

Introduction

The K-System HART Multiplexer works as a master/slave system and when fully occupied can drive up to 256 HART field devices. Up to 15 additional slaves can be connected to the master, each of which can support another 16 channels. This allows up to 7936 field devices to be addressed through one RS 485 interface.

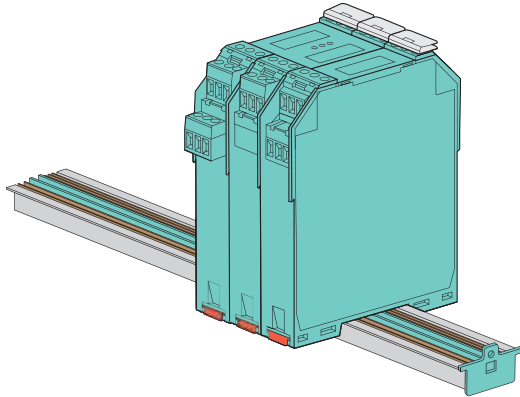


Figure 1 K-System HART communication

Components

HART Multiplexer

HART Multiplexer Master

- HART field device inputs
- Up to 15 KFD0-HMS-16 slave units can be connected
- Configured using **PACTware™**
- Power supply via Power Rail

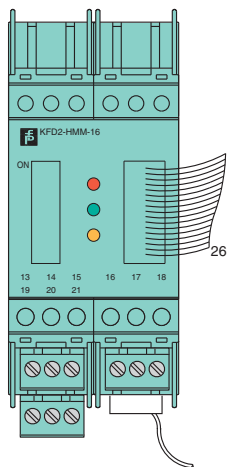


Figure 2 40 mm housing (KFD2-HMM-16)

HART Multiplexer Slave

- 20 mm housing
- HART field device inputs
- Used with HART Multiplexer Master KFD2-HMM-16

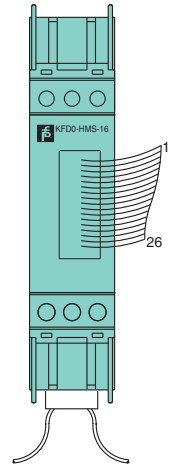


Figure 3 20 mm housing (KFD0-HMS-16)

HART Termination Boards

The wiring of the single I/O components of the HART product portfolio is done via a Termination Board. Since a wide variety of Termination Boards are available, only the basic wiring options are described here. Field devices and DCS are connected via Termination Boards. The Termination Boards are designed to establish the connection of a KFD*-HM*-16 HART Multiplexer to up to 16 field devices.

More detailed information to connection layout can be found in the data sheet of the according Termination Board.

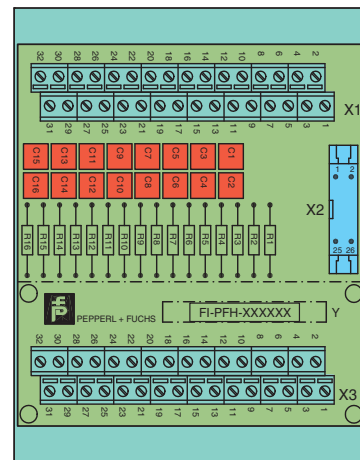


Figure 4 HART Termination Board

Topology

A wide variety of Termination Boards are available. For additional information about topology, refer to HART Multiplexer System manual.

External assembly

Multiplexer Master and Slaves are connected to Termination Boards, which transmits the control signals via screw terminals. In this case the Termination Board provides a parallel connection to the Multiplexer or Slave. This assembly method is completely independent of DCS.

Assembly integrated in the K-System

For hazardous location applications, the intelligent field device must be isolated from the safe area via a K-System isolator. The isolated signals are then connected to Termination Boards, where a parallel connection to the Multiplexer or Slave is made via a 26-pin ribbon cable.

Assembly integrated in the DCS

Multiplexer Master and Slaves are connected to Termination Boards, which transmits the signals via a system cable to the DCS. In this case the Termination Board provides a parallel connection to the Multiplexer or Slave. The Termination Boards are designed specifically for individual DCS.

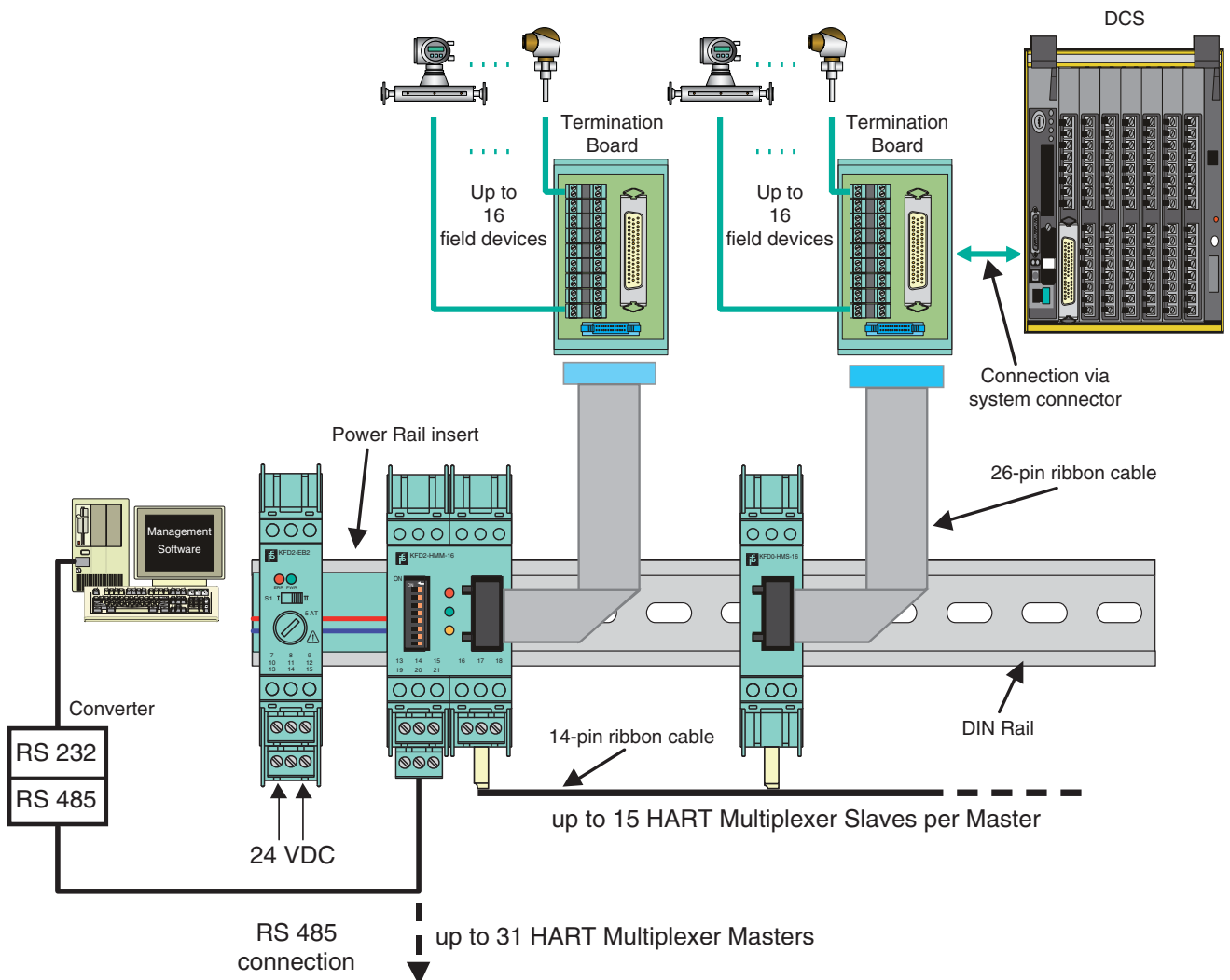


Figure 5 Example of HART Interface topology

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Mounting

The HART Interface Solutions are mounted on a 35 mm DIN rail. To reduce wiring and installation costs, Power Rail is the optimum solution.

Power Rail

The Power Rail is a plastic insert into a standard DIN rail and contains two leads that deliver power to the modules. Power is sent through the rail by a power feed module that delivers 24 V DC at 4 A. The module uses a 4 A fuse to protect the barriers. The Power Rail virtually eliminates the risk of wiring faults and facilitates easy expansion. Power Rail is available in two versions:

- UPR-03: 3-lead version supplies power and error signals
- UPR-05: 5-lead version supplies three leads for power and error signal and two leads for serial data exchange.

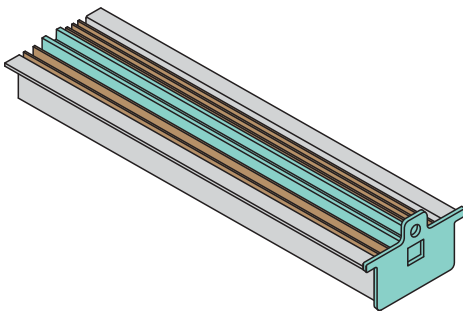


Figure 6 Universal Power Rail UPR-05

HART Multiplexer mounting on Power Rail

As shown in the figure, the isolation modules are snapped onto the Universal Power Rail in a vertical downward movement.

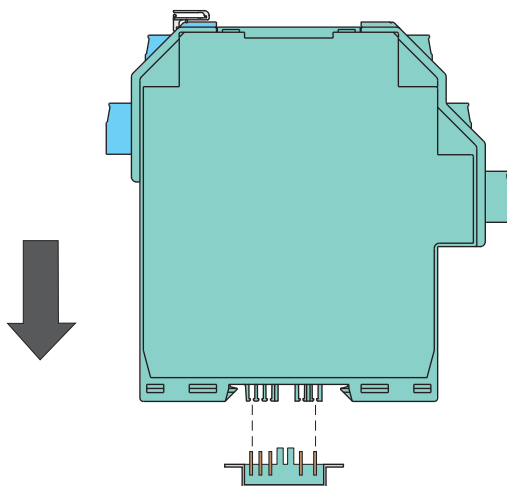


Figure 7 Proper HART Multiplexer mounting

CORRECT: Device snapped on vertically.

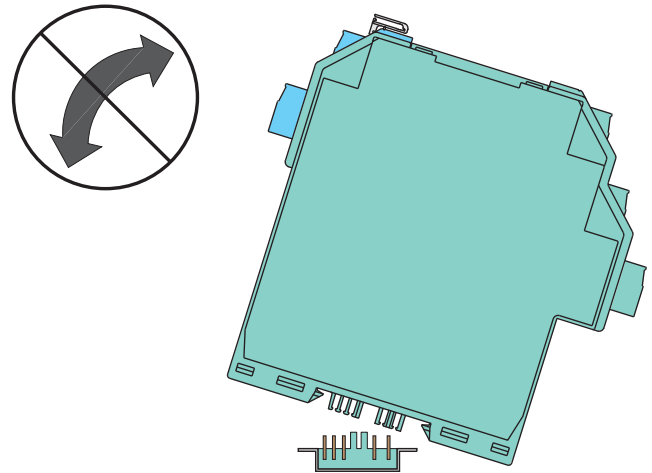


Figure 8 Improper HART Multiplexer mounting

INCORRECT: Device snapped on from the side.

Mounting the Termination Board

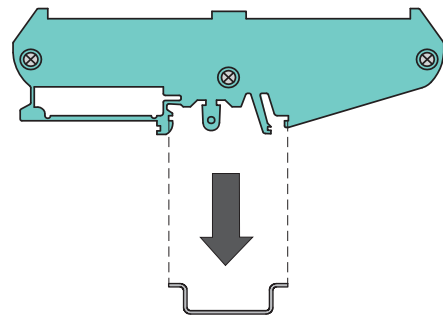


Figure 9 Termination Board mounting on DIN rail

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Power connection to HART Multiplexer

Supply voltage

K-System HART Multiplexers are available with a supply voltage of 24 V DC. The supported supply voltage for the modules is identified on the side plate.

Conventional power supply without Power Rail

Conventional power supplies create complicated and expensive wiring systems. After all isolated barriers are connected, there is a significant amount of wiring and more wiring must be added for features such as lead breakage and short-circuit monitoring.

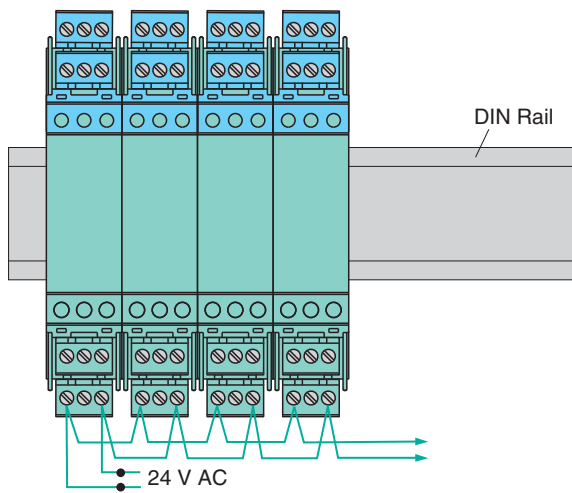


Figure 10 Conventional installation

Power supply with Power Rail

The Pepperl+Fuchs Power Rail eliminates wiring hassles and reduces expense. The power feed module mounts on the Power Rail for easy and reliable distribution of power to all connected isolated modules. This method eliminates all of the parallel power wiring necessary on a conventional installation without Power Rail.

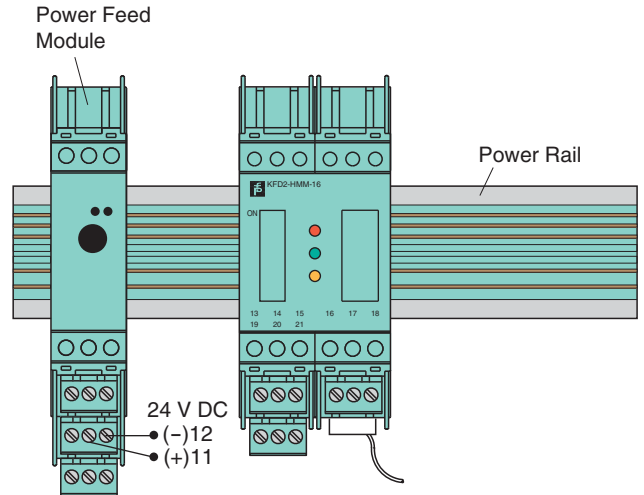


Figure 11 Power Rail installation

For additional information about connection, refer to system description Isolated Barriers K-System.

Safety information

The corresponding data sheets, the Declaration of Conformity, the EC-Type Examination Certificate and applicable certificates (see data sheet) are an integral part of this document.

Intended use

Laws and regulations applicable to the usage or planned purpose of usage must be observed. Devices are only approved for proper usage in accordance with intended use. Improper handling will result in voiding of any warranty or manufacturer's responsibility.

These devices are used in C&I technology for the galvanic isolation of C&I signals, such as 20 mA and 10 V unit signals, and also for the adaptation and/or standardisation of signals.

The devices are not suitable for the isolation of signals in power engineering, unless this is specifically referred to in the respective data sheet.

Protection of operating personnel and the system is not ensured if the product is not used in accordance with its intended use.

Installation and commissioning

Commissioning and installation must be carried out by specially trained and qualified personnel only.

Installation of the interface devices in the safe area

The devices are constructed to satisfy the IP20 protection classification and must be protected from adverse environmental conditions such as water spray or dirt exceeding the pollution degree 2.

The devices must be installed outside the hazardous area!

Installation and commissioning of the interface devices within Zone 2/Div. 2 of the hazardous area

Only devices with the corresponding manufacturer's Declaration of Conformity or separate certificate of conformity can be installed in Zone 2/Div. 2.

The individual data sheets indicate whether these conditions are met.

For US and Canada installations, in Zone 2/Div. 2 follow the NEC and CEC wiring methods. The enclosure must be able to accept Zone 2/Div. 2 wiring methods. The referenced product certification control drawing must be observed.

For all other applications, the devices should be installed in a switch or junction box that:

- meets at least IP54 in accordance to EN 60529.
- meets to the requirements of resistance to light and resistance to impact according to EN 60079-0/ IEC 60079-0.
- meets to the requirements of thermal endurance according to EN 60079-15/IEC 60079-15.
- must not cause ignition danger by electrostatic charge during intended use, maintenance and cleaning.

The EC-Type Examination Certificates, standard certificates/approvals or the manufacturer's Declaration of Conformity should be observed. It is especially important to observe the "special conditions" if these are included in the certificates.

Repair and maintenance

The transfer characteristics of the devices remain stable over long periods of time. This eliminates the need for regular adjustment. Maintenance is not required.

Fault elimination

No changes can be made to devices that are operated in hazardous areas. Repairs on the device are not allowed.

Isolation coordinates for installations for galvanic isolation according to EN 50178 and EN 61140

The devices of the K-System are electronic equipment for use in secluded electrical operating sites where only skilled personnel or electrically instructed personnel will have admission or access.

The devices are assessed for pollution degree 2 and overvoltage category II according to EN 50178.

For additional details, see data sheets.

Technical data

Electrical data

For electrical data, see data sheets.

Mechanical data

Mounting

- Snap-on 35 mm standard DIN rail acc. to EN 60715. Can be mounted horizontally or vertically, side by side.
- Panel mount: The lugs on the base of the modules must be extended and used for mounting purposes with 3 mm screws.
- K-MS mounting base for screw attachment

Mass

Termination Boards: 200 g to 400 g

Modules: 100 g to 250 g

Housing material

Polycarbonate (PC)

Dimensions

Housing drawings please refer to the appendix.

Protection degree

Modules: IP20 acc. to EN 60529

Connection

- Removable connector with integrated self-opening device terminals for leads of up to a max. of 1 x 2.5 mm² (14 AWG)
- Signal connection via ribbon cable

Labeling

place for labeling on the front side, label: 8 mm x 18 mm

Ambient conditions

Ambient temperature

Modules: -20 °C to 60 °C (253 K to 333 K)

Termination Boards: 0 °C to 55 °C (273 K to 328 K)

Storage temperature

-40 °C to 90 °C (233 K to 363 K)

Reference conditions for adjustment

22.5 °C ± 2.5 °C (295.5 K ± 2.5 K)

Relative humidity

max. 95 % without moisture condensation

Vibration resistance

acc. to EN 60068-2-6, 10 Hz to 150 Hz, 1 g, high crossover frequency

Shock resistance

acc. to EN 60068-2-27, 15 g, 11 ms, half-sine

Conformity with standards and directives

General

- EMC acc. to NAMUR NE21 and EN 61326
- LEDs acc. to NAMUR NE44
- Software acc. to NAMUR NE53
- Switch-on pulse suppression
- HART Multiplexer Master KFD2-HMM-16:
 - Supply voltage 20 V DC to 30 V DC via Power Rail or supply terminals
 - Fault signals via Power Rail
- HART Multiplexer Slave KFD0-HMS-16: no additional power supply necessary
- Safety devices acc. to VDE 0660 T.209, AK acc. to DIN 19250