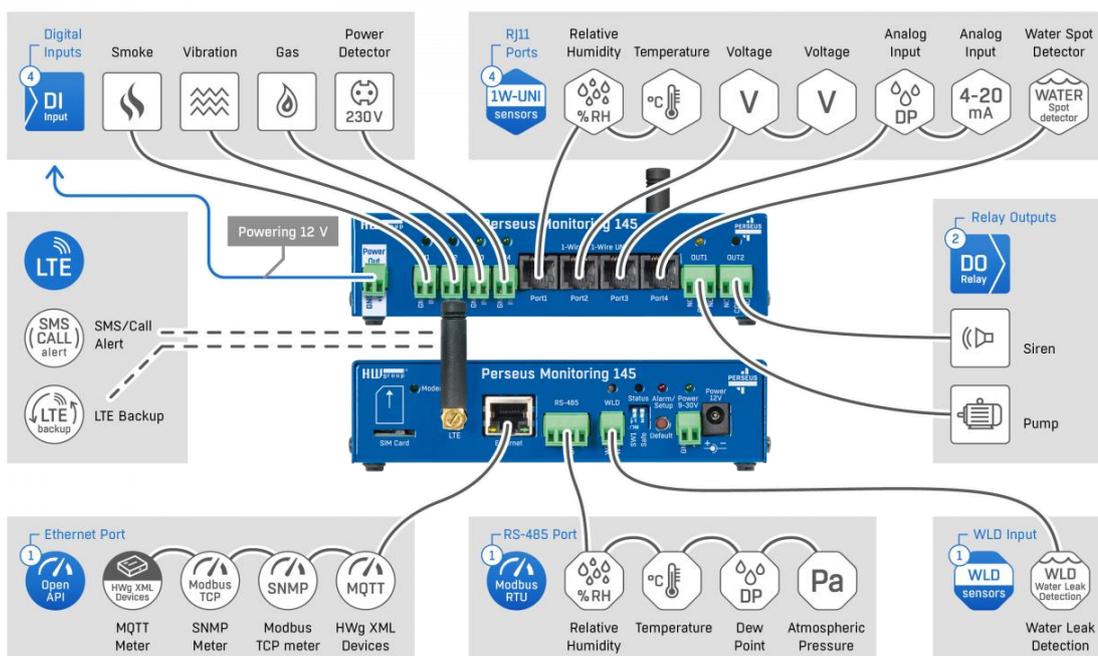
External sensors (up to 1000 variables) - RJ11 ports (1W-UNI) or RS-485 (Modbus/RTU). Multiple DI / DO (relay) and a WLD port.

Perseus Monitoring 140 & 145 is a remote environmental monitoring device with advanced alarming, local conditions and actions. It can be used to integrate all sensors at the remote site (telco room, industrial machine or warehouse).

The alert situation can be indicated locally by switching DO (relay outputs), sent from the device as standalone alerts (SMS, Call, Email) or analyzed & alerted from the Portal (SensDesk Technology) with Graphs, Virtual sensors, Device Invalid alerts, PDF reports or Portal account open API (SNMP / XML). Perseus device can also individually share all measured values via the Open API (SNMP, MQTT, Modbus/TCP, XML, ..)

Internal LTE modem in Perseus Monitoring 145 allows for backup connectivity to the Portal, as well as SMS and Call alerts. Alerting from the Portal is recommended, it's reliable for LAN even with the LTE device connectivity, the user can be alerted if the device is disconnected (Device Invalid Alert). The Perseus 145 internal LTE modem can also be configured as an SMS gateway for other HW group devices.

## Perseus Monitoring 145: Interfaces



# Perseus Energy 240

Perseus Energy 240 is the simplest and most affordable Perseus LAN monitoring device, designed to connect HW group's and third-party RS-485 Modbus/RTU sensors to the SensDesk Technology-based Portal. It can also be used as a Modbus/RTU to Modbus/TCP gateway.

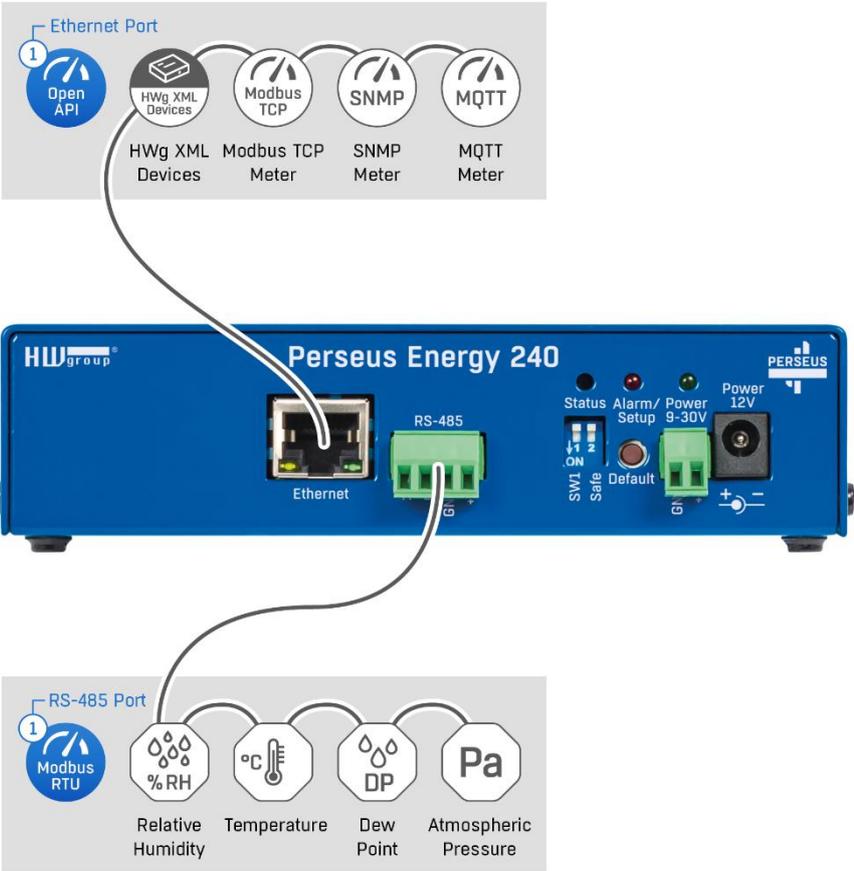
Perseus Energy 240 supports up to 100 Meters with 1000 Variables, connected via RS-485 (Modbus/RTU).

It can read values from other network devices via generic SNMP, Modbus/TCP, MQTT and XML (for HWg devices).

It can analyze metered data from RTU / LAN devices with using local alarms, conditions and actions, and LUA scripts executed in the Perseus device.

Perseus Energy 240 is a gateway, it has only RS-485 interface, no RJ11 ports and no DI (Digital Inputs).

## Perseus Energy 240: Interfaces

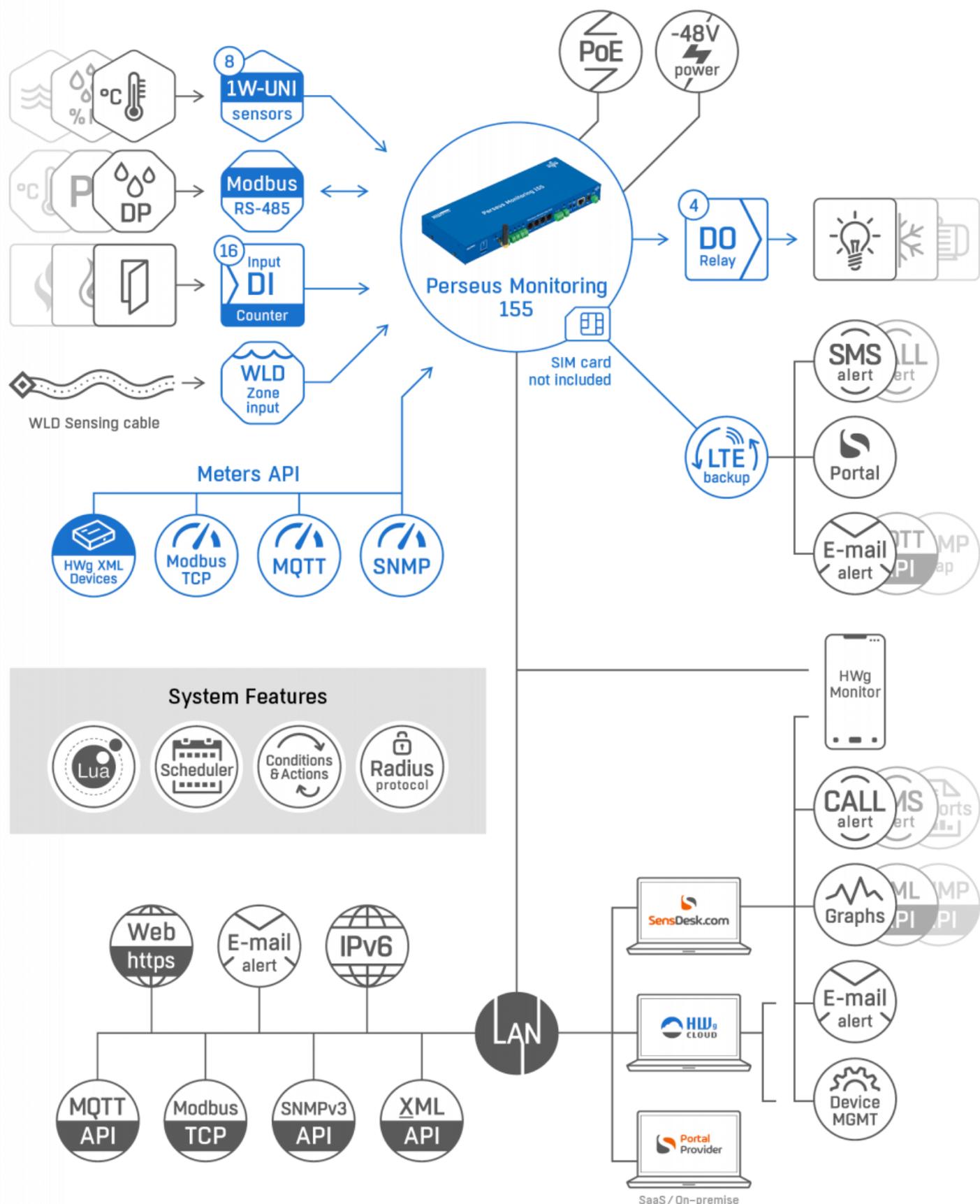


# Perseus products comparison

	Perseus Energy 240	Perseus Monitoring 140	Perseus Monitoring 145	Perseus Monitoring 150	Perseus Monitoring 155
<b>IPv6</b>	✓	✓	✓	✓	✓
<b>SNMP</b>	SNMP v1 + SNMP v3	SNMP v1 + SNMP v3	SNMP v1 + SNMP v3	SNMP v1 + SNMP v3	SNMP v1 + SNMP v3
<b>SNMP Trap</b>	✓	✓	✓	✓	✓
<b>COAP</b>	✗	✗	✗	✗	✗
<b>DHCP</b>	✓	✓	✓	✓	✓
<b>HTTP</b>	✓	✓	✓	✓	✓
<b>HTTPS</b>	✓	✓	✓	✓	✓
<b>XML</b>	✓	✓	✓	✓	✓
<b>SMTP</b>	✓	✓	✓	✓	✓
<b>SMTP TLS</b>	✓	✓	✓	✓	✓
<b>HWg-Push (SensDesk)</b>	✓	✓	✓	✓	✓
<b>MQTT</b>	✓	✓	✓	✓	✓
<b>Modbus/TCP</b>	✓	✓	✓	✓	✓
<b>Meters limit</b>	100	100	100	100	100
<b>Meters API: 1-Wire</b>	✗	✓	✓	✓	✓
<b>Meters API: RS-485/HWg</b>	✗	✗	✗	✗	✗
<b>Meters API: Modbus/RTU</b>	✓	✓	✓	✓	✓
<b>Meters API: Modbus/TCP</b>	✓	✓	✓	✓	✓
<b>Meters API: HWg XML</b>	✓	✓	✓	✓	✓
<b>Meters API: SNMP</b>	✓	✓	✓	✓	✓
<b>Meters API: MQTT</b>	✓	✓	✓	✓	✓
<b>Meters API: M-Bus</b>	✗	✗	✗	✗	✗

<b>Variables limit</b>	1000	1000	1000	1000	1000
<b>1-Wire values*</b>	0	100	100	100	100
<b>RS-485 values*</b>	100	100	100	100	100
<b>Number of 1-Wire ports</b>	0	4	4	8	8
<b>Number of RS-485 ports</b>	1	1	1	1	1
<b>Inputs</b>	0	DI: 4 WLD: 1	DI: 4 WLD: 1	DI: 16 WLD: 1	DI: 16 WLD: 1
<b>Outputs</b>	0	Relays: 2	Relays: 2	Relays: 4	Relays: 4
<b>Power supply</b>	9-30V / 500mA	9-30V / 500mA	9-30V / 500mA	9-30V / 500mA  48V / 250mA  PoE / 250mA	9-30V / 500mA  48V / 250mA  PoE / 250mA
<b>PoE/48V</b>	X	X	X	✓	✓
<b>Operating environment</b>	-30°C ÷ 85°C / 5%RH ÷ 95%RH	-30°C ÷ 85°C / 5%RH ÷ 95%RH	-30°C ÷ 65°C / 5%RH ÷ 95%RH	-30°C ÷ 85°C / 5%RH ÷ 95%RH	-30°C ÷ 65°C / 5%RH ÷ 95%RH
<b>Storage environment</b>	-30°C ÷ 65°C / 5%RH ÷ 95%RH	-30°C ÷ 65°C / 5%RH ÷ 95%RH			
<b>Ethernet</b>	10/100 Mbit	10/100 Mbit	10/100 Mbit	10/100 Mbit	10/100 Mbit
<b>WiFi</b>	NO	NO	NO	NO	NO
<b>Mobile networks</b>	NO	NO	LTE	NO	LTE
<b>RS-232</b>	NO	NO	NO	NO	NO
<b>RS-485</b>	YES	YES	YES	YES	YES

# Perseus 155 usage scheme (example)



## Basic features

---

- **Ethernet:** RJ45 (100BASE-T); WEB: Built-in web server
- **LTE:** Global (for models with modem)
- **Sensors:** RJ11 port - max. 100 external sensors (1-Wire / 1-Wire UNI)
- **RJ11 sensors:** Temperature, Relative Humidity (Indoor / Outdoor), Voltage, Current (0-30A), Current Loop (4-20mA) and much more
- **RS-485 (Modbus/RTU):** Terminal block
- **WLD:** Zone input for external Water Leak Detection sensing cable
- **DO (Digital Outputs):** DO (relays)
- **DI (Digital Inputs):** DI (dry contact)
- **Detectors:** Smoke, door contact, fan failure detector, power presence, etc
- **Device Alerts:** SNMP trap, email, (SMS / Calls with internal LTE modem or external SMS GW)
- **Portal Alerts:** Email, SMS / Calls, Device Invalid Alert
- **Open API:** SNMP, XML, Modbus/TCP, MQTT
- **Professional product:** IPv6, SNMP Traps, SNMP v3
- **Security:** Radius - IEEE 802.1X, Admin and user accounts, HTTPs (customer certificate)

## Application and usage

---

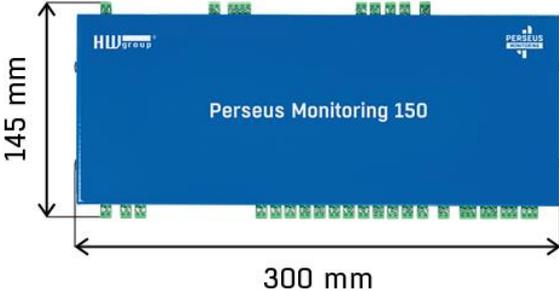
- Remote site data concentrators from all local sensors / meters
- Remote environmental monitoring inside the cabinet or telco site
- Data Center / Single rack monitoring
- Remote technical room monitoring
- Telecommunication installations
- Remote infrastructure monitoring
- Remote machine monitoring
- Remote environmental monitoring of warehouse / storage spaces
- Pharmaceutical / warehouse environment monitoring
- Remote base transceiver station monitoring
- Greenhouse monitoring

# Technical parameters (shared)

<b>Ethernet</b>	
Interface	RJ45 (10/100BASE-T)
Supported protocols	IP: ARP, TCP/IP (HTTP, HTTPS, SNMP, SMTP, HWg-Push, netGSM, TLS, Modbus/RTU, MQTT, 802.1x), UDP/IP (SNMP, Syslog)
SNMP	Version 1 + Version 3
<b>RJ11 1-Wire sensors</b>	
Port/connector	RJ11 (Port1 – Port8*) *can vary by model type
Meter limit	Max. 2 Meters (physical sensors) per port (*for details see sensor's manual)
Sensor type	Only HW group sensors can be connected to 1-Wire RJ11 ports
Sensors/distance	Max. 60 meters total length (per each RJ11 port) (*for details see sensor's manual)
Powering sensors	Each RJ11 can power 2 or more physical sensors. Details in manual for each sensor.
<b>RS-485 sensors</b>	
Port/connector	Terminal block
Meter limit	Up to 100 Meters (*up to 5 directly powered)
Sensor type	Modbus/RTU (Original from HW group or generic Modbus/RTU)
Sensors/distance	1× Max. 1000 meters total length (per each RS-485 port)
<b>DI (Digital Inputs)</b>	
Type	Dry contact input (mechanical switch or relay outputs)
Port/connector	IN1 – IN16* / ø2 mm terminal block *can vary by model type
Type	Digital Input (supports S0 pulse counter)
Sensitivity	Sensitivity 1 (On) = 0-500 Ohm, 10-12V/ ~ 3mA
Max. distance	Up to 50m
<b>DO (Digital Outputs)</b>	
Type	Relays standard
Load voltage	120V AC / 60V DC / 1000mA
<b>WLD zone (Water Leak Detection)</b>	
Port/connector	WLD/ Terminal block
Type	WLD water sensing (detection) cable (Type A)
Sensor states	0 = OK, 1 = Flooding, 2 = Cable disconnected
Sensing cable length	Total length max. 185 m (non-sensing extension cables included)
<b>Power supply</b>	
Power voltage	9-30V / 500 mA, 48V (PoE version only)
Connector	Connector Jack Ø5.5 x 2.1 / 10 [mm], Terminal Block
PoE (Power over Ethernet)	PoE (Power over Ethernet) RJ45 - IEEE 802.3af Class 2 (where applicable)
<b>LED</b>	
Link	Yellow - Ethernet connection state
Activity	Green - Ethernet activity
Alarm / Setup	Red – Solid – A meter, Variable or Condition is in the Alarm state Red – Lit after startup – The Default button is pressed and the configuration is waiting for the configuration to be restored Blinking – Device is upgrading

Status	Lit while waiting for a factory reset
DI (Digital Input)	Green = Input ON (1)
WLD zone	Green = Detection Zone OK, Red = Detection Zone Flooded, Yellow = Detection Cable Disconnected/Damaged
DO output	Yellow = Output ON (1)
Modem	Green = Solid LTE connection Green flashing = during connection and network search
<b>Button</b>	
Reset	<p>Bootloader recall (safe mode): Press the button, turn on the power within 2 seconds, press the button 3 times</p> <p>Factory reset: Press the button, connect the power and wait 10 seconds for the Status LED to turn off</p>
<b>LTE modem (modem models only)</b>	
Interface	<p>FDD LTE bands: B1/ 2/ 3/ 4/ 5/ 7/ 8/ 12/ 13/ 17/ 18/ 19/ 20/ 25/ 26/ 28/ 66</p> <p>TDD LTE bands: B34/ 38/ 39/ 40/ 41</p> <p>GSM bands: B2/ 3/ 5/ 8</p>
Antenna connector	SMA small
<b>Other parameters</b>	
Elmag. radiation	CE / FCC Part 15, Class B
Elmag. compatibility	EN 61326-1:2013, EN 61010-1:2010, EN 55011:2009, EN 62311:2008

### Perseus Monitoring 150

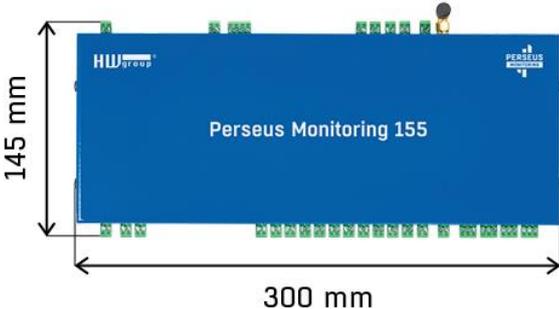


**Operating environment:**  
 -30 °C to 85 °C (-22 °F to 185 °F), 5 % RH to 95 % RH

**Storage environment:**  
 -30 °C to 65 °C (-22 °F to 149 °F), 5 % RH to 95 % RH

**Weight:**  
 1120 g

### Perseus Monitoring 155

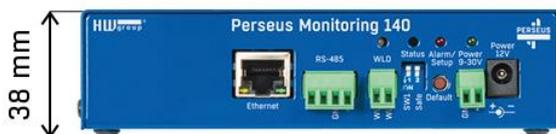
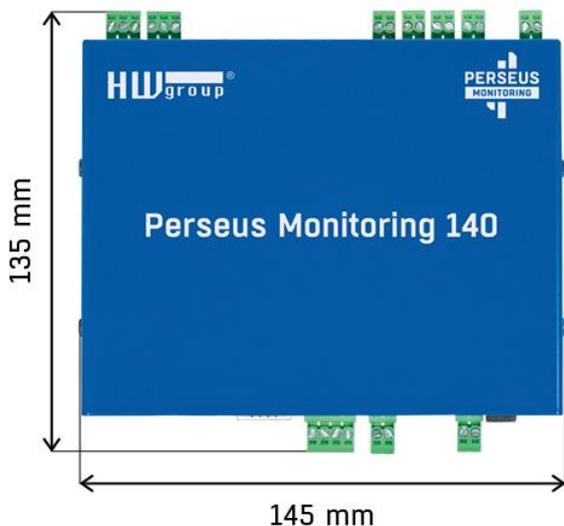


**Operating environment:**  
 -30 °C to 65 °C (-22 °F to 149 °F), 5 % RH to 95 % RH

**Storage environment:**  
 -30 °C to 65 °C (-22 °F to 149 °F), 5 % RH to 95 % RH

**Weight:**  
 1120 g

## Perseus Monitoring 140



**Operating environment:**

-30 °C to 85 °C (-22 °F to 185 °F), 5% RH to 95% RH

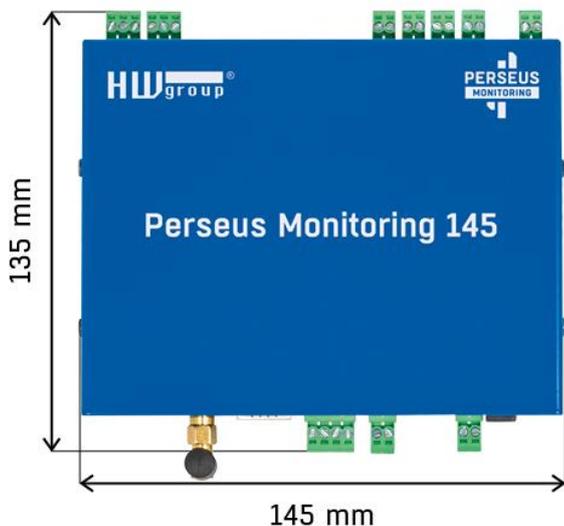
**Storage environment:**

-30 °C to 65 °C (-22 °F to 149 °F), 5% RH to 95% RH

**Weight:**

550 g

## Perseus Monitoring 145



**Operating environment:**

-30 °C to 65 °C (-22 °F to 149 °F), 5% RH to 95% RH

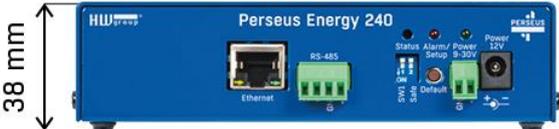
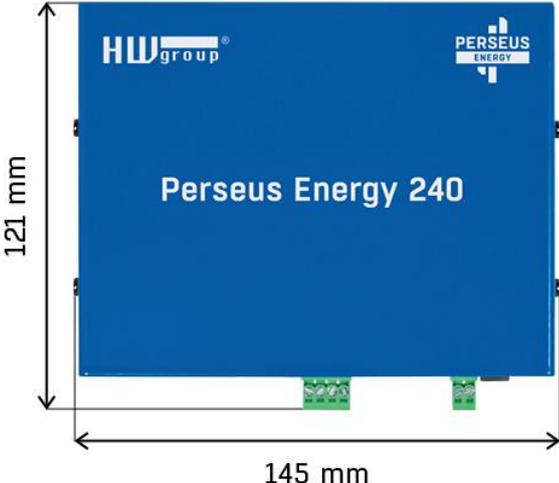
**Storage environment:**

-30 °C to 65 °C (-22 °F to 149 °F), 5% RH to 95% RH

**Weight:**

550 g

# Perseus Energy 240



**Operating environment:**  
-30 °C to 85 °C (-22 °F to 185 °F), 5 % RH to 95 % RH

**Storage environment:**  
-30 °C to 65 °C (-22 °F to 149 °F), 5 % RH to 95 % RH

**Weight:**  
488 g

# First start-up

## 1) Cable connection

Connect the device to the **Ethernet** (direct cable to the switch, crossed to PC).

Connect the power adapter to the power grid and to the device.

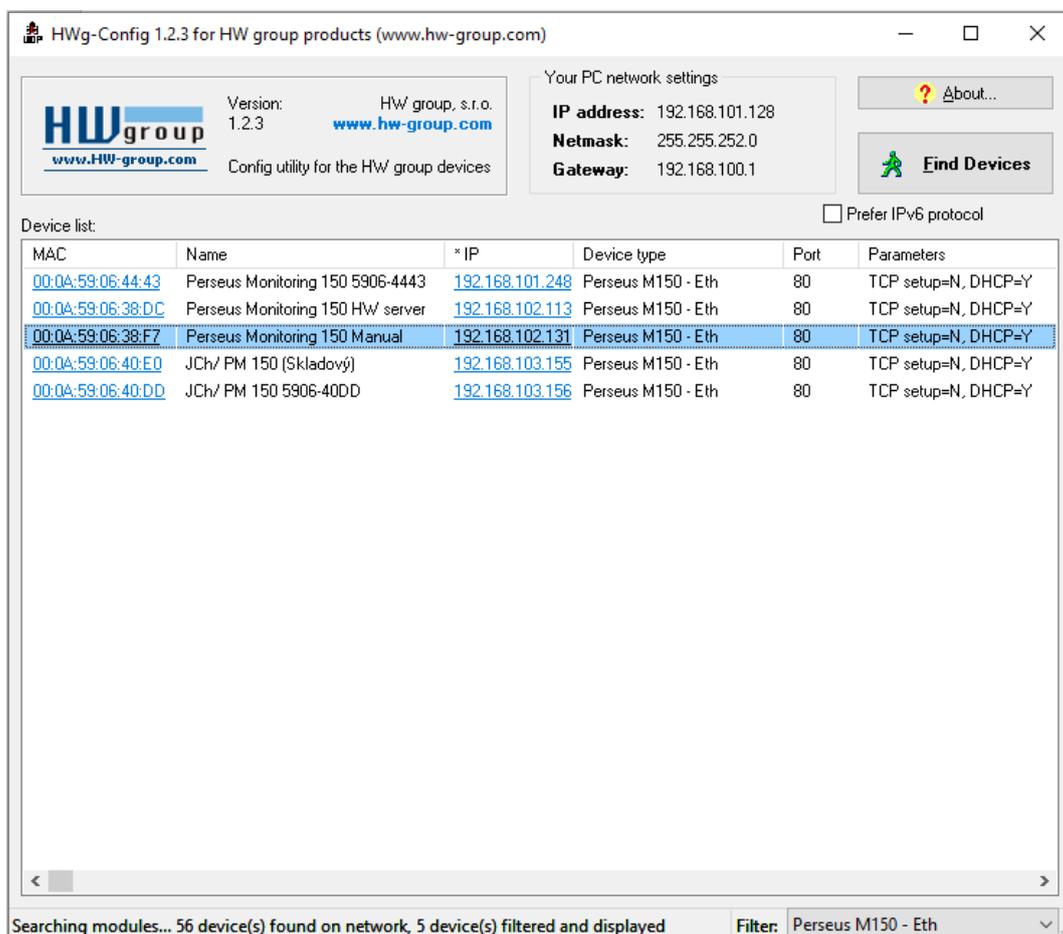
If the Ethernet connection is OK, the **LINK (yellow)** light should come up a moment later. The **ACTIVITY light (green)** indicates Ethernet activity.

## 2) The setting of the IP address - HWg-Config

The **HWg-Config** program for MS Windows can be downloaded at <https://www.hw-group.com> -> [Products](#) -> [Software](#) -> [HWg-Config](#).

Launch **HWg-Config**, program automatically searches for LAN connected devices.

If the device is connected later, click the **Find Devices** button. Local network HWg devices will be listed. Click on the MAC address of the device to open the dialogue window for device settings.



**Set device network parameters:**

- IP address / HTTP port (80 by standard)
- Your network mask
- IP address of your network gateway
- You can also use DHCP (if available in your network)
- Device name (optional parameter)

Save the settings by clicking on **Apply Changes**.

**Details** [X]

**Name:** Perseus Monitoring 150 Manual

**IP address:** 192.168.102.13(DHCP) : **Port:** 80

**Enable DHCP**

**IPv6**

Link local address: Not supported  
Address/prefix: Not supported

**Mask:** 255.255.252.0 (DHCP)

**MAC:** 00:0A:59:06:38:F7

**Gateway:** 192.168.100.1 (DHCP)

**FW version:** 0.7.11 **DHCP:** Supported

**Primary DNS:** 192.168.100.237 (DHCP)

**Device type:** Perseus M150 - Eth (110)

**Secondary DNS:** 0.0.0.0 (DHCP)

Enable NVT

Enable TCP setup

Enable TEA authorisation

Enable IP access filter

**Default values**

Check if IP address is already in use

Ready

**Note: The device provides 2 options how to restore its default settings:**

- 1) Right-click on the device's MAC address. Click on the **Load default values** item.  
Note: Device default values can be restored from the HWg-Config program only during the first 60 seconds after the device is powered up.
- 2) Switch off the device. Press the **RESET** button on the device, **hold it down and connect the device** power source (power adaptor). Hold the button down for another 5 seconds until all the LEDs light up.

### 3) How to open the device website

- 1) Enter the device IP address in your web browser if you know it.
- 2) Use right-click on device in the HWg-Config program. Select **Open in WEB Browser**.
- 3) Click on the underlined IP address in the HWg-Config program.

The screenshot shows the HWg-Config 1.2.3 application window. The title bar reads "HWg-Config 1.2.3 for HW group products (www.hw-group.com)". The interface includes a logo for HW group, version information (1.2.3), and the company name (HW group, s.r.o.). It also displays the user's PC network settings: IP address: 192.168.101.128, Netmask: 255.255.252.0, and Gateway: 192.168.100.1. There are buttons for "About..." and "Find Devices".

The "Device list:" section contains a table with the following data:

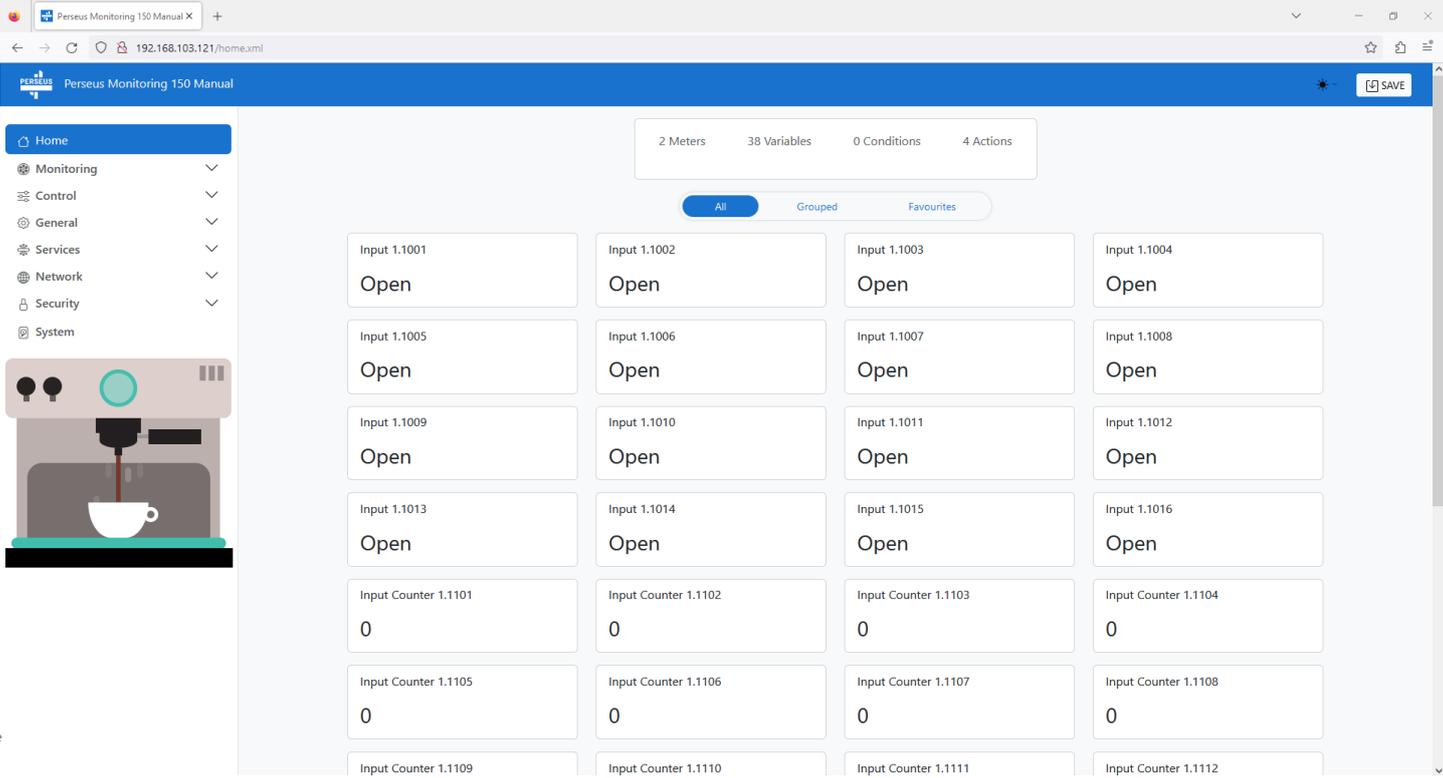
MAC	Name	* IP	Device type	Port	Parameters
<a href="#">00:0A:59:06:44:43</a>	Perseus Monitoring 150 5906-4443	<a href="#">192.168.101.248</a>	Perseus M150 - Eth	80	TCP setup=N, DHCP=Y
<a href="#">00:0A:59:06:38:DC</a>	Perseus Monitoring 150 HW server	<a href="#">192.168.102.113</a>	Perseus M150 - Eth	80	TCP setup=N, DHCP=Y
<a href="#">00:0A:59:06:38:F7</a>	Perseus Monitoring 150 Manual	<a href="#">192.168.102.131</a>	Perseus M150 - Eth	80	TCP setup=N, DHCP=Y
<a href="#">00:0A:59:06:40:E0</a>	JCh/ PM 150 (Skladový)	<a href="#">192.168.103.155</a>	Perseus M150 - Eth	80	TCP setup=N, DHCP=Y
<a href="#">00:0A:59:06:40:DD</a>	JCh/ PM 150 5906-40DD	<a href="#">192.168.103.156</a>	Perseus M150 - Eth	80	TCP setup=N, DHCP=Y

A context menu is open over the third row (MAC: 00:0A:59:06:38:F7), showing the following options:

- Show detail settings of device...
- Open in WEB Browser (port 80)**
- Open TCP Setup (port 99)
- Download device configuration...
- Upload device configuration...
- Load default values
- Export Devices...

The status bar at the bottom indicates: "Searching modules... 56 device(s) found on network, 5 device(s) filtered and displayed". The filter is set to "Perseus M150 - Eth".

4) Perseus device GUI will open on the Home page.



# Introduction into Perseus monitoring units

The Perseus family of products is a modern monitoring control panel designed to read, record, analyze and send values from connected sensors and detectors to a remote portal, as well as to perform simple and more complex actions based on the received data. Of course, it is also possible to send alarm messages, control external devices and inform about sensor, device and operator failures. There is a new possibility of customer scripts depending on the product line, from simple conditions and calculations to a complete application defined by a script (PLC like).

The Perseus family contains the same basic features, but with regard to the expected use in the target application, its products are divided into 4 product lines:

**Perseus Monitoring** - a base line designed for environmental monitoring in IT, pharmaceutical, food and other industries, including support for independent audits for quality management systems (ISO) and specific professional certifications.

**Perseus Energy** - a range of products primarily designed to measure energy consumption, energy savings and design methods to increase the efficiency of heating and cooling systems, including the preparation of independent reports for subsidy schemes.

**Perseus Industrial** - a series of customer products with a high degree of durability, designed for project deployment not only in the engineering environment, focused mainly on the support of industrial standards. The series is characterized by the possibility of defining complete customer applications in a program in LUA (PLC like).

**Perseus Concept** - a series of products for sampling in projects, tenders, public procurement, etc. These units are functionally and communicatively (API) identical to the entire Perseus family, but without a guarantee of continuity of production of specific models.

# Features common to all products in the Perseus family

---

- **Modular system** - all units share a common interface (API) and differ only in HW design, number of connectors and types of buses or presence of the LTE modem.
- **Wide range of connectable sensors and devices** (varies by model):
  - **1-Wire** - sensors designed for simple applications for easy installation and configuration for specific bus extensions;
  - **Dry contact** - potential-free two-state input for connecting external relays or open collectors;
  - **RS-485 (Modbus/RTU)** – sensors designed for harsh industrial environments, long distances and the ability to connect third-party sensors. The Perseus family can automatically search for HW group sensors of the Modbus/RTU standard on the bus;
  - **M-BUS** – energy meters such as electricity meters, calorimeters, water meters and gas meters and other sensors equipped with this interface, designed for remote energy readings in residential buildings and industrial plants;
  - **SNMP** - devices equipped with SNMP protocol, from which it is necessary to read and process the obtained values. Within the Perseus exchanges, the data obtained appear to be connected to a physical bus;
  - **Modbus/TCP** - devices using the Modbus/TCP protocol, from which it is necessary to read and process the obtained values. Within the Perseus exchanges, the data obtained appear to be connected to a physical bus.
  - **MQTT (Subscriber)** - devices equipped with a MQTT broker, from which it is necessary to read and process the received values. Within the Perseus exchanges, the received data appear to be connected to a physical bus.
  - **HW group XML** - older devices produced by HW group, such as HWg-STE, STE2, Poseidon2, Damocles2 and others, from which it is necessary to read and process the received values. Within the Perseus exchanges, the received data seem to be connected to a physical bus.
- **Wide range of options for concentration, serialization and publishing of acquired data (API):**
  - **XML** - the obtained values are provided via an XML file that can be downloaded using the standard http protocol;
  - **SNMP** - the obtained values are provided via the UDP SNMP protocol. We support SNMPv1 and SNMPv3;
  - **MQTT** - the obtained values are provided via MQTT TCP protocol and are periodically sent to the MQTT broker (MQTT publisher);
  - **Modbus/TCP** - the obtained values are provided via TCP protocol Modbus/TCP.
- **High level of security** - Perseus control panels can be secured against misuse not only with a local user list, but also centrally via a RADIUS server. Communication via HTTPS with the option to upload your own SSL certificates is a matter of course.
- **Multiple safe ranges support** - Multiple safe ranges can be defined for each monitored variable, each defined by the range of MIN, MAX, Hysteresis and Delay for alarm escalation and reminder capabilities.
- **Almost unlimited target directory for alarms** - Alarm message recipients, such as email or SMS, are defined using the address book.

- **User-defined alarm message templates** - All user messages can be defined using a set of macros to customize them to the user's needs.
- **Sophisticated system of calendars (planners)** - it is now possible to schedule different events or their recipients during working hours and outside them, to take into account working days and weekends or holidays, it is possible to launch specific events on specific days, at the exact time or, for example, with a clearly defined recurrence period (e.g. the 1st Wednesday of the month at 12:00, if it is not the 24th).
- **Sophisticated system of triggering actions** - user-defined actions can now be triggered by conditions or based on a schedule (scheduler), it is possible to suppress their execution at the start of the device, or to define whether they should be executed only at the beginning of the triggered condition, at its end, in both cases.
- **Support for disabling triggered actions** - Each meter, value, condition and action can be individually enabled or disabled. This feature can be used, for example, to suppress the execution of actions in case of a planned shutdown of the monitored technology, long-term failure, etc. Supported types of actions:
  - E-mail - sends a message via e-mail;
  - SMS - sends a message by SMS;
  - SNMP Trap - sends a message via SNMP;
  - Set Output - sets the output to the desired value;
  - Script - Executes the defined LUA script (for future use, probably only Perseus Industrial models).
- **LUA scripting support** - All products in the Perseus family allow you to recalculate values and perform simple logical operations using LUA language scripts defined for each value. In addition, the Industrial series offers the possibility of defining the entire application through scripts.
- **Support for variable recalculations** - Each variable can now be recalculated using simple mathematics (value shift, multiplication or division) before processing, or processed using a LUA script containing a value recalculation or a simple condition.
- **Support for virtual values and meters** - It is possible to create virtual values and apply recalculations of quantities (from mA to kPa, etc.), conditions, cycles and other operations definable by LUA scripts.
- **Support for connecting sensors from external HW group devices** - The Perseus family is able to connect older devices from the HW group family of monitoring control panels and work with its sensors as if they were from the Perseus family.
- **Support for connecting sensors from external SNMP devices** - Perseus family is able to connect any SNMP devices and work with the received values as if they were Perseus sensors.
  - The Perseus family is equipped with the ability to scroll through the available values (SNMP walk).
- **Support for different reading periods for different meters** - it is possible to set an individual reading period for each meter, thus increasing the number of sensors on the bus or saving meter batteries.
- **Ability to use an LTE modem as a backup connection** - devices equipped with LTE modems can, in addition to sending SMS and ringing, also use the LTE connection as a backup in case of Ethernet connection failure, and in such a case the modem is also able to send data to remote servers (HWg Push for SensDesk

technology, MQTT publish/subscribe for MQTT brokers, SNMP traps) or e-mails.

The modem has no router function.

- **Brand new output APIs (XML, HWg-PUSH, SNMP, Modbus/TCP)** - All output APIs have a completely new form that reflects all technological innovations, even at the cost of losing backward compatibility with previous HWg product families.

# Basic differences between Poseidon2, Damocles2, HWg-PWR, Ares vs. Perseus platform

---

## **Poseidon2, Damocles2, HWg-PWR, Ares**

- + Simplicity of adding sensors
- + Ease of setting simple alarms
- + Clear GUI
- + Simple licensing per monitored variable
- + Clear division of sensors according to function into sensors, inputs (DI) and outputs (DO)
- Inability to group quantities of the same sensors
- Inability to create logical conditions
- Inability to connect input expanders and classify them as DI
- Absence of an event planner
- Does not support 3rd party sensors

## **Perseus**

- + Wide range of settings and functions
- + Ability to set different behavior at different times
- + Modern graphical interface with day and night mode
- + Ability to create user templates
- + Support for virtual variables
- + LTE modem as backup data line
- + All quantities are variables, only some are of sensor type, others are input, output or even analog output. The variable has its parameters such as: value, unit, state and others
- + Support for 3rd party Modbus/RTU sensors
- More complex alarm creation
- New licensing on Meter/Variable
- Lack of backward compatibility with Poseidon2, Damocles2, HWg-PWR, Ares

# 1st Generation and 2nd Generation Sensors

---

With regard to the capabilities of the Perseus family, HW group has developed a completely new range of sensors with new protocols.

<b>Protocols</b>	<i>1st generation</i>	<i>2.generation</i>	<i>Backward compatibility with the 1st generation</i>
<b>1-Wire</b>	1-Wire/1-Wire UNI	1-Wire UNI v3	<b>YES</b>
<b>RS-485</b>	HW group ASCII	Modbus/RTU	<b>NO</b>

In both cases, the goal is to provide multiple monitored values under one physical address so that these values can be logically grouped and worked with as a whole. If you are using 3 Htemp. 1st generation in Poseidon or Ares units, you will see 3 temperature values and 3 humidity values without specifying which two values belong to which physical sensor.

If you use 3 2nd generation sensors, they will be interpreted as 3 meters in the Perseus unit, each with 2 variables.

At the same time, the HW group is trying to maintain an identical set of sensors with both 1-Wire and RS-485 interfaces (and in the future, other interfaces such as wireless radio interfaces). All HW group sensors (1-Wire and RS-485 Modbus/RTU) are capable of automatically detecting Perseus units on the network, despite the fact that the RS-485 standard does not support anything like search broadcast polling.

# Meter vs variable vs value

## PREVIOUS HWg DEVICES

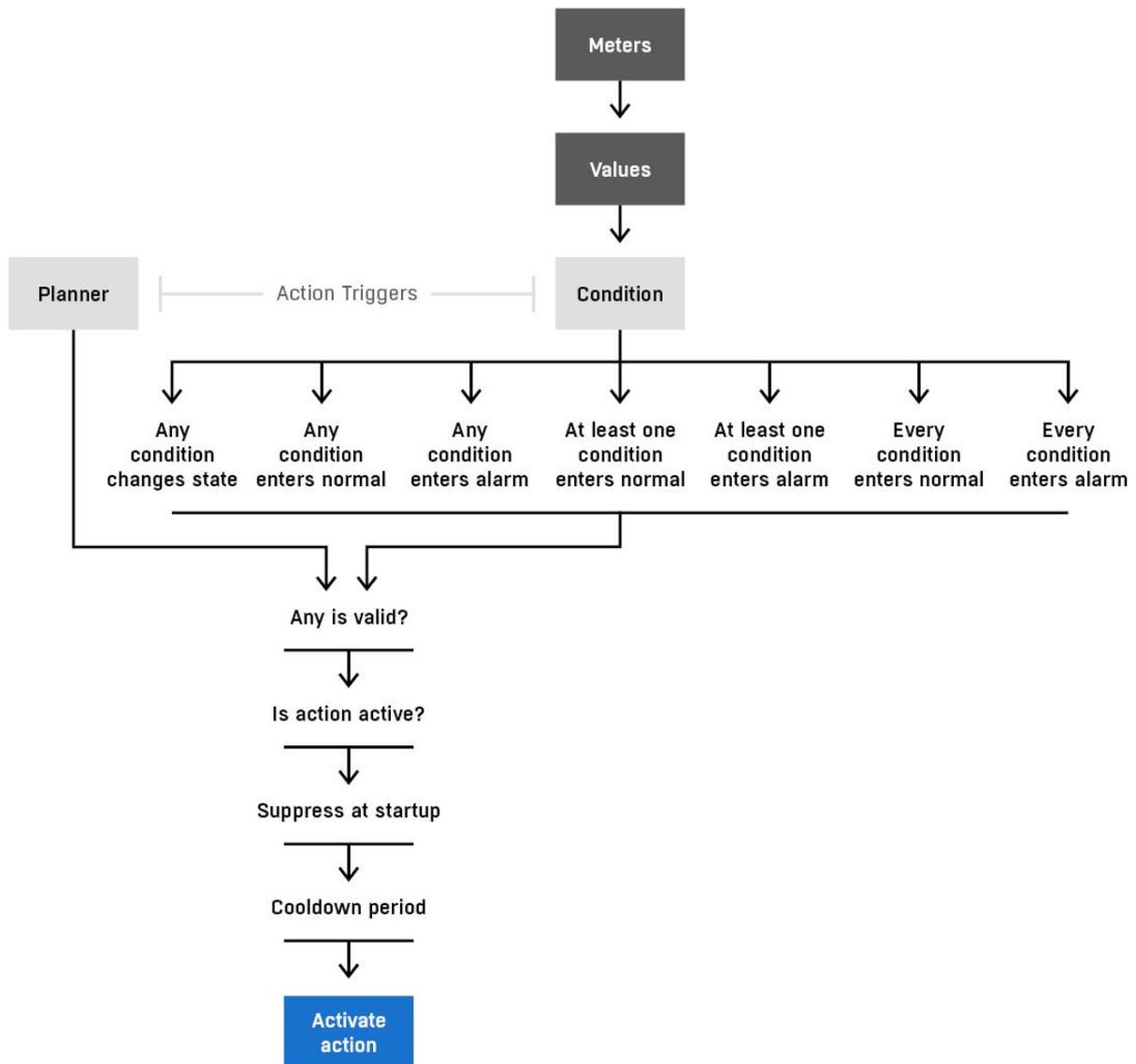
Interface		Sensor values
1-Wire	HWg XML	°C
Dry Contact	MQTT	% RH
RS-485	SNMP	0/1
		X/0/1

**SENSOR VALUES**  
vs.  
**METERS**

## PERSEUS PLATFORM

Interface		Meters	Variables
1-Wire	HWg XML	Poseidon2	°C
Dry Contact	MQTT	STE2	%RH
RS-485	SNMP	HTemp	0/1
Modbus/RTU		Temp	X/0/1

With the introduction of a new merging value structure, the nomenclature has been changed to better reflect the new structure.



- **Interface** - represents the HW or SW interface through which the data is read.
- **Meter** - represents the physical Meter (sensor) itself. We use the term meter, taken from HWg-PWR, to distinguish it from sensor, which could be interpreted differently in older devices. In addition, the meter can be a Poseidon unit, UPS or PLC, so the term sensor is inappropriate.
- **Variable** - represents the actual measured quantity and is equivalent to value in older devices. However, the term Variable is more accurate because of the options, as "variable has value" while "value has value" is misleading.
- **Parameters** - the actual definition of the variable, including the value, unit, exponent, and other properties.

## Licensing change

While the Poseidon and Ares products perceived any connected variable as a "Sensor" and each device had a limited number of sensor values, the Perseus family perceives each connected 2nd generation sensor as a "Meter".

	Htemp - number of "licenses"		THPVoc 1W-UNI - number of "licenses"	
	Sensor 1st generation	Sensor 2nd generation	Sensor 1st generation	Sensor 2nd generation
<b>Poseidon</b>	2	2	4	4
<b>Perseus</b>	2	1	4	1

*The Perseus family supports the connection of up to 102 meters and the monitoring of up to 1200 variables. 2 meters are "reserved" for a physical device (meter of type Local) and for 1 virtual meter (for the creation of virtual values - "virtual sensors"). This leaves 100 meters for external value sources.*

***Along with the licensing change, there is also a simplification of the limits on the number of connected sensors (meters), where we no longer distinguish between restrictions on a specific interface, but only an overall limit on the number of meters, regardless of their type. Perseus units have internal limits of 102 (100 for external meters + 2 system - motherboard and operating parameters) meters and 1200 variables (up to 200 can be reserved for system variables - motherboard and operating parameters).***

In practice, this means that there is no specific SW limit on the number of 1-Wire sensors, RS-485 (Modbus/RTU) or M-Bus meters, but the limitation is based on the nature and speed of the bus (see chapter Description and limitations of buses). For example, if we use 8pcs of 1-Wire meters, 32pcs of RS-485 meters and 12pcs of M-Bus electricity meters, we have 52 external meters out of a total limit of 100. On the other hand, it is not possible to require the possibility of connecting 100 pcs of 1-Wire sensors if the device has only 4 RJ-11 connectors, because in all probability it would not be possible to maintain the topology of the 1-Wire buses (see chapter Description and limitations of buses).

# Third-party templates and sensors (meters)

---

The Perseus family supports a wide range of third-party meters (sensors). Regardless of the manufacturer, they allow you to connect any device that complies with the protocol standards supported by the Perseus family - currently Modbus/RTU, Modbus/TCP, SNMP, MQTT and partially M-Bus (only models equipped with this interface). For these devices, it is not possible to use the variable auto-detection function similar to 1-Wire or M-Bus, and it is necessary to define the individual parameters manually. Due to the fact that there are dozens and in some cases hundreds of parameters that even a layman has to find out and fill in, the Perseus series is equipped with template support for these meters. Templates are predefined sets of parameters for specific sensors (meters) from specific manufacturers. They work in such a way that the necessary template of meters is uploaded to Perseus, and then when adding a device, a template is used for pre-setting (in fact, it is enough to just fill in the address and possibly login details) and add the meter and variables according to the template. There is no need to know data types, conversion formulas, specific addresses or SNMP OID values, or to find out their units. However, templates cannot work for dynamic structures (sensors with a variable number of tracked values)!

## Template repository

---

Since Perseus can support literally thousands of third-party meters, and it would be very difficult to work with them in the device itself, Perseus units do not contain all available templates, but only a very small selection.

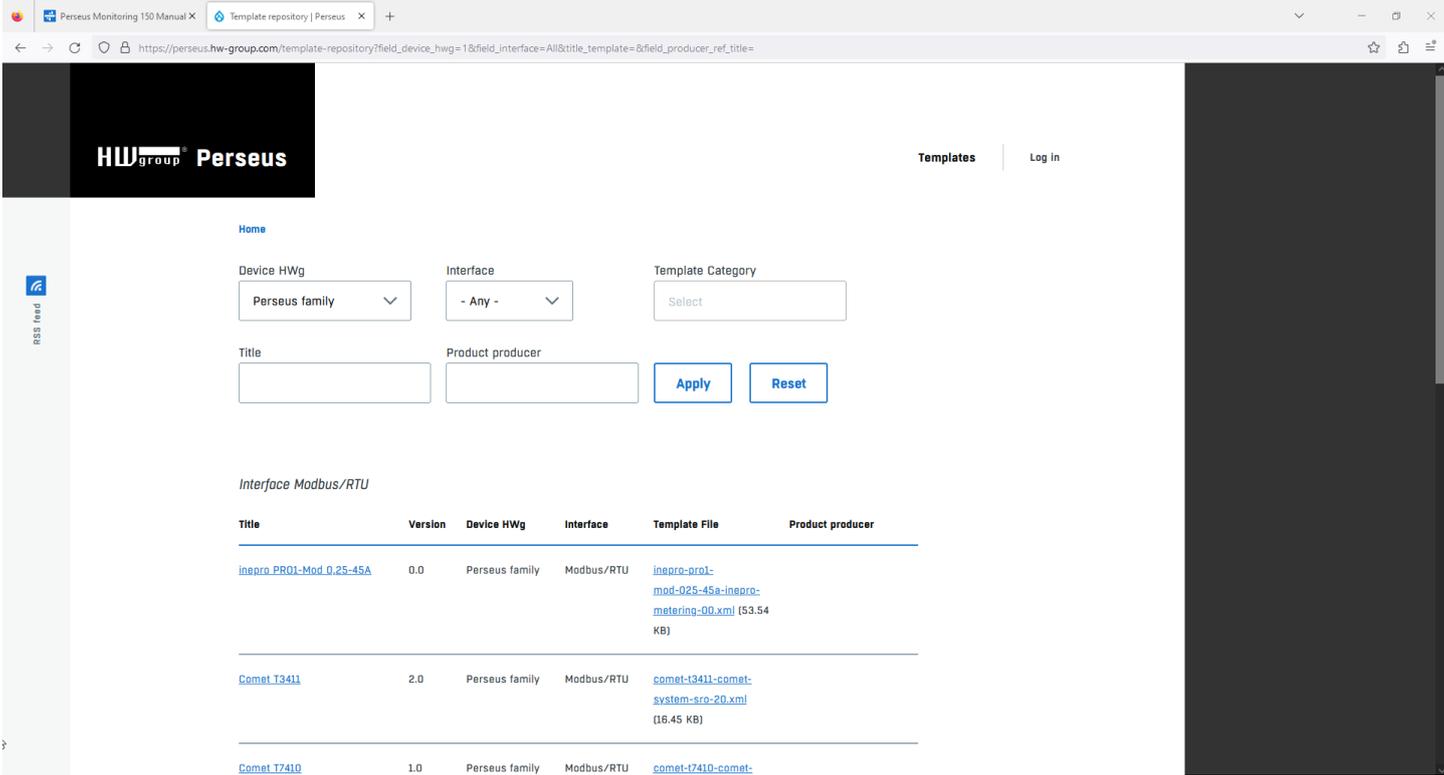
It is unlikely that the user will need more than say 10 different templates in one device (their number is not limited), it is useless to go through lists of hundreds to thousands of templates, even if they are sorted parametrically, not to mention that adding a single template would require a firmware release.

Therefore, a public portal (<https://perseus.hw-group.com>) was created as a repository for templates, LUA scripts and customer configurations (only project customers for medium sized projects). Here the customer searches for the required template (if he does not find it, the HW group will help him to create it and then it will be added to the repository), downloads it and uploads it to the device.

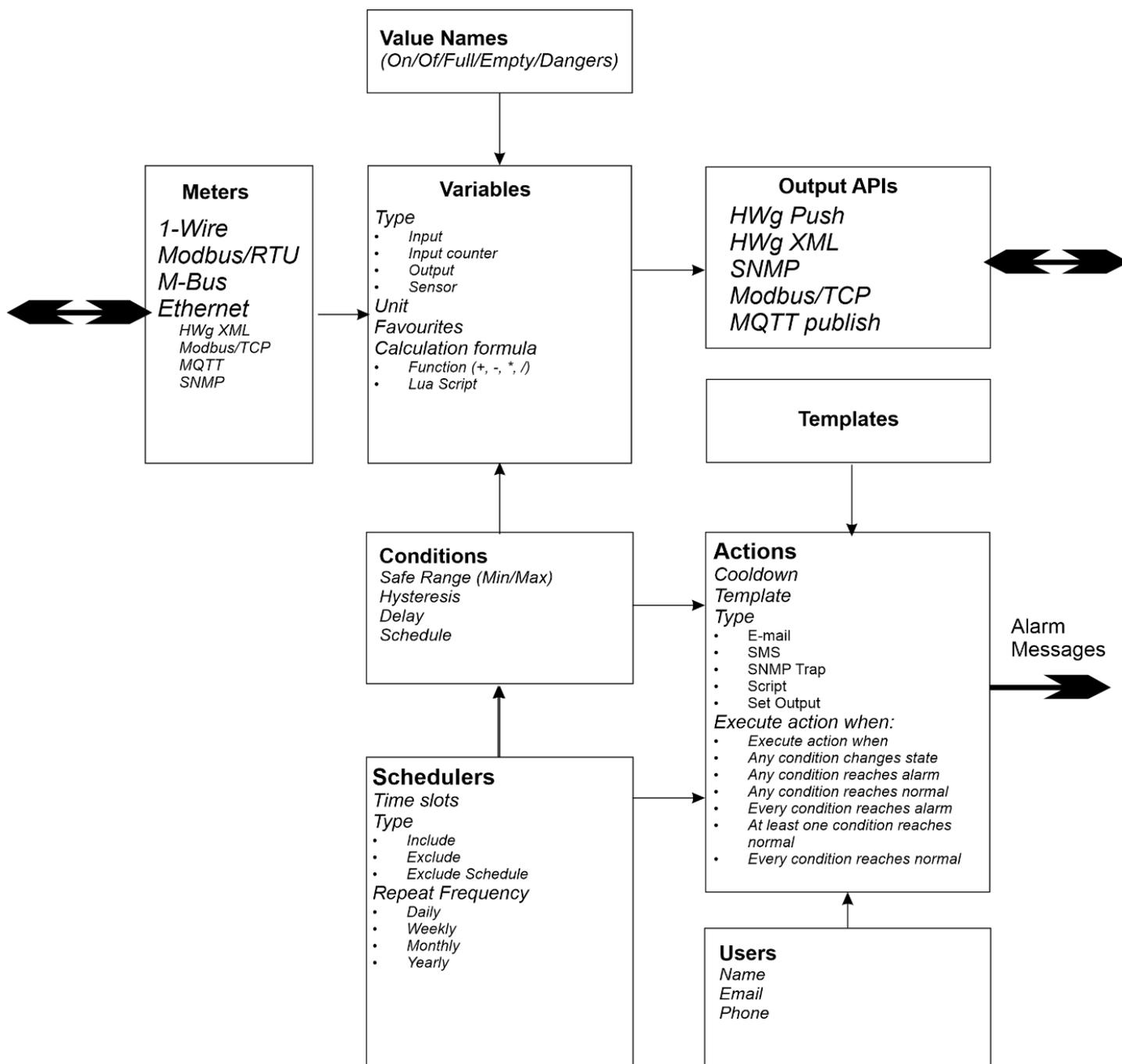
Over time, there will probably be a functional communication channel for downloading directly from the device, but primarily devices in closed networks should be considered.

It is not in the power of the HW group to create all templates in advance, but there is a prepared process for their remote creation in cooperation with the customer. Contact us at [sales@hw-group.com](mailto:sales@hw-group.com) if you need help with third-party sensor templates, custom LUA scripts or custom configuration.

Templates are available at a special website: <https://perseus.hw-group.com>



# Architecture of the Perseus platform



The Perseus platform products are identical in all series and built on a common foundation. In contrast to the Poseidon units, where sensors are recognized, the Perseus units recognize Meters, similar to the HWg-PWR units.

Meters have their own physical interface (1-Wire, RS-485, M-Bus, Ethernet (XML or SNMP), motherboard, etc.) and can be set to read period, name, etc. The meter is an envelope for variables (values) and is supposed to represent the physical sensor, its connector and supply cable, regardless of what quantities it measures, how many detectors it contains, and so on. Meter is a HTemp 1-wire outdoor sensor, as well as an externally connected STE2 r2 unit or even the entire Poseidon2 4002.

Variable is a monitored variable, no matter if it is an analog value, a digital input, a relay output or a WLD detector.

Each Meter can have one or more (n) variables - i.e. the monitored variable, whether it is a sensor, a detector (DI) or an output (DO or analogue). Variables can be physical (data coming from the meter after it has been created) or virtual (for example, a calculated dew point, or a simple condition). A variable has its value, unit, exponent, and other parameters.

Each variable can have one or more (n) Conditions. The Conditions are formed by defining the Saferange, i.e. Minimum and Maximum Allowed Value, Hysteresis (Inertia Area) and Delay. Based on the conditions, the state of each Variable is defined. If a Variable has no condition defined, its state can be only OK or Invalid, but the Alarm state (Alarm Hi, Alarm Lo, etc.) can never occur. A variable (value) has a status of OK (read OK), invalid (read error) or disabled. Variables never take the state Alarm, which is only available for individual Conditions. Also, Actions handle the state of the Condition, not the state of the Variable.

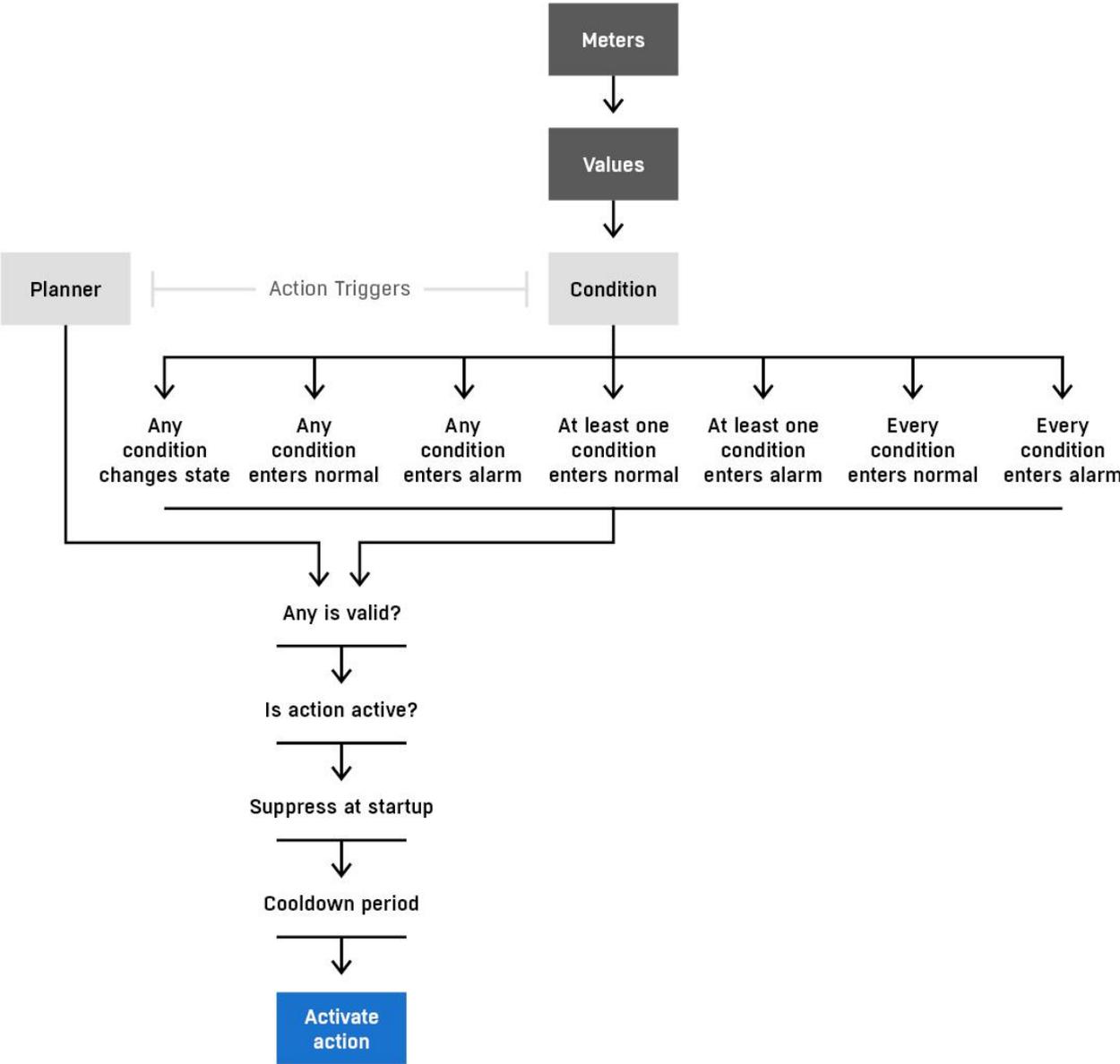
In addition, the Condition can be supplemented with a Scheduler, which can be used to define when the condition will be evaluated. If no calendar is selected, the Condition is evaluated each time the variable or meter is read, whereas if a calendar defining the working time period is selected, the Condition outside this period will be ignored and no follow-up actions will be performed.

In addition, one or more Actions can be assigned to each Condition, such as sending an email, sending an SMS, sending an SNMP trap or switching the output. In addition, the Action can be suppressed on device startup, or it can be performed only at the beginning or end of the alarm state, at the beginning or end of the OK state, and so on. So the setting options are really detailed.

An Action is an action element that is triggered either in real time by a scheduler, by changing the state assigned to a Condition, or by a combination of both.

In the case of actions such as sending an SMS or e-mail, it is possible to assign one or more destinations in the form of SMS or e-mail message recipients, which are defined separately and can be freely assigned to actions

An action can be assigned to a calendar (planner) and thus regularly trigger actions such as periodic e-mail, SMS or output switching, i.e. similar to the cron function.



## Alarms

---

The procedure for creating alarm messages is therefore very different from simpler systems such as Poseidon2 or STE2, because to send an e-mail for example, in addition to defining an SMTP server, it is also necessary to define a destination (recipient), a message template (if the default one is not sufficient), a condition and to connect these elements at the level of each Value. On the other hand, it is not a problem to always send Alert messages to those employees who are currently on duty, or to suppress operations performed on weekends and holidays.

## Types of meters of the Perseus platform

---

Each interface has its own set of IDs by which the meters can be sorted:

1	Local
1xx	1-Wire
3xx	M-BUS
4xx	Modbus/RTU
5xx	Modbus/TCP
6xx	Network
7xx	Virtual
8xx	MQTT
9xx	SNMP
10xx	LocalGPS* Perseus Industrial

## Types of Perseus platform variables

---

As already mentioned, within the Perseus family there is no distinction between sensors, digital inputs (DI) and relay outputs (DO), but all variables are Variables and have their type as a parameter:

0	Unknown
1	Input
2	Input counter
3	Output
4	Sensor

In the future, variable types will expand based on their parameters, such as:

- Input
  - Binary
  - Status
- Output
  - Analog
  - Two-state
  - Multi-state

# Meter States, Variables, and Conditions

Unlike previous generations of measuring data panels from HW group, the Perseus family has the ability to work with different states of its components. Therefore, not only the Variable, but also the Meter and the Conditions have their state. Variables or meters can never be in the Alarm state, that is a matter of Condition.

<b>ID</b>	<b>Meter</b>	<b>Variables</b>	<b>Condition</b>	<b>Scheduler</b>	<i>Note</i>
<b>0</b>	Unknown	Unknown	Unknown	Inactive	
<b>1</b>	OK	OK	OK	Active	
<b>2</b>		VariableInvalid	VariableInvalid		
<b>3</b>	MeterInvalid	MeterInvalid	MeterInvalid		
<b>4</b>			AlarmLow		
<b>5</b>			AlarmHigh		
<b>6</b>			Inactive		Deactivate by scheduler
<b>7</b>	Disabled	Disabled	Disabled		

*Measured vs. Monitored Variable - Just a note for the dictionary.*

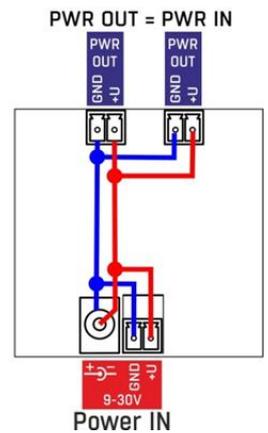
# Hardware Specifications

## Ethernet

Ethernet 100Base-T (10/100Mbps). Once connected, the green "Link" LED on the connector will illuminate to indicate that the active element is properly connected, and the yellow "Activity" LED will blink during communication.

## Power

The power supply of the device is indicated by a green LED. The power supply is always in the range of 9-30V, and 48V, PoE (Power over Ethernet).



## PowerOut

It is used to power the end sensors and accessories. The PowerOut output is directly coupled to the 9-30V input. For units with 48V or PoE input, the output can be used as a 12V/120mA power supply.

## 1-Wire/1-Wire UNI

Connection of sensors produced by HW group with 1-Wire/1-Wire UNI interface. A bus of up to 60 meters and a maximum of 2 1-Wire UNI sensors can be directly connected to each port. For more information, see chapter Connecting sensors.

## RS-485

It is used to connect RS-485 sensors and Modbus/RTU protocol.

## Inputs

INx - Inputs for connecting dry contacts. Inputs always have a common GND potential. The switching of the input is signaled by a green LED. The inputs are equipped with pulse counters.

## Outputs

---

OUTx – relay outputs with changeover contact. In idle state, the terminals NCx (Normally Close) + COMx (Common) are closed, in closed NOx (Normally Open) + COMx. The switched output is indicated by a yellow LED.

## Alarm/Setup LED

---

A red LED indicates the status of the device

- Solid On – A meter, variable or condition is in the Alarm state
- Blinking – Device is upgrading

## LED Status

---

While waiting for the configuration to be restored, the status LED lights up. After the light goes out, a recovery is performed.

## LED Modem

---

Indicates the status of the modem.

- Lights up during LTE connection
- Flashes while connecting and searching for a network

## DIP1/DIP2 System Switches

---

DIP1 - SW1 - Reserved for future use.

DIP2 - Safe Mode - Activation activates HW protection of the setting. No parameters can be changed.

## WLD

---

It is used to connect the flood detection cable. LED indicates WLD state:

Green – OK

Red – Flooded

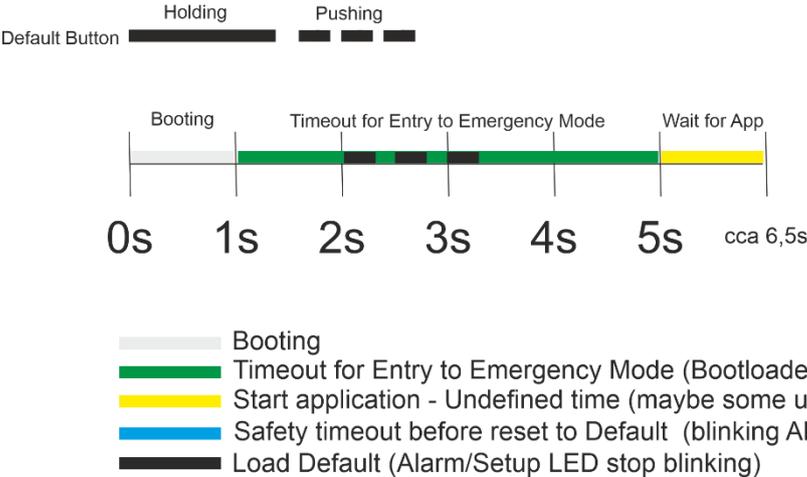
Yellow - Disconnected

# Default button

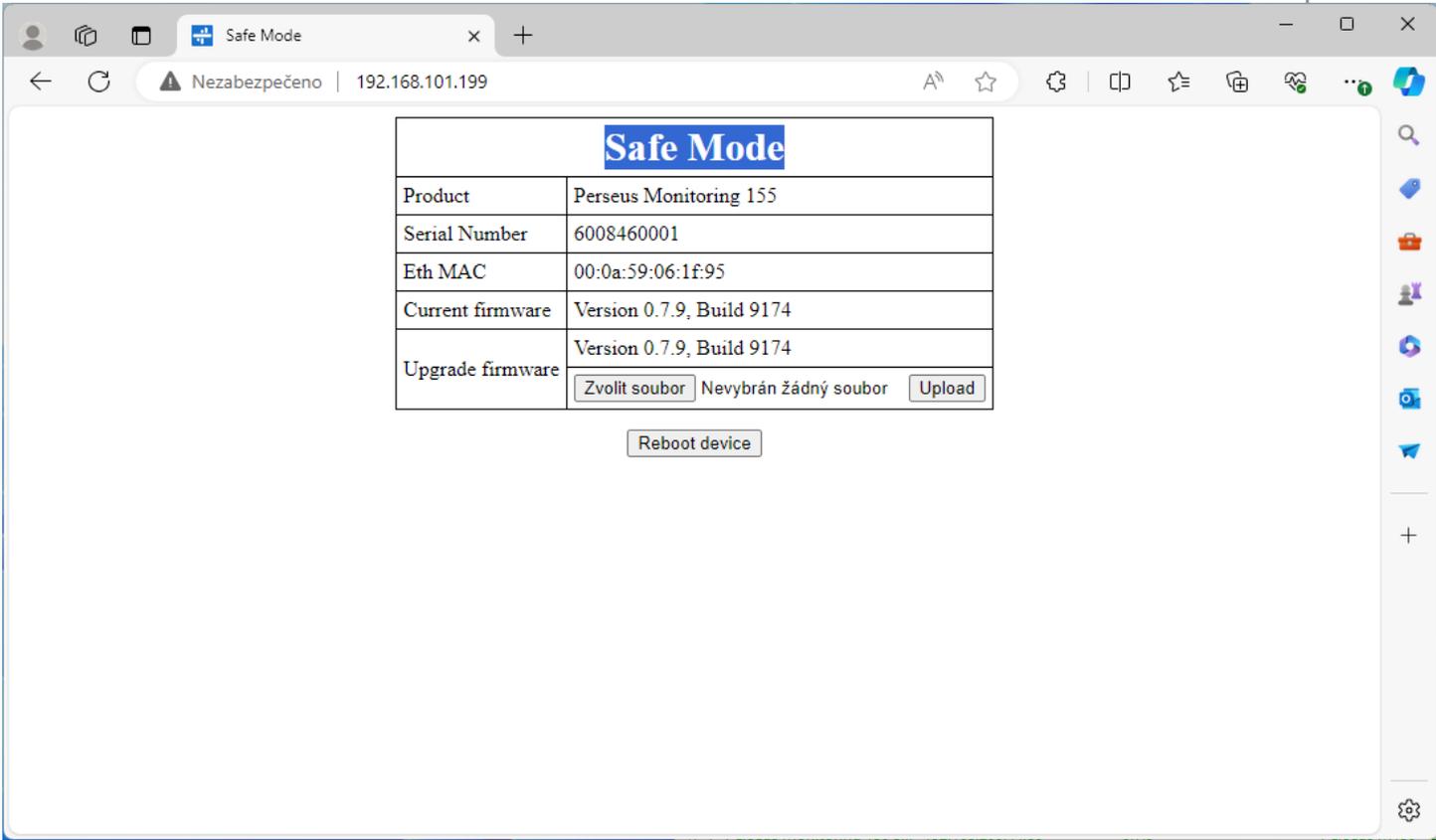
Multi-function button for factory reset and emergency boot loader recall.

**Bootloader Recall (Safe Mode)** - Press the button, turn on the power within 3 seconds, press the button 3 times.

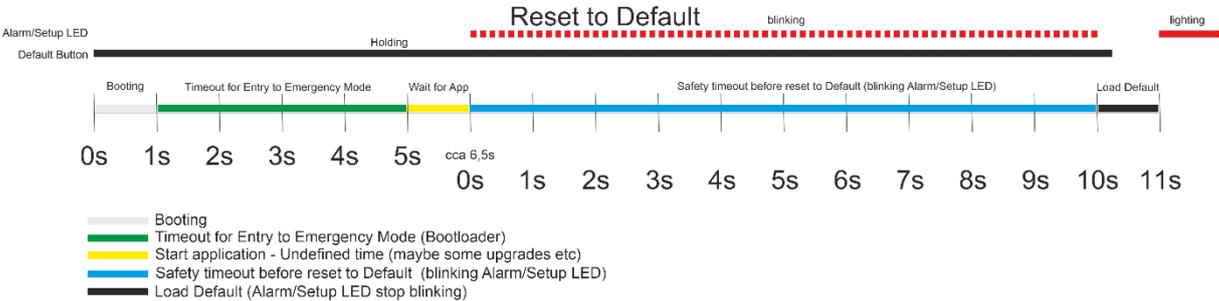
## Emergency mode (Bootloader)



This will take you to the Safe Mode web page where you can upload the new firmware:



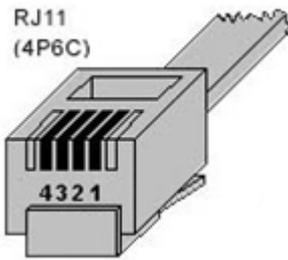
Factory Reset - Press the button, apply the power and wait for the Alarm/Status LED to turn off. Releasing the button while the LED is flashing will ensure that the application is booted up with the current configuration.



# Connecting Sensors

## 1-Wire Bus (RJ11) sensors

---



- Connect the sensor to the Poseidon before turning on the power - **the connector must click**;
- **Max distance per active port is 60m**;
- Sensors can be daisy-chained to connect them one after the other;
- After a change in the connected sensors, you must perform sensor auto-detection again. (WWW interface > [Sensors](#) > **Autodetect sensors**)
- for details see sensor's manual)

# WWW interface of Perseus platform

## Menu structure

- **Home** - Front Page
- **Monitoring** - a group of pages for working with sensors and their safe range
  - **Meters** - a page for working with meters
  - **Variables** - a page for working with monitored variables
  - **Conditions** - overview of existing conditions (SafeRange)
- **Control** - device settings in terms of action and reaction to the data obtained;
  - **Actions** - overview of existing actions and the possibility of creating new ones
  - **Targets** - overview of existing alarm targets and the possibility of creating new ones
  - **Scheduler** - overview of existing calendars and schedulers and the ability to create new ones
  - **SMS** - setting parameters for sending SMS, template definitions and queue preview
  - **E-mails** - setting parameters for sending SMS, define templates and preview the queue
  - **Scripts** - overview of existing variables that have been set to be recalculated by a script and edited by LUA
- **General** - General device settings
  - **Identification** - Identification of devices on the network and in the API
  - **Web Server** - web server parameters (http and HTTPS ports) and the ability to upload SSL certificates
  - **Time** - set the system time and its synchronization
  - **Meter templates** - Manage meter templates, variables, and LUA Scripts
- **Services** - Additional device services
  - **Portal** - set up the target Sensdesk Technology portal
  - **SNMP** - set parameters for SNMP communication
  - **MQTT** - MQTT publisher settings
  - **Modbus TCP** - Modbus/TCP settings
- **Network** - Setting the network parameters
  - **Ethernet** - Basic network parameters
  - **WiFi** - setting WiFi parameters (where applicable)
- **Security** - System Security
  - **Radius** - set the Radius server parameters
  - **Users** - Add users authorized to work with the device
- **Modem** - set the properties of the LTE modem (where applicable)
- **System** - Basic information about the device, FW upgrade and configuration

# Home

On the front page of Perseus products, you will find a navigation menu in the left column and an overview of all monitored variables in the main window.

The Summary section lists the number of monitored Meters, Variables, Conditions and Actions, with the numbers in the Invalid and Alarm states. Individual elements include a link to the list to make it easier to identify the problem.

The All/Grouped/Favourites switch allows you to list all variables, list them merged by meters, or filter the overview of monitored variables to Favourites only. Which variables are preferred is set by a checkbox in the variable detail.

The variable overview allows you to sort by ID, name, or status. Variables in the Invalid state are highlighted in yellow, in the red circle they have the number of conditions that are in the Alarm state and preferred ones have an asterisk displayed in the upper right corner.

If it is an output type variable, the slider on the home page allows you to switch the output (change the output value). The exception is an output to which an internal condition is assigned.

# Monitoring

Monitoring is a group of functions for working with Sensors, Meters, Variables and Conditions, the result of which is the definition of the status of individual elements of the chain, to which it will be possible to apply other functions and actions (alarm messages, etc.).

The screenshot shows the Perseus Monitoring 150 Manual X interface. The breadcrumb trail at the top indicates the navigation path: Meters > Diagnostic Meter 2 > Variables > Uptime 2.2001. The main content area is divided into three sections: Configuration, Value Names, and Conditions.

**Configuration:**

- Enable:
- Name: Uptime 2.2001
- Home page favourite:
- Type: Sensor Incremental
- Decimal digits: 0 (Affects value's calculation and display)
- Unit: [Empty field]
- Calculation formula: Function (dropdown), value[505058] = ( raw\_value[505058] / 0 ) / 0

**Value Names:**

Value	Name

**Conditions:**

ID	Name	State	Min	Max	Hysteresis	Delay	Enabled

**Details:**

- Value: 505058
- ID: 2001
- Value: 505058
- State: Ok
- Dynamic view: [Line graph showing value over time]

Within a group of pages, it is possible to move between objects not only by using the main menu and the overview pages Meters, Variables and Conditions, but also by using the "breadcrumbs".

Meters => name of Meter => Variables => name of Variables => Conditions => Name of condition.

**1** – Overview of individual meters. Their overview will expand and it is possible to switch to another one. Of course, switching to another meter shortens the menu accordingly.

**2** – Current meter – by clicking on it, you can switch to its properties and the menu will be shortened accordingly.

**3** – Overview of individual variables of the meter. Their overview will expand and it is possible to switch to another one.

**4** - The current variable, whose parameters are displayed on the page.

Of course, switching to another meter shortens the menu accordingly.

# Menu Monitoring / Meters

The site is used to work with meters, search, add, delete and edit them. It allows you to work with all the interfaces that the Perseus can handle. *The availability of individual items (interfaces) may vary in different models.*

The screenshot shows the 'Meters' section of the Perseus Monitoring 150 Manual web interface. The interface is divided into a sidebar on the left and a main content area. The sidebar contains navigation options: Home, Monitoring (selected), Variables, Conditions, Control, General, Services, Network, Security, and System. The main content area is titled 'Meters' and shows a list of meters under the 'All (2)' tab. The list is organized into two sections: 'Input' and 'Input Counter'. Each meter entry includes an ID, a name, a status indicator (Ok), and a value (0). The 'Input' section lists meters from 1.1001 to 1.1016, and the 'Input Counter' section lists meters from 1.1101 to 1.1106. A 'Variables 37' button is visible in the top right corner of the list area.

ID	Name	Status	Type	Value
1.1001	Input 1.1001	Ok	Input	0
1.1002	Input 1.1002	Ok	Input	0
1.1003	Input 1.1003	Ok	Input	0
1.1004	Input 1.1004	Ok	Input	0
1.1005	Input 1.1005	Ok	Input	0
1.1006	Input 1.1006	Ok	Input	0
1.1007	Input 1.1007	Ok	Input	0
1.1008	Input 1.1008	Ok	Input	0
1.1009	Input 1.1009	Ok	Input	0
1.1010	Input 1.1010	Ok	Input	0
1.1011	Input 1.1011	Ok	Input	0
1.1012	Input 1.1012	Ok	Input	0
1.1013	Input 1.1013	Ok	Input	0
1.1014	Input 1.1014	Ok	Input	0
1.1015	Input 1.1015	Ok	Input	0
1.1016	Input 1.1016	Ok	Input	0
1.1101	Input Counter 1.1101	Ok	Input Counter	0
1.1102	Input Counter 1.1102	Ok	Input Counter	0
1.1103	Input Counter 1.1103	Ok	Input Counter	0
1.1104	Input Counter 1.1104	Ok	Input Counter	0
1.1105	Input Counter 1.1105	Ok	Input Counter	0
1.1106	Input Counter 1.1106	Ok	Input Counter	0

The All tab provides an overview of all meters, their names, statuses and IDs. It can also be used to find out the total number of connected meters (number in brackets).

## Local

Local contains local and diagnostic meters, typically local sensors, digital inputs, outputs and pods contained directly on the motherboard of the device. These are not meters connected via external buses.

The screenshot shows the 'Perseus Monitoring 150 Manual' web interface. The left sidebar contains navigation options: Home, Monitoring (selected), Meters, Variables, Conditions, Control, General, Services, Network, Security, and System. The main content area is titled 'Meters' and shows 'Main Board Meter 1' selected. The 'Details' section displays: ID: 1, Name: Main Board Meter 1, Type: Local, Port: 0, and State: OK. The 'Configuration' section shows: Enable: checked, Name: Main Board Meter 1, Measure period: 1 Sec, and a 'Manual Read' button. The 'Variables' section contains a table with 6 columns: ID, Name, State, Value, Unit, and Options.

ID	Name	State	Value	Unit	Options
1001	Input 1.1001	OK	0		[Edit] [Delete]
1002	Input 1.1002	OK	0		[Edit] [Delete]
1003	Input 1.1003	OK	0		[Edit] [Delete]
1004	Input 1.1004	OK	0		[Edit] [Delete]
1005	Input 1.1005	OK	0		[Edit] [Delete]
1006	Input 1.1006	OK	0		[Edit] [Delete]

### Details section

- **ID** - ID of the meter – see chapter Monitoring / Meters
- **Name** - The name of the meter. The name can be changed in the Configuration section
- **Type** - type of meter – see chapter Monitoring / Meters
- **Port** - The port number to which the meter is connected. For local or Ethernet sensors, this is an internal designation.
- **State** - meter status (Unknown/OK/Device Invalid)

### Configuration section

- **Enable** - Turns the meter on or off
- **Name** - The name of the meter for easier orientation
- **Read Period** - the minimum period is 1s, but it may vary depending on the unit configuration, numbers and types of sensors in order to comply with the necessary timeouts
- **Manual Read** - Button for manual reading of the meter

### Variables section

A well-arranged table of connected variables, their states and values. Depending on the type of interface, it is possible to detect meter variables in this section (**Scan Variable** button) or manually add them (**+ button**).

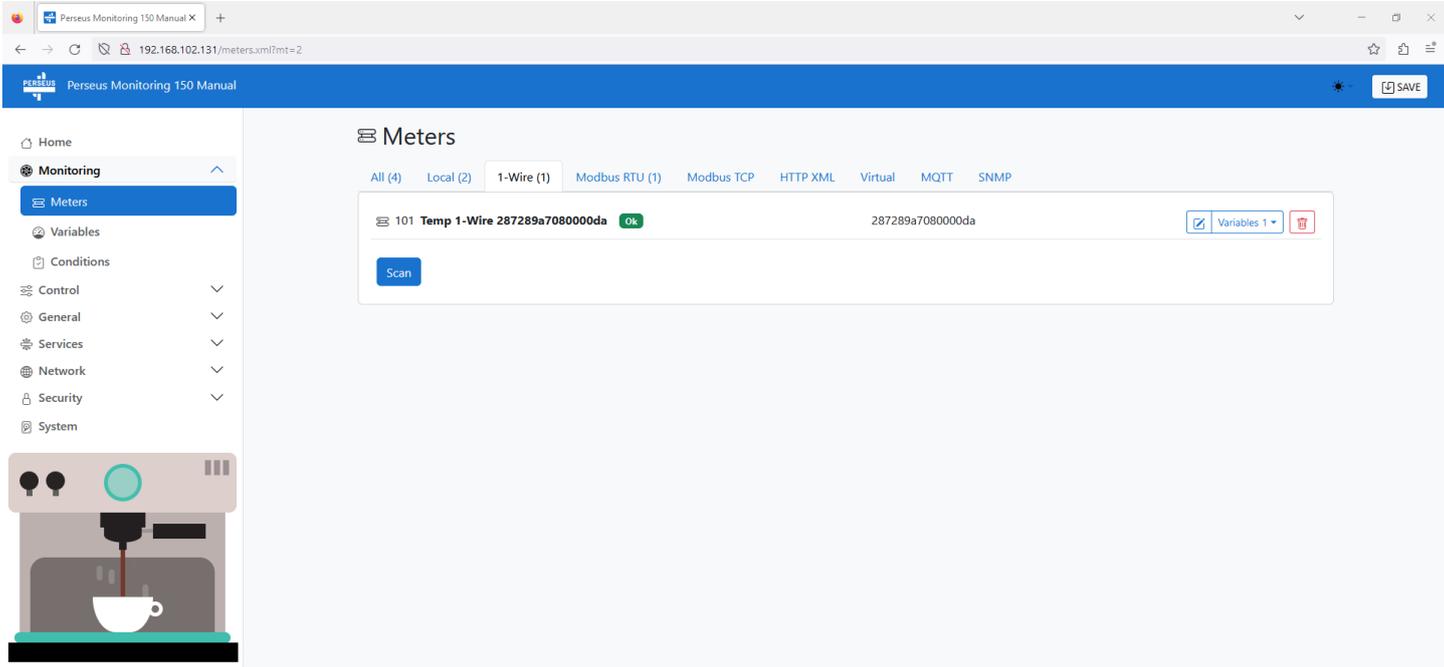
- **ID** - ID of the variable
- **Name** - The name of the variable
- **State** - The current state of the variable
- **Value** - The current value
- **Unit**
- **Options** - Options for working with the variable (Delete/Edit)

In the case of local meters, the meter can only be renamed and the reading period can be changed.

By clicking on the name or icon of the edit you can open the page for editing the variable – for more information, see chapter Variables.

### 1-Wire

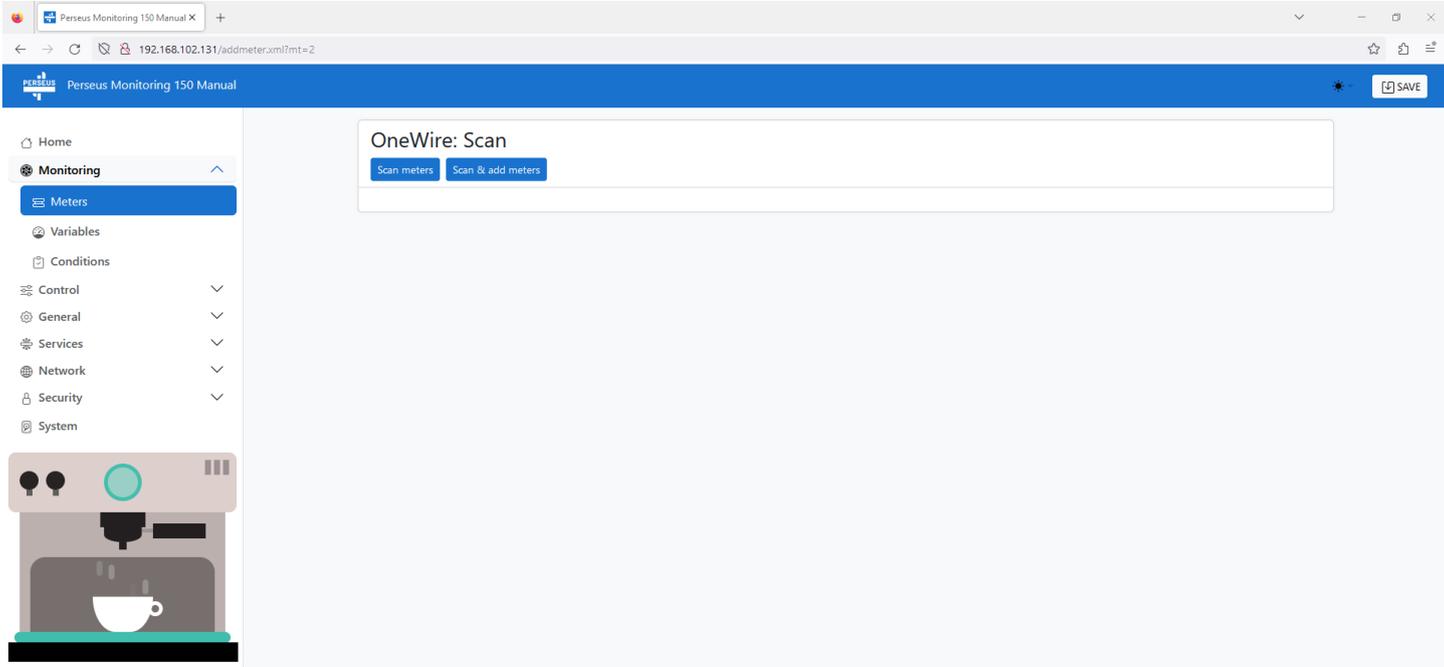
The 1-Wire tab contains meters connected via the 1-Wire interface.



HW group s.r.o. ©2024  
FW version 0.8.6\_9465



The 1-Wire: Find button opens the 1-Wire meter search page:



HW group s.r.o. ©2024  
FW version 0.8.6\_9465



The *Scan & add meters* button scans the bus and adds all the sensors found, the *Scan meters* scan the 1-Wire buses and lists the connected meters and detected Variables:

HW group s.r.o. ©2024  
FW version 0.8.6\_9465

Here you just need to select the individual meters and variables. By selecting the meter, all variables are selected, or you can select only specific ones (not all).

HW group s.r.o. ©2024  
FW version 0.8.6\_9465

### Details section

- **ID** – ID of the meter – see chapter Monitoring / Meters
- **Name** – The name of the meter. The name can be changed in the Configuration section
- **Type** – type of meter – see chapter Monitoring / Meters

- **Port** – The port number to which the meter is connected. For local or Ethernet sensors, this is an internal designation
- **State** – meter status (Unknown/OK/Device Invalid)

### Configuration section

- **Enable** – Turns the meter on or off
- **Name** – The name of the meter for easier orientation
- **Measure Period** – Period of reading – the minimum period is 1s, but it may vary depending on the unit configuration, numbers and types of sensors in order to comply with the necessary timeouts
- **1-Wire Address** – Unique, immutable 1-Wire ID read from the meter
- **Manual Read** – Button for manual reading of the meter

### Variables section

A well-arranged table of connected variables, their states and values. Depending on the type of interface, it is possible to detect meter variables in this section (**Scan variables** button) or manually add them (**+ button**).

- **ID** – ID of the variable
- **Name** – The name of the variable
- **State** – The current state of the variable
- **Value** – The current value
- **Unit**
- **Options** – Options for working with the variable (Delete/Edit)

In the case of 1-Wire meters, you can just rename the meter and change the reading period.

### Scan Variables

Import variables
✕

---

Imported sensors

1	1.Temp	0.0 °C	<input checked="" type="checkbox"/>
---	--------	--------	-------------------------------------

---

Found sensors

## Modbus/RTU

The Modbus/RTU tab contains Modbus/RTU meters connected via the RS-485 interface.

The screenshot shows the 'Meters' page in the Perseus Monitoring 150 Manual web interface. The page is titled 'Meters' and has a sub-tab for 'Modbus RTU (1)'. Below the title, there are tabs for 'All (4)', 'Local (2)', '1-Wire (1)', 'Modbus RTU (1)', 'Modbus TCP', 'HTTP XML', 'Virtual', 'MQTT', and 'SNMP'. The main content area shows a single meter entry for '401 Regmet RK-CHM-D' with a status of 'Ok' and a value of '3'. Below the entry are buttons for 'Modbus RTU templates', 'Scan', and 'Add +'. The left sidebar shows navigation options like Home, Monitoring, Meters, Variables, Conditions, Control, General, Services, Network, Security, and System. The bottom left features a coffee machine illustration and copyright information for HW group s.r.o. ©2024, FW version 0.8.6\_9465. The HW group logo is in the bottom right.

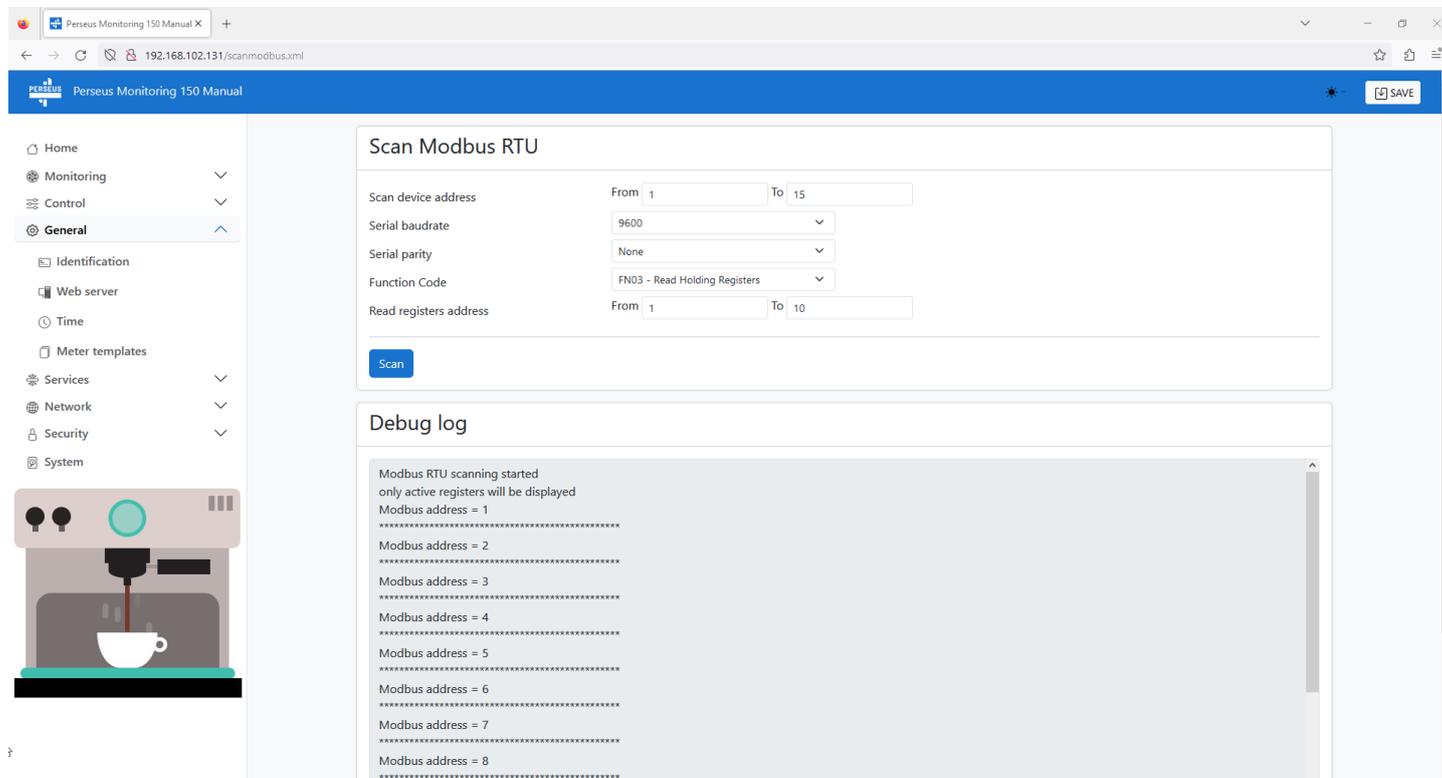
The Modbus RTU Templates button opens a page of installed templates on the device.

The screenshot shows the 'Modbus RTU templates' page in the Perseus Monitoring 150 Manual web interface. The page is titled 'Modbus RTU templates' and has a sub-tab for 'Modbus RTU (1)'. Below the title, there are tabs for 'All (4)', 'Local (2)', '1-Wire (1)', 'Modbus RTU (1)', 'Modbus TCP', 'HTTP XML', 'Virtual', 'MQTT', and 'SNMP'. The main content area shows a list of installed templates: 'Regmet RK-CHM-D', 'Sensit STH 102', 'Sensit KSTHC 102', and 'Sensit SD 112A'. Each template has a plus button next to it. The page also includes a 'Reload templates' button and a 'Manage template files' link. The left sidebar shows navigation options like Home, Monitoring, Meters, Variables, Conditions, Control, General, Services, Network, Security, and System. The bottom left features a coffee machine illustration and copyright information for HW group s.r.o. ©2024, FW version 0.8.6\_9465. The HW group logo is in the bottom right.

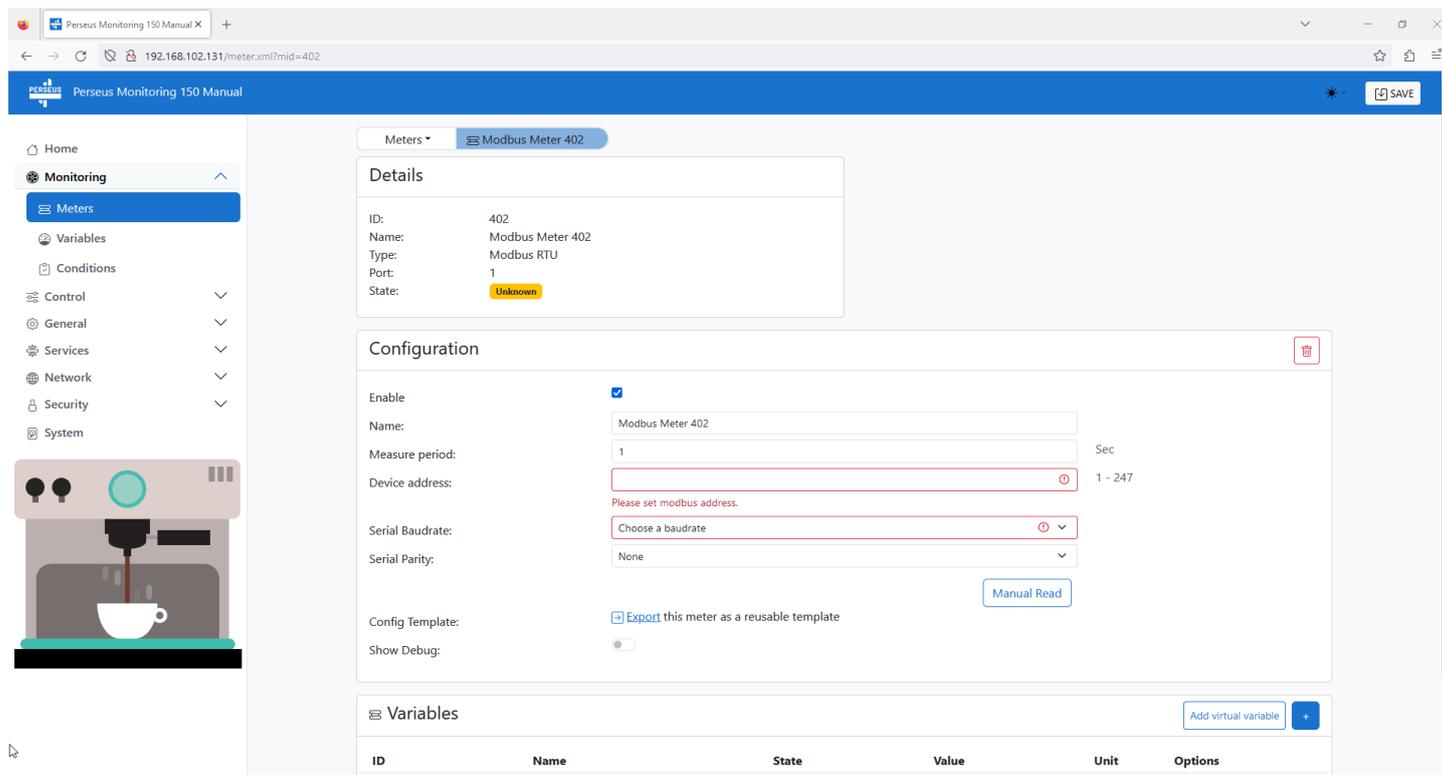
Here you can select meters and variables from the list of installed templates and use the Save button (bulk addition requires later editing of meters and entering their addresses), or add individual meters - you will be redirected to the meter edit page with a prompt to enter the meter address.

If a template for a specific meter is missing, it can be added on the General/Meter Templates page.

With the RS-485 bus, it is not currently possible to automatically search for and add a meter (there are no sensors yet that support this functionality). However, it is possible to use the Modbus Scan button to scan the bus area. If the device encounters a valid search of a specific range, the registers will be shown:



It is also possible to create and add the meter and variables manually:



### Details section

- **ID** – ID of the meter – see chapter Monitoring / Meters
- **Name** – The name of the meter. The name can be changed in the Configuration section
- **Type** – type of meter – see chapter Monitoring / Meters
- **Port** – The port number to which the meter is connected. For local or Ethernet sensors, this is an internal designation.
- **State** – meter status (Unknown/OK/Device Invalid)

### Configuration section

- **Enable** – Turns the meter on or off
- **Name** – The name of the meter for easier orientation
- **Measure Period** – Reading period– the minimum period is 1s, but it may vary depending on the unit configuration, numbers and types of sensors in order to comply with the necessary timeouts
- **Device Address** – Modbus/RTU address in the range 1 - 247, which serves as a unique identifier of the meter on the bus. As a rule, the address is indicated on the meter label or in the manufacturer's documentation
- **Serial Baudrate** – Transmission rate of the meter on the bus
- **Serial Parity** – Data parity of the meter on the bus
- **Manual Read** – Button for manual reading of the meter
- **Config Template** – Export settings as a template (exports meter and variable settings).

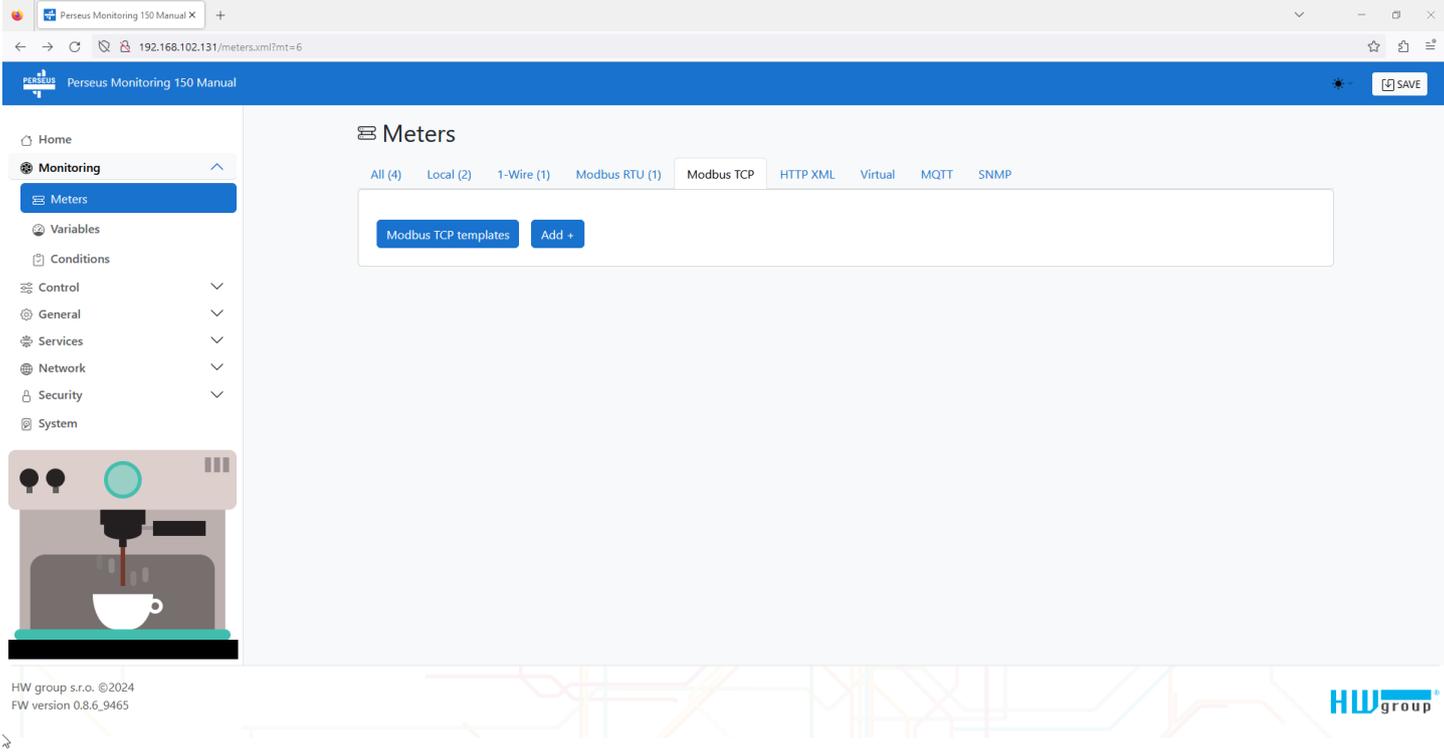
### Variables section

A well-arranged table of connected variables, their states and values. Depending on the type of interface, it is possible to detect meter variables in this section (**Scan variables** button) or manually add them (**+ button**).

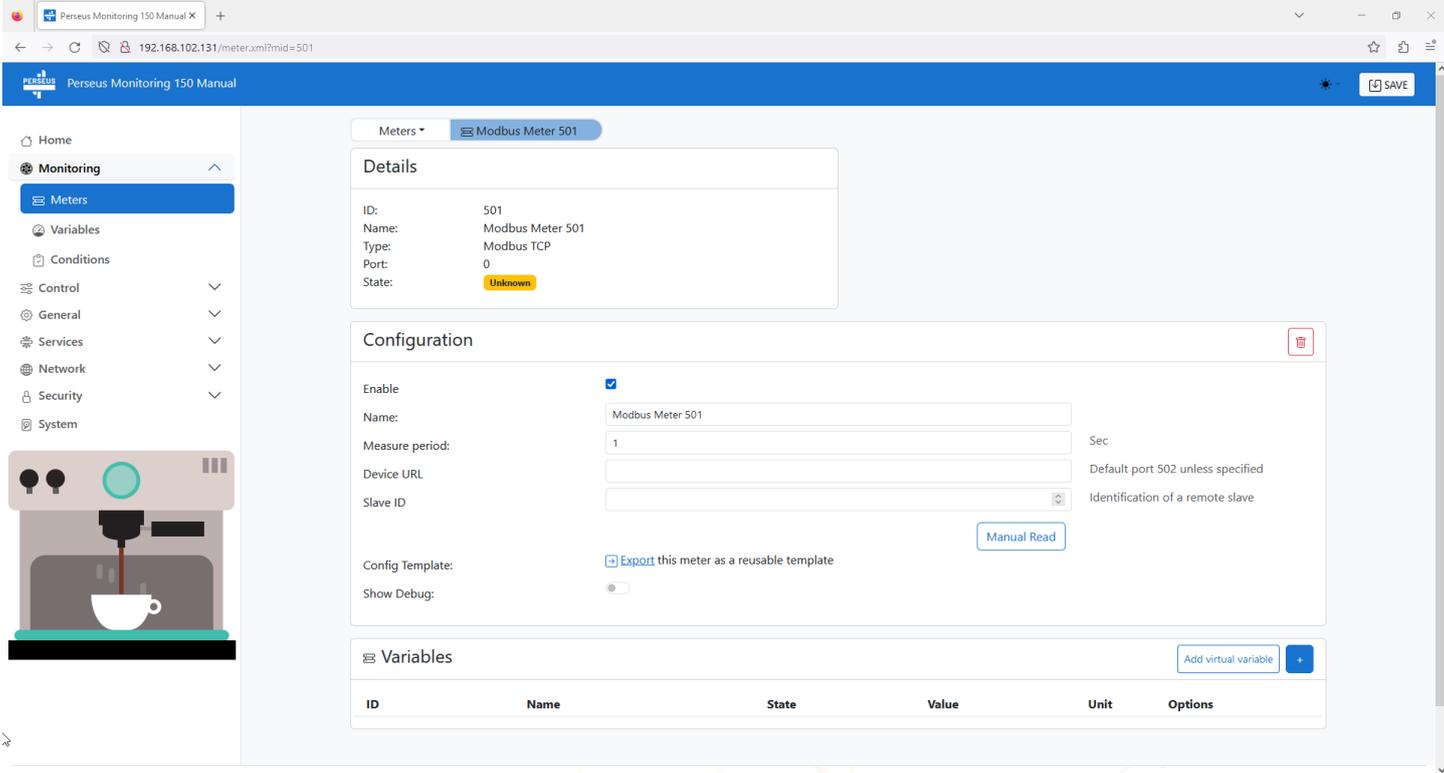
- **ID** – ID of the variable
- **Name** – The name of the variable
- **State** – The current state of the variable
- **Value** – The current value
- **Unit**
- **Options** – Options for working with the variable (Delete/Edit)

# Modbus/TCP

The Modbus/TCP tab contains meters that are connected via the Ethernet interface and using the Modbus/TCP protocol (e.g. Poseidon2, Damocles2 and others).



Modbus TCP templates allow you to browse through the available templates. The Add + button will allow you to add another meter:



### Details section

- **ID** – ID of the meter – see chapter Monitoring / Meters
- **Name** – The name of the meter. The name can be changed in the Configuration section
- **Type** – type of meter – see chapter Monitoring / Meters
- **Port** – The port number to which the meter is connected. For local or Ethernet sensors, this is an internal designation.
- **State** – meter status (Unknown/OK/Device Invalid)

### Configuration section

- **Enable** – Turns the meter on or off
- **Name** – The name of the meter for easier orientation
- **Read Period** – Reading period – the minimum period is 1s, but it may vary depending on the unit configuration, numbers and types of sensors in order to comply with the necessary timeouts
- **Device URL** – IP address and port of the device to be read

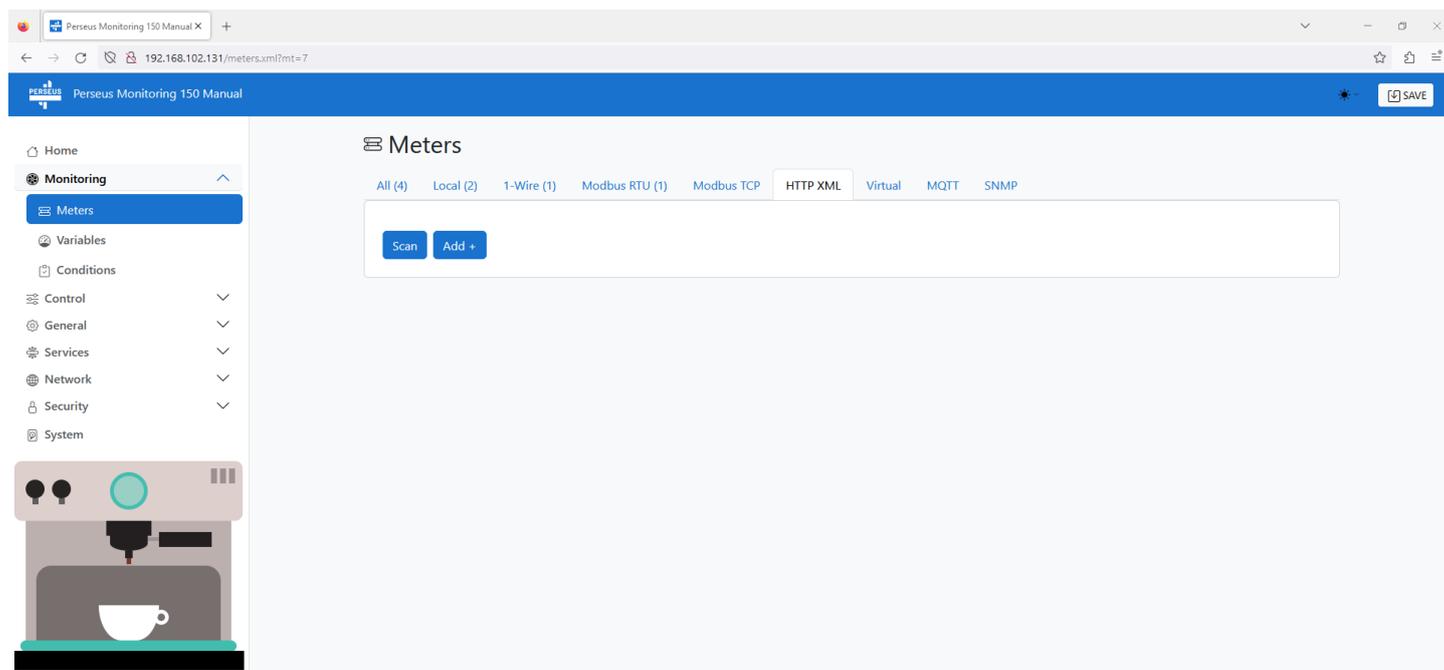
### Variables section

A well-arranged table of connected variables, their states and values. Depending on the type of interface, it is possible to detect meter variables in this section (**Scan Variables** button) or manually add them (**+ button**).

- **ID** – ID of the variable
- **Name** – The name of the variable
- **State** – The current state of the variable
- **Value** – The current value
- **Unit**
- **Options** – Options for working with the variable (Delete/Edit)

## HTTP XML

Network meters allow you to connect remote HW group devices via XML.

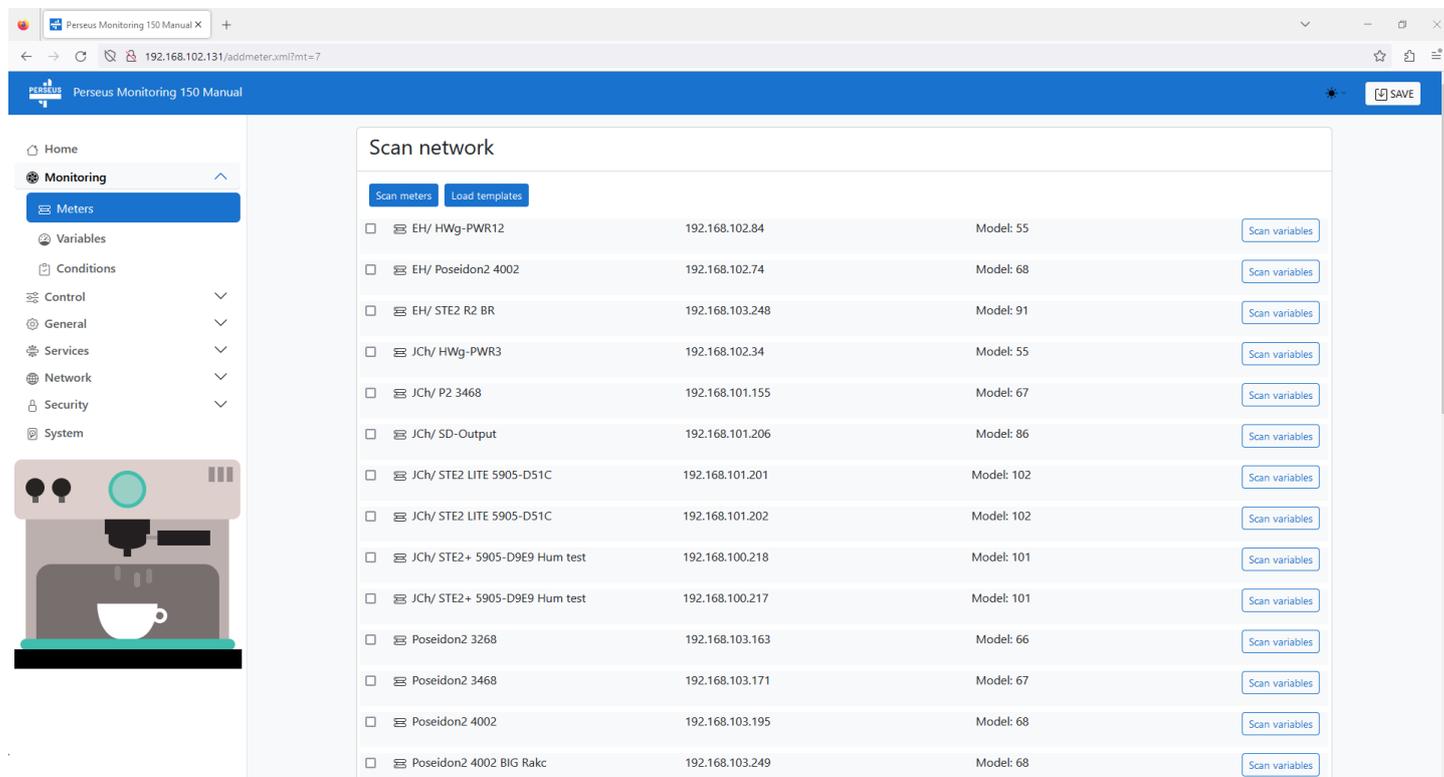


HW group s.r.o. ©2024  
FW version 0.8.6\_9465



### Automatic search for HW group devices

The *Network Scan* button scans the local network using the HWg search (UDP broadcast) function and lists all found devices.



Here you can select Meters and confirm the selection with the *Save* button (bulk addition requiring later editing of meters and scanning of variables), or add individual meters with the *Scan values* button and select specific variables:

Meter Name	IP Address	Model	Action
SD-Input 5906-313A	192.168.100.9	Model: 85	Scan variables
SD-Output 5905-1E91	192.168.100.26	Model: 86	Scan variables
SD-Water 5905-1FE7	192.168.100.12	Model: 84	Scan variables
Water 501	0 WLD		
Shapelez R2	192.168.103.178	Model: 91	Scan variables
Input 1	0		
Input 2	0		
Sensor 35186	-999.9 C		
STE2 LITE Prague Online	192.168.103.246	Model: 102	Scan variables
Sensor 597	-999.9		
Sensor 54156	36.0 C		
STE2 PLUS 5905-D352	192.168.103.253	Model: 101	Scan variables
Vitek stul	192.168.103.206	Model: 91	Scan variables
Vitek stul	192.168.103.254	Model: 91	Scan variables
WLD2 5905-DEAA	192.168.103.105	Model: 89	Scan variables

HW group s.r.o. ©2024  
FW version 0.8.6\_9465



Again, the selected items must be saved by clicking the *Save* button.

### Manually adding HW group devices

*Network: Add* allows you to add another meter

- Home
- Monitoring
  - Meters
  - Variables
  - Conditions
- Control
- General
- Services
- Network
- Security
- System

Meters HTTP XML Meter 601

**Details**

ID: 601  
 Name: HTTP XML Meter 601  
 Type: Net  
 Port: 0  
 State: Unknown

**Configuration**

Enable

Name:

Measure period:  Sec

Device URL:

Device pathname:

Authorization:  Path for

[Manual Read](#)

Config Template:  Expert this meter as a reusable template

Show Debug:

**Variables** [Add virtual variable](#) [Scan variables](#) [+](#)

ID	Name	State	Value	Unit	Options

### Details section

- **ID** – ID of the meter – see chapter Monitoring / Meters
- **Name** – The name of the meter. The name can be changed in the Configuration section
- **Type** – type of meter – see chapter Monitoring / Meters
- **Port** – The port number to which the meter is connected. For local or Ethernet sensors, this is an internal designation.
- **State** – meter status (Unknown/OK/Device Invalid)

### Configuration section

- **Enable** – Turns the meter on or off
- **Name** – The name of the meter for easier orientation
- **Read Period** – Reading period – the minimum period is 1s, but it may vary depending on the unit configuration, numbers and types of sensors in order to comply with the necessary timeouts
- **Device URL** – IP address and port of the device to be read
- **Device pathname** – the path to the downloaded file. It usually values.xml
- **Authorization** – name and password for authorization to the remote device – only if the device is protected by the authorization

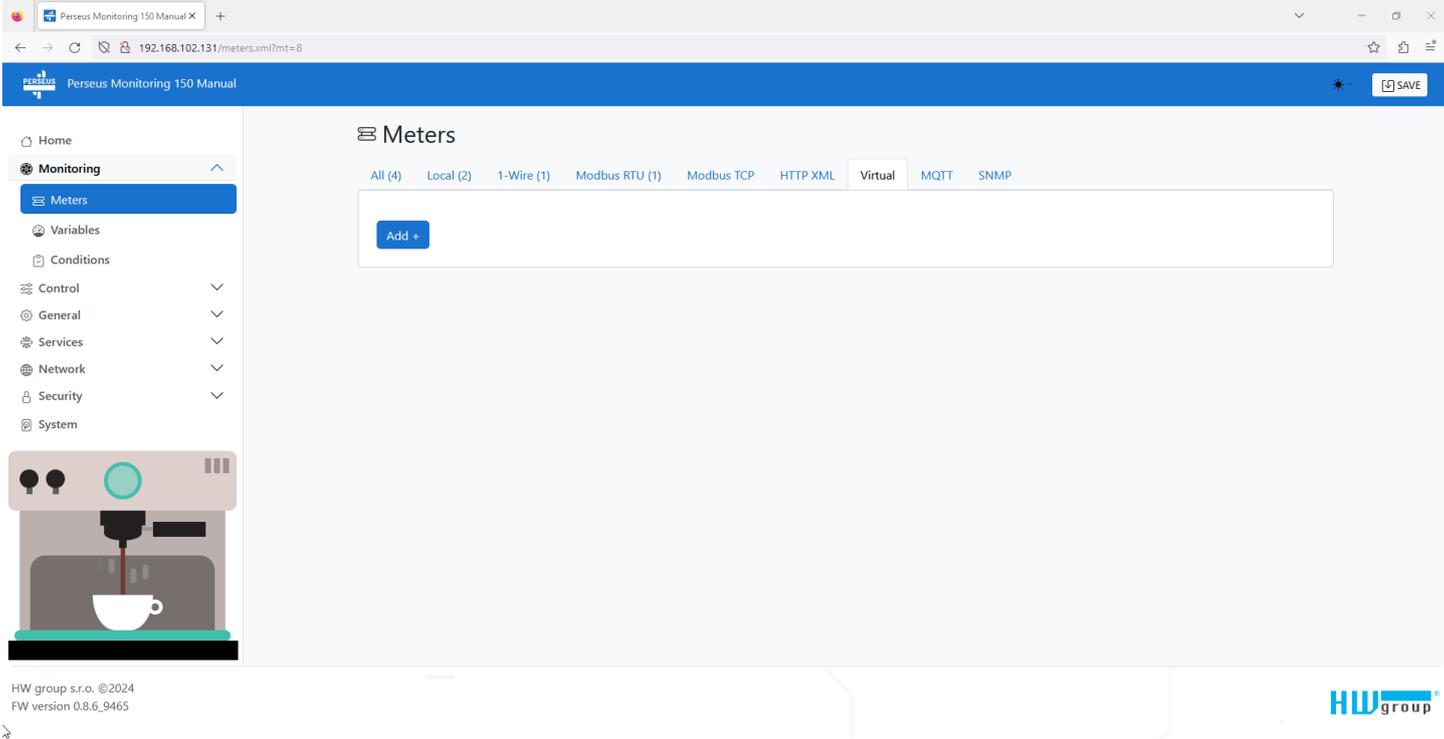
### Section Variables

A well-arranged table of connected variables, their states and values. Depending on the type of interface, it is possible to detect meter variables in this section (**Scan Variables** button) or manually add them (**+ button**).

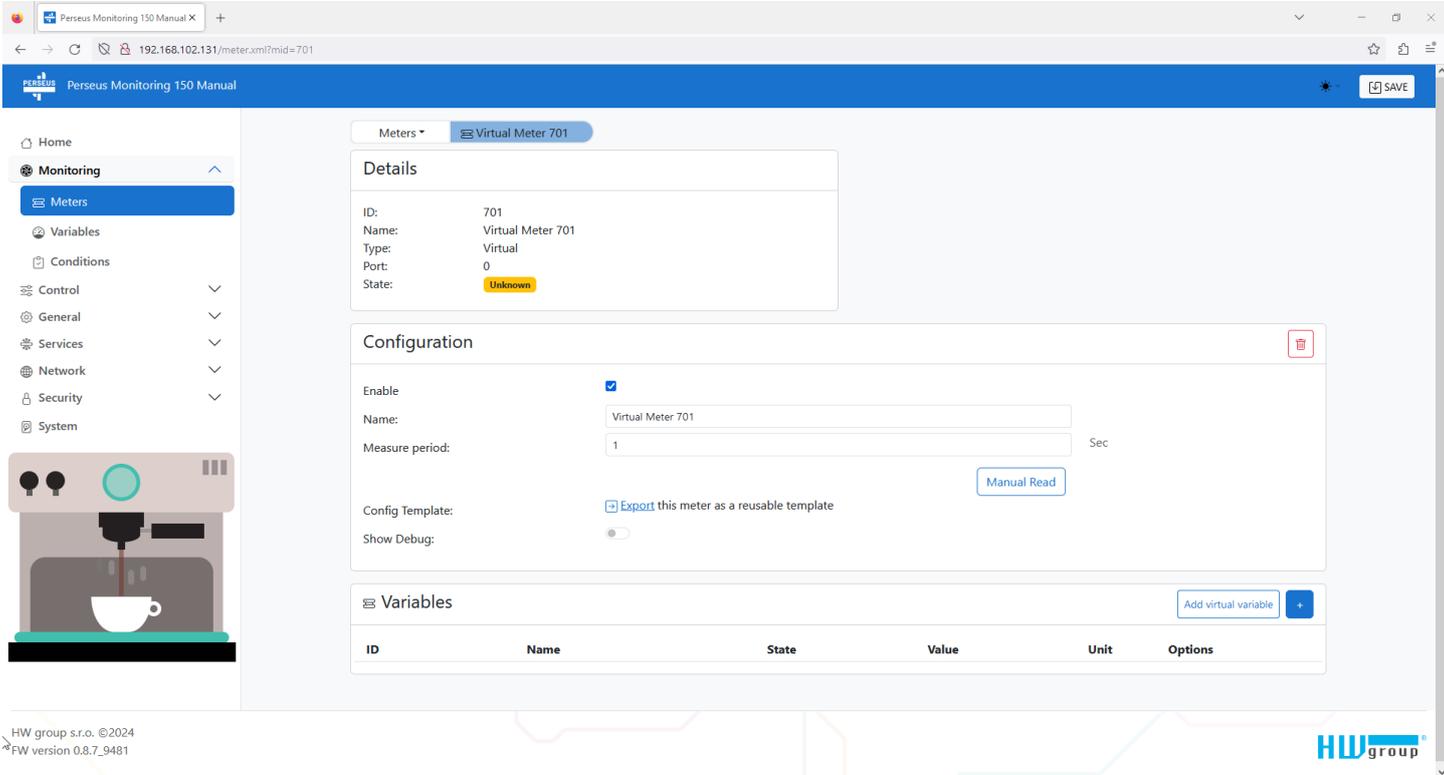
- **ID** – ID of the variable
- **Name** – The name of the variable
- **State** – The current state of the variable
- **Value** – The current value
- **Unit**
- **Options** – Options for working with the variable (Delete/Edit)

# Virtual

The Virtual tab is used to create and manage virtual meters. Virtual meters are used to associate virtual variables, such as recalculated values and quantities, results of logical operations, and so on.



Use the **Add+** button to add a new virtual meter.



### **Details section**

- **ID** – ID of the meter – see chapter Monitoring / Meters
- **Name** – The name of the meter. The name can be changed in the Configuration section
- **Type** – type of meter – see chapter Monitoring / Meters
- **Port** – The port number to which the meter is connected. For local or Ethernet sensors, this is an internal designation.
- **State** – meter status (Unknown/OK/Device Invalid)

### **Configuration section**

- **Enable** – Turns the meter on or off
- **Name** – The name of the meter for easier orientation
- **Read Period** – Reading period – the minimum period is 1s, but it may vary depending on the unit configuration, numbers and types of sensors in order to comply with the necessary timeouts

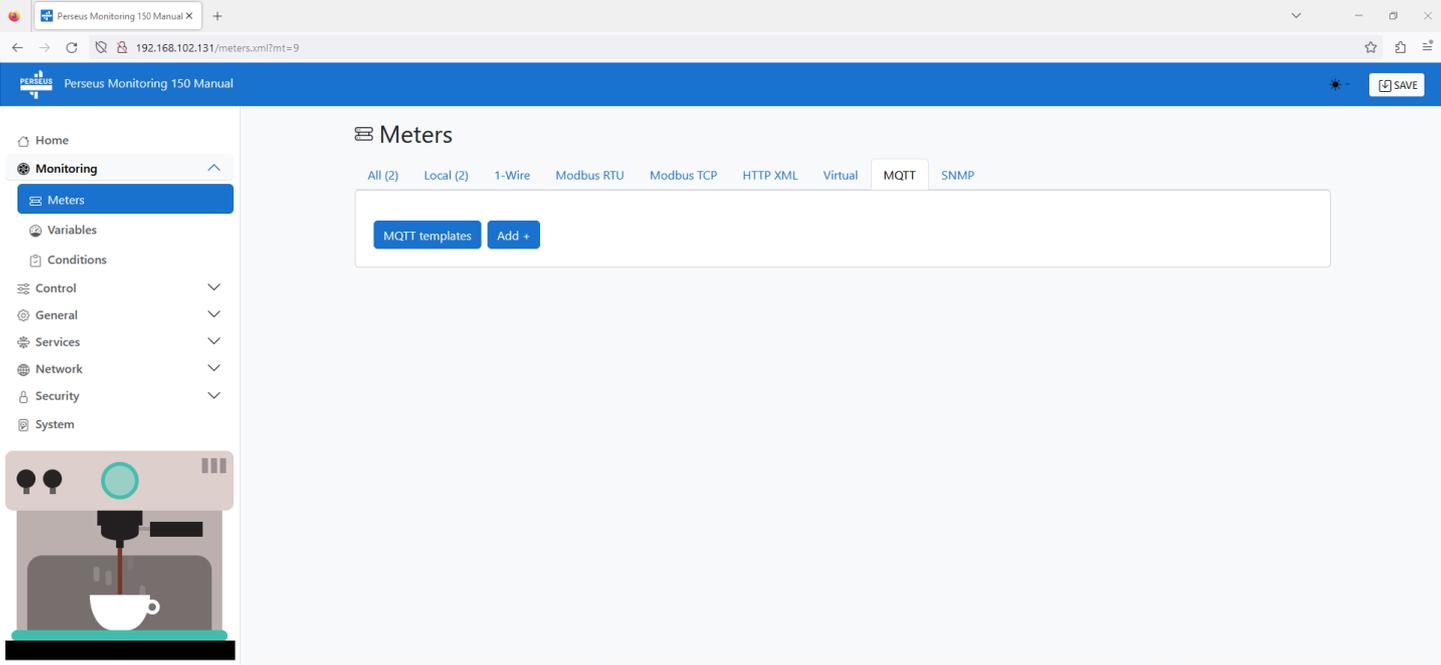
### **Variables section**

A well-arranged table of connected variables, their states and values. Variables can only be added using the **+ button**.

- **ID** – ID of the variable
- **Name** – The name of the variable
- **State** – The current state of the variable
- **Value** – The current value
- **Unit**
- **Options** – Options for working with the variable (Delete/Edit)

# MQTT

The MQTT tab is used to create and manage meters connected via the MQTT protocol. Perseus then behaves like a standard MQTT subscriber.

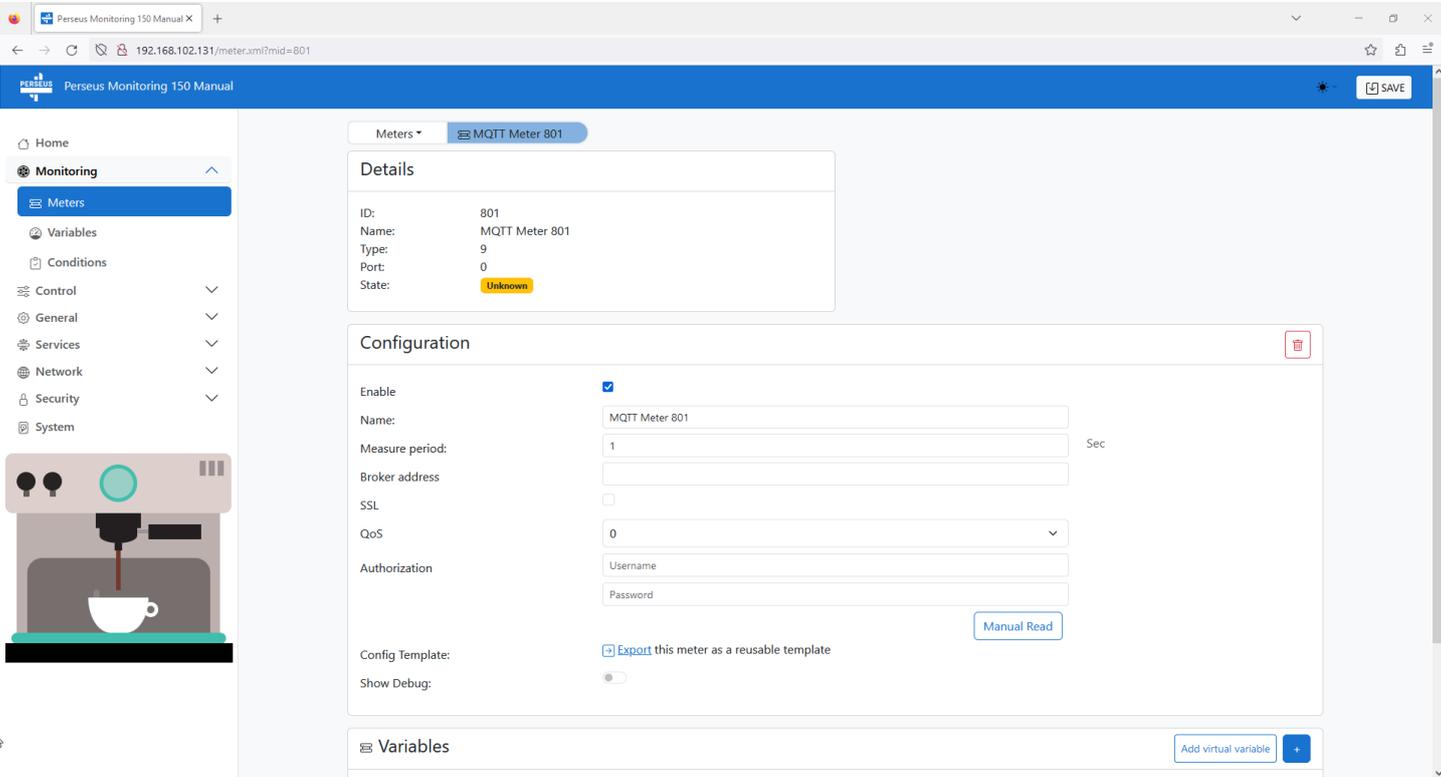


HW group s.r.o. ©2024  
FW version 0.8.7\_9481



MQTT templates are available with the MQTT templates button.

A new meter can be added with the **Add+** button.



### Details section

- **ID** – ID of the meter – see chapter Monitoring / Meters
- **Name** – The name of the meter. The name can be changed in the Configuration section
- **Type** – type of meter – see chapter Monitoring / Meters
- **Port** – The port number to which the meter is connected. For local or Ethernet sensors, this is an internal designation.
- **State** – meter status (Unknown/OK/Device Invalid)

### Configuration section

- **Enable** – Turns the meter on or off
- **Name** – The name of the meter for easier orientation
- **Read Period** – Reading period – the minimum period is 1s, but it may vary depending on the unit configuration, numbers and types of sensors in order to comply with the necessary timeouts
- **Broker address** – set the IP address and MQTT port of the broker to be read
- **Authorization** – name and password for authorization to the remote broker
- **Client ID** – ID of Perseus in MQTT network.
- **QoS** – Quality of Service (Perseus in publisher mode have always “0”)
- **Retained messages** – MQTT Flag that tells MQTT broker to keep last value for any new subscriber, so it doesn’t wait for new published value but instead the new subscriber receives last known value.
- **Publish Period** – the period of sending data to the MQTT broker.
- **Common Topic prefix** – prefix for MQTT Topic (address).

### Debug log section

Used to display the debug dump

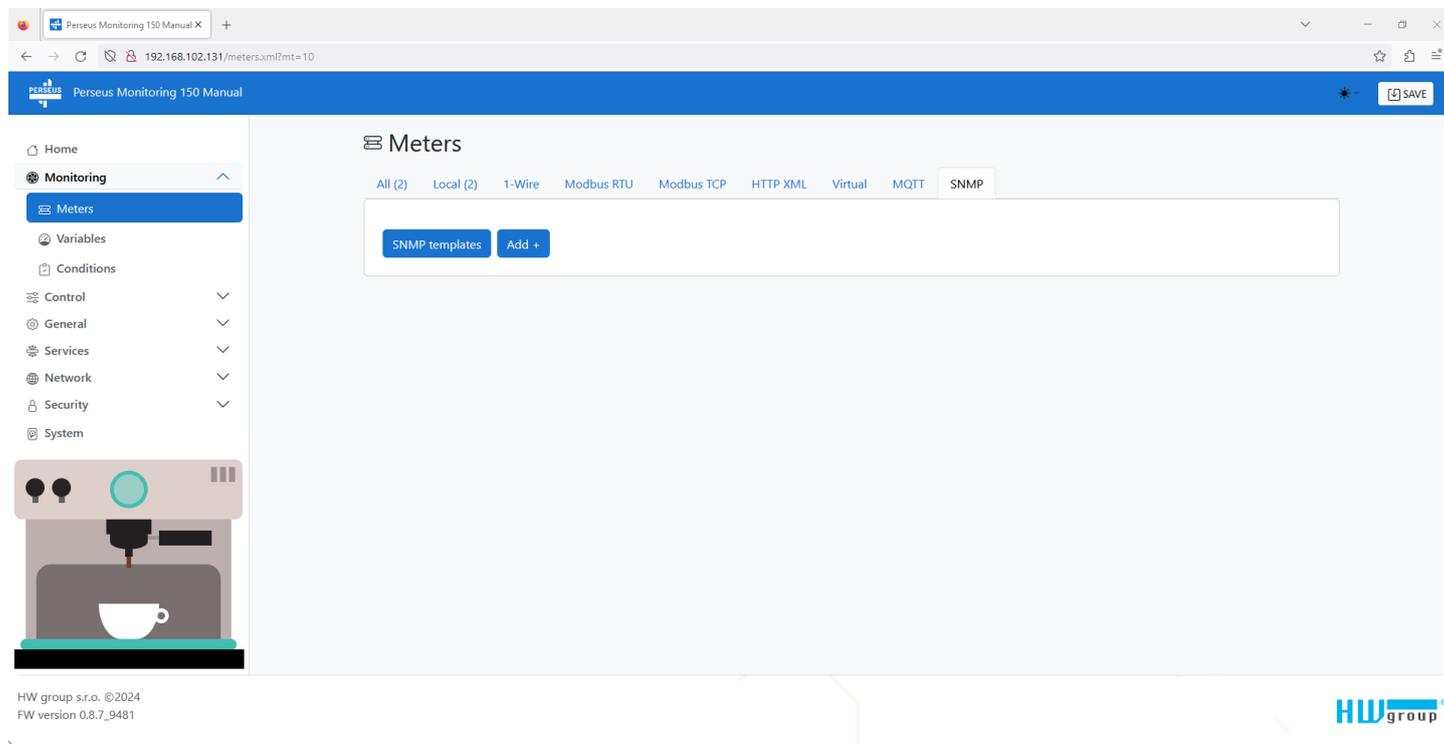
### Variables section

A well-arranged table of connected variables, their states and values. Depending on the type of interface, it is possible to detect meter variables in this section (**Scan Variables** button) or manually add them (**+ button**).

- **ID** – ID of the variable
- **Name** – The name of the variable
- **State** – The current state of the variable
- **Value** – The current value
- **Unit**
- **Options** – Options for working with the variable (Delete/Edit)

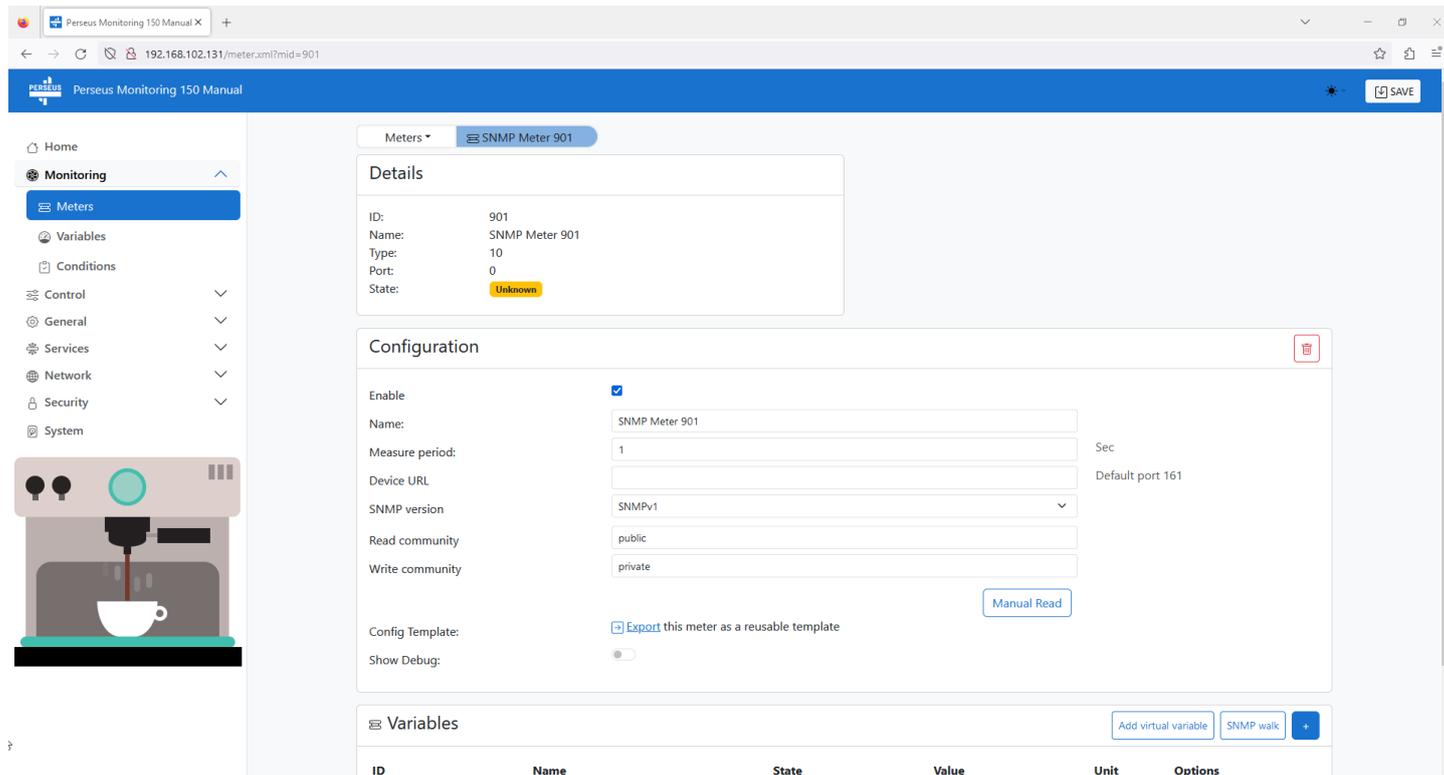
## SNMP

SNMP meters allow you to connect any SNMP agents (SNMPv1 and SNMPv3), and read specific SNMP OIDs from them and work with the resulting value as with a standard sensor. The Perseus family is also equipped with the ability to scroll through the available values (SNMP walk).



SNMP templates are available with the SNMP templates button.

A new meter can be added with the **Add+** button.



### Details section

- **ID** – ID of the meter – see chapter Monitoring / Meters
- **Name** – The name of the meter. The name can be changed in the Configuration section
- **Type** – type of meter – see chapter Monitoring / Meters
- **Port** – The port number to which the meter is connected. For local or Ethernet sensors, this is an internal designation.
- **State** – meter status (Unknown/OK/Device Invalid)

### Configuration section

- **Enable** – Turns the meter on or off
- **Name** – The name of the meter for easier orientation
- **Read Period** – Period reading – the minimum period is 1s, but it may vary depending on the unit configuration, numbers and types of sensors in order to comply with the necessary timeouts
- **Device URL** – IP address and port of the device to be read
- **SNMP version** – use the SNMP protocol to be used for communication
- **Community** – Community for authorization after SNMP

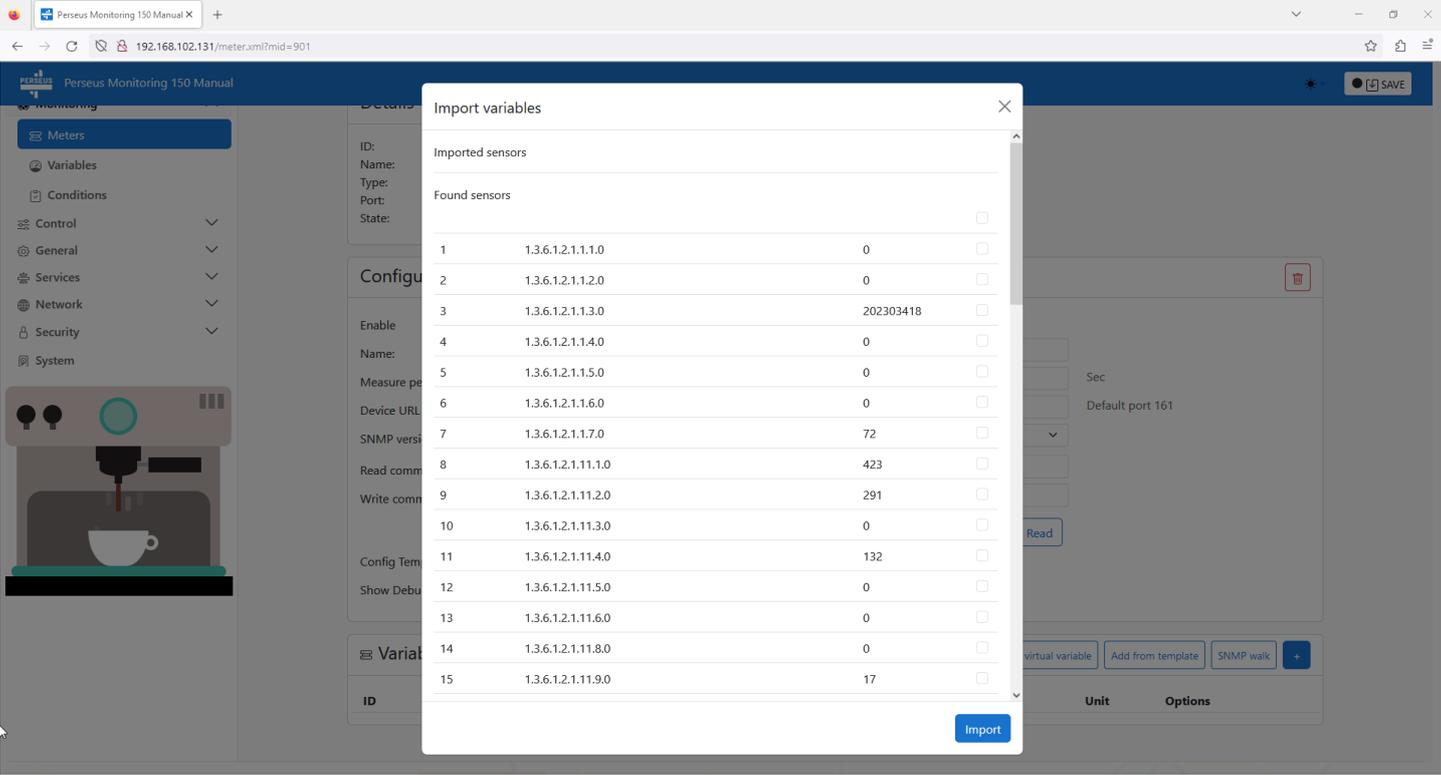
### Debug log section

Used to display the debug dump

### Variables section

A well-arranged table of connected variables, their states and values. Here it is possible to detect meter variables (**Scan Variables** button) or manually add them (**+ button**).

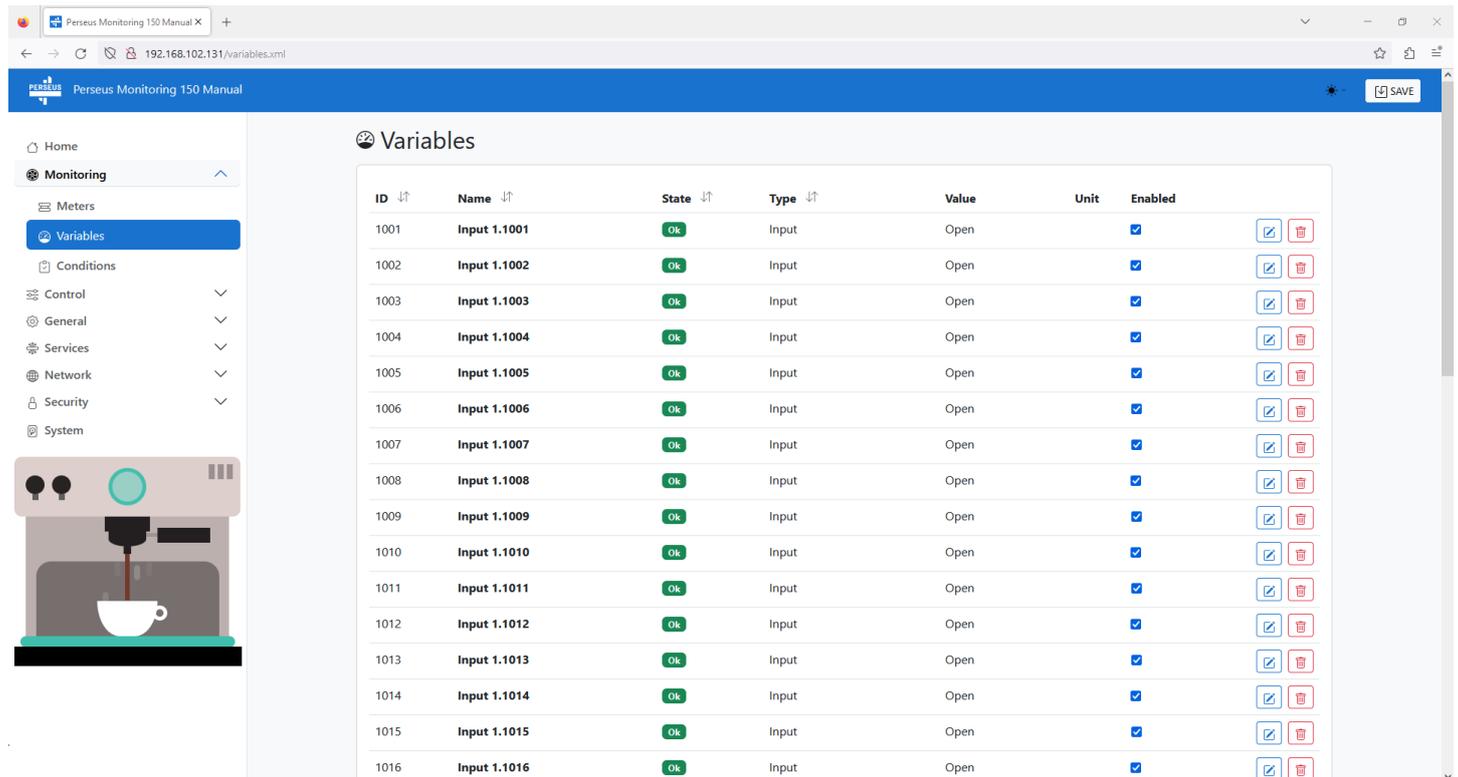
- **ID** – ID of the variable
- **Name** – The name of the variable
- **State** – The current state of the variable
- **Value** – The current value
- **Unit**
- **Options** – Options for working with the variable (Delete/Edit)



To scan the OID, it is possible to select individual values or select them in bulk and then confirm the selection with the Import button.

# Menu Monitoring / Variables

This page is used to view, delete and sort monitored variables.



ID	Name	State	Type	Value	Unit	Enabled	
1001	Input 1.1001	Ok	Input	Open		<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="trash"/>
1002	Input 1.1002	Ok	Input	Open		<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="trash"/>
1003	Input 1.1003	Ok	Input	Open		<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="trash"/>
1004	Input 1.1004	Ok	Input	Open		<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="trash"/>
1005	Input 1.1005	Ok	Input	Open		<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="trash"/>
1006	Input 1.1006	Ok	Input	Open		<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="trash"/>
1007	Input 1.1007	Ok	Input	Open		<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="trash"/>
1008	Input 1.1008	Ok	Input	Open		<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="trash"/>
1009	Input 1.1009	Ok	Input	Open		<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="trash"/>
1010	Input 1.1010	Ok	Input	Open		<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="trash"/>
1011	Input 1.1011	Ok	Input	Open		<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="trash"/>
1012	Input 1.1012	Ok	Input	Open		<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="trash"/>
1013	Input 1.1013	Ok	Input	Open		<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="trash"/>
1014	Input 1.1014	Ok	Input	Open		<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="trash"/>
1015	Input 1.1015	Ok	Input	Open		<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="trash"/>
1016	Input 1.1016	Ok	Input	Open		<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="trash"/>

The information is presented in a clear table containing:

- **ID** – ID of the variable (variable ordering can be changed)
- **Name** – variable name (variable sorting can be changed)
- **State** – Current state of the variable (variable sorting can be changed)
- **Type** – variable type (Input/Output/Sensor, etc.) (variable ordering can be changed)
- **Value** – Current value (it is possible to change the sorting of values)
- **Unit** – Unit
- **Enabled** – options to enable or disable work with variables
- **Icons for deleting and editing variables**

For a description of variable states, see chapter Meter states, variables and conditions.

## Variable

The page includes the ability to edit the variable.

### Configuration section

- **Enable** – enable the variable to be used. If unchecked, Perseus retains the ID of the variable, but does not read, evaluate, or perform subsequent operations linked to it
- **Name** – The name of the variable for easier orientation
- **Home page favourite** – Enables priority display on the homepage (Favourites section)
- **Type** – The type of the variable. See chapter Types of Variables of the Perseus family
- **Decimal digits** – the number of decimal places. Affects the value for calculations and displays.
- **Unit** – The unit of the variable. For inputs and outputs, but also in other cases, it can be blank – the variable is dimensionless
- **Calculation formula** – Possibilities of variable conversion
  - **No calculation** – The displayed value is equal to the measured value. No recalculation is performed
  - **Function** – simple calculation by formula
  - **Calculation by LUA script** – Recalculation using a function defined by a LUA script – For more information, see chapter Scripts

Depending on the interface, the Configuration section may have certain specifics:

### Modbus specific

- **Function Code** – define the Modbus function used to work with the variable – See below

- **Modbus register** – set the Modbus register number. The absolute address and the Modicon address are automatically displayed next to the register number (e.g. Absolute Address: 5 [0x5], Modicon Register: 40006)
- **Data type** – define the data type of the variable (INT/UNIT/FLOAT/BIT) and bit length (8/16/32/64 bits)
- **Swap bytes** – Usually, when sending multibyte variables, the higher byte is sent first and then the lower one, but this is not always the rule. *Swap bytes* allow you to swap the order of byte values

### SNMP specific

- **OID** – Entire SNMP OID (Object Identifier) of the required variable
- **Data type** – define the data type of the variable (Integer)

### Value Names Section

The Value Names section is used to define text values for status sensors. For example, Open/Close, Flooded/Torn/OK and so on. The value is always determined by a number for the needs of machine readability, but it can also be named for visualization purposes. Value Names can also be defined for continuous sensors, but this option does not make much sense.

### Conditions Section

The Conditions section serves as an overview and creation of conditions (safe ranges) for further processing. On this page, once added, you can only define:

- **ID** – ID of the condition within the given variable
- **Name** – Condition name – the entire condition ID is automatically added to the name. The name can be changed in the edit of the condition
- **State** – Displays the status of the condition after evaluation. For a description of variable states, see chapter Meter states, variables and conditions
- **Min** – Minimum allowed value
- **Max** – Maximum allowed value
- **Hysteresis** – Area of inertia
- **Delay** – Minimal delay for activation of the AlarmHi or AlarmLo state
- **Enabled** – Enable or disable the condition for the given variable
- **Icons for editing and deleting**

For more information about individual parameters, see the chapter Editing Conditions.

**Each condition has its status given by the evaluation of the currently obtained value (after recalculation).** It is not uncommon for one condition to be in the Alarm state while another is in the OK state. On the Homepage, the variable shows the number of Condition in the Alarm state.

A new action can be added by pressing the + button in the Conditions section, and existing ones can be edited by clicking on their name or on the appropriate edit icon.

If a condition to which actions are linked is deleted, the actions will remain defined in the system and are not just executed (unless another condition is linked to them).

## Portal settings Section

The section is used to enable sending a variable to the portal using the HWg Push protocol. The same parameters can be set on the General / Portal page

Due to the fact that Perseus units can work with a very high number of variables, but usually not all read variables are monitored, unlike other devices of the Perseus HW group units, they do not automatically send all measured variables to the portal, but only those for which this function is manually enabled are sent.

- **Push enable** – enable or disable the sending of the tag to the Sensdesk technology portal. This allows you to send only monitored parameters to the portal.
- **Autopush delta** – if the value increment is more than specified by the Autopush delta parameter since the last time data was sent to the portal, an extraordinary data push will occur. If the parameter is 0, the function is disabled for this variable.
- **Portal range** – set the allowed range of values for working with the portal. If not set, the state of the tag is not evaluated for the purposes of working with the *Sensdesk Technology portal*. If set, it is possible to monitor the status of the variable and, if the set range is exceeded, to call up an extrapush to the portal. Since evaluation is not necessary for most parameters, *the Portal range is not* set by default. The parameters are identical to the parameters in the Conditions section:
  - **ID** – ID of the condition within the given variable
  - **Name** – Condition name – the entire condition ID is automatically added to the name. The name can be changed in the edit of the condition
  - **State** – Displays the status of the condition after evaluation. For a description of variable states, see chapter Meter states, variables and conditions
  - **Min** – Minimum allowed value
  - **Max** – Maximum allowed value
  - **Hysteresis** – Area of inertia
  - **Delay** – delay for activation of the AlarmHi or AlarmLo state
  - **Enabled** – enable or disable the condition for the given variable
  - **Icons for editing and deleting**

The screenshot displays the Perseus Monitoring 150 Manual web interface. On the left is a coffee machine icon. The main content area is divided into several sections:

- Value Names:** A table with columns 'Value' and 'Name'.
- Dynamic view:** A line chart showing 'value' on the y-axis (ranging from 2.830 to 2.850) and 'time' on the x-axis (ranging from 1 to 1000).
- Conditions:** A table with columns: ID, Name, State, Min, Max, Hysteresis, Delay, and Enabled. It contains one entry: '1 Condition 2.2001.1' with state 'Alarm high'.
- Portal settings:** Includes 'Push enable' (checkbox), 'Autopush delta' (input field with '0'), and 'Portal range'.
- Portal range:** A table with columns: ID, Name, State, Min, Max, Hysteresis, Delay, and Enabled. It contains one entry: '1000 Portal Range 2.2001.1000' with state 'Alarm high'.

At the bottom left, it says 'HW group s.r.o. ©2024' and 'FW version 0.8.7\_9481'. At the bottom right is the 'HW group' logo.

HW group s.r.o. ©2024  
FW version 0.8.7\_9481



**Details section**

The Detail section allows you to view an overview of information about a variable, such as the value, its text representation (if any), status, and a chart. For more information about variable editing parameters, see the Variables chapter.

# Menu Monitoring / Conditions

Since a *Condition* is always bound to a specific variable (*Variables*), the *Conditions page* contains only an overview of existing conditions, their status and links to *Meter* and *Variable*.

Condition	Meter	Variable	State
Condition 1.1301.1	Main Board Meter 1	WLD 1.1301	Ok
Condition 2.2001.1	Diagnostic Meter 2	Uptime 2.2001	Alarm high
Portal Range 2.2001.1000	Diagnostic Meter 2	Uptime 2.2001	Alarm high

HW group s.r.o. ©2024  
FW version 0.8.7\_9481

HWgroup

- **Meter** - Name of the *Meter* to which the condition is attached. Contains a link to edit the *Meter* (it is possible to change the order of meters)
- **Variable** - The name of the *Variable* to which the condition is bound. Contains a link to the *Variable edit* (variable ordering can be changed)
- **Condition** - The name of the *Condition* to which the condition is attached. Contains a link to edit the *Condition* (it is possible to change the order of the conditions)
- **State** - condition state (it is possible to change the sorting of states) A description of the condition states can be found in the chapter *Meter states*, *variables* and *conditions*

## Condition Editing

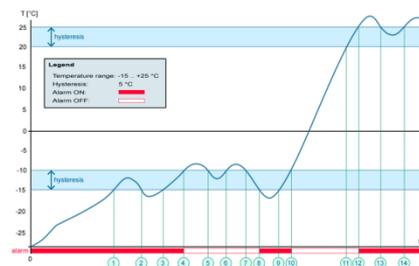
The screenshot shows the 'Condition 1.1301.1' configuration page. The 'Configuration' section includes fields for Name (Condition 1.1301.1), Enable (checked), Min (2), Max (2), Hysteresis (0), and Delay (0). The 'Details' section shows ID (1), Unique ID (1.1301.1), State (OK), Variable (WLD 1.1301), Current value (2), Value state (OK), and Meter (Main Board Meter 1). The 'Schedule' section has 'Active on' set to 'Always'. The 'Actions' section shows 'No actions assigned' and a 'Create new Action' button.

HW group s.r.o. ©2024  
FW version 0.8.7\_9481

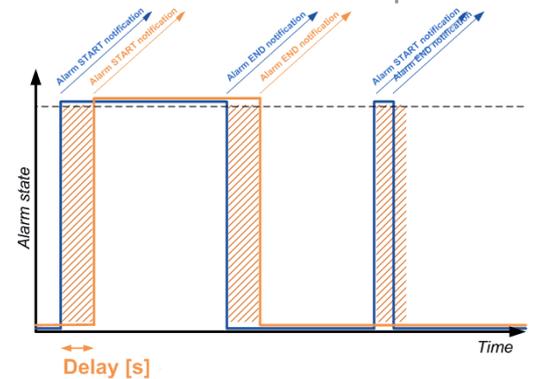


### Configuration section

- **Name** – The name of the condition for easier reference. By default, it is pre-filled as a compound "Condition ID\_meter.ID\_values.ID\_condition" (Condition 109.109001.1)
- **Enable** – enable (activates the condition). Disabling disables follow-up actions without having to turn them off or delete them individually, or even delete the conditions themselves. The function is suitable for temporary suspension of alarm actions, for example during a planned outage of the monitored technology.
- **Min** – The minimum allowed value. If the monitored value is lower, the **AlarmLo status occurs**
- **Max** – The maximum value allowed. If the monitored value is higher, the **AlarmHi status occurs**
- **Hysteresis** – The *Hysteresis value* defines the width of the tolerance band (inertia area) for returning the condition to the OK state. The function prevents multiple alarms from occurring in cases where the value oscillates around the set point. The function is evident from the graph.  
Without the inner hysteresis band of 5°C, the alarm triggered at point 8 would end at point 9, thanks to the hysteresis function, the alarm is extended until the temperature rises to the end of the hysteresis band (point 10)  $5^{\circ}\text{C} + (-15^{\circ}\text{C}) = -10^{\circ}\text{C}$ .



- Hysteresis = 5°C - Unit sends 3 E-mails (SMS) - Alarm in points 0..4, 8..10, 12 and onwards
- No hysteresis (0°C) - Unit sends 8 E-mails (SMS) - Alarm at points 0..1, 2..3, 8..9, 12..13, 14 and more
- Delay - Delays sending information about the start and end of the alarm.



### Details section

The details section contains an overview of the condition's properties:

- **ID** - ID of the condition within Variables.
- **Unique ID** - a unique ID within the perseus unit. It consists of ID\_meter.ID\_values.ID\_condition
- **State** - current state of the condition
- **Meter** - The meter to which variables with this condition are connected
- **Variable** - Variable to which this condition is bound
- **Current value** - Current value variable
- **Value state** - This is the status of Variables, not specific conditions, unless it is a condition with ID=1
- **Condition State** - current condition status
- **State delayed** - if the Delay setting is set, displays how long the state change will be delayed

### Schedule section

This section is used to set the validity of the condition depending on the real time. This makes it possible, for example, not to trigger an event outside of working days, or to perform different actions during and outside of working hours. The default value is Always, so the condition is always applied. A new schedule can be added on the Control=>Scheduler page. The Edit button is used for redirection and the changes made on the page are not applied and must be saved first using the Save button.

### Actions section

Use the *Action* section to add one or more actions of the type:

- **E-mail** - sends a message by e-mail
- **SMS** - send a message via SMS.
- **SNMP Trap** - sends a message via SMS
- **Set Output** - sets the output to the desired value.
- **Script** - Runs the defined LUA Script (actually only Perseus Industrial models)

It is either possible to assign an existing action by selecting it at the *Assign action* position and pressing *the Assign button*, or you can open the dialog of creating a new action by clicking on the *Create Action button*.

For a description of condition states, see Meter states, variables and conditions.

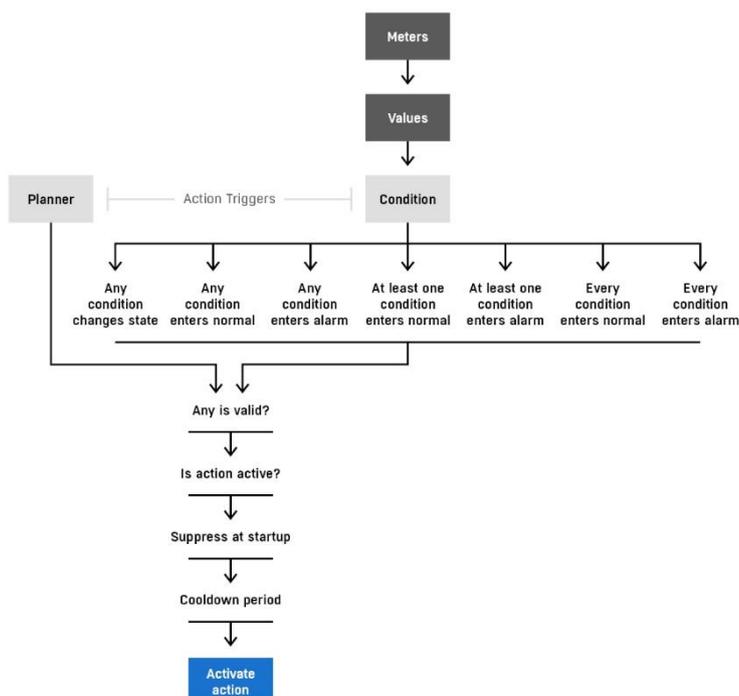
# Menu Control / Action

This page provides an overview of existing events and their editing. The table contains information about the event's name and ID, type (Email/SMS/Set Output/SNMP Trap), and whether it is enabled.

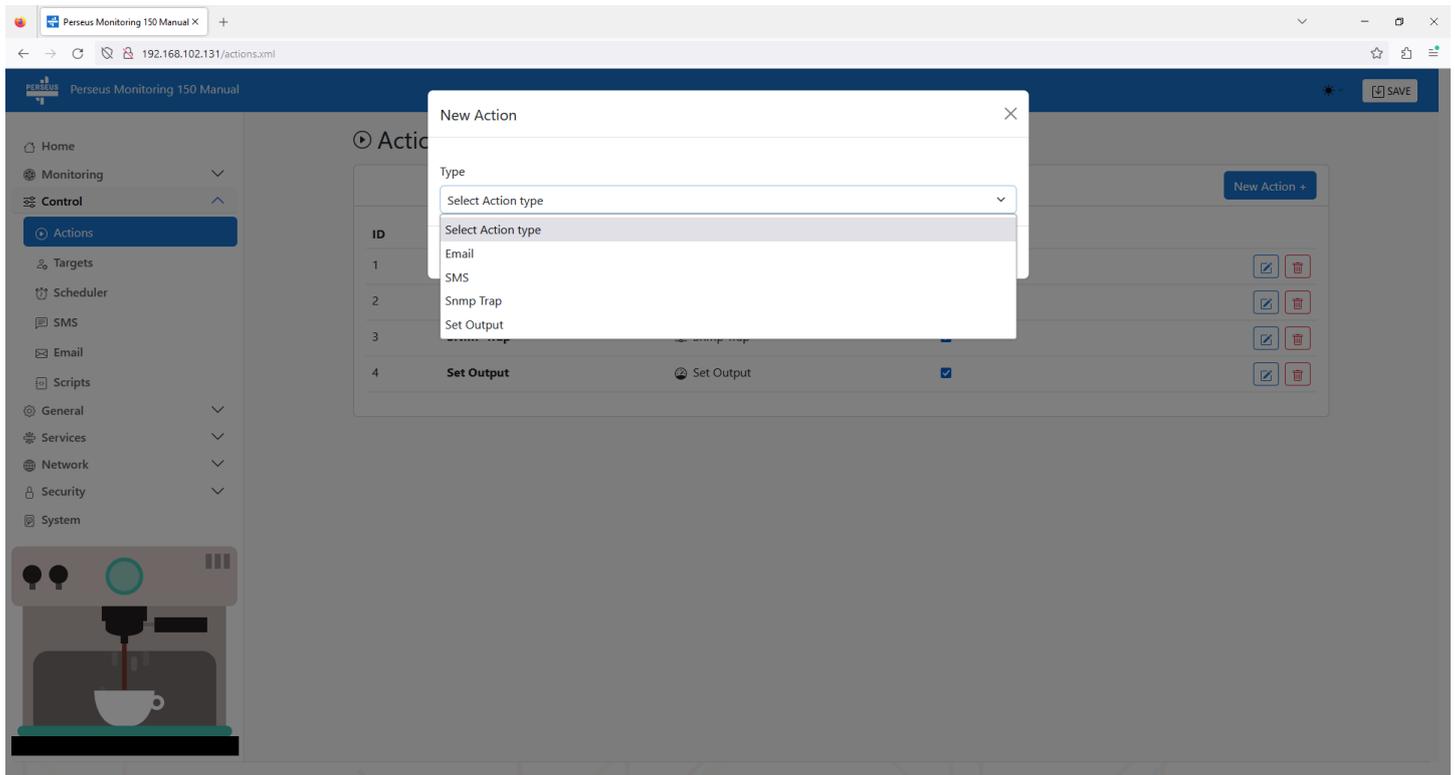
ID	Name	Type	Enabled
1	Email	Email	<input checked="" type="checkbox"/>
2	SMS	SMS	<input checked="" type="checkbox"/>
3	SNMP Trap	Snmp Trap	<input checked="" type="checkbox"/>
4	Set Output	Set Output	<input checked="" type="checkbox"/>

Action is an action element that is triggered either in real time by a scheduler, by changing the state of an assigned condition, or by a combination of both, and is complemented by a wide range of options and conditions:

## Dependency scheme

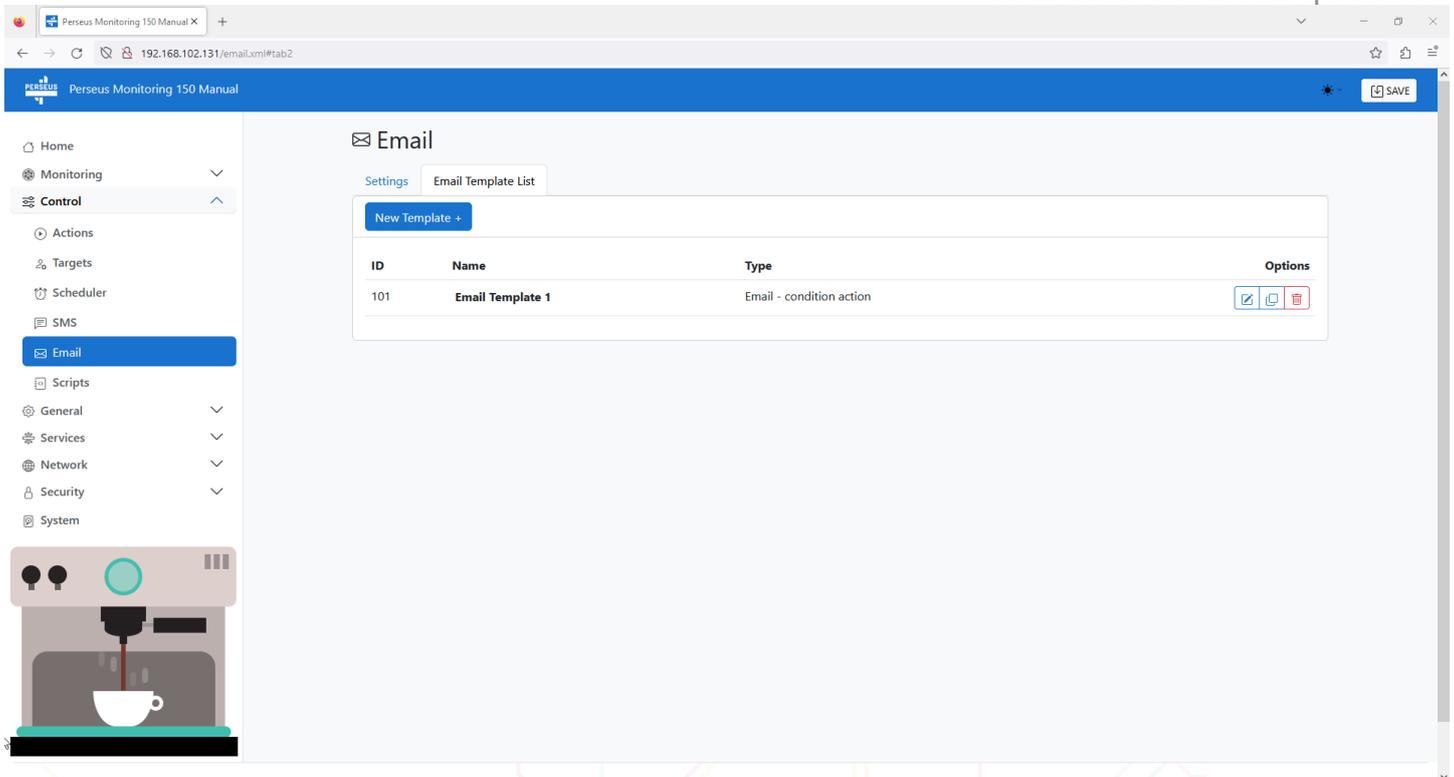


The action can be edited by clicking on the name of the existing action or on the corresponding edit button. To create a new action, use the "New Action +" button, which launches a simple wizard to add a new action.

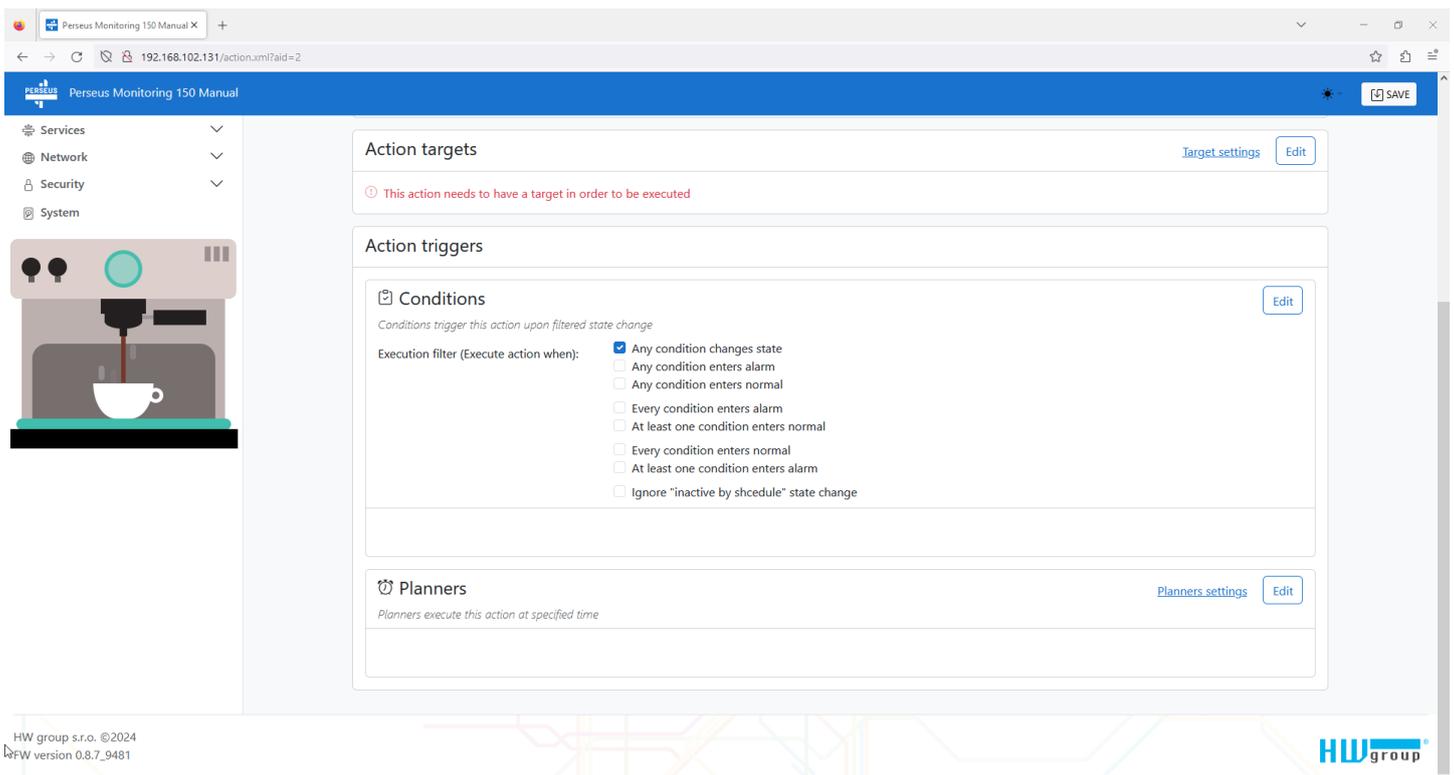


The modal window contains only limited options for setting action parameters, but it contains the basic ones, i.e.:

- **Type** – Action type – Can be switched to a different action type
- **Name** – The name of the action – The action has a naming option for easier orientation. If it is not filled in, it will be automatically filled in as "Action ID"



Clicking on the name of the action or the edit button will open the detailed settings of the action:



## Action Features

- **Name** - The name of the action is used for clearer work with actions within the system
- **Enable** - Enables or disables the action. This functionality is suitable for suppression of the performance of the action, for example, during planned outages of monitored technologies, long-term failures, etc

- **Cooldown period** - the time in milliseconds for which the action execution is postponed - Equivalent to the Delay parameter for conditions.
- **Type** - type of action (E-mail, SMS, Set Output, SNMP Trap)
- **Template** (SMS and E-mail actions only)- Message template It is selected from a list of existing actions together with a link to edit or create a new template. By default, a default template for Alarm messages is always created on the device. In the future, a template for periodic reports will be added (a template type flag will be added).
- **Output Target** (Set Output only) - Select the output that will be controlled by the action. A single output can only be served by one action, so if you want to select an output already served by another action, this will not be possible with an indication of which action the output is controlling. For the needs of serving output based on multiple conditions, it is possible to use actions bound to a virtual value that executes the required logical function using LUA Script.
- **Ring out** (SMS type action only) - Ring - SMS message is always sent and when this flag is activated, the phone to which the message was sent is subsequently ringed to emphasize the existence of the message.
- **Suppress execution after device start** - suppress the execution of the action after the device starts. If the conditions for performing an action are met at system startup, this action will not be performed - useful for system restarts, upgrades, etc.

### Action triggers

Action triggers represent action triggers. The trigger of the action can be the Scheduler, or in this case the planner, which will run the action periodically according to the relevant schedule, or the condition linked to values. Combinations of these triggers are also possible.

- **Conditions section** – Attaches or detaches from the condition action that triggers the action. If an action has at least one condition assigned, it does not have to have any planer assigned, and vice versa. However, both types of triggers can be freely combined.
  - **Execution filter (Execute action when)** - filter for starting the execution of the action
    - **Any condition changes state**
    - **Any condition enters alarm** - The action is executed if any condition enters the alarm (AlarmHi or AlarmLo) - the OR function is applied to all connected conditions (the Alarm state must be true on at least one condition)
    - **Any condition enters normal** - the action is executed if any condition enters normal (OK state) - the OR function is applied to all connected conditions (the OK state must be true on at least one condition)
    - **Every condition enters alarm** - The action is executed if all connected conditions enter the alarm (AlarmHi or AlarmLo) - the AND function is applied to all connected conditions (the Alarm state must apply to all connected conditions)
    - **At least one condition enters normal** - The action is executed if the first of the connected conditions returns to the normal state

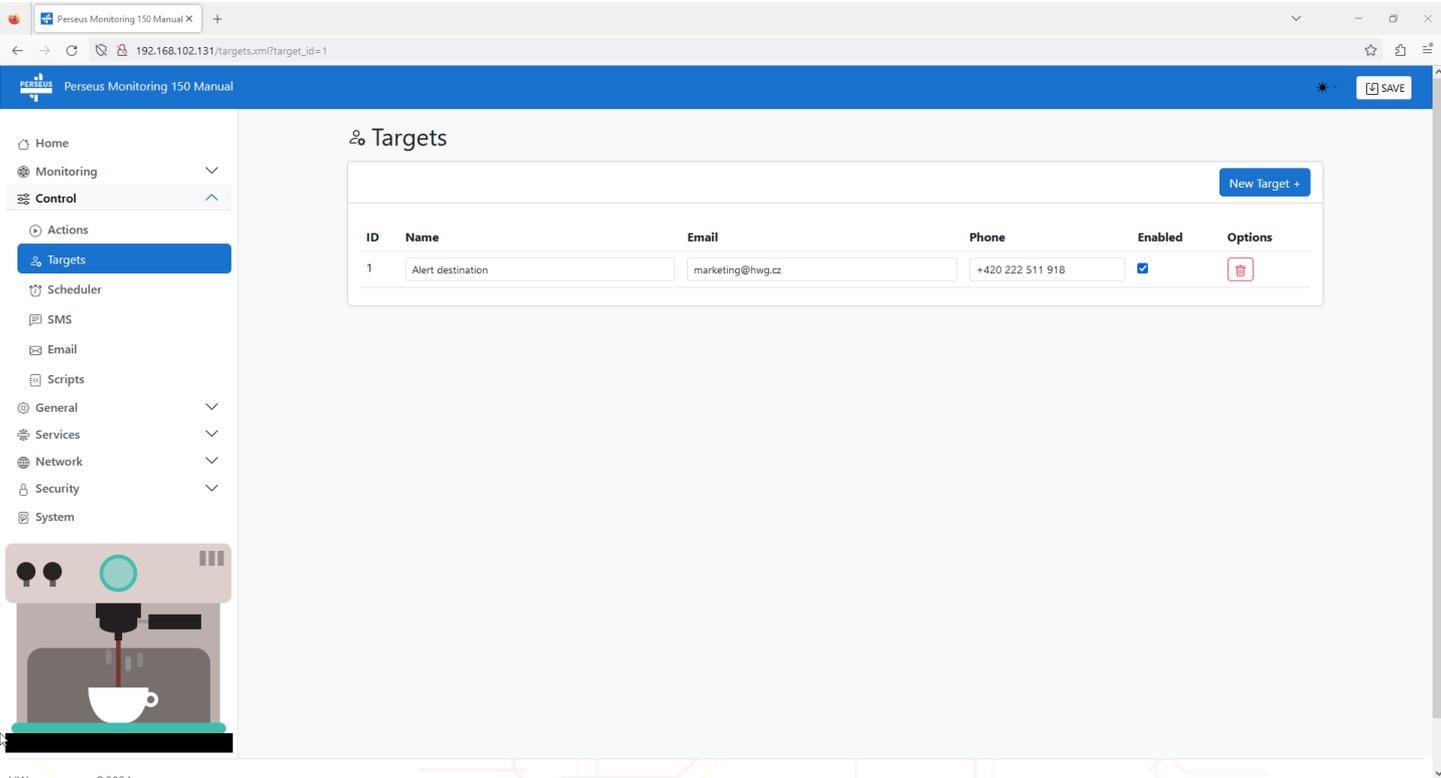
- **Every condition enters normal** - The action is executed if all connected conditions are normal (OK state) - the AND function is applied to all connected conditions (the OK state must be true on all connected conditions)
- **At least one condition enters alarm** - The action is executed if the first of the connected conditions is set to the normal state
- **Ignore "inactive by schedule" state change** - The action is not executed if the scheduler changes its state
- **Planner section** (old name Schedules) - Attaches or detaches from scheduler actions that trigger the action. If an event has a calendar assigned to it, it does not have to have a condition assigned to it and vice versa. However, both types of triggers can be freely combined.

***Action targets section (only action types that require a cite definition)***

Attaches or detaches from the target action for messages.

# Menu Control / Targets

The page is used to create destinations for SMS and Email alarms. It is de facto a directory.

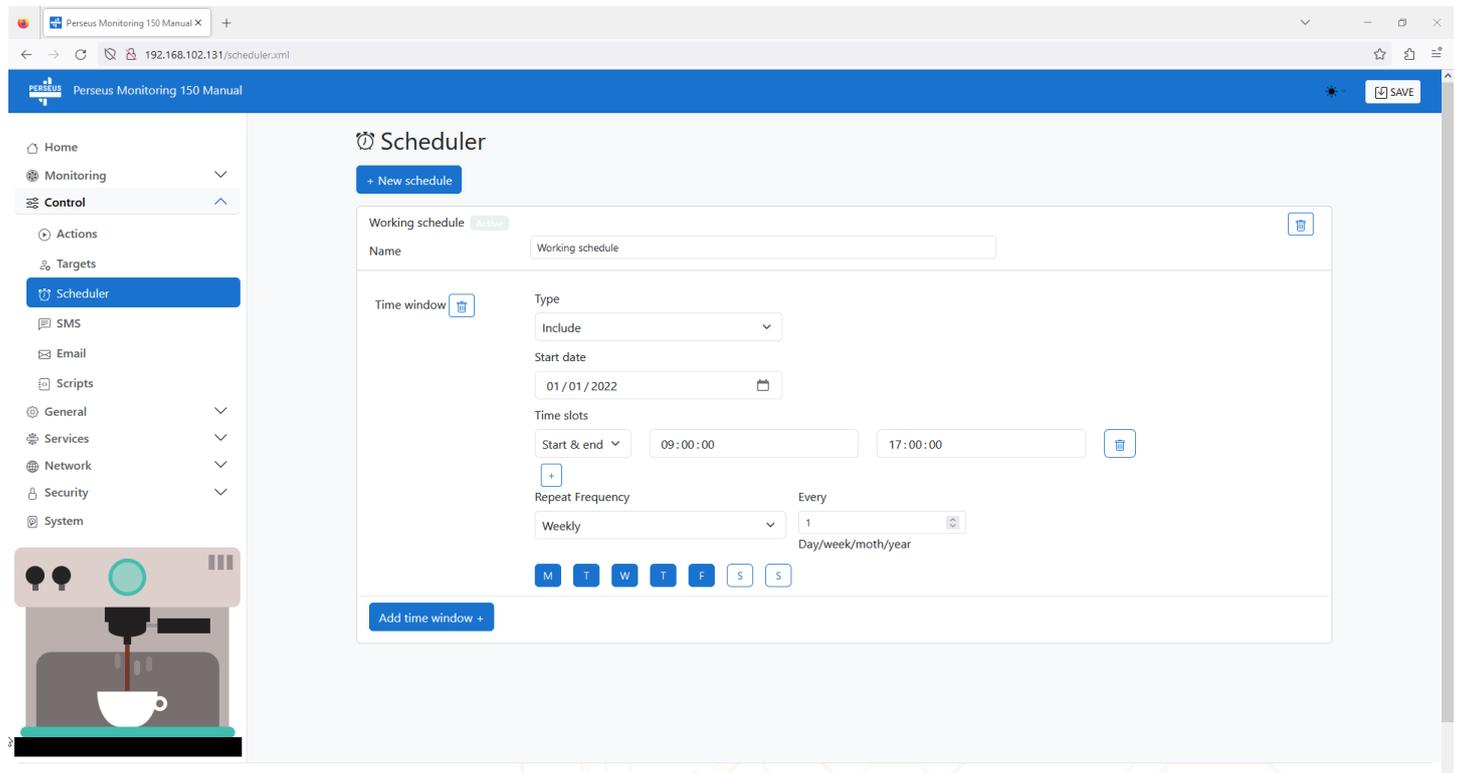


An email address and a phone number can be defined for each target (user). Individual recipients are then assigned to actions.

In the future, targets for SNMP traps will also be added here.

# Menu Control / Scheduler

The page is used to define schedulers that can serve as a parameter of the Condition activity or as an action trigger.



Within the Perseus unit, one or more schedulers (calendars) can be defined and they can be used to condition the validity of Conditions or trigger actions. These schedulers can also be combined with each other to create more complex constructs such as activity conditions only during working hours, but not on public holidays.

For each *Scheduler*, the following is defined:

- **Name** - The name of the scheduler - used to make it easier to work within the Perseus unit
- **Time window** - define the time window that the scheduler interprets. Multiple time windows can be defined within one plan (for example, for the purposes of defining different working hours on different days – office hours)
  - **Type** - window type
  - **Include** - Scheduler is active, inside the defined time window
  - **Exclude** - Scheduler is active, outside the defined time window
  - **Exclude Schedule** – Exclude another scheduler Exclude another schedule (e.g. the public holiday scheduler can be excluded from the scheduler of working hours Mon-Fri 7-17)
  - **Select schedule** - Selects the scheduler or time window that will be excluded from this
  - **Start date** – the start date of the planner's validity (it can be in the past) allows you to set the validity of the plan, for example, for company-wide holidays
  - **Time slots** – Range of time validity – multiple time ranges can be defined within the day (e.g. 0:00-07:00 and 16:00-23:59 for the definition of

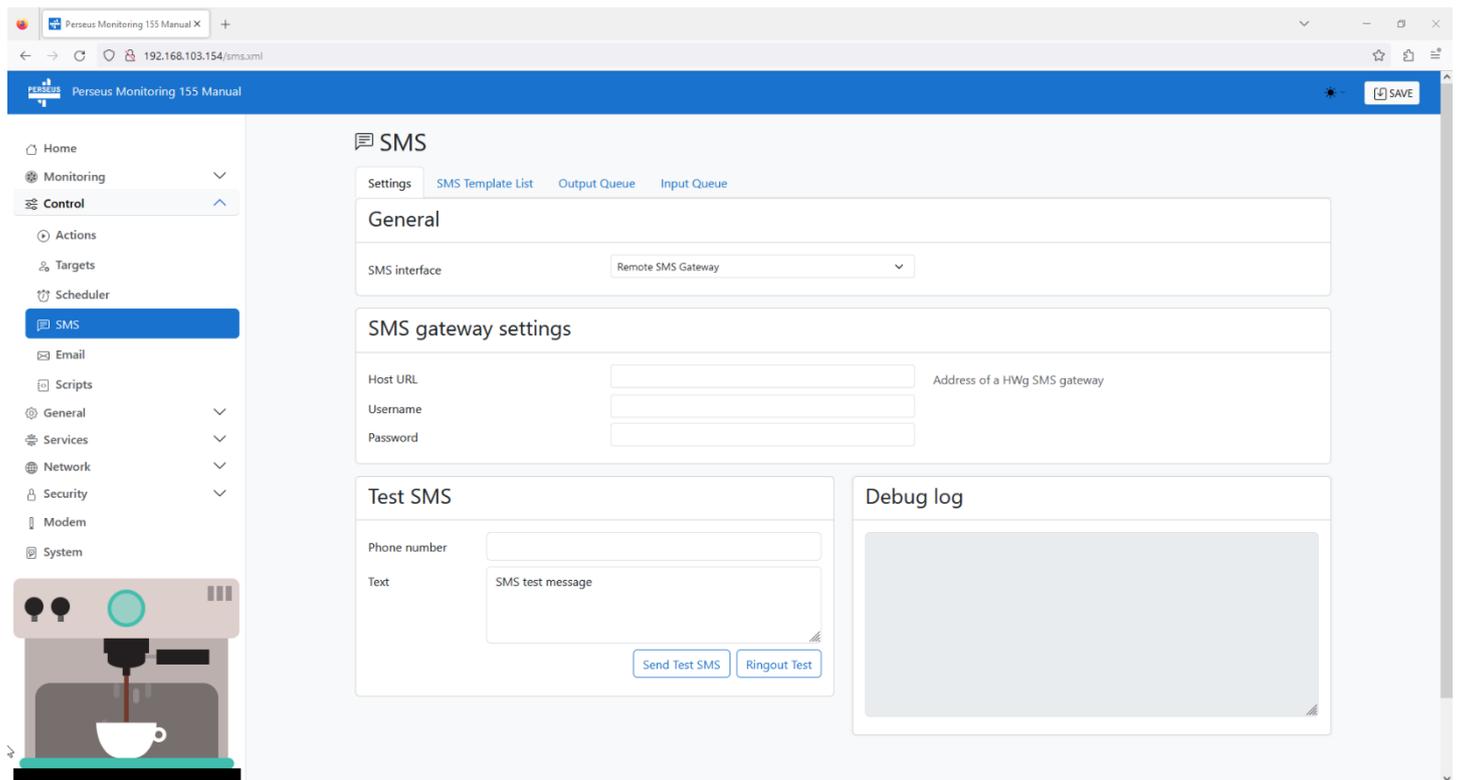
heating). However, it is possible to set, for example, the start or end time of the event, for example for scheduling the sending of periodic e-mails, or switching the output with the Pulse Timer.

- **Repeat Frequency**
  - **Never** – this is a one-time event that will not recur
  - **Daily** – daily repetition
  - **Weekly** – Specific days of the week can be defined when the scheduler will be applied.
  - **Monthly** – Monthly recurrence – Specific numbers of days in the month when the scheduler will be applied can be defined.
  - **Yearly** – Yearly recurrence – Specific dates in the year when the scheduler will be applied can be defined.
- **Every** – recurrence period (Day/week/month/year) – Every 2nd Tuesday, 1st Wednesday of the month, etc.

Most of the more complex schedules can be applied in multiple ways. For example, it is possible to create a working time planner, from 08:00 to 16:00 every working day, and use Exclude Schedule to insert a public holiday calendar into it as an exception (so it can be applied multiple times), as well as it is possible to define a scheduler containing 2 time windows, the first of the Include type with a time range from 08:00 to 16:00 every working day and the second of the Exclude type containing a list of public holidays, respectively, exceptions. Similarly, 2 Wednesdays of the month can be applied, where the definition of a monthly repetition from the 8th to the 15th day of the month together with a second window with weekly repetition every Wednesday can achieve the desired one.

# Menu Control / SMS

Contains SMS gateway configuration.



## General Section

SMS interface - allows you to define whether the SMS gateway function is active and whether the built-in modem or remote gateway is used.

- **Disabled** - The SMS function is disabled
- **Remote SMS Gateway** - HWg-SMS-GW3 (or newer models) will be used for sending messages
- **Internal** (only models with built-in LTE modem) - an internal modem will be used for sending messages. You can find its settings on the Modem page

## SMS gateway settings section

This is where the parameters of the remote gateway are defined

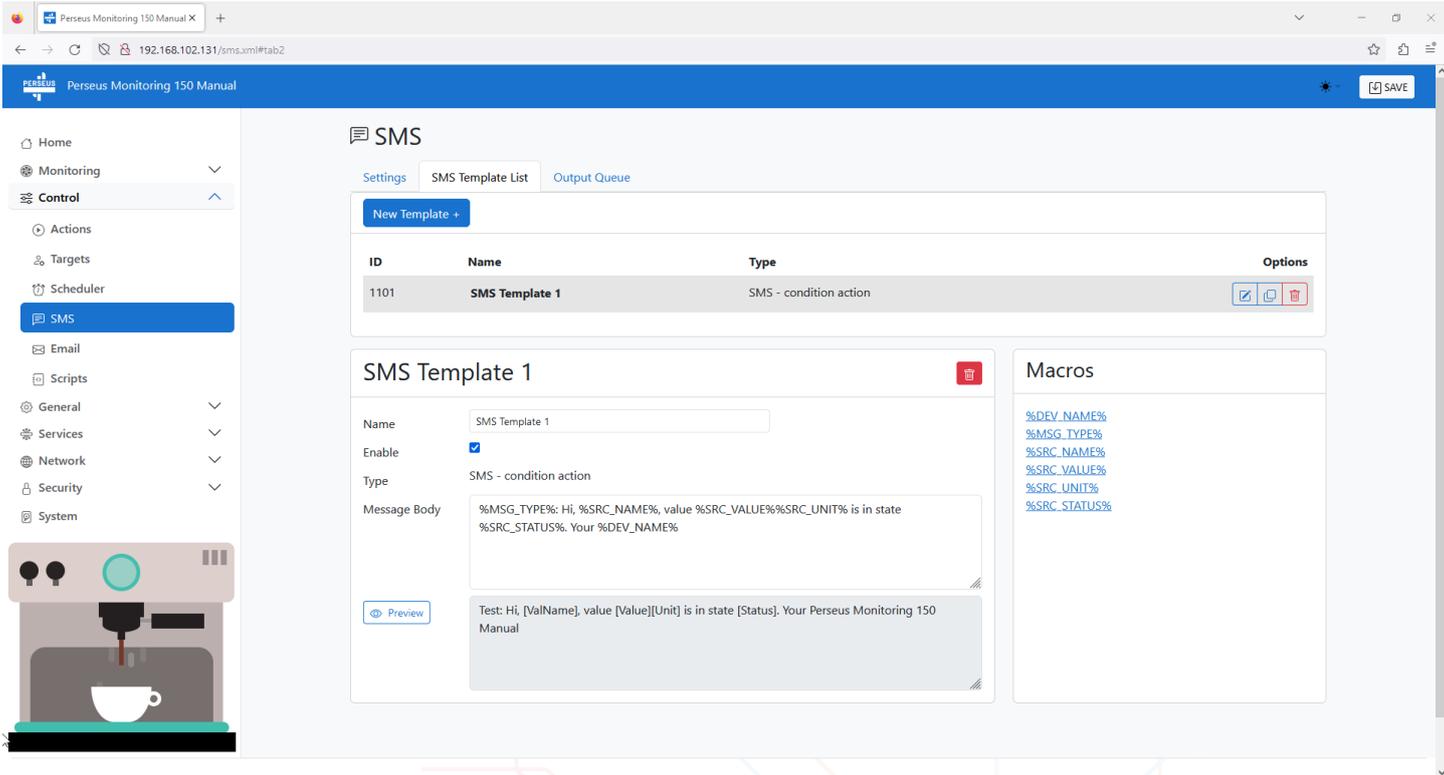
- **Host URL** - IP address or URL of the HWg-SMS-GW3 remote gateway. By default, everything is sent to the Service.xml service on port 80. If other parameters are to be set, the full path including the port should be included in the Host URL.
- **Username/Password** - Authorization parameters of the remote SMS gateway

## SMS Test Section

It is used to send a test message (Text) to a specified phone number, or to test the ringing of a given number.

# SMS Template List

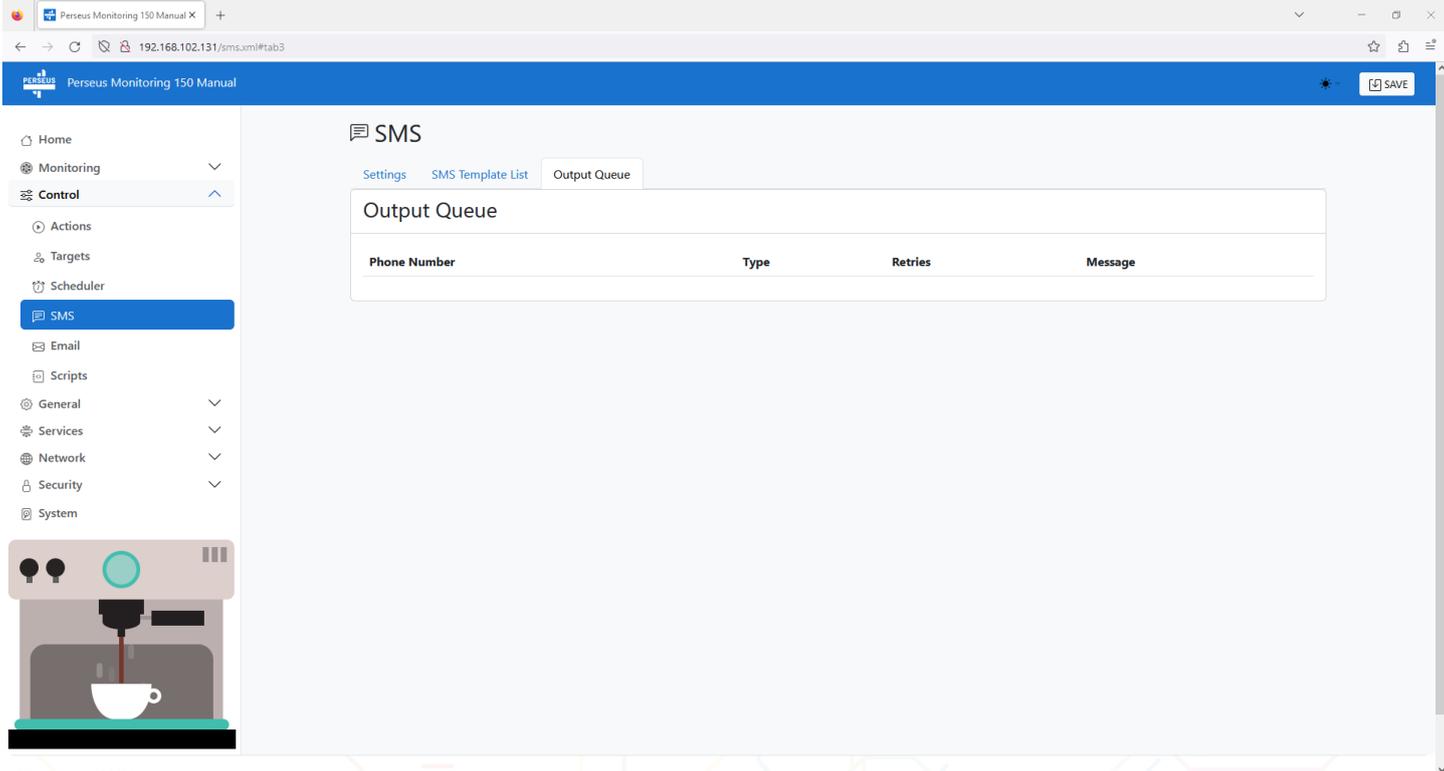
It contains a list of SMS message templates with the possibility of creating, cloning and editing them.



On the overview page, there is a list of current templates and the option to edit, clone or delete them. After pressing the "New Template +" button, a new template is created, which can be named and edited after clicking on the name or pressing the edit button.

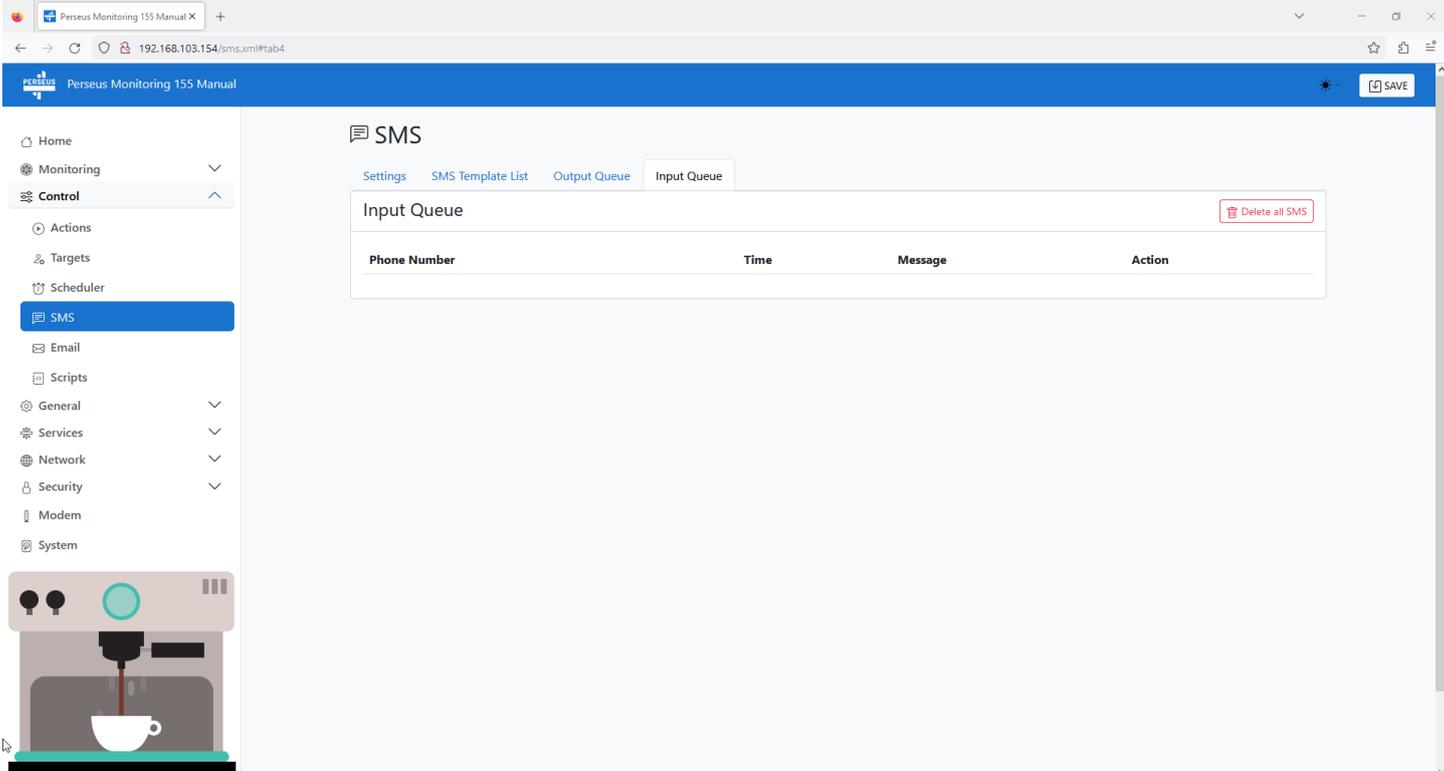
# SMS Output Queue

The page contains a queue of outgoing messages.



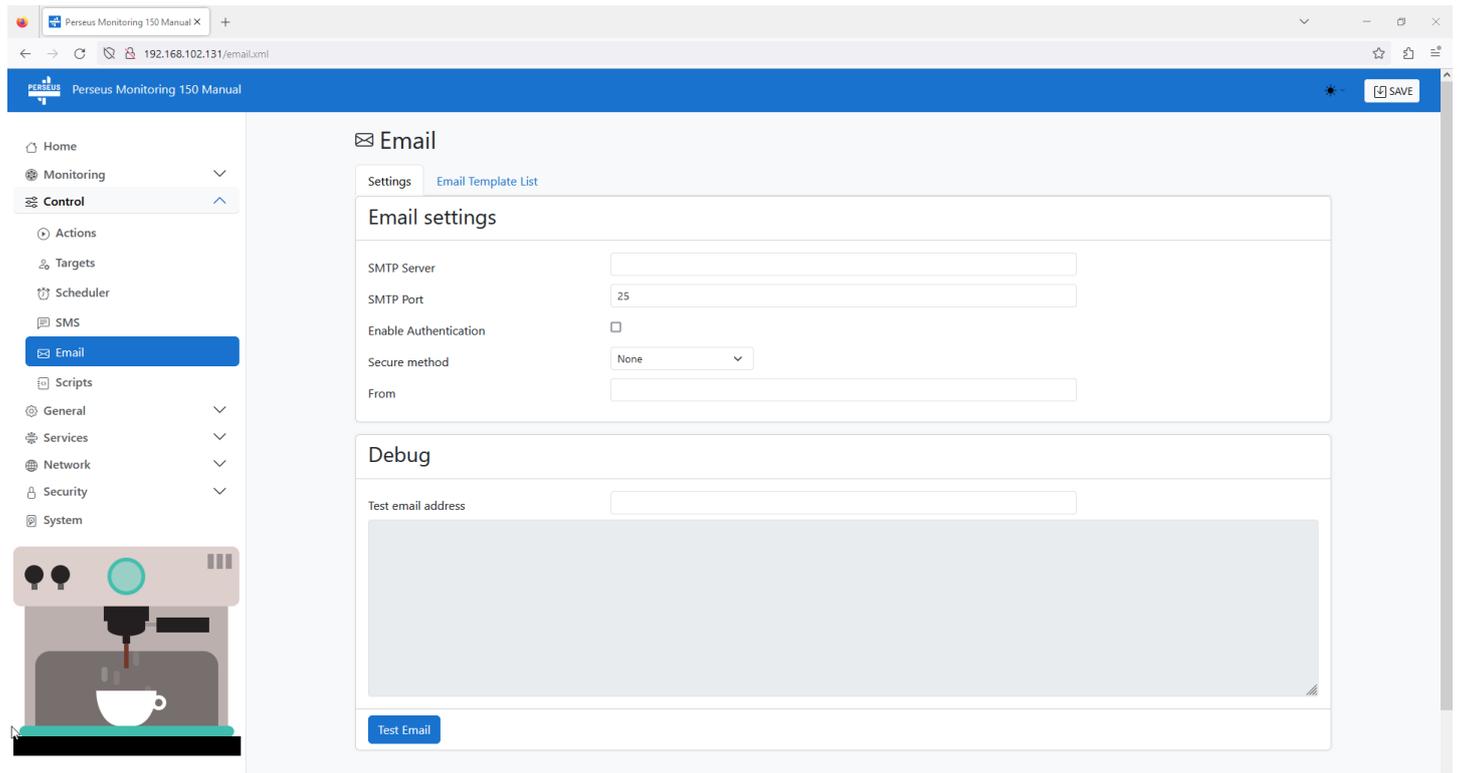
# SMS Input Queue

The page contains a queue of ingoing messages.



# Menu Control / Email

Contains SMTP server parameters for sending messages.



## Email settings section

- SMTP Server – domain name or IP address of the SMTP server
- SMTP Port – set the port for communication with the SMTP server (25 by default)
- Enable Authentication – activate the use of a password if the SMTP server requires authorization.
- Username – name used for authorization on the SMTP server.
- Password – set the password for logging in to the SMTP server.
- Secure method – define the communication security method (“Automatic” may not be supported by target SMTP server, most common is “STARTTLS”)
- Email Sender Address – Email address to be listed as the sender in the email

## Debug section

It contains debugging data and the ability to send a test email to a specified address.

## Email Template List

It contains a list of e-mail message templates with the ability to create, clone, and edit them.

The screenshot displays the Perseus Monitoring 150 Manual web interface. The left sidebar contains navigation options: Home, Monitoring, Control, Actions, Targets, Scheduler, SMS, Email (selected), Scripts, General, Services, Network, Security, and System. The main content area is titled "Email" and shows the "Email Template List" tab. A table lists the current templates:

ID	Name	Type	Options
101	Email Template 1	Email - condition action	[Edit] [Clone] [Delete]

Below the table, the configuration for "Email Template 1" is shown. The fields are:

- Name: Email Template 1
- Enable:
- Type: Email - condition action
- Subject: Subj %DEV\_NAME%: %MSG\_TYPE%
- Message Body: Hi, %SRC\_NAME%, value %SRC\_VALUE% %SRC\_UNIT% is in state %SRC\_STATUS%. Device Name: %XML(deviceName)% MAC: %XML(Agent/EthMAC)% IP: %XML(network/eth/ipv4/address)%

A "Preview" button is located below the message body field. To the right, a "Macros" section lists available variables:

- %DEV\_NAME%
- %MSG\_TYPE%
- %SRC\_NAME%
- %SRC\_VALUE%
- %SRC\_VALUE\_NAME%
- %SRC\_UNIT%
- %SRC\_STATUS%
- %XML(deviceName)%
- %XML(Agent/EthMAC)%
- %XML(network/eth/ipv4/address)%

On the overview page, there is a list of current templates and the option to edit, clone or delete them. After pressing the "New Template +" button, a new template is created, which can be named and edited after clicking on the name or pressing the edit button.

# Menu Control / Scripts

The page contains a list of values that have the Calculation formula parameter set to Calculation by LUA script with the possibility to edit their scripts.

Perseus Monitoring 150 Manual

## Values Script List

List of variables with Calculation Formula set on Calculation by LUA script - for debug only

ID	Name	Type	RawValue	Value	Script preview	State	Action
2001	Uptime 2.2001	Sensor Incremental	8438	15	<pre>this.value = 15 -- This function takes in a number and returns its binary form as a string function toBinary(num)   local bin = "" -- Create an empty string to store the binary form   local rem -- Declare a variable to store the remainder    while num &gt; 0 do     rem = num % 2     bin = rem .. bin     num = math.floor(num / 2)   end   return bin -- Return the string end toBinary(this.value) print(bin)</pre>	OK	

The table clearly states:

- **ID** - ID of the value
- **Name** - Name of the value
- **Type** - type of value
- **RawValue** - Raw Value
- **Value** - the resulting value
- **Script preview** – preview of the script
- **State** - the state of the value
- **Action** - edit button

When you open the script editing, a window opens with the script code, a debugging window and macro help:

The screenshot shows the 'Value LUA Script Edit' interface. On the left is a navigation menu with 'Scripts' selected. The main area is divided into three sections: a table with metadata, a large text area for the Lua script, and a 'Debug window'. The table shows:

Path	RawValue	Value	LUA script
Diagnostic.Meter.2 / Uptime.2.2001	8648	-1000	

The 'Debug window' displays 'nil'. The 'Macros' section on the right contains several examples:

- Value: 1001.Input 1.1001
- var(1001).value;
- Time Schedule state: 1.Working schedule
- schedule().state
- this.value = this.raw\_value
- this.value = (this.raw\_value + 10) \* 19
- print("RawValue = " .. this.raw\_value)
- print("Final Value:" .. this.value)
- print(this.condition().state)
- simple condition example
- print("Read storage 1 = " .. this.storage(1))
- print("Write storage 1 = " .. this.storage(1, 5.0))
- simple storage example
- counter storage example

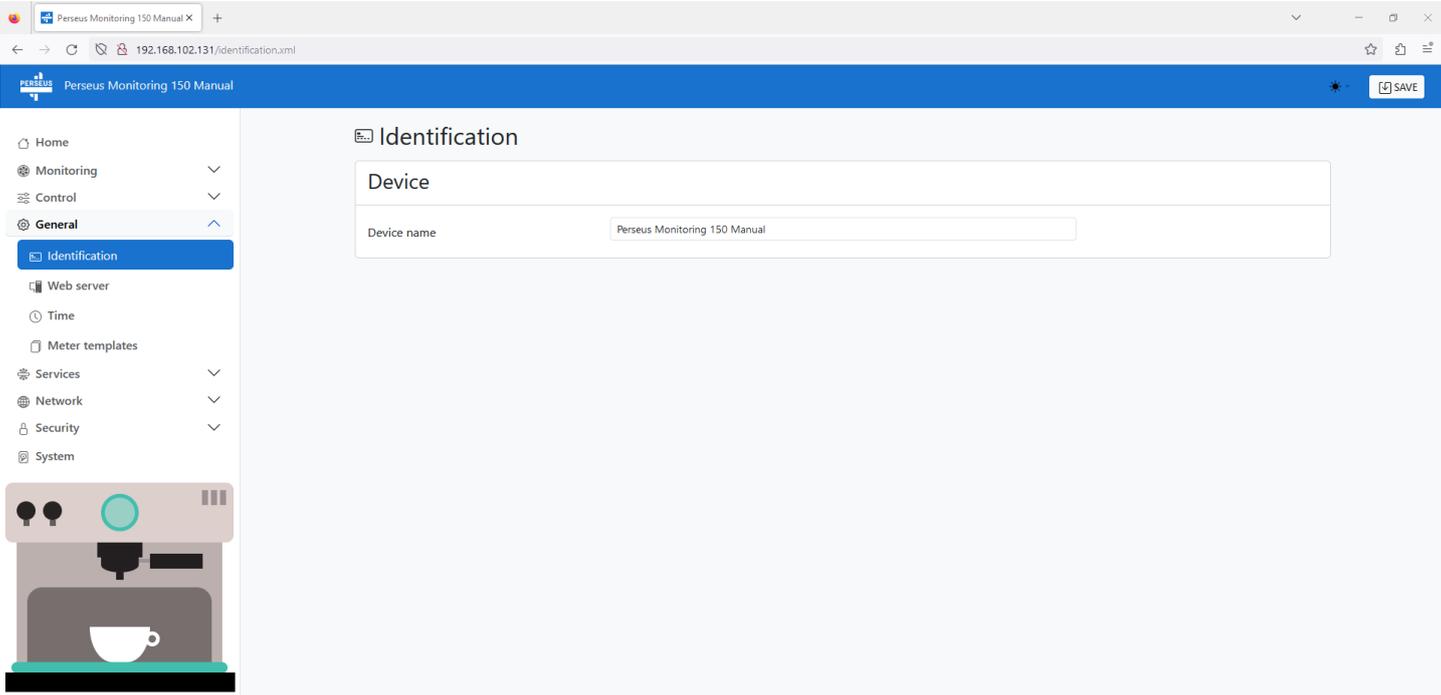
- **Path** – Link to the appropriate Meter / Variables
- **RawValue** – source value to which the script is applied
- **Value** – The resulting value including the unit
- **LUA Script** – custom script code
- **Debug window** – Debug window

### Macros section

The section contains examples of macros as well as simple functions. By clicking on the "link", the corresponding macro or its code is inserted into the Lua Script window at the cursor position. To insert a specific Values or scheduler state, you can use the drop-down options, select a variable and then click on the row below the select. For more information about working with scripts, see LUA Script.

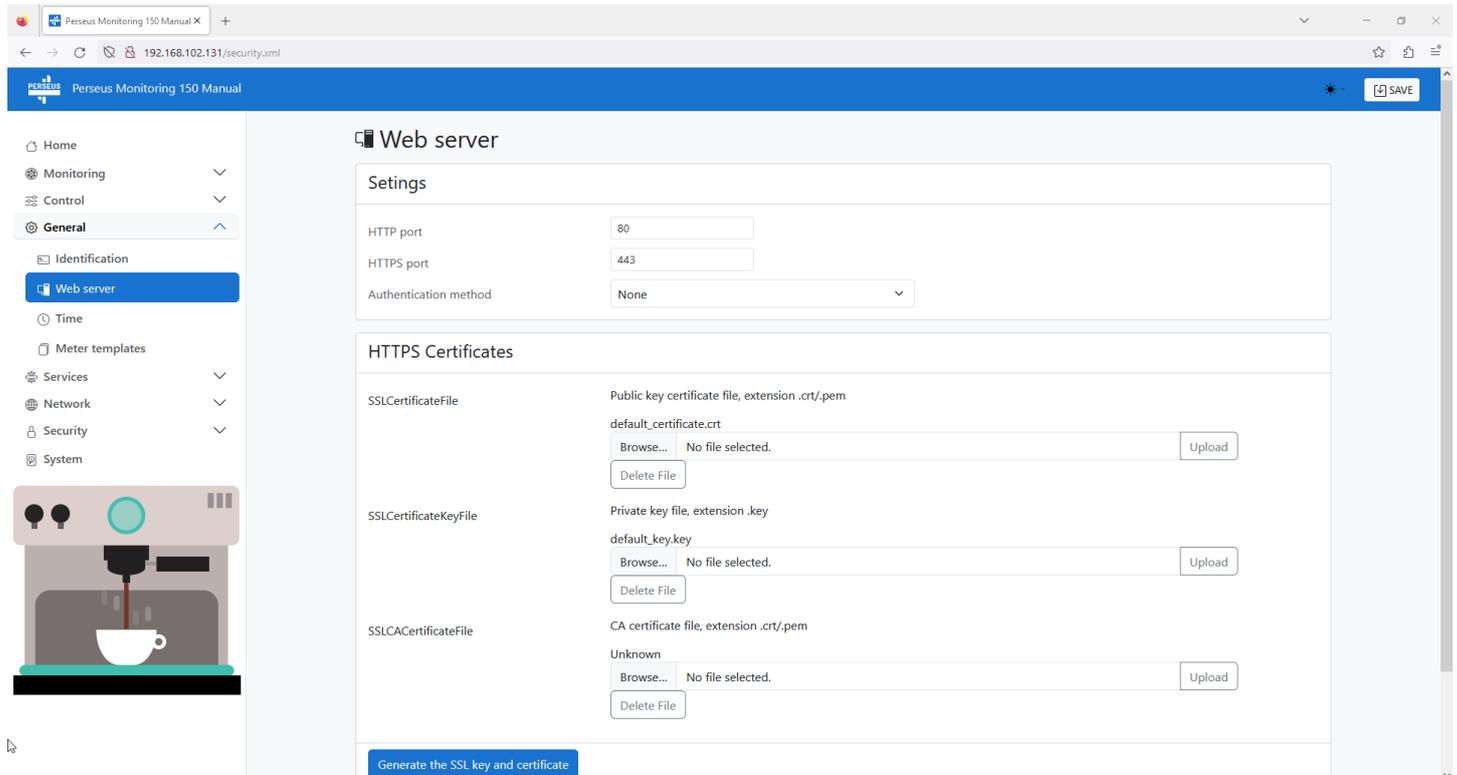
# Menu General / Identification

On the page, it is possible to define the name of the device.



# Menu General / Web Server

It defines the parameters of the web server of the device, i.e. the operation of the administration web.



## Settings section

Sets the ports on which the website listens (both HTTP and HTTPS) and defines how users are authorized (auth selection is necessary, else the device User logins are not required even if they are defined in Security-Users)

- **None** - Perseus web interface does not require any authorization
- **Local authentication** - only local users defined on the Security / Users page can access
- **Radius authentication** - Only users authorized through the Radius server are allowed to access
- **Radius then Local authentication** - Can be accessed by users authorized through the Radius server or by local users

## HTTPS Certificates Section

It is used to manage certificates needed for HTTPS server operation. It is possible to upload and delete the public key, the private key, and the certificate of the certification authority that issued the public and private keys (CAs).

**Generate the SSL key and certificate** - Generate the SSL private key and self-signed certificate for closed networks or testing purposes. The generated certificate is self-signed and appears as untrusted. Add the certificate to the exceptions list, or use a certificate signed by a trusted certificate authority. Please note that the generated data replaces SSLCertificateFile and SSLCertificateKeyFile.



# Menu General / Time

Setting the actual date and time.

The screenshot shows the 'Time' configuration page in the Perseus Monitoring 150 Manual. The interface includes a sidebar menu on the left with 'Time' selected. The main content area is divided into three sections:

- SNTP settings:** Contains input fields for 'SNTP Server' (time.google.com), 'Time Zone' (1), 'Summertime' (Central European), and 'Sync Period' (1h).
- Device time:** Displays 'Current Time' (16:16:33) and 'Current Date' (15.07.2024). It includes input fields for 'Time' and 'Date' (dd/mm/yyyy) and buttons for 'Set browser's datetime' and 'Set Time manually'.
- Debug log:** Shows a log entry for 'SNTP session Start' with details: 'Parsing URL Address: time.google.com', 'Address resolve start', 'host = time.google.com', 'protocol =', and 'port = 123'.

A clock widget is visible in the top right corner of the main content area, showing the current time and date.

## SNTP Settings section

- **SNTP Server** – IP address or domain address of the time synchronization server; time.google.com
- **Time Zone** – set the time zone of the device location. It is used to set the correct system time. Necessary for the correct recording of measured values
- **Summertime** – Daylight saving time permits. It is used to set the correct system time. Necessary for the correct recording of measured values
- **Sync Period** – set the time synchronization interval with the server

## Device time section

The Time Setup section allows you to fill in the current date and time manually (or take the browser's time) in case it is not possible to synchronize with a time server.

# Menu General / Meter Templates

Use the page to view and manage uploaded Templates of meters and variables.

Because Perseus can support hundreds to thousands of 3rd party meters, only a very small sample of templates is loaded in Perseus units for easier handling, even for HW group devices. If the unit does not contain the necessary meter template, it can be downloaded from the <https://perseus.hw-group.com> portal and manually uploaded to the device via the configuration templates page, where you can also see a list of already uploaded templates and there is also the option to delete them.

Uploaded templates are stored in a part of the memory that is not subject to wiping the device to factory settings, and manually uploaded templates can only be deleted here.

Perseus Monitoring 150 Manual

Configuration Templates

Templates can be downloaded from [template repository](#)

User Template Files    Template assignments

Template Files

Filename	Type	Action
regmet-rk-chm-d-regmet-sro-20.xml		

Upload template file

Browse... No file selected.

Upload

HW group s.r.o. ©2024  
FW version 0.8.7\_9481

HW group

## Template assignments

An overview of assigned Templates to the Meters for diagnostic purposes.

Perseus Monitoring 155 Manual X +

192.168.103.154/cfg\_template.xml#tab2

Perseus Monitoring 155 Manual SAVE

- Home
- Monitoring
- Control
- General
  - Identification
  - Web server
  - Time
  - Meter templates**
  - Services
  - Network
  - Security
  - Modem
  - System



## Configuration Templates

Templates can be downloaded from [template repository](#)

User Template Files    Template assignments

List of meters and their parent templates. Only meter supporting configuration templates are displayed.

ID	Name	Template ID
401	Modbus/RTU Comet T3411	chIOgkSW
402	Modbus STH 102	HJD5ilBG
403	Inepro PRO1-Mod	RatTvnUw
404	Regmet RK-CHM-D	paNWZg1x

# Menu Services / Portal

Setting up communication with the portal using the HWg-Push protocol. In communication with the portal, the device is an active element and automatically initiates communication and sends data to the portal. This happens at regular intervals set from the portal, when any alarm starts or ends, when the output status changes, or when the value changes by more than the set value.

Due to the fact that Perseus units can work with a very high number of variables, but usually not all loaded variables are monitored, unlike other devices of the Perseus HW group unit, they do not automatically send all measured variables to the portal, but only those for which this function is manually enabled in the Variables section are sent.

**The connection to the hwg-cloud.com portal is pre-filled in the device.**

The screenshot displays the 'Portal' configuration page in the Perseus Monitoring 150 Manual interface. The left sidebar shows navigation options like Home, Monitoring, Control, General, Services, and Portal. The main content area is titled 'Portal' and contains several sections:

- Portal Message:** A text box containing 'Portal disabled\_'. Below it is a 'Settings' section.
- Settings:** A form with the following fields:
  - Enable:** A checkbox that is currently unchecked.
  - Portal URL:** A text input field containing 'http://hwg-cloud.com/portal.php'.
  - Portal Port:** A text input field containing '80'.
  - Team (provided by portal):** A text input field containing 'teamname'.
  - Team password (provided by portal):** A password input field with masked characters.
- Timers:** A table listing various timer settings:
 

Push Period:	900	s
Log Period:	300	s
Current Push Timer:	0	s
Current Log Timer:	0	s
Current Check Timer:	0	s
AutoPush Block Timer:	0	s
Retransmit number:	0	
Websocket state:	Not started	
- Debug log:** A scrollable log showing the following sequence of events:
 

```
Parsing URL Address: http://develop.ip-sensors.com/portal.php
Address resolve start
host = develop.ip-sensors.com
protocol = http
port = 80
ipaddr = 185.239.216.14
Connected to remote host
Preparing http header
Sending http header
Sending http data
Waiting for http response
Parsed incoming http response header
```

## Portal Message section

Feedback from the portal, including, for example, links to charts, etc. It depends on the type of portal.

## Settings section

- **Enable** – enable or disable this feature.
- **Portal URL** - The full URL of the remote server. It is necessary to add the http://, optionally https:// and change the port number according to the type of communication.
- **Portal Port** – The port on which the portal is listening.

- **Team (provided by portal)** – The name of the team to which it should be assigned. You can find it by logging in to the portal on the My Team page.
- **Team password (provided by portal)** – the password for team assignment. You can find it after logging in to the portal on the My Team page.

### Timers section

- **Push Period** - displays the period set by the portal to send data to the portal
- **Log Period** - displays the period of saving the measured data, which will be sent to the portal after the Push period
- **Current Push Timer** – shows how long it will take for the next standard data to be sent.
- **Current Log Timer** – shows how long it will take for the next data caching.
- **Current Check Timer** – show how long it will take for the next check of orders to change the status of outputs.
- **Autopush Block Timer** – shows how long it takes after sending an AutoPush to send additional information using AutoPush – the period is set retrospectively from the portal.

### Debug Log section

Window for debugging device-portal communication

- **Manual Push** – button to manually send data to the portal immediately.

### Variables section

- **Push enable** – enable or disable the sending of the tag to the Sensdesk technology portal. This allows you to send only monitored parameters to the portal.
- **AP delta** – if there is an increase in value more than specified by the Autopush delta parameter since the last time data was sent to the portal, an extraordinary data push will occur. If the parameter is 0, the function is disabled for this variable.
- **Portal range** – set an optional range of values to be used for working with the portal. If not set, the state of the tag is not evaluated for the purposes of working with the *Sensdesk Technology portal*. If set, it is possible to monitor the status of the variable and, if the set range is exceeded, to call up an extrapush to the portal. Since evaluation is not necessary for most parameters, *the Portal range is not set by default*. The parameters are identical to the parameters in the Conditions section:
  - **Min** – Minimum allowed value
  - **Max** – Maximum allowed value
  - **Hysteresis** – Area of inertia
  - **Delay** – delay for activation of the AlarmHi or AlarmLo state
  - **State** – Displays the status of the condition after evaluation. For a description of variable states, see chapter Meter states, variables and conditions.

### Variables

Select which variables will be pushed to the portal service

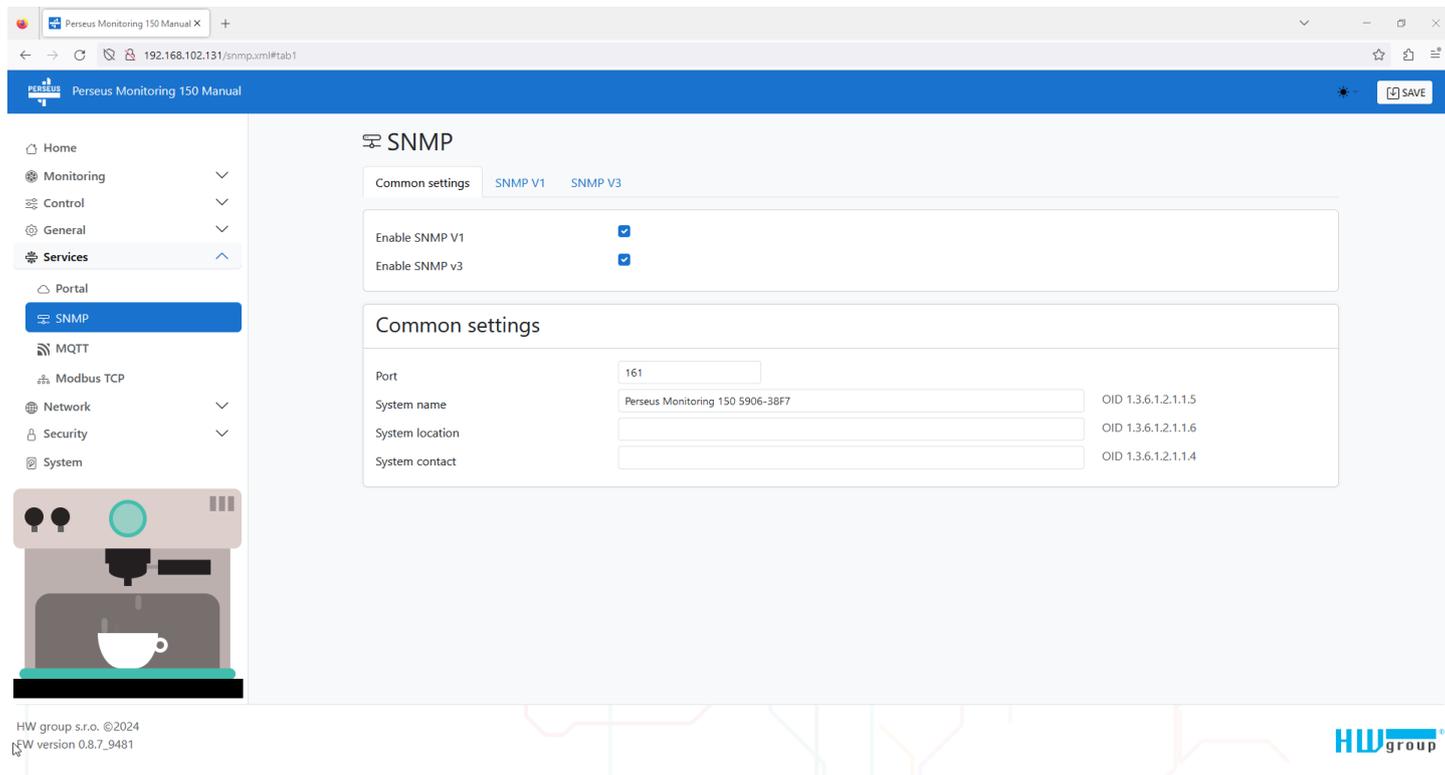
Variable	AP delta	Portal range	Push enabled
1001 <b>Input 1.1001</b> 0	AP delta 0	+	<input checked="" type="checkbox"/>
1002 <b>Input 1.1002</b> 0	AP delta 0	+	<input checked="" type="checkbox"/>
1003 <b>Input 1.1003</b> 0	AP delta 0	+	<input checked="" type="checkbox"/>
1004 <b>Input 1.1004</b> 0	AP delta 0	+	<input checked="" type="checkbox"/>
1005 <b>Input 1.1005</b> 0	AP delta 0	+	<input checked="" type="checkbox"/>
1006 <b>Input 1.1006</b> 0	AP delta 0	+	<input checked="" type="checkbox"/>
1007 <b>Input 1.1007</b> 0	AP delta 0	+	<input checked="" type="checkbox"/>
1008	AP delta	+	<input checked="" type="checkbox"/>

# Menu Services / SNMP

The page contains the settings of the SNMP agent in the Perseus unit.

## Common settings

The page contains the option to enable the SNMPv1 and SNMPv3 agents (a separate tab is created for each version), the option to set the port on which SNMP listens and the definition of three system variables System name, System location and System contact.



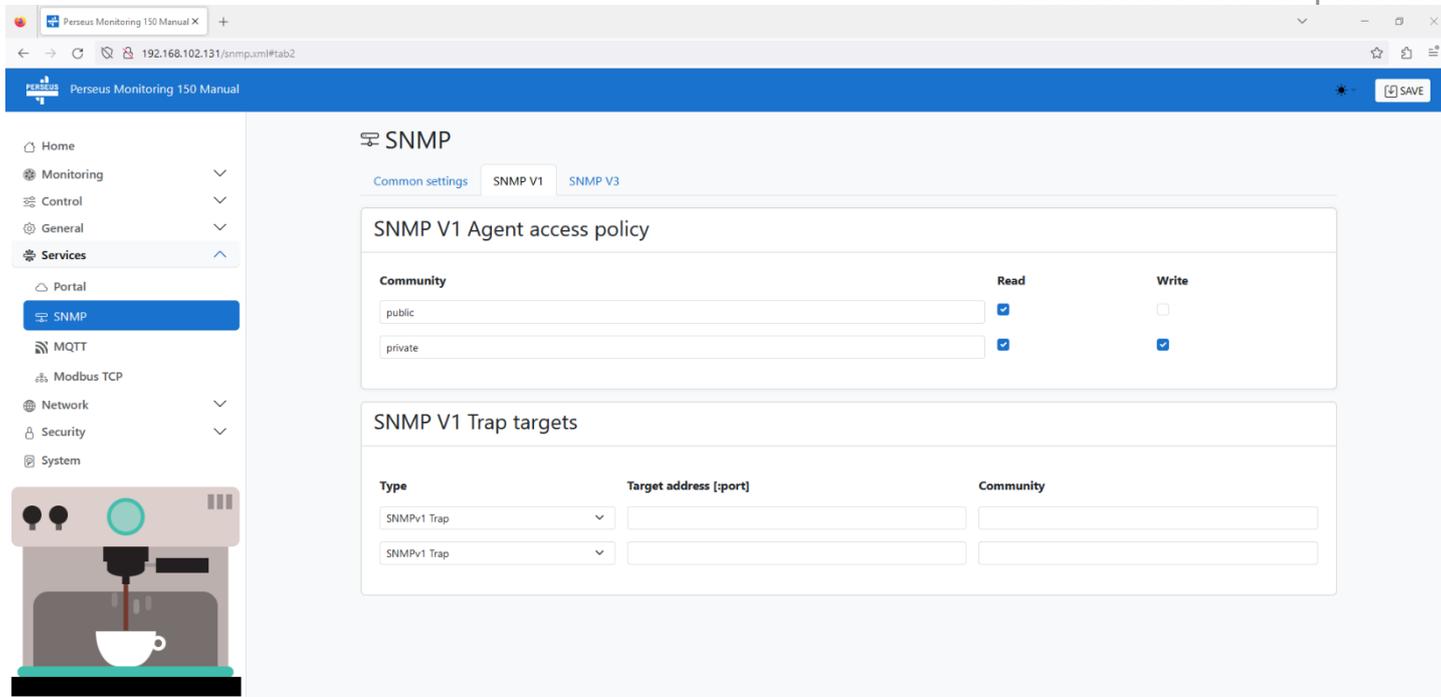
The screenshot shows the 'SNMP' configuration page in the Perseus Monitoring 150 Manual. The page is divided into two main sections: 'Common settings' and 'SNMP V1' / 'SNMP V3'. The 'Common settings' section includes a 'Port' field set to 161, and three system variables: 'System name' (Perseus Monitoring 150 5906-38F7), 'System location', and 'System contact'. The 'SNMP V1' and 'SNMP V3' sections are currently inactive, showing 'Enable SNMP v1' and 'Enable SNMP v3' checkboxes, both of which are checked.

HW group s.r.o. ©2024  
FW version 0.8.7\_9481

HWgroup

## SNMP v1

It is used to set up SNMP v1 community, including their permissions.

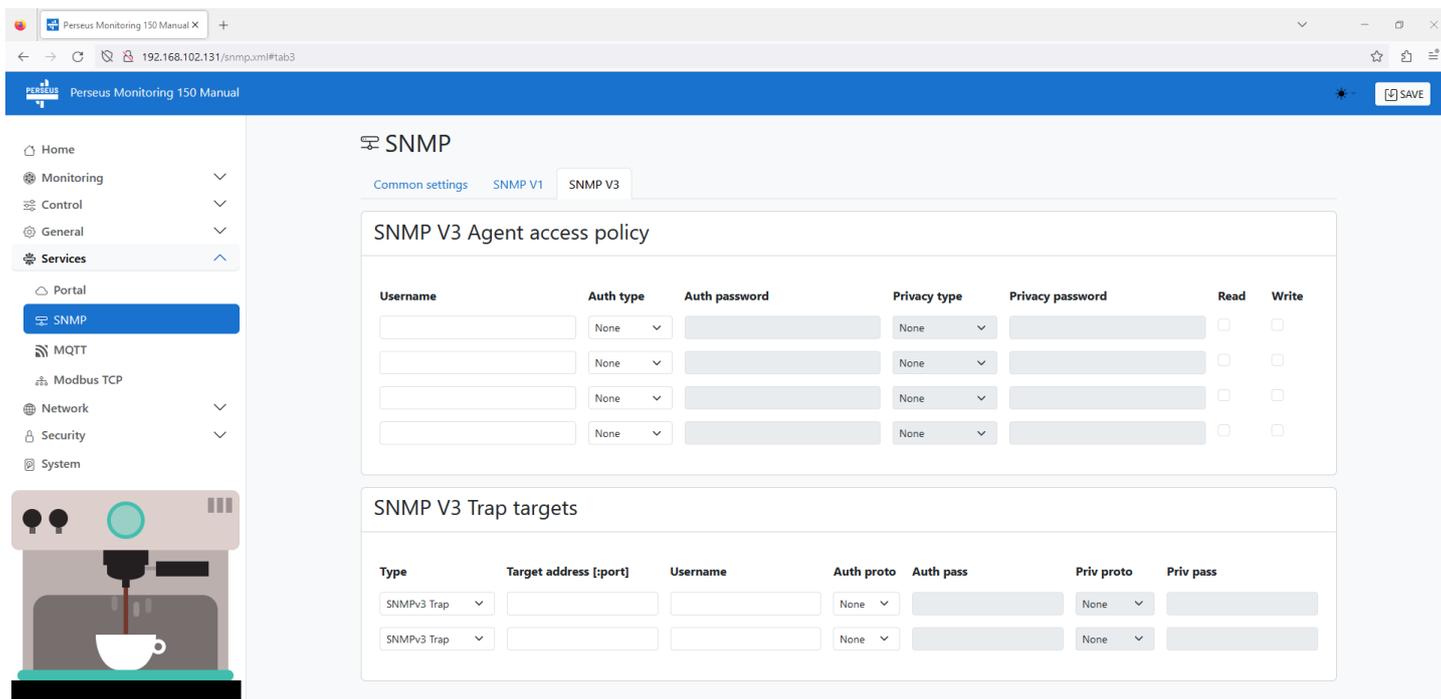


HW group s.r.o. ©2024  
FW version 0.8.7\_9481



### SNMP v3

It is used to set up SNMP v3 users and encryption, including their permissions.



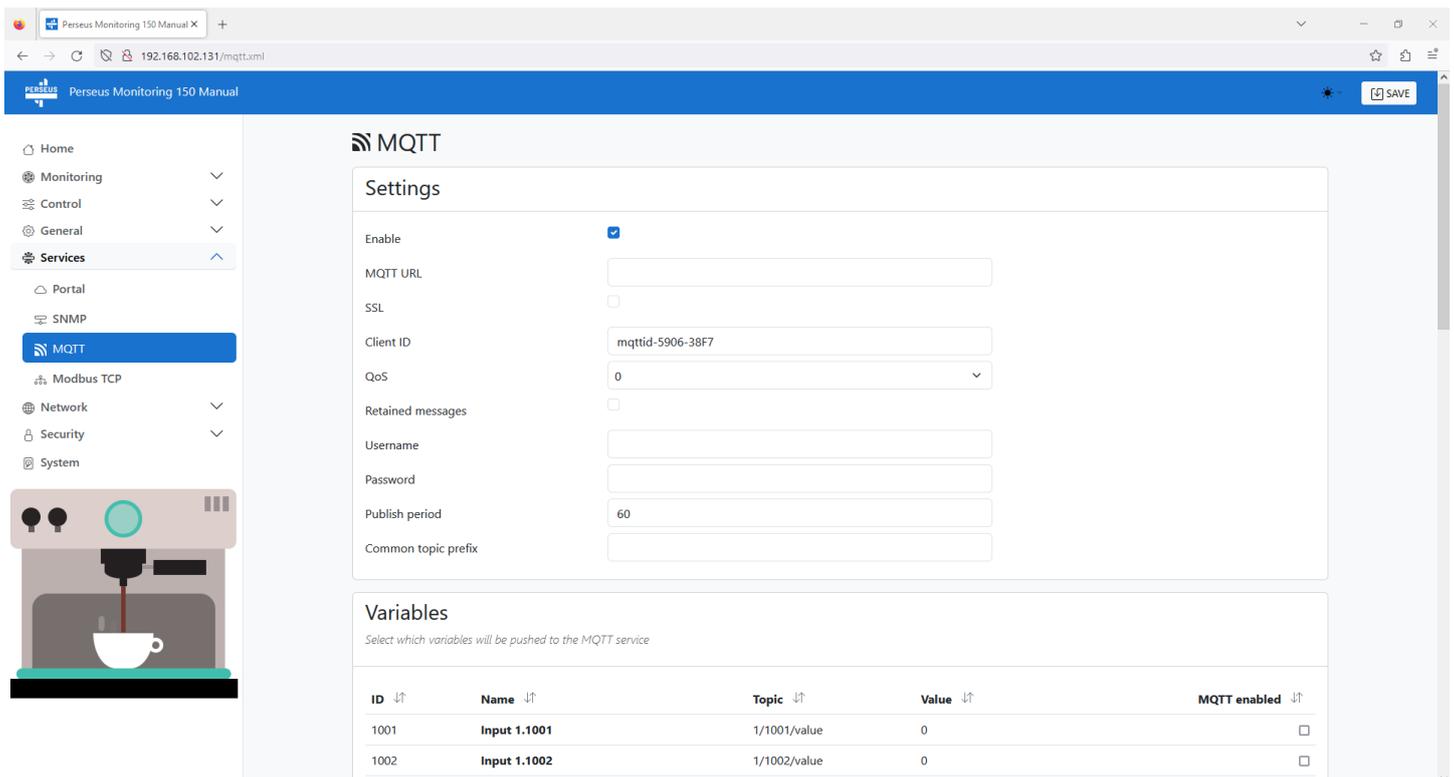
HW group s.r.o. ©2024  
FW version 0.8.7\_9481



# Menu Services / MQTT

The page contains the MQTT Publisher settings in the Perseus unit.

Due to the fact that Perseus units can work with a very high number of variables, but usually not all of the loaded variables are monitored, unlike other devices of the Perseus HW group units, they do not automatically send all measured variables to the MQTT broker, but only those for which this function is manually enabled in the Variables section are sent.



**MQTT Settings**

Enable

MQTT URL

SSL

Client ID

QoS

Retained messages

Username

Password

Publish period

Common topic prefix

**Variables**

Select which variables will be pushed to the MQTT service

ID	Name	Topic	Value	MQTT enabled
1001	Input 1.1001	1/1001/value	0	<input type="checkbox"/>
1002	Input 1.1002	1/1002/value	0	<input type="checkbox"/>

## Settings section

- **Enable** – enable or disable the MQTT data sending function.
- **MQTT URL** – IP address or domain address of the server with the MQTT broker. (for example test.mosquitto.org:1884)
- **SSL** – enable or disable SSL support when communicating with the MQTT broker.
- **Client ID** – ID of Perseus in MQTT network.
- **QoS** – Quality of Service (Perseus in publisher mode have always “0”)
- **Retained messages** – MQTT Flag that tells MQTT broker to keep last value for any new subscriber, so it doesn't wait for new published value but instead the new subscriber receives last known value.
- **Username** – set the username to log in to the MQTT broker.
- **Password** – set the password to log in to the MQTT broker.
- **Publish Period** – the period of sending data to the MQTT broker.
- **Common Topic prefix** – prefix for MQTT Topic (address).

## Variables section

- **ID** – ID of the relevant variable
- **Name** – The name of the variable
- **Topic** – the complete Topic after the prefix
- **Value** – The current value
- **MQTT enabled** – enable sending of a specific variable

# Menu Services / Modbus TCP

The screenshot shows the 'Modbus TCP server' configuration page. The 'Settings' section has 'Enable' checked and 'Port' set to 0. The 'Register maps' section shows a table for '1 Main Board Meter 1' with a 'Modbus TCP Unit ID' of 1. The table lists meter registers with their addresses, types, lengths, read functions, descriptions, and current values.

Meter registers	Address	Type	Length	Read function	Description	Current value
	0	INT32	2	0x03	ID	1
	2	UINT16	1	0x03	State	1
1.1001 Input 1.1001						
	100	INT32	2	0x03	ID	1001
	102	UINT16	1	0x03	State	1
	103	FLOAT32	2	0x03	Value	0
1.1002 Input 1.1002						
	132	INT32	2	0x03	ID	1002

This page shows available options for Modbus TCP server communication.

Since Perseus units can handle a very large number of Variables, the published Variables remain grouped within individual Meters, and in Modbus TCP, Meters can be distinguished by Meter ID or Modbus TCP unit ID. This allows configuration portability between Perseus units while maintaining the same register addresses across all units regardless of the number of Meters and Variables.

## Settings section

- **Enable** – Enable/Disable the TCP server of Perseus
- **Port** – IP Port used for Modbus TCP server; default is 502

## Register maps

- **Modbus TCP Unit** – Every Meter has its own ID; this allows Perseus to support almost any number of meters Perseus reads and provide them to the Modbus TCP clients
- **Meter registers** – predefined map of registers for existing meters Perseus have set, including their Address, type, Length, Read function, Description and Current state

# Menu Network / Ethernet

On the Ethernet page, you can enable Ethernet communication over IPv4 and IPv6 and possibly set network parameters such as IP address, mask, gateway, etc.

## Ethernet Settings Section

The block contains information about the status of the Ethernet connection and the option to enable IPv4 and IPv6 protocols

## IPv4 Section

The block contains basic settings of network parameters for Ethernet communication:

- **DHCP** - Enables the IP address setting function of the DHCP server, if available. Enabling or disabling DHCP depends on the needs of the user and the network administrator.
- **IP address** – set the IP address of the unit, it is necessary to restart the device after changing the settings.
- **Network Mask** – set the local network mask, after changing the settings it is necessary to restart the device.
- **Gateway** – the default gateway for communication, it is necessary to restart the device after changing the settings.
- **DNS Primary/DNS Secondary** – set up the primary and secondary DNS servers, the Gateway must be set up correctly for proper functioning. A DNS server is required to convert a domain name to an IP address, without its settings the following services will not work:
  - Time synchronization (SNTP) is used in emails and SNMP traps for the time of the event.
  - E-mail Sending (SMTP).
  - Logging of values with time stamp.

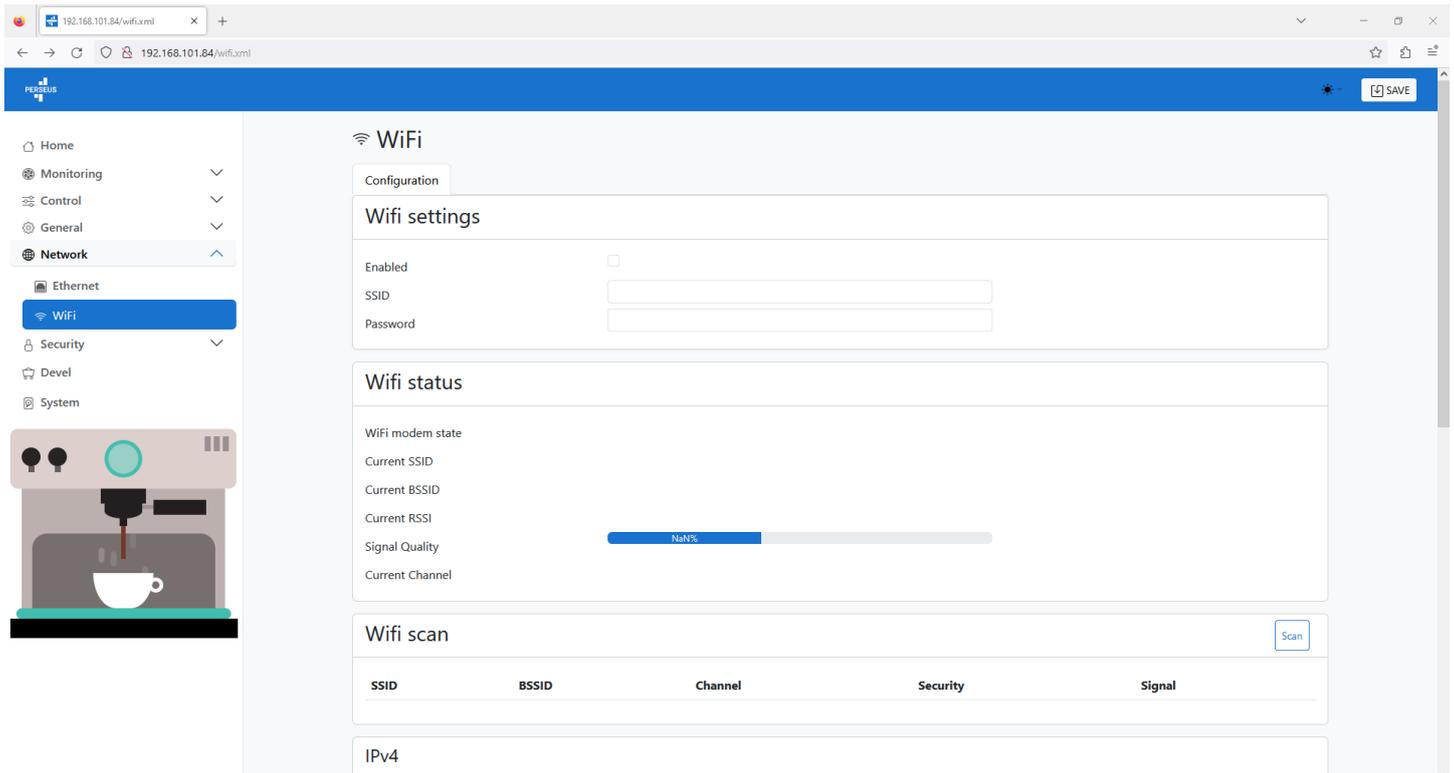
## IPv6 Section

The block contains options for working on IPV6 networks.

- **SLAAC** - Enables support for automatic network configuration using SLAAC.
- **Link-local address** – link address of the device – visible only from the internal network.
- **Global Address** – global (public) IP address and network prefix. It consists of a line address and a network prefix.
- **Gateway** – the default gateway for communication, it is necessary to restart the device after changing the settings.
- **DNS Primary/DNS Secondary** – setting up the primary and secondary DNS servers, the Gateway must be set up correctly for proper operation.

# Menu Network / WiFi

Setting up a WiFi connection – WiFi-equipped models only.



## WiFi Setup Section

- **Enable** – Turns WiFi on or off. The wireless interface is turned off by default.
- **SSID** – The name of the WiFi network to which the device is to be connected. If you don't know your network name, use the Scan AP function at the bottom of the page.
- **Password** – Network security password. If you don't know it, contact your network administrator.

## WiFi status section

### WiFi modem state

- *Disable* – WiFi off.
- *Wait for power on* – wait for the WiFi module to turn on.
- *Init* – initialize the WiFi module.
- *Connecting*.
- *SSID check* – controlling the SSID.
- *Connected* – Connected to the selected WiFi network.
- *Network wifi scan* – scan available WiFi networks.
- *Wait for scan* – wait for WiFi scanning to start.
- **Current SSID** – The current name of the network to which the device is connected. If the parameter is missing, the device is not connected to any WiFi network.
- **Current BSSID** – The current identifier of the WiFi connection point of the device is connected to. If the parameter is missing, the device is not connected to any WiFi network.

- **Current RSSI** – The relative strength of the received signal. The higher the RSSI, the stronger the signal.
- **Signal Quality** – WiFi signal strength in % with graphical indicator.
- **Current Channel** – the WiFi channel on which the device communicates. If the parameter is missing, the device is not connected to any WiFi network.

### WiFi Scan section

- **SSID** – The name of the WiFi network found.
- **BSSID** – Mount Point Identifier (MAC Address).
- **Channel** – set the WiFi channel on which the access point communicates.
- **Security** – type of WiFi communication security.
- **Signal** – set the signal level in DB. The higher the value, the better. ATTENTION, -60 is more than -90! A highlighted line is provided.

### IPV4 Section

The section contains basic settings of network parameters for communication:

- **IP address** – set the IP address of the unit, it is necessary to restart the device after changing the settings.
- **Network Mask** – set the local network mask, after changing the settings it is necessary to restart the device.
- **Gateway** – the default gateway for communication, it is necessary to restart the device after changing the settings.
- **DNS Primary/DNS Secondary** – set up the primary and secondary DNS servers, the Gateway must be set up correctly for proper functioning. A DNS server is required to convert a domain name to an IP address, without its settings the following services will not work:
  - Time synchronization (SNTP) is used in emails and SNMP traps for the time of the event.
  - E-mail Sending (SMTP).
  - Logging of values with time stamp

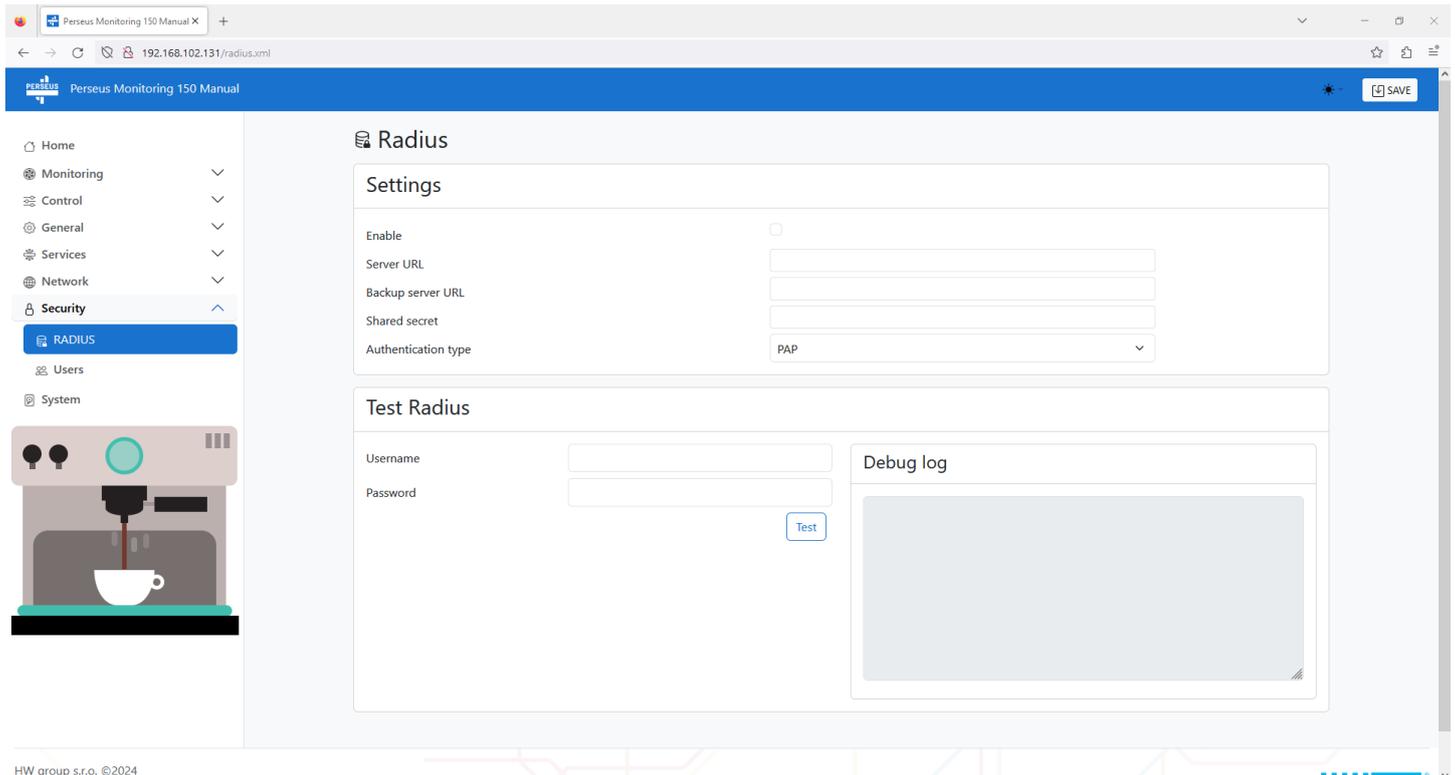
### IPV6 Section

This section contains options for working on IPV6 networks.

- **SLAAC** - Enables support for automatic network configuration using SLAAC.
- **Link-local address** – link address of the device – visible only from the internal network.
- **Global Address** – global (public) IP address and network prefix. It consists of a line address and a network prefix.
- **Gateway** – the default gateway for communication, it is necessary to restart the device after changing the settings.
- **DNS Primary/DNS Secondary** – setting up the primary and secondary DNS servers, the Gateway must be set up correctly for proper operation

# Menu Security / Radius

Contains parameters for setting up a RADIUS authorization server.



HW group s.r.o. ©2024

## Settings section

- **Enable** – Enables/disables the client's Radius function
- **URL Server** - The address of the primary authorization server
- **Backup server URL** - Secondary authorization server address (optional)
- **Shared secret** – shared password to the RADIUS server.
- **Authentication type** – type of authorization protocol (PAP/EAP MD5)

## Test Radius Section

- **Username** – username to connect to the RADIUS server.
- **Password** – password for connection to the RADIUS server

# Menu Security / Users

The page defines users and their rights for working with the Perseus unit.

Perseus Monitoring 150 Manual

Users

New User +

ID	Username	Access Type	Enabled	Note
1	Manual	ReadOnly	<input checked="" type="checkbox"/>	Manual test user

HW group s.r.o. ©2024  
FW version 0.8.7\_9481

HWgroup

The page contains a clear list of users, their permissions, and the ability to quickly turn them on and off (for example, to remove permissions). It is advisable to delete users in order to preserve the history of their activities within the unit (the audit trail will record logins, parameter changes, etc. over time).

This page coexists with the other one, General - Web server, where you need to select Authentication method.

## User Editing

New users can be created by pressing the New Users + button.

The screenshot displays the 'User detail' configuration page in the Perseus Monitoring 150 Manual web interface. The interface includes a sidebar with navigation options: Home, Monitoring, Control, General, Services, Network, Security, RADIUS, Users, and System. The main content area shows a 'User detail' form with the following fields:

- Enable:** A checkbox that is checked.
- Username:** A text input field.
- Password:** A text input field.
- User Note:** A text input field.
- Access Type:** A dropdown menu with the following options: No Access, Admin, and ReadOnly.

A 'SAVE' button is located in the top right corner of the form. The footer of the page contains the text: HW group s.r.o. ©2024, FW version 0.8.7\_9481, and the HWgroup logo.

- **Enable** – enable/disable the user
  - **Username** – username
  - **Password** – password
  - **User Note** – A note, e.g. job title
  - **Access Type** – Permission type
- No Access** – the user has no access – equivalent to shutting down
- Admin** – The user has the option to make any changes to the unit, including downloading and uploading the configuration
- Read Only** – the user does not have the right to change any settings, nor does he have access to download the configuration and can only browse the website

# Menu Modem

Only models with an LTE modem. The page is used to set the parameters of the built-in LTE modem.

The screenshot shows the 'Modem' configuration page in the Perseus Monitoring 155 Manual. The interface includes a sidebar with navigation options like Home, Monitoring, Control, General, Services, Network, Security, Modem, and System. The main content area is divided into three sections:

- Modem**:
 

Modem status	Ready
Network status	Registered (home network)
Signal quality	-71 dBm (67 %)
Operator	Vodafone CZ
- Mobile data**:
 

Data status	LTE
PPP phase	Unknown
LCP state	Unknown
IP address	Unknown
- Modem settings**:
 

Enable	<input checked="" type="checkbox"/>
Mobile data	<input checked="" type="checkbox"/>
Roaming	<input type="checkbox"/>
Dial in string	<input type="text" value="*99#"/>
APN	<input type="text" value="internet"/>
Username	<input type="text"/>

## Modem section

Contains information about the status of the modem

- **Network status** – information about device registration in the operator's GSM network.
- **Signal quality** – GSM signal level. The information can help you debug network issues.
- **Operator** – set the name of the operator to which the GSM modem is connected.

## LTE status section

- **Data status** – status of Data connection (EDGE/.../LTE)
- **PPP phase** – status of connection to the operator's data network
- **LCP state** – link connection status
- **IP address** – IP address obtained from the operator

## Settings section

- **Enable** – Enables/Disables built-in modem
- **Mobile data** - allows data transfers (if disabled, it is only possible to send SMS and ring)
- **Roaming** - Allow device traffic in the roaming network
- **Dial in string** - phone number for dial-up connection (read from SIM or received from operator)
- **APN** - APN of the data network (read from the SIM or received from the operator)
- **Username** - Username to connect to the operator's network
- **Password** - password to connect to the operator's network

- **SIM PIN** – PIN for SIM card (Enter PIN here if its Enabled on SIM)

### ***PIN management section***

In this section you can Enable/Disable PIN on SIM card, read status and get remaining PIN/PUK attempts.

### ***GNSS section***

Contains information about the global positioning (only models with special modems)

- **Enable** - enable modem position support. The obtained data will be available to the unit as part of the new local meter
- **State** - Receiver status
- **UTC** - read time from the positioning system
- **Latitude** - latitude
- **Longitude** - longitude
- **Precision** - accuracy
- **Altitude** - altitude
- **Speed** - speed of movement
- **Show location in Google Maps** - Link to view Google maps

# Menu System

The screenshot shows the 'System' section of the Perseus Monitoring 150 Manual web interface. The interface is displayed in a browser window with the URL '192.168.102.131/system.xml'. The left sidebar contains a navigation menu with options: Home, Monitoring, Control, General, Services, Network, Security, and System (selected). The main content area is titled 'System' and is divided into three sections: Product Information, Configuration, and FW update.

**Product Information**

Product name	Perseus Monitoring 150
Serial Number	6008450016
Eth MAC Address	00:0A:59:06:38:F7
Bootloader version	2.0_1297
FW version	0.8.7_9481
IO Expander version	1.0_1070, 1.0_1052
Compile time	Jul 15 2024, 13:01:44
Uptime	2 hours, 42 minutes, 7 seconds

**Configuration**

Device setup in XML	<a href="#">setup.xml</a>	Backup configuration file
Device setup in ZIP	<a href="#">setup.zip</a>	Backup configuration file

**FW update**

Upgrade server:   0.8.7  
 Firmware is up to date.

Upload Firmware or setup.xml configuration:  No file selected.

## System Section

- **Product Name** – The name (type) of the device
- **Serial Number** – Serial number of the device
- **Eth MAC Address** – The MAC address of the wired device
- **WiFi STA MAC Address** – MAC address of the device for WiFi connection (only for models equipped with wifi)
- **Bootloader version** – Bootloader version. It is used for diagnostic purposes in case of troubleshooting
- **FW version** – Firmware and Build version. It is used for diagnostic purposes in case of troubleshooting
- **IO Expander version** – Firmware of Perseus built-in IO Expanders. It is used for diagnostic purposes in case of troubleshooting
- **Compile time** – set the firmware compilation time. It is used for diagnostic purposes in case of troubleshooting
- **UpTime** – The running time of the device since it was last powered on or rebooted. It is used for diagnostic purposes in case of troubleshooting
- **Configuration** – for downloading of device setup (backup, support, copy...)
  - **Device setup in XML** – limited setup excluding Templates (this option may be removed in future)
  - **Device setup in ZIP** – full device setup including Templates packed in the zip archive
- **FW update** – firmware update via the Internet
  - **Upgrade server** – full path to HW group server with an upgrade script
  - **Check for update** – print the latest firmware version on the HW group update server
  - **Download & Upgrade** – start the firmware upgrade from the HW group update server

- **Upload Firmware or Configuration** – Upload newer firmware or configuration file to the device. Restoring the configuration may fail if there is too much difference in firmware versions

### ***Demo mode section***

Allows to activate Demo mode secured by password.

In Demo mode the device only shows the saved Meters / Variables / Conditions and Actions and does not allow any changes.

### ***System section***

- **Restart** – Restarts the device.
- **Factory Reset** – Restores factory settings. By default, the setting is enabled by DHCP. If the device does not receive an address within 60 seconds of powering on, it defaults to 192.168.10.20. Neither the username nor the password is defined by default.