

Special Documentation

Proline Cubemass 100

HART

Web server



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1 Document information

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
- Connection of the computer via the service interface
- 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



The Technical Documentation for the measuring device is available:



- On the CD-ROM supplied with the measuring device (depending on the device version, the CD-ROM might not be part of the delivery!)
- Via the *W@M Device Viewer*: enter the serial number from the nameplate (www.endress.com/deviceviewer)
- Via the *Endress+Hauser Operations App*: enter the serial number from the nameplate or scan the 2-D matrix code (QR code) on the nameplate.

 Technical documentation can also be downloaded from the Download Area of the Endress+Hauser web site: 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 used

1.4.1 Safety symbols



Symbol	Meaning
	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.

Symbol	Meaning
 CAUTION	CAUTION! This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium injury.
 NOTICE	NOTE! 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 Indicates procedures, processes or actions that are allowed.
	Forbidden Indicates 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
	Series of steps
	Result of a step

1.4.3 Symbols in graphics

Symbol	Meaning
	Item numbers
	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 Occupational 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 in proper technical condition and fail-safe condition only.
- ▶ The operator is responsible for 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, despite this, modifications are required, consult with Endress+Hauser.

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

We only provide a warranty if the device is installed and used as described in the Operating Instructions. The device is equipped with security mechanisms to protect it against any inadvertent changes to the device settings.

IT security measures in line with operators' security standards and designed to provide additional protection for the device and device data transfer must be implemented by the operators themselves.

3 Product features and availability

3.1 Product features

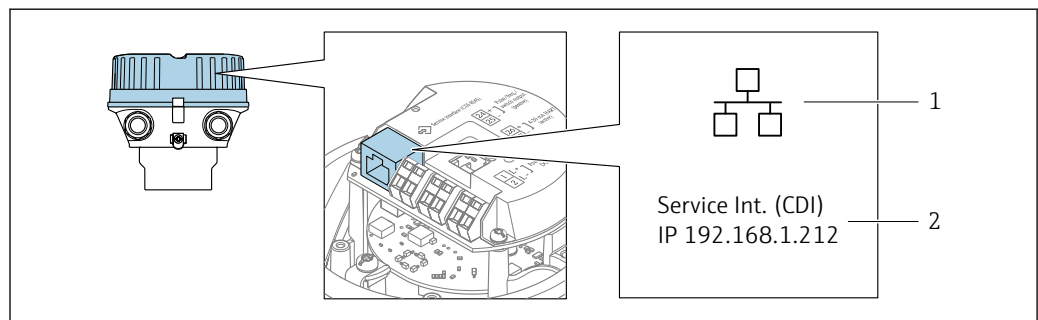
Thanks to the integrated Web server, the device can be operated and configured via a Web browser and via a service interface (CDI-RJ45) . In addition to the measured values, status information on the device is also displayed and allows the user to monitor the status of the device. Furthermore the device data can be managed and the network parameters can be configured.

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. No particular measures are required to put the feature into operation.

3.3 Identification in the measuring device

All the hardware components available and their functions for the measuring device are described on an adhesive label on the inside of the electronics compartment cover. The service interface (CDI-RJ45) has the following identification:



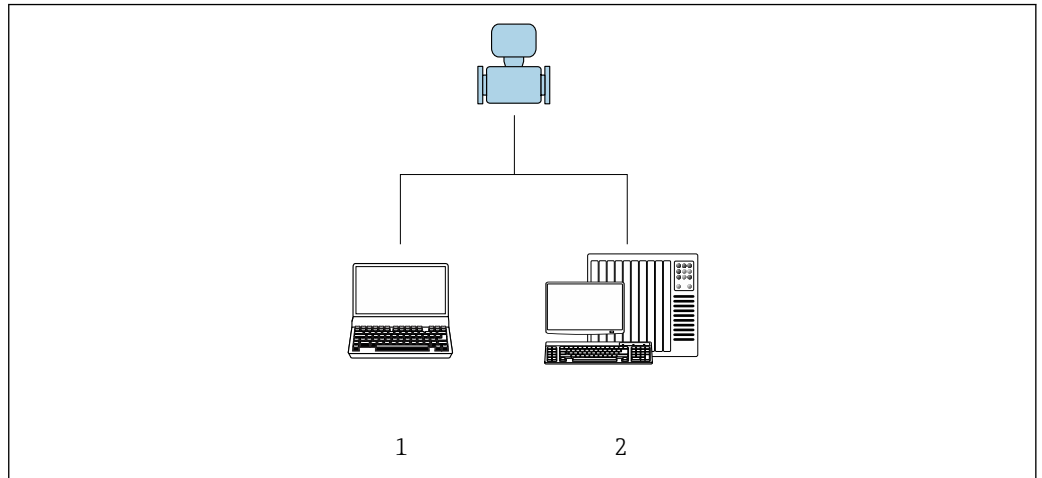
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1 Example of the CDI-RJ45 service interface

1 Symbol for service interface

2 Information on the default setting for the IP address

4 Operation options

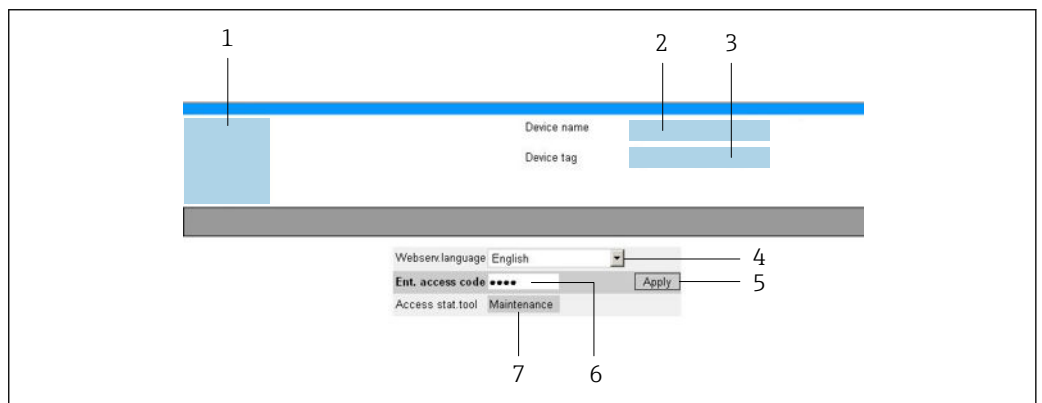


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2 Example of a Proline flowmeter with an integrated Web server

- 1 Computer with Web browser (e.g. Internet Explorer)
- 2 Control station via network

4.1 Logging on



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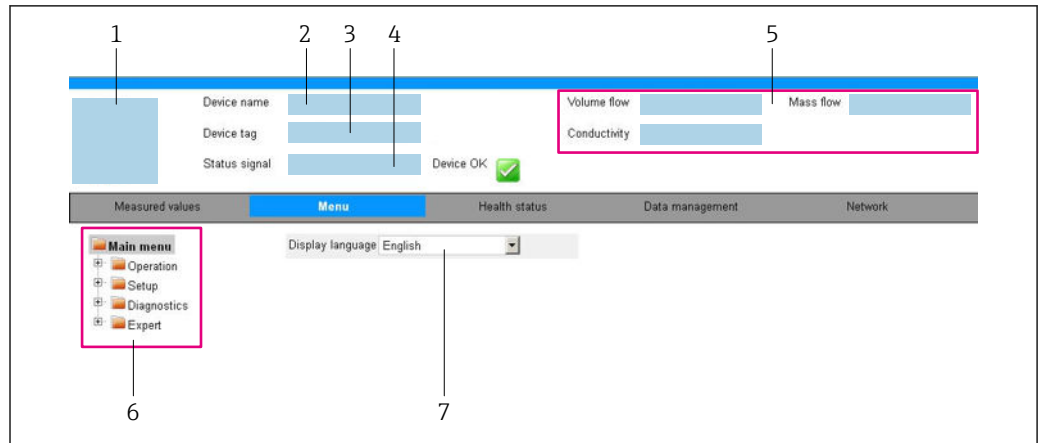
- 1 Picture of device
- 2 Device name
- 3 Device tag
- 4 Web server language
- 5 Login key
- 6 Access code
- 7 User role

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

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

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

4.2 User interface



A0032879

- 1 Picture of device
- 2 Device name
- 3 Device tag
- 4 Status signal
- 5 Current measured values
- 6 Navigation area
- 7 Local display language

4.2.1 Header

The following information appears in the header:

- Device tag
- Device status with status signal → 22
- Current measured values

4.2.2 Function row

Functions	Meaning
Measured values	Displays the measured values of the measuring device
Menu	<ul style="list-style-type: none"> ■ Access to the operating menu from the measuring device ■ The structure of the operating menu is the same as for the operating tools 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 PC and measuring device: <ul style="list-style-type: none"> ■ Device configuration: <ul style="list-style-type: none"> - Load the configuration from the measuring device (XML format, save configuration) - Save the configuration to the measuring device (XML format, restore configuration) ■ Logbook - Export Event logbook (.csv file) ■ Documents - Export documents: <ul style="list-style-type: none"> - Parameter data record backup (.csv file, create documentation of the measuring point configuration) - Heartbeat verification report (PDF file, only available with the "Heartbeat Verification" application package)
Network configuration	Configuration and checking of all the parameters required for establishing the connection to the measuring device: <ul style="list-style-type: none"> ■ 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

4.2.3 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.


4.2.4 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







4.3 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 modified properties of the Internet protocol (TCP/IP) →  17.

5 Commissioning

Establishing a connection to the integrated Web server


1. Configure the computer →  12 →  12.
2. Check the settings on the measuring device and change them if necessary →  17.
3. Connect the measuring device to the computer →  17.
4. Establish a connection to the Web server →  18.
5. Start the Web browser and access the operating menu →  18.
 - ↳ The measuring device can be operated via the Web server.

5.1 Prerequisites - computer


5.1.1 Hardware

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

5.1.2 Software

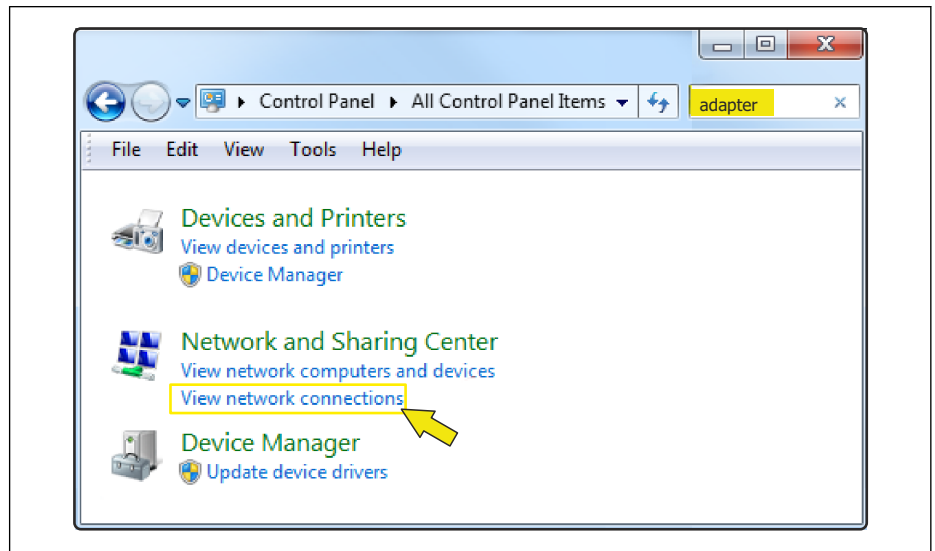
Recommended operating systems	Microsoft Windows 7 or higher.  Microsoft Windows XP is supported.
Web browsers supported	<ul style="list-style-type: none"> ▪ Microsoft Internet Explorer 8 or higher ▪ Microsoft Edge ▪ Mozilla Firefox ▪ Google Chrome ▪ Safari

5.1.3 Configuring the computer

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 <i>Use a Proxy Server for Your LAN</i> must be deselected .
JavaScript	JavaScript must be enabled.  If JavaScript cannot be enabled: enter <code>http://XXX.XXX.X.XXX/basic.html</code> in the address line of the Web browser, e.g. <code>http://192.168.1.212/basic.html</code> . A fully functional but simplified version of the operating menu structure starts in the Web browser.
Network connections	Only the active network connections to the measuring device should be used. Switch off all other network connections such as WLAN.

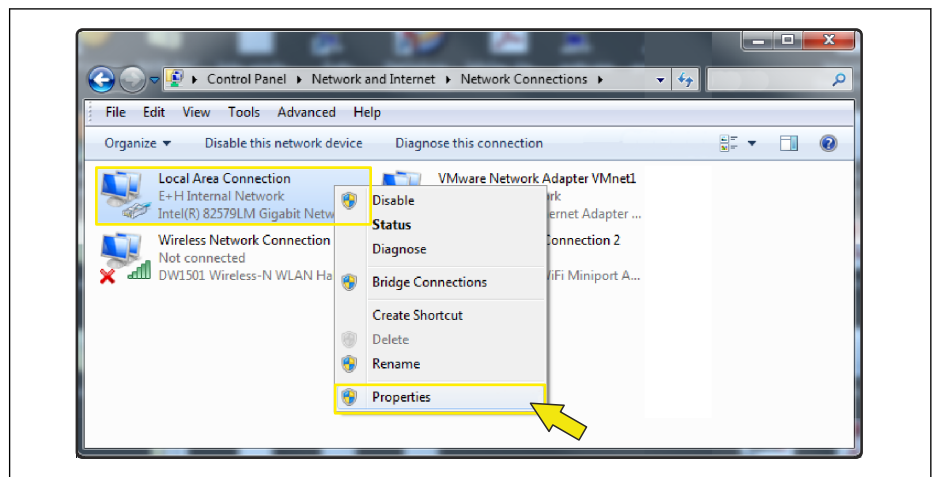
Configuring IP settings for Windows

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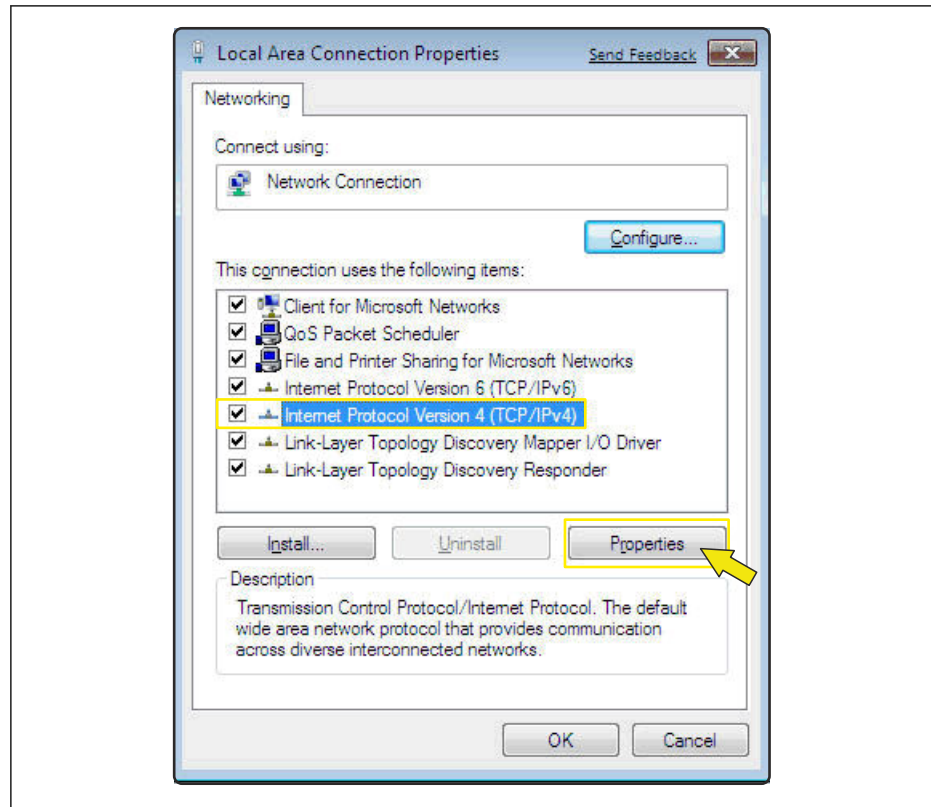
3. Enter the term "adapter" in the search field.
 - ↳ The *Network and Sharing Center* is listed in the search results.
4. Select the *Network Connections* option under *Network and Sharing Center*.
 - ↳ This opens a new window with the network connections.



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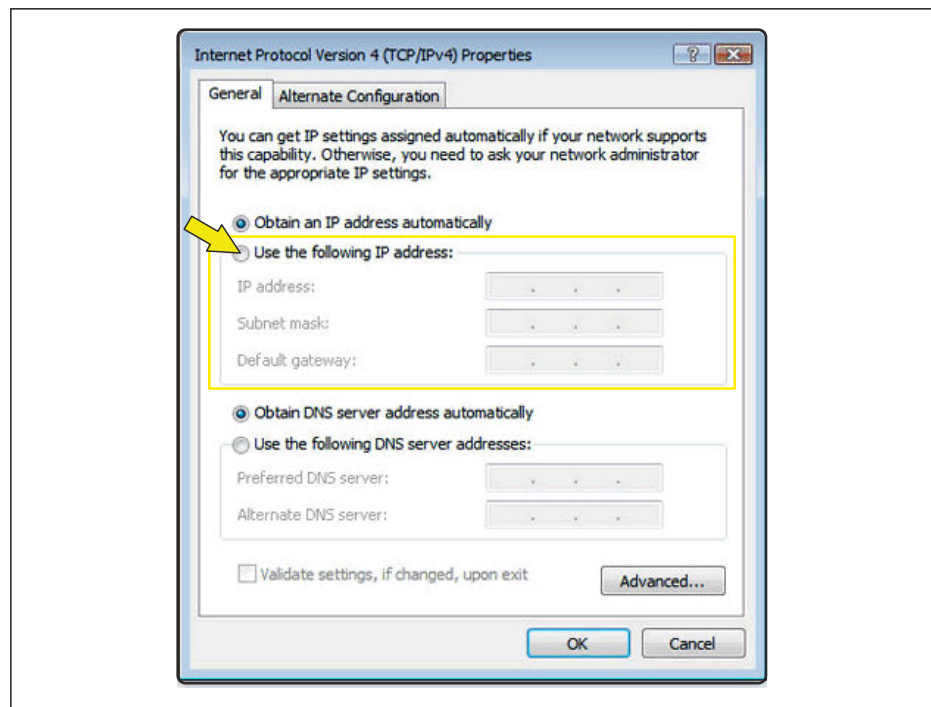
5. In this window, select the *Local Area Connection* (LAN).

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 numerical sequences except: 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 these standard settings and must be changed if necessary.

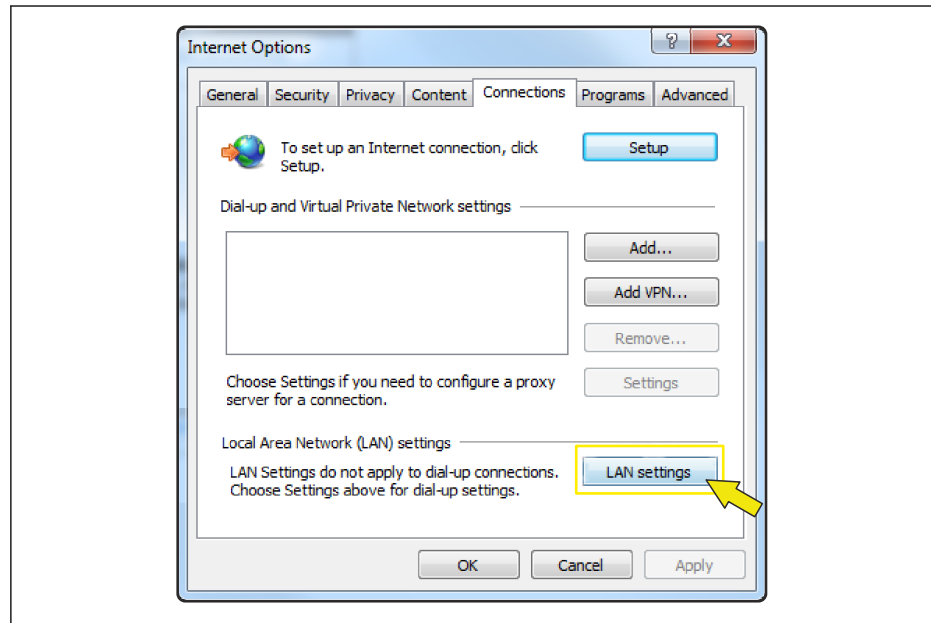
Changing the proxy server settings

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

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

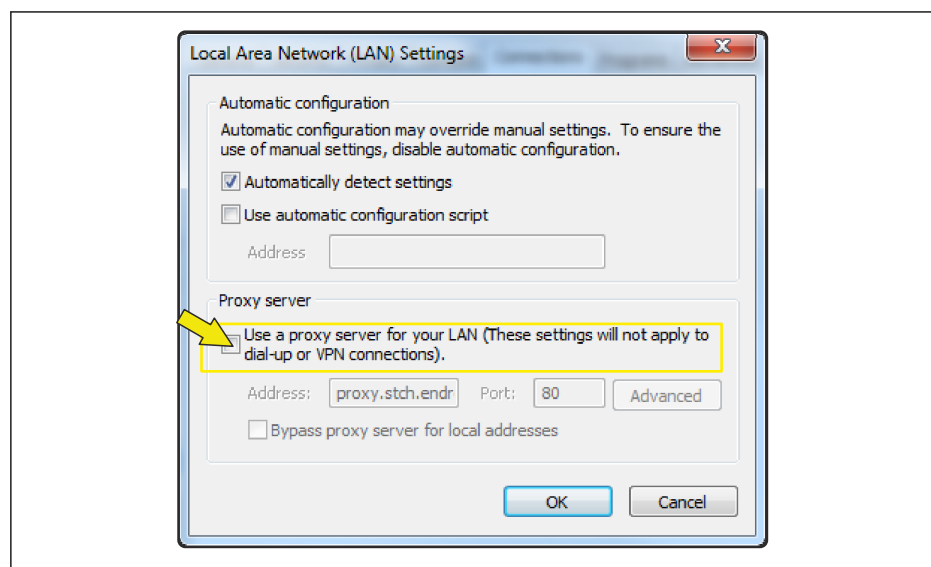
Changing the proxy server settings taking Internet Explorer as the sample browser

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.

5.2 Prerequisites - measuring device

5.2.1 Enabling the Web server

The Web server must be enabled in the measuring device (factory setting).

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

5.2.2 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 the default fixed IP address: 192.168.1.212. This can be entered in the Web browser on the computer to establish communication.

or an operating tool


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

5.3 Connecting the computer to the measuring device

The measuring device can be connected to the computer via:
Service interface (CDI-RJ45)

5.3.1 Via service interface (CDI-RJ45)

Preparing the measuring device

1. Depending on the housing version:
Release the securing clamp or securing screw of the housing cover.
2. Depending on the housing version:
Unscrew or open the housing cover.
3. The location of the connection socket depends on the measuring device and the communication protocol:
Connect the computer to the RJ45 connector via the standard Ethernet connecting cable →  8.


Configuring the Internet protocol of the computer


The following information refers to the default Ethernet settings of the device.

IP address of the device: 192.168.1.212 (factory setting)

NOTICE

Risk of electric shock! Components carry dangerous voltages!

- ▶ Never open the measuring device while it is connected to the supply voltage.
- ▶ The information and safety instructions in the Operating Instructions pertaining to the measuring device must always be observed →  4.

1. Switch on the measuring device.
2. Connect to the computer using a cable →  8.
3. If a 2nd network card is not used, close all the applications on the notebook.
 - ↳ Applications requiring Internet or a network, such as e-mail, SAP applications, Internet or Windows Explorer.

4. Close any open Internet browsers.
5. Configure the properties of the Internet protocol (TCP/IP) as defined in the table:





IP address	192.168.1.XXX; for XXX all numerical sequences except: 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

5.4 Establishing a connection to the Web server


5.4.1 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 →  17.
- The IP address of the measuring device is known →  17.
- The computer used meets the requirements for hardware and software →  12.
- The measuring device and computer are connected to one another →  17
- The measuring device is switched on.

5.4.2 Starting the Web browser

 If JavaScript cannot be enabled:
enter `http://XXX.XXX.X.XXX/basic.html` in the address line of the Web browser, e.g. `http://192.168.1.212/basic.html`. A fully functional but simplified version of the operating menu structure starts in the Web browser.

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

1. Start the Web browser on the computer.
2. Enter the IP address of the Web server in the address line of the Web browser:
192.168.1.212
↳ The login page appears.

 If a login page does not appear, or if the page is incomplete →  21

5.5 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 (client).

Assign or specify the IP address via:	Description
The use of the standard IP address ¹⁾	<ul style="list-style-type: none"> ■ The measuring device uses the fixed IP address: 192.168.1.212 ■ The device is connected via the CDI-RJ45 service interface.

1) Factory setting

5.6 Overview of the Web server parameters

5.6.1 Language

Navigation

"Operation" menu → Web server language

Parameter overview with brief description

Parameter	Description	Selection	Factory setting
Web server language	Set web server language.	<ul style="list-style-type: none"> ■ English ■ Deutsch * ■ Français * ■ Español * ■ Italiano * ■ Nederlands * ■ Portuguesa * ■ Polski * ■ русский язык (Russian) * ■ Svenska * ■ Türkçe * ■ 中文 (Chinese) * ■ 日本語 (Japanese) * ■ 한국어 (Korean) * ■ Bahasa Indonesia * ■ tiếng Việt (Vietnamese) * ■ čeština (Czech) * 	English



* Visibility depends on order options or device settings

5.6.2 "Web server" submenu


Navigation

"Expert" menu → Communication → Web server

► Web server	
Web server language (7221)	→ 20
MAC address (7214)	→ 20
IP address (7209)	→ 20
Subnet mask (7211)	→ 20

Default gateway (7210)	→  20
Web server functionality (7222)	→  20

Parameter overview with brief description

Parameter	Description	Selection / User interface	Factory setting
Web server language	Set web server language.	<ul style="list-style-type: none"> ▪ English ▪ Deutsch[*] ▪ Français[*] ▪ Español[*] ▪ Italiano[*] ▪ Nederlands[*] ▪ Portuguesa[*] ▪ Polski[*] ▪ русский язык (Russian)[*] ▪ Svenska[*] ▪ Türkçe[*] ▪ 中文 (Chinese)[*] ▪ 日本語 (Japanese)[*] ▪ 한국어 (Korean)[*] ▪ Bahasa Indonesia[*] ▪ tiếng Việt (Vietnamese)[*] ▪ čeština (Czech)[*] 	English
MAC address	Displays the MAC address of the measuring device.  MAC = Media Access Control	Unique 12-digit character string comprising letters and numbers, e.g.: 00:07:05:10:01:5F	Each measuring device is given an individual address.
IP address	Displays the IP address of the Web server of the measuring device.	4 octet: 0 to 255 (in the particular octet)	192.168.1.212
Subnet mask	Displays the subnet mask.	4 octet: 0 to 255 (in the particular octet)	255.255.255.0
Default gateway	Displays the default gateway.	4 octet: 0 to 255 (in the particular octet)	0.0.0.0
Web server functionality	Switch the Web server on and off.	<ul style="list-style-type: none"> ▪ Off ▪ On 	On

* Visibility depends on order options or device settings

6 Diagnostics and troubleshooting



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

6.1 General Web server troubleshooting

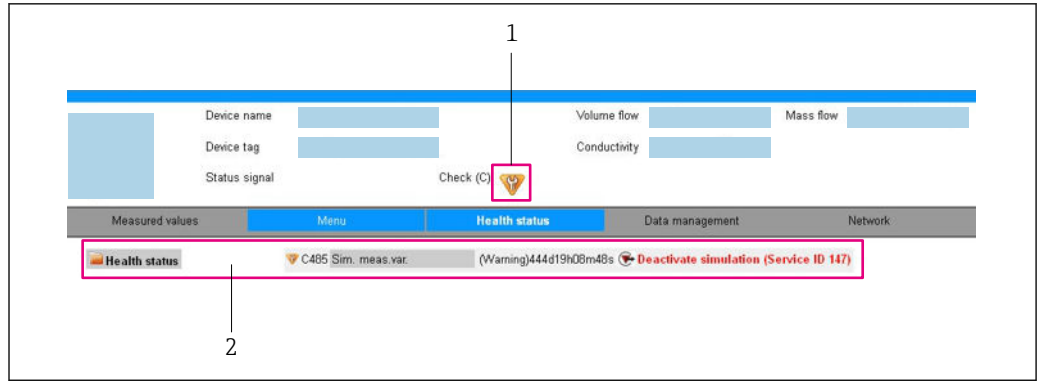
For access

Error	Possible causes	Solution
Not connecting to Web server	Web server 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 setting for the Ethernet interface of the computer	1. Check the properties of the Internet protocol (TCP/IP) → 17. 2. Check the network settings with the IT manager.
Not connecting to Web server	Incorrect IP address	Check the IP address: 192.168.1.212 → 17
Web browser frozen and operation no longer possible	Data transfer 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 incomplete or difficult to read	Not using optimum version of Web server.	1. Use the correct Web browser version → 12. 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	<ul style="list-style-type: none"> ▪ JavaScript not enabled ▪ JavaScript cannot be enabled 	1. Enable JavaScript. 2. Enter http://XXX.XXX.X.XXX/basic.html as the IP address.

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.



- 1 Status area with status signal
- 2 Diagnostic information → 22 and remedial measures with Service ID

i In addition, diagnostic events which have occurred can be shown in the **Diagnostics** menu:

- Via parameter
- Via submenu

Status signals

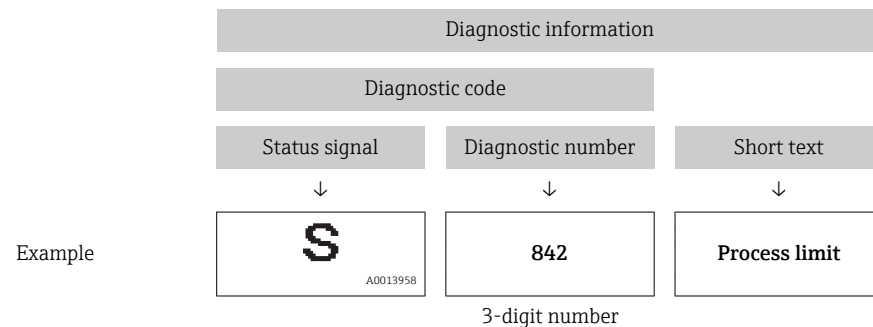
The status signals provide information on the state and reliability of the device by categorizing the cause of the diagnostic information (diagnostic event).

Symbol	Meaning
	Failure A device error has occurred. The measured value is no longer valid.
	Function check The device is in service mode (e.g. during a simulation).
	Out of specification The device is operated: <ul style="list-style-type: none"> ▪ Outside its technical specification limits (e.g. outside the process temperature range) ▪ Outside of the configuration carried out by the user (e.g. maximum flow in parameter 20 mA value)
	Maintenance required Maintenance is required. The measured value is still valid.

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

Diagnostic information

The fault can be identified using the diagnostic information. The short text helps you by providing information about the fault.



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 ICMP(v6) "echo request" packets (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 →  17.
2. Check whether the Web server is enabled →  17.

7 Technical data

Web serverStack: standard TCP stack with IPv4 functionality

Connection and session management

- Fixed IP address, i.e. no access possible from outside the network
 - Open ports:
 - 80 (HTTP for Web server)
 - 8000 (for Endress+Hauser Service communication)
 - Only one connection possible at any one time via Hypertext Transfer Protocol (HTTP)
 - Time out after 10 minutes
-

Supported functions

- Java Script
 - Hypertext Markup Language (HTML)
 - Cascading Style Sheets (CSS)
-

Functions not supported

- Domain Name System (DNS)
- Hyper Text Transfer Protocol Secure (HTTPS)

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