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71590216
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Valid as of version
01.00.zz (Device firmware)

Special Documentation
Proline Prowirl 200

Web server
PROFINET with Ethernet-APL

ethernet-apl™
advanced physical layer

Endress+Hauser
People for Process Automation

Table of contents

1 About this document

1.1 Document function

This manual is a Special Documentation; it does not replace the Operating Instructions pertaining to the device. It serves as a reference for using the Web server integrated in the measuring device.

1.2 Target group

The document is aimed at specialists who work with the device over the entire life cycle and perform specific configurations.

1.3 Using this document

1.3.1 Information on the document structure

This Special Documentation contains a range of information, including:
- Prerequisites for use on the computer and measuring device
- Configuration of the communication interface
- Establishing a connection
- Diagnostics and troubleshooting

The information and safety instructions in the Operating Instructions pertaining to the measuring device must always be observed → 4.

1.3.2 Device documentation

For an overview of the scope of the associated Technical Documentation, refer to the following:
- *Device Viewer* (www.endress.com/deviceviewer): Enter the serial number from the nameplate
- *Endress+Hauser Operations app*: Enter serial number from nameplate or scan matrix code on nameplate.

Technical documentation can also be downloaded from the Download Area of the Endress+Hauser website: www.endress.com → Download. However this technical documentation applies to a particular instrument family and is not assigned to a specific measuring device.

1.4 Symbols

1.4.1 Safety symbols

DANGER
This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.

WARNING
This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in serious or fatal injury.

CAUTION
This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium injury.

NOTICE
This symbol contains information on procedures and other facts which do not result in personal injury.

1.4.2 Symbols for certain types of information

Symbol	Meaning
	**Permitted** Procedures, processes or actions that are permitted.
	**Forbidden** Procedures, processes or actions that are forbidden.
	**Tip** Indicates additional information.
	Reference to documentation
	Reference to page
	Reference to graphic
▶	Notice or individual step to be observed
1., 2., 3...	Series of steps
	Result of a step

1.4.3 Symbols in graphics

Symbol	Meaning
1, 2, 3, ...	Item numbers
1., 2., 3., ...	Series of steps

2 Basic safety instructions

2.1 Requirements for personnel

Personnel involved in installation, commissioning, diagnostics and maintenance must meet the following requirements:
- Trained, qualified specialists must have a relevant qualification for this specific function and task
- Are authorized by the plant owner/operator
- Are familiar with federal/national regulations
- Before starting work, read and understand the instructions in the manual and supplementary documentation as well as the certificates (depending on the application)
- Follow instructions and comply with basic conditions

Operating personnel must meet the following requirements:
- Be instructed and authorized by the plant operator with regard to the requirements of the task
- Follow the instructions in this manual

2.2 Designated use

The designated use of the measuring device is described in the Operating Instructions pertaining to the device → 🖹 4.

2.3 Workplace safety

For work on and with the device:
- Wear the required personal protective equipment according to federal/national regulations.

If working on and with the device with wet hands:
- It is recommended to wear gloves on account of the higher risk of electric shock.

2.4 Operational safety

Risk of injury!
- Operate the device only if it is in proper technical condition, free from errors and faults.
- The operator is responsible for the interference-free operation of the device.

Modifications to the device

Unauthorized modifications to the device are not permitted and can lead to unforeseeable dangers!
- If modifications are nevertheless required, consult with the manufacturer.

2.5 Product safety

This device is designed in accordance with good engineering practice to meet state-of-the-art safety requirements, has been tested, and left the factory in a condition in which it is safe to operate.

It meets general safety standards and legal requirements. It also complies with the EC directives listed in the device-specific EC Declaration of Conformity. Endress+Hauser confirms this by affixing the CE mark to the device.

2.6 IT security

Our warranty is valid only if the product is installed and used as described in the Operating Instructions. The product is equipped with security mechanisms to protect it against any inadvertent changes to the settings.

IT security measures, which provide additional protection for the product and associated data transfer, must be implemented by the operators themselves in line with their security standards.

2.7 Device-specific IT security

The device offers a range of specific functions to support protective measures on the operator's side. These functions can be configured by the user and guarantee greater in-operation safety if used correctly. The following list provides an overview of the most important functions:

Function/interface	Factory setting	Recommendation
Write protection via hardware write protection switch → 🖹 7	Not enabled.	On an individual basis following risk assessment.
Access code (also applies for Web server login or FieldCare connection) → 🖹 7	Not enabled (0000).	Assign a customized access code during commissioning.
Web server	Enabled.	On an individual basis following risk assessment.
CDI service interface	–	On an individual basis following risk assessment.

2.7.1 Protecting access via hardware write protection

Write access to the parameters of the device via the local display or operating tool (e.g. FieldCare, DeviceCare) can be disabled via a write protection switch (DIP switch on the main electronics module). When hardware write protection is enabled, only read access to the parameters is possible.

Hardware write protection is disabled when the device is delivered.

2.7.2 Protecting access via a password

A password can be used to protect against write access to the device parameters.

This controls write access to the device parameters via the local display or other operating tools (e.g. FieldCare, DeviceCare) and, in terms of functionality, corresponds to hardware write protection. If the CDI service interface is used, read access is only possible by first entering the password.

User-specific access code

Write access to the device parameters via the local display or operating tool (e.g. FieldCare, DeviceCare) can be protected by the modifiable, user-specific access code.

When the device is delivered, the device does not have an access code and is equivalent to *0000* (open).

2.7.3 Access via Web server

The Web server is enabled when the device is delivered. The Web server can be disabled if necessary (e.g. after commissioning) via the **Web server functionality** parameter.

The device and status information can be hidden on the login page. This prevents unauthorized access to the information.

For detailed information on device parameters, see:
The "Description of Device Parameters" document

3 Product features and availability

3.1 Product features

Due to the integrated Web server, the device can be operated and configured via a Web browser and via PROFINET with Ethernet-APL. In addition to the measured values, device status information is also displayed and allows users to monitor the status of the device. Furthermore the device data can be managed and the network parameters can be configured.

Access to the network is required for the APL connection.

3.2 Availability

The integrated web server is a standard feature. It does not need to be ordered for the device ex works as it is provided as standard when the device is delivered to the customer. Connection is via the APL field switch or Ethernet switch.

3.3 Identification in the measuring device

An adhesive label on the inside of the electronics compartment cover or the connection compartment describes all the available hardware components, and their functions, for the measuring device.

4 Commissioning

Establishing a connection to the integrated Web server

1. Configure the computer → 10.
2. Check the settings on the measuring device and change them if necessary → 15.
3. Connect the measuring device to the computer via the Ethernet switch or APL field switch → 15.
4. Establish a connection to the web server → 16.
5. Start the web browser and access the operating menu → 16.
   ↳ The measuring device can be operated via the Web server.

4.1 Prerequisites - computer

4.1.1 Hardware

Hardware	Interface
Interface	The computer must have an RJ45 interface.
Connection	Standard Ethernet cable with RJ45 connector
Screen	Recommended size: ≥12" (depends on the screen resolution)

4.1.2 Software

Software	Interface
Recommended operating systems	Microsoft Windows 8 or higher.
Web browsers supported	▪ Microsoft Internet Explorer 8 or higher ▪ Microsoft Edge ▪ Mozilla Firefox ▪ Google Chrome ▪ Safari

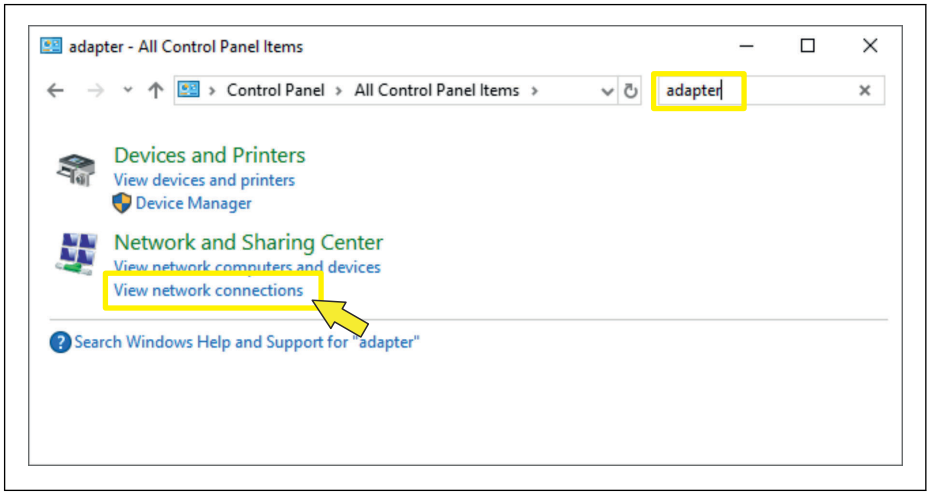
4.1.3 Configuring the computer

Settings	Interface
User rights	Appropriate user rights (e.g. administrator rights) for TCP/IP and proxy server settings are necessary (for adjusting the IP address, subnet mask etc.).
Proxy server settings of the web browser	The web browser setting *Use proxy server for LAN* must be **disabled** .
JavaScript	JavaScript must be enabled. When installing a new firmware version: To enable correct data display, clear the temporary memory (cache) under **Internet options** in the web browser.
Network connections	Only the active network connection to the measuring device should be used.

Configuring IP settings for Windows

- To configure the IP settings, appropriate user rights (e.g. administrator rights) are required for the computer.
- Before configuring the IP settings, close all the windows of the Web browser.

1. Click *Start* (Windows icon).
   ↳ The Start menu appears.
2. In the Start menu, select *Control Panel*.
   ↳ This opens a new window with the control panel elements.



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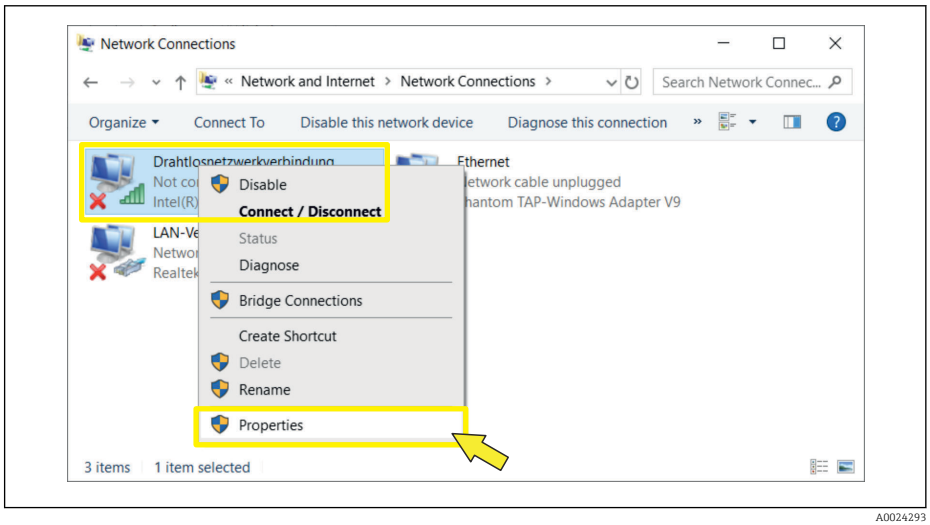
3. Enter the term "adapter" in the search field.
   ↳ The *Network and Sharing Center* is listed in the search results.
4. Select the *Network Connections* option under *Network and Sharing Center*.
   ↳ This opens a new window with the network connections.



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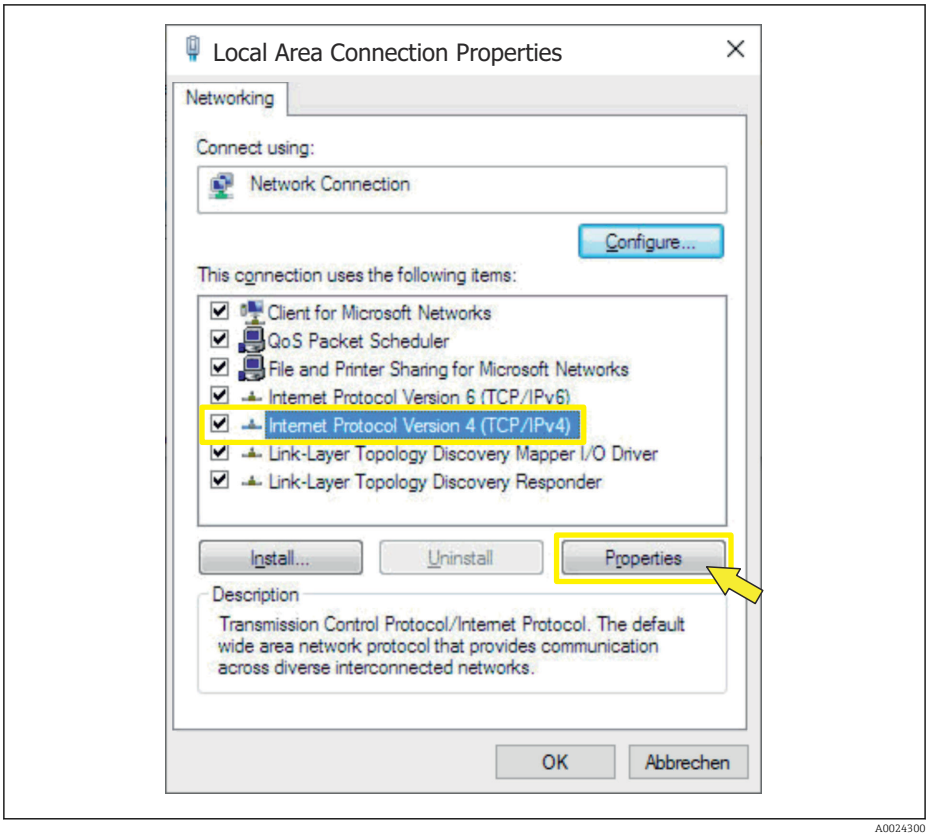
5. In the window, select the *Ethernet or wireless network connection* network adapter for the connection.

6. Right-click to open the picklist and select *Properties*.
   ↳ The *Local Area Connection Properties* dialog box opens.



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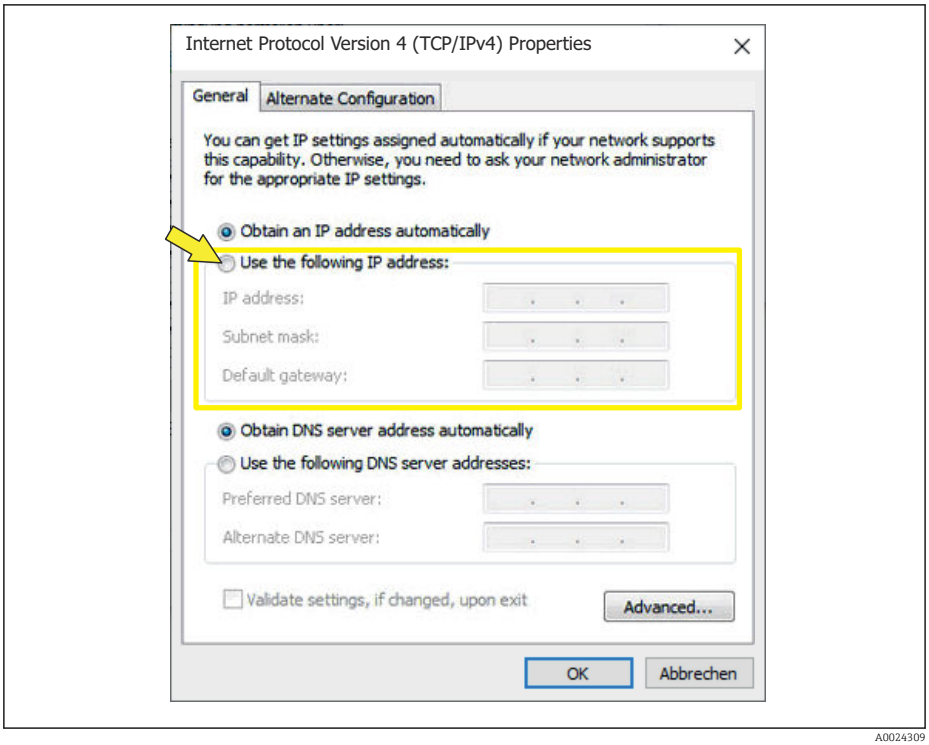
7. Select the *Internet Protocol Version 4 (TCP/IPv4)* item.
8. Click the *Properties* button.
   ↳ The *Internet Protocol Version 4 (TCP/IPv4) Properties* window opens.



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9. In the *General* tab, select the *Use the Following IP Address* option.

10. Enter the IP address, subnet mask and default gateway as indicated in the following table and then click *Ok* to confirm.

Standard settings for IP address, subnet mask and default gateway

IP address	192.168.1.XXX For XXX, all sequences of numbers apart from: 0, 212 and 255 → e.g. 192.168.1.213
Subnet mask	255.255.255.0
Default gateway	192.168.1.212 or leave cells empty

The standard settings correspond to those for private networks. In the case of Ethernet-based networks, the settings can deviate from this standard setting and may need to be changed.

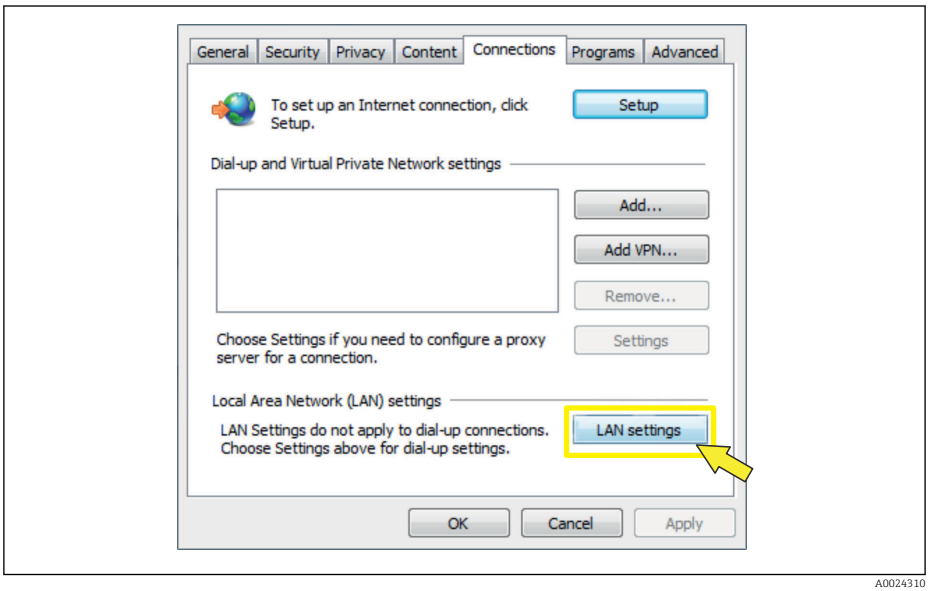
Changing the proxy server settings

To establish communication, the proxy server setting *Use a Proxy Server for Your LAN* must be deselected for the Web browser.

To change the proxy server setting, appropriate user rights (e.g. administrator rights) are required for the computer.

Changing the proxy server settings taking Internet Explorer as the sample browser

1. Open the Web browser.
2. In the *Options* menu, select the *Internet Options* item.
   ↳ This opens a new window with the Internet options.



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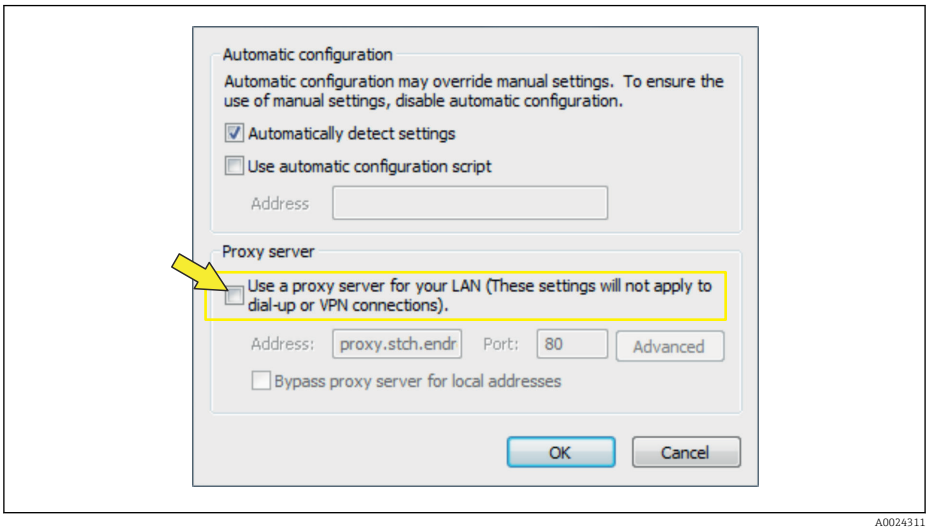
3. Select the *Connections* tab.
4. Under *Local Area Network Settings* click the *LAN Settings* button.
   ↳ This opens a new window with the *Local Area Network Settings*.



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5. Deselect the *Use a Proxy Server for Your LAN* checkbox and then click *Ok* to confirm.

4.2 Prerequisites - measuring device

4.2.1 Enabling the web server

The web server must be enabled in the measuring device (default setting).

If the web server is disabled, it can be enabled again via the **Web server functionality** parameter (→ 20). To do so, users can choose from the following operation options:
- Local display
- Operating tool e.g. FieldCare, DeviceCare, SIMATIC PDM

4.2.2 Determining the IP address of the measuring device

The IP address of the device is required to establish communication between the device (web server) and a computer (client). The device has a default IP address 192.168.1.212. This can be entered in the web browser on the computer to establish communication.

The IP address can be assigned to the measuring device in a variety of ways:
- Dynamic Configuration Protocol (DCP), factory setting:
  The IP address is automatically assigned to the measuring device by the automation system (DCP server).
- Software addressing:
  The IP address is entered via the **IP address** parameter (→ 19)
- DIP switch for "Default Ethernet Network Settings":
  For establishing the network connection via the APL port. The fixed IP address 192.168.1.212 is used.

IP address assigned or specified via:	Determine IP address settings via parameters or DIP switches		
	Local display (if available)	Operating tool e.g. FieldCare, DeviceCare	DIP switches in electronics compartment
Dynamic Configuration Protocol (DCP), factory setting	✓	✓	✗
Software addressing of the IP address via the **IP address** parameter	✓	✓	✗
DIP switch for "Default Ethernet Network Settings", use the fixed IP address: 192.168.1.212	✗	✗	✓

Using the local display or operating tool

The **IP address** parameter can be used to determine the IP address via an operating tool e.g. FieldCare, DeviceCare, SIMATIC PDM.

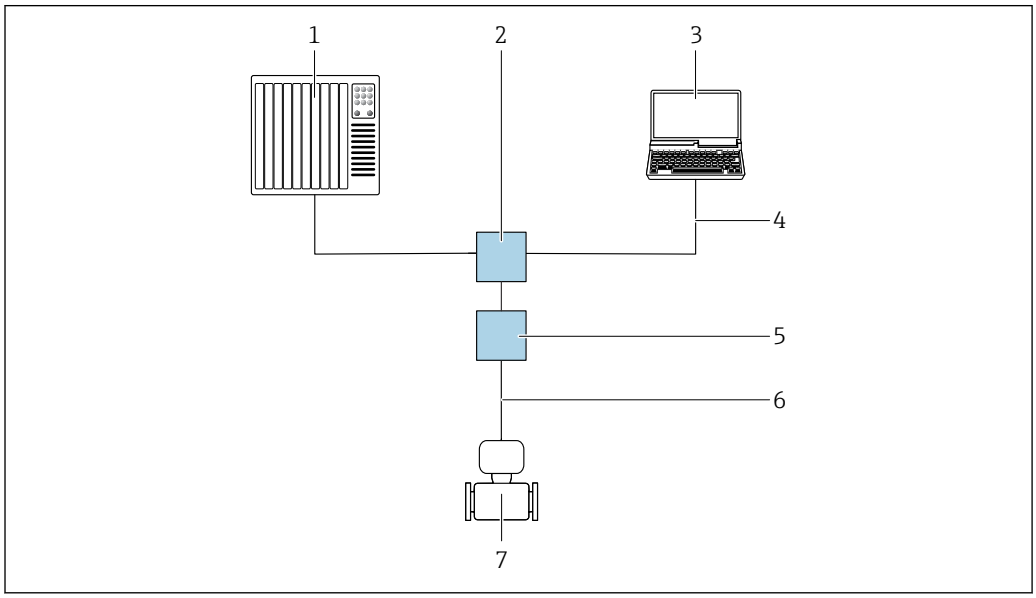
4.3 Connecting the computer to the measuring device

The measuring device can be connected to the computer via the Ethernet switch or APL field switch.

4.3.1 Via Ethernet-based fieldbus

If the IP address of the measuring device is assigned via , the network connection can be established directly via the Ethernet network.

The measuring device works with the Dynamic Configuration Protocol (DCP) on leaving the factory, i.e. the IP address of the PROFINET interface of the measuring device is automatically assigned by the automation system (DCP server), (e.g. Siemens S7). The host system assigns an IP address to the measuring device. The assigned IP address can be used to establish the connection to the network → 15.



1 *Connection with web server via APL field switch*

1 *Automation system, e.g. Simatic S7 (Siemens)*
2 *Ethernet switch, e.g. Scalance X204 (Siemens)*
3 *Computer with web browser (e.g. Internet Explorer) to access the integrated web server*
4 *Standard Ethernet cable with RJ45 connector*
5 *APL field switch*
6 *2-wire fieldbus cable type A*
7 *Measuring device*

4.4 Establishing a connection to the web server

4.4.1 Prerequisites

The IP settings in the measuring device and computer must match before a connection can be established successfully. In particular this concerns the IP addressing and Web browser settings.

The following conditions must be met to connect:
- The web server of the measuring device is enabled → 15.
- The IP address of the measuring device is known → 15.
- The computer used meets the requirements for hardware and software → 10.
- The measuring device and computer are interconnected via the Ethernet switch → 15
- The measuring device is switched on.

4.4.2 Starting the web browser

When installing a new firmware version:
To enable correct data display, clear the temporary memory (cache) under **Internet options** in the web browser.

Prerequisite: The IP address of the measuring device is known.

1. Start the Web browser on the computer.
2. Enter the defined device address in the address line of the Web browser.
   ↳ The login page appears.

Prerequisite: The IP address of the measuring device is not known.

1. Start the web browser on the computer.
2. Restart the device.
3. Enter the default IP address 192.168.1.212 → 15.
   ↳ The login page appears.

If a login page does not appear, or if the page is incomplete → 24

4.5 Setting the IP address

The IP address of the measuring device is required to establish communication between the measuring device (web server) and a computer (via Ethernet switch).

Assign or specify the IP address via:	Description
DCP (Dynamic Configuration Protocol) [1]	The measuring device is automatically assigned the IP address by the automation system or a tooling system.
Software addressing	The measuring device uses the IP address set in the **IP address** parameter (→ 🖹 19) (e.g. Siemens Proneta).
Use of the DIP switch: default Ethernet network settings [2]	▪ The measuring device uses the fixed IP address: 192.168.1.212 ▪ DIP switch: default Ethernet network settings = **OFF** ▪ Following a restart, the measuring device can be connected via the Ethernet network. ▪ To avoid IP address conflicts, this DIP switch must never be used on two measuring devices simultaneously within an Ethernet network.

1) Factory setting
2) For a temporary connection when servicing, for example, or if the IP address is not known. The measuring device is disconnected from the network/automation system.

4.6 Overview of the web server parameters

4.6.1 Language

Navigation
"Operation" menu → Web server language

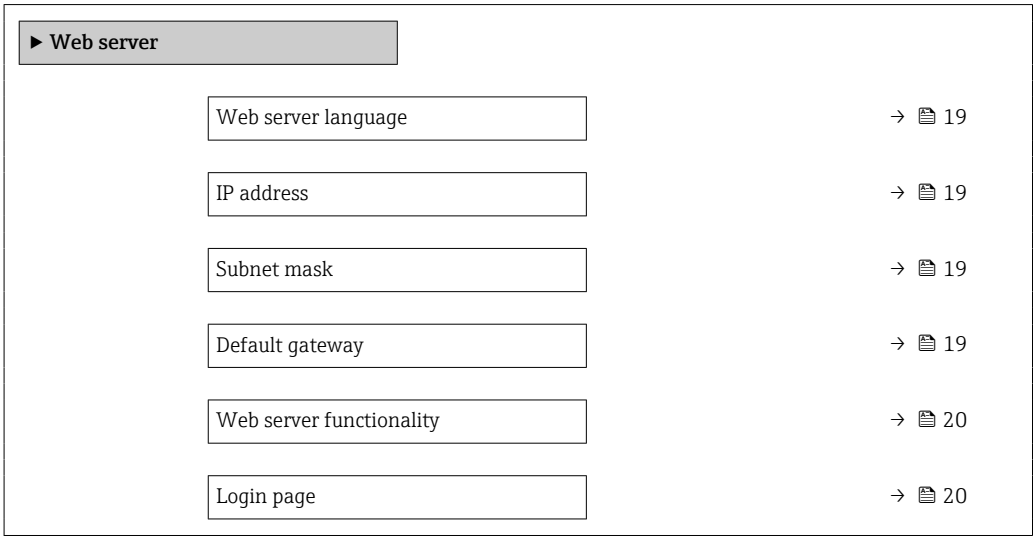
Parameter overview with brief description

Parameter	Description	Selection	Factory setting
Web server language	Set web server language.	▪ English ▪ Deutsch ▪ Français ▪ Español ▪ Italiano ▪ Nederlands * ▪ Portuguesa ▪ Polski ▪ русский язык (Russian) ▪ Svenska * ▪ Türkçe ▪ 中文 (Chinese) ▪ 日本語 (Japanese) * ▪ 한국어 (Korean) * ▪ tiếng Việt (Vietnamese) * ▪ čeština (Czech) *	English

* Visibility depends on order options or device settings

4.6.2 "Web server" submenu

Navigation
"Expert" menu → Communication → Web server



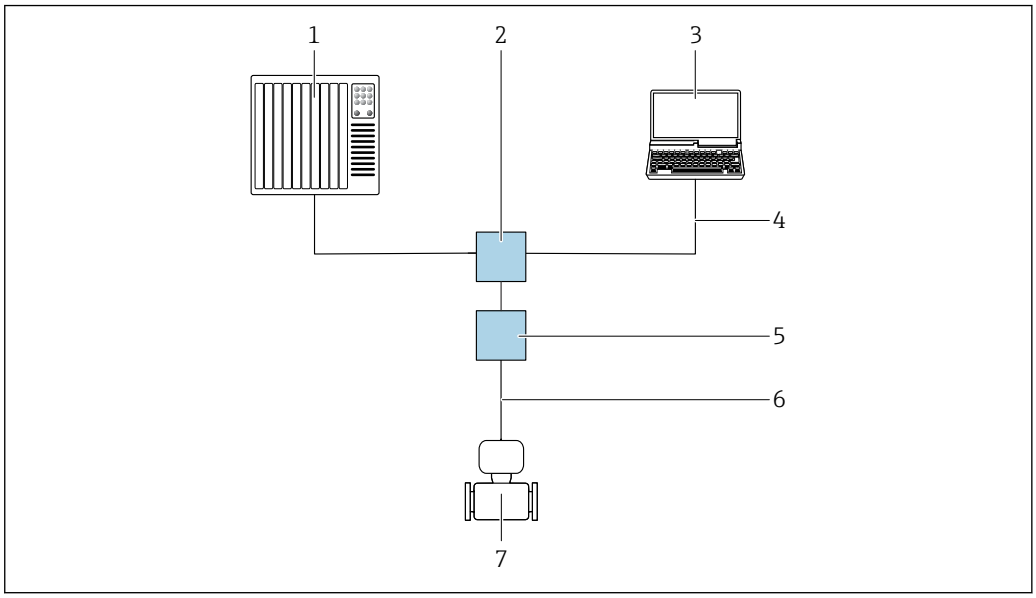
Parameter overview with brief description

Parameter	Description	Selection / User entry	Factory setting
Web server language	Set web server language.	▪ English ▪ Deutsch ▪ Français ▪ Español ▪ Italiano ▪ Nederlands * ▪ Portuguesa ▪ Polski ▪ русский язык (Russian) ▪ Svenska * ▪ Türkçe ▪ 中文 (Chinese) ▪ 日本語 (Japanese) * ▪ 한국어 (Korean) * ▪ العَرَبيّة (Arabic) * ▪ Bahasa Indonesia * ▪ ภาษาไทย (Thai) * ▪ tiếng Việt (Vietnamese) * ▪ čeština (Czech) *	English
IP address	IP address of the Web server integrated in the measuring device. If the DHCP client is switched off and write access is enabled, the IP address can also be entered.	4 octet: 0 to 255 (in the particular octet)	0.0.0.0
Subnet mask	Displays the subnet mask. If the DHCP client is switched off and write access is enabled, the Subnet mask can also be entered.	4 octet: 0 to 255 (in the particular octet)	255.255.255.0
Default gateway	Displays the default gateway. If the DHCP client is switched off and write access is enabled, the Default gateway can also be entered.	4 octet: 0 to 255 (in the particular octet)	0.0.0.0

Parameter	Description	Selection / User entry	Factory setting
Web server functionality	Switch the Web server on and off.	▪ Off ▪ On	On
Login page	Select format of login page.	▪ Without header ▪ With header	With header

* Visibility depends on order options or device settings

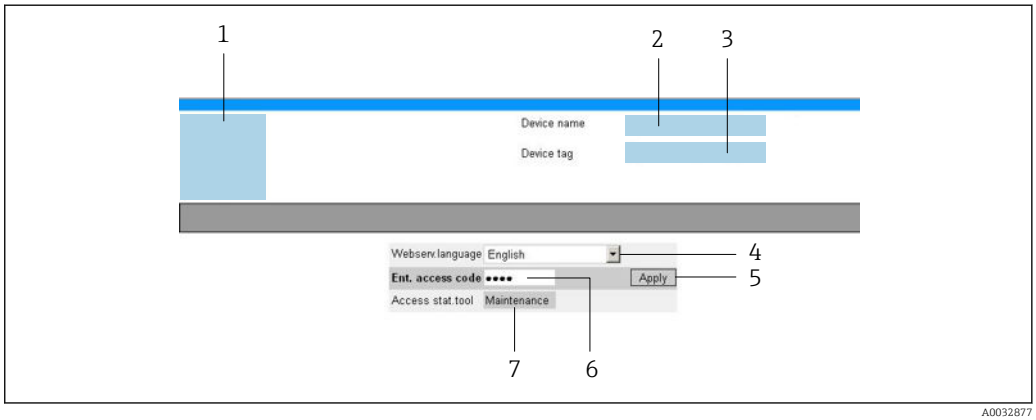
5 Operation options



2 *Connection with web server via APL field switch*

1 *Automation system, e.g. Simatic S7 (Siemens)*
2 *Ethernet switch, e.g. Scalance X204 (Siemens)*
3 *Computer with web browser (e.g. Internet Explorer) to access the integrated web server*
4 *Standard Ethernet cable with RJ45 connector*
5 *APL field switch*
6 *2-wire fieldbus cable type A*
7 *Measuring device*

5.1 Logging on



1 *Picture of device*
2 *Device name*
3 *Tag name*
4 *Web server language*
5 *Login key*
6 *Access code*
7 *User role*

1. Select the required operating language for the web browser (4).
2. Enter the user-specific access code (6).
3. Confirm entry with **Login**(5).

Access code	0000 (factory setting); can be changed by customer

If no action is performed for 10 minutes, the Web browser automatically returns to the login page.

5.2 User interface

5.2.1 Header

The following information appears in the header:
- Device name
- Device tag
- Device status with status signal → 25
- Current measured values

5.2.2 Function row

Functions	Meaning
Measured values	Displays the measured values of the device
Menu	▪ Access to the operating menu from the measuring device ▪ The structure of the operating menu is the same as for the local display For detailed information on the structure of the operating menu, see the Operating Instructions for the measuring device
Device status	Displays the diagnostic messages currently pending, listed in order of priority

Data management	Data exchange between computer and measuring device:
	▪ Device configuration:
	  ▪ Load settings from the device (XML format, save configuration)
	  ▪ Save settings to the device (XML format, restore configuration)
	▪ Documents - Export documents:
	  ▪ Export backup data record (.csv file, create documentation of the measuring point configuration)
	  ▪ Verification report (PDF file, only available with the "Heartbeat Verification" application package)
	▪ Upload the GSDML file for system integration

Network configuration	Configuration and checking of all the parameters required for establishing the connection to the measuring device: ▪ Network settings (e.g. IP address, MAC address) ▪ Device information (e.g. serial number, firmware version)
Logout	End the operation and call up the login page

5.2.3 Navigation area

If a function is selected in the function bar, the submenus of the function open in the navigation area. The user can now navigate through the menu structure.

5.2.4 Working area

Depending on the selected function and the related submenus, various actions can be performed in this area:
- Configuring parameters
- Reading measured values
- Calling up help text
- Starting an upload/download

5.3 Logging out

Before logging out, perform a data backup via the **Data management** function (upload configuration from device) if necessary.

1. Select the **Logout** entry in the function row.
   ↳ The home page with the Login box appears.
2. Close the Web browser.
3. If no longer needed:
   Reset the modified properties of the Internet protocol (TCP/IP) .

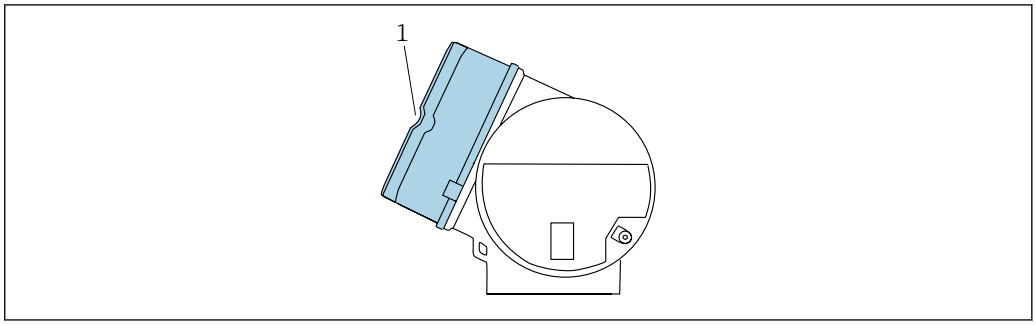
If communication with the web server was established via the default IP address 192.168.1.212, DIP switch no. 10 must be reset (from **ON** → **OFF**). Afterwards, the IP address of the device is active again for network communication.

5.4 Addressing Ethernet-based fieldbuses

5.4.1 Activating the default IP address

Activating the default IP address via the DIP switch

Risk of electric shock when opening the transmitter housing.
- ▶ Before opening the transmitter housing:
- ▶ Disconnect the device from the power supply.



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1 Main electronics module with DIP switch

1. Depending on the housing version, loosen the securing clamp or fixing screw of the housing cover.
2. Depending on the housing version, unscrew or open the housing cover and disconnect the local display from the main electronics module where necessary.
3. Set the "Fix IP" DIP switch on the main electronics module to **ON**.
4. Reassemble the transmitter in the reverse order.
5. Reconnect the device to the power supply.
   ↳ The default IP address is used once the device is restarted.

6 Diagnostics and troubleshooting

For details on the diagnostic information, see the Operating Instructions for the device → 4.

6.1 General web server troubleshooting

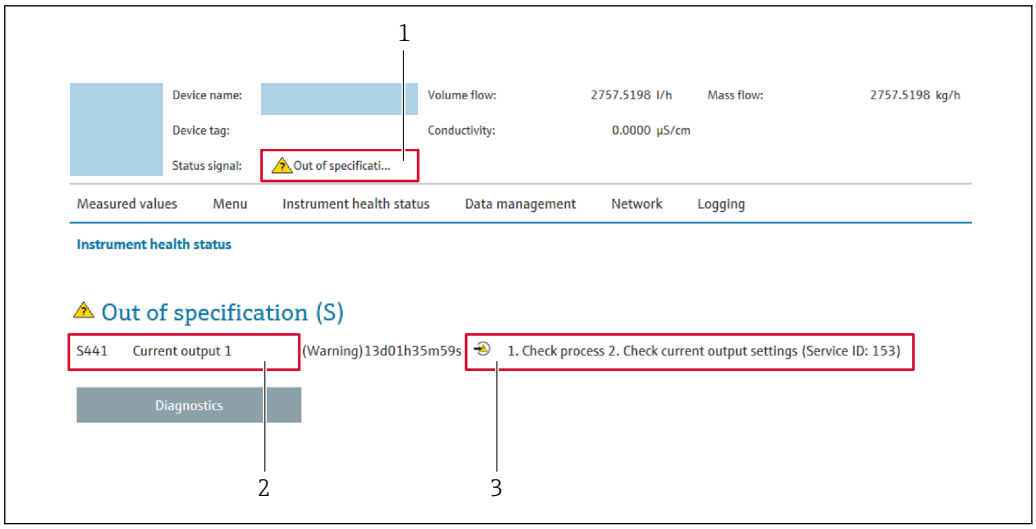
For access

Problem	Possible causes	Remedy
No connection to web server.	Web server is disabled.	Using the "FieldCare" or "DeviceCare" operating tool, check whether the Web server of the measuring device is enabled, and enable it if necessary.
	Incorrect settings for the Ethernet interface of the computer.	1. Check the properties of the Internet protocol (TCP/IP) . 2. Check the network settings with the IT manager.
Web browser is frozen and operation no longer possible.	Data transfer is active.	Wait until data transfer or current action is finished.
	Connection lost	1. Check cable connection and power supply. 2. Refresh the Web browser and restart if necessary.
Content of web browser is incomplete or difficult to read.	Not using optimum version of Web server.	1. Use the correct Web browser version . 2. Clear the Web browser cache and restart the Web browser.
	Unsuitable view settings.	Change the font size/display ratio of the Web browser.
No or incomplete display of contents in the web browser.	▪ JavaScript is not enabled ▪ JavaScript cannot be enabled	Enable JavaScript.

6.2 Diagnostic information in the Web browser

6.2.1 Diagnostic options

Any faults detected by the measuring device are displayed in the Web browser on the home page once the user has logged on.



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1 Status area with status signal
2 Diagnostic information
3 Remedial measures with service ID

In addition, diagnostic events which have occurred can be shown in the **Diagnostics** menu:
- Via parameter
- Via submenu

Status signals

The status signals provide information on the state and reliability of the device by categorizing the cause of the diagnostic information (diagnostic event).

Symbol	Meaning
	Failure A device error has occurred. The measured value is no longer valid.
	Function check The device is in the service mode (during a simulation, for example).
	Out of specification The device is being operated: Outside its technical specification limits (e.g. outside the process temperature range)
	Maintenance required Maintenance is required. The measured value is still valid.

The status signals are categorized in accordance with VDI/VDE 2650 and NAMUR Recommendation NE 107.

6.2.2 Calling up remedy information

Remedy information is provided for every diagnostic event to ensure that problems can be rectified quickly. These measures are displayed in red along with the diagnostic event and the related diagnostic information.

6.3 Diagnostic information in the measuring device

6.3.1 Overview of Web server information events

Unlike a diagnostic event, an information event is displayed in the event logbook only and not in the diagnostic list.

Information event	Event text
I1000	--------(device OK)
I1110	Write protection switch changed
I1361	Web server login failed
I1627	Web server login successful
I1631	Web server access changed

6.4 Checking the network connection

The network connection between the computer and measuring device can be checked using the "ping" utility of the Internet Control Message Protocol (ICMP).

The "ping" utility sends an ICMP(v6) "echo request" packet (ping, ICMP packet type 8 (0x08)) to the target address of the measuring device. According to the protocol specification, the measuring device must send back a response: ICMP "echo reply" (pong, ICMP packet type 0 (0x00)).

1. Click *Start* (Windows icon).
   ↳ The Start screen opens along with the search field.
2. In the search field, enter "cmd" (command).
   ↳ A link to "cmd.exe" is displayed in the results field.
3. Select the "cmd.exe" link.
   ↳ A new command window opens.
4. Enter ping and the IP address, e.g.: ping 192.168.1.212
   ↳ The network connection status is displayed.

Depending on the operating system used, or the version of the operating system, other tools can also be used, such as Powershell.exe, prompt etc.

If the measuring device cannot be reached the router responsible delivers the following response:
- "Network unreachable"
  or
- "Host unreachable"

1. Check the IP address settings → 15.
2. Check whether the Web server is enabled → 15.

7 Technical data

Web server	Stack: standard TCP stack with IPv4 functionality
Connection and session management	▪ Open ports: 80 (HTTP for Web server) ▪ Only one connection possible at any one time via Hypertext Transfer Protocol (HTTP) ▪ Time out after 10 minutes
Supported functions	▪ Java Script ▪ Cascading Style Sheets (CSS)
Functions not supported	▪ Domain Name System (DNS) ▪ Hyper Text Transfer Protocol Secure (HTTPS)

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