

Диагностические модули

Технические характеристики

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Россия +7(495)268-04-70

Казахстан +7(727) 345-47-04

Беларусь +(375) 257-127-884

Узбекистан +998(71)205-18-59

Киргизия +996(312)96-26-47

эл.почта: phb@nt-rt.ru || сайт: <https://pepperl-fuchs.nt-rt.ru/>



Advanced Diagnostic Module

FieldConnex® Fieldbus

HD2-DM-A

- 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 PCS and PAM possible

Advanced diagnostic module, plug-in module for the fieldbus power hub

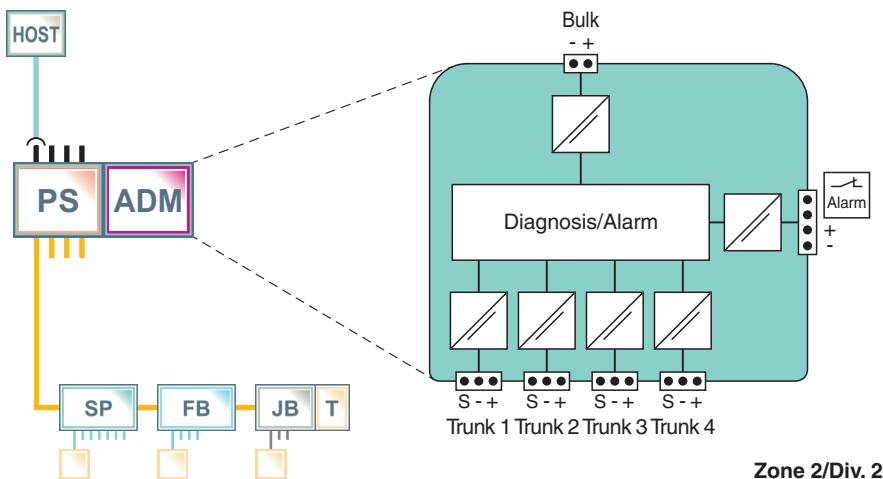


Function

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 manageable 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: an embedded expert system, a data historian, and a built-in oscilloscope (see datasheet DTM-FC.AD*).

Connection



Technical Data

General specifications

Design / Mounting		Motherboard based
Installation in hazardous area		Zone 2 / Div. 2
Supply		
Rated voltage	U _r	19.2 ... 35 V
Rated current	I _r	110 ... 30 mA
Power dissipation		max. 2 W

Technical Data

Fieldbus connection

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
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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 50 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
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

Core cross section		motherboard specific
Housing material		Polycarbonate
Degree of protection		IP20
Mass		approx. 100 g
Dimensions		
Height		106 mm
Width		18 mm
Depth		128 mm
Mounting		motherboard mounting
Mating cycles		100

Data for application in connection with hazardous areas

Certificate		TÜV 04 ATEX 2500 X
Marking		Ⓔ II 3 G Ex nA IIC T4 Gc
Directive conformity		
Directive 2014/34/EU		EN 60079-0:2012 , EN 60079-11:2012 , EN 60079-15:2010

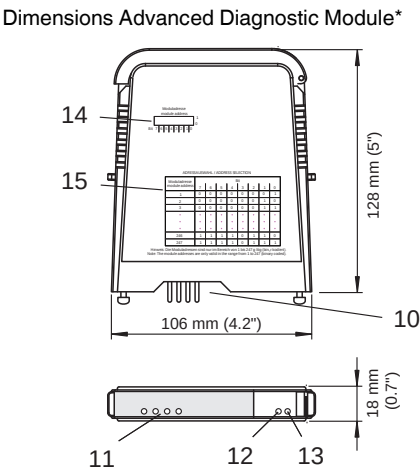
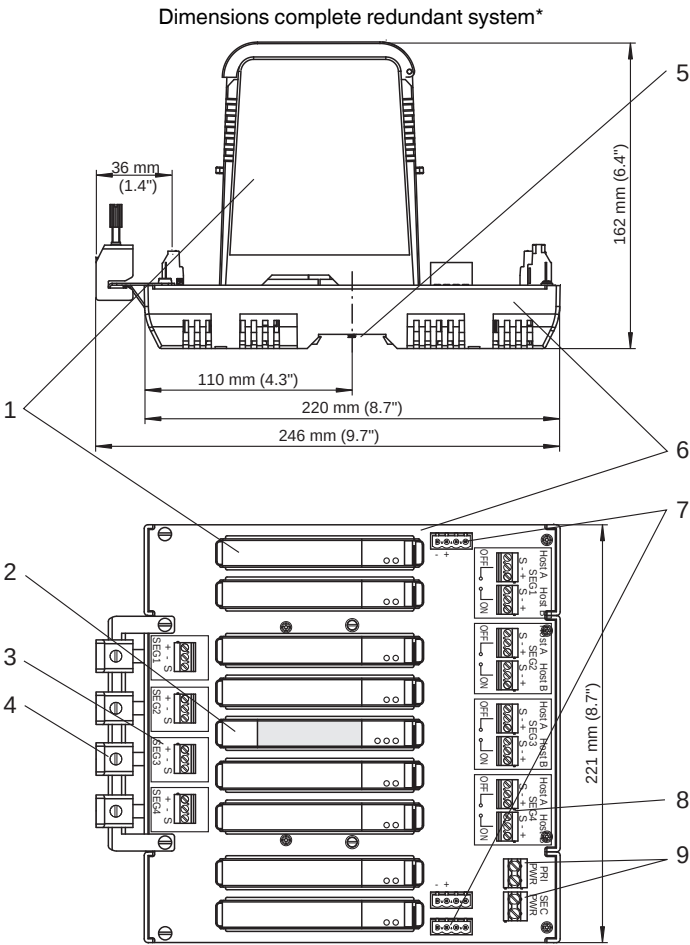
International approvals

FM approval		
FM certificate		FM 19 US 0015 X and FM 19 CA 0011 X
FM marking		AEx/Ex ec IIC T4
IECEx approval		
IECEx certificate		IECEx TUN 13.0038X

IECEx marking	Ex nA IIC T4 Gc
Certificates and approvals	
Patents	This product may be covered by the following patent: US7,698,103
General information	

Additional Information

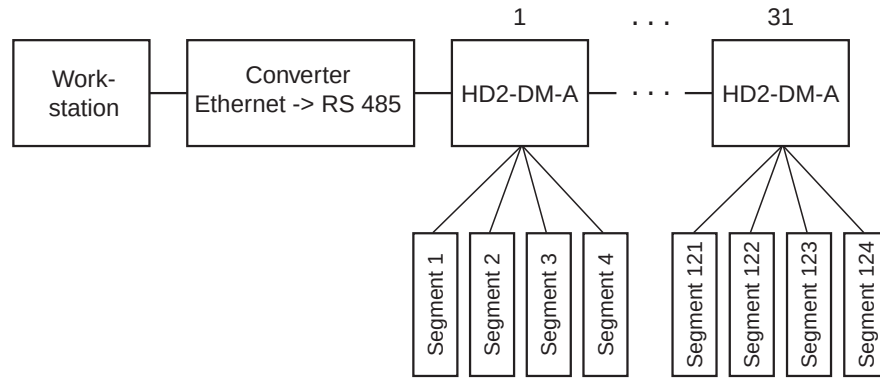
Dimensions and Assembly



*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

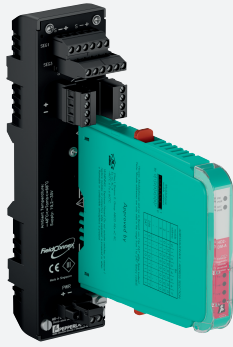
- 10 Plug connections to Motherboard
- 11 LED Seg 1 ... Seg 4
- 12 LED green SEC Power
- 13 LED green PRI Power
- 14 Dip-Switch-Array for diagnostic address or address on the diagnostics bus
- 15 Address selection overview



Installation notes see manual.

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



Advanced Diagnostic Kit

FieldConnex® Fieldbus

KT-MB-DMA

- Comprehensive diagnostics for the fieldbus physical layer
- Module and motherboard for retrofit of any installation
- 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
- Full software integration into PCS and PAM possible

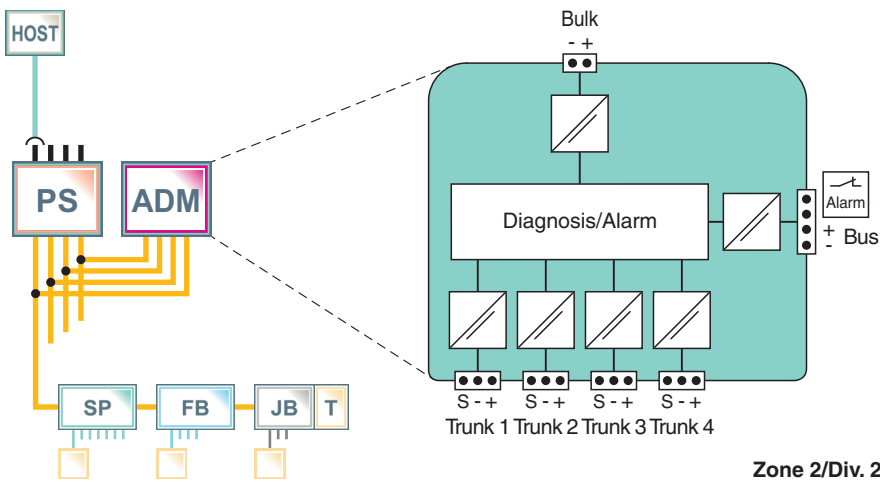
Advanced diagnostic kit for retrofitting advanced diagnostics



Function

The kit of FieldConnex® Advanced Diagnostic Module (ADM) and motherboard is a comprehensive measurement tool for the physical layer for retrofitting of up to four fieldbus segments. Its 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 manageable 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: an embedded expert system, a data historian, and a built-in oscilloscope (see datasheet DTM-FC.AD*).

Connection



Technical Data

General specifications

Design / Mounting	Motherboard based	
Installation in hazardous area	Zone 2 / Div. 2	

Supply

Rated voltage	U _r	19.2 ... 35 V
Rated current	I _r	110 ... 30 mA
Power dissipation	max. 2 W	

Fieldbus connection

Technical Data

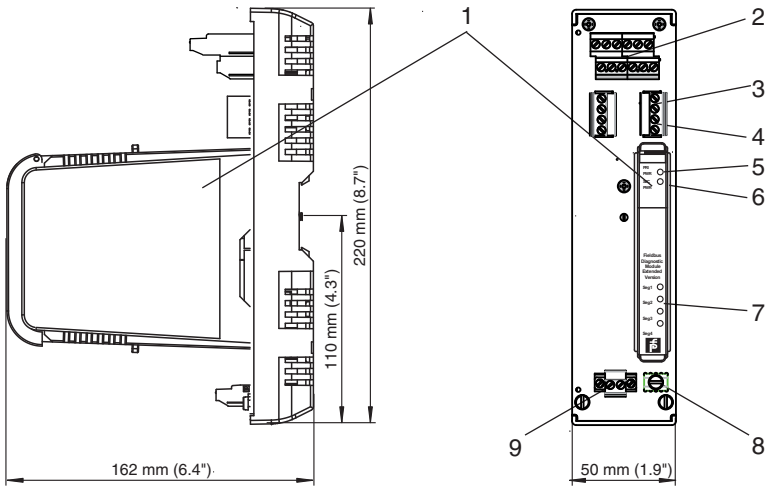
Number of segments	4
Fieldbus type	FOUNDATION Fieldbus/PROFIBUS PA
Indicators/operating means	
LED PRI PWR	green: on, primary bulk power supply connected
LED SEC PWR	green: on, secondary bulk power supply connected
LED Seg 1...4	yellow: bus activity; red 2 Hz flashing: alarm; red: hardware error
Fault 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
Directive conformity	
Electromagnetic compatibility	
Directive 2004/108/EC	EN 61326-1:2006
Standard conformity	
Electromagnetic compatibility	NE 21
Degree of protection	IEC 60529
Shock resistance	EN 60068-2-27
Vibration resistance	EN 60068-2-6
Ambient conditions	
Ambient temperature	-40 ... 60 °C (-40 ... 140 °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
Mechanical specifications	
Connection type	screw terminal , pluggable
Core cross section	2.5 mm²
Housing material	Polycarbonate
Degree of protection	IP20
Mass	approx. 290 g
Dimensions	
Height	220 mm
Width	50 mm
Depth	162 mm
Mounting	DIN rail mounting
International approvals	
FM approval	
FM certificate	FM 19 US 0015 X and FM 19 CA 0011 X
FM marking	AEx/Ex ec IIC T4
General information	

Product Photo



Additional Information

Dimensions and Assembly

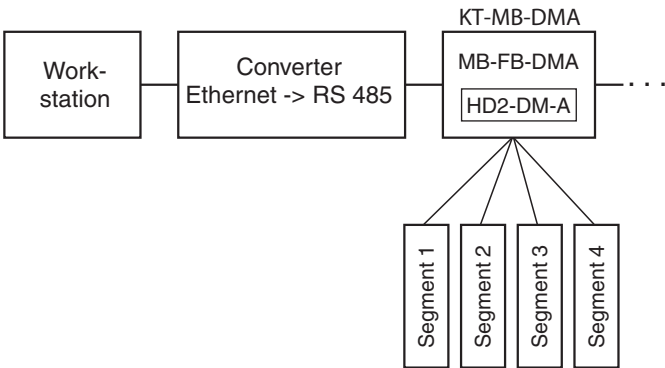


*all dimensions without tolerance indication

- Description:

 - 1 Advanced Diagnostic Module
 - 2 Connections for fieldbus segments
 - 3 Connection voltage free contact
 - 4 Diagnostic bus
- 5 LED green PRI Power
 - 6 LED green SEC Power
 - 7 LEDs Seg 1 ... Seg 4
 - 8 Screen/ground connection clamp
 - 9 Connections for bulk power supply

System Topology



Installation notes see manual.

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
- T-Connector, Part. No.: 208182 (packaging unit = 4 pieces), to loop-in the diagnostic module at the segment outputs of the common Fieldbus Power Supplies on the market.



Advanced Diagnostic Module

FieldConnex® Fieldbus

HD2-DM-A.RO

- Diagnostics for fieldbus physical layer and power supply
- Plug-in Module for the FieldConnex Power Hub
- Plug and play - no engineering required
- For online monitoring
- For FOUNDATION Fieldbus H1 and PROFIBUS PA
- Installation in Zone 2/Class I, Div. 2
- System state and fault indication via LEDs
- Alarm limits configurable via DIP switches
- Fault indication transmission by voltage free contact

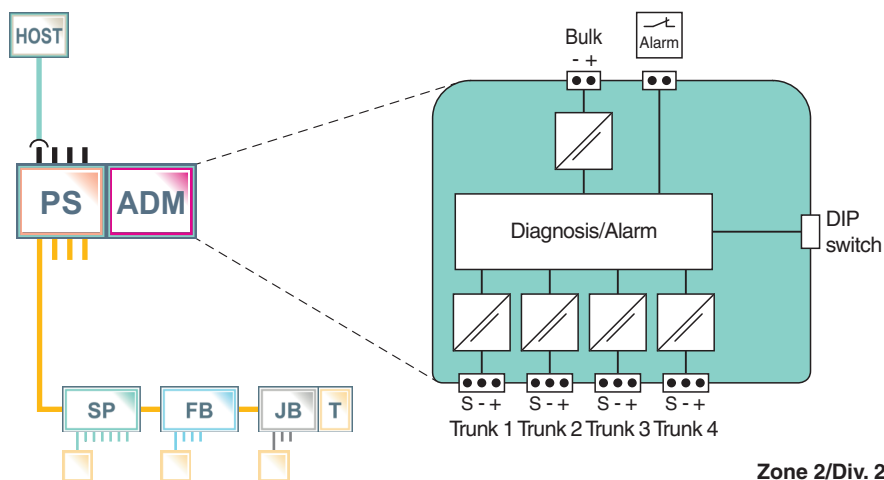
Advanced diagnostic module with relay output for fieldbus power hub physical layer diagnostics



Function

Designed as a plug-in module for the FieldConnex® Power Hub, the Advanced Diagnostic Module (ADM) with relay output is a monitoring tool for the physical layer of up to four fieldbus segments. Passive input circuits leave the physical layer untouched, avoiding alteration of the signal. The ADM indicates unwanted conditions via voltage-free contact. It provides physical layer diagnostics "plug-and-play", without additional engineering. If desired, the values for maintenance and out-of-specification limit ranges are configurable via DIP switches. LED signals indicate that a limit has been exceeded. For commissioning and troubleshooting, a comprehensive diagnostic module such as the FieldConnex(R) mobile ADM (see DM-AM-KIT) is recommended.

Connection



Technical Data

General specifications

Design / Mounting		Motherboard based
Installation in hazardous area		Zone 2 / Div. 2
Supply		
Rated voltage	U _r	19.2 ... 35 V
Rated current	I _r	40 ... 25 mA
Power dissipation		max. 1 W
Fieldbus connection		
Number of segments		4

Technical Data

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; yellow 2 Hz flashing: Maintenance required; red 2 Hz flashing: specification limit violated; red: hardware error
Fault signal		VFC alarm 1 A, 50 V DC, normally closed
DIP switch		fieldbus type , redundant supply , Signal level , Noise level , Jitter
Galvanic isolation		
Fieldbus segment/Fieldbus segment		functional insulation acc. to IEC 62103, rated insulation voltage 50 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
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		
Core cross section		motherboard specific
Housing material		Polycarbonate
Degree of protection		IP20
Mass		approx. 100 g
Dimensions		
Height		106 mm
Width		18 mm
Depth		128 mm
Mounting		motherboard mounting
Data for application in connection with hazardous areas		
Certificate		TÜV 04 ATEX 2500 X
Marking		Ⓔ II 3 G Ex nA 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		
FM certificate		FM 19 US 0015 X and FM 19 CA 0011 X
FM marking		AEx/Ex ec IIC T4
IECEx approval		
IECEx certificate		IECEx TUN 13.0038X
IECEx marking		Ex nA IIC T4 Gc
Certificates and approvals		
Patents		This product may be covered by the following patent: US7,698,103
General information		

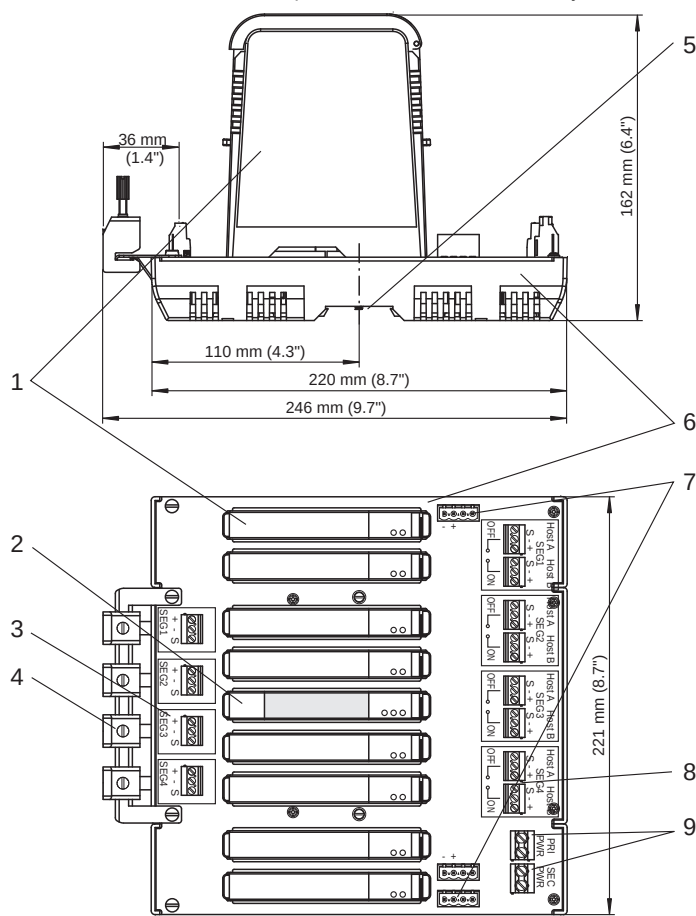
Assembly



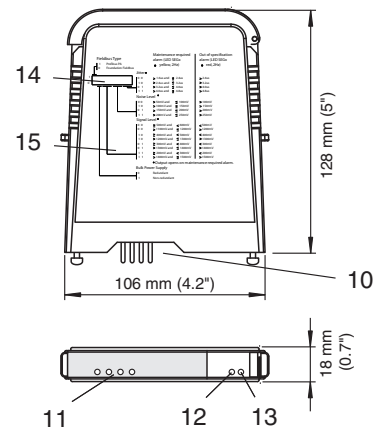
Additional Information

Dimensions and Assembly

Mounted complete redundant Power Hub System*



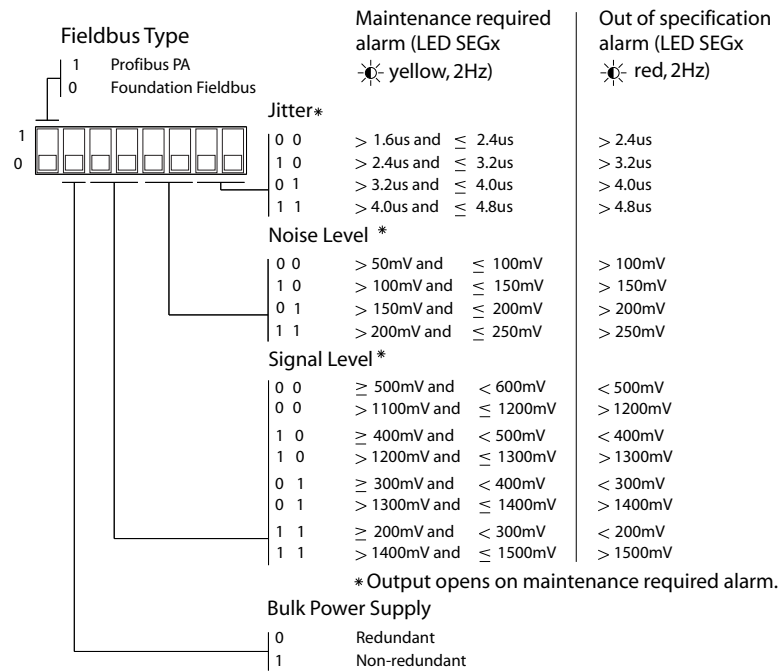
Advanced Diagnostic Module, Relay Output*



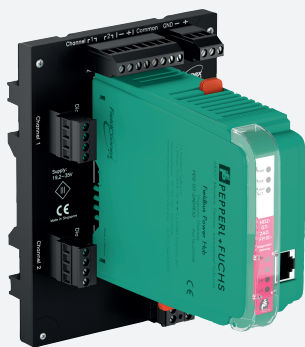
*all dimensions without tolerance

Description:

- 1 Power Supply Modules, see separate data sheets
- 2 Advanced Diagnostic Module, Relay Output
- 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 diagnostic bus (not applicable for HD2-DM-A.RO)
- 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 PWR
- 13 LED green PRI PWR
- 14 DIP switch array
- 15 DIP switch settings overview



DIP switch settings overview



Diagnostic Gateway Kit

FieldConnex® Fieldbus

KT-MB-GT2AD.FF

- System integration kit for Advanced Diagnostics
- PCS integration via Diagnostic Manager or device DTM
- Simple automatic setup of Advanced Diagnostics
- Common alarm handling
- For FOUNDATION Fieldbus and PROFIBUS PA
- Installation in Zone 2

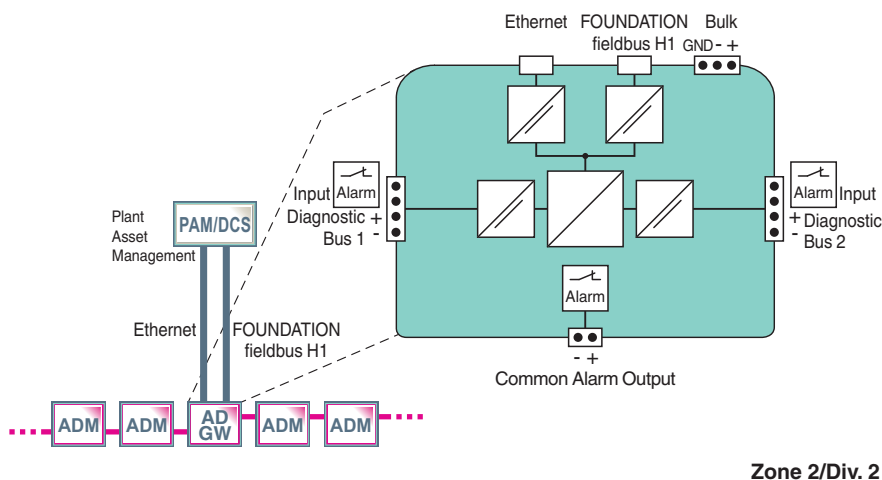
Diagnostic gateway kit with Ethernet, FF-H1 interface for advanced diagnostics



Function

The FieldConnex® Diagnostic Gateway is the interface between stationary Advanced Diagnostic Modules (ADM) and the control system. It offers access to all ADM data in two ways: via Ethernet and the Diagnostic Manager software or via FOUNDATION Fieldbus H1 and DTM/EDD or both. The gateway configures itself and automatically detects the ADMs. The Diagnostic Manager automatically finds gateways on the same subnet. The setup of the diagnostic bus and all connected modules is automatic. This significantly simplifies engineering of FieldConnex® Advanced Diagnostics.

Connection



Technical Data

General specifications

Design / Mounting	Motherboard based	
Installation in hazardous area	Zone 2 / Div. 2	

Supply

Rated voltage	U_r	19.2 ... 35 V DC SELV/PELV
Rated current	I_r	120 ... 70 mA
Power dissipation	max. 2.5 W	

Fieldbus connection

Number of segments	4	
Fieldbus type	FOUNDATION Fieldbus	
Physical layer profile	profile type 114	

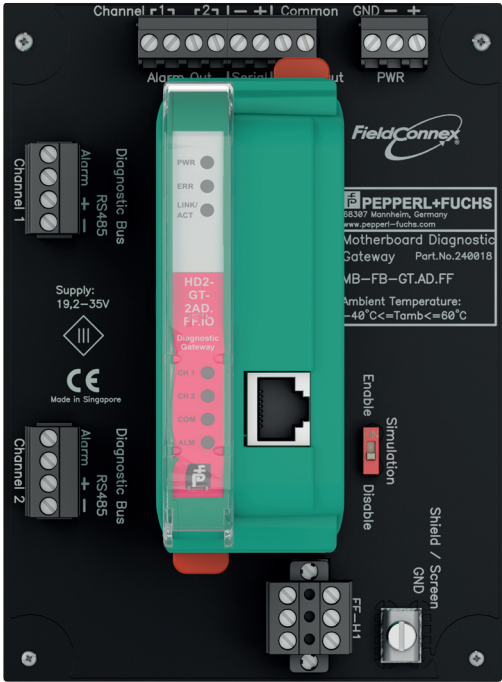
Technical Data

ITK version		6
Implementation		resource block 1x RS function block 4x MDI, 1x MDO, 1x MAI, 1x DI transducer block 16x ADM TB, 1x IO TB
Firmware update		Ethernet
Polarity		polarity-sensitive
Rated voltage	U_N	9 ... 35 V
Rated current	I_N	0 mA
Ethernet Interface		
Port		100 BASE-TX
Protocol		TCP/IP and UDP/IP
Services		ICMP , DHCP , AutoIP , HTTP
Connection type		RJ-45 socket, 8-pin
Transfer rate		100 MBit/s
Diagnostic Bus		
Number of Diagnostic Bus Channels		2
Number of Diagnostic Modules/Channel		31 Using Ethernet Interface , 8 Using Fieldbus Interface
Termination		integrated
Cable length/Channel		30 m
Indicators/operating means		
LED ERR		red: Hardware fault
LED PWR		green: Power on
LINK/ACT		yellow
CH1, CH2		yellow: diagnostic bus activity
Outputs		
Output I		alarm output diagnostic bus channel 1 , volt-free contact , NC contact
Voltage		50 V DC
Current		max. 1 A
Output II		alarm output diagnostic bus channel 2 , volt-free contact , NC contact
Voltage		50 V DC
Current		max. 1 A
Output III		common alarm , volt-free contact , NC contact
Voltage		50 V DC
Current		max. 1 A
Galvanic isolation		
All circuits/FE		functional insulation acc. to IEC 62103, rated insulation voltage 50 V _{eff}
Output I, II/other circuits		functional insulation acc. to IEC 62103, rated insulation voltage 250 V _{eff}
Ethernet/Supply		functional insulation acc. to IEC 62103, rated insulation voltage 50 V _{eff}
Ethernet/other circuits		functional insulation acc. to IEC 62103, rated insulation voltage 50 V _{eff}
Fieldbus/other circuits		functional insulation acc. to IEC 62103, rated insulation voltage 50 V _{eff}
Diagnostic Bus/other circuits		functional insulation acc. to IEC 62103, rated insulation voltage 50 V _{eff}
Directive conformity		
Electromagnetic compatibility		
Directive 2014/30/EU		EN 61326-1:2013
Standard conformity		
Galvanic isolation		IEC 62103
Electromagnetic compatibility		NE 21
Degree of protection		IEC 60529
Fieldbus standard		IEC 61158-2
Climatic conditions		DIN IEC 721
Shock resistance		EN 60068-2-27
Vibration resistance		EN 60068-2-6
Ethernet		IEEE 802.3
Ambient conditions		

Technical Data

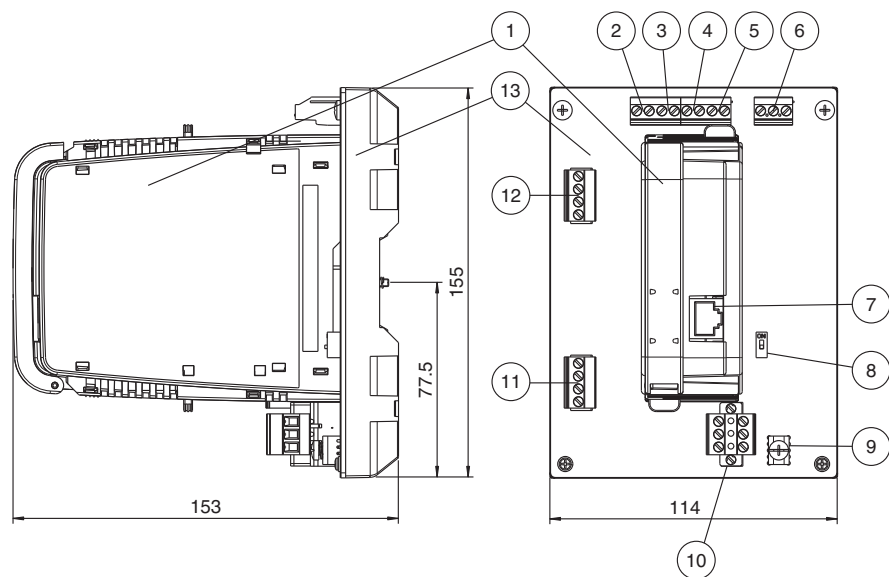
Ambient temperature	-40 ... 60 °C (-40 ... 140 °F) hazardous area -40 ... 70 °C (-40 ... 158 °F) safe area horizontal DIN rail mounting
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)
Relative humidity	< 95 % non-condensing
Shock resistance	15 g 11 ms
Vibration resistance	1 g , 10 ... 150 Hz
Pollution degree	max. 2, according to IEC 60664
Corrosion resistance	acc. to ISA-S71.04-1985, severity level G3
Mechanical specifications	
Housing material	Polycarbonate
Degree of protection	IP20
Mass	470 g
Dimensions	
Height	see dimensions
Width	see dimensions
Depth	see dimensions
Mounting	DIN rail mounting
Data for application in connection with hazardous areas	
Certificate	TÜV 14 ATEX 115980 X
Marking	Ⓔ II 3 G Ex nA IIC T4 Gc
Directive conformity	
Directive 2014/34/EU	EN 60079-0:2012 , EN 60079-11:2012 , EN 60079-15:2010
International approvals	
IECEx approval	IECEx TUN 14.0003X
Approved for	Ex nA IIC T4 Gc
General information	

Assembly



Additional Information

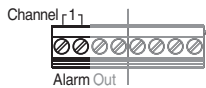
Dimensions and Assembly



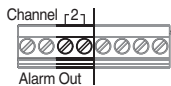
All dimensions in

Description

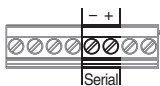
- 1 Diagnostic gateway module HD2-GT-2AD.FF.IO
- 2 Output I:
Alarm output diagnostic bus channel 1, volt-free contact, NC contact



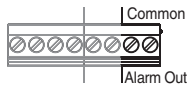
- 3 Output II:
Alarm output diagnostic bus channel 2, volt-free contact, NC contact



- 4 Serial, not used



- 5 Output III:
Common alarm, volt-free contact, NC contact

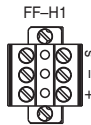


- 6 Bulk power supply connection



- 7 Ethernet, 8-pin RJ45 socket
- 8 Enable/disable simulation switch

- 9 Grounding terminal
- 10 FF-H1



- 11 Diagnostic bus channel 2



- 12 Diagnostic bus channel 1



- 13 Motherboard MB-FB-GT.AD.FF

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Ярославль (4852)69-52-93

Россия +7(495)268-04-70

Казахстан +7(727) 345-47-04

Беларусь +(375) 257-127-884

Узбекистан +998(71)205-18-59

Киргизия +996(312)96-26-47

эл.почта: phb@nt-rt.ru || сайт: <https://pepperl-fuchs.nt-rt.ru/>