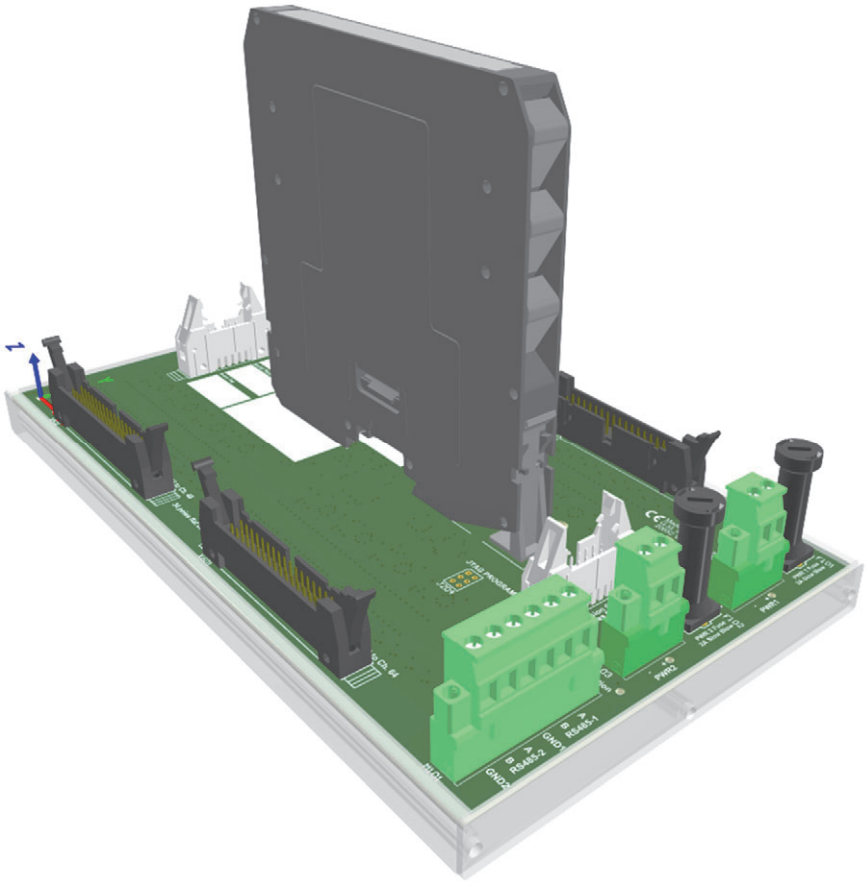


INSTRUCTION MANUAL

Termination Boards for HART® multiplexing

technology for safety

General description

This instruction manual refers to the following termination boards:

MODEL	PAGE
TBE-D5001-HRT-003	5
TBE-D5001-HRT-004	8
TBE-D5001-HRT-005	11
TBE-D5001-HRT-006	14
TBE-D5001-HRT-007	17

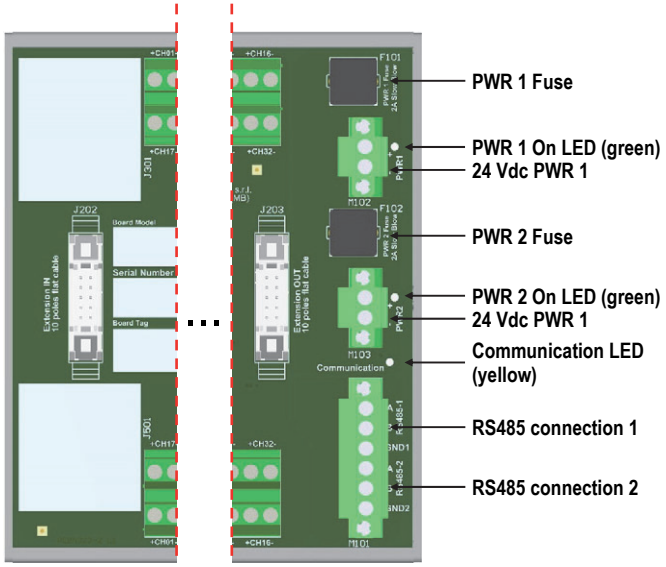
Common specifications

Power supplies and communication

For all termination boards.
Redundant power supply connections and LED indications are shown here below.

LED Signaling:
Meaning of LEDs on termination boards:

TAG	LED COLOR	MEANING
PWR 1	GREEN	The LED is on when the PWR 1 is connected
PWR 2	GREEN	The LED is on when the PWR 2 is connected
Communication	YELLOW	The LED is off when modem in not connected, steady on when communication with modem is correctly established, blinking otherwise



Start-up

Before powering the unit check that all wires are properly connected, particularly supply conductors and their polarity.
Check conductors for exposed wires that could touch each other causing dangerous unwanted shorts.
Turn on power, the “PWR 1” and/or “PWR 2” green LED must be lit.

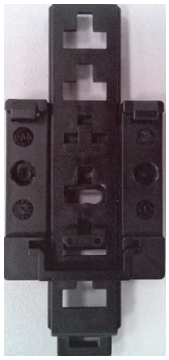
Warning

Termination Boards are installed onto standard EN/IEC60715 TH 35 DIN-Rail located in Safe Area or Zone 2, Group IIC, Temperature T4 Hazardous Area within the specified operating temperature limits Tamb -40 to +70 °C. Termination Boards must be installed, operated and maintained only by qualified personnel, in accordance to the relevant national/international installation standards (e.g. EN/IEC60079-14 Electrical apparatus for explosive gas atmospheres - Part 14: Electrical installations in hazardous areas (other than mines)), following the established installation rules. De-energize power source (turn off power supply voltage) before plugging or unplugging the terminal blocks when installed in Hazardous Area or unless area is known to be nonhazardous.
For hazardous location, TBE-D5001-HRT-003, TBE-D5001-HRT-xxx series shall only be installed in an interlocked enclosure. As an alternative the enclosure shall carry the following warning marking: "Warning - do not remove or replace fuse when energized".
Warning: substitution of components may impair suitability for Zone 2/Division 2. Avertissement: la substitution des composants peut nuire à l’aptitude à la Zone 2/Div. 2.
Explosion Hazard: to prevent ignition of flammable or combustible atmospheres, disconnect power before servicing or unless area is known to be nonhazardous.
Danger d'Explosion: pour prévenir une inflammation de l'atmosphère inflammable ou combustible, couper l'alimentation avant de réparer à moins de savoir que l'emplacement n'est pas dangereux.
Warning - Explosion Hazard: do not remove or replace fuses or plug-in module unless power has been disconnected or the area is free of ignitable concentrations.
Avertissement - Risque d’Explosion. ne pas retirer ni remplacer un fusible si l’appareillage est sous tension.
Failure of a proper installation or use of the equipment may risk to damage the unit or severe personal injury.
Termination boards cannot be repaired by the end user and must be returned to the manufacturer or his authorized representative. Any unauthorized modification must be avoided.

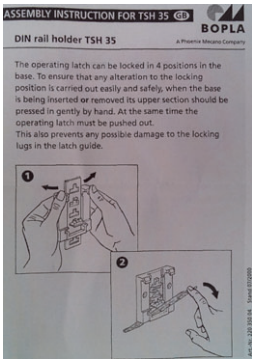
DIN-Rail clip installation on termination board enclosure

The Termination Board is already provided with plastic DIN-rail clips. Metal clips, replacement plastic clips as well as conformal coating must be ordered as a separate accessory. Should customer need different or additional clips, they can be ordered as TBE-FIX-PL-001 (plastic) or TBE-FIX-MT-001 (metal). Customer can add also TBE-MNT-001 code (for each DIN-Rail clip) to request further DIN-Rail clip factory mounting. Otherwise, customer follows DIN-Rail clip installation procedure.

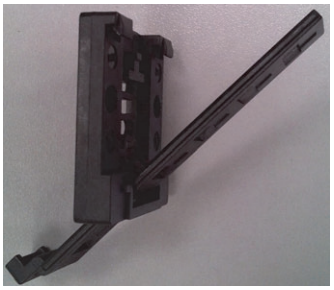
For termination board with 2x Plastic DIN-Rail clips TBE-FIX-PL-001, extract each clip and related instruction sheet from plastic bag. Follow the instruction sheet and the following figures to change lever position (from default to specific for TBE-D5001-HRT-xxx) on each clip:



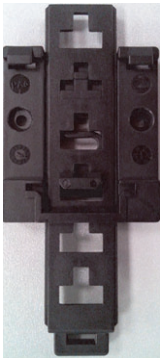
Default position



Instruction sheet

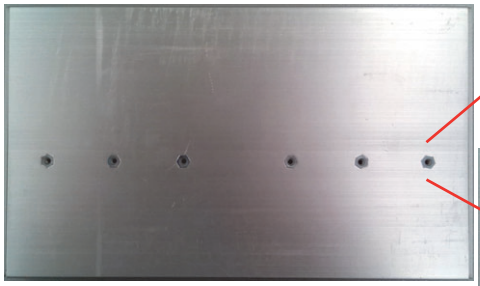


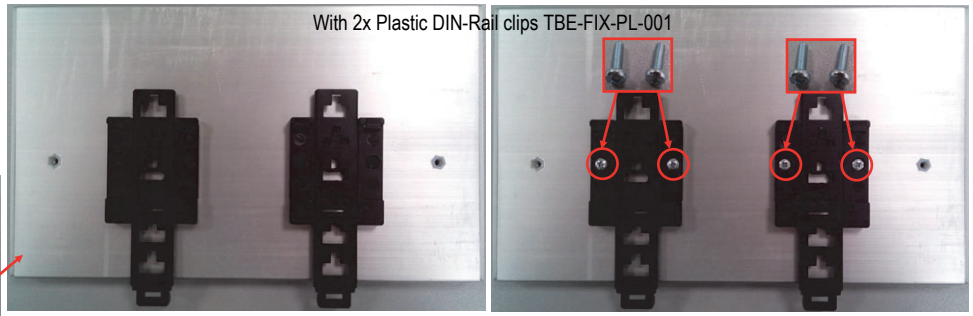
Changing lever position

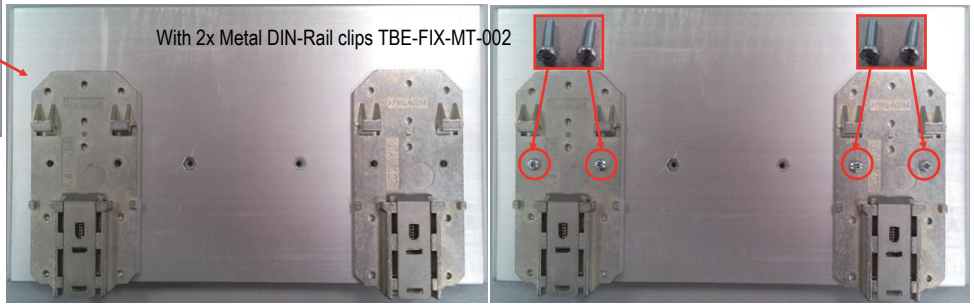


Specific position for TBE-D5001-HRT-xxx

For the termination boards **TBE-D5001-HRT-003, TBE-D5001-HRT-004, TBE-D5001-HRT-005, TBE-D5001-HRT-006 and TBE-D5001-HRT-007**, place the enclosure as shown in the following figures and fix each Plastic or Metal DIN-Rail clip to enclosure by 2 x M3 (10 mm) screws included on TBE-FIX set:







TBE with Conformal Coating

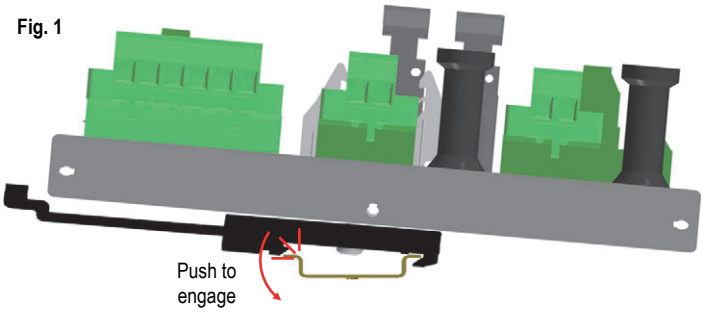
On TBE order, customer can add the following code to request Conformal Coating applied on TBE by factory process:
TBE-CTG-001 code for TBE-D5001-HRT-003, TBE-D5001-HRT-004, TBE-D5001-HRT-005, TBE-D5001-HRT-006, TBE-D5001-HRT-007.

Models mounting and removing

For termination board with 2 x Plastic DIN-Rail clips TBE-FIX-PL-001:

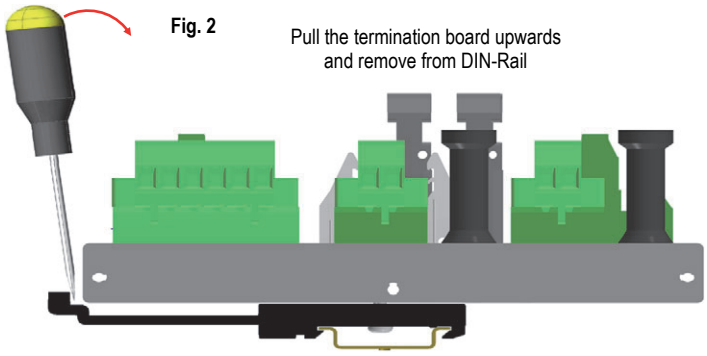
Mounting:
To mount termination board on 35 mm DIN-Rail, hook one side of the mounting foot over the rail's lip and press the Termination Board down firmly until fixed (see Fig.1).

Fig. 1



Removing:
To remove a termination board from the mounting rail, insert a blade screwdriver in the mounting foot and lever (see Fig. 2).

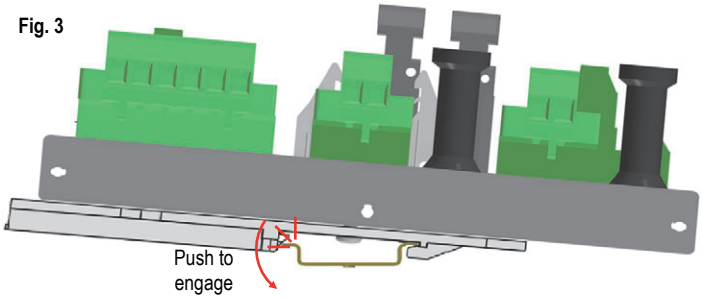
Fig. 2



For termination board with 2 x Metal DIN-Rail clips TBE-FIX-MT-002:

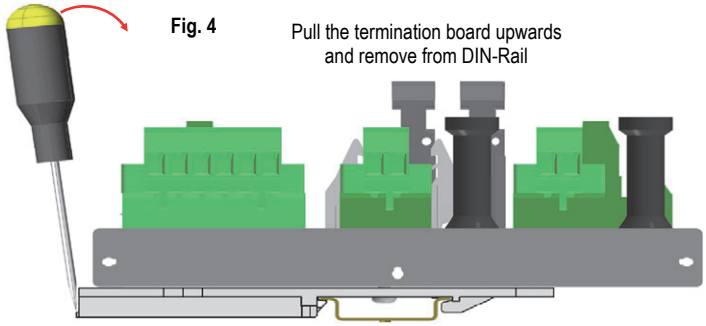
Mounting:
To mount termination board on 35 mm DIN-Rail, hook one side of the mounting foot over the rail's lip and press the Termination Board down firmly until fixed (see Fig.3).

Fig. 3



Removing:
To remove a termination board from the mounting rail, insert a blade screwdriver in the mounting foot and lever (see Fig. 4).

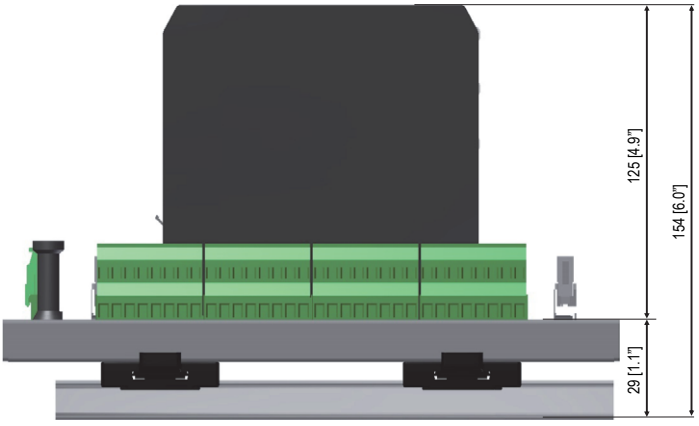
Fig. 4

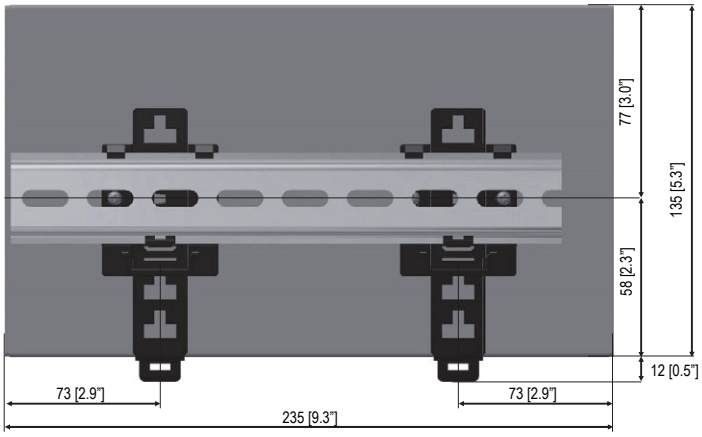


Overall dimensions

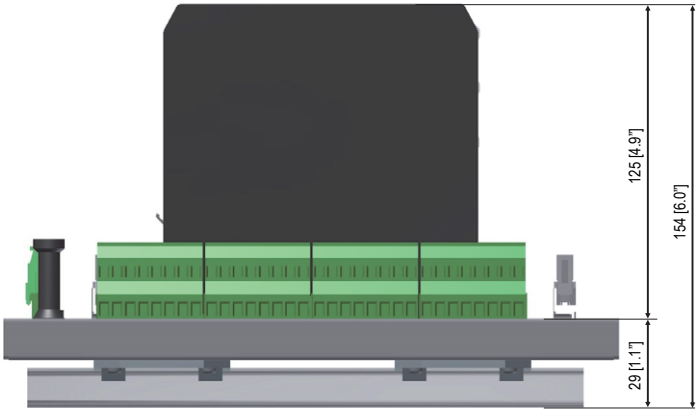
For all termination boards.

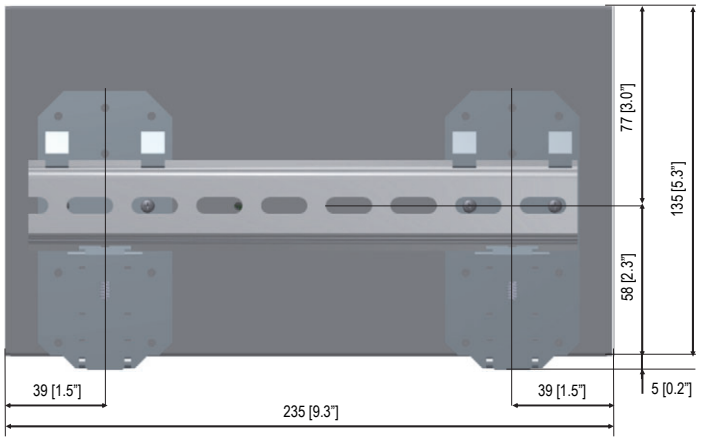
With 2 x Plastic DIN-Rail clips TBE-FIX-PL-001, with all dimensions are expressed in millimeters [inches]:





With 2 x Metal DIN-Rail clips TBE-FIX-MT-002, with all dimensions are expressed in millimeters [inches]:





TBE-D5001-HRT-003

SIL3 HART® Mux Term. Board for GMI Term. Board Connection

Characteristics:

General description:

This Termination Board with Enclosure (TBE) allows the remote monitoring of any HART®-compatible 4/20 mA field loop. This is obtained by one locally mounted HART® Multiplexer Modem 5700 series and by interface connectors to access field smart devices.

The single TBE-D5001-HRT-003 Termination Board supports 64 channels. Yet, it could be extended with additional units (up to 4) to manage all 256 channels available on the HART® Multiplexer Modem 5700 series.

The Mux unit connects, via the RS-485 interface, to an external PC running an FDT-based software package (PACTware™, etc...) through a dedicated Device Type Manager (DTM). The PC can communicate with multiple Mux units, located on different boards, in a multi-drop RS-485 mode.

The HART® Termination Board TBE-D5001-HRT-003 is SIL 3 certified as non-interfering with the signal loops. The 24 Vdc Power Supply of the TBE is connected to two plug-in terminal blocks, for a redundant power supply.

Installation:

TBE-D5001-HRT-003 is a Termination Board supported by an aluminum shell suitable for installation on EN/IEC60715 TH 35 DIN-Rail. TBE-D5001-HRT-003 shall only be used to mount one HART® Multiplexer Modem 5700 series.

TBE-D5001-HRT-003 unit can be mounted with any orientation over the entire ambient temperature range.

Electrical connections are the following:

- PWR1, PWR 2, RS485-1, RS485-2: polarized removable screw terminal blocks for conductors up to 2.5 mm² (13 AWG) with a torque of 0.5-0.6 Nm.
- X301, X401, X501, X601: 34 poles connector with retaining method
- J202, J203: 10 poles connector with retaining method.

Electrical connection can be plugged in/out into a powered unit without suffering or causing any damage **(for Zone 2 installations check the area to be nonhazardous before servicing)**. Connect only one individual conductor per each clamping point.

Use only cables that are suitable for a temperature of at least 85°C.

Wiring has to be sized according to the current and the length of the cables.

On the section “Termination Board Description” a block diagram identifies all connections.

Installation and wiring must be in accordance to the relevant national/international installation standards (e.g. EN/IEC60079-14 Electrical apparatus for explosive gas atmospheres - Part 14: Electrical installations in hazardous areas (other than mines)), make sure that conductors are well isolated from each other and do not produce any unintentional connection.

The unit shall be installed in an area of not more than pollution degree 2 according to EN/IEC60664-1. When installed in EU Zone 2, the unit shall be mounted in a certified Ex enclosure that provides a minimum ingress protection of IP54 in accordance with EN/IEC60079-0. When installed in a Class I, Division 2 Hazardous Location, the unit shall be mounted in a supplemental enclosure that provides a degree of protection not less than IP54. The enclosure must have a door or cover accessible only by the use of a tool.

Units must be protected against dirt, dust, extreme mechanical (e.g. vibration, impact and shock) and thermal stress, and casual contacts. If enclosure needs to be cleaned use only a cloth lightly moistened by a mixture of detergent in water.

Any penetration of cleaning liquid must be avoided to prevent damage to the unit.

Any unauthorized card modification must be avoided.

According to EN/IEC61010, TBE-D5001-HRT-003 unit must be connected to SELV or PELV supplies.

All circuits connected to TBE-D5001-HRT-003 unit must comply with the overvoltage category II (or better) according to EN/IEC60664-1.

Technical Data:

General:

Number of positions: 1 x HART® Multiplexer Modem 5700 series

Maximum number of channels: 64 on a single board, extendable to 256 with 4 boards and 1 HART® Multiplexer Modem 5700 series. Up to 16128 smart devices in full topology with 252 boards and 63 HART® Multiplexer Modem 5700 series.

Supply:

24 Vdc nom (20 to 30 Vdc), reverse polarity protected, double terminal blocks for redundant power supply, with OR diodes to mix supply voltages.

Current consumption: 35 mA @ 24 Vdc with full topology (4 boards), typical.

Connection: by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm².

Protection fuse: 2 A time lag.

HART Interface:

Connection: 4 x 34-poles receptacle connector (require female mating connector).

Cable: flat cable CABF032.

Channel-to-channel isolation voltage: 50 V.

Additional TBs Interface:

Connection: 2 x flat cable 10 poles male connectors (requires female mating connector).

Cable: flat cables CABF022, CABF023, CABF024.

Compatibility:

CE mark compliant, conforms to Directive:
2014/34/EU ATEX, 2014/30/EU EMC, 2014/35/EU LVD, 2011/65/EU RoHS.

Environmental conditions:

Operating: temperature limits – 40 to + 70 °C, relative humidity max 90 % non condensing, up to 35 °C.

Max altitude: 2000 m a.s.l.

Storage temperature: temperature limits –45 to +80 °C.

Safety Description:

ATEX: II 3G Ex ec IIC T4 Gc

IECEx: Ex ec IIC T4 Gc

UL: NI / I / 2 / ABCD / T4; ***C-UL:*** NI / I / 2 / ABCD / T4

Approvals:

UL 20 ATEX 2492X conforms to EN60079-0, EN60079-7.
IECEx ULD 20.0042X conforms to IEC60079-0, IEC60079-7.
UL & C-UL E222308 conforms to UL 61010-1, UL 61010-2-201 and UL 121201 for UL; CSA C22.2 No.61010-1, CSA C22.2 No.61010-2-201 and CSA C22.2 No. 213 for C-UL.
SIL 3 conforms to IEC61508:2010 Ed.2.

Mounting:

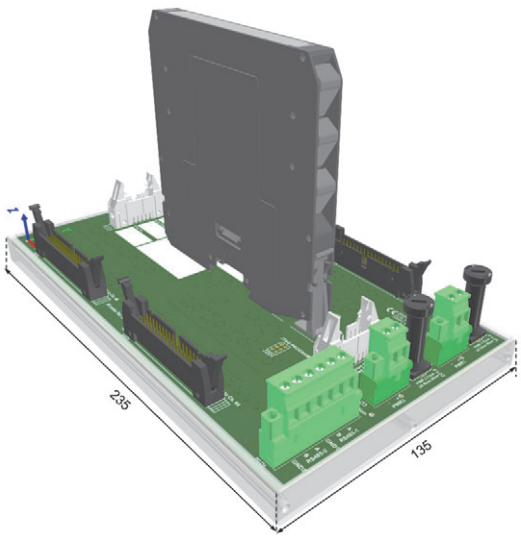
Hardware included for mounting on single DIN-rail 35 mm.

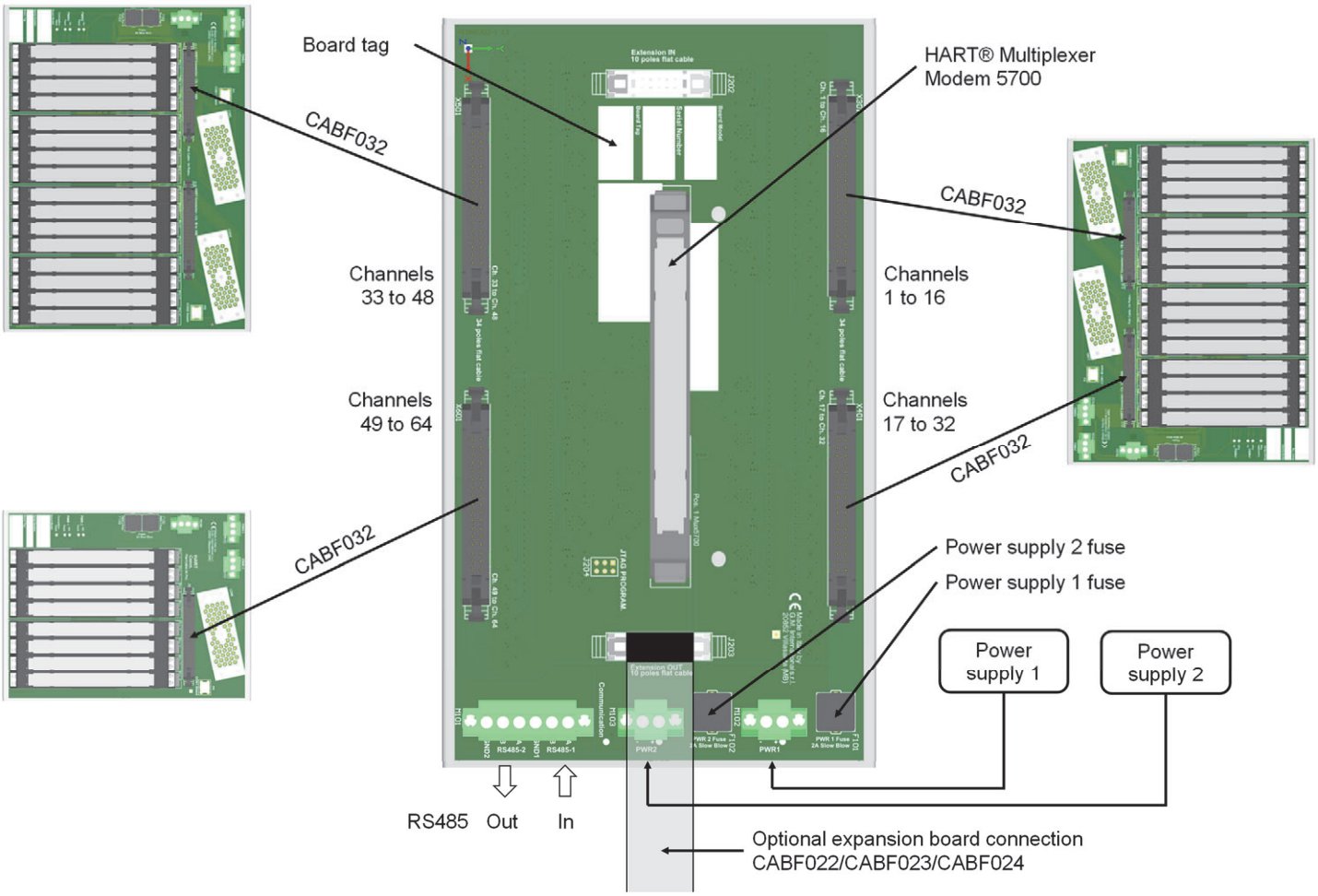
Weight: about 710 g (+ 50 g plastic clips or 380 g metal clips).

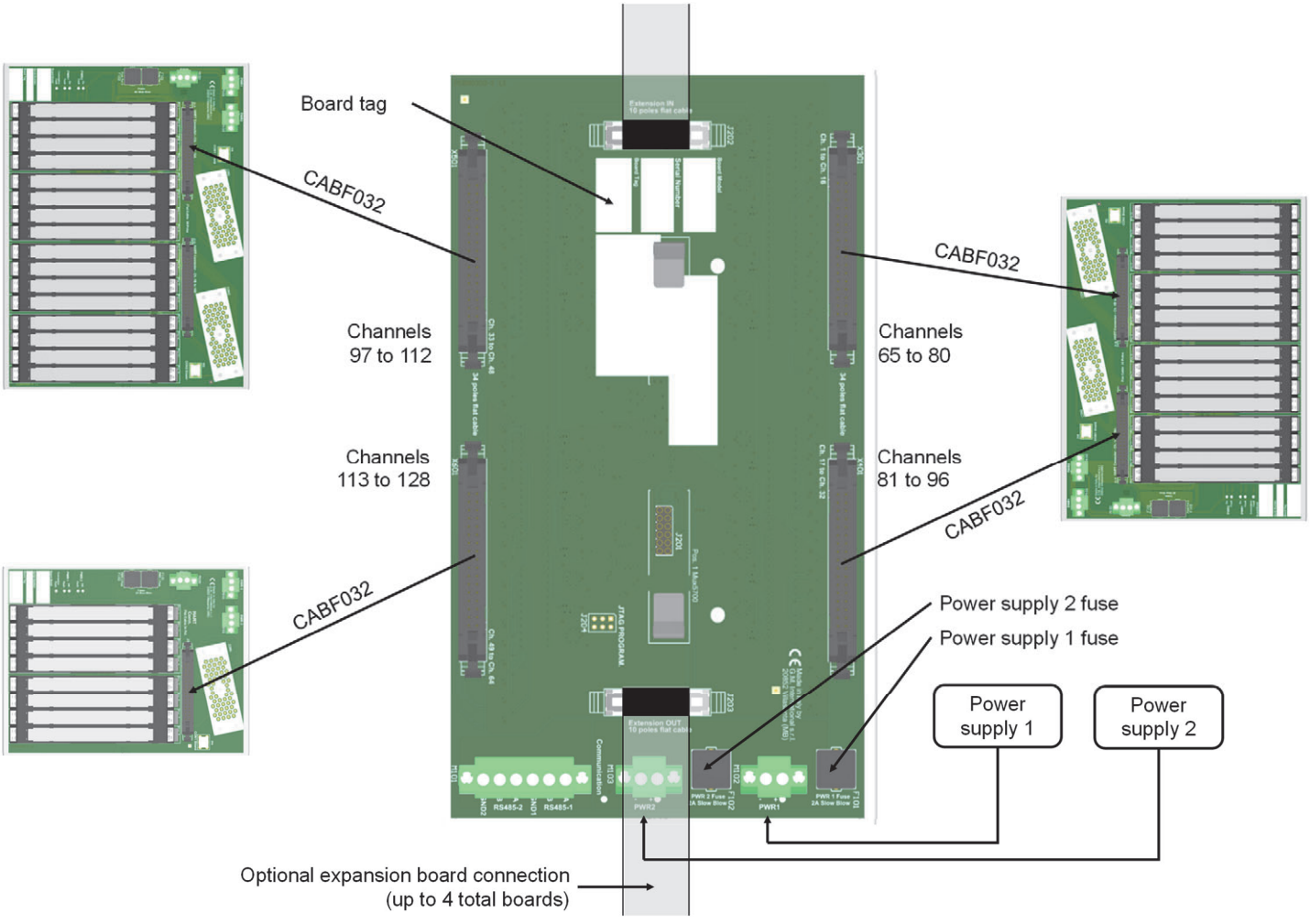
Location: installation in Safe Area/Ordinary Location or Zone 2, Group IIC T4, or Class 1, Div. 2, Group A, B, C, D, T4.

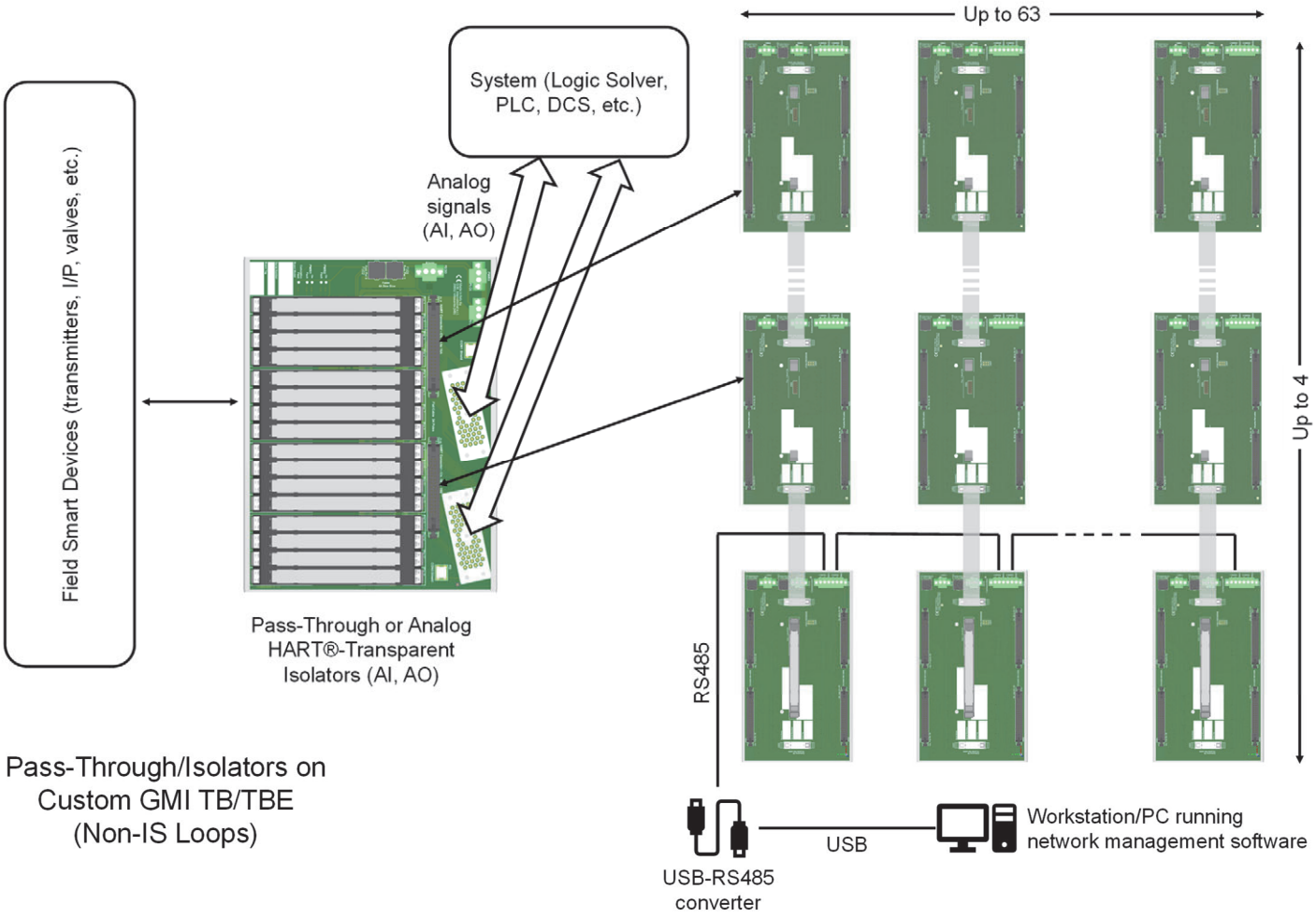
Dimensions: Width 235 mm, Depth 135 mm, Height 154 mm.

Image:

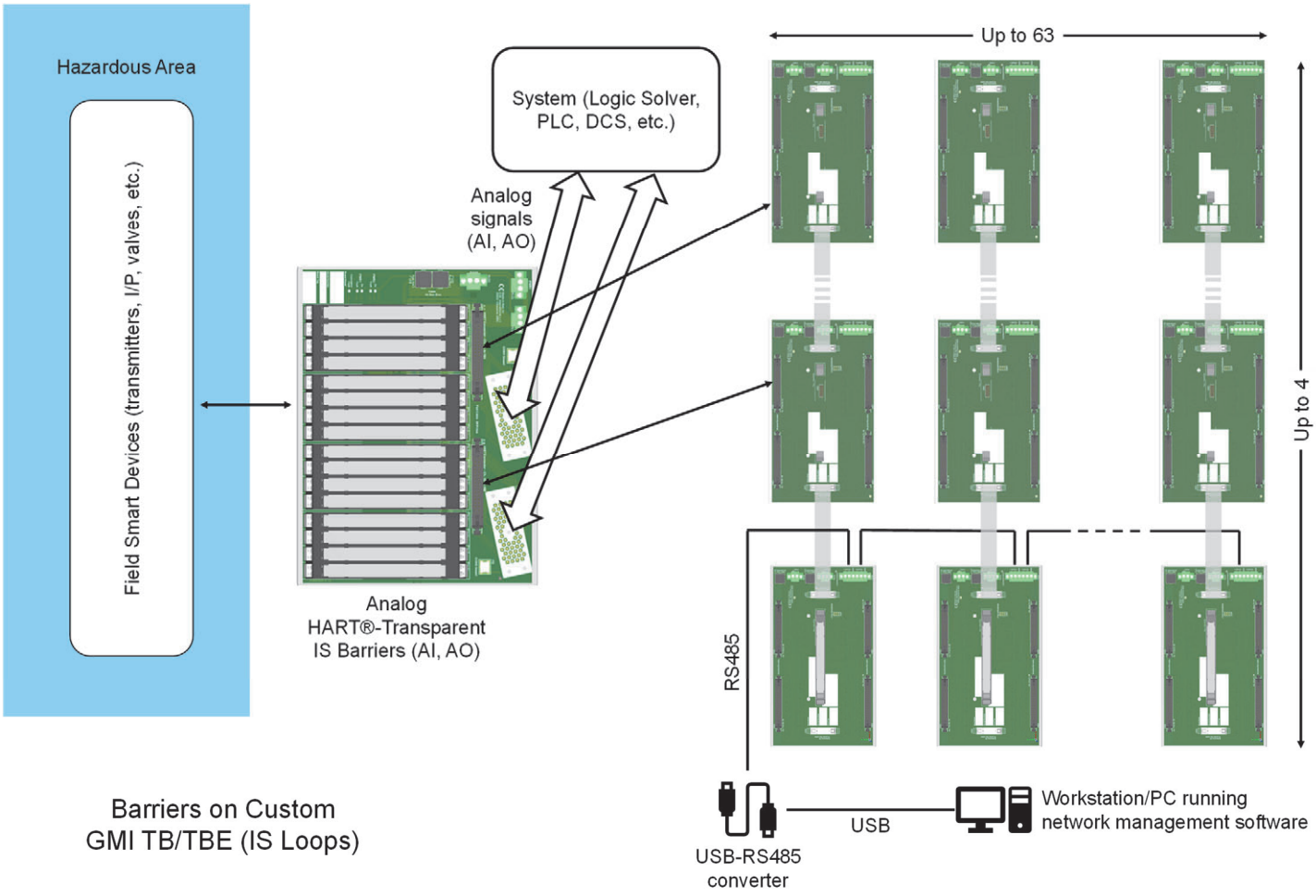



Board tag
CABF032
Channels
33 to 48
Channels
49 to 64
CABF032
HART® Multiplexer
Modem 5700
CABF032
Channels
1 to 16
Channels
17 to 32
CABF032
Power supply 2 fuse
Power supply 1 fuse
Power
supply 1
Power
supply 2
RS485 Out In
Optional expansion board connection
CABF022/CABF023/CABF024


Board tag
CABF032
Channels
97 to 112
Channels
113 to 128
CABF032
CABF032
Channels
65 to 80
Channels
81 to 96
CABF032
Power supply 2 fuse
Power supply 1 fuse
Power
supply 1
Power
supply 2
Optional expansion board connection
(up to 4 total boards)



Pass-Through/Isolators on Custom GMI TB/TBE (Non-IS Loops)



Barriers on Custom GMI TB/TBE (IS Loops)

TBE-D5001-HRT-004

SIL3 HART® Mux Term. Board with Terminal Outputs (for AI cards with 250 Ω input impedance & AO cards)

Characteristics:

General description:

This Termination Board with Enclosure (TBE) allows the remote monitoring of any HART®-compatible 4/20 mA field loop. This is obtained by one locally mounted HART® Multiplexer Modem 5700 series and terminal block interface connectors to access the relevant loops.

The board is installed in series to the loops and is totally transparent to both transmitter and receiver. This model is suitable for interfacing AI cards of safety PLCs with typical input impedance of 250 Ω and AO cards.

The single TBE-D5001-HRT-004 Termination Board supports 32 channels. Yet, it could be extended with additional units (up to 8) to manage all 256 channels available on the HART® Multiplexer Modem 5700 series.

The Mux unit connects, via the RS-485 interface, to an external PC running an FDT-based software package (PACTware™, etc...) through a dedicated Device Type Manager (DTM). The PC can communicate with multiple Mux units, located on different boards, in a multi-drop RS-485 mode.

The HART® Termination Board TBE-D5001-HRT-004 is SIL 3 certified as non-interfering with the signal loops.

The 24 Vdc Power Supply of the TBE is connected to two plug-in terminal blocks, for a redundant power supply.

Installation:

TBE-D5001-HRT-004 is a Termination Board supported by an aluminum shell suitable for installation on EN/IEC60715 TH 35 DIN-Rail. TBE-D5001-HRT-004 shall only be used to mount one HART® Multiplexer Modem 5700 series.

TBE-D5001-HRT-004 unit can be mounted with any orientation over the entire ambient temperature range.

Electrical connections are the following:

- PWR1, PWR 2, RS485-1, RS485-2: polarized removable screw terminal blocks for conductors up to 2.5 mm² (13 AWG) with a torque of 0.5-0.6 Nm.
- J301-J304, J501-J504: polarized fixed screw terminal blocks for conductors up to 2.5 mm² (13 AWG) with a torque of 0.5-0.6 Nm.
- J202, J203: 10 poles connector with retaining method.

Electrical connection can be plugged in/out into a powered unit without suffering or causing any damage **(for Zone 2 installations check the area to be nonhazardous before servicing)**. Connect only one individual conductor per each clamping point.

Use only cables that are suitable for a temperature of at least 85°C.

Wiring has to be sized according to the current and the length of the cables.

On the section "Termination Board Description" a block diagram identifies all connections.

Installation and wiring must be in accordance to the relevant national/international installation standards (e.g. EN/IEC60079-14 Electrical apparatus for explosive gas atmospheres - Part 14: Electrical installations in hazardous areas (other than mines)), make sure that conductors are well isolated from each other and do not produce any unintentional connection.

The unit shall be installed in an area of not more than pollution degree 2 according to EN/IEC60664-1. When installed in EU Zone 2, the unit shall be mounted in a certified Ex enclosure that provides a minimum ingress protection of IP54 in accordance with EN/IEC60079-0. When installed in a Class I, Division 2 Hazardous Location, the unit shall be mounted in a supplemental enclosure that provides a degree of protection not less than IP54. The enclosure must have a door or cover accessible only by the use of a tool.

Units must be protected against dirt, dust, extreme mechanical (e.g. vibration, impact and shock) and thermal stress, and casual contacts. If enclosure needs to be cleaned use only a cloth lightly moistened by a mixture of detergent in water.

Any penetration of cleaning liquid must be avoided to prevent damage to the unit.

Any unauthorized card modification must be avoided.

According to EN/IEC61010, TBE-D5001-HRT-004 unit must be connected to SELV or PELV supplies.

All circuits connected to TBE-D5001-HRT-004 unit must comply with the overvoltage category II (or better) according to EN/IEC60664-1.

Technical Data:

General:

Number of positions: 1 x HART® Multiplexer Modem 5700 series

Maximum number of channels: 32 on a single board, extendable to 256 with 8 boards and 1 HART® Multiplexer Modem 5700 series. Up to 16128 smart devices in full topology with 504 boards and 63 HART® Multiplexer Modem 5700 series.

Supply:

24 Vdc nom (20 to 30 Vdc), reverse polarity protected, double terminal blocks for redundant power supply, with OR diodes to mix supply voltages.

Current consumption: 45 mA @ 24 Vdc with full topology (8 boards), typical.

Connection: by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm².

Protection fuse: 2 A time lag.

HART Interface:

Connection: 32+32 screw terminal blocks to accommodate terminations up to 2.5 mm².

Channel-to-channel isolation voltage: 50 V.

Additional TBs Interface:

Connection: 2 x flat cable 10 poles male connectors (requires female mating connector).

Cable: flat cables CABF022, CABF023, CABF024.

Compatibility:

CE mark compliant, conforms to Directive:

2014/34/EU ATEX, 2014/30/EU EMC, 2014/35/EU LVD, 2011/65/EU RoHS.

Environmental conditions:

Operating: temperature limits – 40 to + 70 °C, relative humidity max 90 % non condensing, up to 35 °C.

Max altitude: 2000 m a.s.l.

Storage temperature: temperature limits –45 to +80 °C.

Safety Description:

ATEX: II 3G Ex ec IIC T4 Gc

IECEx: Ex ec IIC T4 Gc

UL: NI / I / 2 / ABCD / T4; ***C-UL:*** NI / I / 2 / ABCD / T4

Approvals:

UL 20 ATEX 2492X conforms to EN60079-0, EN60079-7.

IECEx ULD 20.0042X conforms to IEC60079-0, IEC60079-7.

UL & C-UL E222308 conforms to UL 61010-1, UL 61010-2-201 and UL 121201 for UL; CSA C22.2 No.61010-1, CSA C22.2 No.61010-2-201 and CSA C22.2 No. 213 for C-UL.

SIL 3 conforms to IEC61508:2010 Ed.2.

Mounting:

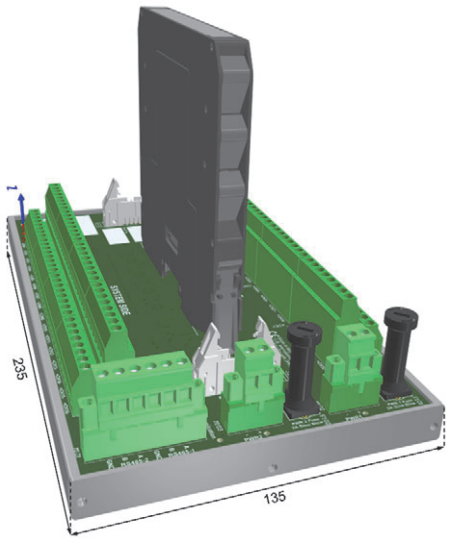
Hardware included for mounting on single DIN-rail 35 mm.

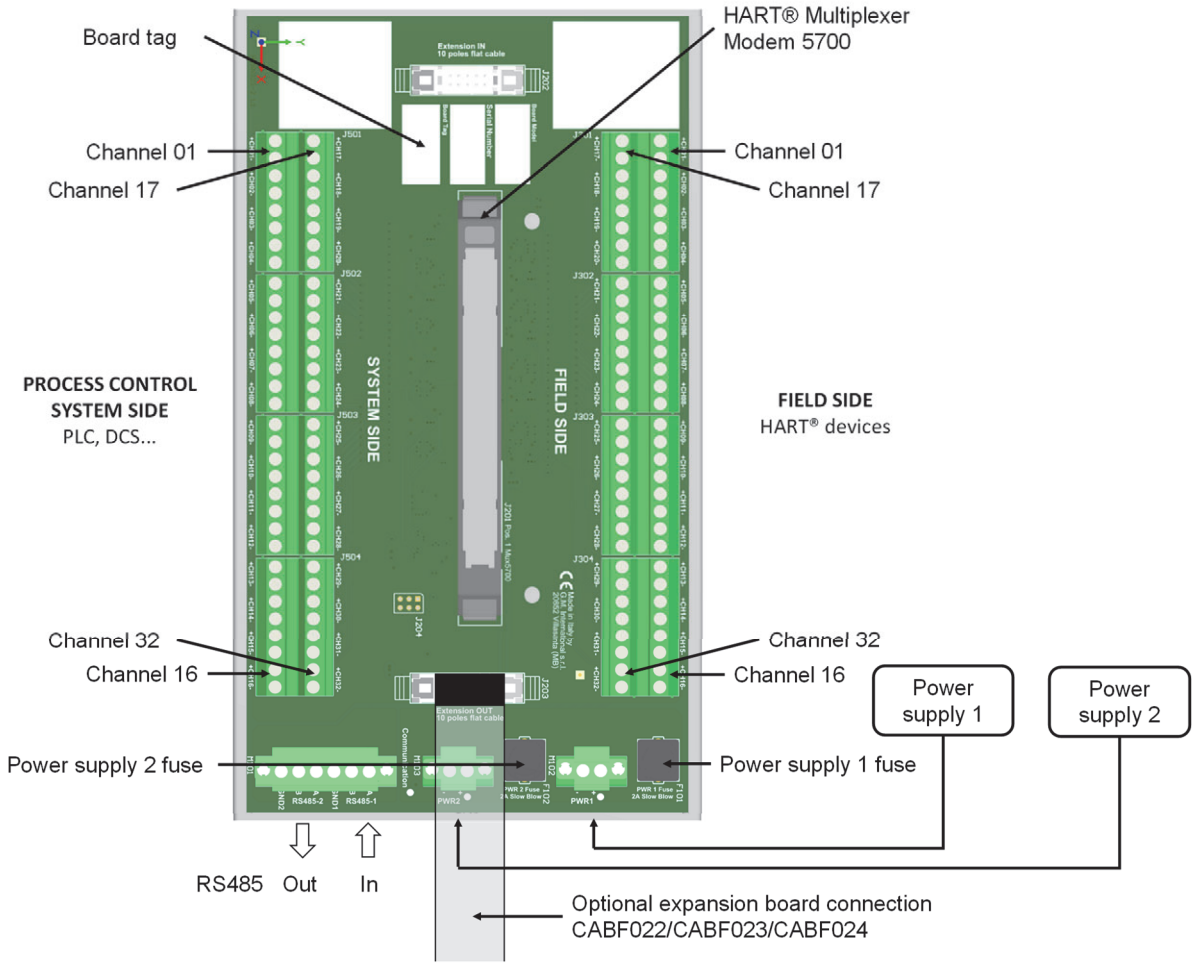
Weight: about 1.08 kg (+ 50 g plastic clips or 380 g metal clips).

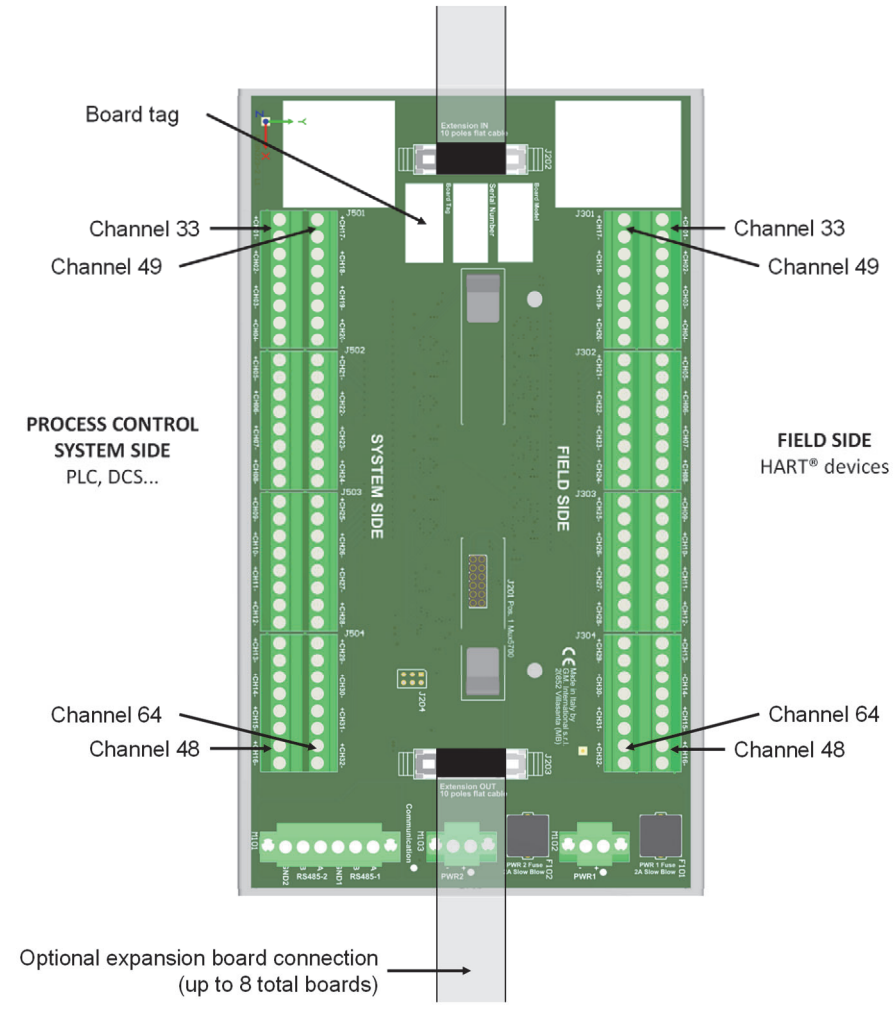
Location: installation in Safe Area/Ordinary Location or Zone 2, Group IIC T4, or Class 1, Div. 2, Group A, B, C, D, T4.

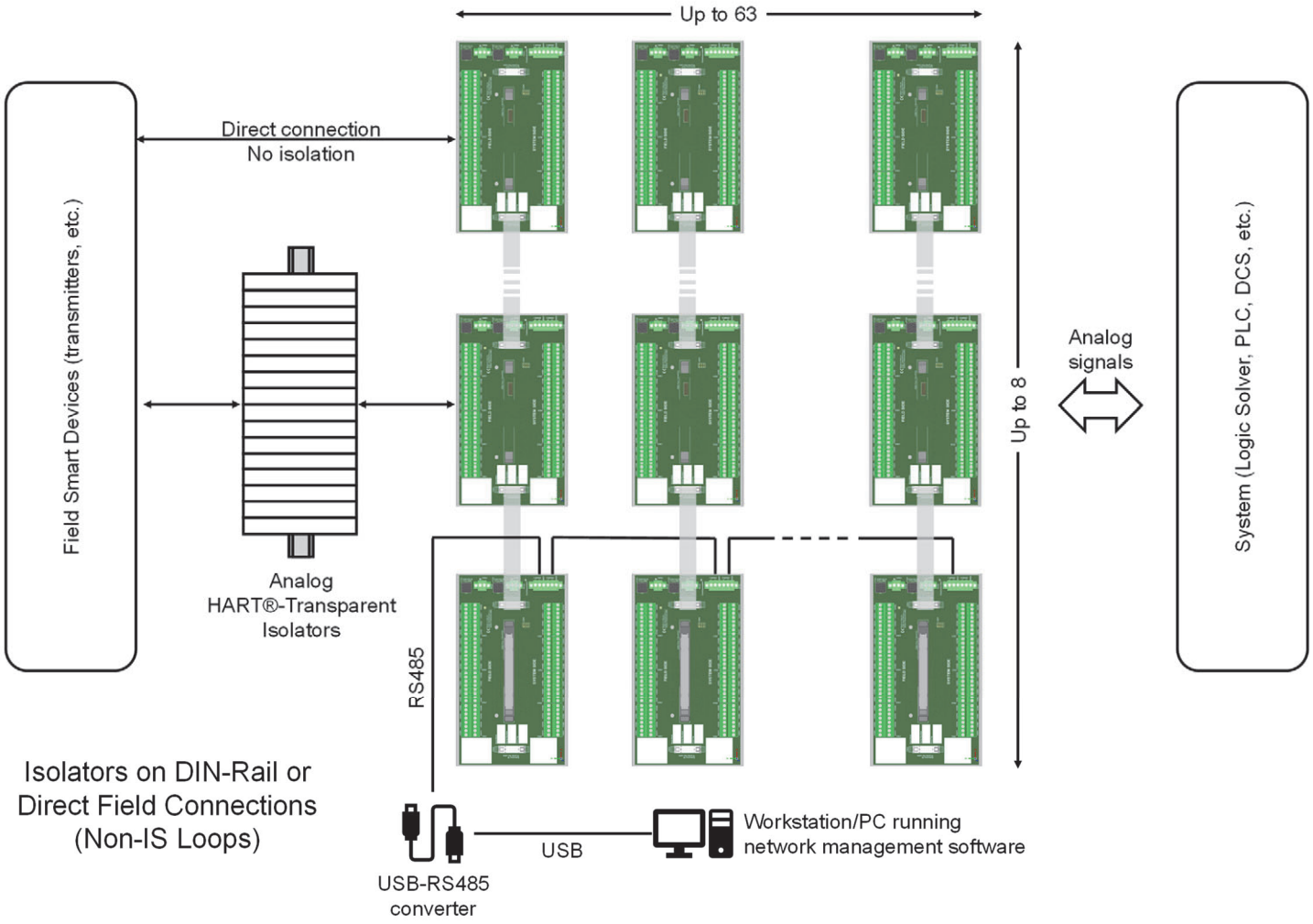
Dimensions: Width 235 mm, Depth 135 mm, Height 154 mm.

Image:

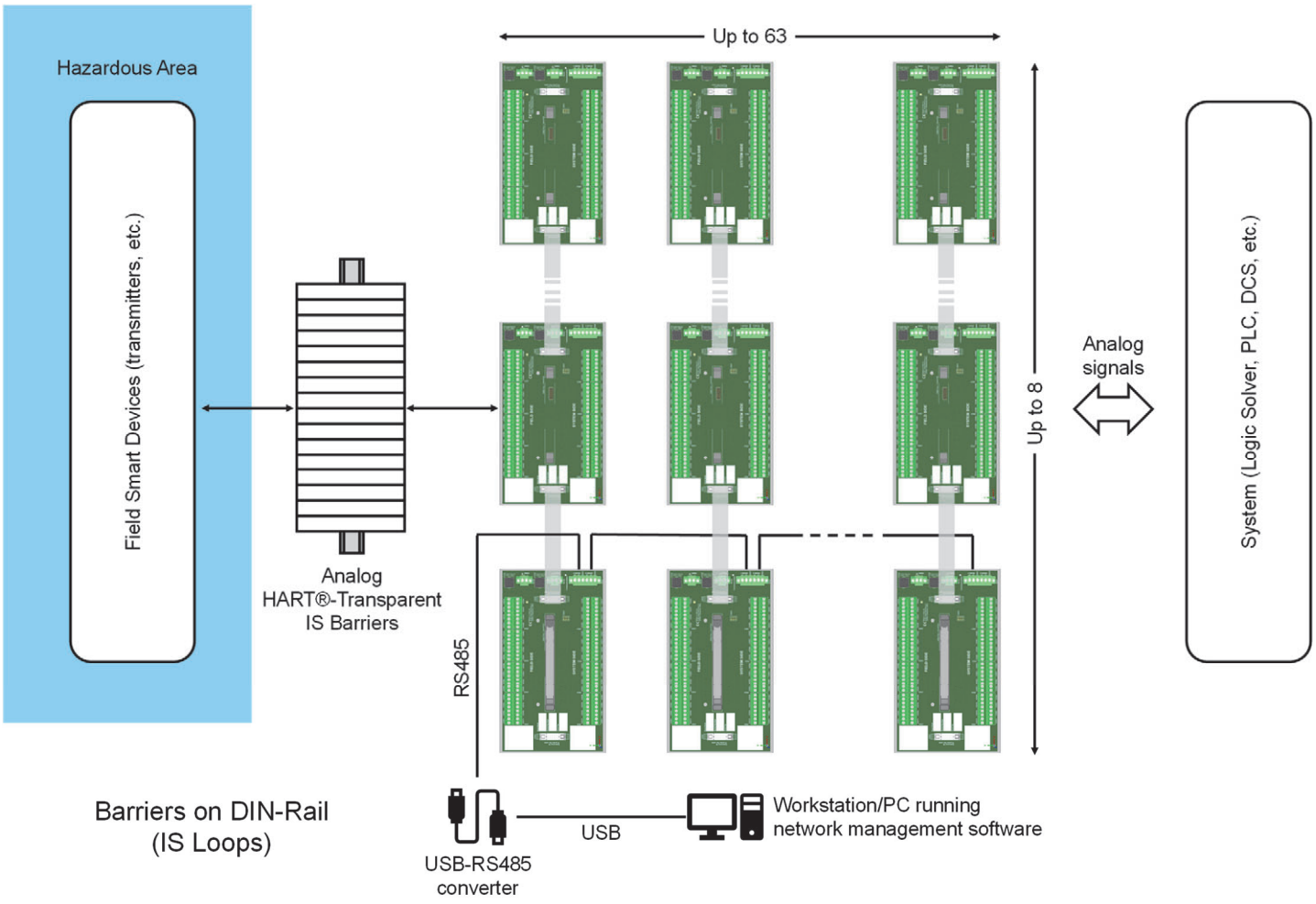



Board tag
HART® Multiplexer
Modem 5700
Channel 01
Channel 17
Channel 01
Channel 17
PROCESS CONTROL
SYSTEM SIDE
PLC, DCS...
SYSTEM SIDE
FIELD SIDE
FIELD SIDE
HART® devices
Channel 32
Channel 16
Channel 32
Channel 16
Power
supply 1
Power
supply 2
Power supply 2 fuse
Power supply 1 fuse
RS485 Out In
Optional expansion board connection
CABF022/CABF023/CABF024


Board tag
Channel 33
Channel 49
Channel 33
Channel 49
PROCESS CONTROL
SYSTEM SIDE
PLC, DCS...
SYSTEM SIDE
FIELD SIDE
FIELD SIDE
HART® devices
Channel 64
Channel 48
Channel 64
Channel 48
Optional expansion board connection
(up to 8 total boards)



Isolators on DIN-Rail or
Direct Field Connections
(Non-IS Loops)



Barriers on DIN-Rail
(IS Loops)

TBE-D5001-HRT-005

SIL3 HART® Mux Term. Board with Terminal Outputs (for AI cards with 1/5 V input signal)

Characteristics:

General description:

This Termination Board with Enclosure (TBE) allows the remote monitoring of any HART®-compatible 4/20 mA field loop. This is obtained by one locally mounted HART® Multiplexer Modem 5700 series and terminal block interface connectors to access the relevant loops.

The board is installed in series to the loops and is totally transparent to both transmitter and receiver. This model is suitable for interfacing AI cards of safety PLCs needing a 1/5 V input signal.

The single TBE-D5001-HRT-005 Termination Board supports 32 channels. Yet, it could be extended with additional units (up to 8) to manage all 256 channels available on the HART® Multiplexer Modem 5700 series.

The Mux unit connects, via the RS-485 interface, to an external PC running an FDT-based software package (PACTware™, etc...) through a dedicated Device Type Manager (DTM). The PC can communicate with multiple Mux units, located on different boards, in a multi-drop RS-485 mode.

The HART® Termination Board TBE-D5001-HRT-005 is SIL 3 certified as non-interfering with the signal loops.

The 24 Vdc Power Supply of the TBE is connected to two plug-in terminal blocks, for a redundant power supply.

Installation:

TBE-D5001-HRT-005 is a Termination Board supported by an aluminum shell suitable for installation on EN/IEC60715 TH 35 DIN-Rail. TBE-D5001-HRT-005 shall only be used to mount one HART® Multiplexer Modem 5700 series.

TBE-D5001-HRT-005 unit can be mounted with any orientation over the entire ambient temperature range.

Electrical connections are the following:

- PWR1, PWR 2, RS485-1, RS485-2: polarized removable screw terminal blocks for conductors up to 2.5 mm² (13 AWG) with a torque of 0.5-0.6 Nm.
- J301-J304, J501-J504: polarized fixed screw terminal blocks for conductors up to 2.5 mm² (13 AWG) with a torque of 0.5-0.6 Nm.
- J202, J203: 10 poles connector with retaining method.

Electrical connection can be plugged in/out into a powered unit without suffering or causing any damage **(for Zone 2 installations check the area to be nonhazardous before servicing)**. Connect only one individual conductor per each clamping point.

Use only cables that are suitable for a temperature of at least 85°C.

Wiring has to be sized according to the current and the length of the cables.

On the section “Termination Board Description” a block diagram identifies all connections.

Installation and wiring must be in accordance to the relevant national/international installation standards (e.g. EN/IEC60079-14 Electrical apparatus for explosive gas atmospheres - Part 14: Electrical installations in hazardous areas (other than mines)), make sure that conductors are well isolated from each other and do not produce any unintentional connection.

The unit shall be installed in an area of not more than pollution degree 2 according to EN/IEC60664-1. When installed in EU Zone 2, the unit shall be mounted in a certified Ex enclosure that provides a minimum ingress protection of IP54 in accordance with EN/IEC60079-0. When installed in a Class I, Division 2 Hazardous Location, the unit shall be mounted in a supplemental enclosure that provides a degree of protection not less than IP54. The enclosure must have a door or cover accessible only by the use of a tool.

Units must be protected against dirt, dust, extreme mechanical (e.g. vibration, impact and shock) and thermal stress, and casual contacts. If enclosure needs to be cleaned use only a cloth lightly moistened by a mixture of detergent in water.

Any penetration of cleaning liquid must be avoided to prevent damage to the unit.

Any unauthorized card modification must be avoided.

According to EN/IEC61010, TBE-D5001-HRT-005 unit must be connected to SELV or PELV supplies.

All circuits connected to TBE-D5001-HRT-005 unit must comply with the overvoltage category II (or better) according to EN/IEC60664-1.

Technical Data:

General:

Number of positions: 1 x HART® Multiplexer Modem 5700 series

Maximum number of channels: 32 on a single board, extendable to 256 with 8 boards and 1 HART® Multiplexer Modem 5700 series. Up to 16128 smart devices in full topology with 504 boards and 63 HART® Multiplexer Modem 5700 series.

Supply:

24 Vdc nom (20 to 30 Vdc), reverse polarity protected, double terminal blocks for redundant power supply, with OR diodes to mix supply voltages.

Current consumption: 45 mA @ 24 Vdc with full topology (8 boards), typical.

Connection: by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm².

Protection fuse: 2 A time lag.

HART Interface:

Connection: 32+32 screw terminal blocks to accommodate terminations up to 2.5 mm².

Channel-to-channel isolation voltage: 50 V.

Additional TBs Interface:

Connection: 2 x flat cable 10 poles male connectors (requires female mating connector).

Cable: flat cables CABF022, CABF023, CABF024.

Compatibility:

CE mark compliant, conforms to Directive:

2014/34/EU ATEX, 2014/30/EU EMC, 2014/35/EU LVD, 2011/65/EU RoHS.

Environmental conditions:

Operating: temperature limits – 40 to + 70 °C, relative humidity max 90 % non condensing, up to 35 °C.

Max altitude: 2000 m a.s.l.

Storage temperature: temperature limits –45 to +80 °C.

Safety Description:

ATEX: II 3G Ex ec IIC T4 Gc

IECEx: Ex ec IIC T4 Gc

UL: NI / I / 2 / ABCD / T4; ***C-UL:*** NI / I / 2 / ABCD / T4

Approvals:

UL 20 ATEX 2492X conforms to EN60079-0, EN60079-7.

IECEx ULD 20.0042X conforms to IEC60079-0, IEC60079-7.

UL & C-UL E222308 conforms to UL 61010-1, UL 61010-2-201 and UL 121201 for UL; CSA C22.2 No.61010-1, CSA C22.2 No.61010-2-201 and CSA C22.2 No. 213 for C-UL.

SIL 3 conforms to IEC61508:2010 Ed.2.

Mounting:

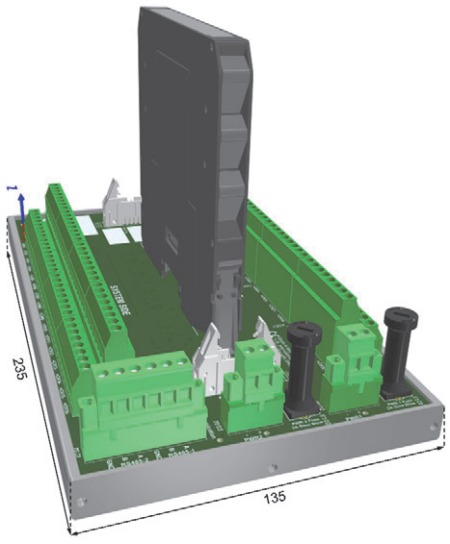
Hardware included for mounting on single DIN-rail 35 mm.

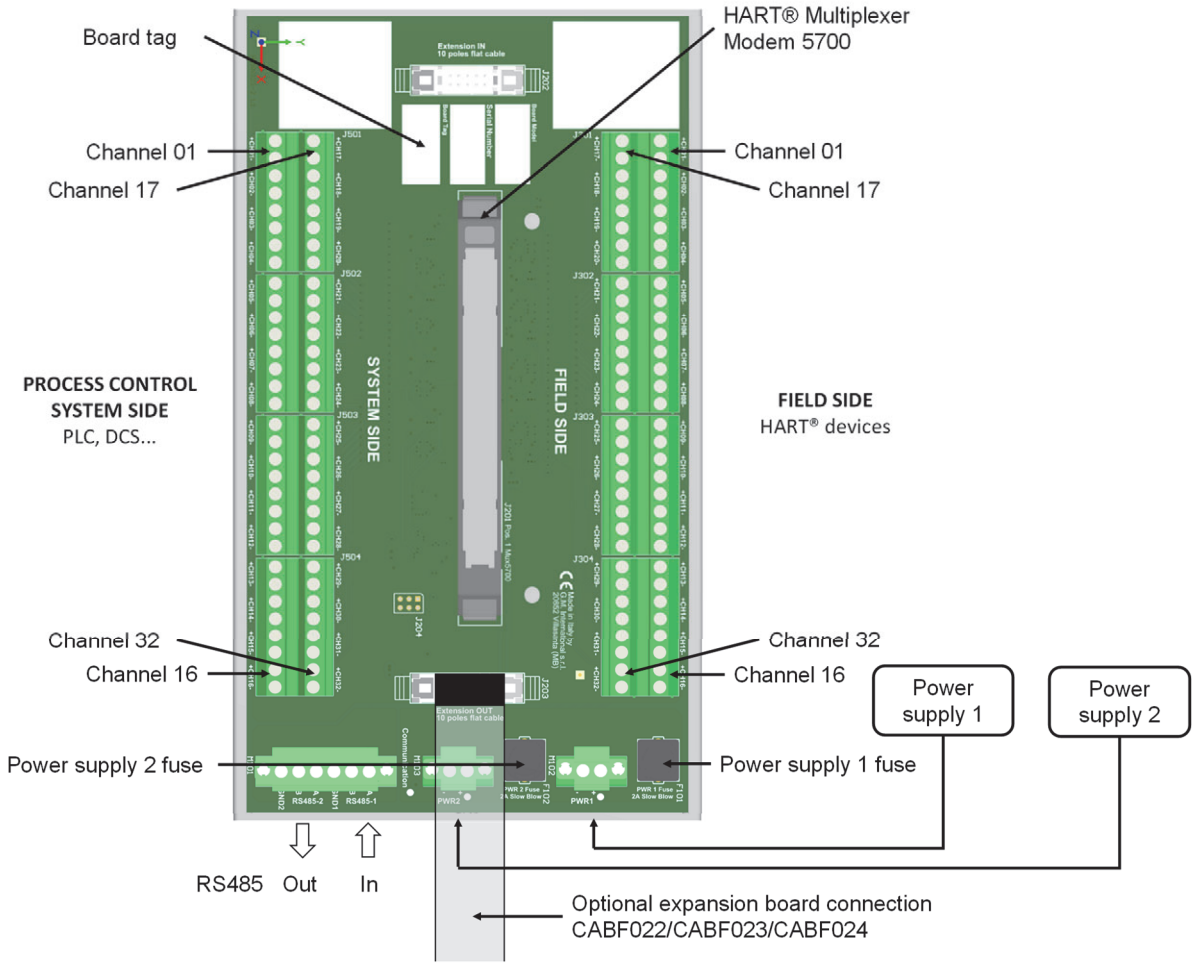
Weight: about 1.08 kg (+ 50 g plastic clips or 380 g metal clips).

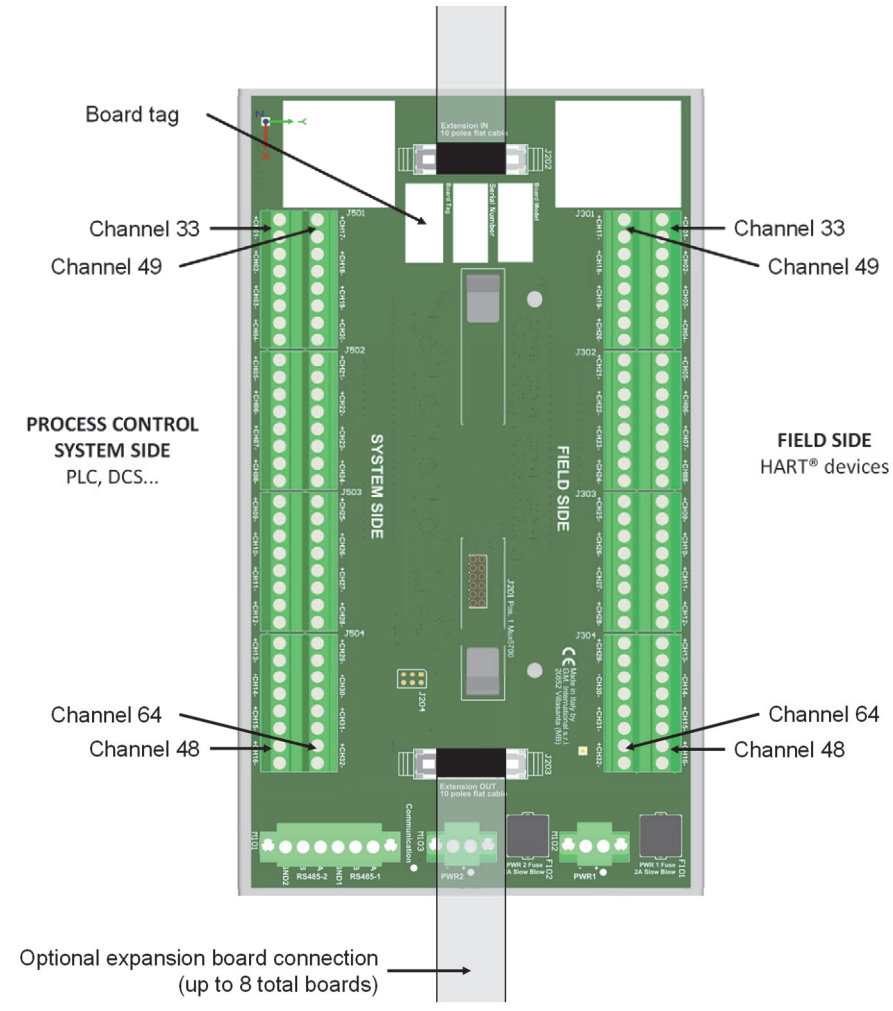
Location: installation in Safe Area/Ordinary Location or Zone 2, Group IIC T4, or Class 1, Div. 2, Group A, B, C, D, T4.

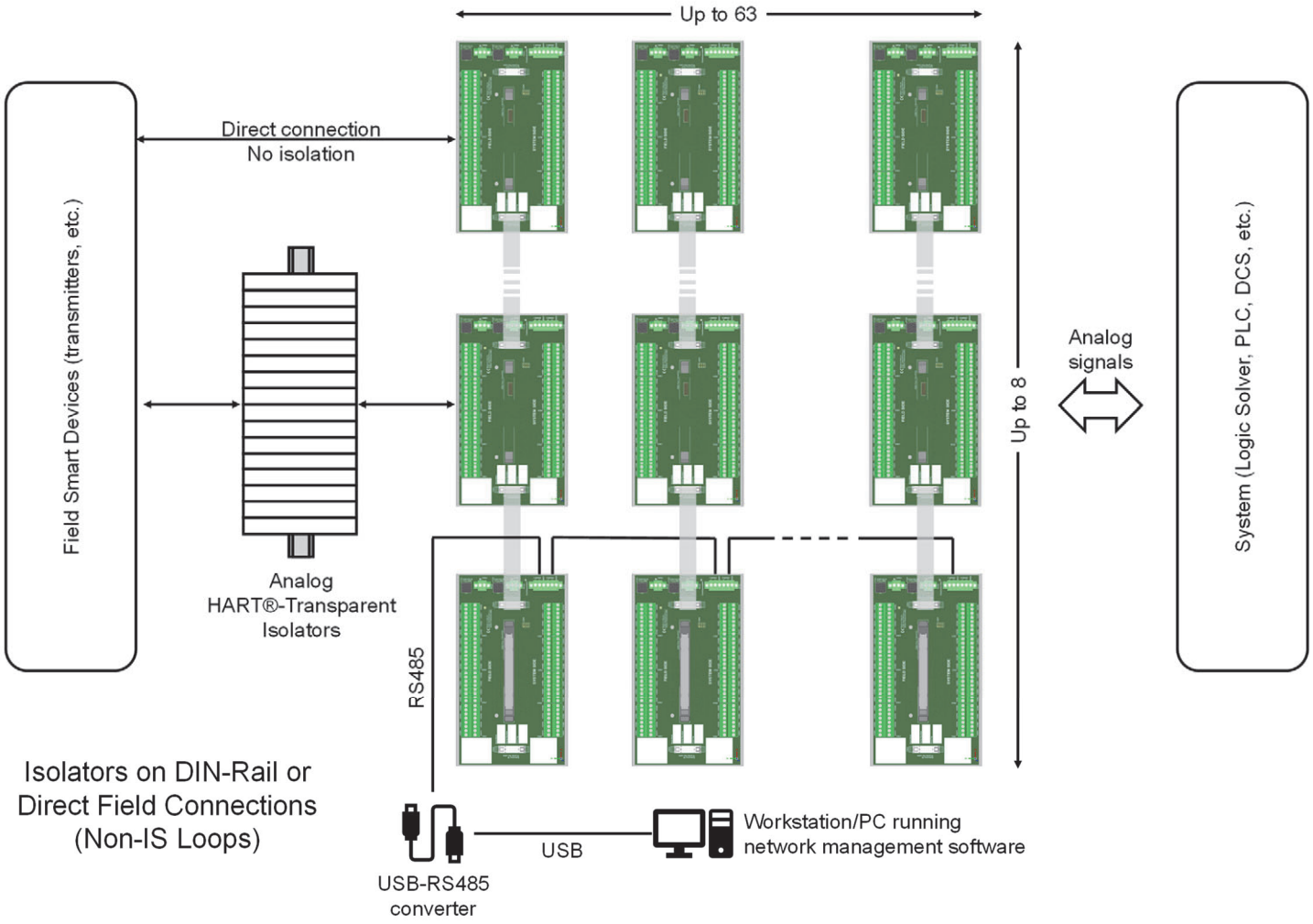
Dimensions: Width 235 mm, Depth 135 mm, Height 154 mm.

Image:

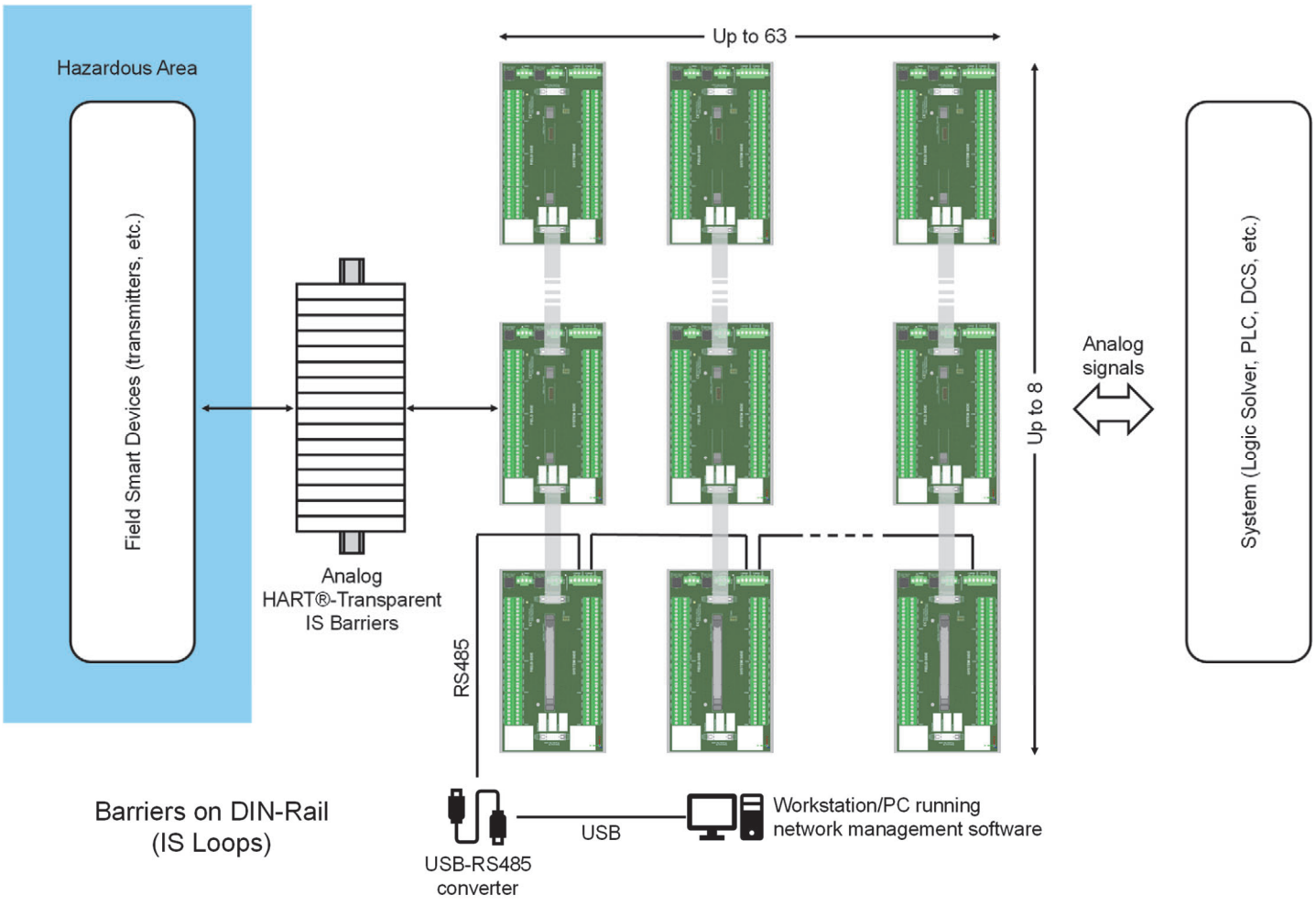



Board tag
HART® Multiplexer
Modem 5700
Channel 01
Channel 17
Channel 01
Channel 17
PROCESS CONTROL
SYSTEM SIDE
PLC, DCS...
SYSTEM SIDE
FIELD SIDE
FIELD SIDE
HART® devices
Channel 32
Channel 16
Channel 32
Channel 16
Power
supply 1
Power
supply 2
Power supply 2 fuse
Power supply 1 fuse
RS485 Out In
Optional expansion board connection
CABF022/CABF023/CABF024


Board tag
Channel 33
Channel 49
Channel 33
Channel 49
PROCESS CONTROL
SYSTEM SIDE
PLC, DCS...
SYSTEM SIDE
FIELD SIDE
FIELD SIDE
HART® devices
Channel 64
Channel 48
Channel 64
Channel 48
Optional expansion board connection
(up to 8 total boards)



Isolators on DIN-Rail or
Direct Field Connections
(Non-IS Loops)



Barriers on DIN-Rail
(IS Loops)

TBE-D5001-HRT-006

SIL3 HART® Mux Term. Board with Terminal Outputs (for AI cards with 100 Ω to 150 Ω input impedance)

Characteristics:

General description:

This Termination Board with Enclosure (TBE) allows the remote monitoring of any HART®-compatible 4/20 mA field loop. This is obtained by one locally mounted HART® Multiplexer Modem 5700 series and terminal block interface connectors to access the relevant loops.

The board is installed in series to the loops and is totally transparent to both transmitter and receiver. This model is suitable for interfacing AI cards of safety PLCs with input impedance from 100 Ω to 150 Ω.

The single TBE-D5001-HRT-006 Termination Board supports 32 channels. Yet, it could be extended with additional units (up to 8) to manage all 256 channels available on the HART® Multiplexer Modem 5700 series.

The Mux unit connects, via the RS-485 interface, to an external PC running an FDT-based software package (PACTware™, etc...) through a dedicated Device Type Manager (DTM). The PC can communicate with multiple Mux units, located on different boards, in a multi-drop RS-485 mode.

The HART® Termination Board TBE-D5001-HRT-006 is SIL 3 certified as non-interfering with the signal loops.

The 24 Vdc Power Supply of the TBE is connected to two plug-in terminal blocks, for a redundant power supply.

Installation:

TBE-D5001-HRT-006 is a Termination Board supported by an aluminum shell suitable for installation on EN/IEC60715 TH 35 DIN-Rail. TBE-D5001-HRT-006 shall only be used to mount one HART® Multiplexer Modem 5700 series.

TBE-D5001-HRT-006 unit can be mounted with any orientation over the entire ambient temperature range.

Electrical connections are the following:

- PWR1, PWR 2, RS485-1, RS485-2: polarized removable screw terminal blocks for conductors up to 2.5 mm² (13 AWG) with a torque of 0.5-0.6 Nm.
- J301-J304, J501-J504: polarized fixed screw terminal blocks for conductors up to 2.5 mm² (13 AWG) with a torque of 0.5-0.6 Nm.
- J202, J203: 10 poles connector with retaining method.

Electrical connection can be plugged in/out into a powered unit without suffering or causing any damage **(for Zone 2 installations check the area to be nonhazardous before servicing)**. Connect only one individual conductor per each clamping point.

Use only cables that are suitable for a temperature of at least 85°C.

Wiring has to be sized according to the current and the length of the cables.

On the section "Termination Board Description" a block diagram identifies all connections.

Installation and wiring must be in accordance to the relevant national/international installation standards (e.g. EN/IEC60079-14 Electrical apparatus for explosive gas atmospheres - Part 14: Electrical installations in hazardous areas (other than mines)), make sure that conductors are well isolated from each other and do not produce any unintentional connection.

The unit shall be installed in an area of not more than pollution degree 2 according to EN/IEC60664-1. When installed in EU Zone 2, the unit shall be mounted in a certified Ex enclosure that provides a minimum ingress protection of IP54 in accordance with EN/IEC60079-0. When installed in a Class I, Division 2 Hazardous Location, the unit shall be mounted in a supplemental enclosure that provides a degree of protection not less than IP54. The enclosure must have a door or cover accessible only by the use of a tool.

Units must be protected against dirt, dust, extreme mechanical (e.g. vibration, impact and shock) and thermal stress, and casual contacts. If enclosure needs to be cleaned use only a cloth lightly moistened by a mixture of detergent in water.

Any penetration of cleaning liquid must be avoided to prevent damage to the unit.

Any unauthorized card modification must be avoided.

According to EN/IEC61010, TBE-D5001-HRT-006 unit must be connected to SELV or PELV supplies.

All circuits connected to TBE-D5001-HRT-006 unit must comply with the overvoltage category II (or better) according to EN/IEC60664-1.

Technical Data:

General:

Number of positions: 1 x HART® Multiplexer Modem 5700 series

Maximum number of channels: 32 on a single board, extendable to 256 with 8 boards and 1 HART® Multiplexer Modem 5700 series. Up to 16128 smart devices in full topology with 504 boards and 63 HART® Multiplexer Modem 5700 series.

Supply:

24 Vdc nom (20 to 30 Vdc), reverse polarity protected, double terminal blocks for redundant power supply, with OR diodes to mix supply voltages.

Current consumption: 45 mA @ 24 Vdc with full topology (8 boards), typical.

Connection: by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm².

Protection fuse: 2 A time lag.

HART Interface:

Connection: 32+32 screw terminal blocks to accommodate terminations up to 2.5 mm².

Channel-to-channel isolation voltage: 50 V.

Additional TBs Interface:

Connection: 2 x flat cable 10 poles male connectors (requires female mating connector).

Cable: flat cables CABF022, CABF023, CABF024.

Compatibility:

CE mark compliant, conforms to Directive:

2014/34/EU ATEX, 2014/30/EU EMC, 2014/35/EU LVD, 2011/65/EU RoHS.

Environmental conditions:

Operating: temperature limits – 40 to + 70 °C, relative humidity max 90 % non condensing, up to 35 °C.

Max altitude: 2000 m a.s.l.

Storage temperature: temperature limits –45 to +80 °C.

Safety Description:

ATEX: II 3G Ex ec IIC T4 Gc

IECEx: Ex ec IIC T4 Gc

UL: NI / I / 2 / ABCD / T4; ***C-UL:*** NI / I / 2 / ABCD / T4

Approvals:

UL 20 ATEX 2492X conforms to EN60079-0, EN60079-7.

IECEx ULD 20.0042X conforms to IEC60079-0, IEC60079-7.

UL & C-UL E222308 conforms to UL 61010-1, UL 61010-2-201 and UL 121201 for UL; CSA C22.2 No.61010-1, CSA C22.2 No.61010-2-201 and CSA C22.2 No. 213 for C-UL.

SIL 3 conforms to IEC61508:2010 Ed.2.

Mounting:

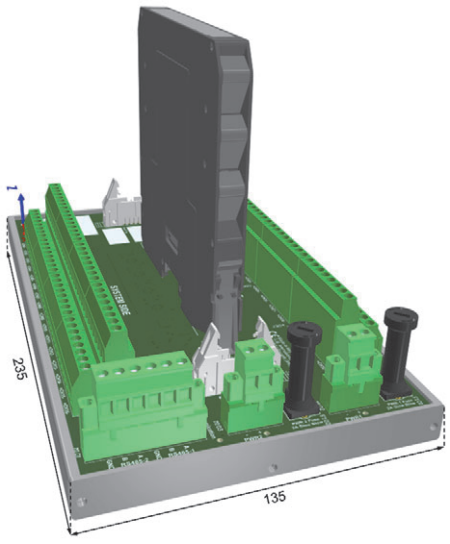
Hardware included for mounting on single DIN-rail 35 mm.

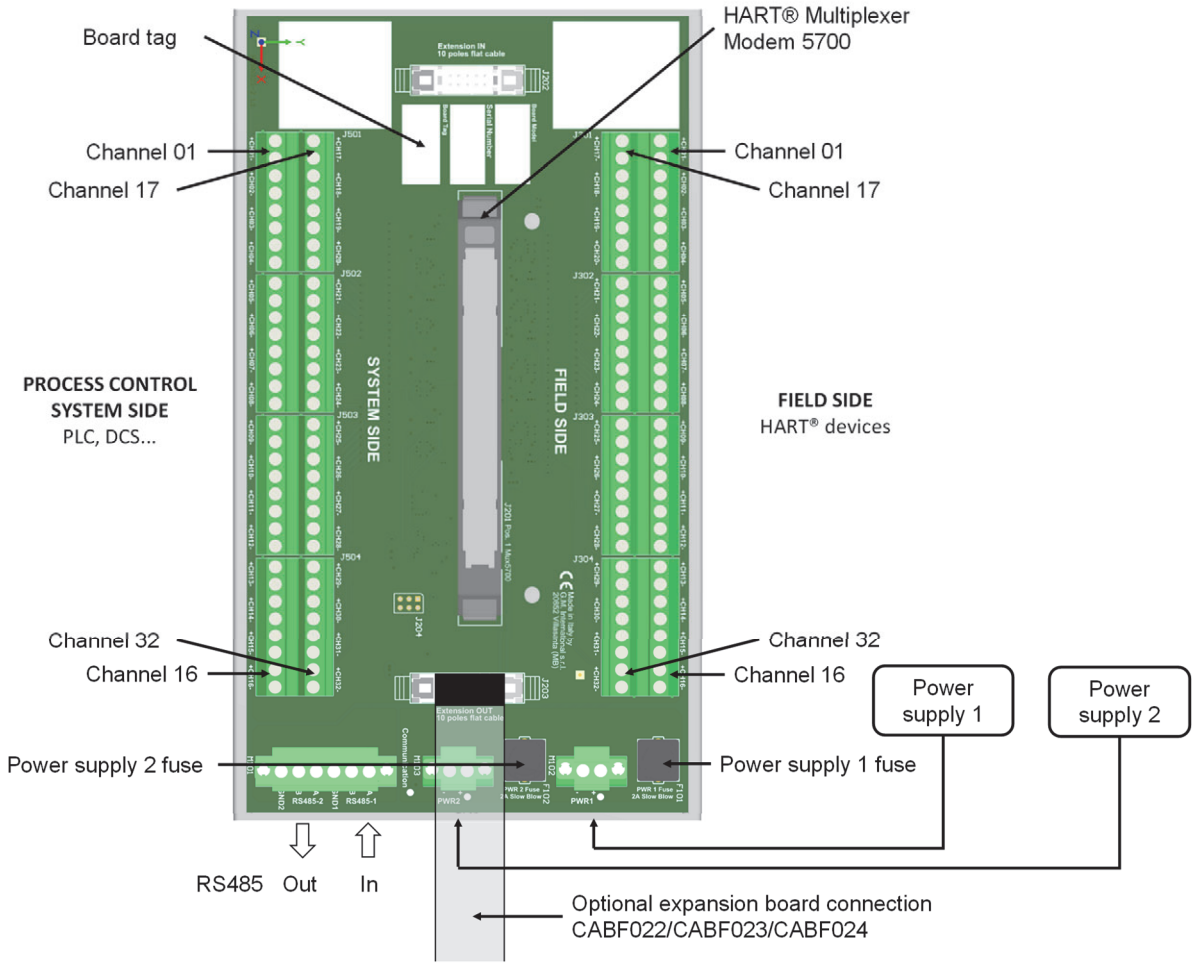
Weight: about 1.08 kg (+ 50 g plastic clips or 380 g metal clips).

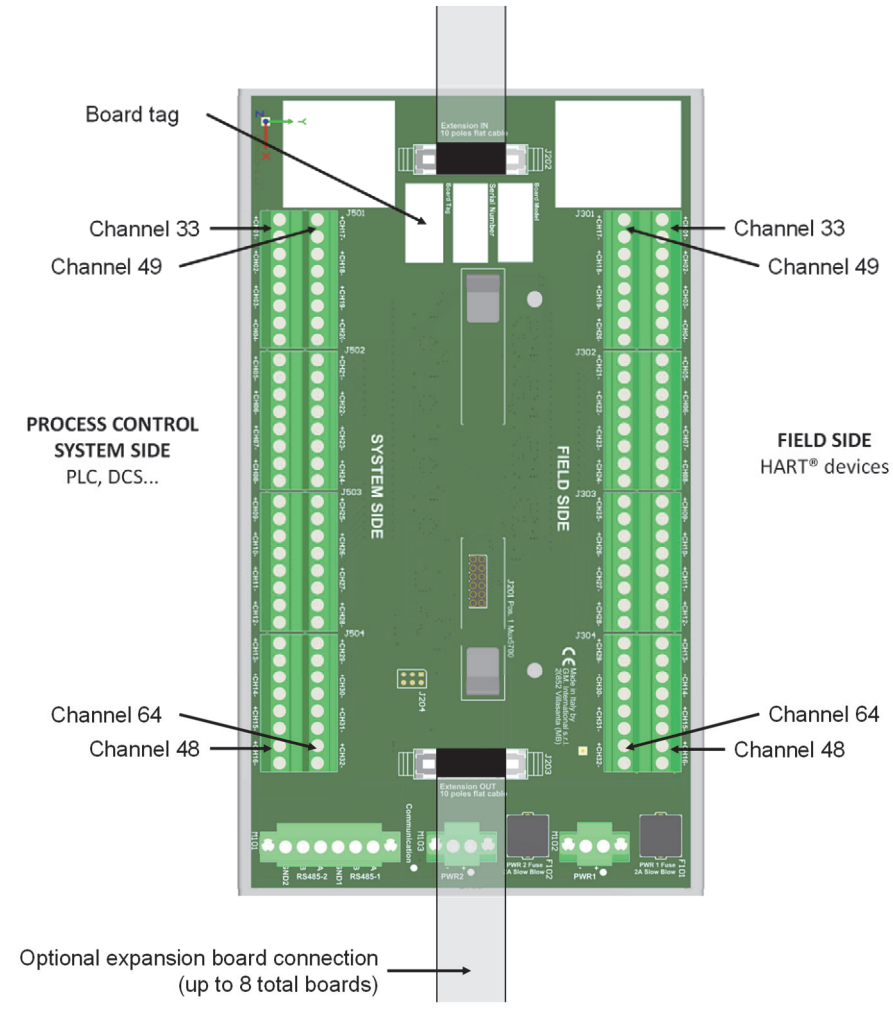
Location: installation in Safe Area/Ordinary Location or Zone 2, Group IIC T4, or Class 1, Div. 2, Group A, B, C, D, T4.

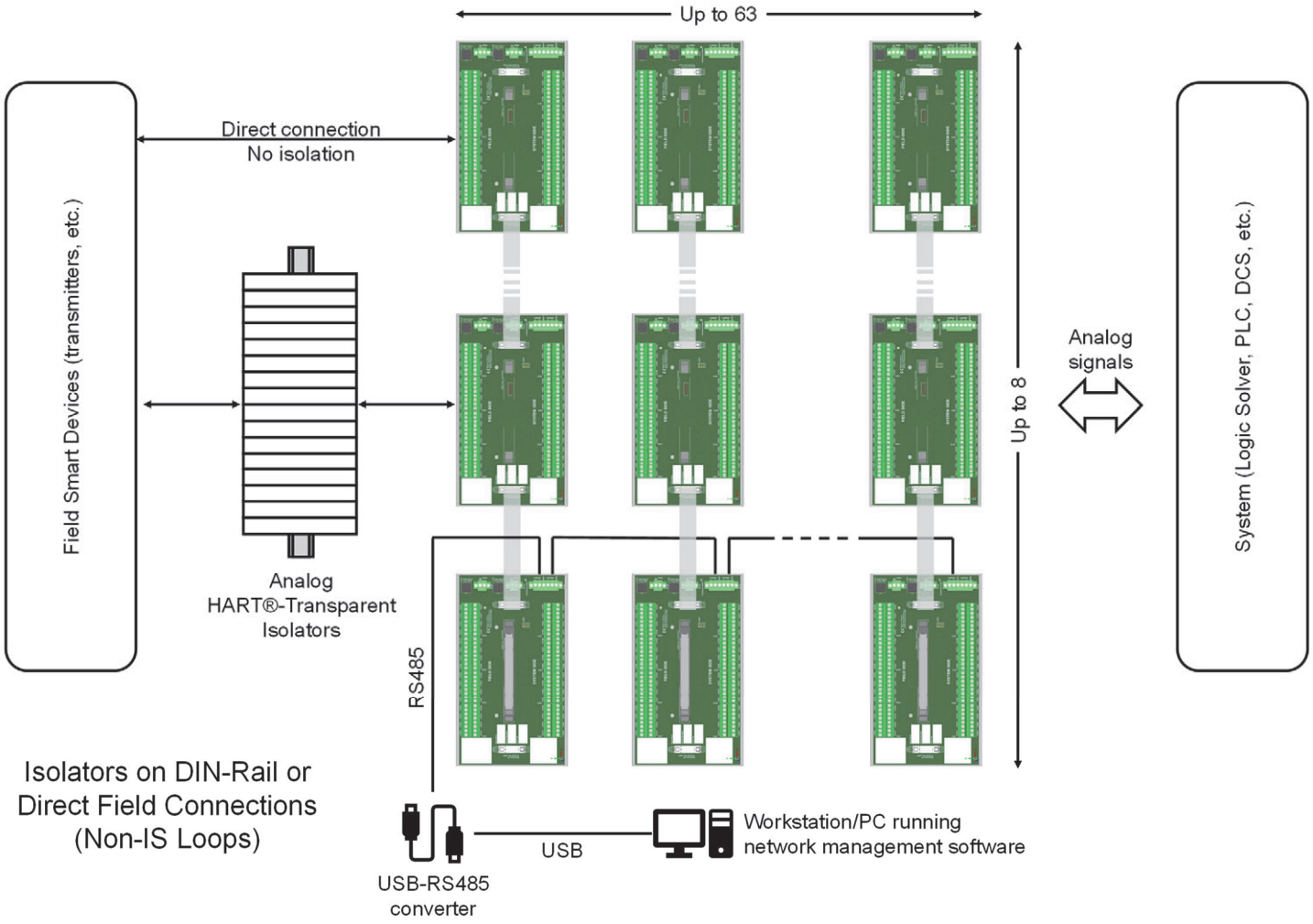
Dimensions: Width 235 mm, Depth 135 mm, Height 154 mm.

Image:

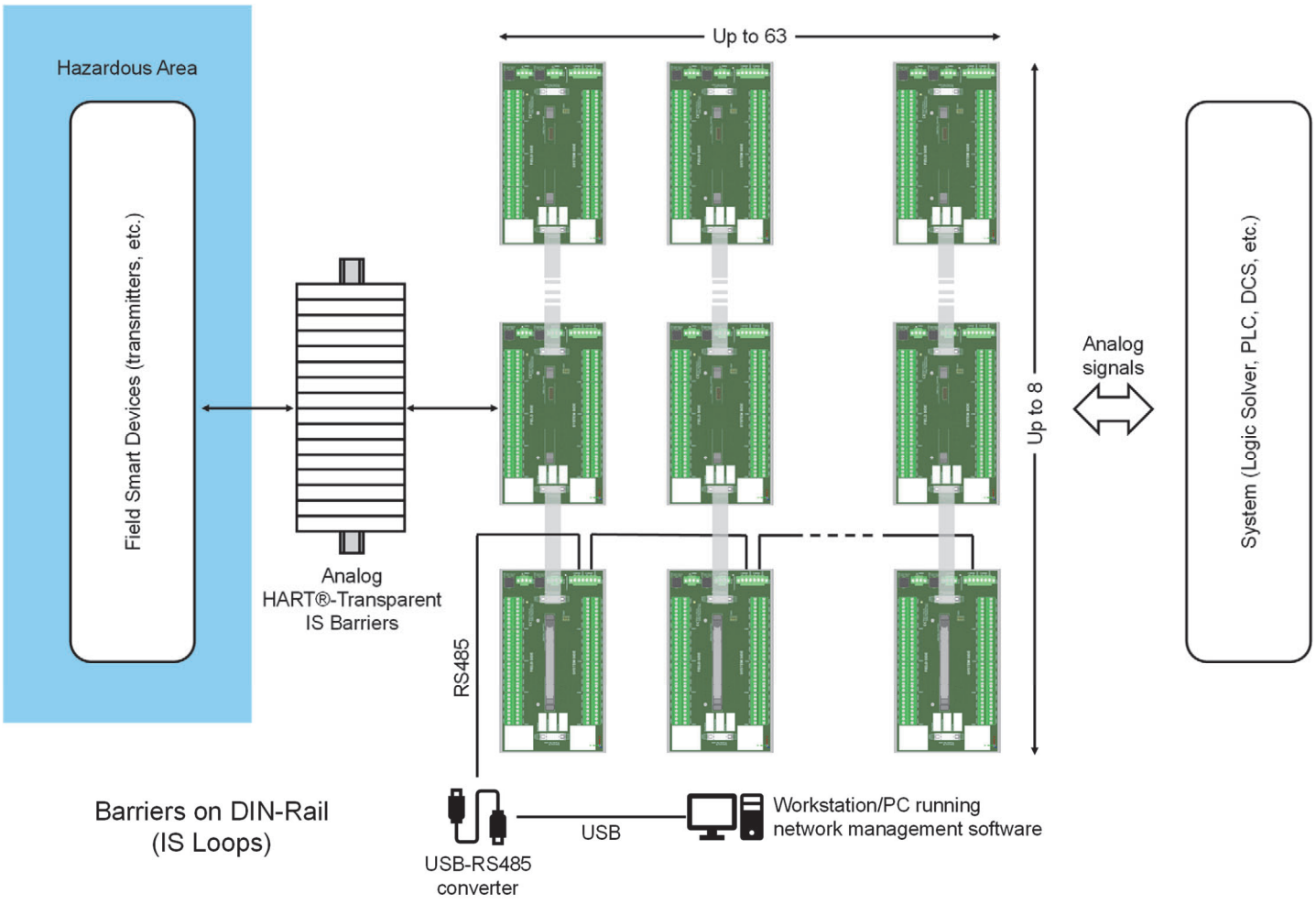



Board tag
HART® Multiplexer
Modem 5700
Channel 01
Channel 17
Channel 01
Channel 17
PROCESS CONTROL
SYSTEM SIDE
PLC, DCS...
SYSTEM SIDE
FIELD SIDE
FIELD SIDE
HART® devices
Channel 32
Channel 16
Channel 32
Channel 16
Power
supply 1
Power
supply 2
Power supply 2 fuse
Power supply 1 fuse
RS485 Out In
Optional expansion board connection
CABF022/CABF023/CABF024


Board tag
Channel 33
Channel 49
Channel 33
Channel 49
PROCESS CONTROL
SYSTEM SIDE
PLC, DCS...
SYSTEM SIDE
FIELD SIDE
FIELD SIDE
HART® devices
Channel 64
Channel 48
Channel 64
Channel 48
Optional expansion board connection
(up to 8 total boards)



Isolators on DIN-Rail or
Direct Field Connections
(Non-IS Loops)



Barriers on DIN-Rail
(IS Loops)

TBE-D5001-HRT-007

SIL3 HART® Mux Term. Board with Terminal Outputs (for AI cards with 0 Ω to 50 Ω input impedance)

Characteristics:

General description:

This Termination Board with Enclosure (TBE) allows the remote monitoring of any HART®-compatible 4/20 mA field loop. This is obtained by one locally mounted HART® Multiplexer Modem 5700 series and terminal block interface connectors to access the relevant loops.
The board is installed in series to the loops and is totally transparent to both transmitter and receiver. This model is suitable for interfacing AI cards of safety PLCs with input impedance from 0 Ω to 50 Ω.
The single TBE-D5001-HRT-007 Termination Board supports 32 channels. Yet, it could be extended with additional units (up to 8) to manage all 256 channels available on the HART® Multiplexer Modem 5700 series.
The Mux unit connects, via the RS-485 interface, to an external PC running an FDT-based software package (PACTware™, etc...) through a dedicated Device Type Manager (DTM). The PC can communicate with multiple Mux units, located on different boards, in a multi-drop RS-485 mode.
The HART® Termination Board TBE-D5001-HRT-007 is SIL 3 certified as non-interfering with the signal loops.
The 24 Vdc Power Supply of the TBE is connected to two plug-in terminal blocks, for a redundant power supply.

Installation:

TBE-D5001-HRT-007 is a Termination Board supported by an aluminum shell suitable for installation on EN/IEC60715 TH 35 DIN-Rail. TBE-D5001-HRT-007 shall only be used to mount one HART® Multiplexer Modem 5700 series.
TBE-D5001-HRT-007 unit can be mounted with any orientation over the entire ambient temperature range.
Electrical connections are the following:

- PWR1, PWR 2, RS485-1, RS485-2: polarized removable screw terminal blocks for conductors up to 2.5 mm² (13 AWG) with a torque of 0.5-0.6 Nm.
- J301-J304, J501-J504: polarized fixed screw terminal blocks for conductors up to 2.5 mm² (13 AWG) with a torque of 0.5-0.6 Nm.
- J202, J203: 10 poles connector with retaining method.

Electrical connection can be plugged in/out into a powered unit without suffering or causing any damage **(for Zone 2 installations check the area to be nonhazardous before servicing)**. Connect only one individual conductor per each clamping point.
Use only cables that are suitable for a temperature of at least 85°C.
Wiring has to be sized according to the current and the length of the cables.
On the section "Termination Board Description" a block diagram identifies all connections.
Installation and wiring must be in accordance to the relevant national/international installation standards (e.g. EN/IEC60079-14 Electrical apparatus for explosive gas atmospheres - Part 14: Electrical installations in hazardous areas (other than mines)), make sure that conductors are well isolated from each other and do not produce any unintentional connection.
The unit shall be installed in an area of not more than pollution degree 2 according to EN/IEC60664-1. When installed in EU Zone 2, the unit shall be mounted in a certified Ex enclosure that provides a minimum ingress protection of IP54 in accordance with EN/IEC60079-0. When installed in a Class I, Division 2 Hazardous Location, the unit shall be mounted in a supplemental enclosure that provides a degree of protection not less than IP54. The enclosure must have a door or cover accessible only by the use of a tool.
Units must be protected against dirt, dust, extreme mechanical (e.g. vibration, impact and shock) and thermal stress, and casual contacts. If enclosure needs to be cleaned use only a cloth lightly moistened by a mixture of detergent in water.
Any penetration of cleaning liquid must be avoided to prevent damage to the unit.
Any unauthorized card modification must be avoided.
According to EN/IEC61010, TBE-D5001-HRT-007 unit must be connected to SELV or PELV supplies.
All circuits connected to TBE-D5001-HRT-007 unit must comply with the overvoltage category II (or better) according to EN/IEC60664-1.

Technical Data:

General:

Number of positions: 1 x HART® Multiplexer Modem 5700 series
Maximum number of channels: 32 on a single board, extendable to 256 with 8 boards and 1 HART® Multiplexer Modem 5700 series. Up to 16128 smart devices in full topology with 504 boards and 63 HART® Multiplexer Modem 5700 series.

Supply:

24 Vdc nom (20 to 30 Vdc), reverse polarity protected, double terminal blocks for redundant power supply, with OR diodes to mix supply voltages.
Current consumption: 45 mA @ 24 Vdc with full topology (8 boards), typical.
Connection: by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm².
Protection fuse: 2 A time lag.

HART Interface:

Connection: 32+32 screw terminal blocks to accommodate terminations up to 2.5 mm².
Channel-to-channel isolation voltage: 50 V.

Additional TBs Interface:

Connection: 2 x flat cable 10 poles male connectors (requires female mating connector).
Cable: flat cables CABF022, CABF023, CABF024.

Compatibility:

CE mark compliant, conforms to Directive:
2014/34/EU ATEX, 2014/30/EU EMC, 2014/35/EU LVD, 2011/65/EU RoHS.
Environmental conditions:
Operating: temperature limits – 40 to + 70 °C, relative humidity max 90 % non condensing, up to 35 °C.
Max altitude: 2000 m a.s.l.
Storage temperature: temperature limits –45 to +80 °C.

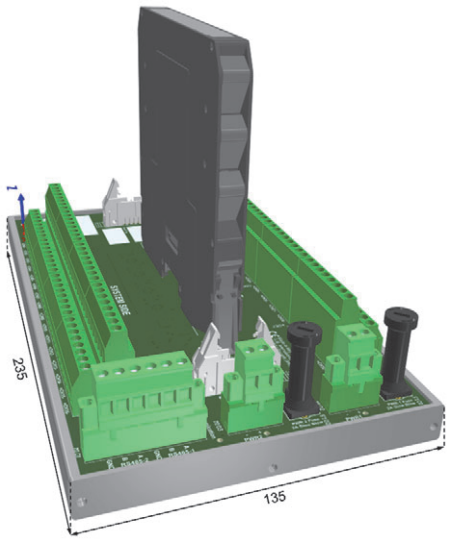
Safety Description:

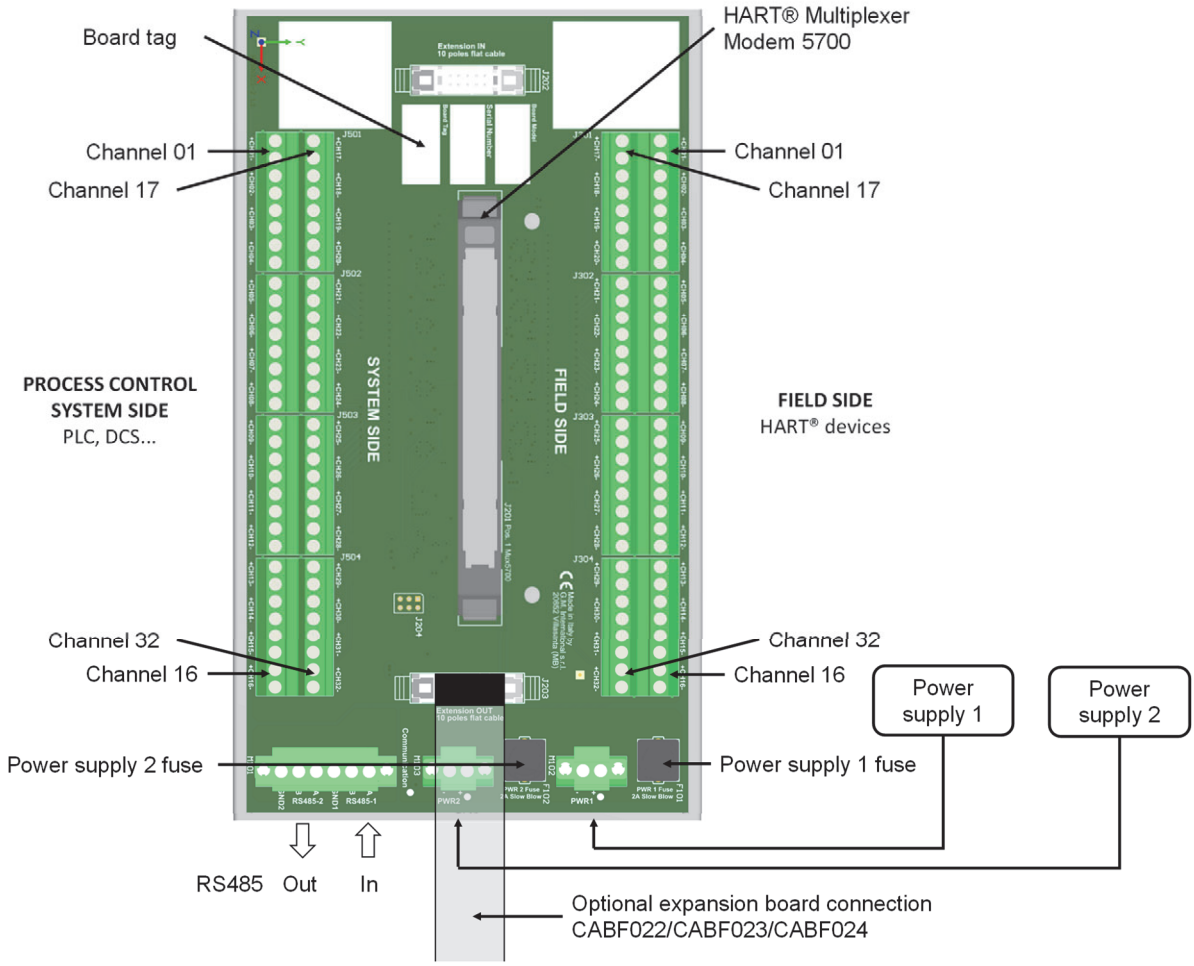
ATEX: II 3G Ex ec IIC T4 Gc
IECEx: Ex ec IIC T4 Gc
UL: NI / I / 2 / ABCD / T4; ***C-UL:*** NI / I / 2 / ABCD / T4
Approvals:
UL 20 ATEX 2492X conforms to EN60079-0, EN60079-7.
IECEx ULD 20.0042X conforms to IEC60079-0, IEC60079-7.
UL & C-UL E222308 conforms to UL 61010-1, UL 61010-2-201 and UL 121201 for UL; CSA C22.2 No.61010-1, CSA C22.2 No.61010-2-201 and CSA C22.2 No. 213 for C-UL.
SIL 3 conforms to IEC61508:2010 Ed.2.

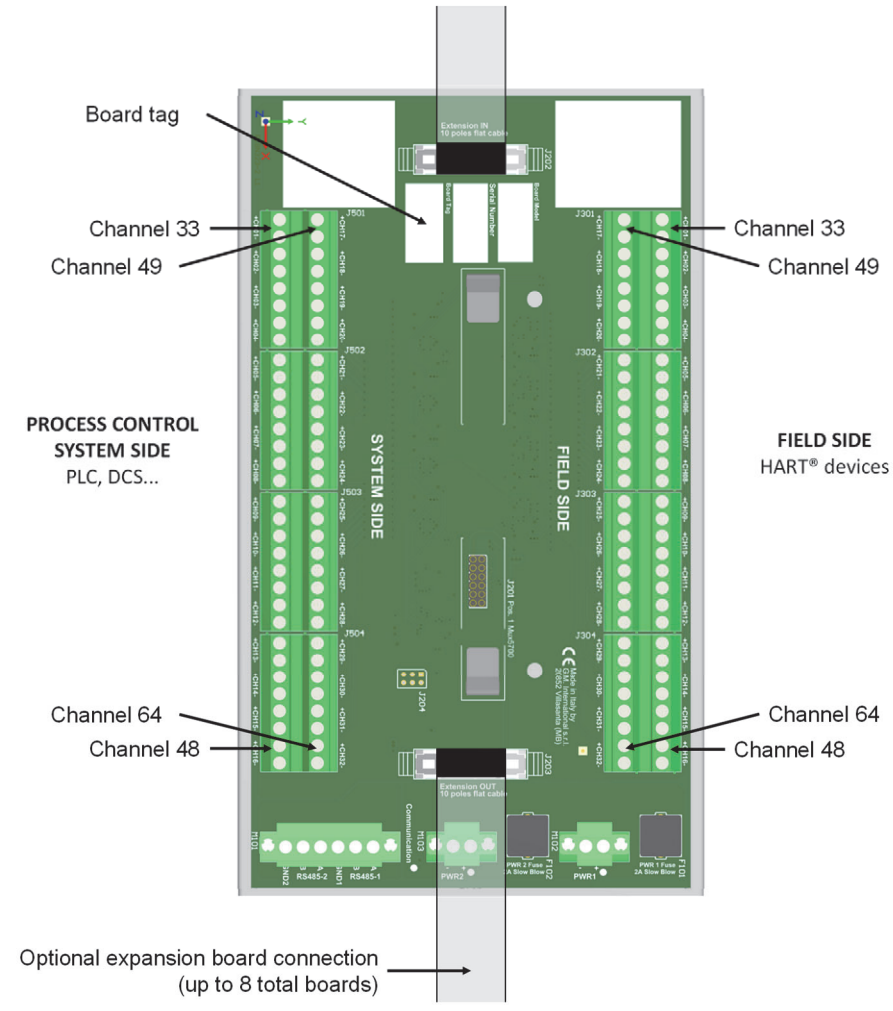
Mounting:

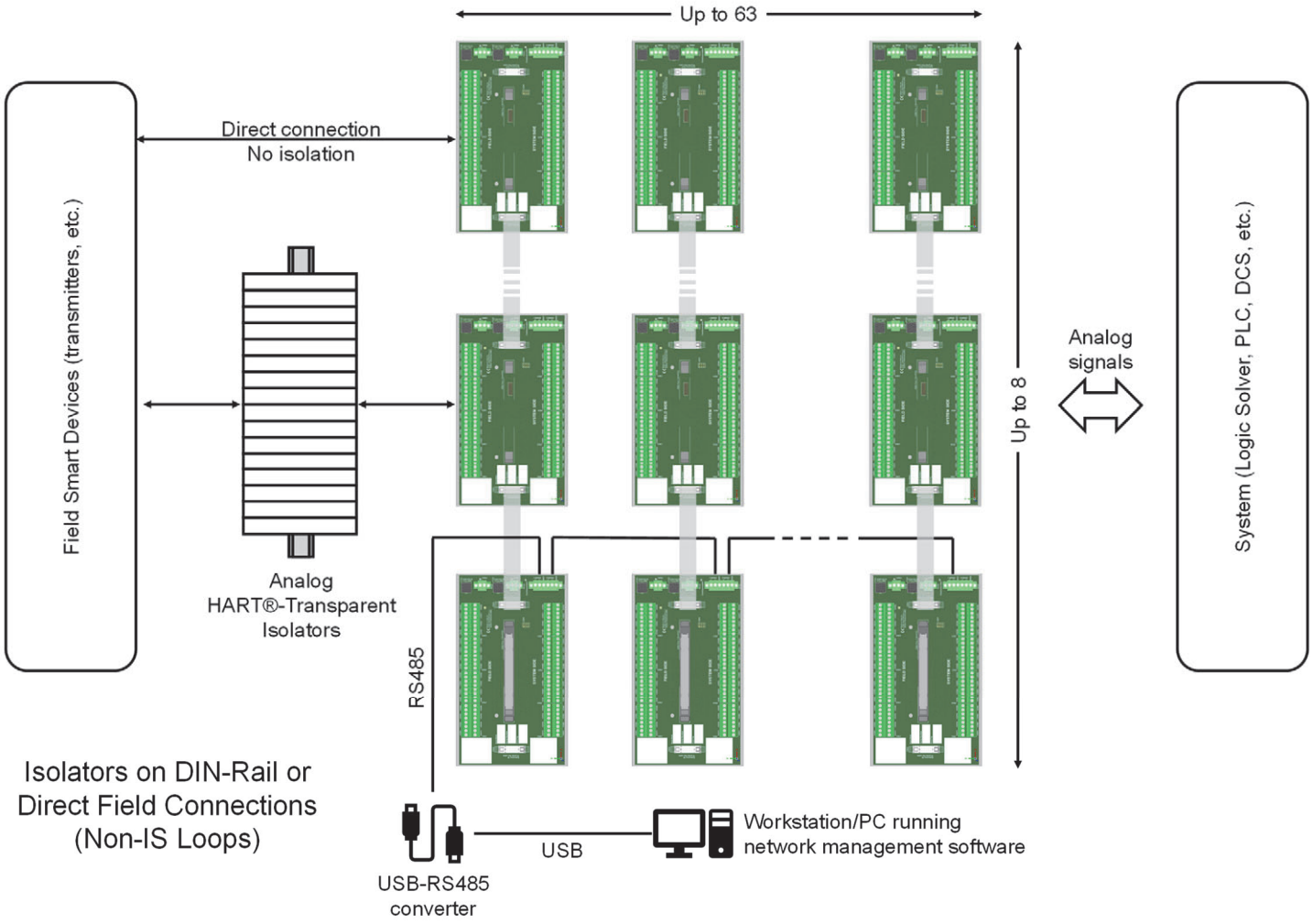
Hardware included for mounting on single DIN-rail 35 mm.
Weight: about 1.08 kg (+ 50 g plastic clips or 380 g metal clips).
Location: installation in Safe Area/Ordinary Location or Zone 2, Group IIC T4, or Class 1, Div. 2, Group A, B, C, D, T4.
Dimensions: Width 235 mm, Depth 135 mm, Height 154 mm.

Image:

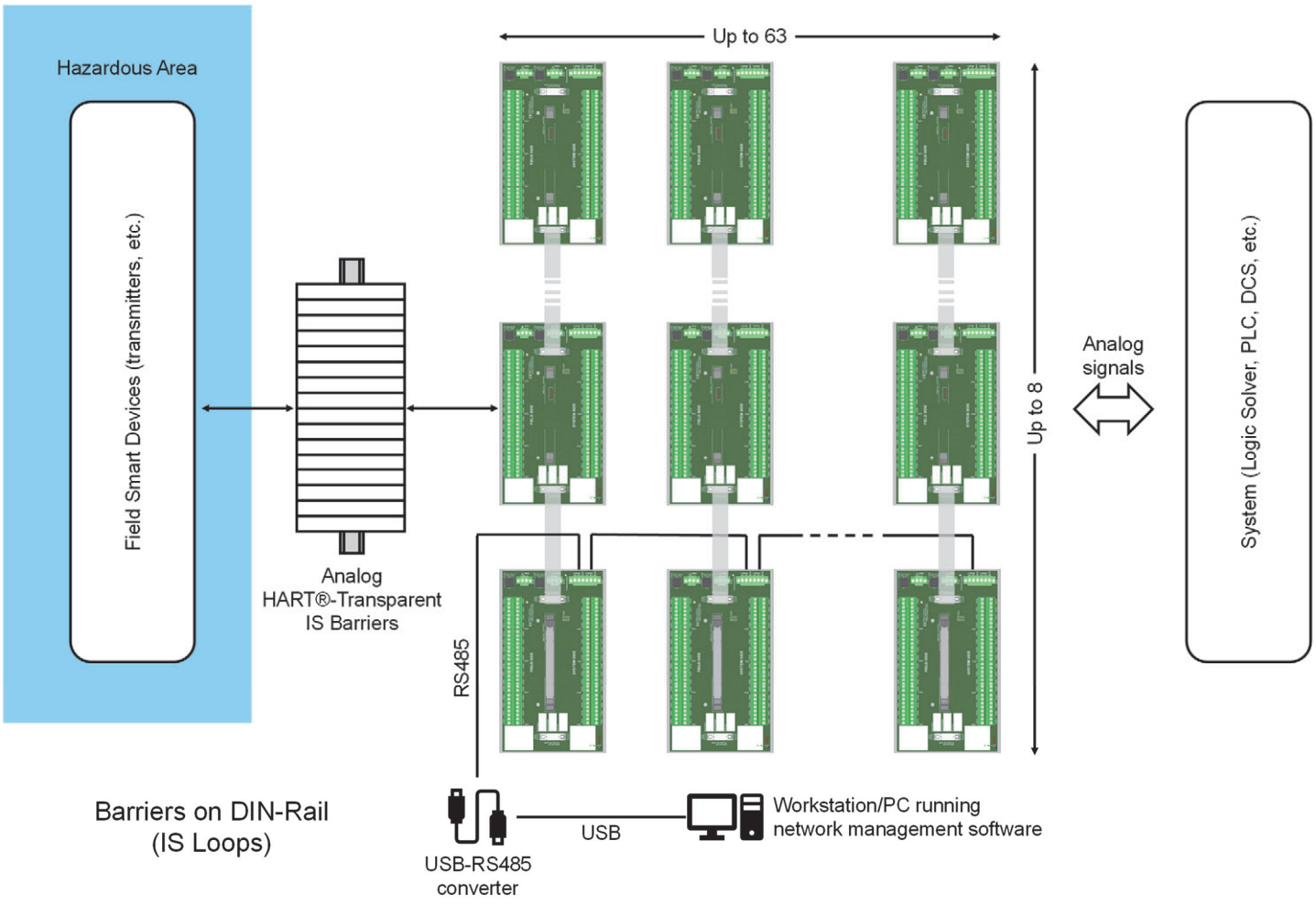



Board tag
HART® Multiplexer
Modem 5700
Channel 01
Channel 17
Channel 01
Channel 17
PROCESS CONTROL
SYSTEM SIDE
PLC, DCS...
SYSTEM SIDE
FIELD SIDE
FIELD SIDE
HART® devices
Channel 32
Channel 16
Channel 32
Channel 16
Power
supply 1
Power
supply 2
Power supply 2 fuse
Power supply 1 fuse
RS485 Out In
Optional expansion board connection
CABF022/CABF023/CABF024


Board tag
Channel 33
Channel 49
Channel 33
Channel 49
PROCESS CONTROL
SYSTEM SIDE
PLC, DCS...
SYSTEM SIDE
FIELD SIDE
FIELD SIDE
HART® devices
Channel 64
Channel 48
Channel 64
Channel 48
Optional expansion board connection
(up to 8 total boards)



Isolators on DIN-Rail or
Direct Field Connections
(Non-IS Loops)



Barriers on DIN-Rail
(IS Loops)