Fieldbus Diagnostic Handheld
FDH-1

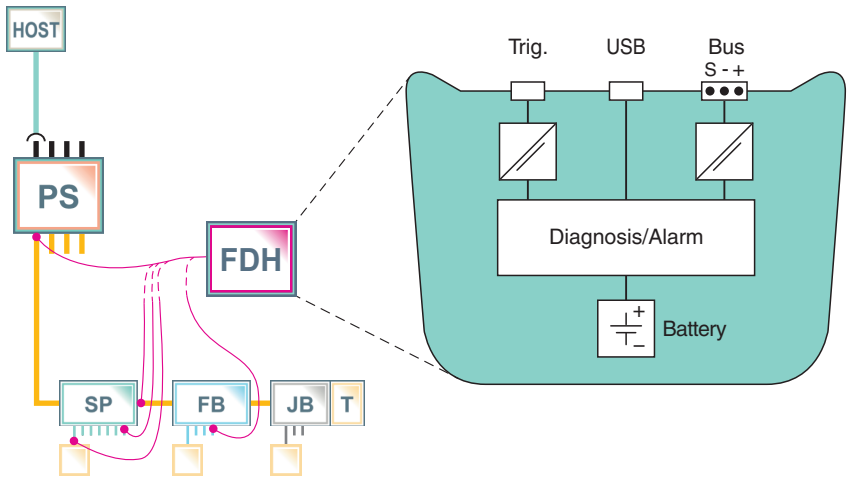
- Comprehensive diagnostics for the fieldbus physical layer
- Handheld with display and integrated expert system
- Fieldbus interface Ex ia, FISCO, Entity, and DART
- For commissioning, online monitoring and troubleshooting
- For FOUNDATION Fieldbus H1 and PROFIBUS PA
- Multi-language support
- Operation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

Fieldbus Diagnostic Handheld

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.

Connection



Technical Data

General specifications		
Design / Mounting		Handheld/mobile
Supply		
Connection		Fieldbus , Battery , 9V 6LR61 block, type alkaline, carbon-zinc, lithium iron disulfide, nickel-cadmium, nickel-metal hydride, or rechargeable lithium , USB
Fieldbus connection		
Fieldbus type		FOUNDATION Fieldbus/PROFIBUS PA
Rated voltage	U_N	8.5 ... 35 V
Rated current	I_N	... 10 mA , if bus powered
Indicators/operating means		

Release date: 2022-08-01 Date of issue: 2022-08-01 Filename: 250382_eng.pdf

Technical Data

Display		LC display
Keypad		Membrane 8 keys
Directive conformity		
Electromagnetic compatibility		
Directive 2014/30/EU		EN 61326-1:2013
Standard conformity		
Electromagnetic compatibility		NE 21:2011
Degree of protection		IEC 60529
Shock resistance		EN 60068-2-27
Vibration resistance		EN 60068-2-6
Software		
Languages		English (default), German (optional), Portuguese (optional),
Ambient conditions		
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
Mechanical specifications		
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
Data for application in connection with hazardous areas		
EU-type examination certificate		ZELM 14 ATEX 0531
Marking		Ⓔx II 2(1) G Ex ib [ia Ga] IIC T4 Gb , Ⓔx II 3(1) G Ex ic [ia Ga] IIC T4 Gc , Ⓔx II 3 G Ex ic IIC T4 Gc , Ⓔx II (1 D) [Ex ia IIIC Da] , Ⓔx II (3 D) [Ex ic IIIC Dc]
Bus		
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
Bus		
Type		Fieldbus
Type of protection		ic
Internal capacitance		< 1.8 F
Internal inductance		< 1.5 µH
Voltage U_i		35 V
Outputs		
Type		Trigger output
Maximum safe voltage	U_m	140 V
Interface		
Type		USB interface
Maximum safe voltage	U_m	253 V
Voltage U_i		6 V
Directive conformity		
Directive 2014/34/EU		EN 60079-0:2012 , EN 60079-11:2012
International approvals		
CSA approval		CSA 16.70029275
Approved for		Class I, Division 2, Groups A, B, C, D T4 Associated equipment for Class I, Division 1

Release date: 2022-08-01 Date of issue: 2022-08-01 Filename: 250382_eng.pdf

Technical Data

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]
General information	
Supplementary information	Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable. For information see www.pepperl-fuchs.com.

Assembly

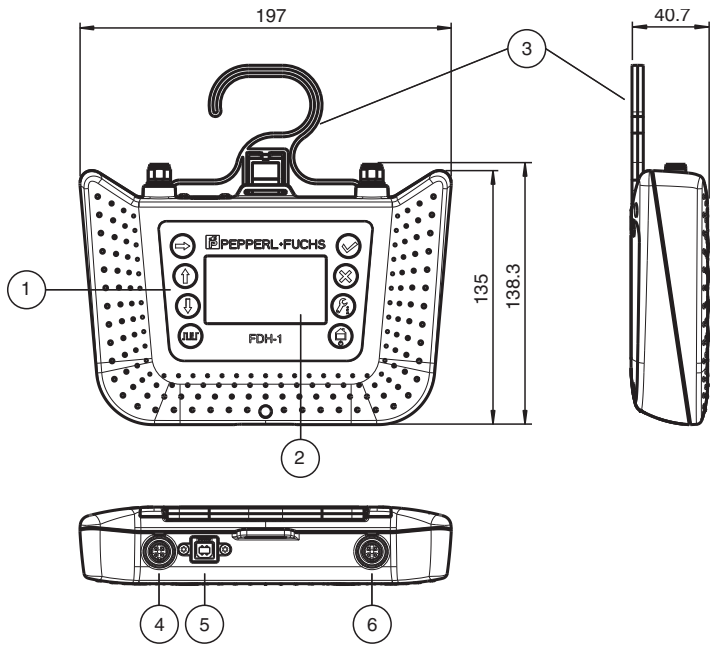
Accessories

	ACC-FDH-CTRG	FDH-1 Accessory, Trigger Output Cable
	FDH-SW-P	FDH-1 Manager Software, Premium License

Release date: 2022-08-01 Date of issue: 2022-08-01 Filename: 250382_eng.pdf

Additional Information

Dimensions and Assembly



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

Additional Information

Functional Overview of FDH-1

Pre-commissioning

FDH-1 checks:
- Installed cables for fieldbus suitability
- Insulation levels and ground faults

Segment commissioning and troubleshooting

The commissioning wizard with automated segment check procedures reports and stores comprehensive physical layer measurements. The wizard detects or measures, e. g.:
- Physical layer attributes and compares actual setup against planned setup
- Over- and undertermination

Commissioning reports can be uploaded for backup, storage, and documentation.

External oscilloscope can be triggered on fieldbus-specific events via separate output.

Release date: 2022-08-01 Date of issue: 2022-08-01 Filename: 250382_eng.pdf

Expert system	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.
Device coupler output test	Function for testing short circuit current limitation for device coupler outputs and measuring the maximum current.
Failure Margin Test	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.
Online monitoring	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.
Data storage and history	Upload of history recordings to FDH-1 Manager software enables comparison at a later time for best practices in plant upkeep. (Premium edition only)
Supported measurements (selection)	– Ground faults and unbalance – Signal level – Jitter – Signal polarity – Noise – Communication error statistics
FDH-1 power options during operation	– Fieldbus – USB – Internal battery

Additional Features of the FDH-1 Manager Software

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

Release date: 2022-08-01 Date of issue: 2022-08-01 Filename: 250382_eng.pdf