RTU-HTemp Display

Indoor temperature and humidity sensor with LCD display and Modbus RTU communication interface for integration into monitoring systems.

Safety Warnings

The device complies with applicable standards valid in the Czech Republic, has undergone live testing, and is delivered in operational condition. To ensure safe operation, all safety and maintenance instructions listed below must be observed.

Improper use of the sensor may compromise the safety protections provided by the manufacturer.

The sensor must not be used if:

- It is visibly damaged.
- It does not operate correctly.
- There are loose parts inside the sensor.
- It has been exposed to long-term humidity or has become wet.
- It has been repaired or modified by unauthorised personnel.
- The supply cable is visibly damaged.

The power socket or other means of disconnecting the device from the power supply must be freely accessible at all times.

The manufacturer is liable for the device only if it is powered by the supplied or an approved power source.

If you experience any difficulties during installation or initial start-up of the sensor, please do not hesitate to contact our technical support team for assistance.

HW group s.r.o.

http://www.hw-group.com

email: support@HWg.cz

Rumunská 26/122

Prague, 120 00

Phone: +420 222 511 918

Before contacting technical support, please prepare the exact model designation of your device (as stated on the manufacturing label) and the firmware version (see below), if available.

Product Overview

The RTU-HTemp Display is a sensor designed for indoor applications to measure temperature and humidity.

Measured values are transmitted via the Modbus RTU protocol.

The sensor is equipped with an LCD display with adjustable brightness, showing the current temperature and humidity values.

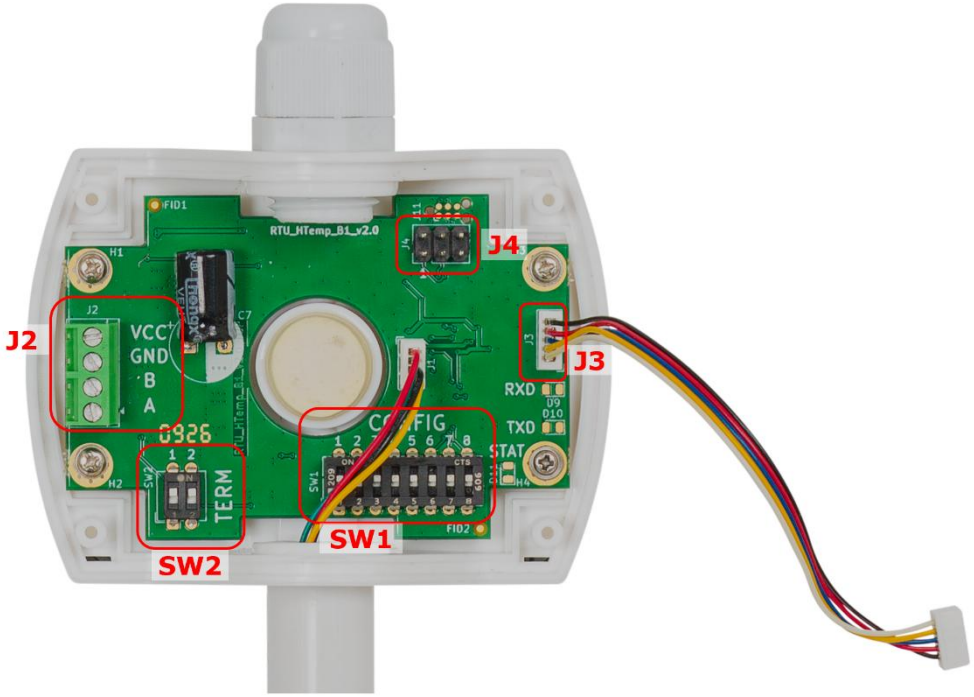
The sensor is fully compatible with the HWg Perseus platform.

Applications

- HVAC control
- Building management systems (BMS)
- Server rooms and data centers
- Healthcare facilities
- Laboratories and clean rooms
- Museums, archives, and libraries
- Offices and commercial buildings
- Warehouses and storage areas
- Industrial control rooms
- Retail spaces and showrooms
- Residential indoor monitoring
- Other indoor applications

Description of Connectors and Configuration Elements

The following figure shows the location of the connectors and configuration elements on the device.



- **J1** – Temperature sensor connection – factory connected
- **J2** – RS-485 communication line and power supply
- **J3** – Display connection – factory connected
- **J4** – Programming header – DO NOT CONNECT!
- **SW1** – Configuration switches (RS-485 Address / Baudrate)
- **SW2** – RS-485 line termination

Electrical Wiring

Open the sensor by loosening the four corner screws. Inside the device, the connections are made using the 4-position screw terminal block **J2**. The terminal assignments are as follows:

- **VCC** - Positive terminal of the power supply 10.5-30 VDC
- **GND** - negative terminal of the power supply (Ground)
- **A** – RS-485 - positive terminal (A/+)
- **B** – RS-485 - negative terminal (B/-)

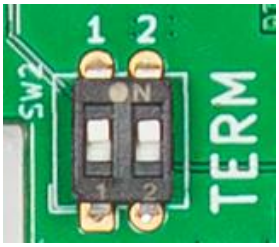
⚠ Warning

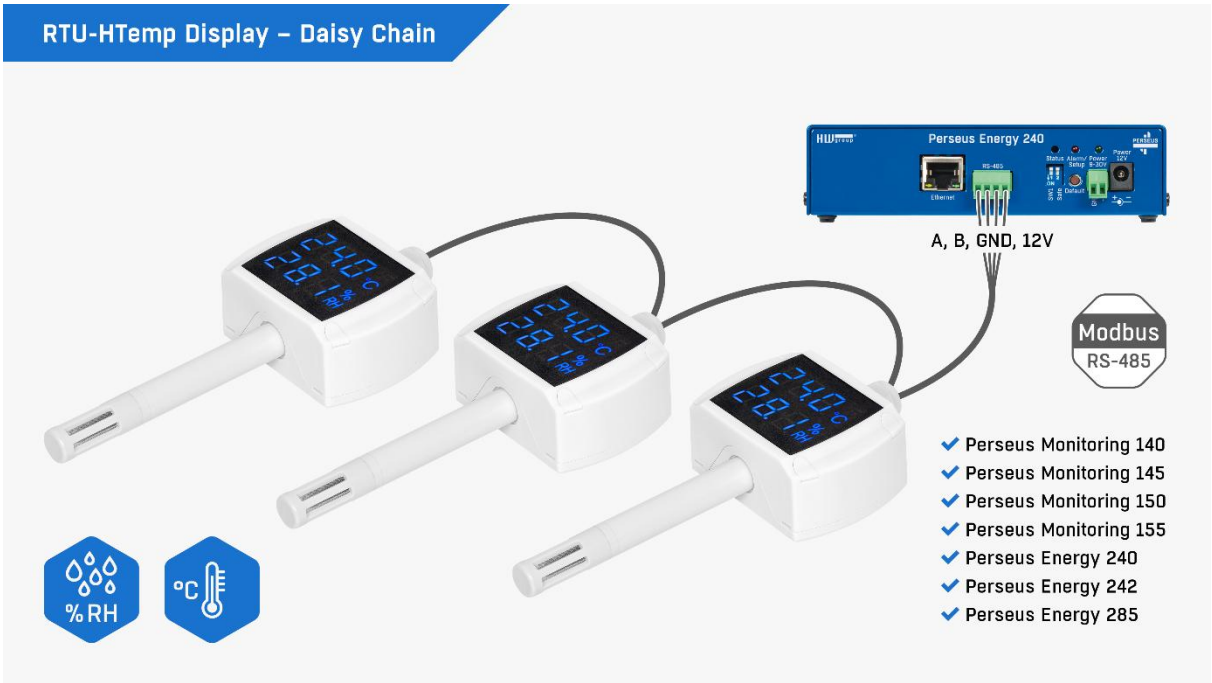
Before applying power, double-check all wiring connections. Although the product includes basic reverse-polarity protection, prolonged incorrect wiring or operation outside the rated parameters may result in permanent device damage.

RS-485 Network Installation Guidelines

To ensure stable and reliable communication, follow these recommendations when installing the RS-485 network:

1) **Topology** - Always use a bus (daisy-chain) topology. Star or ring topologies are not permitted, as they cause signal reflections and degrade communication quality.
2) **Cabling** - Use shielded twisted-pair (STP) cable for the RS-485 communication lines (A and B). The shield should be properly grounded at one point only.
3) **Routing** - Keep communication signal lines separate from 230 V power lines. Do not route them in the same conduit or near high-current cables to prevent electromagnetic interference (EMI).
4) **Termination** – The RS-485 line must be terminated at both ends. RS-485 line termination is configured using DIP switch **SW2**.
   - If the sensor is used as a standalone device or is located at the end of the RS-485 bus (daisy-chain topology), set both switches to the ON position.
   - If the sensor is installed in the middle of the RS-485 bus, set both switches to the position opposite to the ON marking (OFF position).





Power-Up

Power up the sensor by connecting power supply to the **VCC** and **GND** terminals.

After power-up, the sensor briefly displays the configured baud rate and RS-485 address, and then switches to displaying the measured temperature and humidity values.

Automatic Detection of RTU Sensors by Perseus

HWg Perseus devices support automatic detection of HW group Modbus RTU sensors equipped with the UNI3 extension.

The UNI3 extension allows Perseus to:

- detect compatible RTU sensors on the RS-485 bus
- identify available sensor variables
- automatically add sensors to the system
- automatically configure detected variables
- remotely update sensor firmware.

Each UNI3-compatible sensor has:

- a standard Modbus RTU address (primary address)
- a factory-assigned secondary address (serial number)

During automatic detection, Perseus communicates with sensors using the secondary address via the HWg UNI3 protocol extension.

For UNI3 communication:

- Modbus/RTU address 240 is reserved on the RS-485 bus
- supported baud rates are 4800, 9600, and 19200 Bd
- no standard Modbus RTU device with address 240 may be present on the bus

UNI3-compatible sensors can also operate as standard Modbus RTU devices without automatic detection.

Baud Rate Configuration

The baud rate is determined by the positions of DIP switches **7 and 8 on SW1**.

If both switches are OFF (0), the baud rate is taken from the software configuration.

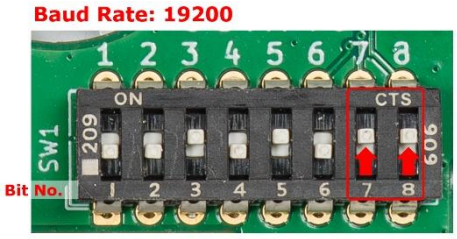
Otherwise, the baud rate is set according to the following table:

Baud Rate	By SW	4800	9600	19200
DIP Switch 7	0	1	0	1
DIP Switch 8	0	0	1	1

Example: Setting Baud rate 19200

Turn ON the following switches:

- Bit 7.
- Bit 8.



Device Address Configuration

The address is determined by the positions of DIP switches **1 to 6 on SW1**. It is a 6-bit value (0-63).

If the address is 0, the address is taken from the configuration, which is intended for use with HWg Perseus.

Calculating the Address

The final device address is calculated by summing the decimal values of all DIP switches set to the ON position.

Each switch corresponds to a specific binary weight (decimal value) as shown below:

Bit No.	1	2	3	4	5	6
Decimal value	1	2	4	8	16	32

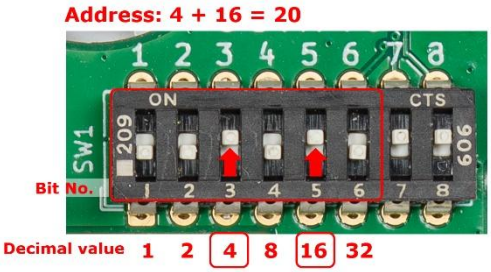
To set the desired address, add together the values of the switches set to ON.

Example: Setting Address 20

Turn ON the following switches:

- Bit 3 (decimal value 4).
- Bit 5 (decimal value 16).
- All other switches must remain OFF.

Calculation: 4 (Bit 3) + 16(Bit 5) = 20



Device Address Configuration By DIP Switch SW1

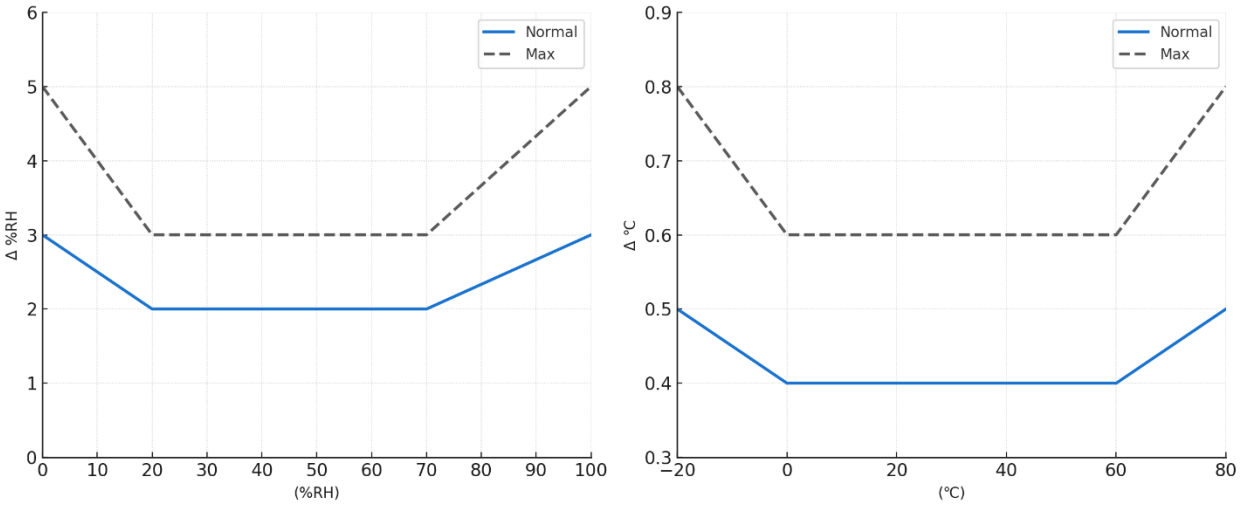
Address	1	2	3	4	5	6
By SW	0	0	0	0	0	0
1	1	0	0	0	0	0
2	0	1	0	0	0	0
3	1	1	0	0	0	0
4	0	0	1	0	0	0
5	1	0	1	0	0	0
6	0	1	1	0	0	0
7	1	1	1	0	0	0
8	0	0	0	1	0	0
9	1	0	0	1	0	0
10	0	1	0	1	0	0
11	1	1	0	1	0	0
12	0	0	1	1	0	0
13	1	0	1	1	0	0
14	0	1	1	1	0	0
15	1	1	1	1	0	0
16	0	0	0	0	1	0
17	1	0	0	0	1	0
18	0	1	0	0	1	0
19	1	1	0	0	1	0
20	0	0	1	0	1	0
21	1	0	1	0	1	0
22	0	1	1	0	1	0
23	1	1	1	0	1	0
24	0	0	0	1	1	0
25	1	0	0	1	1	0
26	0	1	0	1	1	0
27	1	1	0	1	1	0
28	0	0	1	1	1	0
29	1	0	1	1	1	0
30	0	1	1	1	1	0
31	1	1	1	1	1	0

Address	1	2	3	4	5	6
32	0	0	0	0	0	1
33	1	0	0	0	0	1
34	0	1	0	0	0	1
35	1	1	0	0	0	1
36	0	0	1	0	0	1
37	1	0	1	0	0	1
38	0	1	1	0	0	1
39	1	1	1	0	0	1
40	0	0	0	1	0	1
41	1	0	0	1	0	1
42	0	1	0	1	0	1
43	1	1	0	1	0	1
44	0	0	1	1	0	1
45	1	0	1	1	0	1
46	0	1	1	1	0	1
47	1	1	1	1	0	1
48	0	0	0	0	1	1
49	1	0	0	0	1	1
50	0	1	0	0	1	1
51	1	1	0	0	1	1
52	0	0	1	0	1	1
53	1	0	1	0	1	1
54	0	1	1	0	1	1
55	1	1	1	0	1	1
56	0	0	0	1	1	1
57	1	0	0	1	1	1
58	0	1	0	1	1	1
59	1	1	0	1	1	1
60	0	0	1	1	1	1
61	1	0	1	1	1	1
62	0	1	1	1	1	1
63	1	1	1	1	1	1

Technical Specifications

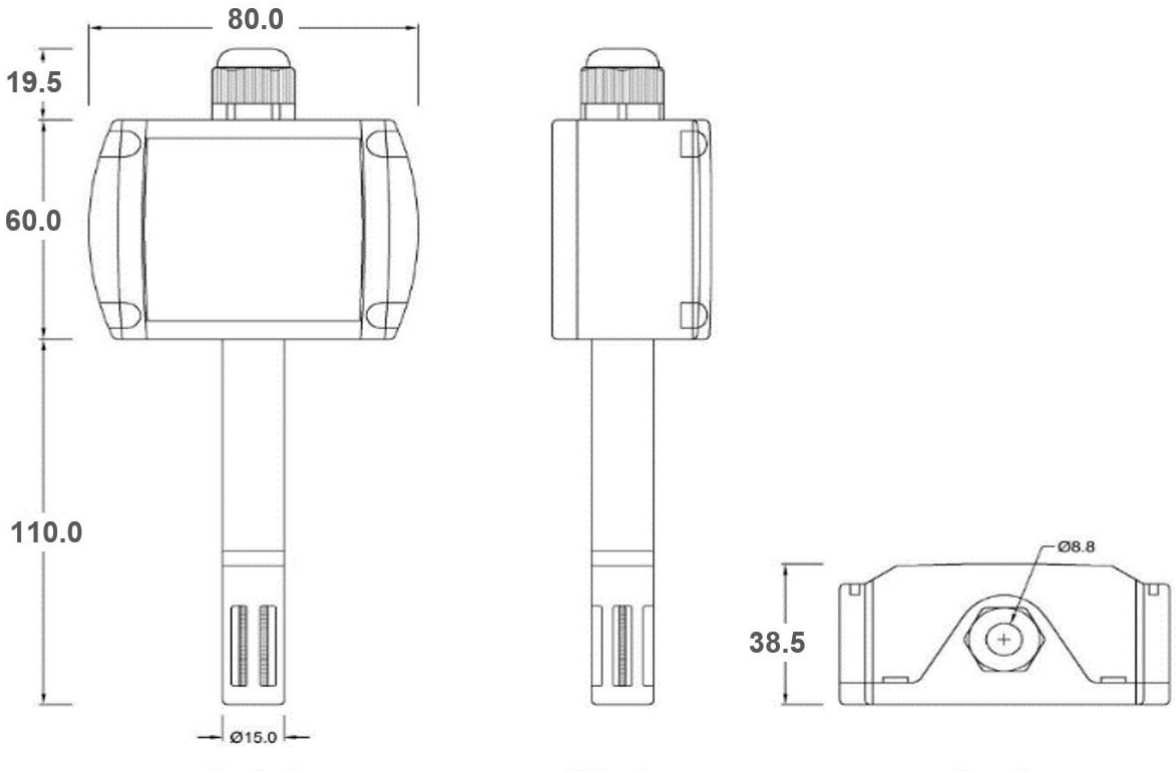
Parametre	Temperature	Relative Humidity
Measuring range:	-20 to +80 ℃	0 to 100 %RH
Accuracy:	±0.8 ℃	±5 %RH
Resolution:	0.1 ℃	0.1 %RH
Long-term stability:	< 0.2 ℃ / year (normal operation)	< 2 %RH/ year (normal operation)
Output:	RS-485, Modbus RTU	
Device address:	0-255 (can be set using the UNI3 calibrator or a DIP switch)	
Communication Speed:	1200, 4800, 9600, 19200 bps (configurable)	
Power supply:	+10.5 to 24 V DC	
Operating Temperature:	-20 to +80 ℃	
Connector:	4-pin terminal block	
Ingress protection:	IP65 (indoor application)	
Display size:	2,8"	
Dimensions:	80 x 189.5 x 38.5 mm (W × H × D)	
Weight:	125 g	

Accuracy Chart



Mechanical Dimensions

Unit: mm (±0.5)



Package Contents

The package includes the sensor, a metal mounting bracket, screws, and wall plugs.

Modbus RTU - Register Address Map

Reading Registers

Modbus Function: FN04 - Read Input Registers

Modbus Register No	Modicon Register	Absolute Address	Parameter	Data Type	Units	Notes
1	30001	0 [0x0]	Temperature	INT16	°C	The raw value must be divided by 10.
2	30002	1 [0x1]	Relative humidity	INT16	%RH	The raw value must be divided by 10.

Writing Registers

Modbus Function: FN06 – Write Single Register

Modbus Register No	Modicon Register	Absolute Address	Parameter	Data Type	Notes
3	40003	2 [0x2]	Display Brightness	UINT8	Range 0–8, 0 = display off

Display Orientation

The display on the sensor can be rotated by 180°.

Remove the four corner screws, rotate the display, and reinstall the screws.

Connecting to the HWg Perseus Platform

1) Connect the Sensor to HWg Perseus

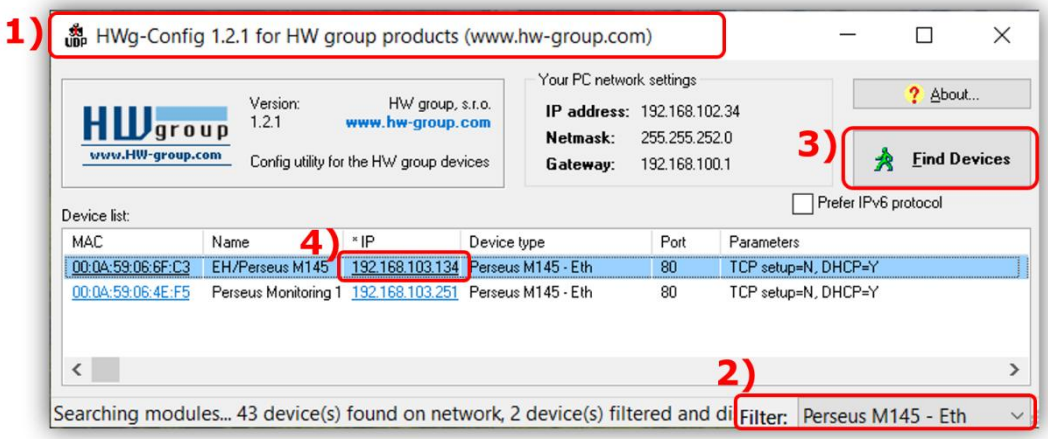
- Connect the Perseus device and the sensor via the RS-485 port.
- Use a daisy-chain topology and apply termination on the last sensor in the line.
- Connect the Perseus device to the LAN network and to the power supply.

2) Open the Perseus Web Interface

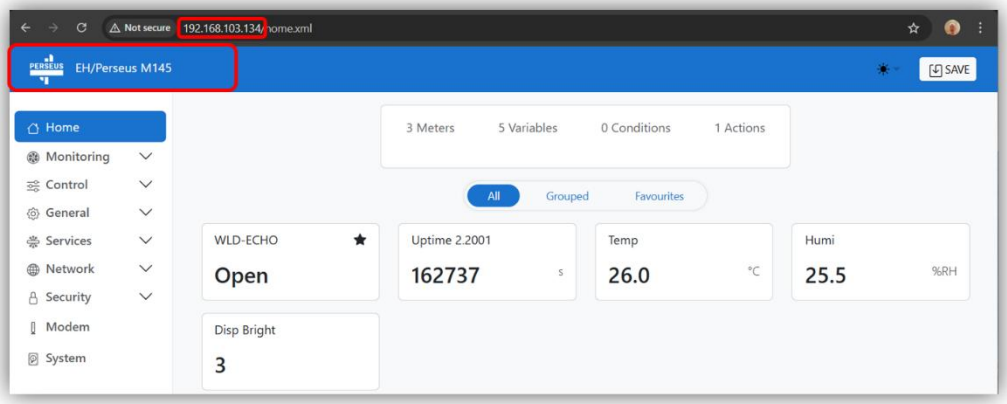
Option A – Local access

- Use **HWg-Config** to find the IP address of the Perseus device on your local network.

  Note: The computer and the Perseus device must be on the same network.
- Download **HWg-Config** if needed:
  https://www.hw-group.com/software/hwg-config-udp-config
- Open **HWg-Config**, find your **Perseus** device in the device list, and click its **IP address**.
- If necessary, use the **Filter** option and click **Find Devices**.

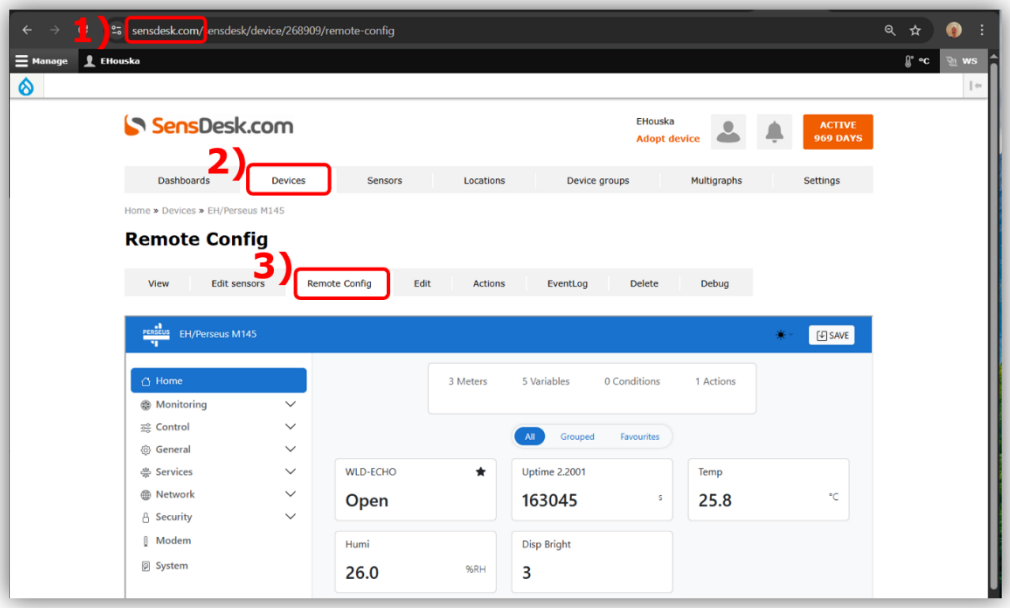


- The Perseus web interface will open in your web browser.



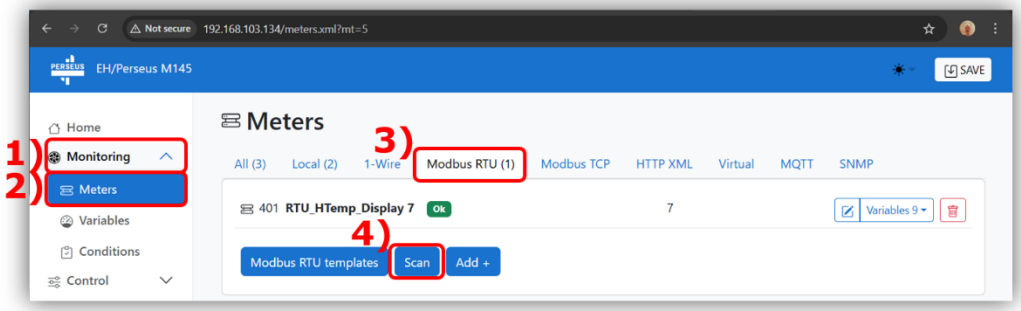
Option B – Remote Config (SensDesk technology portal)

- If **Remote Config** is enabled, open the **SensDesk** technology portal.
  - Go to **Devices**, select the corresponding **Perseus** device, and click **Remote Config**.
- The remote Perseus web interface will open.



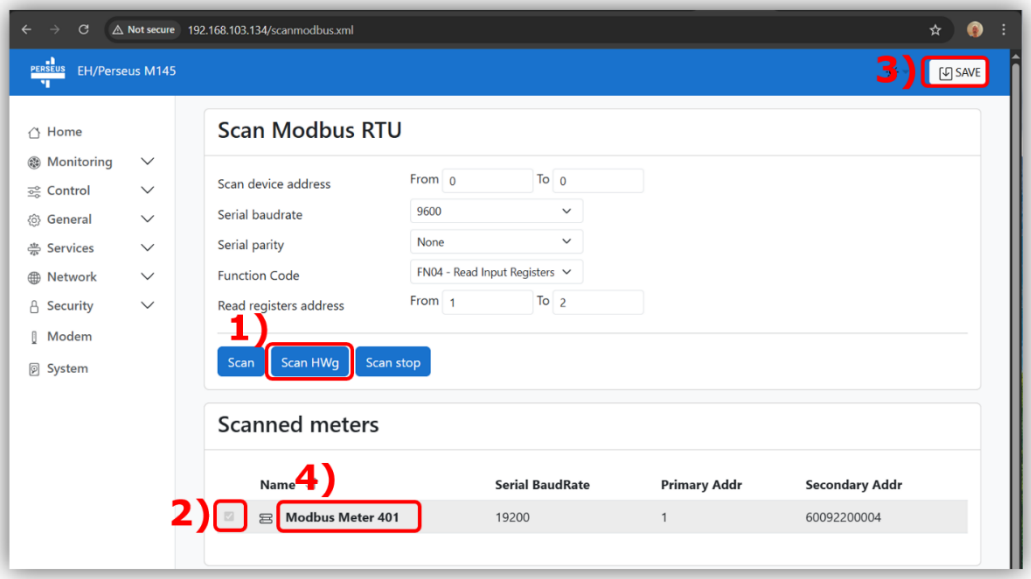
3) Add the RTU-HTemp Display to Perseus

- In the Perseus web interface, go to **Monitoring** → **Meters** → **Modbus RTU**.
- Click **Scan**.

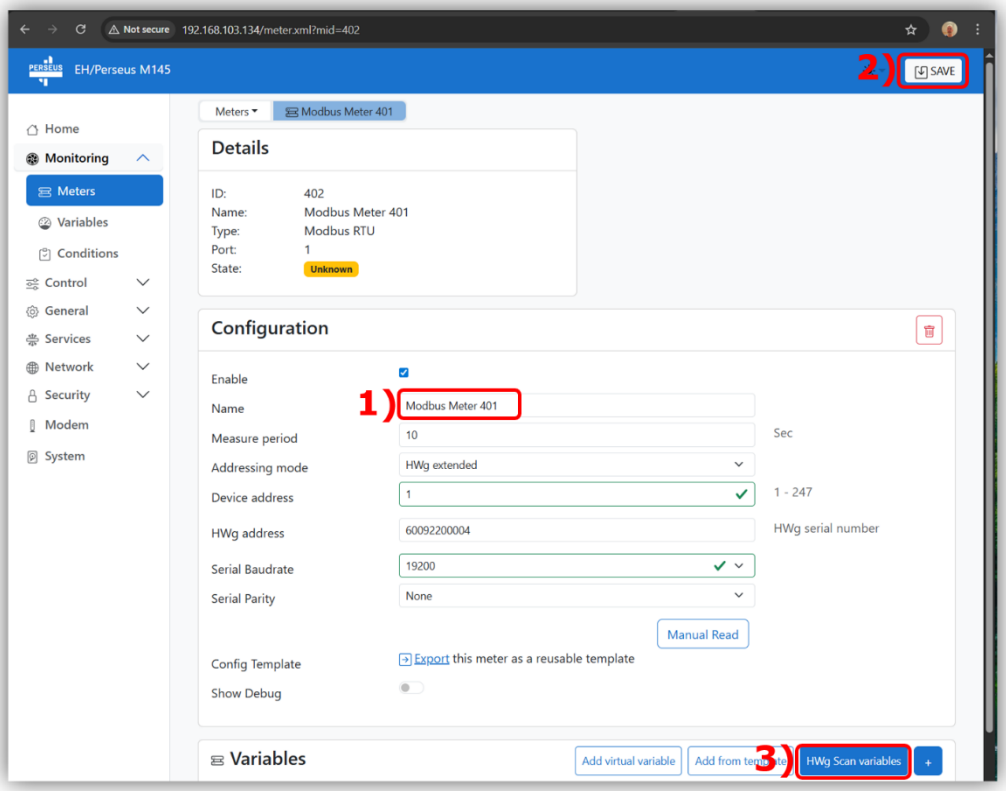


- Then Click **Scan HWg** to search for available HWg Modbus RTU meters.
- Select the required meter by checking the checkbox and click **Save**.

- Click the **Modbus Meter** name to open the sensor configuration.

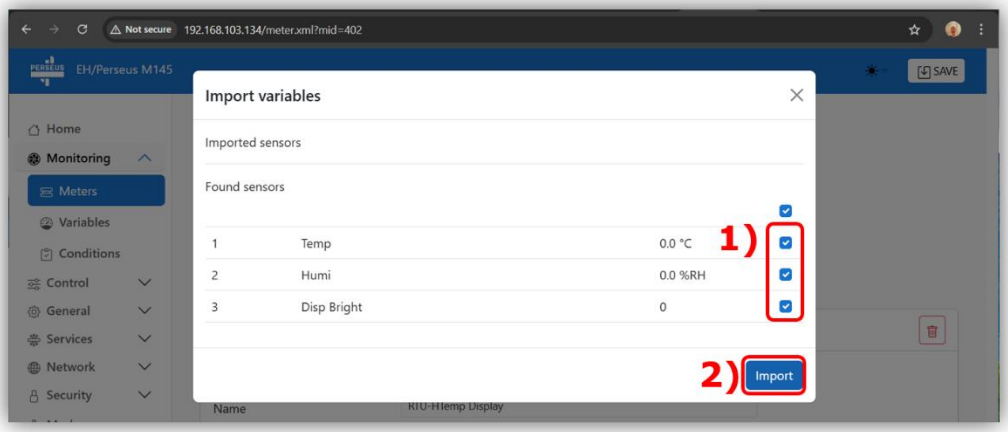


- Set **Name**
- Click **Save**
- Click **HWg Scan variables** to load the available variables/values



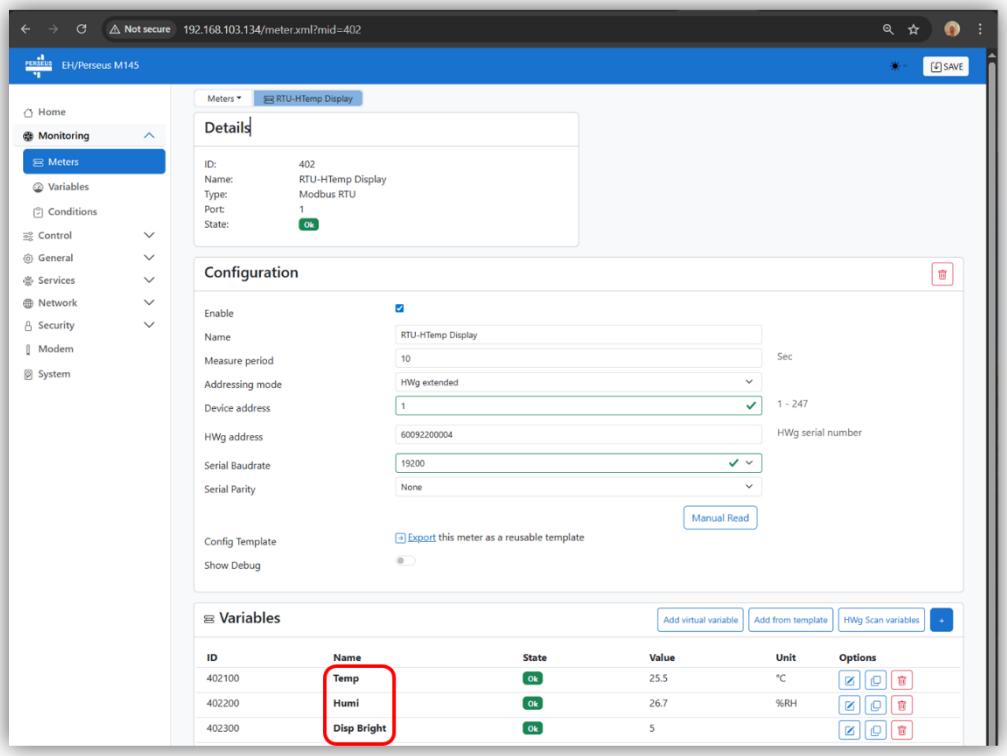
- The **Import variables** table will be displayed.
- Select the values you want to use by checking.

– Click **Import**.



4) Adjust Parameters for Individual Variables

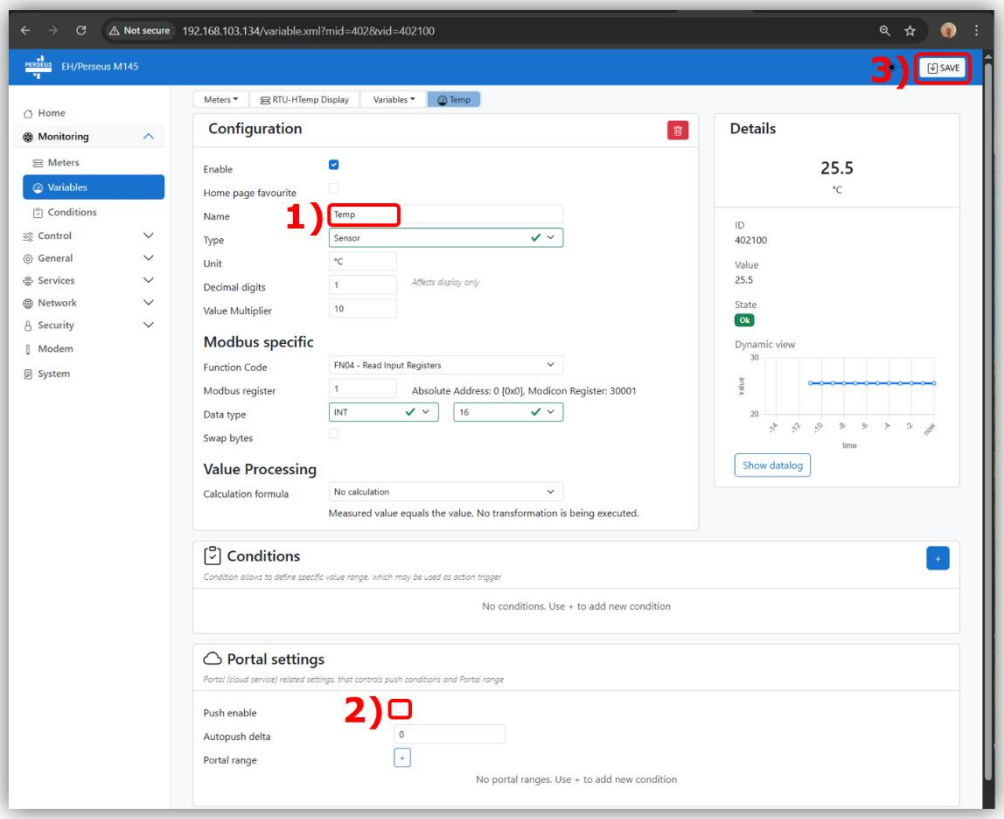
– In the **Variables** section, click the corresponding **Variable** (measured value) if adjustments are needed.



– Edit the **Name** field and enter a custom name for easy identification.

– To display the value in the portal, enable **Push enable** in the **Portal settings section**.

– Click **Save**

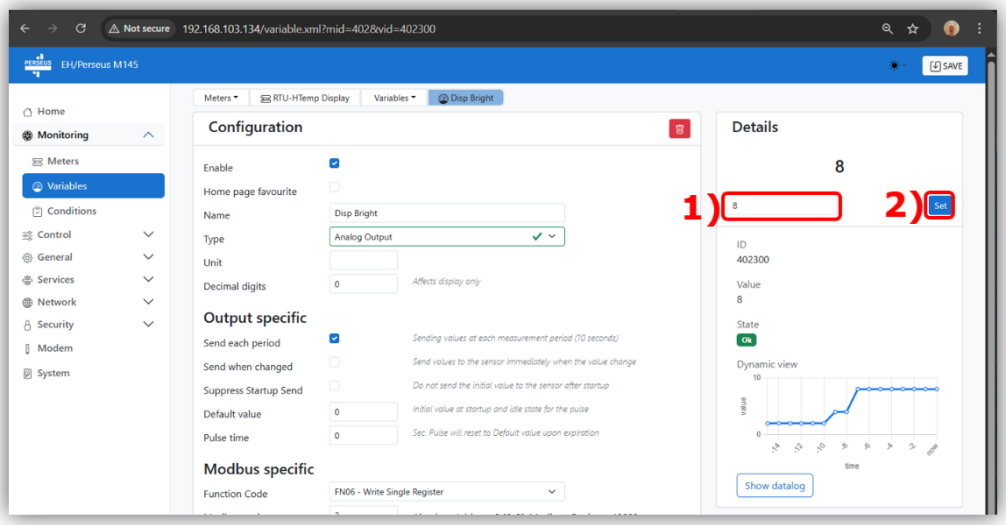


5) Adjust Display Brightness

– In the **Variables** section, click **Disp Bright**.

– In the **Details** section, enter a **brightness value** from 0 to 8 (0 = display off, 8 = maximum brightness).

– Click **Set** to apply the new brightness setting.

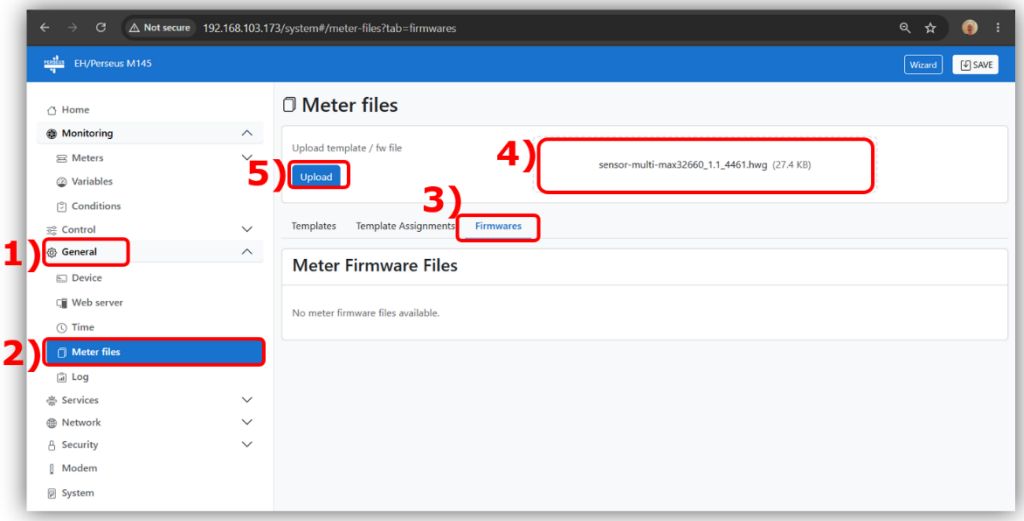


Firmware Upgrade via Perseus Platform

Firmware upgrades of UNI3-compatible sensors can be performed remotely using a Perseus device with firmware version 1.0.10 or later.

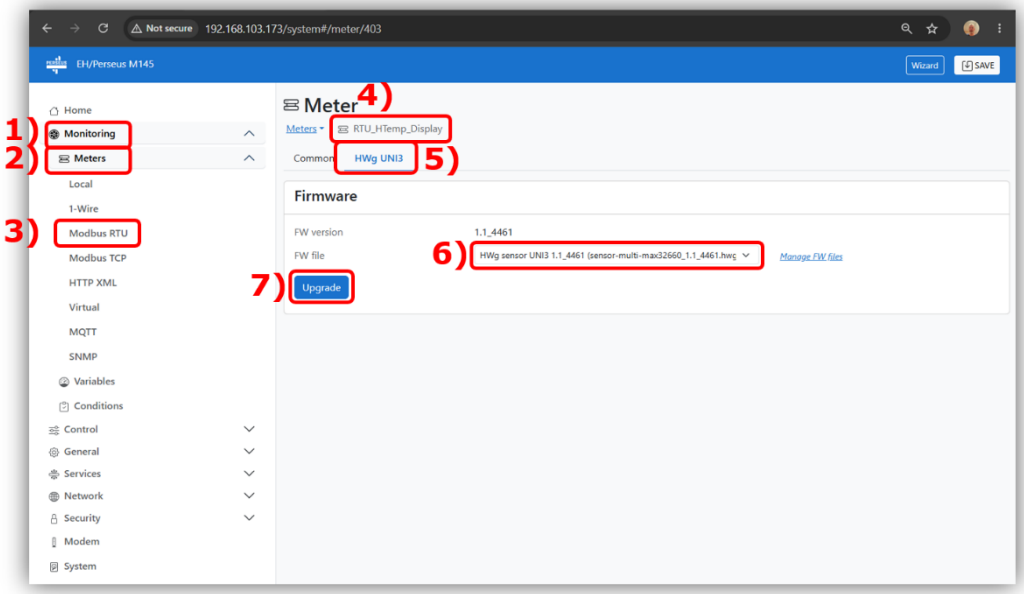
1) Upload Firmware File to Perseus

- Open the Perseus web interface.
- Navigate to **General** → **Meter Files** → **Firmwares**.
- Upload the desired firmware file. Click **Upload.**



2) Perform Firmware Upgrade

- Navigate to **Monitoring** → **Meters** → **Modbus RTU**.
- Select the desired sensor.
- Click **HWg UNI3**.
- Select the uploaded firmware file. Click **Upgrade**.



HW group s. r. o.
Rumunská 26/122 Prague,
120 00 Czech Republic

Phone: +420 222 511 918
Fax: +420 222 513 833
www.HW-group.com

manual version: May 2026