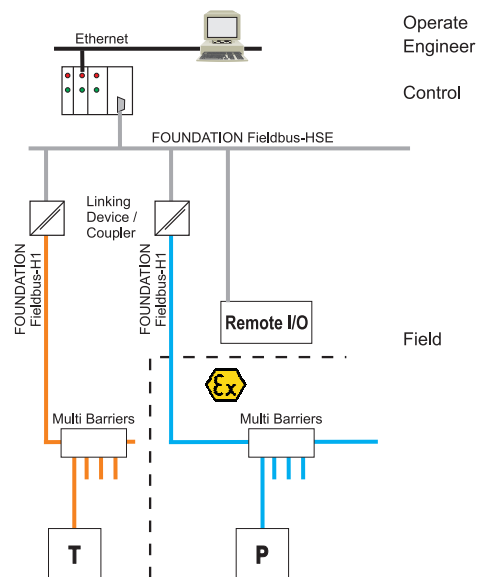


# FOUNDATION fieldbus Links & Coupler

Measurement made easy



## Power-Conditioner for FOUNDATION fieldbus-H1 lines

- Power conditioner module

## Power supply for FOUNDATION fieldbus-H1 lines

- Motherboard for Power supply (simplex)
- Motherboard for Power supply (redundant)
- Power supply modules
- Accessories

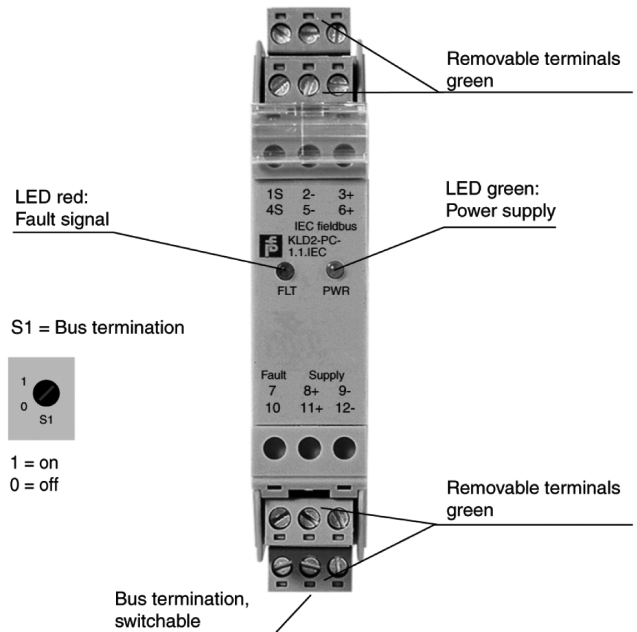
## Diagnostic for FOUNDATION fieldbus-H1 lines

- Diagnostic module basic
- Diagnostic module advanced
- Diagnostic gateway module advanced
- DTM Professional
- Accessories

## FOUNDATION fieldbus Links & Coupler

## NGP110 – Power conditioner module

- Output: 14.7 ... 30.7 V/1 A
- For very high segment load
- High-Power Trunk for high device count and long cable runs
- Installation only in safe areas
- For FOUNDATION fieldbus-H1
- Selectable, high-availability terminator
- Low heat dissipation
- Supply via Power Rail

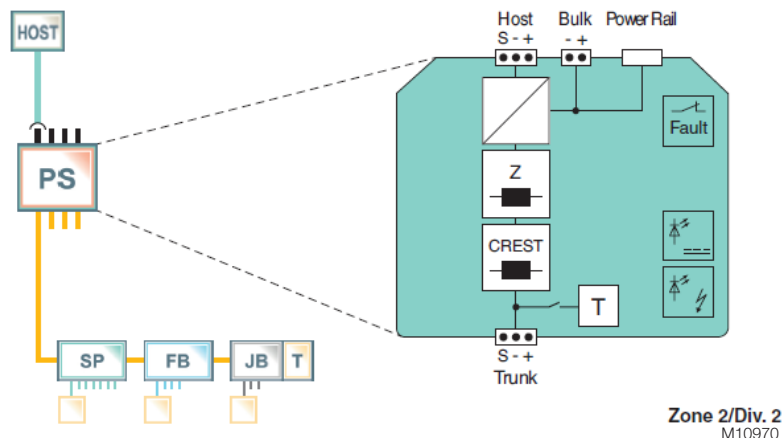


M10748

The fieldbus power conditioner is an all-in-one module for single fieldbus segments. It provides short-circuit limitation (1 A) and impedance matching only. The output voltage depends on the bulk power voltage.

The device feeds high power to the trunk for maximum cable lengths and high device count in any hazardous area. Fieldbus couplers provide explosion protection for live work at the spur.

Availability and a long service life are achieved through: only one passive impedance filter per segment with CREST for superior signal transmission, optimized design for low power dissipation and high-availability fieldbus termination. Any mounting direction allows optimized and space-saving cabinet layout.



## NGP110 – Power conditioner module

### Technical data

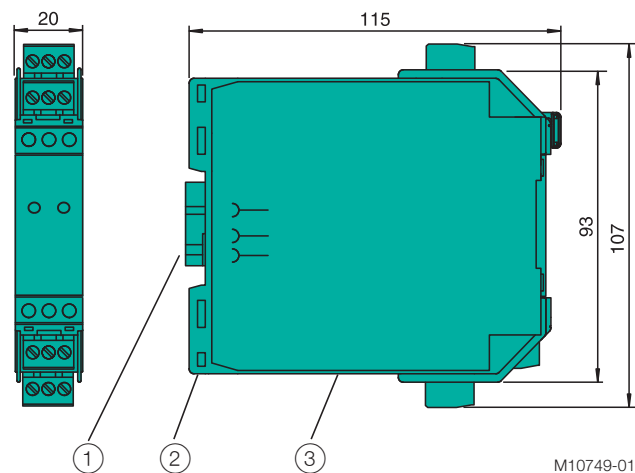
<b>Supply</b>	
Connection	Power Rail or terminals 8+, 11+; 9-, 12-
Rated voltage	16 ... 32 V DC
Rated current	1.02 A
Power loss	16 ... 32 V at 1 A: ≤ 1.86 W; typ. 1.6 W
<b>Fieldbus interface</b>	
Field-side	
Connection	terminals 3+, 6+; 2-, 5-; 1S, 4S (S=screen connection)
Rated voltage	14.7 ... 30.7 V DC
Rated current	1 A
Terminating impedance	100 Ω switchable off and on via rotary switch: 1 → on; 0 → off
<b>Error output</b>	
Connection	Power Rail or terminals 7, 10
Rated voltage	32 V DC
Rated current	10 mA
Voltage drop	1.2 V at 10 mA
<b>Directive conformity</b>	
Electromagnetic compatibility	
Directive 2004/108/EC	EN 61326-1:2006

<b>Standard conformity</b>	
Electromagnetic compatibility	NE 21:2006
Protection degree	IEC/EN 60529
Fieldbus standard	IEC 61158-2, ISA S 50.02 part 2
Climatic conditions	DIN IEC 721
<b>Ambient conditions</b>	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)
Relative humidity	< 95 % non-condensing
Pollution Degree	max. 2, according to IEC 60664
<b>Mechanical specifications</b>	
Connection type	terminals
Core cross-section	up to 2.5 mm <sup>2</sup>
Housing	20 mm x 115 mm x 107 mm
Protection degree	IP20
Mass	approx. 100 g
Mounting	DIN rail mounting
<b>International approvals</b>	
UL approval	UL E106378, CUL E106378
Approved for	Class I, Division 2, Groups A, B, C, D

# FOUNDATION fieldbus Links & Coupler

## NGP110 – Power conditioner module

### Mounting dimensions



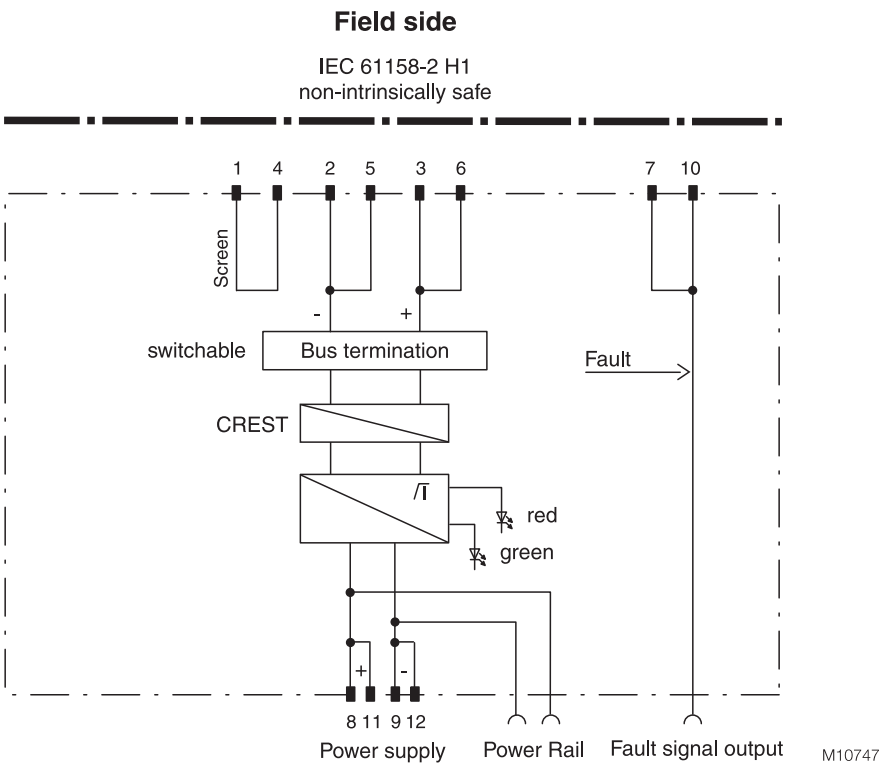
M10749-01

① Protective cap, remove for power supply via Power Rail ② Extendable lugs ③ Bus termination, switchable

LED indicator		Fault signal output	Conditions
green	ON	OFF	supply voltage > 14.4 V DC typ.
red	OFF		
green	OFF	ON	supply voltage < 13.2 V DC typ.
red	OFF		
red	2 Hz flashing	ON	OVERLOAD, load current > 1.15 A typ.

# NGP110 – Power conditioner module

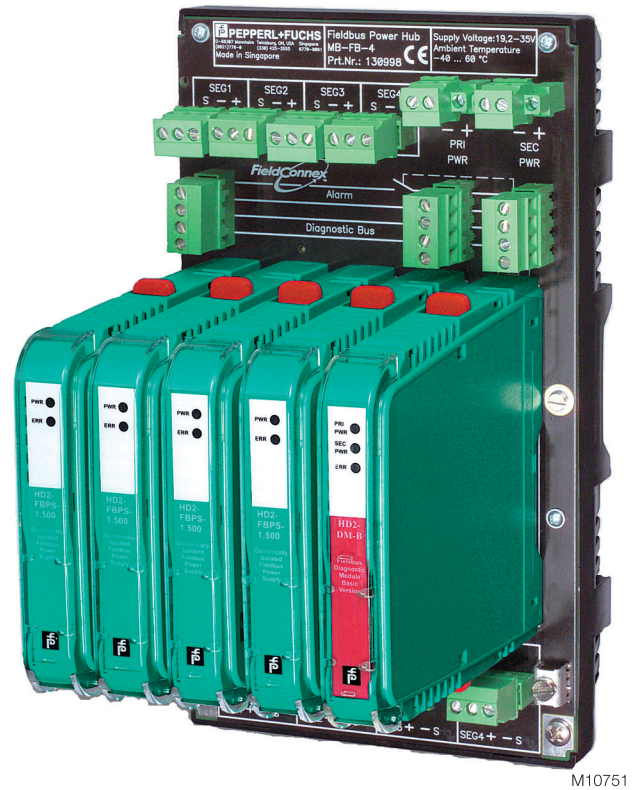
## Electrical connections



# FOUNDATION fieldbus Links & Coupler

## NFP310 – FOUNDATION fieldbus-H1 Motherboard for Power supply (simplex)

- 4 segments, individual modules per segment
- Supports all DCS and PLC hosts
- High-Power Trunk: Live work on devices in any hazardous area
- Features for best signal quality, low heat dissipation
- Optional Advanced Diagnostics
- Passive impedance and CREST technology for high reliability
- Supports Ex ic/nL voltage limitation
- Installation in Zone 2/Div. 2



The Power Hub is a modular fieldbus power supply, providing the most options for most reliable communication. 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 is the wiring interface and mounting plate with common screw terminals for all DCS and PLC host systems.

Sockets for all modules enable simple installation and replacement without tools. Certain motherboards enable power redundancy with seamless transfer. Pairs of modules feed each segment.

Availability and a long service life are achieved through: only one passive impedance filter per segment with CREST for superior signal transmission, optimized design for low power dissipation and high-availability fieldbus termination. Any mounting direction allows optimized and space-saving cabinet layout.

# NFP310 – FOUNDATION fieldbus-H1 Motherboard for Power supply (simplex)

## Technical data

<b>Supply</b>	
Connection	redundant
Rated voltage	19.2 ... 35 V SELV/PELV
Rated current	16 A
<b>Fieldbus interface</b>	
Number of segments	4 simplex
Host-side	general purpose host
Terminating resistor	selectable 100 Ω
<b>Indicators / operating means</b>	
Fault signal	VFC alarm output via connectors
<b>Electrical isolation</b>	
Fieldbus segment / Fieldbus segment	functional insulation acc. to DIN EN 50178, rated insulation voltage 50 V <sub>eff</sub>
Fieldbus segment / Supply	functional insulation acc. to DIN EN 50178, rated insulation voltage 50 V <sub>eff</sub>
<b>Directive conformity</b>	
Electromagnetic compatibility Directive 2004/108/EC	EN 61326-1:2013
<b>Standard conformity</b>	
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
Corrosion resistance	acc. to ISA-S71.04-1985, severity level G3

## Supplementary information


Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable.

<b>Ambient conditions</b>	
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
Pollution Degree	max. 2, according to IEC 60664
Corrosion resistance	acc. to ISA-S71.04-1985, severity level G3

## Mechanical specifications

Connection type	screw terminals
Core cross-section	2.5 mm <sup>2</sup>
Housing material	Polycarbonate
Housing width	125 mm
Housing height	220 mm
Housing depth	65 mm
Degree of protection	IP20
Mass	approx. 850 g
Mounting	DIN mounting rail
Coating	conformal coated

## Data for application in connection with Ex-areas

Statement of conformity Group, category, type of protection, temperature classification	TÜV 04 ATEX 2500 X  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 Approved for	CoC 3024816, CoC 3024816C Class I, Division 2, Groups A, B, C, D, T4 / Class I, Zone 2, AEx/Ex nA IIC T4
IECEx approval Approved for	IECEx TUN 13.0038X Ex nA IIC T4 Gc

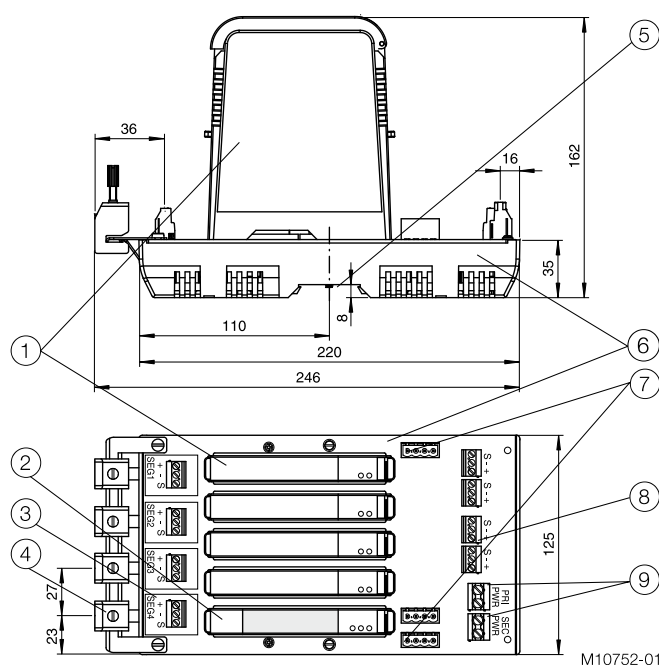
## Certificates and approvals

Marine approval	DNV A-10798
-----------------	-------------

## FOUNDATION fieldbus Links & Coupler

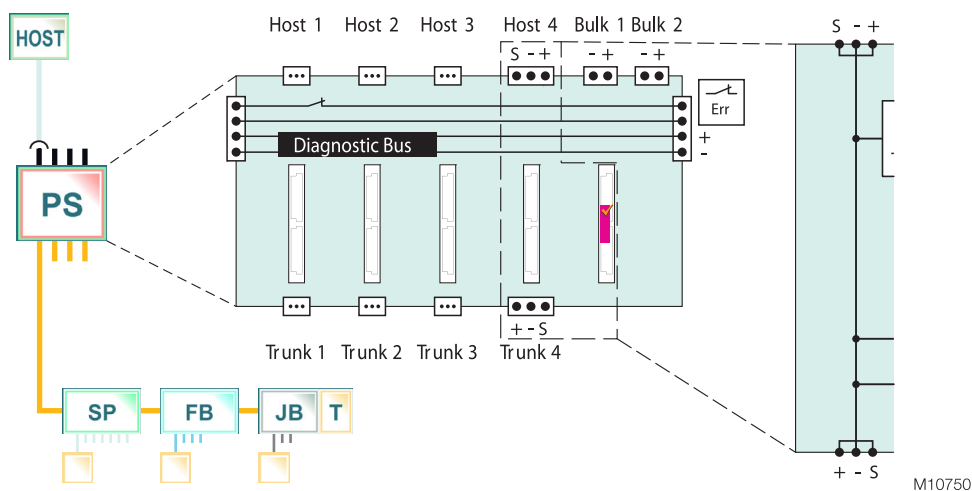
## NFP310 – FOUNDATION fieldbus-H1 Motherboard for Power supply (simplex)

## Mounting dimensions



- ① Power Supply Modules, see separate data sheets    ② Diagnostic Module, see separate data sheet  
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  
⑦ Connections for alarm voltage free contact and diagnostics bus Diagnostics link cable, optional accessory  
⑧ Connections for host    ⑨ Connections for redundant bulk power supply

## Electrical connections



Based on 130998\_ENG.xml / RD 2014-07-25

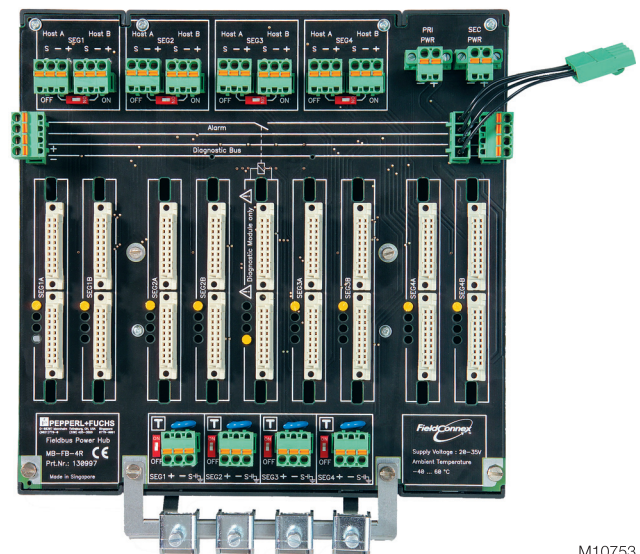


## NFP310 – FOUNDATION fieldbus-H1 Motherboard for Power supply (redundant)

- 4 segments, redundant, individual modules per segment
- Supports all DCS and PLC hosts
- High-Power Trunk: Live work on devices in any hazardous area
- Features for best signal quality, low heat dissipation
- Optional Advanced Diagnostics
- Passive impedance and CREST technology for high reliability
- Supports Ex ic/nL voltage limitation
- Installation in Zone 2/Div. 2

The Power Hub is a modular fieldbus power supply, providing the most options for most reliable communication. 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 is the wiring interface and mounting plate with common screw terminals for all DCS and PLC host systems.



M10753

Sockets for all modules enable simple installation and replacement without tools. Certain motherboards enable power redundancy with seamless transfer. Pairs of modules feed each segment.

Availability and a long service life are achieved through: only one passive impedance filter per segment with CREST for superior signal transmission, optimized design for low power dissipation and high-availability fieldbus termination. Any mounting direction allows optimized and space-saving cabinet layout.

# FOUNDATION fieldbus Links & Coupler

## NFP310 – FOUNDATION fieldbus-H1 Motherboard for Power supply (redundant)

### Technical data


<b>Supply</b>	
Connection	redundant
Rated voltage	19.2 ... 35 V SELV/PELV
Rated current	16 A
<b>Fieldbus interface</b>	
Number of segments	4 redundant
Host-side	redundant general purpose host
Terminating resistor	selectable 100 Ω
<b>Indicators / operating means</b>	
Fault signal	VFC alarm output via connectors
<b>Electrical isolation</b>	
Fieldbus segment / Fieldbus segment	functional insulation acc. to DIN EN 50178, rated insulation voltage 50 V <sub>eff</sub>
Fieldbus segment / Supply	functional insulation acc. to DIN EN 50178, rated insulation voltage 50 V <sub>eff</sub>
<b>Directive conformity</b>	
Electromagnetic compatibility Directive 2004/108/EC	EN 61326-1:2013
<b>Standard conformity</b>	
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
Corrosion resistance	acc. to ISA-S71.04-1985, severity level G3

### Supplementary information

Statement of Conformity, Declaration of Conformity,  
Attestation of Conformity and instructions have to be observed  
where applicable.

<b>Ambient conditions</b>	
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
Pollution Degree	max. 2, according to IEC 60664
Corrosion resistance	acc. to ISA-S71.04-1985, severity level G3

<b>Mechanical specifications</b>	
Connection type	screw terminals
Core cross-section	2.5 mm <sup>2</sup>
Housing material	Polycarbonate
Housing width	220 mm
Housing height	220 mm
Housing depth	65 mm
Degree of protection	IP20
Mass	approx. 1.3 kg
Mounting	DIN mounting rail
Coating	conformal coated

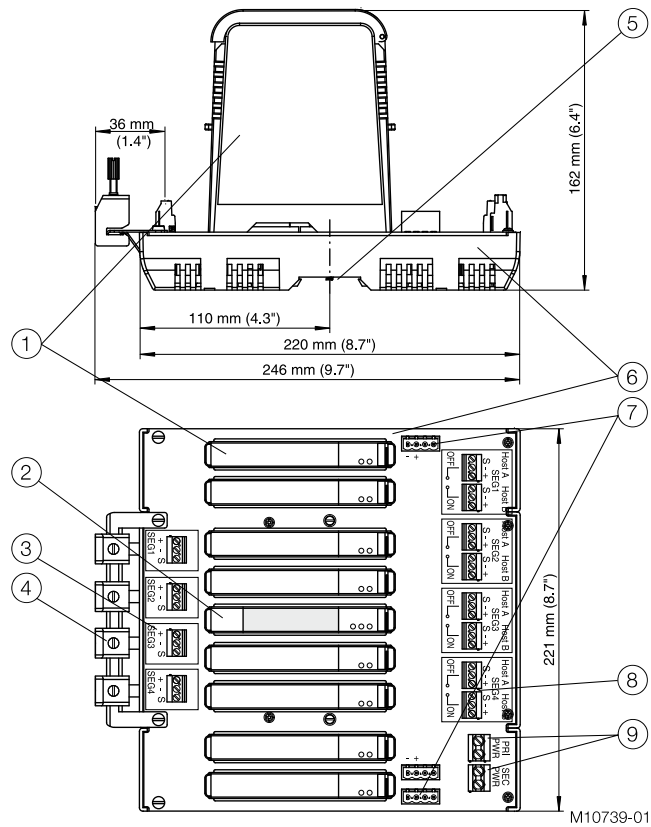
<b>Data for application in connection with Ex-areas</b>	
Statement of conformity Group, category, type of protection, temperature classification	TÜV 04 ATEX 2500 X  II 3 G Ex nA IIC T4 Gc
Directive conformity Directive 94/9/EC	EN 60079-0:2012 , EN 60079- 11:2012 , EN 60079-15:2010

<b>International approvals</b>	
FM approval Approved for	CoC 3024816, CoC 3024816C Class I, Division 2, Groups A, B, C, D, T4 / Class I, Zone 2, AEx/Ex nA IIC T4
IECEx approval Approved for	IECEx TUN 13.0038X Ex nA IIC T4 Gc

<b>Certificates and approvals</b>	
Marine approval	DNV A-10798

## NFP310 – FOUNDATION fieldbus-H1 Motherboard for Power supply (redundant)

### Mounting dimensions

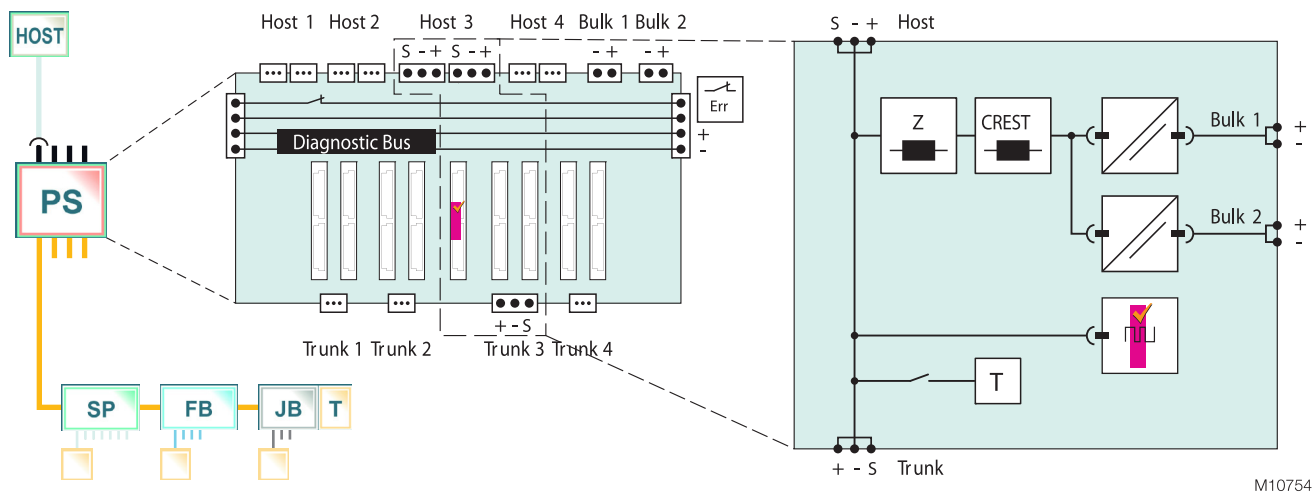


- ① Power Supply Modules, see separate data sheets
- ② Diagnostic Module, see separate data sheet
- ③ Connections for fieldbus trunk, terminator switch
- ④ Screening / earthing kit for trunk cables shield, optional accessory
- ⑤ Mounting slot for DIN rail
- ⑥ Motherboard
- ⑦ Connections for alarm voltage free contact and diagnostics bus Diagnostics link cable, optional accessory
- ⑧ Connections for redundant host with host link switch
- ⑨ Connections for redundant bulk power supply

# FOUNDATION fieldbus Links & Coupler

## NFP310 – FOUNDATION fieldbus-H1 Motherboard for Power supply (redundant)

### Electrical connections



## NGP310 – Power supply module (L0150)

- Output: 28 ... 30 V/500 mA
- High-Power Trunk for high device count and long cable runs
- With galvanic isolation
- Installation in Zone 2/Class I, Div. 2
- For PROFIBUS PA and FOUNDATION fieldbus H1
- High efficiency, low heat dissipation for high packing density
- Hot swappable in redundant configuration
- Module exchange without tools during operation



M10734

This Power Supply Module is a system component for the Power Hub and can be plugged into the motherboard. It adapts current and voltage for the supply of fieldbus segments and field devices.

This power supply features the highest output power and allows for maximum cable lengths and highest number of devices in hazardous areas with the High-Power Trunk concept.

Reliability of communication is enhanced through galvanic isolation between segment and bulk power supply. Two LEDs indicate power and status. In redundant configuration two modules are connected in parallel via simple circuits ensuring seamless operation.

# FOUNDATION fieldbus Links & Coupler


## NGP310 – Power supply module (L0150)

### Technical data

<b>Supply</b>	
Rated voltage	19.2 ... 35 V DC
Rated current	910 ... 490 mA
Power loss	typ. 1.8 W
<b>Fieldbus interface</b>	
Rated voltage	28 ... 30 V
Rated current	500 ... 10 mA
Short-circuit current	550 mA
Terminating impedance	motherboard specific
<b>Indicators / operating means</b>	
LED ERR	red flashing: short-circuit or undervoltage at output
LED PWR	green if $U_{out} > 28\text{ V}$
<b>Electrical isolation</b>	
Fieldbus segment / Supply	functional insulation acc. to IEC 62103, rated insulation voltage 250 V AC
<b>Directive conformity</b>	
Electromagnetic compatibility Directive 2004/108/EC	EN 61326-1:2013
<b>Standard conformity</b>	
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
<b>Ambient conditions</b>	
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

<b>Mechanical specifications</b>	
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. 150 g
Mounting	motherboard mounting

### Data for application in connection with Ex-areas

Outputs Voltage	U <sub>o</sub>	32 V
Statement of conformity Group, category, type of protection, temperature classification	TÜV 04 ATEX 2500 X  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 Approved for	pending Class I, Division 2, Groups A, B, C, D, T4 / Class I, Zone 2, AEx/Ex nA IIC T4
IECEx approval Approved for	IECEx TUN 13.0038X Ex nA IIC T4 Gc

### Certificates and approvals

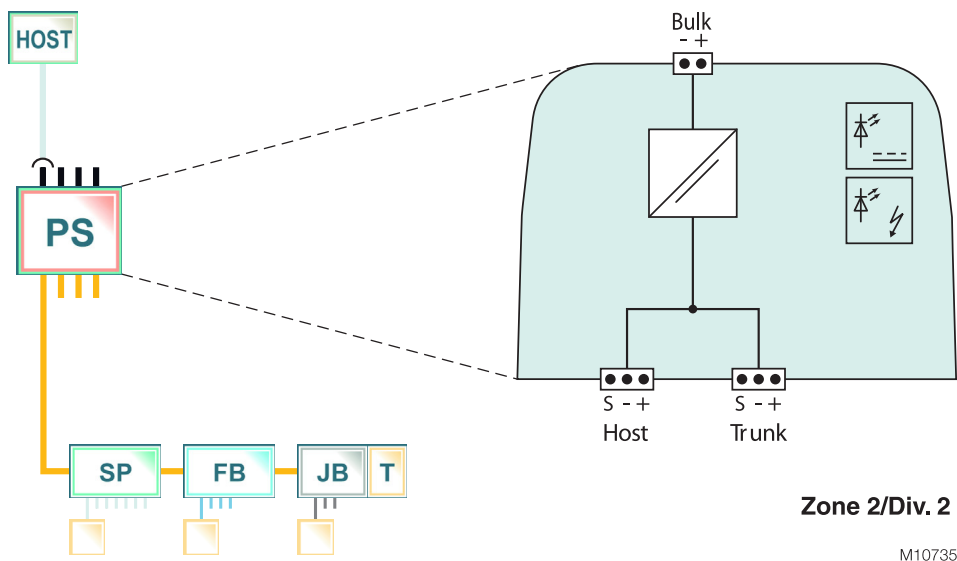
Marine approval	pending
-----------------	---------

### Supplementary information

Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable.

# NGP310 – Power supply module (L0150)

## Electrical connections



# FOUNDATION fieldbus Links & Coupler

## NGP310 – Power supply module (L0152)

- Output: 25 ... 28 V/360 mA
- Universal power supply for most applications
- With galvanic isolation
- Installation in Zone 2/Class I, Div. 2
- For PROFIBUS PA and FOUNDATION fieldbus H1
- High efficiency, low heat dissipation for high packing density
- Hot swappable in redundant configuration
- Module exchange without tools during operation



M10736

This Power Supply Module is a system component for the Power Hub and can be plugged into the motherboard. It adapts current and voltage for the supply of fieldbus segments and field devices.

This power supply satisfies the needs of most fieldbus applications with regards to cable lengths and number of devices.

Reliability of communication is enhanced through galvanic isolation between segment and bulk power supply. Two LEDs indicate power and status. In redundant configuration two modules are connected in parallel via simple circuits ensuring seamless operation.



## NGP310 – Power supply module (L0152)


### Technical data

<b>Supply</b>	
Rated voltage	19.2 ... 35 V DC
Rated current	670 ... 360 mA
Power loss	typ. 2 W
<b>Fieldbus interface</b>	
Rated voltage	25 ... 28 V
Rated current	360 ... 10 mA
Short-circuit current	typ. 400 mA
Terminating impedance	motherboard specific
<b>Indicators / operating means</b>	
LED ERR	red flashing: overload error at output
LED PWR	Power LED: green if $U_{out} > 25$ V
<b>Electrical isolation</b>	
Fieldbus segment / Supply	functional insulation acc. to IEC 62103, rated insulation voltage 250 V <sub>eff</sub>
<b>Directive conformity</b>	
Electromagnetic compatibility Directive 2004/108/EC	EN 61326-1:2006
<b>Standard conformity</b>	
Electromagnetic compatibility	NE 21:2006
Protection degree	IEC 60529
Fieldbus standard	IEC 61158-2
Shock resistance	EN 60068-2-27
Vibration resistance	EN 60068-2-6
Corrosion resistance	acc. to ISA-S71.04-1985, severity level G3
<b>Ambient conditions</b>	
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	motherboard specific
Core cross-section	motherboard specific
Housing material	Polycarbonate
Housing width	18 mm
Housing height	106 mm
Housing depth	128 mm
Protection degree	IP20
Mass	approx. 150 g
Mounting	motherboard mounting

### Data for application in connection with Ex-areas

Statement of conformity Group, category, type of protection, temperature classification	TÜV 06 ATEX 553229 X  II 3 G Ex nA II T4
Directive conformity Directive 94/9/EC	EN 60079-15:2005 , EN 60079-0:2004

### International approvals

FM approval Approved for	CoC 3024816, CoC 3024816C Class I, Division 2, Groups A, B, C, D, T4 / Class I, Zone 2, AEx/Ex nA IIC T4
-----------------------------	---

### Certificates and approvals

Marine approval	DNV A-10798
-----------------	-------------

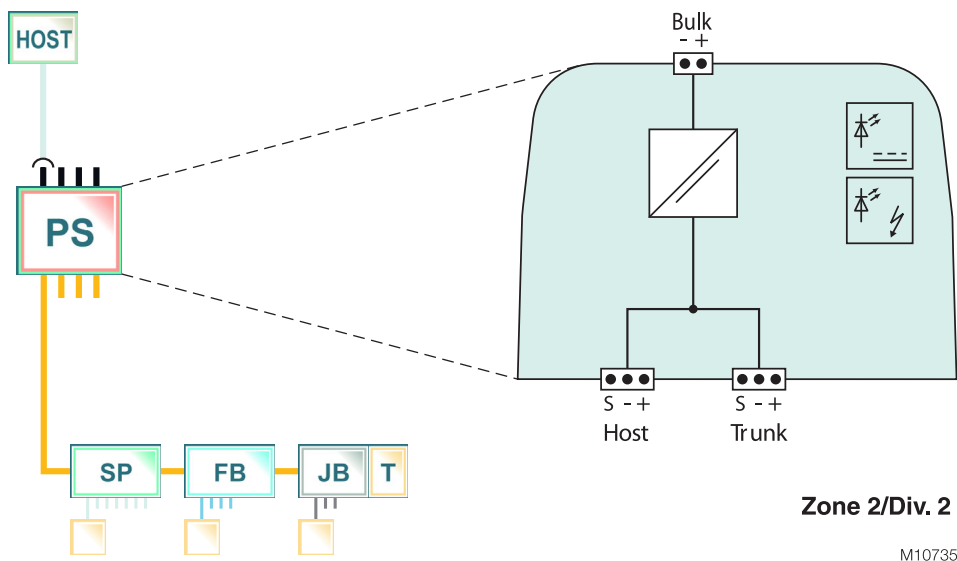
### Supplementary information

Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable.

# FOUNDATION fieldbus Links & Coupler

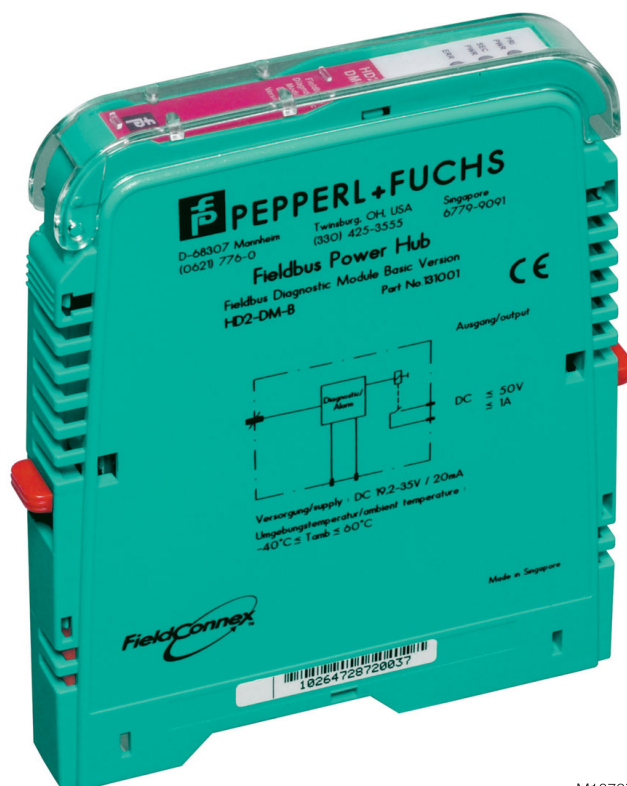
## NGP310 – Power supply module (L0152)

### Electrical connections



## NGP312 – Diagnostic module basic

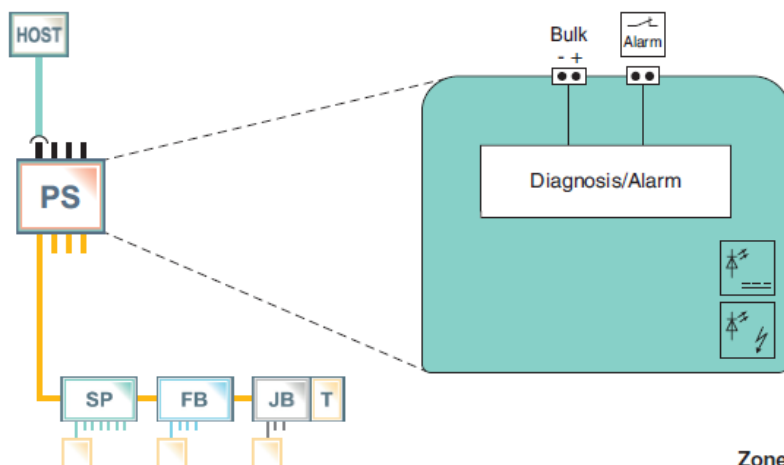
- Basic monitoring for power supply output and health
- Plug-in Module for the Power Hub
- Plug and play - no engineering required
- For online monitoring
- For FOUNDATION fieldbus-H1 and PROFIBUS PA
- Installation in Zone 2/Class I, Div. 2
- System state and fault indication via LEDs



M10737

Designed as a plug-in module for the Power Hub, the Basic Diagnostic Module provides basic system diagnostics. It checks for proper operation of bulk power supplies and monitors the connected trunks for overload or short-circuit conditions. All Power Hub modules are checked for proper function. On redundant power modules it indicates mismatching pairs.

The module indicates a fault condition via voltage-free contact. It provides monitoring "plug-and-play" without additional engineering. LED signals indicate a fault for easy detection.



Zone 2/Div. 2  
M10966

# FOUNDATION fieldbus Links & Coupler

## NGP312 – Diagnostic module basic

### Technical data

Supply	
Rated voltage	19.2 ... 35 V
Rated current	20 mA
Power loss	max. 0.5 W

### Indicators / operating means

LED PRI PWR	green: on, primary bulk power supply connected
LED SEC PWR	green: on, secondary bulk power supply connected
LED ERR	red: 2 Hz flashing, power supply fault (short-circuit, undervoltage), redundancy fault
Fault signal	VFC alarm 1 A, 50 V DC, normally closed

### Electrical isolation

Fieldbus segment / Fieldbus segment	functional insulation acc. to IEC 62103, rated insulation voltage 50 V <sub>eff</sub>
-------------------------------------	---

### 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. 70 g
Mounting	motherboard mounting

### Data for application in connection with Ex-areas

Statement of conformity Group, category, type of protection, temperature classification	TÜV 04 ATEX 2500 X  II 3 G Ex nA nC 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 Approved for	CoC 3024816, CoC 3024816C Class I, Division 2, Groups A, B, C, D, T4 / Class I, Zone 2, AEx/Ex nC IIC T4
IECEx approval Approved for	IECEx TUN 13.0038X Ex nA nC IIC T4 Gc

### Certificates and approvals

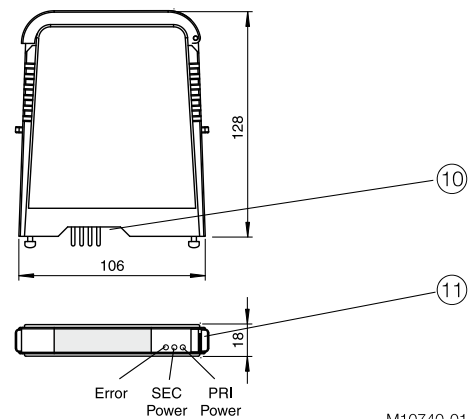
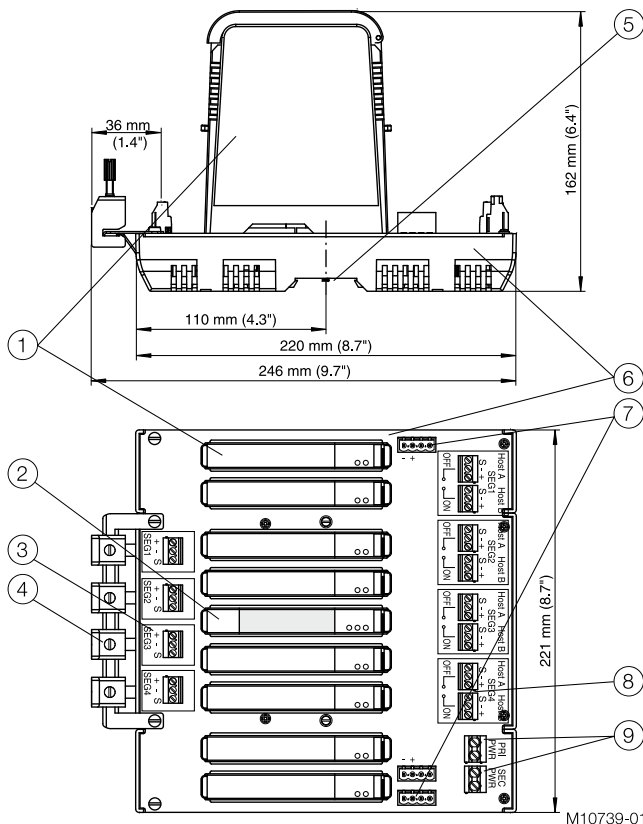
Marine approval	DNV A-10798
-----------------	-------------

### Supplementary information

Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable.

# NGP312 – Diagnostic module basic

## Mounting dimensions



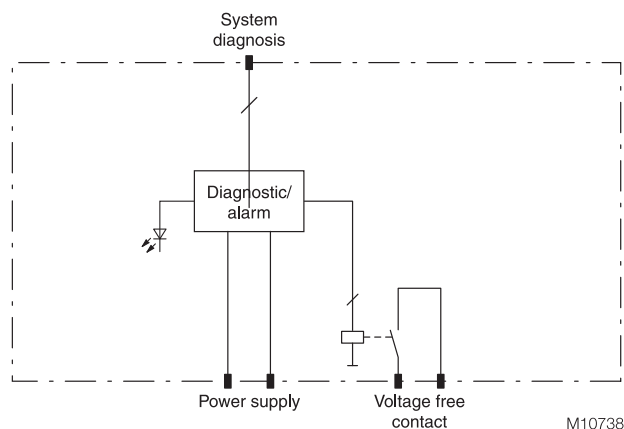
M10740-01

## Dimensions Diagnostics Module

- ① Power Supply Modules, see separate data sheets
- ② Diagnostics 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 State and fault indication LEDs

## Dimensions complete redundant system

## Electrical connections



M10738

Based on 131001\_ENG.xml / RD 2014-08-05

# FOUNDATION fieldbus Links & Coupler

## NGP312 – Diagnostic module advanced

- Comprehensive diagnostics for fieldbus physical layer and power supply
- Plug-in Module for the 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

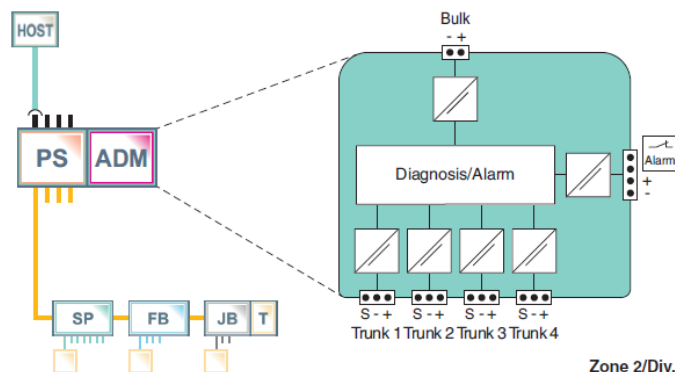


M10741

Designed as a plug-in module for the 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: Embedded expert system data historian and a built-in oscilloscope are included.



Zone 2/Div. 2 M10967

## NGP312 – Diagnostic module advanced

### Technical data

Supply	
Rated voltage	19.2 ... 35 V
Rated current	110 ... 30 mA
Power loss	max. 2 W

Fieldbus interface	
Number of segments	4
Fieldbus type	FOUNDATION fieldbus-H1 / PROFIBUS PA
Rated voltage	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 <sub>eff</sub>
Fieldbus segment / Supply	functional insulation acc. to IEC 62103, rated insulation voltage 50 V <sub>eff</sub>

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 Group, category, type of protection, temperature classification	TÜV 04 ATEX 2500 X  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 Approved for	CoC 3024816, CoC 3024816C Class I, Division 2, Groups A, B, C, D, T4 / Class I, Zone 2, AEx/Ex nA IIC T4
IECEx approval Approved for	IECEx TUN 13.0038X Ex nA IIC T4 Gc

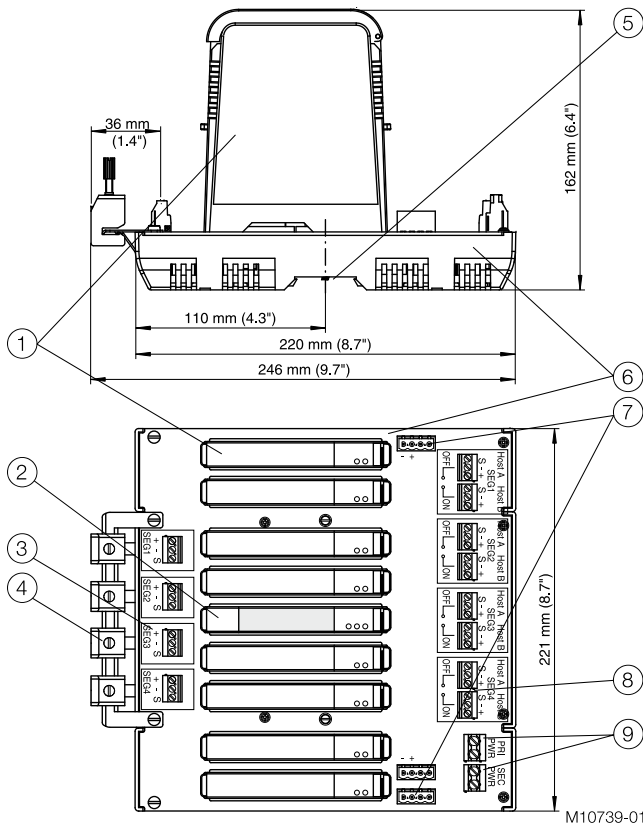
Certificates and approvals	
Marine approval	DNV A-10798

### Supplementary information

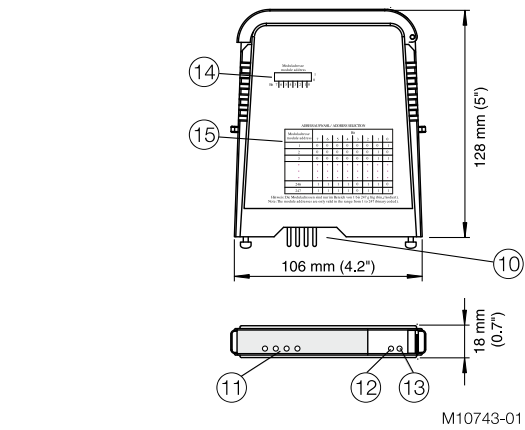
Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable.

# FOUNDATION fieldbus Links & Coupler

## NGP312 – Diagnostic module advanced



Dimensions complete redundant system\*



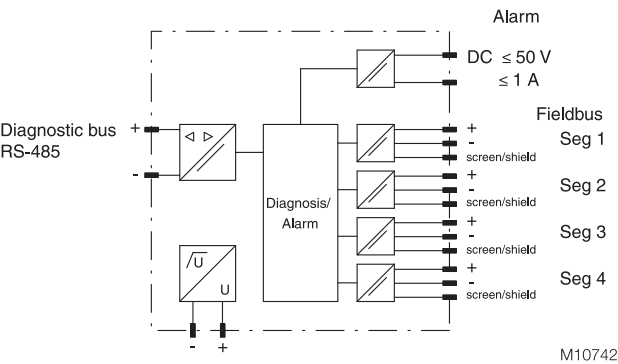
Dimensions Advanced Diagnostic Module\*

- 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

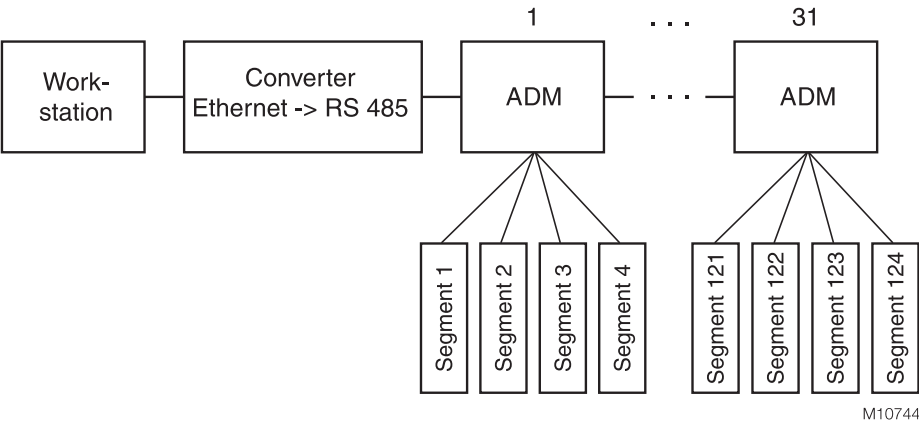


# NGP312 – Diagnostic module advanced

## Electrical connections



## Installation note



# FOUNDATION fieldbus Links & Coupler

## NGP312 – Diagnostic module advanced

### Accessories

- Software User Interface for monitoring up to or including 100 fieldbus segments: Diagnostic Manager, Professional Edition
- Software User Interface for monitoring more than 100 fieldbus segments: Diagnostic Manager, Professional Edition
- 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.

Based on 131000\_ENG.xml / RD 2014-08-05

## NGP312 – Diagnostic gateway module advanced

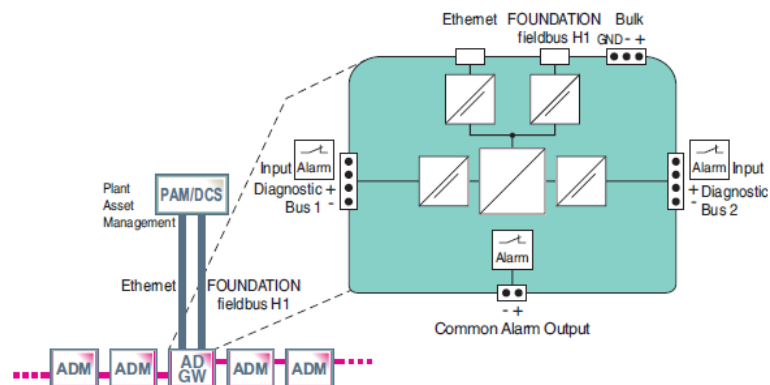
- System integration kit for Advanced Diagnostics
- DCS integration via Diagnostic Manager or device DTM
- Simple automatic setup of Advanced Diagnostics
- Summary alarm handling
- For FOUNDATION fieldbus-H1
- Installation in Zone 2



M10976

The 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 Advanced Diagnostics.



Zone 2/Div. 2

M10971

# FOUNDATION fieldbus Links & Coupler

## NGP312 – Diagnostic gateway module advanced

### Technical data

Supply	
Rated voltage	19.2 ... 35 V DC SELV/PELV
Rated current	120 ... 70 mA
Power loss	max. 2.5 W

Fieldbus interface	
Fieldbus type	FOUNDATION fieldbus-H1
Physical layer profile	profile type 114
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	9 ... 35 V SELV/PELV
Rated current	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	≤ 1 A
Output II	alarm output diagnostic bus channel 2, volt-free contact , NC contact
Voltage	50 V DC
Current	≤ 1 A
Output III	common alarm , volt-free contact , NC contact
Voltage	50 V DC
Current	≤ 1 A

Electrical isolation	
All circuits/FE	functional insulation acc. to IEC 62103, rated insulation voltage 50 V <sub>eff</sub>
Output I, II/other circuits	functional insulation acc. to IEC 62103, rated insulation voltage 250 V <sub>eff</sub>
Ethernet/Supply	functional insulation acc. to IEC 62103, rated insulation voltage 50 V <sub>eff</sub>
Ethernet/other circuits	functional insulation acc. to IEC 62103, rated insulation voltage 50 V <sub>eff</sub>
Fieldbus/other circuits	functional insulation acc. to IEC 62103, rated insulation voltage 50 V <sub>eff</sub>
Diagnostic Bus/other circuits	functional insulation acc. to IEC 62103, rated insulation voltage 50 V <sub>eff</sub>

Directive conformity	
Electromagnetic compatibility Directive 2004/108/EC	EN 61326-1:2013
Low voltage Directive 73/23/EEC	EN 61010

Standard conformity	
Electrical 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

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
Pollution Degree	max. 2, according to IEC 60664
Corrosion resistance	acc. to ISA-S71.04-1985, severity level G3

#### Mechanical specifications

Housing material	Polycarbonate
Housing width	see dimensions
Housing height	see dimensions
Housing depth	see dimensions
Degree of protection	IP20
Mass	470 g
Mounting	DIN rail mounting

#### Data for application in connection with Ex-areas

Statement of conformity Group, category, type of protection, temperature classification	TÜV 14 ATEX 115980 X  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

IECEx approval Approved for	IECEx TUN 14.0003X Ex nA IIC T4 Gc
--------------------------------	---------------------------------------

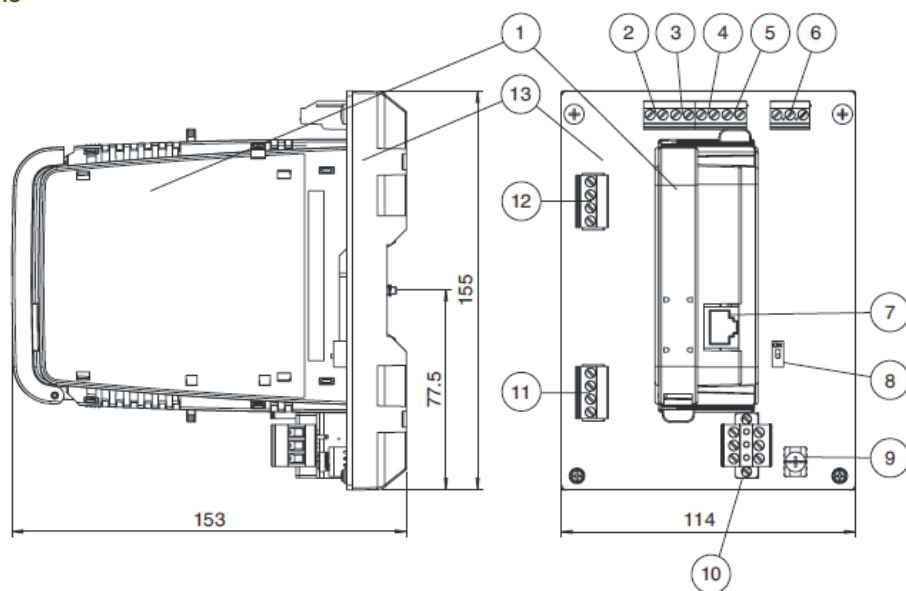
#### Supplementary information

Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable.

# FOUNDATION fieldbus Links & Coupler

## NGP312 – Diagnostic gateway module advanced

### Mounting dimensions



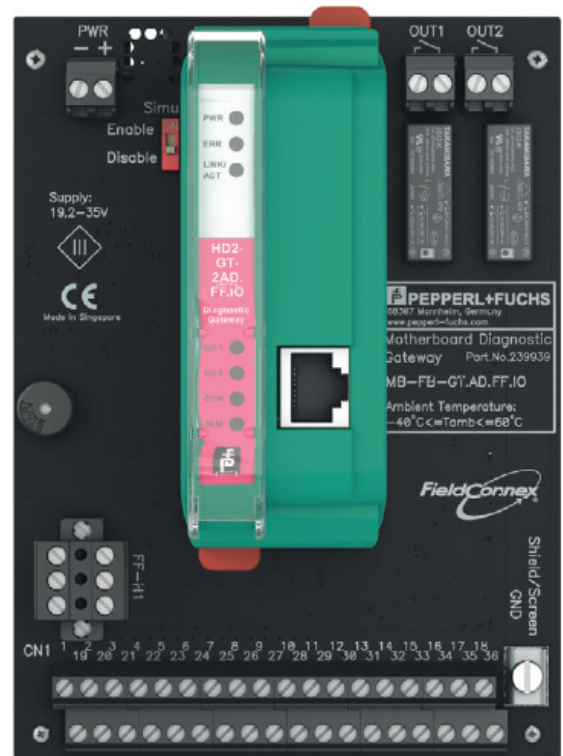
M10757-01

\*all dimensions in millimeters (mm) and without tolerance indication

- ① Advanced Diagnostic Gateway Module ② Diagnostic bus "channel 1" alarm output ③ Diagnostic bus "channel 2" alarm output  
④ "Serial - +", not used ⑤ Common alarm output ⑥ Bulk power supply connection ⑦ Ethernet, 8-pin RJ-45 socket  
⑧ Enable/disable simulation switch ⑨ Grounding terminal ⑩ FF-H1 ⑪ Diagnostic bus channel 2 ⑫ Diagnostic bus channel 1  
⑬ Motherboard

## NGP312 – Diagnostic gateway module advanced with I/O channels

- System integration kit for Advanced Diagnostics
- DCS integration via Diagnostic Manager or device DTM
- Simple automatic setup of Advanced Diagnostics
- Alarm handling and integrated I/O for cabinet monitoring/control
- For FOUNDATION fieldbus-H1
- Installation in Zone 2



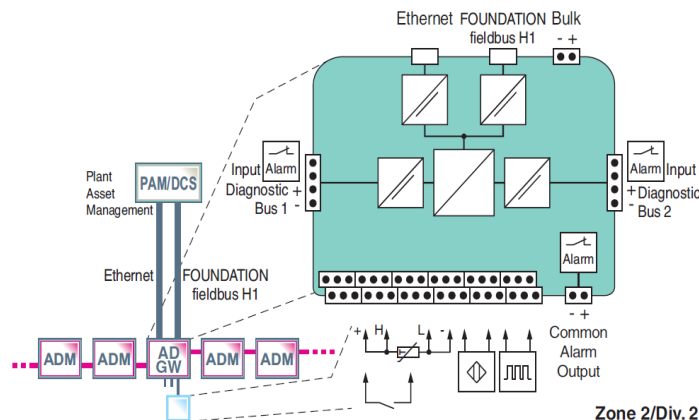
M10973

The 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 Advanced Diagnostics.

Inputs for frequency, temperature, humidity, and NAMUR sensors and 2 relay contacts allow control of the control cabinet. The cabinet and physical layer diagnostics become easy-to-manage plant assets.



M10974

# FOUNDATION fieldbus Links & Coupler

## NGP312 – Diagnostic gateway module advanced with I/O channels

### Technical data

<b>Supply</b>	
Rated voltage	19.2 ... 35 V DC SELV/PELV
Rated current	210 ... 120 mA
Power loss	max. 4.2 W
<b>Fieldbus interface</b>	
Fieldbus type	FOUNDATION fieldbus-H1
Physical layer profile	profile type 114
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	9 ... 35 V SELV/PELV
Rated current	0 mA
<b>Ethernet Interface</b>	
Rated voltage	$U_N \leq 35$ V SELV/PELV
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
<b>Diagnostic Bus</b>	
Connection	only for the connection to protected circuits
Rated voltage	$U_N \leq 35$ V
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

<b>Indicators / operating means</b>	
LED ERR	red: Hardware fault
LED PWR	green: Power on
Fault signal	buzzer on
LINK/ACT	yellow
CH1, CH2	yellow: diagnostic bus activity
<b>Inputs</b>	
Input I, II Input type	selectable: Frequency input , NAMUR/mechanical contact
Frequency Connection Rated voltage Input frequency Pulse duration Accuracy Cable length Line fault detection	only passive load $U_N \leq 35$ V 0.3 Hz to 1 kHz $\geq 50$ $\mu$ s $\pm 1$ % $\leq 30$ m lead breakage , short-circuit
NAMUR Sensor type Connection Rated voltage Switching frequency Cable length Line fault detection	NAMUR sensor according to DIN EN 60947-6 only passive load $U_N \leq 35$ V 10 Hz $\leq 30$ m lead breakage , short circuit
Input III, IV Input type	NAMUR/mechanical contact
NAMUR Sensor type Connection Rated voltage Switching frequency Cable length Line fault detection	NAMUR sensor according to DIN EN 60947-6 only passive load $U_N \leq 35$ V 10 Hz $\leq 30$ m lead breakage , short circuit
Input V Input type	selectable: diagnostic bus CH 1 alarm input , NAMUR/mechanical contact



Alarm Input	
Connection	only passive load
Rated voltage	$U_N \leq 35 \text{ V}$
Cable length	$\leq 30 \text{ m}$
Line fault detection	lead breakage , short circuit
NAMUR	
Sensor type	NAMUR sensor according to DIN EN 60947-6
Connection	only passive load
Rated voltage	$U_N \leq 35 \text{ V}$
Switching frequency	10 Hz
Cable length	$\leq 30 \text{ m}$
Line fault detection	lead breakage , short circuit
Input VI	
Input type	selectable: diagnostic bus CH 2 alarm input , NAMUR/mechanical contact
Alarm Input	
Connection	only passive load
Rated voltage	$U_N \leq 35 \text{ V}$
Cable length	$\leq 30 \text{ m}$
Line fault detection	lead breakage , short circuit
NAMUR	
Sensor type	NAMUR sensor according to DIN EN 60947-6
Connection	only passive load
Rated voltage	$U_N \leq 35 \text{ V}$
Switching frequency	10 Hz
Cable length	$\leq 30 \text{ m}$
Line fault detection	lead breakage , short circuit
Input VII, VIII	
Input type	selectable: Pt100 4-wire temperature input , NAMUR/mechanical contact
Temperature	
Connection	only passive load
Rated voltage	$U_N \leq 35 \text{ V}$
Measurement range	-50 ... 90 °C (-58 ... 194 °F)
Accuracy	1 K
Measuring current	1 mA
Lead resistance	4.2 $\Omega$ per lead
Cable length	$\leq 30 \text{ m}$
Line fault detection	lead breakage , short-circuit

NAMUR	
Sensor type	NAMUR sensor according to DIN EN 60947-6
Connection	only passive load
Rated voltage	$U_N \leq 35 \text{ V}$
Switching frequency	10 Hz
Cable length	$\leq 30 \text{ m}$
Line fault detection	lead breakage , short circuit
Humidity	
Measurement range	0 ... 95 % RH
Accuracy	2 % RH
Resolution	0.04 %

### Outputs

Output I	
Output type	selectable: diagnostic bus CH 1 , relay , NO contact
Contact loading	250 V AC/ 6 A resistive load
Mechanical life	$1 \times 10^5$ switching cycles
Response time	turn-on time 7 ms , turn-off time 3 ms
Switching frequency	$6 \text{ min}^{-1}$ full load, $1200 \text{ min}^{-1}$ without load
Output II	
Output type	selectable: diagnostic bus CH 2 , relay , NO contact
Contact loading	250 V AC/ 6 A resistive load
Mechanical life	$1 \times 10^5$ switching cycles
Response time	turn-on time 7 ms , turn-off time 3 ms
Switching frequency	$6 \text{ min}^{-1}$ full load, $1200 \text{ min}^{-1}$ without load
Output III	
Output type	selectable: common alarm , volt-free contact , NC contact
Connection	only for the connection to protected circuits
Voltage	50 V DC
Current	$\leq 1 \text{ A}$
Output IV	
Output type	common alarm , buzzer

# FOUNDATION fieldbus Links & Coupler



Electrical isolation	
All circuits/FE	functional insulation acc. to IEC 62103, rated insulation voltage 50 V <sub>eff</sub>
Output I, II/other circuits	functional insulation acc. to IEC 62103, rated insulation voltage 250 V <sub>eff</sub>
Ethernet/Supply	functional insulation acc. to IEC 62103, rated insulation voltage 50 V <sub>eff</sub>
Ethernet/other circuits	functional insulation acc. to IEC 62103, rated insulation voltage 50 V <sub>eff</sub>
Fieldbus/other circuits	functional insulation acc. to IEC 62103, rated insulation voltage 50 V <sub>eff</sub>
Diagnostic Bus/other circuits	functional insulation acc. to IEC 62103, rated insulation voltage 50 V <sub>eff</sub>

Directive conformity	
Electromagnetic compatibility Directive 2004/108/EC	EN 61326-1:2013
Low voltage Directive 73/23/EEC	EN 61010

Standard conformity	
Electrical 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	
Ambient temperature	-40 ... 60 °C (-40 ... 140 °F)
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)
Relative humidity	< 95 % non-condensing
Shock resistance	5 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
Housing width	see dimensions
Housing height	see dimensions
Housing depth	see dimensions
Degree of protection	IP20
Mass	500 g
Mounting	DIN rail mounting

Data for application in connection with Ex-areas	
FOUNDATION fieldbus-H1 Connection	For connection to circuits with safe limited voltage according to IEC 60079-11:2011, type of protection "ic"
Voltage	U <sub>I</sub> ≤ 35 V
Statement of conformity Group, category, type of protection, temperature classification	TÜV 14 ATEX 115980 X Motherboard:  II 3 G Ex nA nC IIC T4 Gc Gateway:  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

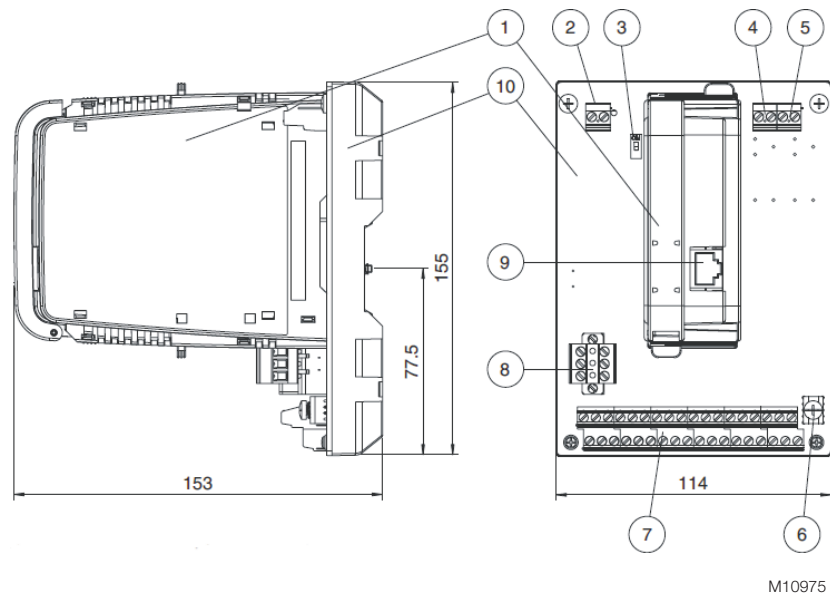
International approvals	
IECEx approval Approved for	IECEx TUN 14.0003X Motherboard: Ex nA nC IIC T4 Gc , Gateway: Ex nA IIC T4 Gc

## Supplementary information

Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable.

## NGP312 – Diagnostic gateway module advanced with I/O channels

### Mounting dimensions



\*all dimensions in millimeters (mm) and without tolerance indication

- ① Advanced Diagnostic Gateway Module   ② Bulk power supply   ③ Enable/disable simulation switch   ④ Relay output 1  
 ⑤ Relay output 2   ⑥ Grounding terminal   ⑦ I/O terminal block   ⑧ FF-H1   ⑨ Ethernet, 8-pin RJ45 socket   ⑩ Motherboard

### Terminal Assignment of I/O Terminal Block (PINs)

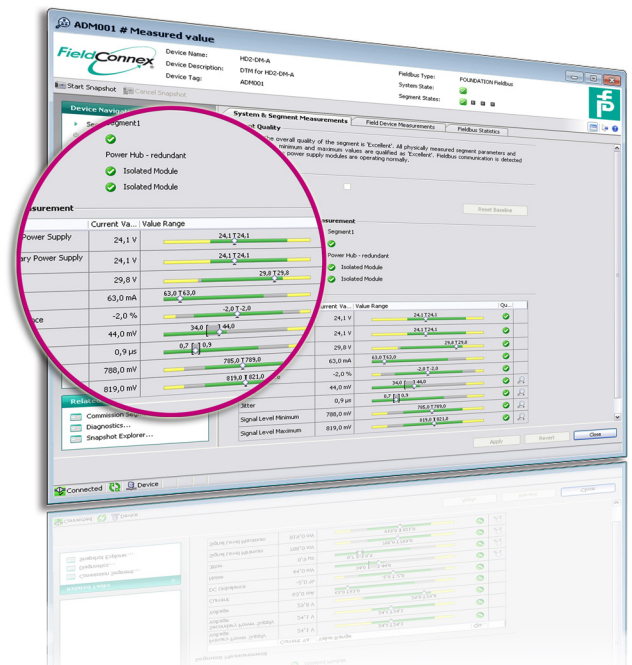
1(+)/2(-) Input I – Frequency input 1, Binary/NAMUR  
 3(+)/4(-) Input II – Frequency input 2, Binary/NAMUR  
 5(+)/6(-) Input III – Binary/NAMUR  
 7(+)/8(-) Input IV – Binary/NAMUR  
 9(+)/10(H)/11(L)/12(-) Input VII – Temperature input 1, Binary/NAMUR  
 13(GND) Ground  
 14(+)/15(H)/16(L)/17(-) Input VIII – Temperature input 2, Binary/NAMUR  
 18(GND) Ground

19(+)/20(-) Output I – Diagnostic bus CH 1  
 21(GND) Ground  
 22(A)/23(B) Input V – Diagnostic bus CH1, Binary/NAMUR  
 24(GND) Ground  
 25(+)/26(-) Output II – Diagnostic bus CH 2  
 27(GND) Ground  
 28(A)/29(B) Input VI – Diagnostic bus CH 2, Binary/ NAMUR  
 30(GND) Ground  
 31/32(Serial) Not used  
 33(GND) Ground  
 34(A)/35(B) Output III – Common alarm output 1  
 36(GND) Ground

# FOUNDATION fieldbus Links & Coupler

## NGP312 – DTM Professional

- Software user interface for Advanced Diagnostic Modules
- Simultaneous access to all ADM of a plant
- Embedded expert system gives pointed advice in clear text
- Includes Commissioning Wizard, data historian, oscilloscope...
- For FOUNDATION fieldbus-H1 and PROFIBUS PA
- Automatic setup of diagnostic system



M10745

The Diagnostic Manager displays measurements of Advanced Diagnostic Modules (ADM). It commissions and configures the ADMs and receives data and alarms in realtime.

An Expert System learns values and characteristics of each segment and translates them into concise descriptions of causes in clear text. Maintenance or repair work can be scheduled proactively while the plant still operates. The Diagnostic Manager and ADM ensure best possible quality of the physical layer, higher plant availability and reduced troubleshooting effort.

# NGP312 – DTM Professional

## Technical data

Software	
Hardware requirements	PC with 1 GHz processor and at least 512 MByte RAM
Operating system	Windows 7, VISTA and XP, each with .NET framework 1.1 and PACTware™ 3.6 /4.0
Languages	English
Licensing	New plant licenses: DTM-FC-AD for production process plants with up to 100 segments DTM-FC-AD.1 for more than 100 segments Upgrade licenses: DTM-FC-AD.UPG upgrade of existing DTMFC-AD DTM-FC-AD.1.UPG upgrade of existing DTM-FC-AD.1
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.
Physical Layer Diagnostics	Bulk power health, segment voltage and current, unbalance, noise, signal level, signal polarity, jitter

Software	
Commissioning Wizard	Generates reports on physical layer and communications data per device or segment. Automates repetitive tasks during commissioning.
Snapshot Explorer	User interface to review the history of Physical Layer Measurement Reports stored.
History Data Export	Export of long-term history data to Excel and the file formats comma-separated (CSV) or binary for graphic analysis and diagram creation
Segment Focus Mode	Fast update of detailed measurements for a single segment
Integrated oscilloscope	Displays fieldbus signals in waveform giving greatest detail. To aid troubleshooting activities, even seldom occurring events can be captured using the oscilloscope's many selectable trigger functions.
OPC Server Interface	The open OPC server interface can easily be adapted to any OPC client. It provides as a Data Access Server (Version 2.05) Summarized State information and basic diagnostic data such as the operating status of the diagnostic module and of the segments.
Remote diagnostics	Fieldbus experts and maintenance contractors are enabled to review Physical Layer diagnostics from off-site.

## Electrical connections



M10746

Based on T33373\_ENG.xml / RD 2010-08-09

# FOUNDATION fieldbus Links & Coupler

## Ordering Information

Power conditioner for FOUNDATION fieldbus-H1 lines		Order number
<b>NGP110</b>		
Power conditioner module	(802561)	3KXN617110L0010
H1-power supply: $U_S = 14.7 \dots 30.7 \text{ V DC}$ , $I_S \leq 1 \text{ A}$ , incl. switchable bus termination.		
Power supply for FOUNDATION fieldbus-H1 lines		
<b>NFP310</b>		
FF-H1 Motherboard for Power supply (simplex)	(130998)	3KXN656310L0110
for 4x power supply modules & for 1x diagnostic module, 4x host connections, 4x switchable H1 bus terminator, DIN top-hat rail, IP 20, II 3G Ex nA IIC T4 Gc, Zone 2/Class I, Div. 2.		
FF-H1 Motherboard for Power supply (redundant)	(130997)	3KXN656310L0120
For 2x4 power supply modules (redundant) & for 1x diagnostic module, 2x4 host connections (redundant), 4x switchable H1 bus terminator, DIN top hat rail, IP 20, II 3G Ex nA IIC T4 Gc, Zone 2/Class I, Div. 2.		
<b>NGP310</b>	<b>PROFIBUS PA / FOUNDATION fieldbus-H1</b>	
Grounding connection set for motherboards	(133733)	3KXN617310L0100
For large-surface connection of the trunk cable shields.		
Power supply module	(255742)	3KXN617310L0150
PA / H1 bus fixed at 31.25 kbit/s, IP 20, II 3 G Ex nA IIC T4 Gc, Zone 2/Class I, Div. 2. — PA / H1 power feed: $U_S = 28 \dots 30 \text{ V DC}$ , $I_S \leq 500 \text{ mA}$ , elec. isolation.		
Power supply module	(189516)	3KXN617310L0152
PA / H1 bus fixed at 31.25 kbit/s, IP 20, II 3G Ex nA II T4, Zone 2/Class I, Div. 2. — PA / H1 power feed: $U_S = 25 \dots 28 \text{ V DC}$ , $I_S \leq 360 \text{ mA}$ , elec. isolation.		

Diagnostic for FOUNDATION fieldbus-H1 lines		Order number
<b>NGP312</b>	<b>PROFIBUS PA / FOUNDATION fieldbus-H1</b>	
Diagnostic module basic For supply & PA / H1 bus, IP 20, Zone 2/Class I, Div. 2., II 3G Ex nA nC IIC T4 Gc — Check power sources, power supply modules, and PA / H1 for overload and short circuit, etc. — Messages only transmitted by means of relay contact.	(131001)	3KXN617312L0160
Diagnostic module advanced For supply & PA / H1 bus, IP 20, Zone 2/Class I, Div. 2., II 3G Ex nA IIC T4 Gc — Check power sources, power supply modules, and PA / H1 for overload and short circuit, etc. — Physical layer checks. — Diagnostic DTM Professional is required (& Diagnostic gateway module for H1 lines) ATTENTION: Check first the release of the DTMs for your frame application!	(131000)	3KXN617312L0161
Diagnostic gateway module advanced Links the Diagnostic bus of the Power supply motherboards with Ethernet and / or FF-H1. Applicable for 2x31 H1 Power supply motherboards with Ethernet / 2x8 with FF-H1. IP 20, Zone 2, II 3G Ex nA IIC T4 Gc. — Diagnostic DTM Professional and Diagnostic module advanced are required ATTENTION: Check first the release of the DTMs for your frame application!	(239818)	3KXN617312L0181
Diagnostic gateway module advanced with I/O channels Links the Diagnostic bus of the Power supply motherboards with Ethernet and / or FF-H1. Applicable for 2x31 H1 Power supply motherboards with Ethernet / 2x8 with FF-H1. IP 20, Zone 2, Motherboard: II 3G Ex nA nC IIC T4 Gc, Gateway: II 3G Ex nA IIC T4 Gc. Additional terminal block with 8 inputs and 3 outputs. — Diagnostic DTM Professional and Diagnostic module advanced are required ATTENTION: Check first the release of the DTMs for your frame application!	(239920)	3KXN617312L0182
Diagnostic bus link cable, 6 cm Links the Power supply motherboard with the diagnostic gateway module.	(133730)	3KXN617312L0190
DTM Professional for the diagnostic module advanced ≤ 100 segments, for Windows 7, Vista and XP (32/64-bit versions), dialog in English — Free-of-charge Gateway DTM is required ATTENTION: Check first the release of the DTMs for your frame application!	(192767)	3KXN617312L0170
DTM Professional for the diagnostic module advanced > 100 segments, for Windows 7, Vista and XP (32/64-bit versions), dialog in English — Free-of-charge Gateway DTM is required ATTENTION: Check first the release of the DTMs for your frame application!	(192911)	3KXN617312L0171

# Contact us

## ABB Automation GmbH

Service Instrumentation

Kallstadter Straße 1

68309 Mannheim

Germany

Customer Service Center: +49 180 5 222 580\*

E-Mail: [automation.service@de.abb.com](mailto:automation.service@de.abb.com)

**[www.abb.com/measurement](http://www.abb.com/measurement)**

\* 14 cents/minute from German landlines,  
max. 42 cents/minute from mobiles.

## Note

We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

We reserve all rights in this document and in the subject matter and illustrations contained therein. Any reproduction, disclosure to third parties or utilization of its contents - in whole or in parts - is forbidden without prior written consent of ABB.

Copyright© 2015 ABB

All rights reserved

3KXN655000R1001



Sales



Service