Description

The Remote I/O-Module ANTARES 16 Digital In-NAMUR is suitable for recording NAMUR encoders and for wired and unwired mechanical contacts.

Its transmission channels are connected conductively to each other.

The module is intended for connection to the RCU ANTARES and to the Remote I/O system ANTARES, which were specially developed for it (see system description).

Within explosion hazardous areas the module may be set up in Zones 1 and 2.

Explosion Protection

ATEX Ex protection type	Ⓔx II 2 (1)G Ex ib [ia IIC/IIB Ga] IIC T4 Gb Ⓔx II (1)D [Ex ia Da] IIIC
Certification	PTB 11 ATEX 2015
CE marking	CE 0044
IECEx Ex marking	Ex ib [ia IIC/IIB Ga] IIC T4 Gb [Ex ia Da] IIIC
Certification	IECEx PTB 11.0055
Ambient temperature range	-20 °C to +60 °C

Safety Data
per transmission channel

U_0 = 9.9 V
I_0 = 11.2 mA
P_0 = 27.7 mW
C_i = negligibly low
L_i = negligibly low

Ex ia IIC:	C_0 =	3.2 µF	L_0 =	20 µH	or
	C_0 =	0.47 µF	L_0 =	100 mH	
Ex ia IIB:	C_0 =	22 µF	L_0 =	10 µH	or
	C_0 =	2.5 µF	L_0 =	100 mH	

Standards
in conformance to Directive 94/9/EC

EN 60079-0:2009	EN 60079-11:2007
EN 61241-0:2006	EN 61241-11:2006
IEC 60079-0:2007-10	IEC 60079-11:2006
IEC 61241-0:2004	IEC 61241-11:2005

in conformance to Directive 2004/108/EC (EMC)

EN 61000-6-2:2005
EN 61000-6-4:2007
EN 55011:2009

Safety Instructions

The Remote I/O Module may be connected and assembled only by qualified personnel who are authorised and trained to assemble electric components in hazardous (potentially explosive) areas. Utilisation in areas other than those specified or the modification of the product by anyone other than the manufacturer will exempt BARTEC from liability for defects or any further liability. The generally applicable statutory rules and other binding directives relating to workplace safety, accident prevention and environmental protection must be adhered to. The Remote I/O Module may be operated only if it is clean and not damaged in any way.

Marking

Particularly important points in these instructions are marked with the following symbols:

Danger! — Non-observance leads to death or serious physical injury. The necessary safety precautions must be taken.

Caution! — Warning of damage to property and financial and penal disadvantages (e.g. loss of guarantee rights, liability claims etc.).

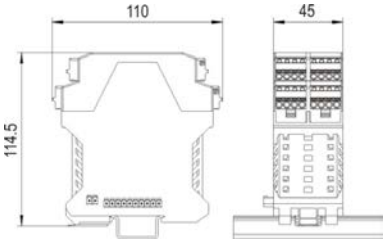
Attention! — Important instructions and information on preventing disadvantageous behaviour.

Note — Important instructions and information on effective, economic and environmentally compatible handling.

Technical Data

Note — More approvals and data are available at www.bartec-group.com

Enclosure material	Polyamide
Type of protection (EN 60 529)	
- Enclosure	IP30
- 10+2 pole plug connectors	IP30, when joined together with RCU ANTARES and its accessories or other Remote I/O Modules ANTARES (see system description for configuration)
Attachment onto mounting rail	TH 35-15 mounting rail DIN EN 60715 (metal, galvanized steel)
Electric connections	plug-in tension spring clamps; 4-pole; up to 2.5 mm²; optional coding and numbering
Dimensions (W x H x D)	45 mm x 110 mm x 114.5 mm



Weight	approx. 490 g
Storage and transport temp.	-25 °C to +85 °C
Relative humidity	5 to 95 % non-condensing
Degree of contamination	2
Vibration (EN 60068-2-6)	2 g/7 mm; 5 Hz - 200 Hz in all 3 axes
Shock (EN 60068-2-27)	15 g, 11 ms in all 3 axes ±3 shocks/direction

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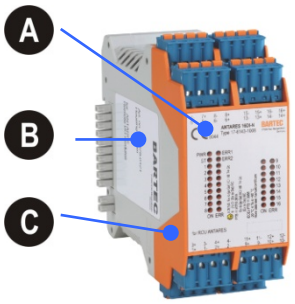
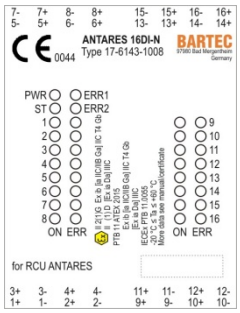
Electric Data

Quantity of channels NAMUR to DIN EN 60947-5-6	16 digital inputs Ex i (short-circuit-proof)	
Galvanic isolation	between inputs and internal bus	
Line break/short-circuit	adjustable for each channel with ANTARES Designer Software	
Sensor supply	8.2 V	
Switching thresholds	damped	<1.2 mA
	not damped	>2.1 mA
	Line break	<0.3 mA
	Short-circuit	>225 Ω

Product Marking Remote I/O Module



A Type Label and Ex Protection



B Module Housing

C Serial Number

Installation and Commissioning

Danger!

If the modules are used in explosion hazardous areas, it is necessary to rule out processes that generate high charge levels or flowing particles in the environment.

Danger!

The ANTARES Remote I/O system must be set up in a Pollution Degree 2 or better environment under DIN EN 60664-1. Make sure there is no condensation on the remote I/O module before installing or operating it.

Caution!

Any work on explosion-protected operating equipment may be done only by authorised persons. Use original parts from BARTEC GmbH always.

Note

When working on electrical systems, the relevant installation and operating regulations must be complied with, such as e.g. Directive 1999/92/EC, Directive 94/9/EC, German Industrial Health and Safety Ordinance (BetrSichV), EN 60079-14, the DIN VDE 0100 series or other applicable national standards and ordinances. The operator of an electrical system in a hazardous environment must keep it in good condition, operate and monitor it properly and do maintenance and repairs.

The Remote I/O Module ANTARES 16DI-N must be placed on the mounting rail with a side spacing of approximately 10 mm from the neighbouring module as shown in Fig. 1. Position the device onto the edge of the DIN rail with upper holding keyway and snap it on the mounting rail. Align it side by side, almost seamlessly, with the neighbouring modules.

The Remote I/O Module ANTARES 16DI-N is connected to the mounting rail by means of a spring-mounted functional ground contact in order to dissipate ESD.

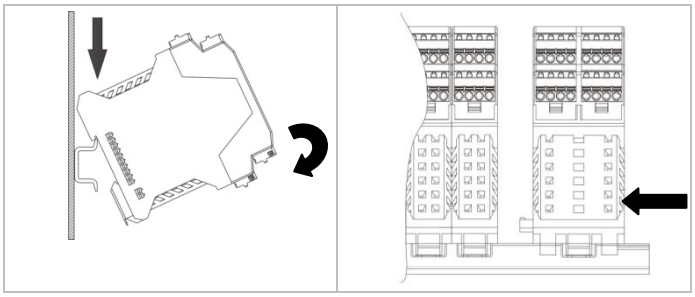


Figure 1

Note

It is essential to select a connection lead that satisfies the thermal and mechanical requirements of the area of application.

Rated connection capacity of the spring clamps

Permissible core cross-sections	
Clamping range single-wire	0.2 mm² - 2.5 mm²
Clamping range fine-stranded	0.2 mm² - 2.5 mm²
Clamping fine-stranded with wire-end ferrule acc. to DIN 46228-1 or DIN 46228-4	0.25 mm² - 2.5 mm²

Supply circuits

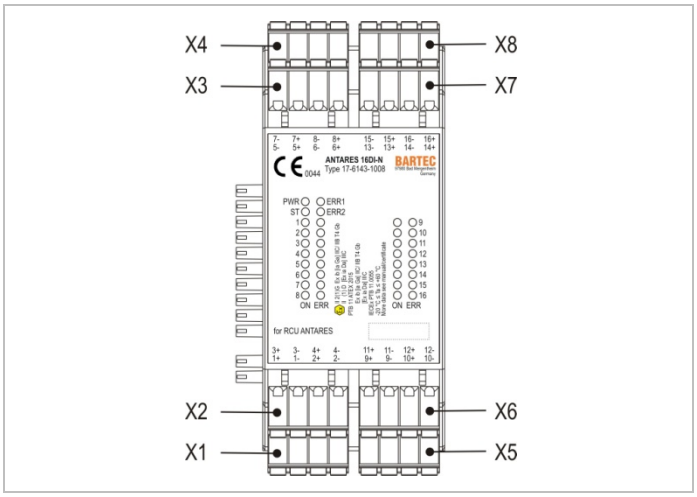
The separately certified RCU ANTARES supplies power to the 10+2-pole plug connector on the side of the Remote I/O Module ANTARES 16DI-N.

Terminals for conductors from external circuits

In the GasEx area, the EN 60079-14 "Explosive atmospheres - Part 14: Electrical installations design, selection and erection" must be observed when connecting the external conductors to the terminals.

In the DustEx area the EN 61241-14 "Electrical apparatus for use in the presence of combustible dust - Part 14: Selection and Installation" must be observed.

The conductors must be connected in accordance with the terminal connection diagram.



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Terminal block	Description	Terminal block	Description
Terminal X4		Terminal X8	
7-	Minus terminal channel 7	15-	Minus terminal channel 15
7+	Plus terminal channel 7	15+	Plus terminal channel 15
8-	Minus terminal channel 8	16-	Minus terminal channel 16
8+	Plus terminal channel 8	16+	Plus terminal channel 16
Terminal X3		Terminal X7	
5-	Minus terminal channel 5	13-	Minus terminal channel 13
5+	Plus terminal channel 5	13+	Plus terminal channel 13
6-	Minus terminal channel 6	14-	Minus terminal channel 14
6+	Plus terminal channel 6	14+	Plus terminal channel 14
Terminal X2		Terminal X6	
3+	Plus terminal channel 3	11+	Plus terminal channel 11
3-	Minus terminal channel 3	11-	Minus terminal channel 11
4+	Plus terminal channel 4	12+	Plus terminal channel 12
4-	Minus terminal channel 4	12-	Minus terminal channel 12
Terminal X1		Terminal X5	
1+	Plus terminal channel 1	9+	Plus terminal channel 9
1-	Minus terminal channel 1	9-	Minus terminal channel 9
2+	Plus terminal channel 2	10+	Plus terminal channel 10
2-	Minus terminal channel 2	10-	Minus terminal channel 10
The Remote I/O Module inputs have a common ground potential			

Shielding for the conductors from the external circuits

Attention!

Connection leads of 25 m or longer requires shielding!
See example for the shielding plan.

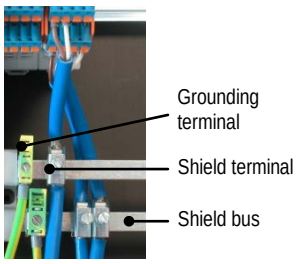

Figure 2

Example of installation:

When shielded conductors are used, one end of the shield must be connected with a large contact area to a shield bus (fig. 2) by means of shield terminals.

The shield bus is connected to the equipotential bonding by means of a grounding terminal 4 mm² (as in fig. 2).

Displays

LED	Colour	Meaning
PWR	GN	Supply ok; goes out if voltage is too low
ST	GN	Data exchange active
ERR1	RD	Communication error
ERR2	RD	Error in the module
ON 1-16	YE	Channel switched on
ERR 1-16	RD	Channel error break/short-circuit

Repairs

Caution!

Only authorised personnel may do any of the repairs on explosion-protected operating equipment. Use only original spare parts from BARTEC GmbH.

Replacement of the ANTARES 16DI-N electronic unit

The ANTARES 16DI-N electronic unit, type 17-6143-1008/01** is a Remote I/O Module without a lower section to the enclosure. The electronic unit is fitted into the lower section of the enclosure (art. no. 05-0078-0121).

Note

The electronic unit can be replaced in an Ex atmosphere without shut down the voltage display (hot-swap see fig. 3-5)

Caution!

Only one electronic unit may be removed at a time when hot swapping, i.e. never pull out two electronic units at the same time.

A defective electronic unit must be replaced by one of the same type only.

The new electronic unit must be installed immediately. The lower section of the enclosure may not remain open!

(1) Use a screwdriver to loosen the plug-in spring clamps (fig. 3).

(2) Loosen the interlocking between the upper section and the lower section (fig. 4).

(3) Raise the electronic unit and take it out of the lower section of the enclosure (fig. 5).

The electronic unit may be touched only on the upper section of the enclosure (see fig. 5)! (ESD danger)

(4) Insert the new electronic unit, whereby the printed circuit boards are pushed into the guide tracks in the lower section of the enclosure until the electronic unit locks into place.

(5) Plug the spring clamps onto the top section of the enclosure.

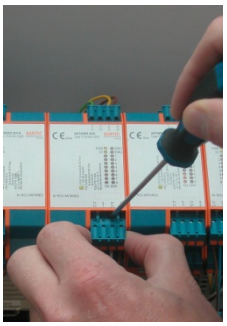
Figure 3


Figure 4

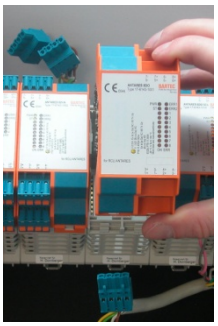
Figure 5

Maintenance

No particular maintenance is required if the device is operated appropriately and the instructions relating to installation and ambient conditions are observed.

Accessories, Spare Parts

Coding pins, labels, etc. are available as accessories (see also BARTEC catalog).

Disposal

The components in the Remote I/O Module contain metal and plastic parts and electronic components.
The statutory requirements for electrical scrap must be observed therefore (e.g. disposal by an approved disposal company).

Order Numbers

ANTARES Remote I/O Module 16DI-N

➡ Type 17-6143-1008/0000

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