

**Features**

- Comprehensive diagnostics for the fieldbus physical layer
- Handheld with display and integrated expert system
- Fieldbus interface Ex ia, FISCO, Entity, and DART
- For commissioning, online monitoring and troubleshooting
- For FOUNDATION Fieldbus H1 and PROFIBUS PA
- Multi-language support
- Operation in Zone 1/Class I, Div. 1
- Choice of power options for different operating modes
- PC software for enhanced interface and data backup

**Function**

The FieldConnex® Fieldbus Diagnostic Handheld FDH-1 is a comprehensive measurement and commissioning tool. The handheld can be connected to any point of a segment. Via display and push buttons, FDH-1 guides the user through many scenarios of testing. FDH-1 can record and store data for up to 32 segments with maximum device count without requiring a connection to a PC.

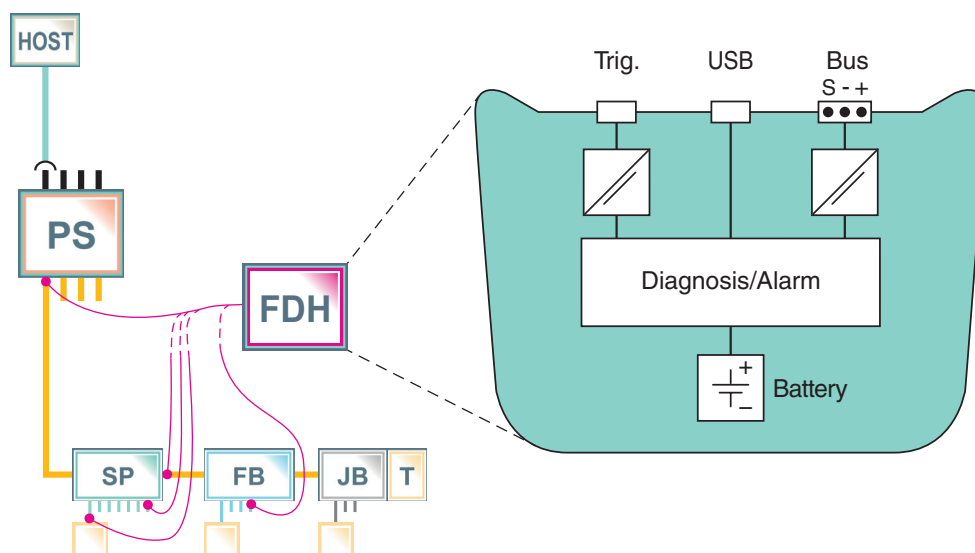
FDH-1 supports inexperienced and expert users alike through different operating modes. Failure margin checks and device coupler tests help set up the optimum condition of the fieldbus infrastructure and find weak spots in the installation. The expert system and wizards enable easy handling and require little or no training. FDH-1 supports multiple languages that can be downloaded onto the handheld.

FDH-1 Manager Software Premium can operate the handheld with enhanced visualization. The software loads data from FDH-1 and saves data back, to allow for comparisons between actual and planned physical layer attributes.

**Assembly**



**Connection**



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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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<b>General specifications</b>		
Design / Mounting		Handheld/mobile
<b>Supply</b>		
Connection		Fieldbus , Battery , 9V 6LR61 block, type alkaline, carbon-zinc, lithium iron disulfide, nickel-cadmium, nickel-metal hydride, or rechargeable lithium , USB
<b>Fieldbus interface</b>		
Fieldbus type		FOUNDATION Fieldbus/PROFIBUS PA
Rated voltage	$U_N$	8.5 ... 35 V
Rated current	$I_N$	... 10 mA , if bus powered
<b>Indicators/operating means</b>		
Display		LC display
Keypad		Membrane 8 keys
<b>Directive conformity</b>		
Electromagnetic compatibility		
Directive 2014/30/EU		EN 61326-1:2013
<b>Standard conformity</b>		
Electromagnetic compatibility		NE 21:2011
Degree of protection		IEC 60529
Shock resistance		EN 60068-2-27
Vibration resistance		EN 60068-2-6
<b>Software</b>		
Languages		English (default), German (optional), Portuguese (optional),
<b>Ambient conditions</b>		
Ambient temperature		-20 ... 50 °C (-4 ... 122 °F)
Storage temperature		-20 ... 70 °C (-4 ... 158 °F)
Relative humidity		< 95 % non-condensing
Shock resistance		15 g , 11 ms
Vibration resistance		1 g , 10 ... 150 Hz
<b>Mechanical specifications</b>		
Connection type		Fieldbus: Cable with test clips and cable with test plugs, 2.5 mm Trigger output: Cable with 2 banana plugs USB: Square type B socket
Degree of protection		IP44
Mass		500 g
<b>Data for application in connection with hazardous areas</b>		
EU-Type Examination Certificate		ZELM 14 ATEX 0531
Marking		⊕ Ex II 2(1) G Ex ib [ia Ga] IIC T4 Gb , ⊕ Ex II 3(1) G Ex ic [ia Ga] IIC T4 Gc , ⊕ Ex II 3 G Ex ic IIC T4 Gc , ⊕ Ex II (1 D) [Ex ia IIIC Da] , ⊕ Ex II (3 D) [Ex ic IIIC Dc]
<b>Bus</b>		
Type		Fieldbus
Type of protection		ia, ib
Internal capacitance	$C_i$	< 1.8 nF
Internal inductance	$L_i$	< 1.5 μH
Voltage	$U_i$	30 V
<b>Bus</b>		
Type		Fieldbus
Type of protection		ic
Internal capacitance		< 1.8 F
Internal inductance		< 1.5 μH
Voltage	$U_i$	35 V
<b>Outputs</b>		
Type		Trigger output
Maximum safe voltage	$U_m$	140 V
<b>Interface</b>		
Type		USB interface
Maximum safe voltage	$U_m$	253 V
Voltage	$U_i$	6 V
<b>Directive conformity</b>		
Directive 2014/34/EU		EN 60079-0:2012 , EN 60079-11:2012
<b>International approvals</b>		
CSA approval		CSA 16.70029275

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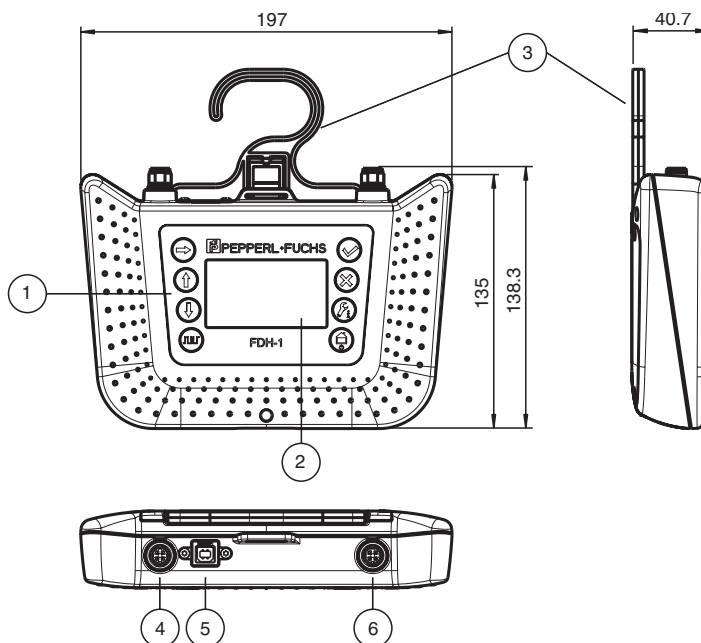
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Approved for	Class I, Division 2, Groups A, B, C, D T4 Associated equipment for Class I, Division 1
IECEX approval	IECEX ZLM 14.0012
Approved for	Ex ib [ia Ga] IIC T4 Gb , Ex ic [ia Ga] IIC T4 Gc , Ex ic IIC T4 Gc , [Ex ia IIIC Da] , [Ex ic IIIC Dc]
<b>General information</b>	
Supplementary information	Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> .

## Dimensions



### Description:

- 1 FDH-1 keypad with 8 keys
- 2 FDH-1 LC display 128 x 64 pixels
- 3 Fold-out hook for positioning on the desk or hanging
- 4 Trigger output for external oscilloscope
- 5 USB port
- 6 Bus connection

All dimensions without tolerance indication

## Scope of Delivery

- FDH-1 fieldbus diagnostic handheld
- Transport case
- Fieldbus cordset with 3 pin test plugs, order code ACC-FDH-CBUSC
- Fieldbus cordset with 3 test clips, order code ACC-FDH-CBUSP
- USB 2.0 cable
- FDH-1 Manager Software

## Accessories

- Cable with 2 banana plugs for trigger output for external oscilloscope, order code ACC-FDH-CTRG
- FDH-1 Manager Software Premium, order code FDH-SW-P

### Functional Overview of FDH-1

<b>Pre-commissioning</b>	FDH-1 checks: <ul style="list-style-type: none"> <li>- Installed cables for fieldbus suitability</li> <li>- Insulation levels and ground faults</li> </ul>
<b>Segment commissioning and troubleshooting</b>	The commissioning wizard with automated segment check procedures reports and stores comprehensive physical layer measurements. The wizard detects or measures, e. g.: <ul style="list-style-type: none"> <li>- Physical layer attributes and compares actual setup against planned setup</li> <li>- Over- and undertermination</li> </ul> <p>Commissioning reports can be uploaded for backup, storage, and documentation. External oscilloscope can be triggered on fieldbus-specific events via separate output.</p>
<b>Expert system</b>	An expert system interprets the raw physical layer measurement data. The system translates the data into easy-to-follow messages that describe causes of faults and suggest steps for corrective actions.
<b>Device coupler output test</b>	Function for testing short circuit current limitation for device coupler outputs and measuring the maximum current.
<b>Failure Margin Test</b>	Function for testing the resistance of each node against adverse signal quality. FDH-1 alters signal level, noise and jitter to determine the maximum levels at which communication still operates.
<b>Online monitoring</b>	Connection to any part of the segment including intrinsically safe circuits is possible for quick checks during operation. FDH-1 automatically creates a live list with address, tag, manufacturer, and device type.
<b>Data storage and history</b>	Upload of history recordings to FDH-1 Manager software enables comparison at a later time for best practices in plant upkeep. (Premium edition only)
<b>Supported measurements (selection)</b>	<ul style="list-style-type: none"> <li>- Ground faults and unbalance</li> <li>- Signal level</li> <li>- Jitter</li> <li>- Signal polarity</li> <li>- Noise</li> <li>- Communication error statistics</li> </ul>
<b>FDH-1 power options during operation</b>	<ul style="list-style-type: none"> <li>- Fieldbus</li> <li>- USB</li> <li>- Internal battery</li> </ul>

### Additional Features of FDH-1 Manager Software

	Features	Basic Edition	Premium Edition
<b>Fieldbus oscilloscope</b>	Visual tool for the fieldbus expert to display the signal waveform and support for finding tricky faults.  Additional trigger functionality for oscilloscope	x	x
<b>Documentation and comparison</b>	Upload of commissioning records for backup, storage, and documentation.  Upload and comparison of history recordings with online measurements	x	x
<b>Configuration</b>	Multi-language support		x

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