

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

PEPPERL+FUCHS

MBHC-FB-4R

FIELDBUS POWER HUB MOTHERBOARD

Used with the applicable FieldConnex Fieldbus system configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official pages follow this cover with source pagination retained.

Pepperl+Fuchs product record 83423; PDS 267022; TDOCT-3940



Power Hub Motherboard

FieldConnex® Fieldbus

MBHC-FB-4R

- 4 segments, redundant, individual modules per segment
- Supports all PLC and PCS hosts
- High-power trunk: Live work on devices in any hazardous area
- Best quality, smallest size and lowest heat dissipation
- For FOUNDATION Fieldbus H1
- Optional advanced diagnostics
- Passive impedance for high reliability
- Supports Ex ic voltage limitation
- Installation in Zone 2/Div. 2
- Spring terminals or screw terminals selectable

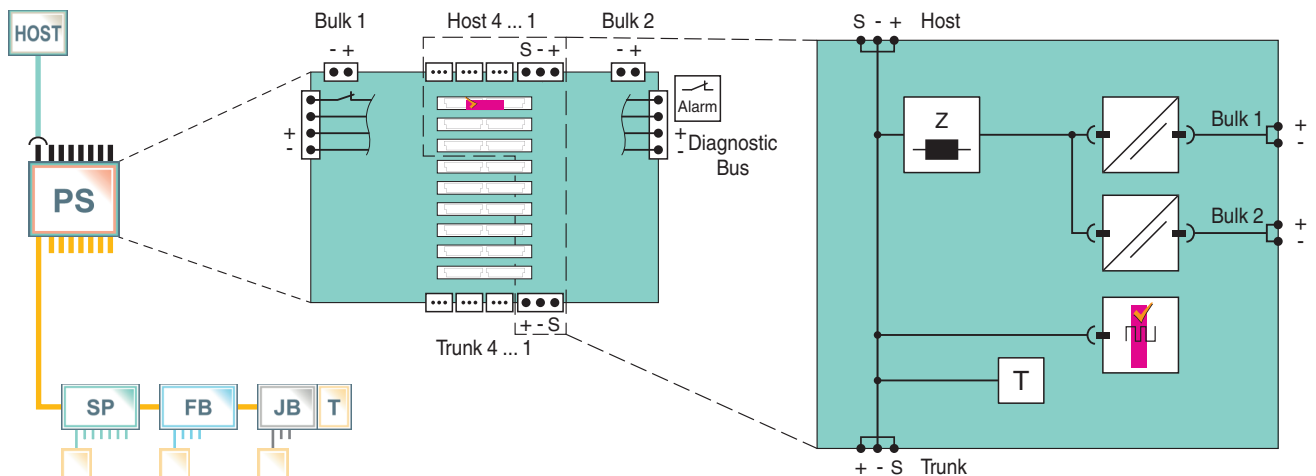
Power hub motherboard with common host interface



Function

The FieldConnex® Compact Power Hub is a modular fieldbus power supply for four segments with lowest power dissipation and smallest foot print. It supports explosion protection e.g. the High-Power Trunk for longest cable run and highest device count. The Power Hub supports optional Advanced Diagnostics for fast fieldbus commissioning and online monitoring. The motherboard for redundant power supply modules is the wiring interface with connectors for all DCS and PLC host systems. Sockets for all modules enable simple installation and replacement without tools. For power redundancy with seamless transfer, pairs of modules feed each segment. Wire connections can be selected as spring terminals or screw terminals. This design allows the most compact cabinet layout. Excellent availability and a very long service life are achieved through: passive impedance filter per segment, high-availability fieldbus termination and plug-in connectors with retaining screws. Electronics are optimized for lowest power dissipation and compactness.

Connection



Technical Data

General specifications		
Design / Mounting		Motherboard based
Installation in hazardous area		Zone 2 / Div. 2
Supply		
Connection		redundant
Rated voltage	U _r	19.2 ... 35 V SELV/PELV
Rated current	I _r	12 A

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

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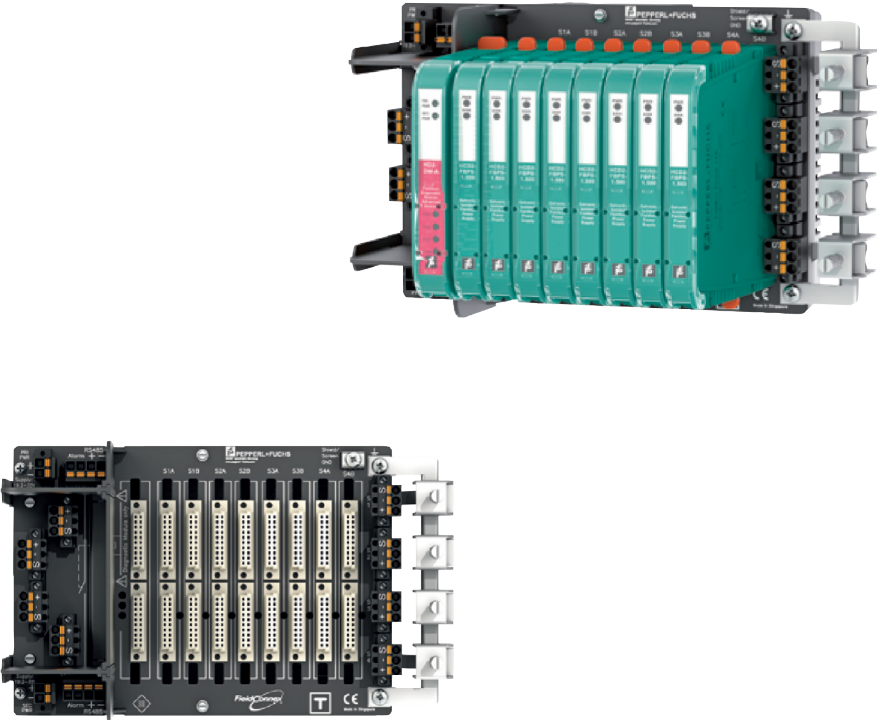
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Technical Data

Power dissipation	typ. 0.4 W per segment
Fieldbus connection	
Number of segments	4 Redundant Power Supply
Host-side	general purpose host
Terminating resistor	100 Ω integrated
Indicators/operating means	
Fault signal	VFC alarm 1 A, 50 V DC, normally closed
Galvanic isolation	
Fieldbus segment/Fieldbus segment	functional insulation acc. to IEC 62103, rated insulation voltage 50 V _{eff}
Fieldbus segment/Supply	functional insulation acc. to IEC 62103, rated insulation voltage 250 V _{eff}
Directive conformity	
Electromagnetic compatibility	
Directive 2014/30/EU	EN 61326-1:2013
Standard conformity	
Electromagnetic compatibility	NE 21:2011
Degree of protection	IEC 60529
Fieldbus standard	IEC 61158-2
Shock resistance	EN 60068-2-27
Vibration resistance	EN 60068-2-6
Ambient conditions	
Ambient temperature	-40 ... 70 °C (-40 ... 158 °F)
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)
Relative humidity	< 95 % non-condensing
Shock resistance	10 g , 11 ms
Vibration resistance	1 g , 10 ... 150 Hz
Pollution degree	max. 2, according to IEC 60664
Corrosion resistance	acc. to ISA-S71.04-1985, severity level G3
Mechanical specifications	
Connection type	screw terminal , pluggable
Core cross section	2.5 mm ²
Housing material	Polycarbonate
Degree of protection	IP20
Mass	approx. 580 g
Mounting	DIN rail mounting
Data for application in connection with hazardous areas	
Certificate	TÜV 10 ATEX 555761X
Marking	Ⓔ II 3G Ex ec IIC T4 Gc
Directive conformity	
Directive 2014/34/EU	EN 60079-0:2012 , EN 60079-11:2012 , EN 60079-15:2010
International approvals	
FM approval	CoC 3024816, CoC 3024816C
Approved for	Class I, Division 2, Groups A, B, C, D, T4 / Class I, Zone 2, AEx/Ex nA IIC T4
IECEx approval	IECEx TUN 13.0037X
Certificates and approvals	
Marine approval	DNV A-14038
General information	
Supplementary information	Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see www.pepperl-fuchs.com .

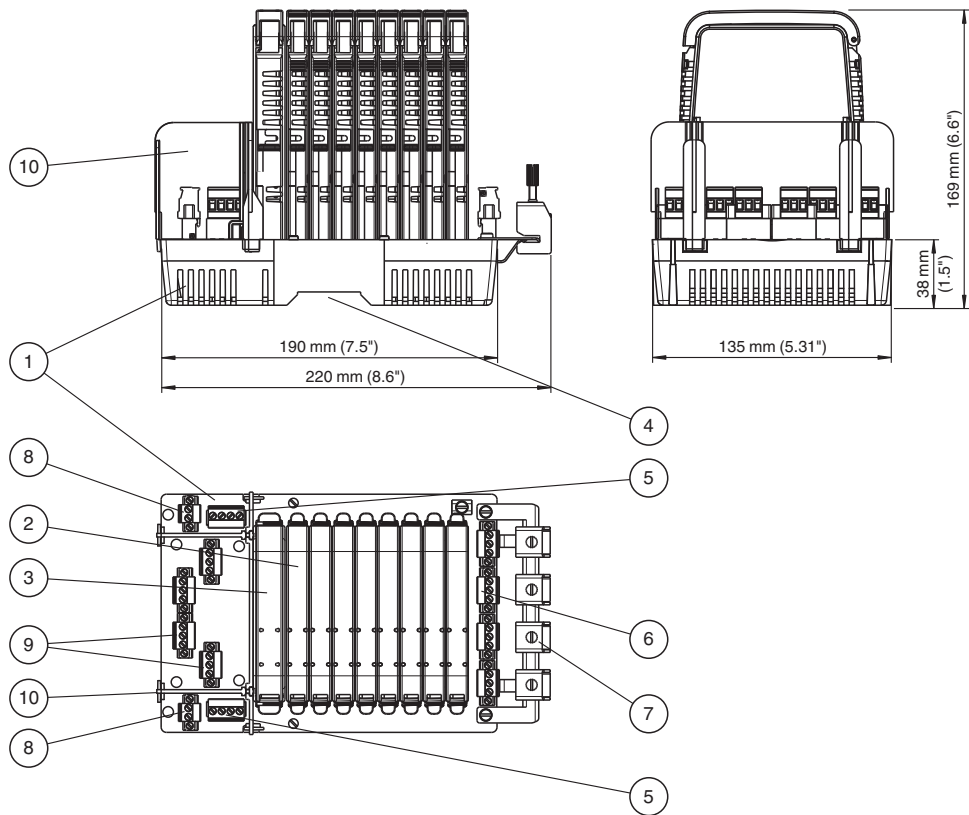
Assembly



Release date: 2024-12-06 Date of issue: 2024-12-06 Filename: 267022_eng.pdf

Additional Information

Dimensions and Assembly



- Description:
- 1 Motherboard MBHC-FB-4R*
 - 2 Power supply modules
 - 3 Diagnostic module
 - 4 Mounting slot for DIN mounting rail
 - 5 Connections for alarm voltage-free contact and diagnostic bus
 - 6 Connections for fieldbus trunk
 - 7 Screening/earthing kit for trunk shields, optional accessory
 - 8 Connections for bulk power supply
 - 9 Connections for host
 - 10 Separation wall

Components

Compatible Power Supply Modules

		HCD2-FBPS-1.23.500	HCD2-FBPS-1.500	
Power Output				
Voltage (V)		21 ... 23	28 ... 29.5	
Current (mA)		500	500	
Limit U ₀ (V)		24	30	
Device in ...	Type of Protection			Required Installation Components
Zone 0/Div. 1	Intrinsically safe Ex ia		■	FieldBarrier
Zone 1/Div. 1	Intrinsically safe Ex ia		■	FieldBarrier
Zone 1/Div. 1	Flameproof Ex d		■	Segment Protector R-SP-E12 or any Segment Protector installed in Zone 2
Zone 2	Intrinsically safe Ex ic (Entity)	■	■	Selected Segment Protectors
Div. 2	Non-incendive	■	■	Any Segment Protector; power module selection depends on voltage of field device

Safe Area	No specific type of protection		■	Segment Protector recommended
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For more details on the power supply modules see respective data sheets.

Diagnostic Module Selection

The following diagnostic modules are compatible with this motherboard.

Type code	Description
HD2-DM-B	Diagnostic Module, basic version
HD2-DM-A	Diagnostic Module, advanced version
HD2-DM-A.RO	Diagnostic Module, advanced version, relay output

The stationary and mobile Advanced Diagnostic Module (ADM) and related components provide measurement tools for the fieldbus physical layer. The ADM monitors many quality indicating values of the fieldbus physical layer. An expert system, which is included, analyzes the values and issues easy to understand messages indicating cause and remedy. The ADM is recommended for:

- **Faster commissioning and plant start-up:** Installation issues are known and corrected before loop check commences
- **Reliable operation through online monitoring:** The quality of the physical layer and installation is monitored making fieldbus a manageable asset
- **Efficient troubleshooting:** An expert system guides the user through issues and faults in the fieldbus installation

Many other tools are included that enhance fieldbus installation and upkeep. Please see datasheet on HD2-DM-A.

Product Versions

Type code	Description
MBHC-FB-4R	Motherboard for redundant power supplies with pluggable screw terminals applicable for all systems
MBHC-FB-4R.1	Motherboard for redundant power supplies with pluggable spring terminals applicable for all systems

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Instruction Manual

1. Marking

MBHC* Redundant Motherboards, 8 Segments

MBHC-FB-8R (removable screw terminals),
MBHC-FB-8R.1 (removable spring terminals), MBHC-FB-8R.YO (redundant Yokogawa ALF connectors, removable screw terminals),
MBHC-FB-8R.YO.1 (redundant Yokogawa ALF connectors, removable spring terminals),
MBHC-FB-8R.HSC (host connector left, removable screw terminals),
MBHC-FB-8R.HSC.1 (host connector left, removable spring terminals),
MBHC-FB-8R.HSC.R (host connector right, removable screw terminals),
MBHC-FB-8R.HSC.R.1 (host connector right, removable spring terminals),
MBHC-FB-8R.RH (redundant host terminals left),
MBHC-FB-8R.RH.R (redundante Host-Anschlussklemmen rechts)

MBHC* Redundant Motherboards, 4 Segments

MBHC-FB-4R (removable screw terminals),
MBHC-FB-4R.1 (removable spring terminals),
MBHC-FB-4R.YO (host connector left, redundant Yokogawa ALF connectors, removable screw terminals),
MBHC-FB-4R.YO.1 (host connector left, redundant Yokogawa ALF connectors, removable spring terminals),
MBHC-FB-4R.YO.R (host connector right, redundant Yokogawa ALF connectors, removable screw terminals),
MBHC-FB-4R.HSC (host connector left, removable screw terminals),
MBHC-FB-4R.HSC.1 (host connector left, removable spring terminals)

MBHC* Simplex Motherboards, 4 Segments

MBHC-FB-4 (removable screw terminals),
MBHC-FB-4.1 (removable spring terminals),
MBHC-FB-4.YO (Yokogawa ALF connector, removable screw terminals),
MBHC-FB-4.YO.1 (Yokogawa ALF connector, removable spring terminals),
MBHC-FB-4.HSC (host connector left, removable screw terminals),
MBHC-FB-4.HSC.1 (host connector left, removable spring terminals)

Fieldbus Power Supplies

HCD2-FBPS-1.23.500 (23 V)
HCD2-FBPS-1.500 (28 V)

ATEX certificate: TÜV 10 ATEX 555761X
ATEX marking: Ⓔ II 3G Ex ec IIC T4 Gc

IECEx certificate: IECEx TUN 13.0037X
IECEx marking: Ex ec IIC T4 Gc

CCC certificate: 2020322303003509
CCC marking: Ex ec IIC T4 Gc

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2. Validity

Specific processes and instructions in this instruction manual require special provisions to guarantee the safety of the operating personnel.

3. Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismounting lies with the plant operator.
The personnel must be appropriately trained and qualified in order to carry out mounting, installation, commissioning, operation, maintenance, and dismounting of the device. The trained and qualified personnel must have read and understood the instruction manual.
Prior to using the product make yourself familiar with it. Read the instruction manual carefully.

4. Reference to Further Documentation

Observe directives, standards, and national laws applicable to the intended use and the operating location.
Observe Directive 1999/92/EC in relation to hazardous areas.

The corresponding datasheets, manuals, declarations of conformity, EU-type examination certificates, certificates, and control drawings if applicable supplement this document. You can find this information under www.pepperl-fuchs.com.

For specific device information such as the year of construction, scan the QR code on the device. As an alternative, enter the serial number in the serial number search at www.pepperl-fuchs.com/device-information.

Due to constant revisions, documentation is subject to permanent change. Please refer only to the most up-to-date version, which can be found under www.pepperl-fuchs.com.

5. Intended Use

The FieldConnex® Power Hub is designed to power segments of the fieldbus according to IEC/EN 61158-2.

The Power Hub consists of a motherboard and power supply modules. Depending on the configuration, further components are gateways and diagnostic modules. See the respective product documentation for these components.

The device is an electrical apparatus for hazardous areas of Zone 2.

The device may be installed in gas groups IIC, IIB, and IIA.

The device must only be operated in the specified ambient temperature range and at the specified relative humidity without condensation.

6. Improper Use

Protection of personnel and the plant is not ensured if the device is not used according to its intended use.

7. Mounting and Installation

Prior to mounting, installation, and commissioning of the device you should make yourself familiar with the device and carefully read the instruction manual.

Only manipulate the connections within the specified ambient temperature range.

Temperature range	-5 °C to +70 °C
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Observe the installation instructions according to IEC/EN 60079-14.

Do not mount a damaged or polluted device.

The device may be installed in a corrosive atmosphere according to ISA-S71.04, severity level G3.

Observe the tightening torque of the screws.

7.1. Requirements for Cables and Connection Lines

Observe the permissible core cross section of the conductor.

Observe the insulation stripping length.

When using stranded conductors, crimp wire end ferrules on the conductor ends.

7.2. HCD2-FB* Mounting and Installation

The modules are intended for mounting on an appropriate fieldbus Power Hub motherboard.

Requirements for Redundant Systems

Each segment on a redundant motherboard must only be fitted with 2 power modules of the same type.

7.3. HD2-DM* Mounting and Installation

The modules are intended for mounting on an appropriate fieldbus Power Hub motherboard.

The Power Hub motherboard features a special connection slot for HD2-DM* diagnostic modules labeled **Diagnostic Module only**. Do not try to plug any other modules into this connection slot. Other modules may be damaged.

7.4. Hazardous Area

7.4.1. Gas

7.4.1.1. Zone 2

Connection or disconnection of energized non-intrinsically safe circuits is only permitted in the absence of a potentially explosive atmosphere.

The device must be installed and operated only in a controlled environment that ensures a pollution degree 2 (or better) according to IEC/EN 60664-1.

The device must be installed and operated only in surrounding enclosures that

- comply with the requirements for surrounding enclosures according to IEC/EN 60079-0,
- are rated with the degree of protection IP54 according to IEC/EN 60529.

Avoid electrostatic charges which could result in electrostatic discharges while installing, operating, or maintaining the device.

7.4.2. Type of Protection

7.4.2.1. Type of Protection Ex i

When using FieldConnex® Power Hubs with suitable FieldConnex® Segment Protectors for intrinsically safe field wiring, ensure that the power supply modules used are within the limits of the required output values.

Intrinsically safe circuits of associated apparatus (installed in non-hazardous area) can be led into hazardous areas. Observe the compliance of the separation distances to all non-intrinsically safe circuits according to IEC/EN 60079-14.

If circuits with type of protection Ex ic are operated with non-intrinsically safe circuits, they must no longer be used as circuits with type of protection Ex ic.

Observe the respective peak values of the field device and the associated apparatus with regard to explosion protection when connecting intrinsically safe field devices with intrinsically safe circuits of associated apparatus (verification of intrinsic safety). Also observe IEC/EN 60079-14 and IEC/EN 60079-25.

In order to maintain the separation distances defined in IEC/EN 60079-11 when using the FieldConnex® Power Hub with Segment Protectors to generate intrinsically safe outputs, use the following accessories.

MBHC-FB-4*: Separation wall ACC-MB-SW

MBHC-FB-8*: Connector cover ACC-MB-CC

8. Operation, Maintenance, Repair

Do not repair, modify, or manipulate the device.

Do not use a damaged or polluted device.

If cleaning is necessary while the device is located in a hazardous area, in order to avoid electrostatic charging only use a clean damp cloth.

If there is a defect, always replace the device with an original device.

9. Delivery, Transport, Disposal

Check the packaging and contents for damage.

Check if you have received every item and if the items received are the ones you ordered.

Keep the original packaging. Always store and transport the device in the original packaging.

Store the device in a clean and dry environment. The permitted ambient conditions must be considered, see datasheet.

The device, built-in components, packaging, and any batteries contained within must be disposed in compliance with the applicable laws and guidelines of the respective country.