Brief Operating Instructions **RID14**

8-channel field indicator with FOUNDATION Fieldbus™





These Brief Operating Instructions are not a substitute for the Operating Instructions pertaining to the device.

Detailed information is provided in the Operating Instructions and other documentation.

Available for all device versions via:

- Internet: www.endress.com/deviceviewer
- Smartphone/tablet: Endress+Hauser Operations app





A0023555

Table of contents

1 1.1	About this document	. 3
2	Safety instructions	5
21	Barning most decisions	- 5
2.2	Intended use	. 5
2.3	Workplace safety	. 5
2.4	Operational safety	5
2.5	Product safety	6
з	Incoming accentance and product identification	6
31	Incoming acceptance and product identification	. 0
3.2	Product identification	. 6
3.3	Storage and transport	. 7
3.4	Certificates and approvals	. 7
	Mounting	0
4	Mounting	. 8
4.1	Mounting requirements	. 8
4.Z 4 3	Post-mounting check	10
1.5		10
5	Electrical connection	10
5.1	Connecting requirements	10
5.2	Connecting the measuring device	11
5.3	Ensuring the degree of protection	14
5.4	Post-connection check	. 15
6	Operation options	16
6.1	Overview of operation options	. 16
6.2	Access to the operating menu via the operating tool	. 18
6.3	Hardware settings	. 18
6.4	Device configuration	. 19

1 About this document

1.1 Symbols

1.1.1 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.

ACAUTION

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.

1.1.2 Electrical symbols

Symbol	Meaning	Symbol	Meaning
	Direct current	\sim	Alternating current
R	Direct current and alternating current	<u> </u>	Ground connection A grounded terminal which, as far as the operator is concerned, is grounded via a grounding system.

Symbol	Meaning
	Potential equalization connection (PE: protective earth) Ground terminals that must be connected to ground prior to establishing any other connections.
	The ground terminals are located on the interior and exterior of the device:Interior ground terminal: potential equalization is connected to the supply network.Exterior ground terminal: device is connected to the plant grounding system.

1.1.3 Symbols for certain types of information

Symbol	Meaning	Symbol	Meaning
	Permitted Procedures, processes or actions that are permitted.		Preferred Procedures, processes or actions that are preferred.
X	Forbidden Procedures, processes or actions that are forbidden.	i	Tip Indicates additional information.
	Reference to documentation		Reference to page
	Reference to graphic	1., 2., 3	Series of steps
4	Result of a step		Visual inspection

1.1.4 Symbols in graphics

Symbol	Meaning	Symbol	Meaning
1, 2, 3,	Item numbers	1., 2., 3	Series of steps
A, B, C,	Views	A-A, B-B, C-C,	Sections
EX	Hazardous area	×	Safe area (non-hazardous area)

2 Safety instructions

2.1 Requirements for the personnel

The personnel must fulfill the following requirements for its tasks:

- 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.

2.2 Intended use

- The device is a field indicator for connection to a fieldbus.
- It is designed for mounting in the field.
- The manufacturer accepts no liability for damages resulting from improper or non-intended use.
- Safe operation is only guaranteed if the Operating Instructions are observed.
- Only operate the device in the permitted temperature range.

2.3 Workplace safety

When working on and with the device:

► Wear the required personal protective equipment as per national regulations.

2.4 Operational safety

Damage to the device!

- Operate the device in proper technical condition and fail-safe condition only.
- ► The operator is responsible for the interference-free operation of the device.

2.5 Product safety

This measuring device is designed in accordance with good engineering practice to meet stateof-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 EU directives listed in the device-specific EU Declaration of Conformity. The manufacturer confirms this by affixing the CE mark to the device.

3 Incoming acceptance and product identification

3.1 Incoming acceptance

Proceed as follows on receipt of the device:

- 1. Check whether the packaging is intact.
- 2. If damage is discovered:

Report all damage immediately to the manufacturer.

- 3. Do not install damaged components, as the manufacturer cannot otherwise guarantee the material resistance or compliance with the original safety requirements, and can also not be held responsible for the consequences that may result.
- 4. Compare the scope of delivery against the contents of your order.
- 5. Remove all the packaging material used for transportation.
- 6. Do the data on the nameplate match the ordering information on the delivery note?
- **7.** Are the technical documentation and all other necessary documents provided, e.g. certificates?



If one of the conditions is not satisfied, contact your Sales Center.

3.2 Product identification

The following options are available for identification of the device:

- Nameplate specifications
- Enter the serial number from the nameplate in the *Device Viewer* (www.endress.com/deviceviewer): all the information about the device and an overview of the Technical Documentation supplied with the device are displayed.
- Enter the serial number on the nameplate into the *Endress+Hauser Operations App* or scan the 2-D matrix code (QR code) on the nameplate with the *Endress+Hauser Operations App*: all the information about the device and the technical documentation pertaining to the device is displayed.

3.2.1 Nameplate

The right device?

The nameplate provides you with the following information on the device:

- Manufacturer identification, device designation
- Order code
- Extended order code
- Serial number
- Tag name (TAG)
- Technical values: supply voltage, current consumption, ambient temperature, communication-specific data (optional)
- Degree of protection
- Approvals with symbols
- ► Compare the information on the nameplate with the order.

3.2.2 Name and address of manufacturer

Name of manufacturer:	Endress+Hauser Wetzer GmbH + Co. KG
Address of manufacturer:	Obere Wank 1, D-87484 Nesselwang or www.endress.com

3.3 Storage and transport

Storage temperature: -40 to +80 °C (-40 to +176 °F)

Maximum relative humidity: < 95 % as per IEC 60068-2-30



Pack the device for storage and transportation in such a way that it is reliably protected against impact and external influences. The original packaging offers the best protection.

Avoid the following environmental influences during storage:

- Direct sunlight
- Proximity to hot objects
- Mechanical vibration
- Aggressive media

3.4 Certificates and approvals





Approval-related data and documents: www.endress.com/deviceviewer \rightarrow (enter the serial number)

3.4.1 FOUNDATION Fieldbus™ certification

The field indicator successfully passed all tests and is certified and registered by the Fieldbus Foundation. The measuring system meets all the requirements of the following specifications:

- Certified in accordance with FOUNDATION Fieldbus[™] specification
- FOUNDATION Fieldbus™ H1
- Interoperability Test Kit (ITK), revision status 6.1.2 (device certification number available on request): The device can also be operated with certified devices of other manufacturers
- Physical Layer Conformance Test of the Fieldbus FOUNDATION™ (FF-830 FS 2.0)

4 Mounting

4.1 Mounting requirements

The indicator is designed for use in the field.

Its orientation is determined by the readability of the display.

Operating temperature range: -40 to +80 °C (-40 to +176 °F)

NOTICE

Reduced operating life of the display at high temperatures

► If possible, do not operate the device in the upper temperature limit range.

The display may react slowly at temperatures < -20 °C (-4 °F).

Readability of the display can no longer be guaranteed at temperatures < -30 °C (-22 °F).

Altitude	Up to 2 000 m (6 561.7 ft) above sea level	
Overvoltage category	Overvoltage category II	
Pollution degree	Pollution degree 2	

4.1.1 Dimensions



I Dimensions of the field indicator; dimensions in mm (in)

4.1.2 Mounting location

Information about the conditions (such as the ambient temperature, degree of protection, climate class etc.) that must be present at the installation location so that the device can be mounted correctly is provided in the "Technical data" section of the Operating Instructions.

RID14

4.2 Mounting the measuring device

The device can be mounted directly on the wall $\rightarrow \square 9$. A mounting bracket is available for pipe mounting $\rightarrow \blacksquare 3$, $\square 10$.

The backlit display can be mounted in four different positions $\rightarrow \square 9$.

4.2.1 Turning the display





The display can be turned in 90° steps.

- 1. Remove the cover clamp (1) and the housing cover (2).
- 2. Remove the display (3) from the electronics unit (4).
- 3. Turn the display to the desired position and then attach it to the electronics unit.
- 4. Clean the thread in the housing cover and housing base and lubricate if necessary. (Recommended lubricant: Klüber Syntheso Glep 1)
- 5. Screw the housing cover (2) and O-ring together and fit the cover clamp (1) back on.

4.2.2 Direct wall mounting

Proceed as follows to mount the device directly on the wall:

- 1. Drill 2 holes
- 2. Fit the device on the wall with 2 screws (Ø 5 mm (0.2 in)).

4.2.3 Pipe mounting

The mounting bracket is suitable for pipes with a diameter between 1.5" and 3.3".

The additional mounting plate must be used for pipes with a diameter between 1.5" and 2.2". The mounting plate is not necessary for pipes with a diameter between 2.2" and 3.3".

Proceed as follows to mount the device on a pipe:



3 Mounting the field indicator on a pipe with a mounting bracket for pipe diameters 1.5" to 2.2"

- 1 Mounting plate
- 2 Mounting bracket
- 3 2 M6 nuts

4.3 Post-mounting check

After installing the device, always perform the following checks:

Device condition and specifications	Notes
Is the measuring device damaged?	Visual inspection
Is the seal undamaged?	Visual inspection
Is the device securely fastened to the wall or the mounting plate?	-
Is the housing cover fixed tightly?	-
Does the device correspond to the measuring point specifications, e.g., ambient temperature etc.?	See Technical data' section

5 Electrical connection

5.1 Connecting requirements

NOTICE

Destruction or malfunction of parts of the electronics

▶ 🛦 ESD - Electrostatic discharge. Protect the terminals from electrostatic discharge.

WARNING

Danger of explosion if the device is incorrectly connected in the hazardous area

► When connecting Ex-certified devices, please take special note of the instructions and connection schematics in the Ex-specific supplement to these Operating Instructions.

NOTICE

The electronics can be destroyed if unit is connected incorrectly

- Switch off the power supply before installing or connecting the device. Failure to observe this may result in the destruction of parts of the electronics.
- ► The post connector is only used to connect the display. If other devices are connected, this can result in the destruction of parts of the electronics.

Devices can be connected to the FOUNDATION Fieldbus™ in two ways:

- Via a conventional cable gland
- Via a fieldbus connector (optional, available as an accessory)

5.2 Connecting the measuring device

5.2.1 Connecting the cable to the field indicator

Proceed as follows to wire the field indicator:



Image: A Opening the field indicator housing

- **1.** Open the cable gland, or remove the cable gland to use a fieldbus connector (optional accessory).
- 2. Remove the cover clamp.
- 3. Remove the housing cover.
- 4. Remove the display.
- 5. Remove the screws from the electronics unit.
- 6. Remove the electronics unit.
- 7. Feed the cable through the cable entry, or screw the fieldbus connector into the housing.
- 8. Connect the cable $\rightarrow \blacksquare 5$, $\blacksquare 12$.
- 9. Assembly is in reverse order.

Quick wiring guide



☑ 5 Terminal assignment

Terminal	Terminal assignment
+	FOUNDATION Fieldbus™ connection (+)
-	FOUNDATION Fieldbus™ connection (-)

5.2.2 Connecting to the FOUNDATION Fieldbus™

Devices can be connected to the FOUNDATION Fieldbus™ in two ways:

- Via a conventional cable gland $\rightarrow \cong 12$
- Via a fieldbus device connector (optional, available as an accessory) $\rightarrow \square 13$

NOTICE

The device and fieldbus cable can be damaged by electrical voltage

- ► Switch off the power supply before installing or connecting the device.
- ► It is recommended to ground the unit via one of the grounding screws.
- If the shielding of the fieldbus cable is grounded at more than one point in systems without additional potential equalization, mains frequency equalizing currents can occur that damage the cable or shield. In such cases, the shielding of the fieldbus cable is to be grounded on one side only, i.e. it must not be connected to the ground terminal of the housing. The shield that is not connected should be insulated!



We recommend that the fieldbus not be looped using conventional cable glands. If you replace even just one measuring device at a later date, the bus communication will have to be interrupted.

Cable gland or entry



Please also observe the general procedure $\rightarrow \square 11$



- 1 FF terminals fieldbus communication and power supply
- 2 Internal ground terminal
- 3 External ground terminal
- 4 Shielded fieldbus cable (FOUNDATION Fieldbus™)
- The terminals for the fieldbus connection (1+ and 2-) are independent of polarity.
- Conductor cross-section: Max. 2.5 mm² (14 in²)
- Always use a shielded cable for the connection.

Fieldbus connector

As an option, a fieldbus connector can be screwed into the field housing instead of a cable gland. Fieldbus connectors can be ordered from Endress+Hauser as an accessory (see 'Accessories' section in the Operating Instructions).

The connection technology of FOUNDATION Fieldbus™ allows devices to be connected to the fieldbus via uniform mechanical connections such as T-boxes, junction boxes etc.

This connection technology using prefabricated distribution modules and plug-in connectors offers substantial advantages over conventional wiring:

- Field devices can be removed, replaced or added at any time during normal operation. Communication is not interrupted.
- Installation and maintenance are significantly easier.
- Existing cable infrastructures can be used and expanded instantly, e.g. when constructing new star distributors using 4-channel or 8-channel distribution modules.



☑ 7 Connectors for connection to the FOUNDATION Fieldbus™

- 1 Fieldbus connector
- 2 Field indicator

Pin assignment/color codes

- **1.1** Blue wire: FF- (terminal 2)
- **1.2** Brown wire: FF+ (terminal 1)
- 1.3 Gray wire: shield
- 1.4 Green/yellow wire: ground

Connector technical data:

- Degree of protection IP 67 (NEMA 4x)
- Ambient temperature: -40 to +105 °C (-40 to +221 °F)

5.3 Ensuring the degree of protection

The devices fulfill the requirements for the IP 67 degree of protection. Compliance with the following points is mandatory to ensure IP 67 protection is guaranteed after installation or after service work:

- The housing seal must be clean and undamaged when inserted into the groove. The seal should be cleaned, dried or replaced.
- The connecting cables must be of the specified outer diameter (e.g., M16 x 1.5, cable diameter 5 to 10 mm (0.2 to 0.39 in)).
- Replace all unused cable entries with dummy plugs.
- The cable entry seal may not be removed from the cable entry.
- The housing cover and cable entry/entries must be closed securely.
- Install the device in such a way that the cable entries point downwards.

5.4 Post-connection check

After completing the device's electrical installation, carry out the following checks:

Device condition and specifications	Notes
Are cables or the device damaged (visual inspection)?	-

Electrical connection	Notes
Does the supply voltage match the specifications on the nameplate?	9 to 32 V _{DC}
Do the cables used meet the required specifications?	Fieldbus cable, see Operating Instructions
Do the cables have adequate strain relief?	-
Are the power supply and signal cables correctly connected?	→ 🖺 12
Are all the screw terminals well tightened and have the connections of the spring terminals been checked?	-
Are all the cable entries installed, tightened and sealed? Cable run with "water trap"?	-
Are all housing covers installed and firmly tightened?	-
Are all the connecting components (T-boxes, junction boxes, connectors, etc.) connected with each other correctly?	-
Has each fieldbus segment been terminated at both ends with a bus terminator?	-
Has the max. length of the fieldbus cable been observed in accordance with the fieldbus specifications?	See cable specifications in the Operating Instructions
Has the max. length of the spurs been observed in accordance with the fieldbus specifications?	
Is the fieldbus cable fully shielded (90%) and correctly grounded?	

6 Operation options

6.1 Overview of operation options

6.1.1 Display



E 8 LC display of the field indicator

- 1 Bar graph display in increments of 10% with indicators for underranging (item 1a) and overranging (item 1b)
- 2 Measured value display, status indication "Bad measured value status"
- 3 14-segment display for units and messages
- 4 "Communication" symbol
- 5 "Parameters cannot be modified" symbol
- 6 Unit "%"
- 7 "Uncertain measured value status" symbol

The backlit LCD display contains a bar graph (0-100) and arrows to indicate measured values above or below the measuring range. Analog process values, digital status and failure codes are displayed in the 7-segment area. Here up to 8 values can be displayed with an alternating time of between 2 and 20 seconds. Plain text can be displayed in the 14-segment area (text is limited to 16 characters and is scrolled if needed).

The indicator also displays the quality of the measured value. If the status of the displayed value is 'good' (value equal to or above 0x80), no symbol is lit and the indicator remains in the normal operational state. If the status of the displayed value is 'uncertain' (value between 0x40 and 0x7F), the 'Uncertain measured value status' symbol is lit. If the status is 'bad' (value below 0x40), within the 7-segment area the display will show "BAD" and the channel number where the bad value is published. The channel number is also displayed in the 14-segment area.

6.1.2 Operation options

Two options are available to the operator for configuring and commissioning the device:

1. Configuration programs

The FF functions and device-specific parameters are configured via the fieldbus interface. Special configuration and operating programs are available from various manufacturers for this purpose $\rightarrow \cong 18$.

Device Description Files are available for download: www.endress.com/download \rightarrow Select device driver \rightarrow Type \rightarrow Select product root.

2. Miniature switches (DIP switches) for various hardware settings

You can make the following hardware settings for the fieldbus interface using miniature switches (DIP switches) on the electronics module $\rightarrow \cong 18$:

Switching the hardware write protection on/off



9 Hardware configuration of the field indicator

Listener mode

The field indicator analyzes the devices active on the bus. These devices are listed and they can be assigned to up to 8 channels via their address. The published values are displayed for the devices and the value to be shown on the display can be selected.

Function block interconnection

A published value, which is assigned to a function block in the field indicator, can be displayed in function block interconnection mode. This can be IN and OUT parameters in the function blocks.

6.2 Access to the operating menu via the operating tool NOTICE

Loss of explosion protection when housing is open

▶ The device must be configured outside the hazardous area.

The FF communication system will only function properly if correctly configured. You can obtain special configuration and operating programs from various manufacturers for the configuration.

Process control systems	Asset management systems	
Emerson DeltaV	Endress+Hauser FieldCare/DeviceCare	
Rockwell Control Logix/FFLD	National Instruments NI-Configurator ($\geq 3.1.1$)	
Honeywell EPKS	Emerson AMS and Handheld FC375	
Yokogawa Centum CS3000	Yokogawa PRM EDD/DTM	
ABB Freelance System/800xA	Honeywell FDM	
Invensys IA Series	PACTware	

These can be used for configuring both the FF functions and all of the device-specific parameters. The predefined function blocks allow uniform access to all the network and fieldbus device data.



The step-by-step procedure for commissioning the fieldbus functions for the first time is described in detail in the comprehensive Operating Instructions, as is the configuration of device-specific parameters.

6.2.1 System files

The following files are required for commissioning and configuring the network:

- Commissioning \rightarrow Device description (DD :*. Sym ,*. Ffo)
- Network configuration \rightarrow CFF file (Common File Format)

These files can be acquired as follows:

- Free of charge via the Internet: www.endress.com/download \rightarrow Device driver \rightarrow Select type \rightarrow Select product root.
- Via the Fieldbus Foundation organization: www.fieldbus.org

6.3 Hardware settings

Hardware write protection can be switched on and off via DIP switches inside the field indicator. If write protection is enabled, no parameters can be changed.

The current write protection status is displayed in the WRITE_LOCK parameter (Resource Block, see Appendix in the Operating Instructions).

Proceed as follows to set the DIP switch:

1. Remove the housing cover and remove the display $\rightarrow \blacksquare 4$, $\blacksquare 11$

- **2.** Configure the DIP switch as required. Switch on ON = function switched on, switch on OFF = function switched off.
- 3. Attach the display to the electronics.
- 4. Close the housing cover and secure it.



- IO Hardware configuration via DIP switches
- 1 ON switch position
- 2 OFF switch position
- 3 Write protection

6.4 Device configuration

Detailed information on the device configuration can be found in the Operating Instructions.



71616050

www.addresses.endress.com

