Features

- Comprehensive diagnostics for fieldbus physical layer and power supply
- Plug-in Module for the FieldConnex Power Hub
- Precise measurements through passive circuits
- For commissioning, online monitoring and troubleshooting
- For FOUNDATION Fieldbus H1 and PROFIBUS PA
- Installation in Zone 2/Class I, Div. 2
- System state and fault indication via LEDs
- Display of data in the safety of the control room
- Automatic setup of diagnostic system
- Full software integration into DCS and PAM possible

Function

Designed as a plug-in module for the FieldConnex® Power Hub, this Advanced Diagnostic Module (ADM) is a comprehensive measurement tool for the physical layer of up to four fieldbus segments. It's passive input circuits leave the physical layer untouched for exact data. The ADM detects gradual or sudden changes and helps trace even intermittent malfunctions.

The ADM supports commissioning, online monitoring and troubleshooting. It can be integrated tightly into the DCS and PAM via a separate diagnostic bus, making the fieldbus physical layer itself a managable asset. Configuration tools automate setup of the ADM and of selected DCS.

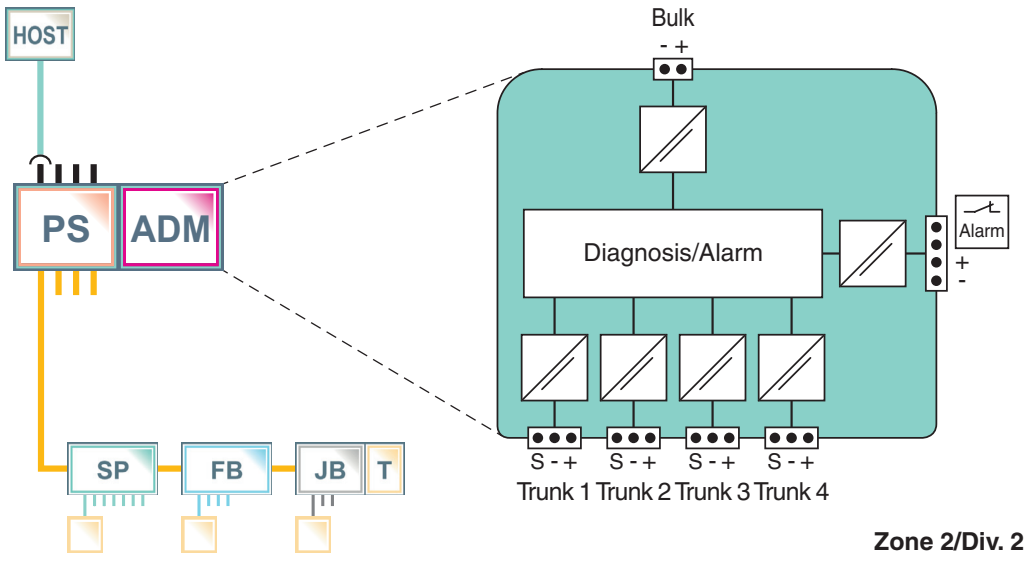
The Diagnostic Manager is the software for display and operation from the safety of the control room. The Professional Edition provides powerful functions and wizards simplifying and automating work procedures: Embedded expert system data historian and a built-in oscilloscope are included. (see datasheet DTM-FC.AD*).

Assembly

FOUNDATION

FieldConnex®

Connection



Zone 2/Div. 2

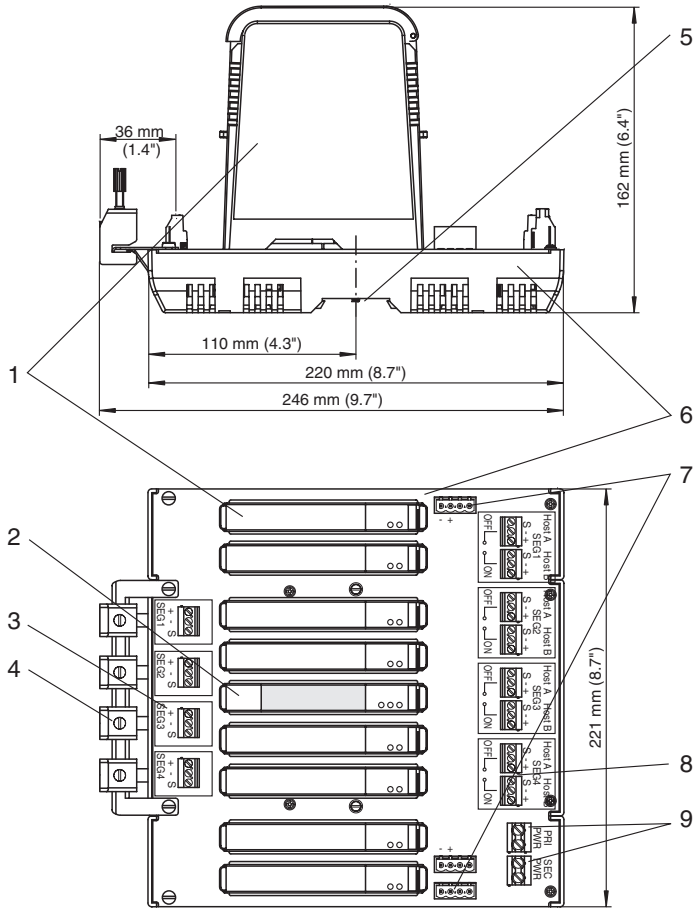
Release date 2015-01-12 17:11 Date of issue 2015-01-12 131000_eng.xml

Supply		
Rated voltage	U_n	19.2 ... 35 V
Rated current	I_N	110 ... 30 mA
Power loss		max. 2 W
Fieldbus interface		
Number of segments		4
Fieldbus type		FOUNDATION Fieldbus/PROFIBUS PA
Rated voltage	U_N	9 ... 32 V
Indicators/operating means		
LED PRI PWR		green: on, primary bulk power supply connected
LED SEC PWR		green: on, secondary bulk power supply connected
LED Seg 1...4		yellow: bus activity; red 2 Hz flashing: alarm; red: hardware error
Fault signal		VFC alarm 1 A, 50 V DC, normally closed
DIP-switch		diagnostic address 1...247, binary coded
Interface		
Interface type		diagnostic bus: RS 485
Electrical 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 50 V_{eff}
Directive conformity		
Electromagnetic compatibility		
Directive 2004/108/EC		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
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		15 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		motherboard specific
Core cross-section		motherboard specific
Housing material		Polycarbonate
Housing width		18 mm
Housing height		106 mm
Housing depth		128 mm
Degree of protection		IP20
Mass		approx. 100 g
Mounting		motherboard mounting
Mating cycles		100
Data for application in connection with Ex-areas		
Statement of conformity		TÜV 04 ATEX 2500 X
Group, category, type of protection, temperature class		¬ II 3 G Ex nA IIC T4 Gc
Directive conformity		
Directive 94/9/EC		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 13.0038X
Approved for		Ex nA IIC T4 Gc
Certificates and approvals		
Marine approval		DNV A-14038
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.

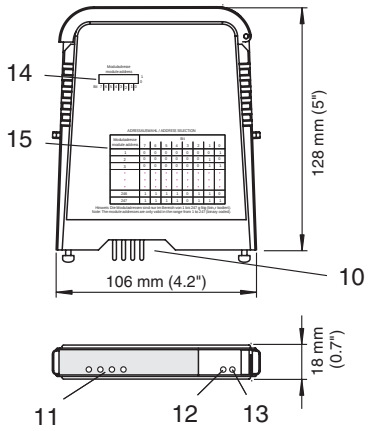
Release date 2015-01-12 17:11 Date of issue 2015-01-12 131000_eng.xml

Dimensions

Dimensions complete redundant system*



Dimensions Advanced Diagnostic Module*



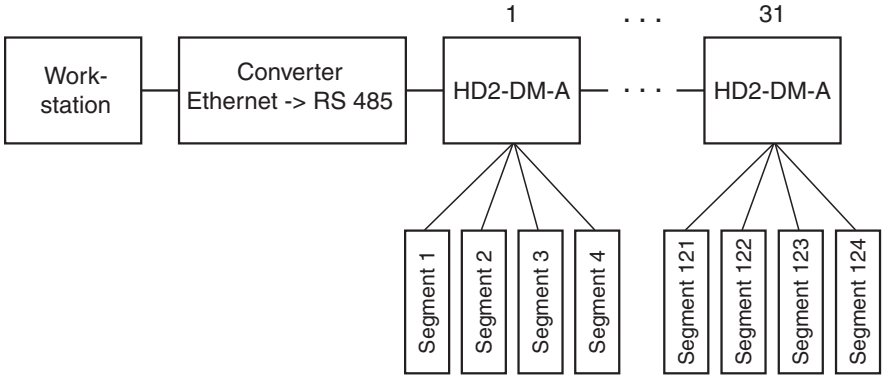
*all dimensions without tolerance indication

Description:

1 Power Supply Modules, see separate data sheets
2 Advanced Diagnostic Module
3 Connections for fieldbus trunk, terminator switch
4 Screening/earthing kit for trunk cables shield, optional accessory
5 Mounting slot for DIN rail
6 Motherboard, see separate data sheets
7 Connections for alarm, voltage free contact and diagnostics bus
8 Connections for redundant host
9 Connections for redundant bulk power supply
10 Plug connections to Motherboard
11 LED Seg 1 ... Seg 4
12 LED green SEC Power
13 LED green PRI Power
14 Dip-Switch-Array for diagnostic address or address on the diagnostics bus
15 Address selection overview

Installation note

System topology



Installation notes see manual.

Release date 2015-01-12 17:11 Date of issue 2015-01-12 131000_eng.xml

Accessories

- Software User Interface for monitoring up to or including 100 fieldbus segments: Diagnostic Manager, Professional Edition DTM-FC.AD
- Software User Interface for monitoring more than 100 fieldbus segments: Diagnostic Manager, Professional Edition DTM-FC.AD.1
- KT-MB-GT2AD Diagnostic Gateway

Functional overview

Expert system	Built-in expert system interprets behavior of each segment based on rules and gives pointed information in clear text. Precisely diagnosis causes and suggests remedies, which are easy to understand.
Supply input voltage	The supply voltage of the primary and secondary input is measured in a range of 0 V ... 40 V.
Segment power redundancy integrity	The health of the primary and backup fieldbus power supply is monitored. Mismatch of redundancy pairs is detected and causes an alarm.
Fieldbus voltage	The segment voltage is measured in a range of 0 V ... 35 V.
Fieldbus current	The current feed into a fieldbus segment is measured in a range of 0 A ... 1 A depending on the used power supply.
Unbalance detection	A capacitive or resistive short between any fieldbus wire and shield is measured and given in a range between -100% ... +100%. (-100% = short against - wire, +100% = short against +wire)
Termination	Over- and Undertermination are detected and reported.
Signal level	Node specific signal levels are measured in a range of 0 V ... 2.5 V.
Jitter	Jitter is a measurement for the timing of each bit. Each component connected (power supply, field instrument, cable, ...) to the segment influences jitter. It is an excellent indicator for segment health. The jitter is either segment- or device-specifically measured in a range of 0 µsec ... 8 µsec.
Signal polarity	For each node the polarity of the signal modulation is given.
Noise measurement	Noise is measured in a frequency range between 100 Hz ... 140 kHz. Noise measurement is node-address-specific in order to detect device-specific noise.
Communication errors statistics	Segment-specific error counters, e. g. for CRC errors, framing errors.
Oscilloscope function	The built-in oscilloscope is a powerful tool for signal voltage behavior analysis. It allows for analysis of specific frames and occurring communication errors. Trigger conditions, as e. g. different frame types, CRC errors, framing errors are either node-address-specific or unspecific. The frame contents detected in the sampled period are analyzed and shown.
Live list generation	A list of all connected devices and additional status information is generated. The ADM detects initial connection of a device to a segment in operation. A message reminds the user to re-run the commissioning wizard.
Alarm management	For all measured values, either segment- or node-specific, alarm limits exist. In addition, warning limits can be defined. When these limits are violated, alarms are generated.
History/trending function	For up to 2 years, segment- and node-specific physical layer values can be stored and time stamped in the Diagnostic Module, so trending analyses are possible over longer periods of time.

Release date 2015-01-12 17:11 Date of issue 2015-01-12 131000_eng.xml