

## Description



The Remote I/O Module ANTARES 8 Analog In is suitable for the direct coupling of eight intrinsically safe two-conductor transmitters.

In addition to analog signal transmission, The Remote I/O Module ANTARES 8 Analog In HART offers the possibility of HART communication with the connected transmitters.

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  $\text{Ex}$  II 2 (1)G Ex ib [Ia IIC/IIB Ga] IIC T4 Gb  
 $\text{Ex}$  II (1)D [Ex ia Da] IIIC

Certification PTB 11 ATEX 2017

CE marking  $\text{CE}$  0044

IECEx Ex marking Ex ib [Ia IIC/IIB Ga] IIC T4 Gb  
[Ex ia Da] IIIC

Certification IECEx PTB 11.0059

Ambient temperature range -20 °C to +60 °C (+50 °C)

At ambient temperatures over +50 °C (max. +60 °C) the Remote I/O Module ANTARES 8AI or 8AIH must be operated in conjunction with distance modules art. no. 05-0078-0106.

### Safety Data per transmission channel

$U_0$  = 27.5 V  
 $I_0$  = 87 mA  
 $P_0$  = 598 mW  
 $C_i$  = 6 nF  
 $L_i$  = negligibly low

Ex ia IIC:  $C_0$  = 79 nF  $L_0$  = 0.2 mH or

$C_0$  = 37 nF  $L_0$  = 1.7 mH

Ex ia IIB:  $C_0$  = 666 nF  $L_0$  = 0.1 mH or

$C_0$  = 264 nF  $L_0$  = 16 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.

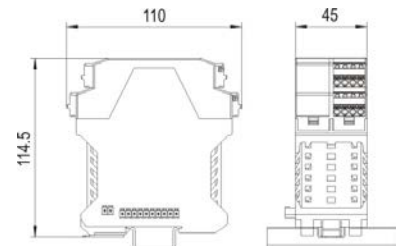
## Technical Data



**Note**

More approvals and data are available at [www.bartec-group.com](http://www.bartec-group.com)

<b>Enclosure material</b>	Polyamide
<b>Type of protection (EN 60 529)</b>	
- 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)
<b>Attachment onto mounting rail</b>	TH 35-15 mounting rail DIN EN 60715 (metal, galvanized steel)
<b>Electric connections</b>	plug-in tension spring clamps; 4-pole; up to 2.5 mm <sup>2</sup> ; optional coding and numbering
<b>Dimensions (W x H x D)</b>	45 mm x 110 mm x 114.5 mm



<b>Weight</b>	approx. 390 g
<b>Storage and transport temp.</b>	-25 °C to +85 °C
<b>Relative humidity</b>	5 to 95 % non-condensing
<b>Degree of contamination</b>	2
<b>Vibration (EN 60068-2-6)</b>	2 g/7 mm; 5 Hz - 200 Hz in all 3 axes
<b>Shock (EN 60068-2-27)</b>	15 g, 11 ms in all 3 axes ±3 shocks/direction

## Electric Data

Quantity of channels	8 analog inputs Ex i / 8 analog inputs Ex i HART (short-circuit-proof)
Galvanic isolation	between inputs and internal bus
Line break/short-circuit	adjustable for each channel with ANTARES Designer Software
Signal range	4 to 20 mA
Signal	min. 0 mA max. 20.5 mA
Short-circuit current	max. 20.8 mA
Input resistance	R <sub>i</sub> = 10 Ω
Resolution	16-bit (15-bit + sign)
Tolerance	±0.1 % of the measuring range final value at +25 °C
Influence of the ambient - temperature	±0.01 %/K of the measuring range final value
Minimum voltage at 20 mA	16 V

## Technical Data Distance-module

The distance module does not have any electronic unit. However, the (mechanical) technical data correspond to those of the Remote I/O modules :

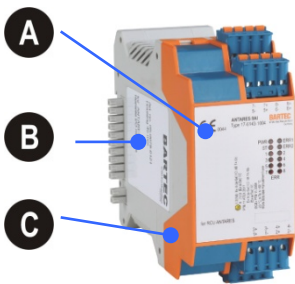


Dimensions (W x H x D)  
22.5 mm x 110 mm x 114.5 mm

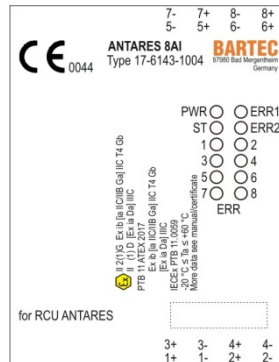
Weight  
approx. ca. 70 g

Without plug-in spring clamps for  
the electric connection.

## Product Marking Remote I/O Module



**A** Type Label and  
Ex Protection e.g. 8AI



**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 (BetSichV), 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 8AI or 8AIH 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 distance module art. no. 05-0078-0106 must be mounted in the same way.

The Remote I/O Module ANTARES 8AI or 8AIH is connected to the mounting rail by means of a spring-mounted functional ground contact in order to dissipate ESD.

## Accessories: Distance module, Art. no. 05-0078-0106



**Danger!**

A distance module (05-0078-0106) is needed on the left and right of the Remote I/O Modules ANTARES 8AI and 8AIH!



**Note**

- Exception: it is not necessary to have any distance module between the Remote I/O Modules ANTARES 8AI/8AIH and a bus end module or an extension module.
- The Remote I/O Modules ANTARES 8AI and 8AIH may be operated without a distance module in the ambient temperature range -20°C to +50°C also.

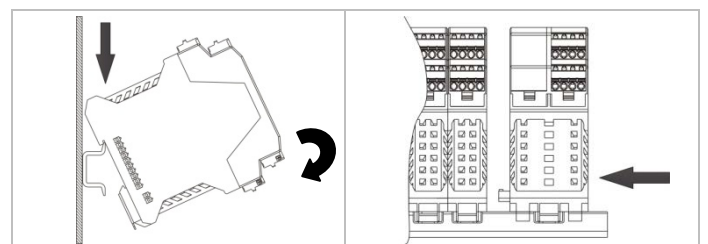


Figure 1



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 mm <sup>2</sup> - 2.5 mm <sup>2</sup>
Clamping range fine-stranded	0.2 mm <sup>2</sup> - 2.5 mm <sup>2</sup>
Clamping fine-stranded with wire-end ferrule acc. to DIN 46228-1 or DIN 46228-4	0.25 mm <sup>2</sup> - 2.5 mm <sup>2</sup>

### Supply circuits

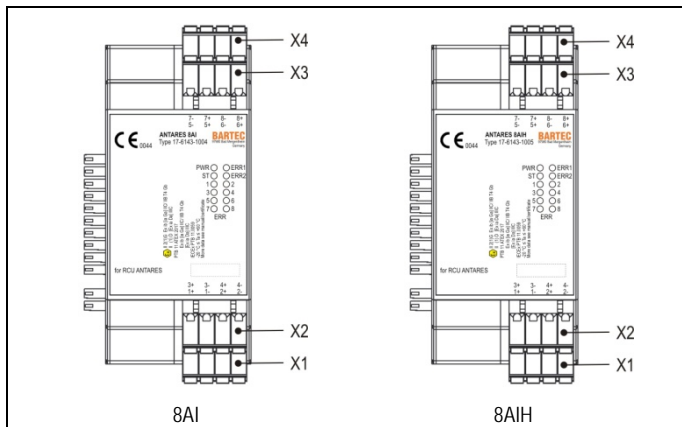
The separately certified ANTARES RCU supplies power to the 10+2-pole plug connector on the side of the Remote I/O Module ANTARES 8AI or 8AIH.

### 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.



Terminal block	Terminal	Description
X4	7-	Minus terminal channel 7
	7+	Plus terminal channel 7
	8-	Minus terminal channel 8
	8+	Plus terminal channel 8
X3	5-	Minus terminal channel 5
	5+	Plus terminal channel 5
	6-	Minus terminal channel 6
	6+	Plus terminal channel 6
X2	3+	Plus terminal channel 3
	3-	Minus terminal channel 3
	4+	Plus terminal channel 4
	4-	Minus terminal channel 4
X1	1+	Plus terminal channel 1
	1-	Minus terminal channel 1
	2+	Plus terminal channel 2
	2-	Minus terminal channel 2

The Remote I/O Module inputs have a common ground potential

### Shielding for the conductors from the external circuits



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 mm<sup>2</sup> (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
ERR 1-8	RD	Channel error break/short-circuit

### Repairs



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 8AI or ANTARES 8AIH electronic unit

The ANTARES 8AI electronic unit, type 17-6143-1004/01\*\* or ANTARES 8AIH, type 17-6143-1005/01\*\*, 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).



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



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.

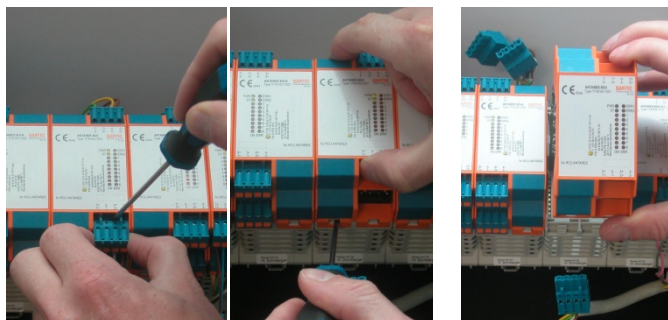


Figure 3

Figure 4

Figure 5

Figures 3-5 without distance modules.

## 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

Distance module, 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 8AI

➔ Type 17-6143-1004/0000

### ANTARES Remote I/O Module 8AIH

➔ Type 17-6143-1005/0000

### Distance Module

➔ Art. no. 05-0078-0106

## Service Address

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