SD - User manual

Safety Notices

The device complies with regulations and standards in force in the Czech Republic and the European Union. The device has been tested and is supplied in working order. To keep the device in this condition, it is necessary to adhere to the following safety and maintenance instructions.

Using the device in a manner other than prescribed by the manufacturer may cause its safeguards to fail!

The power supply outlet or disconnection point must be freely accessible.

The device must not be used in particular under any of the following conditions:
• The device is noticeably damaged
• The device does not function properly
• Unfastened parts can move inside the device
• The device has been exposed to moisture or rain
• The device has been serviced by unauthorized personnel
• The power adapter or power supply cable are noticeably damaged
• If the device is used in a manner other than designed for, the protection provided by the device may fail.
• The local electrical system must include a power switch or a circuit breaker and overcurrent protection.

The manufacturer warrants the device only if it is powered by the supplied power adapter or an approved power supply.

If you have any problems with installing or operating the device, please contact the technical support:

HW group s.r.o.
http://www.hw-group.com
email: support@HWg.cz

Formanská 296
Prague, 149 00
Phone: +420 222 511 918

Before contacting technical support, please have at hand the exact type of your device (at the type plate) and, if known, the firmware version (see later in this manual).

Table of Contents

SD devices

The SD family contains simple devices for monitoring temperature, humidity and other parameters or for detecting water leaks, smoke or open windows and doors. The devices connect via wired Ethernet or wireless WiFi to the SensDesk cloud portal.

The SD devices family includes:

SD-2x1Wire plain – a device for connecting thermometers, hygrometers, or other sensors via the 1-Wire bus. Allows connecting four 1-Wire or 1-Wire UNI sensors.

SD-2xIn plain – a device for connecting a door or window contact, a PIR motion detector or a smoke or gas detector, with a dry contact output. Allows connecting 2 independent sensors.

SD-WLD plain – water leak detector with a moisture-sensing cable. Allows connecting 1 sensing cable of up to 85m length.

SD-2xOut plain – a device with two outputs that can be controlled from the SensDesk portal.

Basic features
• Wired Ethernet as well as WiFi - 802.11 b/g/n (2.4GHz)
• Support for simultaneous Ethernet and WiFi operation (for easy setup)
• 5V or PoE power
• Simple installation, supports DHCP
• Embedded WEB server
• Security protected with a password
• Support for the SensDesk portal

Technical specifications

Ethernet	
Interfaces	RJ45 (10/100BASE-T)
Supported protocols	IP: ARP, TCP/IP (HTTP, HWg-Push)

External sensors (SD-2x1Wire only)	
Port / connector	Port1, Port2 / RJ11 (1-Wire)
What can be connected	4 external temperature or humidity sensors at each port. 2 combined temperature + humidity sensors are also supported.
Sensor types	Only sensors by HW group s.r.o.
Sensors / distance	Max. 4 probes / values (max. 60 m total length per port)
Alarm LED	Port1 – Alarm SENS – lights up in case of alarm at the sensor

DI – Dry Contact Inputs (SD-2xIN only)	
Port / connector	I1, I2 / terminal block ø 2 mm
Type	Digital Input (supports NO/NC Dry contact)
Sensitivity	1 (On) = 0-500 Ω (right pin on the terminal block can be connected to 5V GND)
Max. distance	Up to 50 m
LED	2× green – input closed

DI – Dry Contact Inputs (SD-WLD only)	
Type	Moisture sensing cable
Connector	Terminal block
Sensor states	0 = OK, 1 = flooded, 2 = cable disconnected
Sensing cable length	Up to 85 m
Cable extension	May be extended by at most 100 m, AWG 24
LED	1× green – closed or disconnected cable input

Power	
Supply voltage	5VDC / 250 mA
Connector	Jack Ø 3.5×1.35 / 10 [mm]
PoE (Power over Ethernet)	RJ45 - IEEE 802.3af Class 0

Common LEDs	
LINK	**Green – Ethernet connection status**
Activity	**Yellow – Ethernet activity**
WiFi	**Blue – connected (lit), searching (slow flashing), connecting (fast flashing)**

Push-button	
Reset	To restore factory defaults: press and hold for 5 seconds after connecting power

WiFi	
Supported standards	802.11 b/g/n
Frequency	2,4 GHz
Output power	+19.55 dBm output power in 802.11b mode +16 dBm for 802.11 5n
Security	WEP / WPA / WPA2 PSK / WPA2 TSK / WPS
Antenna	External, RPSMA

| Miscellaneous	
Operating temperature	-10 to +60 ºC (for the device – sensors may support different operating ranges)
Dimensions / weight	67×78×33 [mm] / 250 g
Electromagnetic radiation	CE / FCC Part 15, Class B
EMC	EN 55022, EN 55024, EN 61000

Technical specifications

Connectors

SD-2x1Wire

- *Ethernet* – for a wired internet connection in case of LAN operation, or for initial configuration in case of WiFi operation. Can be used to power the device via PoE (Power over Ethernet).
- *Temp/Humidity* – for connecting up to 4 temperature or humidity sensors/values. The limit is two values per port. The sensor cable can be up to 60m long (per port).
- *Power* – connector for a 5V power supply if the device is powered from an external adapter.
- *Digital Inputs* – for connecting dry contact sensors.

LED indicators

- *Link* – green LED indicates an active network connection.
- *Activity* – flashing yellow LED indicates ongoing communication over the wired network connection.
- *WiFi* – blue LED indicates an active connection to a WiFi Access Point. While establishing the connection, flashing LED indicates status.
- *Alarm LED* – two LEDs in the Port1 and Port2 connectors. When lit, the LEDs indicate Alarm state at the respective connector.

Buttons

- *Reset* – to reset the device to factory defaults.
1. Turn the device off.
2. Press and hold the button.
3. Turn the device on and hold the button for another 5 seconds.
4. All LEDs light up in sequence.
5. Turn the device on again, factory defaults are restored.
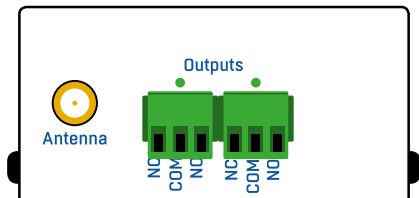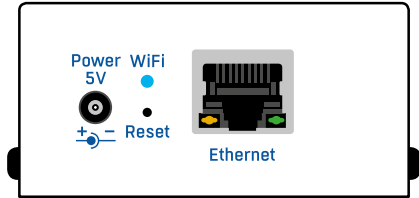
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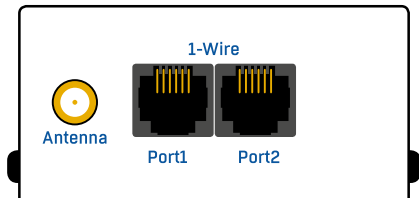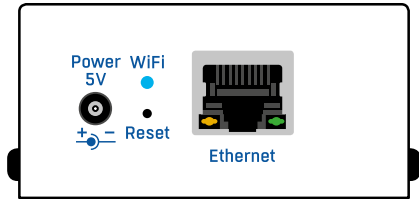
SD-2xIn

- *Ethernet* – for a wired internet connection in case of LAN operation, or for initial configuration in case of WiFi operation. Can be used to power the device via PoE (Power over Ethernet).
- *Power* – connector for a 5V power supply if the device is powered from an external adapter.
- *Digital Inputs* – for connecting dry contact probes.

LED indicators
- *Link* – green LED indicates an active network connection.
- *Activity* – flashing yellow LED indicates ongoing communication over the wired network connection.
- *WiFi* – blue LED indicates an active connection to a WiFi Access Point. While establishing the connection, flashing LED indicates sensor status.
- *Inputs* – when lit, indicates that the contact at the digital input is closed.

Buttons
- *Reset* – to reset the device to factory defaults.
1. Turn the device off.
2. Press and hold the button.
3. Turn the device on and hold the button for another 5 seconds.
4. All LEDs light up in sequence.
5. Turn the device on again, factory defaults are restored.
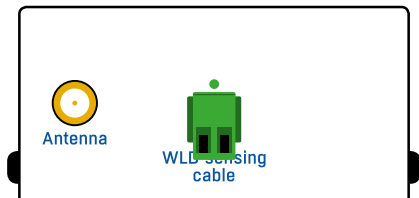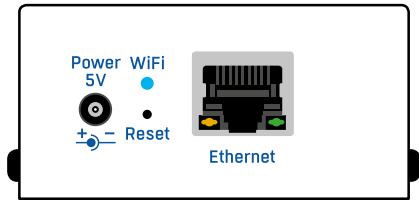
Connectors

SD - Devices   7
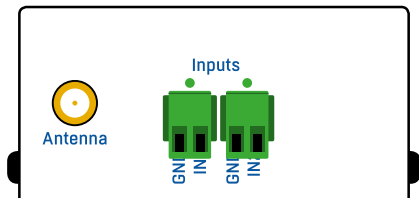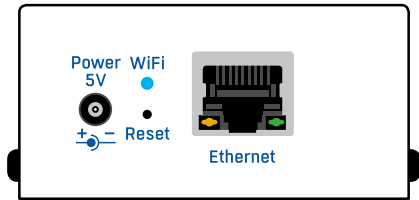
SD-2xOut

- *Ethernet* – for a wired internet connection in case of LAN operation, or for initial configuration in case of WiFi operation. Can be used to power the device via PoE (Power over Ethernet).
- *Power* – connector for a 5V power supply if the device is powered from an external adapter.

LED indicators

- *Link* – green LED indicates an active network connection.
- *Activity* – flashing yellow LED indicates ongoing communication over the wired network connection.
- *WiFi* – blue LED indicates an active connection to a WiFi Access Point. While establishing the connection, flashing LED indicates status.
- *Outputs* – when lit, the corresponding relay contact is closed.

Buttons

- *Reset* – to reset the device to factory defaults.
1. Turn the device off.
2. Press and hold the button.
3. Turn the device on and hold the button for another 5 seconds.
4. All LEDs light up in sequence.
5. Turn the device on again, factory defaults are restored.

SD-WLD

- *Ethernet* – for a wired internet connection in case of LAN operation, or for initial configuration in case of WiFi operation. Can be used to power the device via PoE (Power over Ethernet).
- *Power* – connector for a 5V power supply if the device is powered from an external adapter.

LED indicators
- *Link* – green LED indicates an active network connection.
- *Activity* – flashing yellow LED indicates ongoing communication over the wired network connection.
- *WiFi* – blue LED indicates an active connection to a WiFi Access Point. While establishing the connection, flashing LED indicates status.
- *WLD sensig cable LED* – when lit, the detection cable is moist or disconnected.

Buttons
- *Reset* – to reset the device to factory defaults.
1. Turn the device off.
2. Press and hold the button.
3. Turn the device on and hold the button for another 5 seconds.
4. All LEDs light up in sequence.
5. Turn the device on again, factory defaults are restored.

Setting up

1. Connecting the cables

• Connect the device to the **Ethernet** (with a patch cable to a **switch**, or a cross-over cable to a PC).
• Plug the power adapter into a power outlet and connect it to the power connector.
• The green **Power&Mode** LED in the RJ45 connector lights up.
• If the Ethernet connection works properly, the **LINK** (amber) LED lights up after a short while, and then flashes whenever data transfer takes place (activity indication).
• Rapidly flashing yellow **LINK** LED indicates communication with the DHCP server.

2. Configuring the IP address – HWg Config

The tool is available for download at
www.HW-group.com -> *Software* -> *HWg Config*.
• Click the icon to run **HWg-Config**. The program automatically searches for connected devices.
• To search for devices, click the **Find Devices** icon.
• The program searches for devices in your local network. Double-click a MAC address to open a basic device configuration dialog.
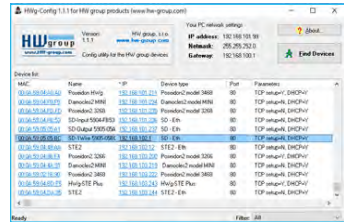
Configure the network parameters
• IP address / HTTP port (80 by default)
• Network mask
• Gateway IP address for your network
• Device name (optional)
Click **Apply Changes** to save the settings.

Restoring factory defaults
• Right-click the device MAC address. Within 60 seconds after powering up the unit, factory defaults can be restored using HWg-Config.
• Press and hold the **RESET** button and connect the power adapter. Hold the button for about another 5 seconds, until all LEDs light up.

WWW interface of the device
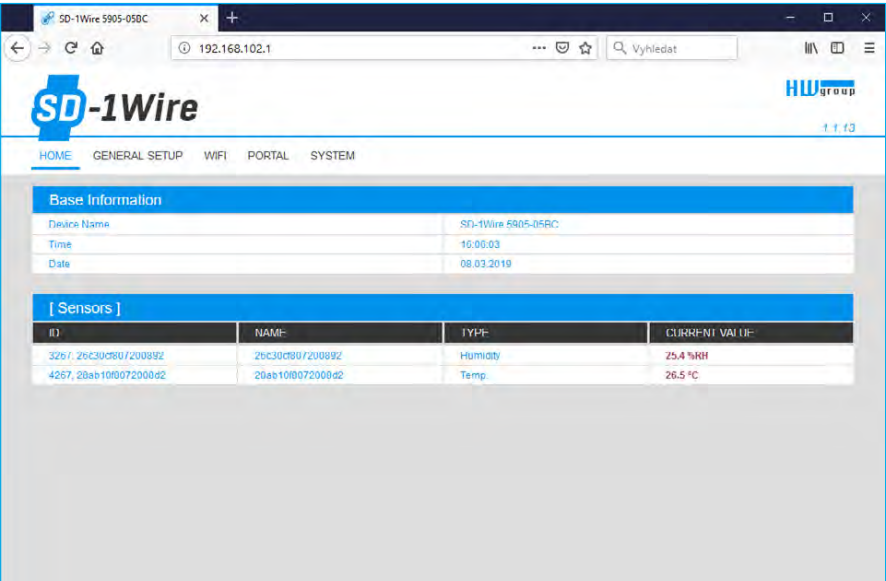
To open the WWW interface of the device:
• Enter the device IP address in a web browser.
• Click the underlined IP address in **HWg-Config**.

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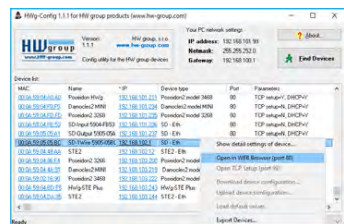
WWW interface

All SD devices have the same graphical WWW interface. They only differ in the logo and the I/O information.

Home

Base Information

- *Device Name* – distinguishes individual devices in larger installations. The name is factory-generated and uniquely identifies the device.
- *Time* – current time on the device clock. The time can be configured automatically over the Internet or from the SensDesk portal. In case of automatic configuration, correct value means that the device can access the Internet. UTC time must be always synchronous with the SensDesk portal.
- *Date* – current date on the device clock. The date can be configured automatically over the Internet or from the SensDesk portal. In case of automatic configuration, correct value means that the device can access the Internet. UTC time must be always synchronous with the SensDesk portal.

[Sensors] (SD-1Wire + SD-Water)

Lists current sensor readings and digital input (dry contact) states.

- *ID* – shows the short and full sensor IDs. The short ID is used for automated processing (contains only numbers). The full ID corresponds to the 1-Wire sensor ID, it is always unique and may contain letters.
- *Name* – sensor name, used for easier identification in large systems. Always corresponds to the full 1-Wire sensor ID, which is also found physically on the sensor.
- *Type* – identifies the sensor type.
- *Current value* – current reading, including the unit.

[Relay Outputs]

- *ID* – shows the ID of the output.
- *Name* – name of the output, used for easier identification in large systems. Always includes the word "Output" + the output ID.
- *Type* – shows the output type.
- *Current value* – current state of the output.

[Digital Inputs]

- *ID* – shows the ID of the input.
- *Name* – name of the input, used for easier identification in large systems. Always includes the word "Input" + the input ID.
- *Type* – shows the input type.
- *Current value* – current state of the input.

General Setup

Base
- *Temperature Unit* – unit for displaying temperature. Options are Celsius / Fahrenheit / Kelvin. Safe range values are automatically recalculated according to the selection.

Network
Only the wired (RJ-45) network connection is configured here. Use the WiFi tab to configure the wireless connection.
- *DHCP* – enables IP address configuration via a DHCP server if available. Decision whether or not to enable DHCP depends on the user needs and your network administrator.
- *IP Address* – IP address of the device. Assigned by your network administrator.
- *Network Mask* – network mask. Assigned by your network administrator.
- *Gateway* – IP address of the default gateway. Assigned by your network administrator.
- *DNS Primary / DNS Secondary* – IP address of your DNS server. Assigned by your network administrator.
- *HTTP Port* – port number where the built-in WWW server listens. It may be useful to change the port number, for instance, if multiple devices need to be accessible from external networks via a router. Ask your network administrator whether or not you need to change this value. The default port is 80.

Security: Device Admin
- *Username / Password* – user name and password for securing access to SD devices.

WiFi

When WiFi is off, only the option to enable it is shown:
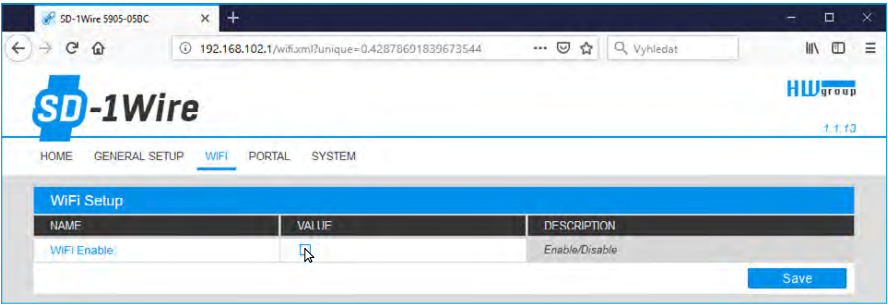
After enabling WiFi, more options are available:

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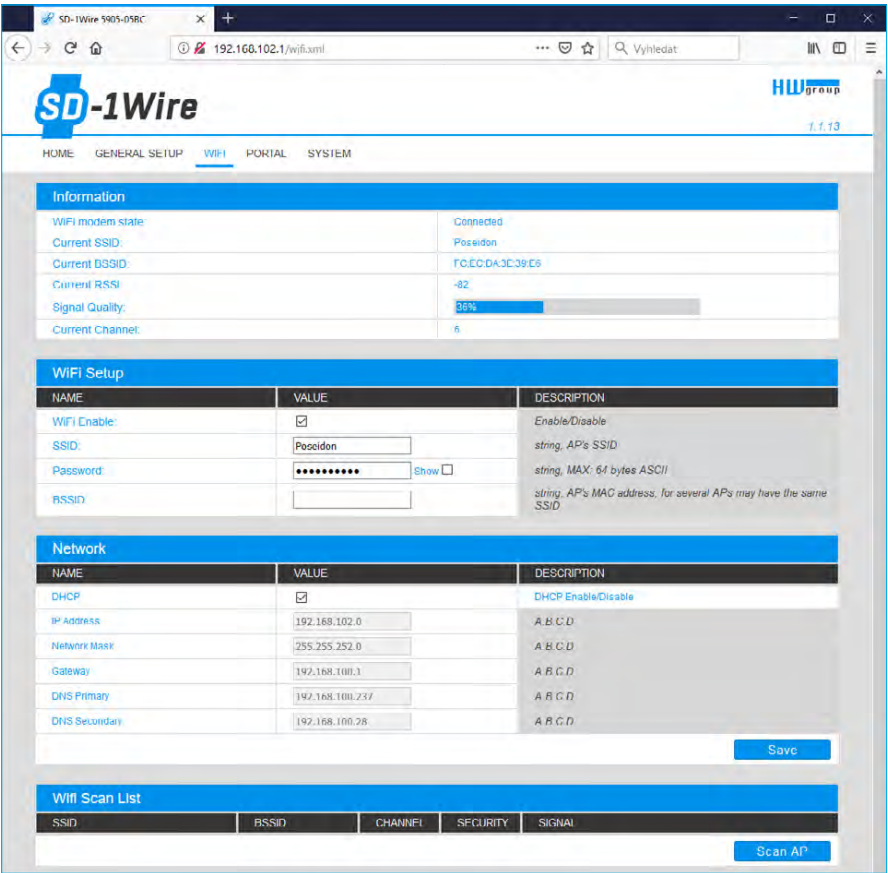
Information

- *WiFi modem state* – displays the WiFi modem status.
  - *Disable* – WiFi turned off.
  - *Wait for power on* – waiting for the WiFi module to switch on.
  - *Init* – WiFi module is being initialized.
  - *Connecting* – connection is being established.
  - *SSID check* – SSID is being verified.
  - *Connected* – connected to the selected WiFi network.
  - *Network wifi scan* – looking for available WiFi networks.
  - *Wait for scan* – waiting for the WiFi network scan to start.
- *Current SSID* – name of the network to which the device is currently connected. The parameter is not shown if the device is not connected to any WiFi network.
- *Current BSSID* – ID of the WiFi network access point to which the device is currently connected. The parameter is not shown if the device is not connected to any WiFi network.
- *Current RSSI* – relative received signal strength indication. The higher the RSSI, the stronger the signal.
- *Signal Quality* – WiFi signal strength in % and with a graphical indication.
- *Current Channel* – WiFi channel used by the device for the connection. The parameter is not shown if the device is not connected to any WiFi network.

WiFi Setup

- *WiFi Enable* – enables or disables WiFi. The wireless interface is disabled by default. After enabling, the device restarts.
- *SSID* – name of the WiFi network to which the device should connect. If the network name is not known, use the Scan AP function at the bottom of the page.
- *Password* – network password. If you don't know it, contact your network administrator.
- *BSSID* – WiFi access point identifier (MAC address). Optional.

Network

WiFi network parameters. Only the wireless interface is configured here. To configure wired Ethernet (RJ-45), use the General Setup tab.
- *DHCP* – enables IP address configuration via a DHCP server if available. Decision whether or not to enable DHCP depends on the user needs and your network administrator.
- *IP Address* – IP address of the device. Assigned by your network administrator.
- *Network Mask* – assigned by your network administrator.
- *Gateway* – IP address of the default gateway. Assigned by your network administrator.
- *DNS Primary / DNS Secondary* – IP address of your DNS server. Assigned by your network administrator.

WiFi Scan List

- *SSID* – name of the discovered WiFi network.
- *BSSID* – access point identifier (MAC address).
- *Channel* – WiFi channel used by the access point.
- *Security* – WiFi security type.
- *Signal* – signal level in decibels. The higher the value, the better. Attention: -60 is better than -90! Highlighted row indicates the AP that is currently used.

Connecting to a discovered WiFi

• By clicking the SSID of the discovered network, WiFi settings are filled in. Only the password needs to be specified manually. The BSSID field remains empty. This is the default setting. When the AP changes, the device reconnects automatically.

• By clicking the BSSID, the MAC address of the specific AP (BSSID) is filled in, in addition to the network name (SSID). The SD device then connects to this specific AP and will not try to change APs in multi-AP networks.

Scan AP

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Portal

Configuration parameters for uploading data to a remote portal using the HWg-PUSH Protocol. For more information about the protocol and the support for portal solutions, see *www.hw-group.com*.
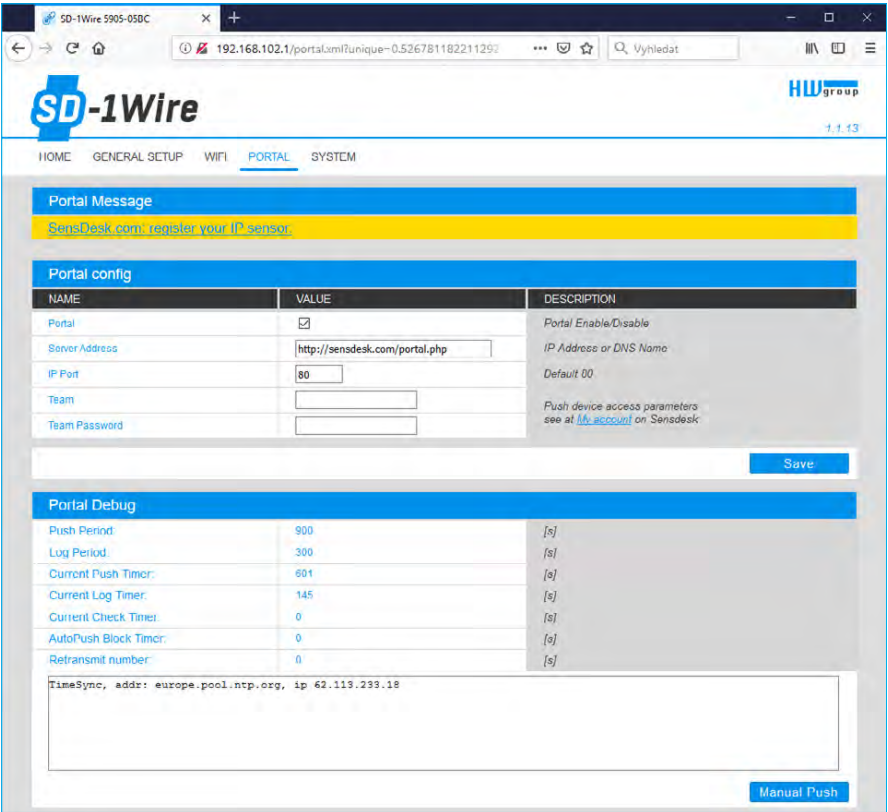
Portal Message
Information from the portal, such as links to graphs. Depends on the portal type.

Portal Config
• *Portal* – turns this feature on or off.
• *Server address* – complete URL of the remote server. Connection parameters for the *www.Sens-Desk.com* portal are pre-filled. The default is always *http://SensDesk.com/portal.php*.
• *IP Port* – port where the portal listens.
• *Team* – username for assigning an SD team. You will receive it from your portal administrator.
• *Team Password* – password for assigning an SD team. You will receive it from your portal administrator.

Portal debug

For debugging only.

- *Push Period* – period of uploading data to the remote portal. The period is determined by the portal and cannot be changed by the user.
- *Log Period* – period for buffering data for the portal. The period is determined by the portal and cannot be changed by the user.
- *Current Push Timer* – indicates the time until the next upload of data to the portal.
- *Current Log Timer* – indicates the time until the next buffering of data for the portal.
- *AutoPush Block Timer* – event counter for the AutoPush function. If the allowed number of events is exceeded in one Push period, the AutoPush function is disabled.
- *Retransmit number* – number of unsuccessful attempts to upload values to the portal.
- *Manual Push* – button to immediately upload data to the portal.

System

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Download
- *Backup configuration* – backup of the device configuration in a BIN format. After configuring the SD device, click this link to save the current configuration in case it needs to be restored.
- *Online values in XML* – current readings in the XML format.

System
- *Product Name* – name (type) of the device.
- *Serial Number* – serial number of the device.
- *Eth MAC Address* – MAC address of the device for wired connections.
- *WiFi STA MAC Address* – MAC address of the device for WiFi connections.
- *Firmware Version* – version of the product firmware. Used for diagnostic purposes and trouble-shooting.
- *Build* – build number. Used for diagnostic purposes and troubleshooting.
- *Compile time* – date and time when the firmware was compiled. Used for diagnostic purposes and troubleshooting.
- *UpTime* – time since the device was last powered on or restarted. Used for diagnostic purposes and troubleshooting.
- *Read available version* – displays the latest firmware version available at the HW group update server.
- *Start Network Upgrade* – starts the firmware upgrade using the HW group update server.
- *Upload Firmware or Configuration* – allows uploading a firmware or configuration file to the device. Restoring the configuration may fail if there is a big difference in firmware versions.

Factory Default
Restores factory default settings. The default IP address is 192.168.10.20 and no user name or password is defined.

System Restart
Restarts the device.

WiFi Radio

Description	Min.	Typical	Max.	Unit
Input frequency	2412	-	2484	MHz
Output impedance*	-	*	-	Ω
Tx power				
Output power of PA for 72.2 Mbps	13	14	15	dBm
Output power of PA for 11b mode	19,5	20	20,5	dBm
Sensitivity				
DSSS, 1 Mbps	-	−98	-	dBm
CCK, 11 Mbps	-	−91	-	dBm
OFDM, 6 Mbps	-	−93	-	dBm
OFDM, 54 Mbps	-	−75	-	dBm
HT20, MCS0	-	−93	-	dBm
HT20, MCS7	-	−73	-	dBm
HT40, MCS0	-	−90	-	dBm
HT40, MCS7	-	−70	-	dBm
MCS32	-	−89	-	dBm
Adjacent Channel Rejection				
OFDM, 6Mbps		37		dB
OFDM, 54Mbps		21		dB
HT20, MCS0		37		dB
HT20, MCS7		20		dB

*The typical impedance of the ESP32 chip WiFi radio output differs for different QFN packages. For ESP32 chips in the QFN 6×6 package (ESP32-D0WDQ6), the value is 30 + j10 Ω. For ESP32 chips in the QFN 5×5 package (ESP32-D0WD, ESP32-D2WD, ESP32-S0WD), the value is 35 + j10 Ω.

Connecting SD devices to SensDesk portal

1 Connect the device to the network and configure the network parameters (see **Setting up**).

WiFi Radio / Connecting SD devices to SensDesk portal
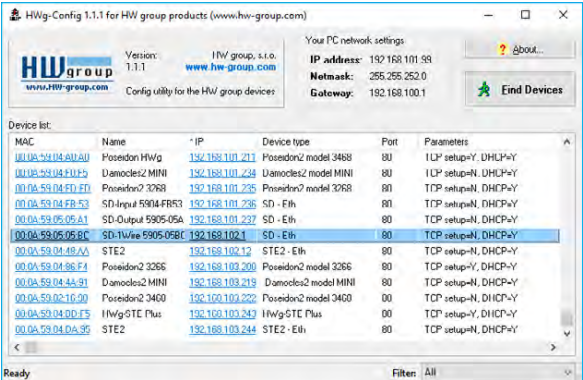
2 Open the device WWW interface:
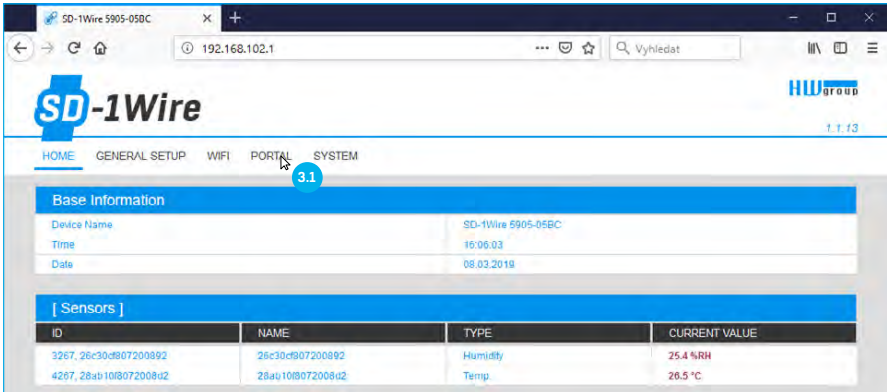
3 At the Portal tab, check the **Portal** box and click **Save**.
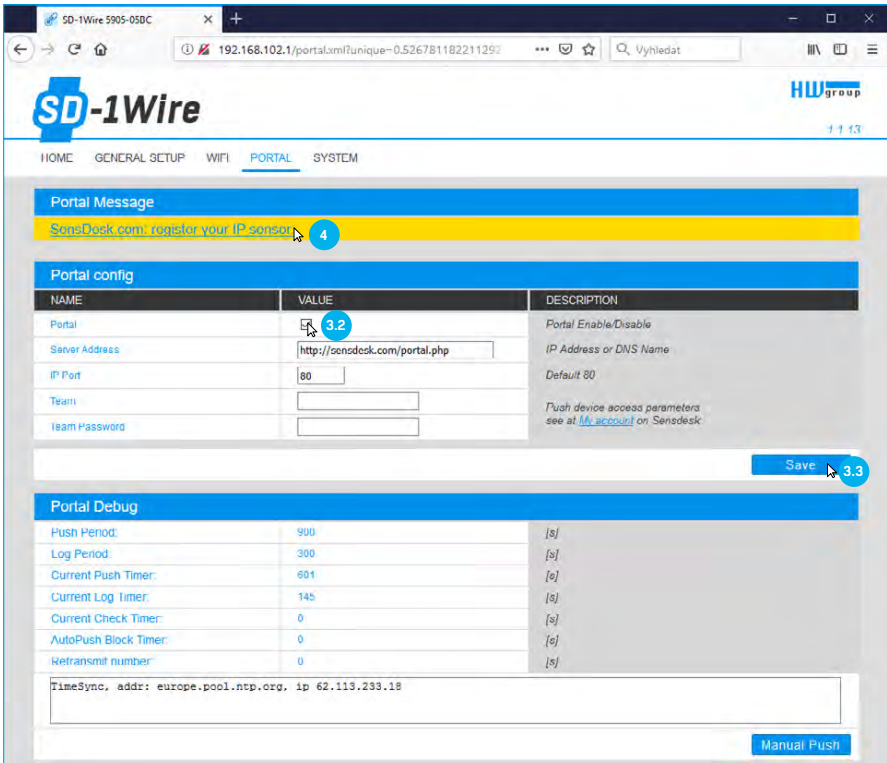
4 Click the **SensDesk.com: register your IP sensor** link to go to the *SensDesk.com* login dialog.

5 If you already have a user account, enter your login credentials. The device is automatically linked to your account.

If you don't have a user account yet, click the **Register to Portal** link. The registration form displays.

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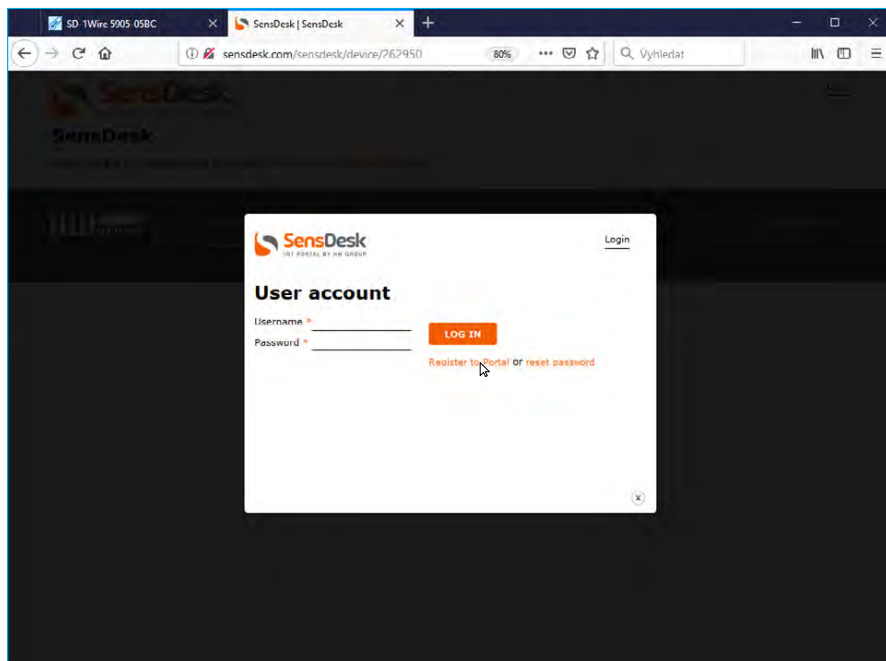
6 Enter your login credentials and a valid e-mail address. **The e-mail address must be unique within the portal**, it must not have been already registered.
After clicking **Create new account**, your account is created and a confirmation e-mail is sent to the address specified.

7 At the **Teams** tab, find the **Team Password**. This password, together with your username, is needed for communication between the device and your account and between mobile apps and the SensDesk portal. The password cannot be changed, and for security reasons it is different from the user account password.
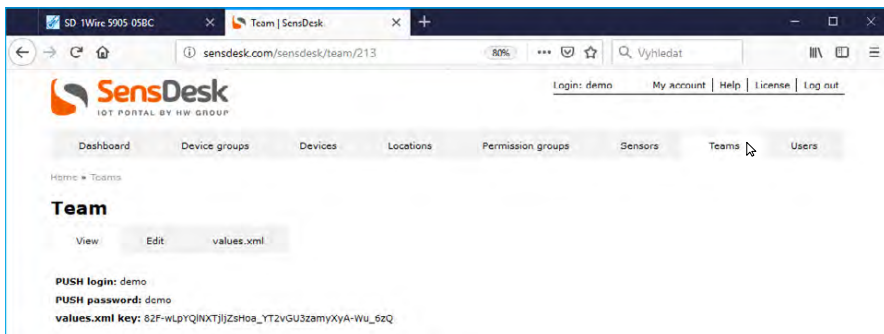
8 This username and password can be manually entered in the portal settings in the web interface of the device in order to avoid the need to register and sign in.
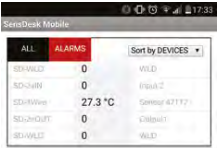
Connecting SD devices to SensDesk portal

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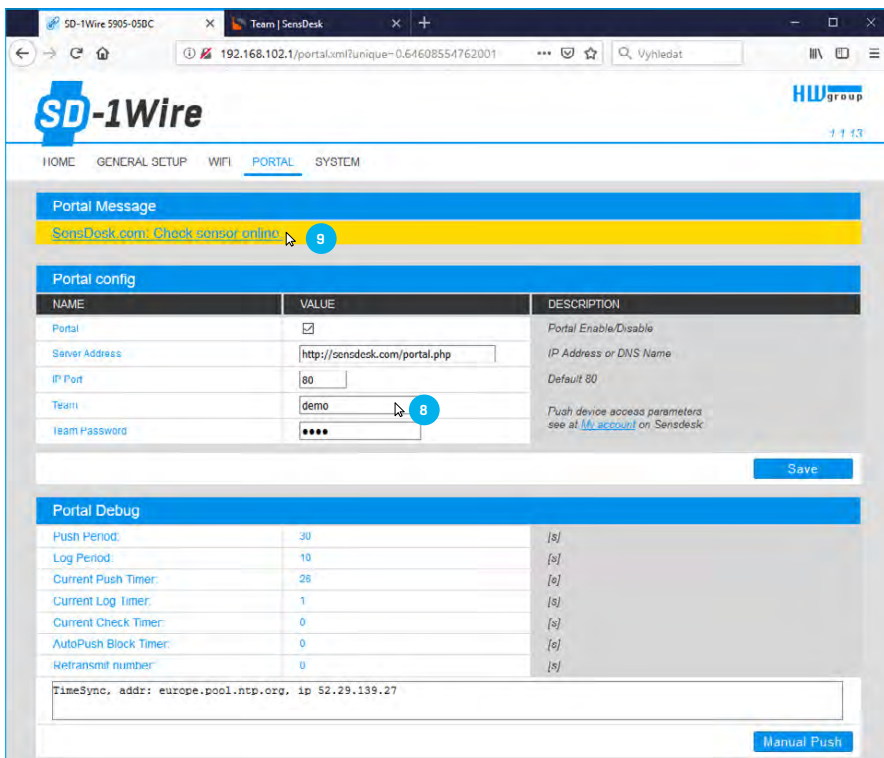
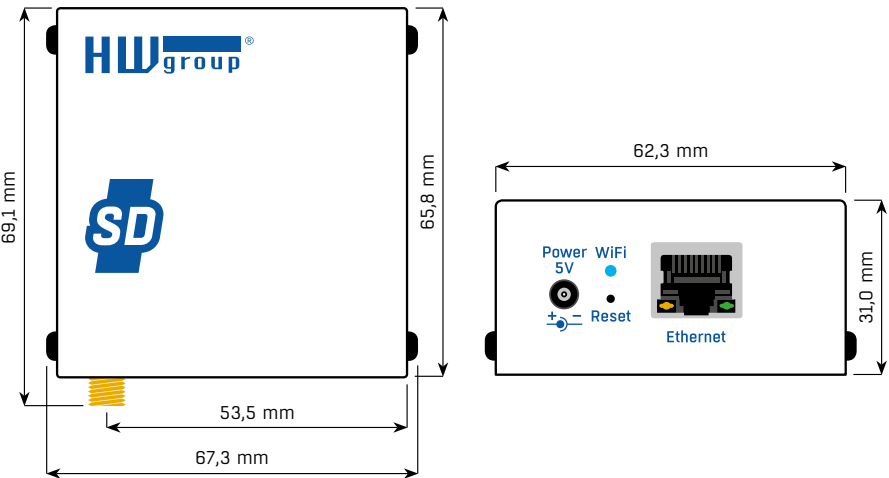**9** To display your device in the SensDesk portal, click the **SensDesk.com: Check sensor online** link.
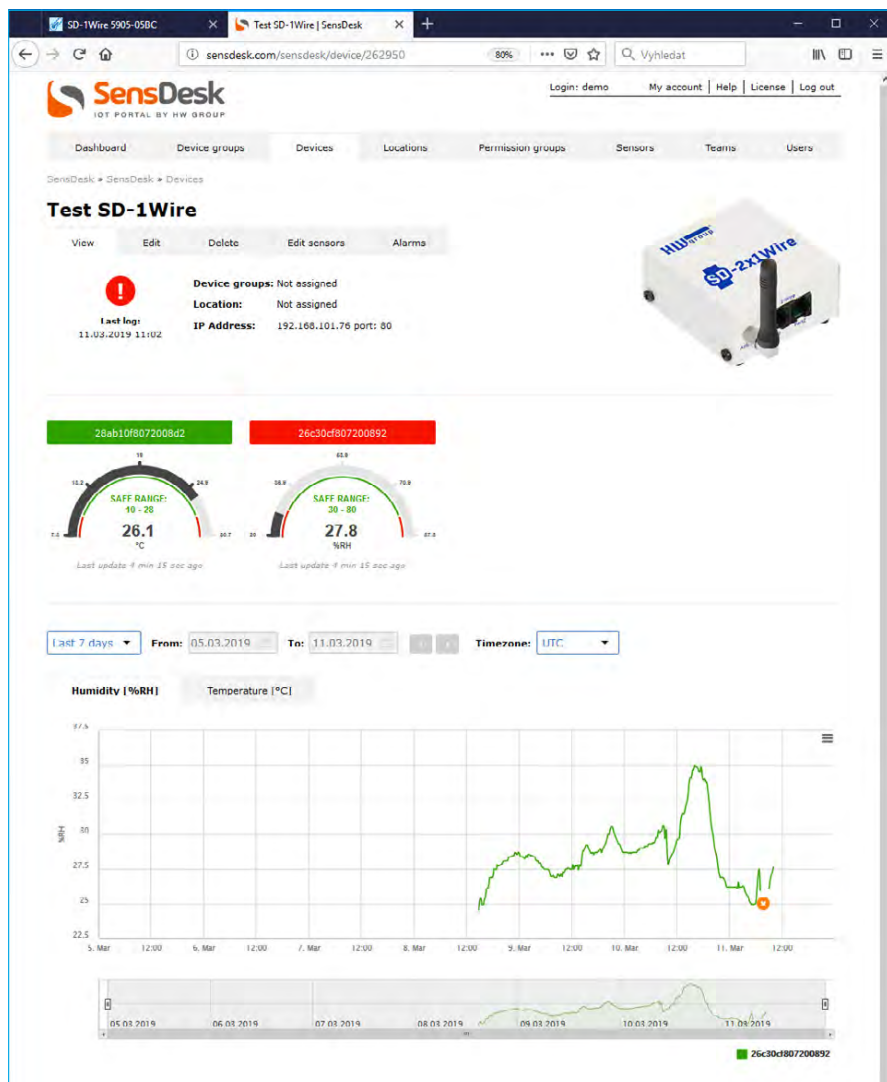
Using the mobile phone app

The **Team** and the **Team Password** can be also used in the mobile app settings.

Mechanical dimensions

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Poseidon2 4002

Designed for demanding monitoring applications, such as in data centers and industrial settings.

Poseidon2 3468

Remote monitoring of temperature, humidity and other sensors. Industrial version.

Poseidon2 3266/3268

Basic unit for monitoring temperature, humidity, and other sensors over the network.

Ares 10/12

Remote environment monitoring at any place with GSM coverage.

Damocles2 2404

Secure industrial I/O device with PoE and telco -48V power options.

HWg-PWR 3/12/25

Consumption metering with external M–bus meters.

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