BARTEC

Zone 1/Zone 21/Mining M2

Network technology

User Manual

Ethernet switch and Media converter

Type 07-7382-..../

BARTEC

User Manual - TRANSLATION

Ethernet Switch and Media Converter

Type 07-7382-1*/******

Type 07-7382-23/******

ATEX Zone 1 and Zone 21 and Mining M2

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Reservation: Technical data subject to change without notice. Changes, errors and misprints may not be used as a basis for any claim for damages.

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1. Basic Security Information

1.1 Information on this User Manual

Read carefully before putting the devices into operation.

The User Manual is a fixed part of the product. It must be kept in the direct vicinity of the device and the installation, operating and service staff must have access to it at all times.

The User Manual contains important information, safety instructions and test certificates which are necessary for the perfect function of the device in operation.

The User Manual is directed at all individuals concerned with the assembly, installation, commissioning and servicing of the product. The applicable guidelines and standards for areas with gas and dust atmosphere (99/92/EC, EN 60079-17 and EN 60079-19) must be observed when conducting this work.

Knowledge of the safety and warning information in this User Manual and the strict compliance with it is essential for safe installation and commissioning. Accidents, injuries and material damage can be avoided by circumspect handling and systematically following the instructions.

The figures in this User Manual serve to illustrate the information and descriptions. They are not necessarily completely transferrable and may differ slightly from the actual execution of the device.

Safety and warning information is particularly emphasised in this User Manual and marked by symbols.

DANGER

DANGER describes a directly imminent danger. If not avoided, death or severe injury will be the consequence.

WARNING

WARNING describes a possibly imminent danger. If not avoided, death or severe injury may be the consequence.

CAUTION

CAUTION describes a possibly imminent danger. If not avoided, mild or slight injury may be the consequence.

ATTENTION

ATTENTION describes a possibly damaging situation. If not avoided, the plant or objects in its vicinity may be damaged.

Important information on effective, economic & environmentally compliant handling.

1.1.1 Languages

The original User Manual is written in German. All other available languages are translations of the original User Manual.

The User Manual is available in German and English. If further languages are required, these must be requested from BARTEC or stated on placing an order.

1.1.2 Changes in the Document

BARTEC reserves the right to change the content of this document without notification. No warranty is assumed for the correctness of the information. In cases of doubt, the German safety instructions apply because it is not possible to rule out errors of translation or printing. In the case of legal disputes, the “General Terms and Conditions of Business” of the BARTEC Group also apply.

The current versions of the datasheets, operating instructions, certificates and EC declarations of conformity can be downloaded from www.bartec-group.com under Products and Solutions in the product area “Automation technology” or may be requested directly from BARTEC GmbH.

1.2 Handling the Product

The product described in this User Manual left the factory in a perfect and tested state in terms of safety. To maintain this state and to achieve a perfect and safe operation of this product, it may only be operated in the manner described by the manufacturer. In addition, the perfect and safe operation of this product requires correct transportation, proper storage and careful operation.

The safe and perfect handling of the product is a prerequisite for its perfect and correct functioning.

1.3 Intended Use

1.3.1 Exclusive Purpose

The Ethernet switches and Media converters are permanently installed electrical apparatus. They serve to transmit data through copper or fibre optic cables in hazardous areas.

They are used exclusively in combination with apparatus which meet the requirements set for Overvoltage Category I.

The permissible operating data for the device being used must be observed.

1.3.2 Unintended Use

Any other use is not in accordance with the intended purpose and can cause damage and accidents. The manufacturer will not be liable for any use over and beyond that for the device’s exclusive intended purpose.

1.4 Duties of the Owner / Managing Operator

The owner / managing operator undertakes to permit work with/on the Ethernet switches and Media converters to be done only by people who

- are familiar with the basic regulations regarding safety and accident prevention and have received instructions on the use of these devices,
- have read and understood the documentation, the safety chapter and the warnings.

The operator checks that the safety and accident prevention regulations applicable to the respective case of use have been observed.

1.5 Safety Information

1.5.1 General Safety Information

- Do not dry wipe or clean devices in potentially explosive atmospheres!
- Do not open devices in potentially explosive atmospheres.
- General statutory provisions or guidelines on occupational health and safety, accident prevention provisions and environmental protection laws must be heeded, e.g. German Industrial Health and Safety Ordinance (BetrSichV) and nationally applicable ordinances.
- Use suitable clothing and shoes with respect to the danger of hazardous electrostatic charges.
- Avoid heat influences outside the specified temperature range.
- Protect device from external influences! Do not expose device to caustic/aggressive liquids, vapours or spray. In the event of malfunctioning or damage to the enclosure, turn off the device immediately, remove it from the hazardous area and bring it to a safe place.

1.6 Maintenance

The pertinent erection and operating provisions for electrical systems must be observed! (e.g. Directive 99/92/EC, Directive 94/9/EC, BetrSichV and nationally applicable ordinances EN 60079-14 and the series DIN VDE 0100)!

Observe the national waste disposal regulations when disposing of the devices.

1.6.1 Servicing

No constant servicing will be necessary if operated correctly under consideration of the assembly instructions and environmental conditions. See Chapter “Service, inspection, repair” in this respect.

1.6.2 Inspection

According to EN 60079-17 and EN 60079-19 the operator of electrical systems in potentially explosive atmospheres is obliged to have these inspected by an electrician to ensure correct condition.

1.6.3 Repairs

Repairs to explosion-protected devices may be performed only by authorised personnel with original spare parts and according to the state of the art. The applicable provisions must be observed in this respect. Please consult BARTEC GmbH if you have any questions.

1.6.4 Commissioning

Before commissioning the device, check that all components and documents are there and all connections have been made correctly.

1.7 Protection Type, Test Certificate and Standards

Markings showing Ex protection type and certification are affixed to the Ethernet switches and Media converters. See Chapter 3 “Technical data” with respect to labelling.

Chapter 3 "Technical Data" contains the directives and standards which are relevant for the Ethernet switches and Media converters and concern the use of devices and protective systems for their intended purpose in hazardous areas.

1.8 Warranty

⚠ WARNING

No changes or conversions may be made without the manufacturer’s written consent.

If components other than those specified are used, explosion protection will no longer be assured. It cannot be guaranteed that parts procured from other suppliers have been designed and manufactured in conformance to safety requirements and with the necessary stress tolerance.

▶ Contact the manufacturer and obtain his approval before performing any changes or retrofits. Use only original spare and expendable parts.

The manufacturer shall exclusively assume the complete warranty only for spare parts ordered from him.

Our “General Terms and Conditions of Sale and Delivery” shall apply in principle. These shall be made available to the operator on signing of contract at the latest. Warranty and liability claims in the case of injury and damage to property shall be excluded if they are attributable to one or several of the following causes:

Improper use of the Ethernet switches and Media converters:

- incorrect assembly, commissioning, operation and servicing.
- failure to observe the information in the User Manual with respect to transport, storage, assembly, installation, commissioning, operation and service.
- unauthorised structural changes.
- faulty monitoring of parts subject to wear and tear.
- incorrectly performed repairs.
- cases of disaster through the impact of foreign bodies and force majeure.

We guarantee the Ethernet switches and Media converters for a period of one year starting on the date of delivery from the Bad Mergentheim factory.

This warranty covers all parts of the delivery and shall be restricted to the free replacement or repair of the defective parts in our Bad Mergentheim factory. For this purpose, any packaging supplied must be kept where possible. In the case of warranty, the goods must be returned to us after written agreement. There shall be no claim to repair at the sight of erection.

The versions, components, monitors and windows shown in this User Manual are merely examples and may deviate from the actual display.

The information contained here refers to the explosion-proof version of the Ethernet switches and Media converters in the BNT series types 07-7382-1***/**** and 07-7382-23**/****.

This User Manual contains all the important information on the subject of explosion protection, installation, connection, commissioning and mode of operation.

1.9 Co-Applicable Documents – Set of Documents

- User Manual for the Ethernet Switches and Media converters – The utilisation of the explosion-proof version is described in this User Manual.
- Technical data sheet for the explosion-proof version of the Ethernet switches and Media converters – This technical data sheet contains the most important technical data and general technical data relating to explosion protection.

1.10 Definitions

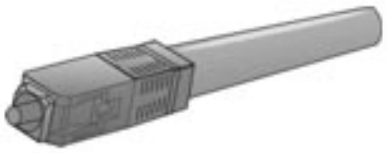
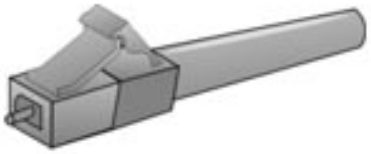
Some abbreviations are used in the documentation.

MC = **M**edia **C**onverter

TX = Copper port

GX2 = Gigabit fibre optic (2 ports)

FO = **F**ibre **o**ptic

ST connector **Straight Tip connector** for fibre optic cables (also known as a BFOC connector [Bayonet Fibre Optic Connector])	
SC connector **S**ubscriber **C**onnector for fibre optic cables	
LC connector **L**ucent **C**onnector – (small-form-factor) for fibre optic cables	

Source file images: wikimedia.org

1.11 Configuration

The following configurations are covered in this manual:

Ethernet switches (TX and GX2) and Media converters (MC)

	Copper Gigabit TX / LSA+ (special)	FO ST	FO SC	FO LC	Installation in hazardous areas	Installation in hazardous areas
BNT 1005^{ex}-TX Ethernet Switch	5x	no	no	no	yes	yes
BNT 1003^{ex}-GX2 Ethernet Switch	1x	2x	no	no	yes	yes
BNT 1002^{ex}-MC Media Converter	1x	1x	no	no	yes	yes

2. Product Description

2.1 Ethernet Switch and Media Converter Definitions

The **BNT 1005ex-TX** and **BNT 1003ex-GX2** Ethernet switches and the **BNT 1002ex-MC** series Media converters are used as stationary devices in Equipment Groups I and II hazardous areas.

They transmit optical or electrical data signals with a bandwidth of up to:

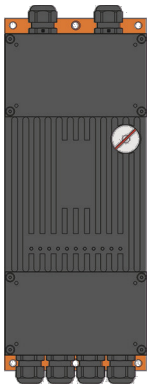
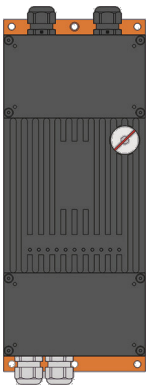
Type		Bandwidth
BNT 1005ex-TX	Ethernet switches	10 Gbit/s
BNT 1003ex-GX2	Ethernet switches	6 Gbit/s
BNT 1002ex-MC	Media converters	2 Gbit/s

The BARTEC Ethernet switches are approved for the following hazardous areas.

- ATEX Zone 1 (Gas explosion protection)
- ATEX Zone 21 (Dust explosion protection)
- ATEX M2 (Mining)

The products are available in two different versions. With an aluminium enclosure for use in ATEX Zone 1 and Zone 21 and in a stainless-steel enclosure for use in the ATEX Zone 1 and Zone 21 and ATEX M2 areas.

Illustration: Ethernet switch in an aluminium enclosure

	Network specifications	Features
Ethernet Switch BNT 1005ex-TX 	– Unmanaged switch – Fully IEEE 802.3, 3u and 3ab compliant – 5 x 10/100/1000BaseT-connections – Full/half duplex operation – Up to 10 Gbit/s data throughput – Auto-sensing – Supports up to 4,000 MAC addresses – Store-and-forward technology – LED display: link/activity – Main device: N-TRON 1005TX	– Direct installation in ATEX Zone 1 and Zone 21 and ATEX M2 – No need for any additional Ex-proof enclosure – No additional power supply required – Additional devices can be connected easily – Jumbo frame support – Full functionality of the basic product – Range max. 100 m
Ethernet Switch BNT 1003ex-GX2 	– Unmanaged switch – Fully IEEE 802.3, 3u, 3z and 3ab compliant – 1 x 10/100/1000BaseT-Connection and 2 x 1000BaseSX Multi Mode FO – ST connector – Full/half duplex operation – Up to 6 Gbit/s data throughput – Autosensing – Supports up to 1.024 MAC addresses – Store-and-forward technology – LED Display: link/activity – Main device: N-TRON 1003GX2	– Direct installation in ATEX Zone 1 and Zone 21 and ATEX M2 – No additional Ex-proof enclosure required – No additional power supply required – Additional devices can be connected easily – Jumbo frame support – Full functionality of the basic product – Range max. 550 m
Media Converter BNT 1002ex-MC 	– Unmanaged switch, Media converter – Fully IEEE 802.3, 3u, 3z and 3ab compliant – 1 x 10/100/1000BaseT-Connection and 1 x 1000BaseSX Multimode FO – ST connector – Full/half duplex operation – Up to 2 Gbit/s data throughput – Autosensing – Supports up to 1.024 MAC addresses – Store-and-forward technology – LED Display: link/activity – Main device: N-TRON 1002MC	– Direct installation in ATEX Zone 1 and Zone 21 and ATEX M2 – No additional Ex-proof enclosure is required – No additional power supply required – Additional devices can be connected easily – Jumbo frame support – Full functionality of the basic product – Range max. 550 m

Unmanaged Switch

An "unmanaged switch" does not support any configuration interface or options. The "unmanaged switch" is plug & play and needs only to be connected to the computer or other network devices. The “unmanaged switch” is a good alternative if advanced applications are not necessary.

2.2 Operation

The Ethernet switches and Media converters are permanently installed electrical apparatus. Their intended purpose is the transmission of optical or electrical data signals inside hazardous areas.

They are used exclusively in combination with apparatus which meet the requirements set for Overvoltage Category I.

The **BNT 1005^{ex}-TX, BNT 1003^{ex}-GX2 and BNT 1002^{ex}-MC Ethernet switches** and **Media converters** are modified for use in the following hazardous areas:

– ATEX Zones 1 and 2
– ATEX Zones 21 and 22
– ATEX M2

The **BNT 1005^{ex}-TX, BNT 1003^{ex}-GX2 and BNT 1002^{ex}-MC Ethernet switches** and **Media converters** must **not** be used in the following zones:

– ATEX Zone 0
– ATEX M1

3. Technical Data

3.1 Explosion Protection

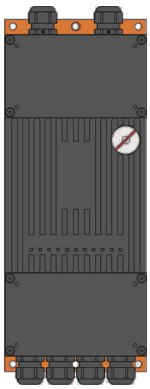
ATEX Zone 1 / 21	
Type 07-7382-1xx1/0000	BNT 1005ex-TX
Ex protection Zone 1	⟨Ex⟩ II 2G Ex eb qb IIC T4
Ex protection Zone 21	⟨Ex⟩ II 2D Ex tb IIIC T135°C
Type 07-7382-1xx3/0000 07-7382-1xx2/0000	BNT 1003ex-GX2 BNT 1002ex-MC
Ex protection Zone 1	⟨Ex⟩ II 2(1)G Ex eb qb [op is] IIC T4
Ex protection Zone 21	⟨Ex⟩ II 2(1)D Ex tb [op is] IIIC T135 °C
ATEX M2	
Type 07-7382-23x1/0000	BNT 1005ex-TX
Ex protection	⟨Ex⟩ I M2 Ex eb qb I
Type 07-7382-23x3/0000 07-7382-23x2/0000	BNT 1003ex-GX2 BNT 1002ex-MC
Ex protection	⟨Ex⟩ I M2 (M1) Ex eb qb [op is] I
Certificate	IBExU 13 ATEX 1131
Standards	EN 60079-0:2009 EN 60079-5:2007 EN 60079-7:2007 EN 60079-28:2007 EN 60079-31:2009
Directive ATEX EMV	 94/9/EG 2004/108/EG
Product labelling	CE 0044

3.2 Other Applicable Standards

Electromagnetic Compatibility (EMC)	
EN 61000-6-2:2005 + AC:2005	Part 6-2: Generic standard – Immunity for industrial environments
EN 61000-6-3:2007 + A1:2011	Part 6-3: Generic standard - Emission standard for residential, commercial and light-industrial environments

3.3 Ethernet Switch / Media Converter

3.3.1 BNT 1005ex-TX

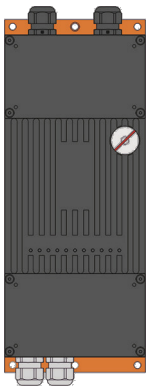


Main device	N-TRON 1005TX
Network specifications	– Unmanaged switch – Fully IEEE 802.3, 3u and 3ab compliant – 5 x 10/100/1000BaseT connections – Full/half duplex operation – up to 10 Gbit/s data throughput – Auto-sensing – supports up to 4,000 MAC addresses – Store-and-Forward technology – LED display: Link/Activity
Operating temperature	-40 °C to +80 °C -40 °F to +176 °F
Storage temperature	-40 °C to +70 °C -40 °F to +158 °F
Air humidity	10 to 90 % non-condensing
Dimensions in mm/inch (height x width x depth)	140 x 380 x 56 mm 5.5 x 14.96 x 2.2 inch
Weight **Zone 1 / Zone 21** **M2**	Depending on the version and configuration approx. 4.5 kg approx. 9.92 lb approx. 7.2 kg approx. 15.87 lb
Protection class (EN 60529)	IP64
Power supply	DC: 10 to 30 V, redundant AC: 90 to 253 V, external
Recommended fuse	1 A (time-lag)
Power consumption	P_{max} = 6 W
Connections	5 x Gigabit TX (copper ports) 1 x Power supply
Range	max. 100 m (copper Cat5e)
Average forwarding time	1580 ns
Supported network protocols	EtherNet/IP ProfiNET IO
Enclosure material **Zone 1 / Zone 21** **M2**	 aluminium (AlCuMgPb F37) or stainless-steel (V2A - X 5 CR Ni 18-10) stainless-steel (V2A - X 5 CR Ni 18-10)
Reliability	> 2 million MTBF hours

3.3.2 BNT 1003ex-GX2

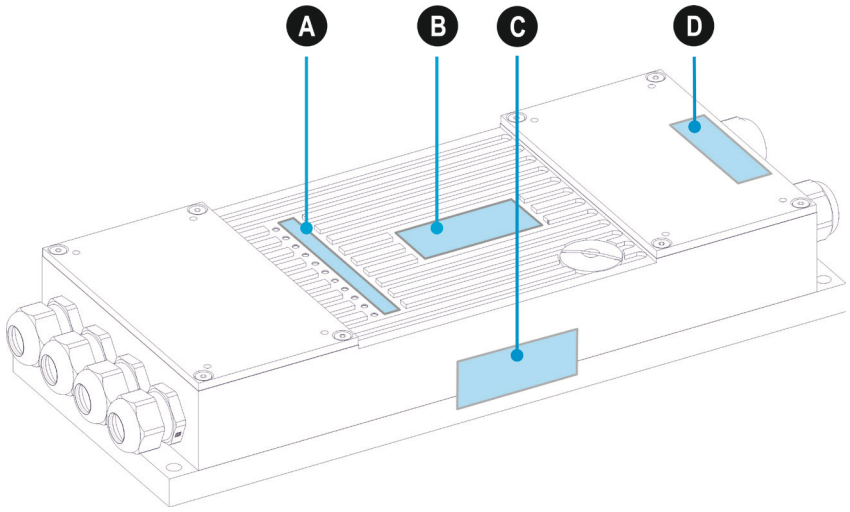
Main device	N-TRON 1003GX2
Network specifications	– Unmanaged switch – Fully IEEE 802.3, 3u, 3z and 3ab compliant – 1 x 10/100/1000BaseT connections and 2 x 1000BaseSX multimode FOC – ST connector – Full/half duplex operation – up to 6 Gbit/s data throughput – Auto-sensing – supports up to 1,024 MAC addresses – Store-and-forward technology – LED display: link/activity
Operating temperature	-40 °C to +80 °C -40 °F to +176 °F
Storage temperature	-40 °C to +80 °C -40 °F to +176 °F
Air humidity	10 to 90 % non-condensing
Dimensions in mm/inch (height x width x depth)	140 x 380 x 56 mm 5.5 x 14.96 x 2.2 inch
Weight **Zone 1 / Zone 21** **M2**	Depending on the version and configuration approx. 4.5 kg approx. 9.92 lb approx. 7.2 kg approx. 15.87 lb
Protection class (EN 60529)	IP64
Power supply	DC: 10 to 30 V, redundant AC: 90 to 253 V, external
Recommended fuse	1 A (time-lag)
Power consumption	P_{max} = 6 W
Maximum optical power	P_{out} = 20 m
Connections	1 x Gigabit TX (copper port) 2 x Gigabit FO ports, ST connector 1 x power supply
Recommended optical fibres	Multi Mode 50/125 µm
Range (applies only to 1000 Mbit/s)	max. 550 m (OF“ST“) with Multi Mode
Average forwarding time	1580 ns
Supported network protocols	EtherNet/IP ProfiNET IO
Enclosure material **Zone 1 / Zone 21** **M2**	 aluminium (AlCuMgPb F37) or stainless-steel (V2A - X 5 CR Ni 18-10) stainless-steel (V2A - X 5 CR Ni 18-10)
Reliability	> 2 million MTBF hours

3.3.3 BNT 1002ex-MC

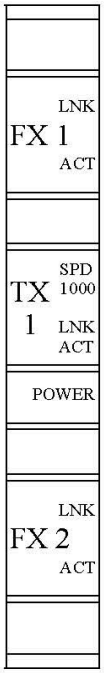


Main device	N-TRON 1002MC
Network specifications	– Unmanaged switch, Media converter – Fully IEEE 802.3, 3u, 3z and 3ab compliant – 1 x 10/100/1000BaseT connections and 1 x 1000BaseSX multimode FOC – ST connector – Full/half duplex operation – up to 2 Gbit/s data throughput – Auto-sensing – supports up to 1,024 MAC addresses – Store-and-Forward technology – LED display: Link/Activity
Operating temperature	-40 °C to +80 °C -40 °F to +176 °F
Storage temperature	-40 °C to +80 °C -40 °F to +176 °F
Air humidity	10 to 90 % non-condensing
Dimensions in mm/inch (height x width x depth)	140 x 380 x 56 mm 5.5 x 14.96 x 2.2 inch
Weight **Zone 1 / Zone 21** **M2**	Depending on the version and configuration approx. 4.5 kg approx. 9.92 lb approx. 7.2 kg approx. 15.87 lb
Protection class (EN 60529)	IP64
Power supply	DC: 10 to 30 V, redundant AC: 90 to 253 V, external
Recommended fuse	1 A (time-lag)
Power consumption	P_{max} = 6 W
Maximum optical power	P_{out} = 20 mW
Connections	1 x Gigabit TX (copper port) 1 x Gigabit FO ports, ST connector 1 x power supply
Recommended optical fibres	Multi Mode 50/125 µm
Range (applies only to 1000 Mbit/s)	max. 550 m (FO “ST“) with Multimode
Average forwarding time	1580 ns
Supported network protocols	EtherNet/IP ProfiNET IO
Enclosure material **Zone 1 / Zone 21** **M2**	 aluminium (AlCuMgPb F37) or stainless-steel (V2A - X 5 CR Ni 18-10) stainless-steel (V2A - X 5 CR Ni 18-10)
Reliability	> 2 million MTBF hours

3.4 Product Labelling

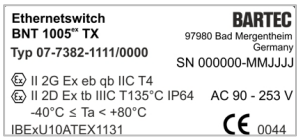


A **LED status display**



B **Type label**

with type number and serial number



C **Seal**

Diese Gehäuse ist werkseitig verschlossen. Nicht öffnen!
This enclosure is factory sealed. Do not open!

D **Warning**

ACHTUNG !
Nicht unter Spannung öffnen
ATTENTION !
Do not open under voltage

4. Transport, Storage and Scope

4.1 Transport

Report any transport damage or incomplete deliveries immediately after receipt in writing to the forwarding company and BARTEC GmbH.

Any damage caused through incorrect storage shall not be covered by the warranty provisions of BARTEC GmbH.

4.2 Storage

ATTENTION

Property damage through incorrect storage!

- ▶ Observe storage temperatures.
- ▶ Keep the Ethernet switches and Media converters away from moisture.

4.3 Scope of Delivery

1 x Ethernet Switch BNT 1005^{ex}-TX or BNT 1003^{ex}-GX2 or
Media Converter BNT 1002^{ex}-MC

1 x User Manual

5. Assembly and Commisioning

Before you assemble the device, make sure that all components and documents exist.

DANGER

Avoid electrostatic charging in potentially explosive atmosphere.
There is a risk of fatal injury in an explosive atmosphere!

- ▶ Do not wipe or clean the devices with a dry cloth.
- ▶ Wear suitable clothing and shoes.
- ▶ Do not use rubber gloves or similar.

DANGER

Unintended use endangers explosion protection.
There is a risk of fatal injury in an explosive atmosphere!

- ▶ Do not make any changes to the Ethernet switch or Media converter.
- ▶ In the event of malfunctioning or damage to the enclosure, turn off the apparatus immediately.

5.1 Requirements in Hazardous (Potentially Explosive) Areas

DANGER

The device is factory-sealed! Always disconnect the terminal compartment from voltage before opening it! There is a danger of death from electrocution and/or a risk of an explosion!

- ▶ Disconnect from the power supply.
- ▶ Secure against unintended reconnection.
- ▶ Verify the absence of voltage.
- ▶ Connect to ground and short-circuit all phases.
- ▶ Cover or safeguard all neighbouring live parts.

1. Ethernet switches and Media converters are installed only in approved Equipment Groups I and II hazardous areas. Permissible Zones are Zones 1 and 21 or Mining M2 depending on the respective version.
2. The Ethernet switches and Media converters must not be opened. Opening is not permissible outisde the hazardous area either and will void the warranty.

3. The user may carry out wiring work only at the terminals which are accessible to him/her (Ex e terminal compartment).
4. Do not use any non-specified components or insert them as replacements or substitutes.
5. The equipotential-bonding connection part must be connected to the equipotential bonding conductor in the hazardous area. Since the intrinsically safe circuits are galvanically connected to earth, equipotential bonding is necessary throughout the entire installation of the intrinsically safe circuits.
6. Protect the Ethernet switches and Media converters from impacts!
7. Do not expose the Ethernet switches and Media converters to any caustic/aggressive liquids, vapours, mists!
8. Avoid the impacts of moisture that exceed the specified levels.
9. Avoid thermal loads that exceed the specified temperature range.
10. The Ethernet switches and Media converters must be mounted so that no objects block the enclosure or obstruct openings.

Outdoor installation

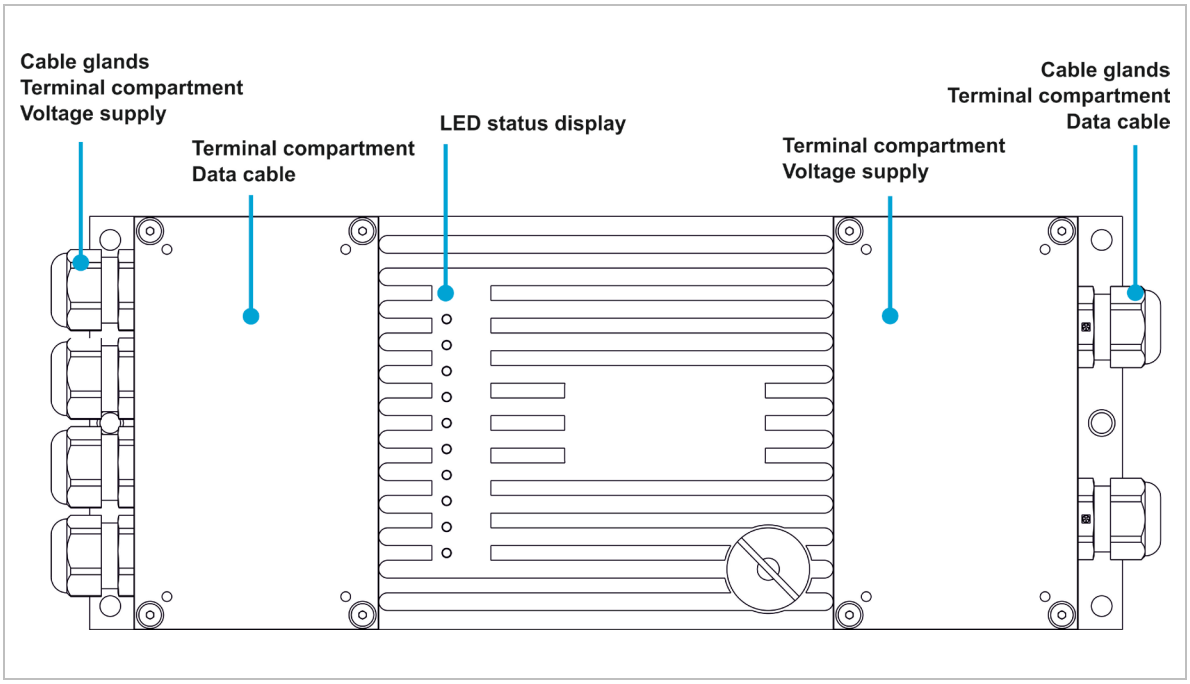
ATTENTION
Damage from condensation or overheating!
▶ Avoid direct sunlight! Remedy e.g. shelter with suffficient air circulation. ▶ Remove condensation on the housing immediately!

5.2 Mechanical Installation

5.2.1 First Steps

- Unpack the Ethernet switch or Media converter and check for damage.
- Attach the enclosure to a suitable mounting place (with protection from falling parts, impacts and vibrations, exposure to the sun's rays, rain).
- Open the terminal compartments and check the sealing for damage.
- Insert the power cable and data cable(s).
- Connect the power cable and data cable in accordance with the connection plan.
- Close the terminal compartment.
- Before switching on, check that all cables are connected and all terminal compartments are closed properly.

5.2.2 Structure (e.g. BNT 1005ex TX)



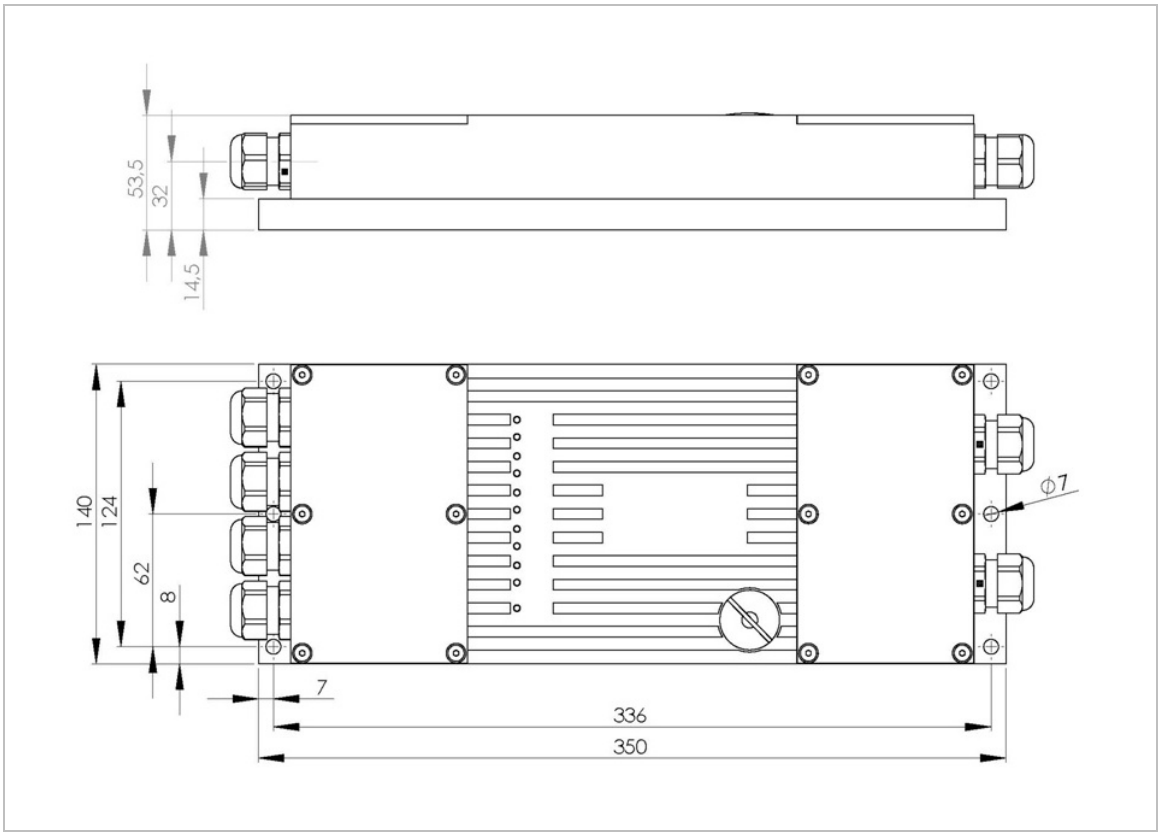
5.2.3 Mounting

The Ethernet switches and Media converters must be mounted securely on a stable supporting surface. Choose a mounting location where the device will not be at risk from falling parts or impacts, and where direct exposure to the sun's rays and rain will be avoided and where it will not be exposed to any vibrations either.

Four boreholes for attachment purposes can be found at the corners of the Ethernet switches and Media converters. The device need not be opened for installation.

- The equipotential-bonding connection part must be connected to the equipotential bonding conductor in the hazardous area. As the intrinsically safe circuits are galvanically connected to earth, the entire installation of the intrinsically safe circuits must be equipotentially bonded.
- It must be possible at all times to disconnect the products from the voltage supply (in the case of a permanent connection by means of an all-pole mains isolating switch or fuse).
- All components must be dry before they are connected to an external power supply.

5.2.4 Drilling Pattern



5.3 Electrical Installation

5.3.1 Terminal Assignment

DANGER

Disconnect the terminal compartment from the voltage supply before opening it!
There is a risk of death from electrocution!

- ▶ Disconnect from the power supply.
- ▶ Secure against unintended reconnection.
- ▶ Verify the absence of voltage.
- ▶ Connect to ground and short-circuit all phases.
- ▶ Cover or safeguard all neighbouring live parts.

ATTENTION

Using a fuse with the wrong rating can cause the fuse to trip!
This can put the device out of operation.

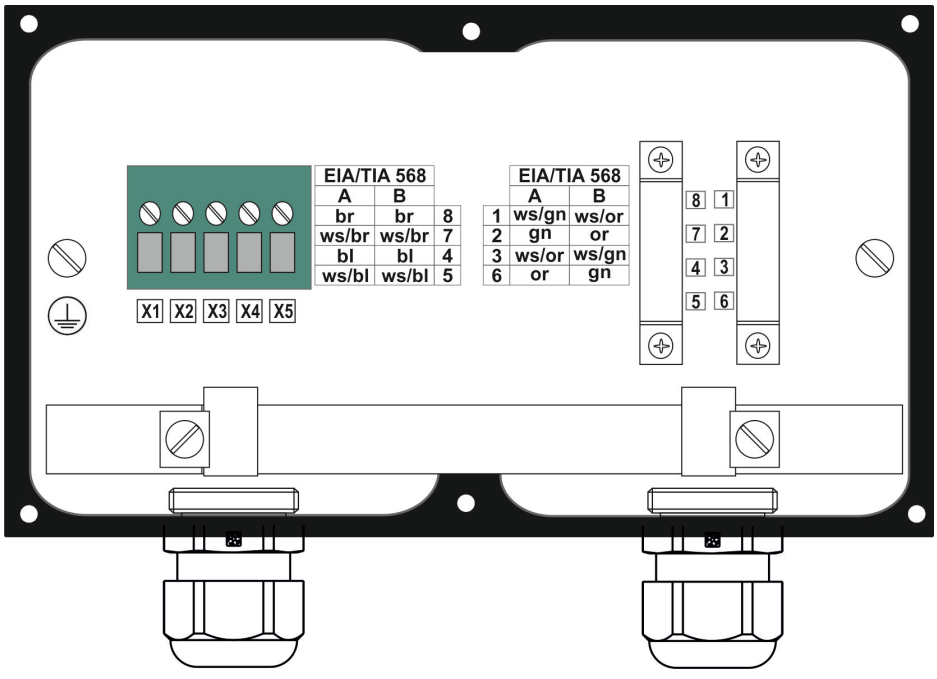
- ▶ Recommended fuse: 1 A time-lag

Two terminal compartments in Ex e version are available for connection.

- Terminal compartment for voltage supply
- Terminal compartment for the data cables

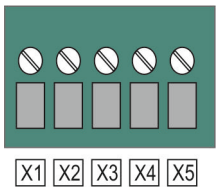
5.4 Terminal Compartment for Voltage Supply

The terminal compartment for the voltage supply is produced in an Ex e version (increased safety).



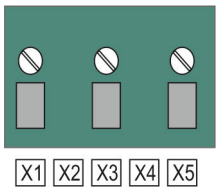
5.4.1 Terminal Assignment DC 24 V, Type 07-7382-xx2x/xxxx

Terminal	Designation
X1	V1 +
X2	V1 -
X3	V2 +
X4	V2 -
X5	PE



5.4.2 Terminal Assignment AC, Type 07-7382-xx1x/xxxx

Terminal	Designation
X1	L
X2	none
X3	N
X4	none
X5	PE



5.4.3 Power Cable

Note on Usage

- Conductor cross-section (flexible) 0.2 - 2.5 mm² / 24AWG-16AWG
- Conductor cross-section (star) 0.2 - 2.5 mm² / 24AWG-16AWG
- Connect 1 core at most per terminal.
- Tightening torque for screws in the terminal compartment max. 0.5 Nm

5.5 Terminal Compartment for the Data Cable

The terminal compartment for the data cable is produced in an Ex e (increased safety) version.

The 10 Mbit/s ports must be connected by means of a Cat3 or higher-quality cable. A twisted pair cable in Cat5 or higher quality must be used to connect 100-1000 Mbit/s ports. Once the connection has been made, the LINK LEDs must light up. Either a straight or crossover cable can be used to connect a port to another switch or router.

ATTENTION

Malfunctioning in the network due to an impermissible connection!

A port-to-port connection on the same switch will create a broadcast storm, which will crash the network!

▶ Do not create a port-to-port connection on the same switch.

ATTENTION

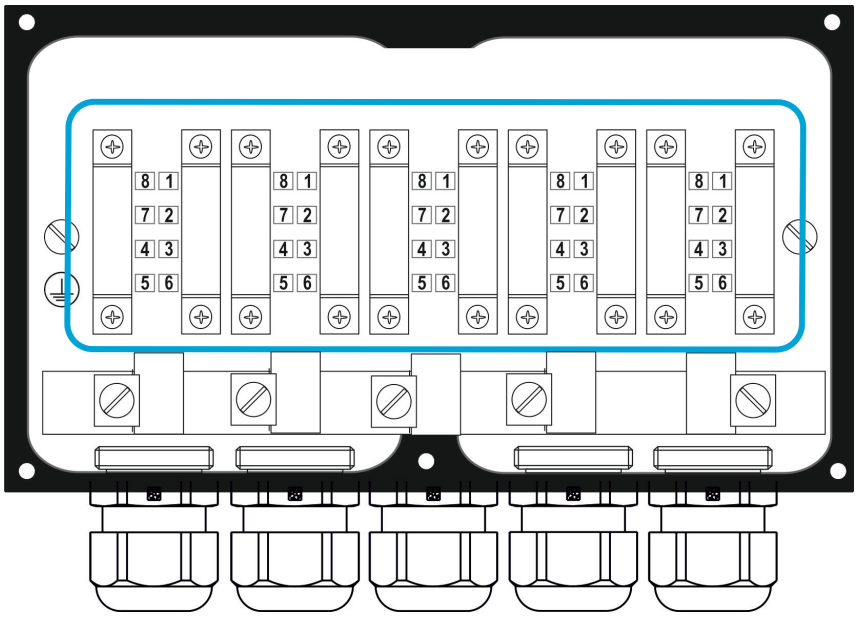
Malfunctioning in the network due to damaged cables!

▶ Use only tools which are specifically suitable for work on network cables.

5.5.1 Terminal Assignment for Ethernet Switches (TX and GX2) and Media Converters (MC)

	Copper gigabit TX / LSA+ (special)	FO ST	FO SC	FO LC	Installation in hazardous areas	Installation in non-hazardous areas
BNT 1005ex-TX Ethernet Switch	5x	no	no	no	yes	yes
BNT 1003ex-GX2 Ethernet Switch	1x	2x	no	no	yes	yes
BNT 1002ex-MC Media Converter	1x	1x	no	no	yes	yes

For channels 1 to 5 (only BNT 1005ex-TX), the following assignment applies:



Terminal	Designation	Colour coding		
		EIA/TIA A	EIA/TIA B	with Siemens cable for PROFINET
8	D3 -	br	br	wh/or
7	D3 +	wh/br	wh/br	or
4	D2 +	br	br	wh/gn
5	D2 -	wh/bl	wh/bl	gn
1	D0 +	wh/gn	wh/or	- - -
2	D0 -	gn	Or	- - -
3	D1 +	wh/or	wh/gn	- - -
6	D1 -	or	gn	- - -

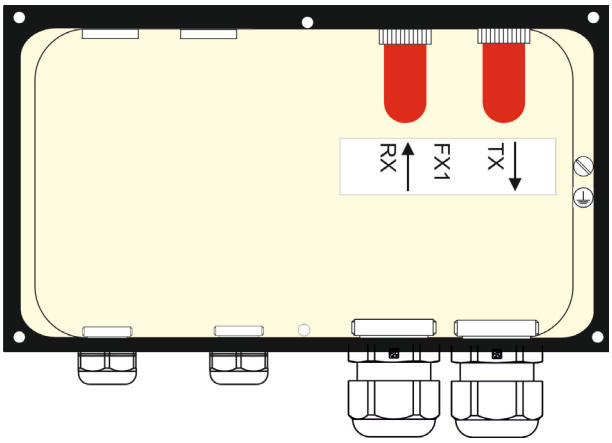
5.5.2 Power Cable

Note on Usage:

- Conductor cross-section (star) 0.4 - 0.64 mm² / 26AWG-22AWG
- Connect at most 1 core per terminal.
- The tightening torque for the retainer clip is 1.2 Nm
- Use a standard commercially available LSA+ insertion tool to connect the copper conductor.

The rubber plug in the cable gland must be cut with a suitable tool to allow the cable to be run through.

5.5.3 Terminal Assignment for the Optical Data Cable for the BNT 1003ex-GX2 and BNT 1002ex-MC

Terminal	Designation	
RX (FX 1)	Rx (Receive Ch 1)	
TX (FX 1)	Tx (Transmit Ch 1)	
RX (FX 2)	Rx (Receive Ch 2)	
TX (FX 2)	Tx (Transmit Ch 2)	

5.5.4 Power Cable – Optical Data Cable

Note on Usage

- Connect the optical interfaces to pre-configured FO cables.
- Compatible with ST connector types
- Recommended fibre type: Multi Mode 50/125 µm

6. Operation

The operator using an electric system in a hazardous environment must keep the accompanying operating equipment in good condition, operate and monitor it correctly, and conduct the required maintenance and repair. Before commissioning the devices, check that all components and documents are there.

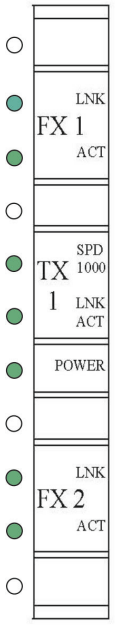
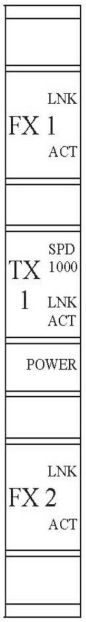
6.1 Network Connection

Unmanaged switches

- do not support any configuration interface
- without exception plug & play
- direct connection to a PC or other network components
- status displayed by means of LEDs

6.2 Mode of Operation of the LEDs

LED	Status	Description
POWER	LED lights up in green	Voltage supply present
	LED off	No voltage supply present
LNK/ACT	LED lights up in green	Connection made, no activity
	LED flashes in green	Connection made, activity
	LED off	No connection made
SPD1000	LED lights up in green	Link with 1000 Mbit/s
	LED off	Link with 10/100 Mbit/s

BNT 1002ex-MC	BNT 1003ex-GX2	BNT 1005ex-GX2
		

6.3 Final inspection

The following aspects must be checked before putting the device into operation:

- ▶ Is the enclosure free of damage?
- ▶ Are all cables connected correctly?
- ▶ Have the cable glands been tightened?
- ▶ Are the sealings for the lid on the terminal compartment in perfect condition?
- ▶ Are the lids on the terminal compartments closed?

6.4 Operation Recommendations and Requirements

- It must be possible at all times to de-energise the products (in the case of fixed connections by means of an all-pole mains isolating switch or fuse)
- All components must be dry before they are connected to an external power supply.

6.4.1 Basic Safety and Health Protection Requirements

Consult your local health and safety officer to ensure that you are acquainted with the safety regulations in your company which serve to protect employees at the work place.

6.4.2 Warnings about Laser Devices

Class 1 Laser devices are not considered to be hazardous when used for their intended purpose.

CAUTION

Laser radiation! Risk of damage to eyesight!

▶ Do not look into the laser beam.

If the limit for eye safety is exceeded, a laser fault will occur and the TX_FAULT output will be activated.

6.5 Handling

The Ethernet switches and Media converters can be damaged from falling objects and/or vibrations which occur at the mounting location.

6.6 Cleaning

We recommend that the devices be cleaned regularly depending on use and also treated with care to ensure smooth and trouble-free operation.

DANGER

There is a danger to life in explosive atmospheres!

▶ Always disconnect the enclosure from the power supply before cleaning it.

▶ When cleaning, observe the company's own safety regulations for work in the hazardous area.

For your own safety and to ensure that the device will operate reliably, take the following precautions:

ATTENTION

Devices can be destroyed if handled inappropriately!

- ▶ In general, disconnect the Ethernet switches and Media converters from the power supply.
- ▶ There must not be any residue, e.g. fluff, clinging to the sealings.
- ▶ There must not be any liquid residue left on the sealings.

6.6.1 Suitable Materials

- Alcohol wipes
- Cotton swabs
- Isopropanol

Enclosure	– with alcohol wipes Disconnect the Ethernet switches and Media converters from the power supply before starting to clean the gaps. – Use cotton cleaning buds dipped in alcohol to remove all grease and dirt deposits in the gaps.
Sealings	Disconnect the Ethernet switches and Media converters from the power supply before starting to clean the sealings. – with alcohol wipes The sealings must be completely dry without any clinging fluff residue before the lid is closed on the terminal compartments again.

7. Faults and Troubleshooting

DANGER

There is a danger to life in hazardous areas!
Take defective devices and accessories out of the hazardous area before starting to examine them.

ATTENTION

Malfunctioning in the network due to an impermissible connection!

A port-to-port connection on the same switch triggers a broadcast storm which causes the network to crash!

▶ Do not create a port-to-port connection on the same switch.

7.1 Troubleshooting

Fault	Possible Cause	Remedy	Reference
Enclosure damaged	Installation incorrect / without protection	Mount the enclosure so that it will not be damaged	>> chapter 5.5
		Return to the manufacturer.	>> chapter 8.3
Moisture in the terminal compart-ment	Incorrect installation	Mount with protection outdoors, e.g. with a roof as protection against rain/sun. Remove condensation water so that it does not penetrate the terminal compartment over the course of time when exposed to the effects of weather. Checks sealings.	>> chapter 5.2
	Defective sealings	Return to the manufacturer.	>> chapter 8.3
No power con-sumption	No voltage supply	Check connection to voltage supply.	>> chapter 5.8
	Incorrect voltage connected	Check if it is connected to the correct voltage supply for the respective variant.	>> chapter 5.8
	External fuse tripped	Check fuse. The fuse might have had the wrong rating.	>> chapter 5.9
	Device defective	Return to the manufacturer.	>> chapter 8.3
No connection- / no network trans-mission	Link LEDs do not light up	Check connection to the voltage supply.	>> chapter 5.9
		Check the network cabling: • correct wiring? • for 10 Mbit/s or higher use at least Cat3 or higher • Do not exceed the maximum lead length. • The network speed must be the same at the input and output sides.	>> chapter 5.9
		Check if the ports are wired correctly.	>> chapter 5.9
	Device defective	Return to the manufacturer.	>> chapter 8.3

8. Service, Inspection, Repair

Only trained and qualified personnel may commission and do maintenance work on the Ethernet switches and Media converters! Such personnel is familiar with the installation, assembly, commissioning and operation of Ethernet switches and Media converters, have been instructed about the risks and have the required qualifications for this work by virtue of their occupation.

8.1 Service Intervals

The mechanical state of the device should be regularly checked. The service intervals will depend on the ambient conditions. We recommend that a service be conducted at least once a year. Regular servicing is not necessary if the device is correctly operated in accordance with the installation instructions and under appropriate consideration of the ambient conditions.

⚠ DANGER

Prevent electrostatic charging in potentially explosive atmospheres.
There is a risk of fatal injury in an explosive atmosphere!

▶ Do not dry wipe or clean devices.

8.2 Inspection

According to EN 60079-17 and EN 60079-19 the owner/operator of electrical plants in potentially explosive atmospheres is obliged to have these plants checked by an electrician to ensure that they are in a correct condition.

8.3 Service and Repair Work

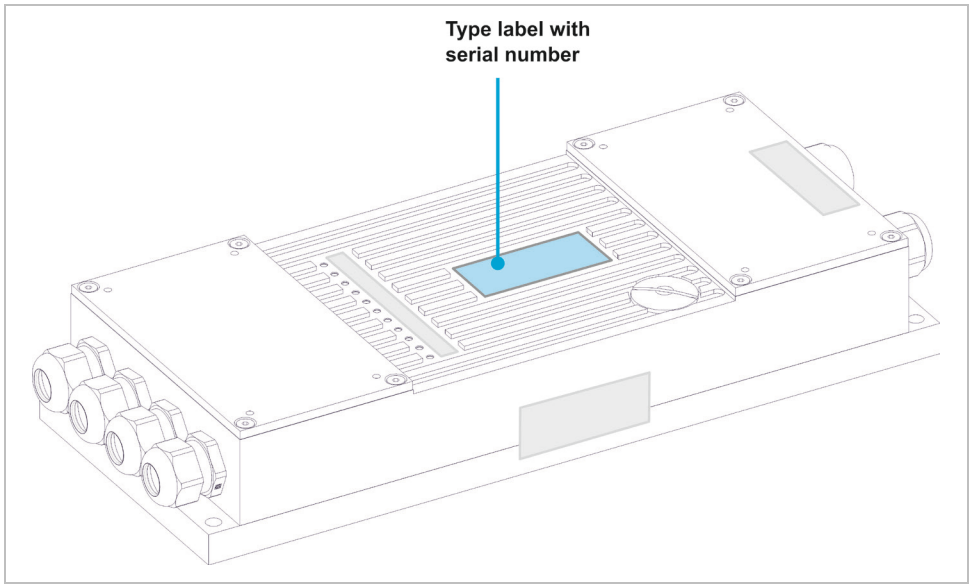
In addition to Directive 99/92/EC, standards EN 60079-17 and EN 60079-19 also apply to the servicing and repair as well as the testing of accompanying operating devices.

Work connected with assembly/dismantling, operation and servicing may only be conducted by trained specialists. All statutory requirements and other binding guidelines on occupational health and safety, accident prevention and environmental protection must be observed.

8.3.1 Information on Sending in for Repairs

The following information is required for the repair.

– Series number of the device (see manufacturer's label)
– Model number or product name (see manufacturer's label)



Please read through the handling guidelines for the RMA process before you send in a defective device for repair. Then complete the RMA form (Return Merchandise Authorization), sign it and send it to our "Returns Centre".

E-Mail: services@bartec.de
Fax: +49 7931 597-119

We cannot guarantee the processing within the contractually agreed period for any returns received by us without RMA number.

The handling guidelines and the RMA form are available for download from our website:

http://www.bartec.de
> Quality and culture
> RMA form

If you have any questions, please send us an e-mail or give us a call.

E-Mail: services@bartec.de
Telephone: +49 7931 597-444

9. Disposal

The Ethernet switches and Media converters contain metal, plastic parts and electronic components.

Our devices are intended as professional electric devices for business use only, referred to as B2B devices under the WEEE-Directive. The WEEE directive sets the framework for waste electric and electronic equipment handling procedures which are to apply throughout the EU. This means that you are not permitted to dispose of this equipment in normal household refuse. It should not be given to the collection sites set up by the public waste management authorities either but instead it should be disposed of in a separate collection in an environmentally sound manner.

Any product we supply can be returned by our customers to us when the time has come to dispose of it. We will ensure that it is disposed of in accordance with the respective applicable statutory regulations.

The sender pays the costs of the dispatch/packaging.

10. Dispatch and Packaging Information

ATTENTION

Sensitive devices! Damage may be caused by incorrect packaging!

▶ Use original packaging for transport.

11. Order Numbers

Selection Chart for ATEX Zone 1 and Zone 21					
Enclosure	**Code no.**	**Power supply**	**Code no.**	**Device**	**Code no.**
Aluminium	**1**	AC 90 V to 230 V	**1**	**BNT 1005ex-TX**	**1**
Aluminium, rugged IP65	**2**			**BNT 1003ex-GX2**	**3**
Stainless steel	**3**	DC 10 V to 30 V, redundant	**2**	**BNT 1002ex-MC**	**2**

Complete order no. 07-7382-1 ☐☐☐ / 0000

Selection Chart for ATEX Mining M2					
Enclosure	**Code no.**	**Power supply**	**Code no.**	**Device**	**Code no.**
Stainless Steel	**3**	AC 90 V to 230 V	**1**	**BNT 1005ex-TX**	**1**
				BNT 1003ex-GX2	**3**
		DC 10 V to 30 V, redundant	**2**	**BNT 1002ex-MC**	**2**

Complete order no. 07-7382-2 ☐☐☐ / 0000

Declaration of Conformity

Ethernet Switch and Media Converter Type 07-7382-1***/**** und 07-7382-23**/****

Erklärung der Konformität
Declaration of Conformity
Attestation de conformité

Nº 01-7382-7C0001

BARTEC
BARTEC GmbH
Max-Eyth-Straße 16
97980 Bad Mergentheim
Germany

Wir	We	Nous
BARTEC GmbH,		
erklären in alleiniger Verantwortung, dass das Produkt	declare under our sole responsibility that the product	attestons sous notre seule responsabilité que le produit
Ethernet Switch	**Ethernet Switch**	**Ethernet Switch**
Typenbezeichnung :	**07-7382-1***/**** 07-7382-23**/****	
auf das sich diese Erklärung bezieht den Anforderungen der folgenden **Richtlinien (RL)** entspricht	to which this declaration relates is in accordance with the provision of the following **directives (D)**	se référant à cette attestation correspond aux dispositions des **directives (D)** suivantes
ATEX-Richtlinie 94/9/EG	**ATEX-Directive 94/9/EC**	**ATEX-Directive 94/9/CE**
EMV-Richtlinie 2004/108/EG	**EMC-Directive 2004/108/EC**	**CEM-Directive 2004/108/CE**
und mit folgenden Normen oder normativen Dokumenten übereinstimmt	and is in conformity with the following standards or other normative documents	et est conforme aux normes ou documents normatifs ci-dessous
EN 60079-0:2009 EN 60079-5:2007 EN 60079-7:2007	**EN 60079-28:2007 EN 61000-6-2:2005 +AC:2005**	**EN 60079-31:2009 EN 61000-6-3:2007 + A1:2011**
Kennzeichnung	**Marking**	**Marquage**
Typ: 07-7382-1*/****	**⟨Ex⟩ II 2(1)G Ex eb qb [op is] IIC T4 ⟨Ex⟩ II 2(1)D Ex tb [op is] IIIC T135°C**	
Typ: 07-7382-23/****	**⟨Ex⟩ I M2(M1) Ex eb qb [op is] I**	

Page 1 of 2

Erklärung der Konformität
Declaration of Conformity
Attestation de conformité

Nº 01-7382-7C0001

BARTEC
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Germany

Verfahren der EG-Baumusterprüfung / Benannte Stelle	Procedure of EC-Type Examination / Notified Body	Procédure d'examen CE de type / Organisme Notifié
IBExU 13 ATEX 1131 **0637 IBExU, Fuchsmühlenweg 7, 09599 Freiberg, D**		

CE 0044

Bad Mergentheim, den 13.01.2014

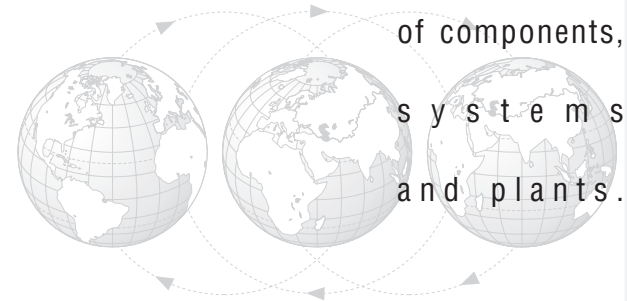
ppa. Ewald Warmuth
Geschäftsleitung / General Manager

Page 2 of 2

► All certifications see www.bartec-group.com

BARTEC

BARTEC protects people and the environment by the safety of components, systems and plants.



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