

PSSu WR S IDN

pilz

Programmable control systems PSS®

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Suggestions and comments for improving this documentation will be gratefully received.

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1.1 Validity of documentation

This documentation is valid for the **PSSu WR S IDN** module. It is valid until new documentation is published.

Please also refer to the following documents:

- ▶ PSSuniversal System Description
- ▶ PSSuniversal Installation Manual

This operating manual explains the function and operation of the programmable safety system, describes the installation and provides guidelines on how to connect the product **PSSu WR S IDN**.

Using the product **PSSu WR S IDN**:

Remote station to connect the PSSuniversal system to **InduraNET p** for standard data

1.1.1 Retaining the documentation

This documentation is intended for instruction and should be retained for future reference.

1.2 Overview of documentation

1 Introduction

The introduction is designed to familiarise you with the contents, structure and specific order of this manual.

2 Overview

This chapter provides information on the module's most important features.

3 Safety

This chapter must be read as it contains important information on intended use.

4 Function Description

This chapter describes the module's individual components.

5 Installation

This chapter explains how to install the module.

6 Interfaces

This chapter describes the module's interfaces.

7 Operation

This chapter explains the display elements and advises on what to do if a fault occurs.

8 Technical Details

1.3 Definition of symbols

Information in this manual that is of particular importance can be identified as follows:



DANGER!

This warning must be heeded! It warns of a hazardous situation that poses an immediate threat of serious injury and death and indicates preventive measures that can be taken.



WARNING!

This warning must be heeded! It warns of a hazardous situation that could lead to serious injury and death and indicates preventive measures that can be taken.



CAUTION!

This refers to a hazard that can lead to a less serious or minor injury plus material damage, and also provides information on preventive measures that can be taken.



NOTICE

This describes a situation in which the unit(s) could be damaged and also provides information on preventive measures that can be taken.



INFORMATION

This gives advice on applications and provides information on special features, as well as highlighting areas within the text that are of particular importance.

1 Introduction

2.1 Scope of delivery

The **PSSu WR S IDN** module is supplied with a chip card for storing the configuration data. Additional chip cards are available as an accessory.

An antenna is required in order to operate the module. Two antenna types are available:

- ▶ For remote and base stations:
PSS ANT 1 IDN
- ▶ For base stations only:
PSS ANT 2 IDN



CAUTION!

The radio approval will be rendered invalid if a third-party antenna is used.

- ▶ InduraNET p devices should only be used with the antennas PSS ANT 1 IDN and PSS ANT 2 IDN.

The antenna is supplied with an SMA antenna cable which is 2 m long and has an impedance level of 50 Ohm. A suitable 2 m long extension cable is available as an accessory.

The chip card reader SCR 335 USB with USB cable is available as an accessory.

2.2 Module features

The module has the following features:

- ▶ This module forms the head module of a remote system in **InduraNET p**.
- ▶ Antenna connection for **InduraNET p**
- ▶ Power supply for max. **2.0 A**
 - When the supply voltage is interrupted, the module supply is buffered for 20 ms.
 - Separate infeed for periphery supply
 - Separate infeed for module supply
- ▶ LEDs for:
 - System status
 - **InduraNET p** status
 - USB status
- ▶ Electronic modules that can be used for input/output:
 - All digital standard modules
(PSSu E S xD...)

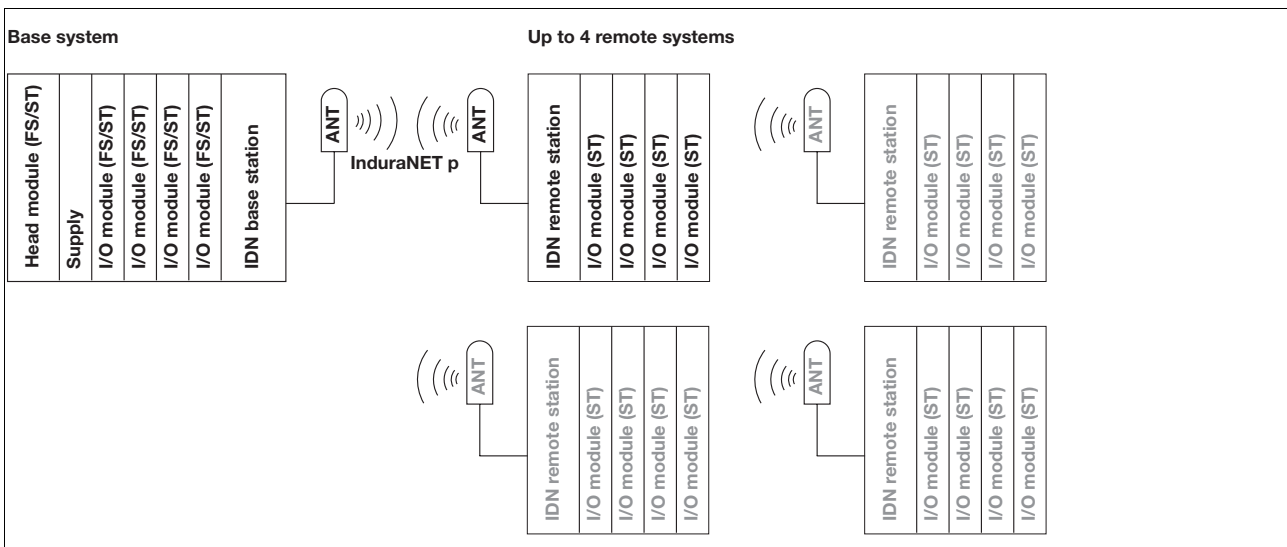
2.3 Features of InduraNET p

InduraNET p enables wireless communication on the PSSuniversal. Data from the standard section is transmitted via radio instead of the module bus. Wireless communication via InduraNET p does not need to be considered in the user program.

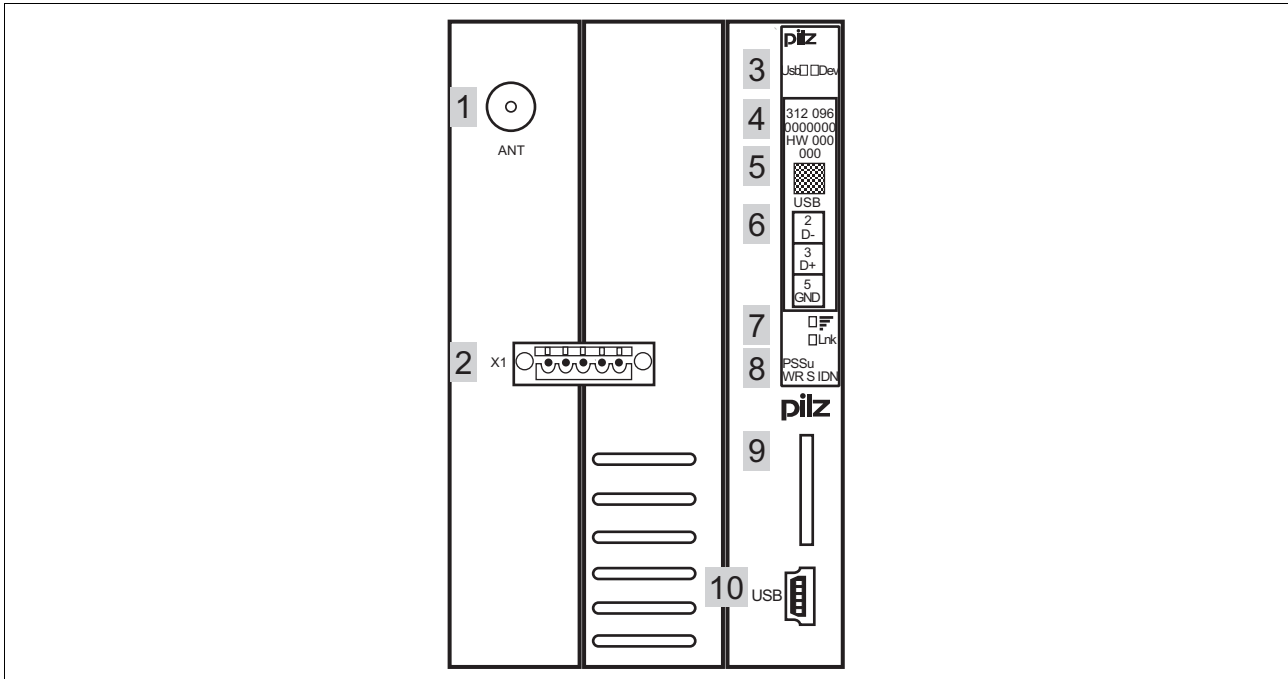
The module bus cycle is recreated in the remote system. This will increase the input/output reaction times of a remote system.

Each InduraNET p device is given an ID, which ensures that all subscribers are uniquely identified. Up to ten InduraNET p networks can coexist within one environment. All the settings for wireless communication are stored within the module on a chip card, which is written via a chip card reader.

Schematic representation of **InduraNET p**



2.4 Front view



Key:

- ▶ 1: Antenna connection (InduraNET p)
- ▶ 2: Combicon plug-in connector X1 to feed in the module supply and periphery supply
- ▶ 3: LEDs for system diagnostics
- ▶ 4: Labelling strip with:
 - Order number
 - Serial number
 - Hardware version number
 - Firmware version number on delivery
- ▶ 5: Field for 2D code
- ▶ 6: Labelling strip with interface configuration of the USB port
- ▶ 7: LEDs for InduraNET p diagnostics
- ▶ 8: Module name
- ▶ 9: Chip card slot
- ▶ 10: USB port (Mini-B)

3.1 Intended use

The module may be used as a remote station in **InduraNET p**, for the wireless communication of ST data. It can be operated with a base station of type PSSu WB S IDN.

The module provides the supply for the module supply and periphery supply within the system.

Intended use includes making the electrical installation EMC-compliant. Please refer to the guidelines stated in the “PSSuniversal Installation Manual”. The module is designed for use in an industrial environment. It is not suitable for use in a domestic environment, as this can lead to interference.

The following is deemed improper use in particular:

- ▶ Any component, technical or electrical modification to the module
- ▶ Use of the module outside the areas described in this manual
- ▶ Use of the module outside the technical details (see chapter entitled “Technical Details”)



INFORMATION

The module is supported by the PSSuniversal Configurator and the PSSuniversal Assistant from Version 1.5.

The module is supported by PSSuniversal head modules from ST Firmware Version 12.

The remote station may be used in conjunction with the base station PSSu WB S IDN. The remote station may be used in conjunction with the following electronic modules:

Module type	Module name
Digital input/output modules	PSSu E S 4DI(-T)
	PSSu E S 4DO 0.5(-T)
	PSSu E S 2DO 2(-T)
Voltage distribution	PSSu E PD(-T)
	PSSu E PD1(-T)

3.1 Intended use

The module's firmware can be updated to a later version using the Firmware Manager on the PSSUniversal Assistant. For the reason, the module's actual firmware version may not always match the firmware version printed on the front of the unit. Updating the firmware can also expand the module's functionality.



INFORMATION

The module's actual firmware version can only be established using the Firmware Manager on the PSSUniversal Assistant.

3.2 Safety regulations

3.2.1 Use of qualified personnel

The products may only be assembled, installed, programmed, commissioned, operated, maintained and decommissioned by qualified personnel. Qualified personnel are people who, because they are:

- ▶ Qualified electrical engineers or
- ▶ Have received training from qualified electrical engineers

are suitably experienced to operate devices, systems, plant and machinery in accordance with the general standards and guidelines for safety technology.

It is the company's responsibility only to employ personnel who:

- ▶ Are familiar with the basic regulations concerning health and safety / accident prevention
- ▶ Have read and understood the safety guidelines given in this description
- ▶ Have a good knowledge of the generic and specialist standards applicable to the specific application.

3.2.2 Warranty and liability

All claims to warranty and liability will be rendered invalid if, among other things:

- ▶ The product was used contrary to the purpose for which it is intended
- ▶ Damage can be attributed to not having followed the guidelines in the manual
- ▶ Operating personnel are not suitably qualified
- ▶ Any type of modification has been made (e.g. exchanging components on the PCB boards, soldering work etc.).

3.2.3 Disposal

The product must be disposed of properly when it reaches the end of its service life.

3.3 Approvals for wireless operation

InduraNET p devices meet the requirements and specifications of the EU directive 1999/5/EU and may be operated in the following European Union countries:

- ▶ Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom

InduraNET p devices may also be operated in the following countries:

- ▶ Andorra, British Virgin Islands, Gibraltar, Greenland, Jersey, Monaco, Montserrat, Netherlands Antilles, Pitcairn, San Marino, Svalbard and Jan Mayen, Vatican City
- ▶ Iceland, Liechtenstein, Norway, Switzerland
- ▶ Australia, Canada, Japan, New Zealand, United States of America

Other countries: On request

3.3 Approvals for wireless operation

3.3.1 European approval

CETECOM ICT Services GmbH
EC Identification Number 0682
 authorized by the German Government



Bundesnetzagentur

BNetzA-bS-02/51-52

to act as Notified Body in accordance with the R&TTE Directive 1999/5/EC of 9. March 1999.

EXPERT OPINION

Registration-No.:	E815229V-EO
Certificate Holder:	Pilz GmbH & Co. KG
	Felix-Wankel-Straße 2 73760 Ostfildern Germany
Product Designation:	PSSu WB S IDN PSSu WR S IDN
Product Description:	Short Range Device - Industrial Wireless Communication System
Product Manufacturer:	Pilz GmbH & Co. KG
	Felix-Wankel-Straße 2 73760 Ostfildern Germany

Essential requirements	Specifications / Standards	Submitted documents	Result
Safety (R&TTE, Article 3.1a)	EN 60950-1:2001, First Edition+A11 :2004	Test Report	conform
EMC (R&TTE, Article 3.1b)	EN 301 489-1 V1.6.1 (2005-09) EN 301 489-3 V1.4.1 (2002-08)	Test Report	conform
Radio spectrum (R&TTE, Article 3.2)	EN 300 328 V1.7.1 (2006-05)	Test Reports	conform

Marking: **The product shall be marked with CE, our notified body number and the Class II identifier (Alert sign) as shown right hand.**

CE 0682 

The scope of this evaluation relates to the submitted documents only.
 The certificate is only valid in conjunction with the following number of annexes.

Number of annexes: **1**

Saarbrücken, 2008-01-29
Place, Date of Issue


 Signed by Frank Mächtsch
Notified Body



CETECOM ICT Services GmbH, Untertürkheimer Straße 6-10, 66117 Saarbrücken, Germany
<http://www.cetecom-ict.de>

3.3 Approvals for wireless operation

Annex 1 of the Certificate „EXPERT OPINION“
Registration no.: E815229V -EO Date: 2008-01-29
Page 1 of 1

Product Characteristics:

- Frequency range : 2400 – 2483.5 MHz
- Output power (EIRP) : ≤ 20 dBm
- Type of modulation : GFSK
- Number of Channels : 75 (one channel selected and allocated during boot process)
- Antenna : External Antenna with SMA connector and 2 m of coax-cable InduraNET p
- Temperature range : -20°C to +55°C
- Power supply : 24 VDC

Conformity Details:

Evaluated test reports	
Requirement	Standard, test report number, date & laboratory
Safety	EN 60950-1:2001, First Edition+A11 :2004 No. : 2-4790-01-08/07 dated 2008-01-29 and issued by CETECOM ICT Services GmbH
FMC	EN 301 489-1 V1.6.1 (2005-09) EN 301 489-3 V1.4.1 (2002-08) -No. : 2-4790-01-09/07 dated 2007-11-19 and issued by CETECOM ICT Services GmbH
Radio spectrum	EN 300 328 V1.7.1 (2006-05) -No. : 2-4790-01-02/07 dated 2007-12-18 and issued by CETECOM ICT Services GmbH -No. : 2-4790-01-03/07 dated 2007-12-18 and issued by CETECOM ICT Services GmbH

3.3 Approvals for wireless operation

3.3.2 FCC approval

FC FCC ID: VT8-IDN02
IC: 7482A-IDN02

Please note the following when operating the device in the USA and Canada:

Installation by professionals only!

This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada. Operation is subject to the following two conditions:

- ▶ (1) This device may not cause harmful interference, and
- ▶ (2) This device must accept any interference received, including interference that may cause undesired operations.

This Class B digital apparatus complies with Canadian ICES-003.

Changes or modifications made to this equipment not expressly approved by Pilz may void the FCC authorisation to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ▶ Reorient or relocate the receiving antenna.
- ▶ Increase the separation between the equipment and receiver.
- ▶ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ▶ Consult the dealer or an experienced radio/TV technician for help.

3.3 Approvals for wireless operation



CAUTION!

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body. The transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

4.1 Module features

4.1.1 Integrated protection mechanisms

The module has the following protection mechanisms:

- ▶ Infeed for module supply
 - Polarity protection
 - Voltage monitoring
 - Transient voltage limitation
- ▶ Module supply
 - Short circuit-proof

The module provides the following diagnostic data:

- ▶ Module status
- ▶ Module error

4.1.2 Remote station in InduraNET p

The module is a remote station in **InduraNET p** and enables the PSSuniversal to be used as a remote system. The remote station is always the first module in a remote systems. The remote station co-ordinates the PSSu module bus on the remote system and exchanges data between the connected I/O modules and an assigned base station in **InduraNET p**.

The module supplies voltage to the modules on the remote system:

- ▶ Supply to the module bus:
 - Module supply supplies itself and subsequent modules (right-hand side)
 - Periphery supply
- ▶ When the voltages are fed separately, the module supply and periphery supply are galvanically isolated. If galvanic isolation is not required, a common power supply may be used for the periphery supply and module supply.

4.2 InduraNET p

Properties of wireless communication

- ▶ Frequency range 2.4 GHz ISM band
- ▶ Strong immunity to signals from other wireless services
- ▶ CFM (Coexistence Frequency Management) guarantees that InduraNET p devices coexist without problem with other radio-based systems.
 - InduraNET p devices do not use non-overlapping WLAN channels.
 - InduraNET p devices do not transmit until they have scanned their frequency range (Listen before Talk).
 - InduraNET p devices switch to free channels in order to avoid collisions.

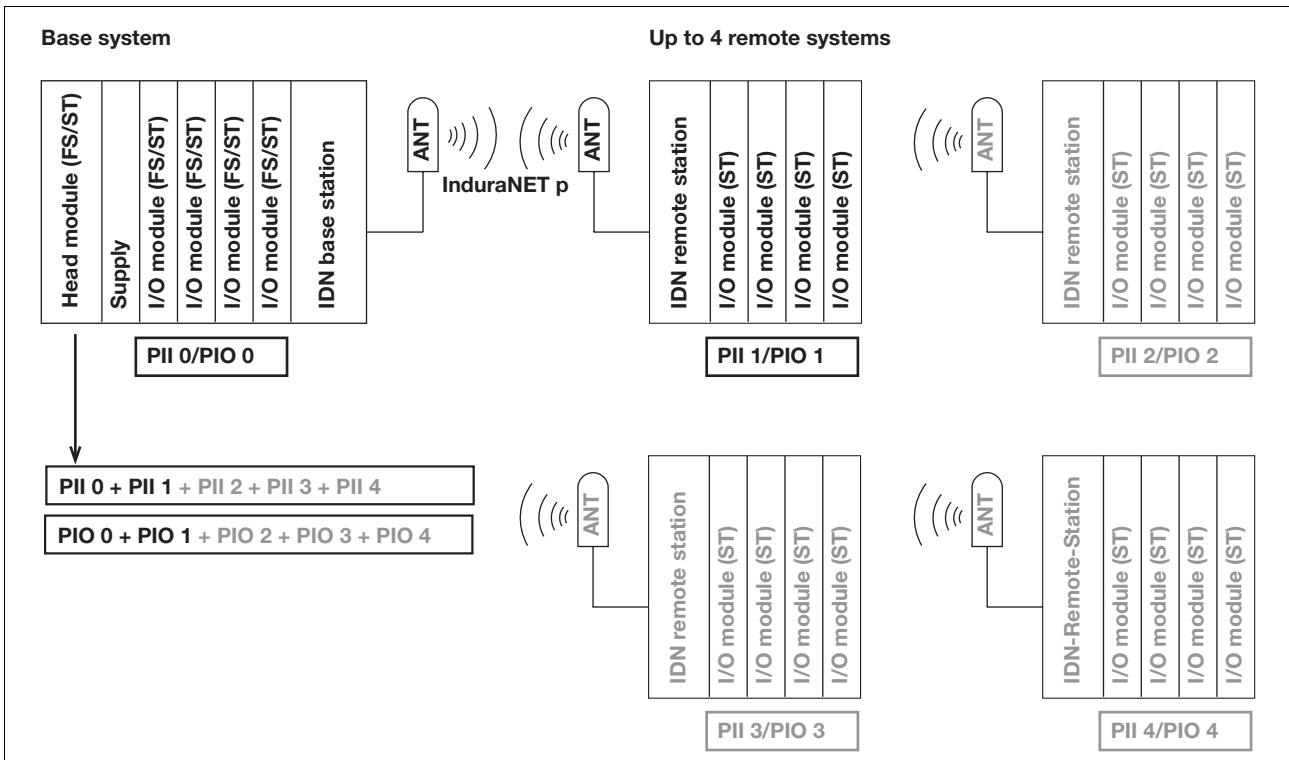
Properties of the antenna

- ▶ The antenna is designed to IP54. It can be installed on a flat surface using one hole mounting.
- ▶ The SMA antenna cable is 2 m long and has an impedance level of 50 Ohm.
- ▶ The max. operating range depends heavily on surface reflection and on the transmissivity of surrounding materials. Approximate guidelines are:
 - 10 m ... 100 m indoors
 - 100 m ... 1000 m outdoors
- ▶ Two antenna types are available:
 - For remote and base station:
PSS ANT 1 IDN is optimised for typical indoor applications.
 - For base station only:
PSS ANT 2 IDN with two redundant antennas in one housing is optimised for high availability in difficult environmental conditions, e.g. for mobile applications.

4.3 Process image

The process image of inputs and outputs is generated in each remote system. The individual process images are combined for the overall system. The sequence for the remote systems is defined in the PSSuniversal Assistant. The base and remote stations themselves do not occupy any inputs and outputs.

Schematic representation:



4.4 USB port

The following functions are available via the USB port:

- ▶ Show actual hardware
- ▶ Comparison of actual/registered hardware
- ▶ Display and update firmware versions

Parameters for the module's ST section can either be set via the fieldbus interface or via the USB port. Parameter setting via the USB port has priority over parameter setting via the fieldbus interface. Once parameters for the the head module have been set via the USB port, the ability to set parameters for the module via the fieldbus interface is disabled. The disable can be lifted in the PSSuniversal Assistant.

Procedure for connecting the head module via the USB port:

- ▶ Connect PC to head module via USB cable.
- ▶ Install USB driver.
- ▶ View the actual hardware registry in the PSSuniversal Assistant and call up other functions.

This way it is possible to copy and edit an existing configuration in the PSSuniversal Assistant.



INFORMATION

The USB driver can be found on the PSSuniversal Assistant CD-ROM, in the subdirectory \bin\PILZ_USB_DRIVER

4.5 Chip card

The user configures the data for all the InduraNET p modules in the PSSuniversal Assistant and then downloads this configuration data to the chip card via the USB port. The chip card reader SCR 335 USB with USB cable is available as an accessory for this purpose.



INFORMATION

The module will not start up if the chip card is missing or is written incorrectly.

4 Function description

5.1 General installation guidelines

Please also refer to the PSSuniversal Installation Manual.

The description below assumes that the mounting rail is already installed.

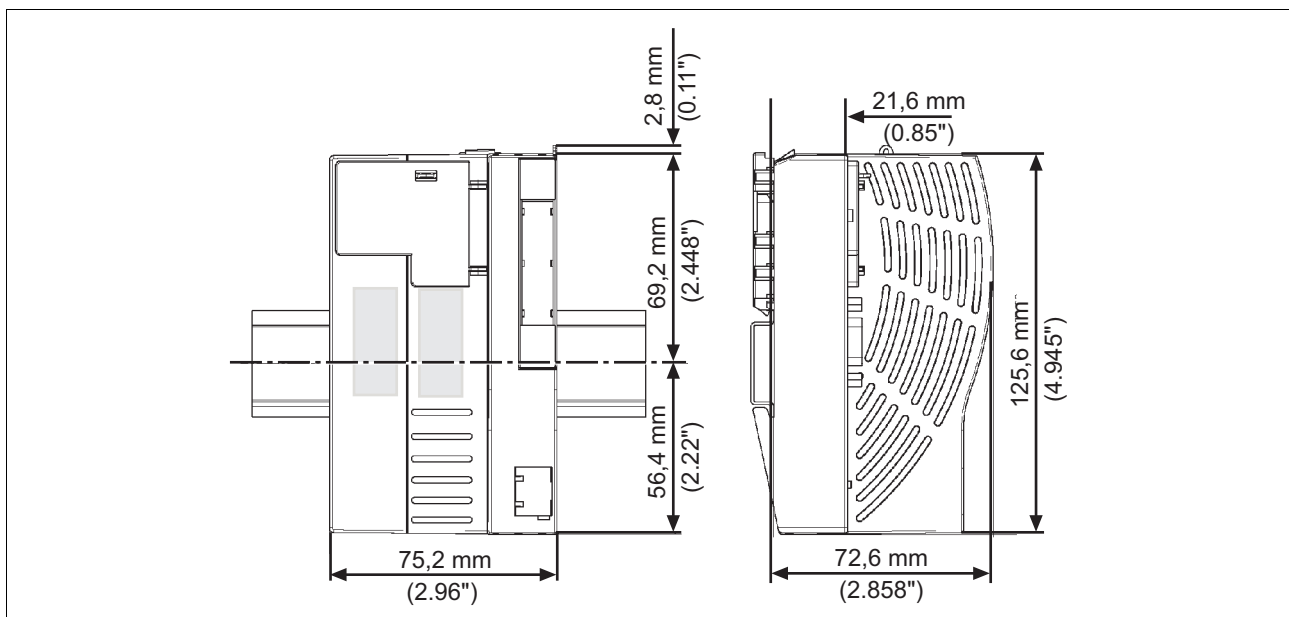


CAUTION!

Damage due to electrostatic discharge!

Electrostatic discharge can damage components. Ensure against discharge before touching the product, e.g. by touching an earthed, conductive surface or by wearing an earthed arm-band.

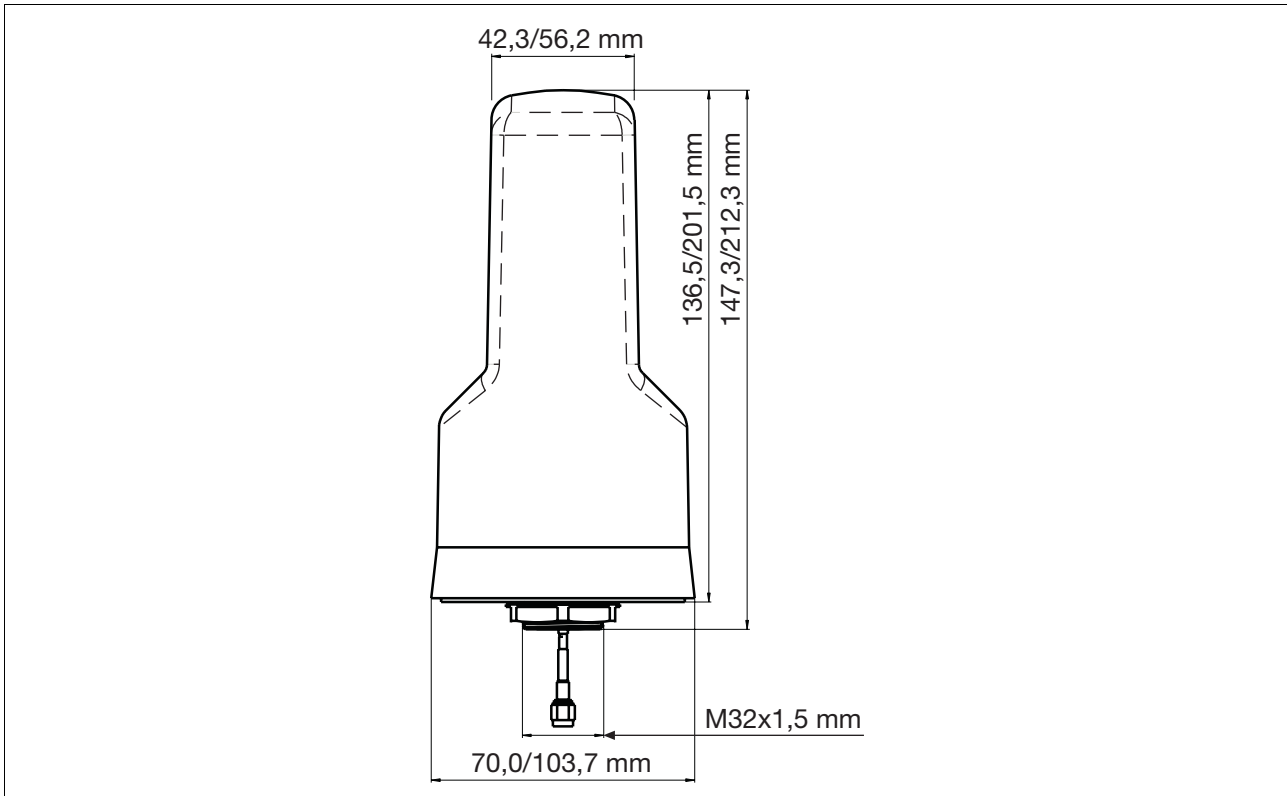
5.1.1 Dimensions



A min. 15 cm clearance is required above the mounting rail in the control cabinet to connect the antenna cable on the module.

5.1 General installation guidelines

Dimensions of the antenna ANT1/ANT2 (ANT 2 for base station only):



5.2 Install remote station

The remote station is installed in exactly the same way as a PSSuniversal head module.

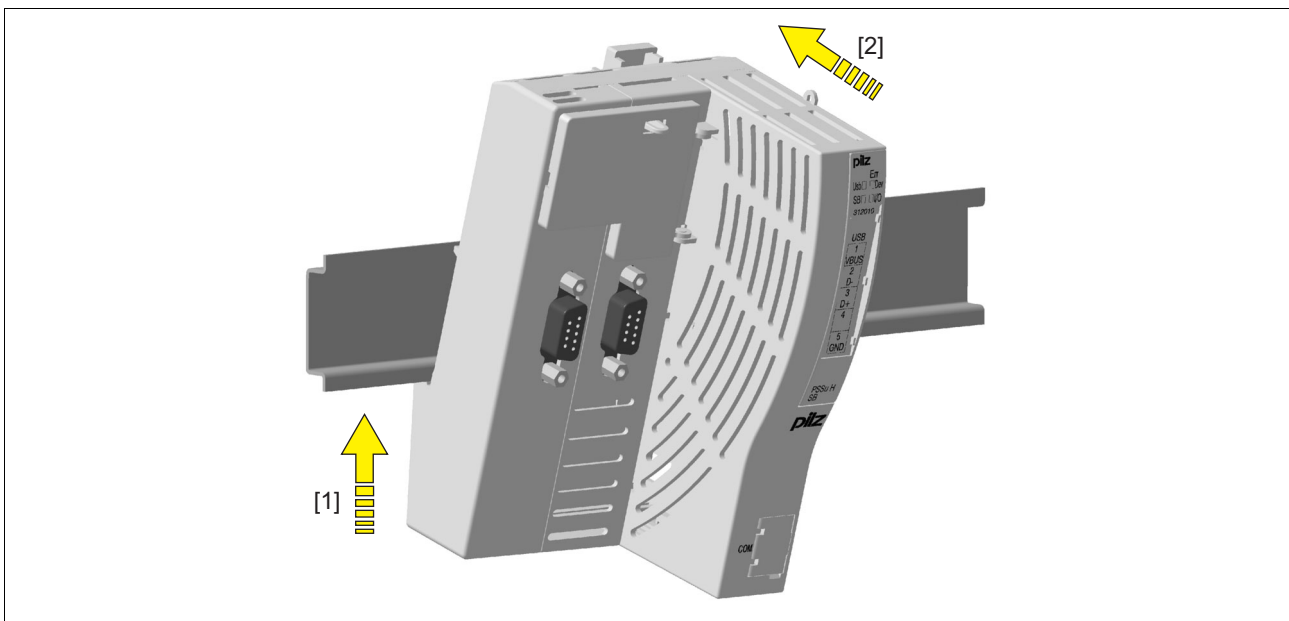
Prerequisite:

- ▶ The mounting rail must be installed.

Procedure:

- ▶ Install an end bracket to the left of the head module or leave enough space for one.
- ▶ Slot the groove on the head module on to the mounting rail from below [1].
- ▶ Push the head module back [2] until you hear it lock into position.

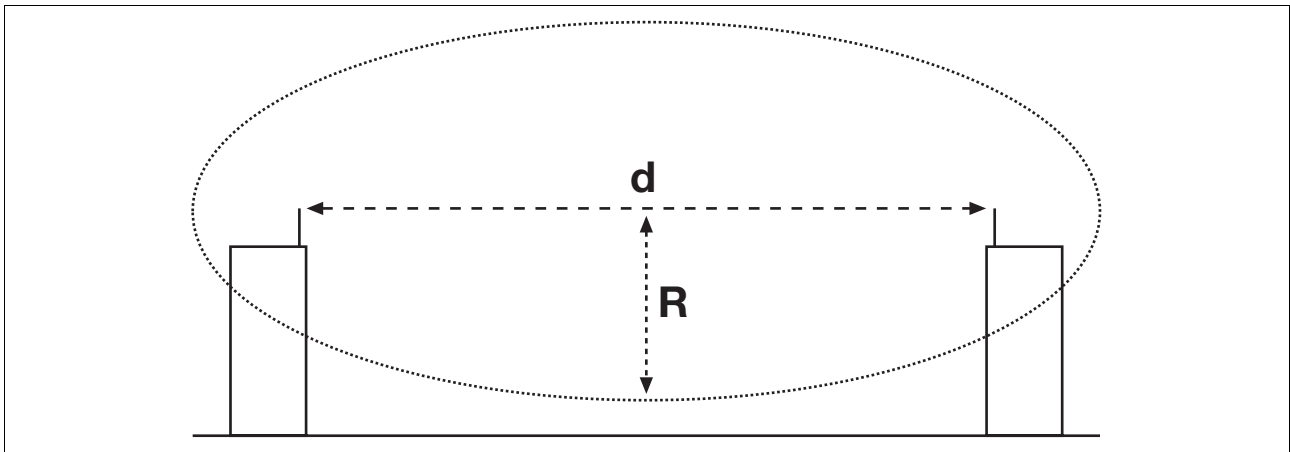
Schematic representation:



5.3 Antenna assembly

As with all radio signals, the InduraNET p signals will mainly propagate in the first Fresnel zone. The Fresnel zone is a spheroid, in whose focus the antennas are located.

Schematic representation:



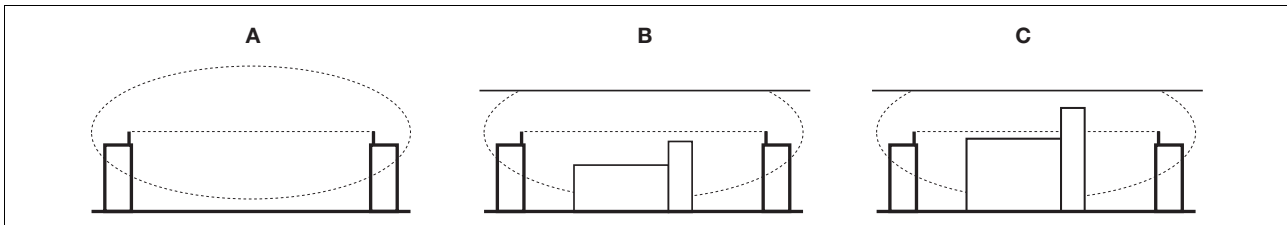
The size of the Fresnel zone depends on the wavelength of the radio signal and the distance of the antennas.

At 2.4 GHz, approximate values for the Fresnel zone's radius R in relation to antenna distance d:

d [m]	5	8	12	16	20	30	50	75	100
R [m]	0,4	0,5	0,6	0,7	0,8	0,9	1,3	1,5	1,8

5.3 Antenna assembly

Reception will deteriorate if any objects or parts of the building lie within the Fresnel zone. When positioning the antennas it is possible to distinguish between three scenarios:



- ▶ A: The Fresnel zone is not adversely affected.
 - Optimum conditions
- ▶ B: The Fresnel zone is adversely affected by the low ceiling and by an object between the antennas. There is visual contact between the antennas (straight, dotted line).
 - These Fresnel zone encroachments will reduce the reception quality. The signals' operating range will be shorter.
- ▶ C: There is no visual contact between the antennas.
 - Unfavourable conditions. The signals are only transmitted indirectly and via reflections.

Please note also:

- ▶ The antenna are designed for use inside buildings, particularly on factory floors.
- ▶ The optimum installation height of the antennas is 1.80 m – 2.00 m, e.g. on top of a control cabinet.
- ▶ The optimum orientation of the installed antenna is vertical on a horizontal surface.
- ▶ People standing within the Fresnel zone have a particularly adverse effect on reception quality.
- ▶ Reflections from walls (concrete, metal) lead to local signal quenching.
 - A diverse antenna (PSS ANT 2 IDN, available as an accessory) can help to improve reception quality on mobile, remote stations.

5.4 Install antenna

The antenna is positioned on the control cabinet or on a flat surface, using one hole mounting. The InduraNET p antenna cable is a 2 m long coaxial cable for high frequency applications with an impedance level of 50 Ohms.



NOTICE

InduraNET p devices may be damaged if they are operated without an antenna.

- ▶ Always operate the **PSSu WR S IDN** device with the antenna connected.



CAUTION!

The radio approval will be rendered invalid if a third-party antenna is used.

- ▶ InduraNET p devices should only be used with the antennas PSS ANT 1 IDN and PSS ANT 2 IDN.

Please refer to the section entitled "Antenna assembly" for information on providing sufficient reception.

Procedure:

- ▶ In the control cabinet ceiling, punch or drill a hole suitable to take an M32 thread fitting (> 32 mm diameter).
- ▶ Feed the antenna cable through the punched hole and assemble the antenna.
- ▶ Screw on the antenna using the nut on the M32 thread.
- ▶ Install the antenna cable from the antenna to the InduraNET p station.
 - The minimum bending radius is 15 mm.
 - The antenna cable must not be bent or trapped.
 - The antenna cable must not be split and then rejoined.
 - Excess cable must not be wound like a coil. Excess cable should be looped.
- ▶ Screw the antenna cable on to the socket labelled "ANT" on the InduraNET p station.
 - The torque on the SMA screw connection is 0.7 – 1.1 Nm. You can achieve the appropriate torque by tightening the screw firmly by hand.

5.4 Install antenna

The 2 m extension cable attenuates the signal by approx. 3 dB. Attenuation of 3 dB halves the transmitted output. For this reason, only use the extension cable where reception conditions are good and operating ranges are short.

- ▶ For reasons of electromagnetic compatibility, the extension cable may only be laid with group 1 cables (see PSSuniversal Installation Manual)

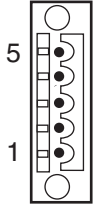

5 Installation

6.1 General wiring guidelines

Please note:

- ▶ Please refer to the technical details regarding the requirements of the supply voltages.
- ▶ Safe electrical isolation must be ensured for the external power supplies that generate the supply voltages. Failure to do so could result in electric shock.
- ▶ The external power supplies must comply with the current applicable standard EN 60950-1, EN 61140, EN 50178 or EN 61558-1.
- ▶ The maximum current load for the periphery supply on the module bus is 10 A.
- ▶ With a common 0 V supply for module supply and periphery supply: Connect together the 0V connections on all the external power supplies and earth the 0 V mains at a single point.
- ▶ The connection of the 0 V supply to the central earth bar or earth fault monitor must be in accordance with the relevant national regulations (e.g. EN 60204-1, NFPA 79:17-7, NEC: Article 250).
- ▶ Minimum range for cable cross sections on connection terminals in mm²:
 - Power supply: 1.5 (AWG16) ... 2.5 (AWG12)
 - Functional earth: 1.5 (AWG16) ... 2.5 (AWG12)
- ▶ Use copper wiring.

6.2 Terminal configuration

Connector description	Terminal configuration	
5-pin Combicon plug-in connector X1	1: +24 V infeed for periphery supply 2: 0 V infeed for periphery supply 3: n.c. 4: +24 V infeed for module supply 5: 0 V infeed for module supply	
USB	Assignment	
Mini-B USB connector	1: n.c. 2: D- USB Data - 3: D+ USB Data + 4: n.c. 5: GND Ground	

▶ n.c. = not connected

6.3 Connection via USB

Please note the requirements of the USB standard for USB 2.0 and for Mini-B USB ports.

The maximum cable runs for USB connection cable are 5 m.

6 Wiring



7.1 Messages

All errors and faults detected by the electronic modules on a remote station are signalled to the base station via InduraNET p and entered in the head module's error stack.

Module error	Explanation	Remedy
Start-up error	Error as the PSSu system starts up	Change faulty module.
Configuration Error	Incorrect module type configured.	The configured hardware registry does not match the actual hardware registry.
ST communication error	Error during ST communication	Change faulty module.
Bus termination error	There is no terminating plate or there is a bad contact with the module bus.	Install a terminating plate with integrated end bracket or insert the base modules together correctly.
Temperature error: Too warm ⁽¹⁾	Ambient temperature too high: Error stack entry	Ensure there is sufficient ventilation in the control cabinet or prevent overload.
Temperature error: Too hot ⁽¹⁾	Ambient temperature too high: Module reset	Ensure there is sufficient ventilation in the control cabinet or prevent overload.
Overvoltage error	A system voltage or infeed is too high.	Stabilise the supply or change the faulty supply voltage module.
Undervoltage error	A system voltage or infeed is too low.	Stabilise the supply or change the faulty supply voltage module.

⁽¹⁾ There are two levels of overtemperature.

► Too warm:




If a module's temperature exceeds a threshold value, the module sends a warning to the head module. If the temperature drops back below the threshold value, the module sends an all-clear.

► Too hot:

If a module's temperature exceeds a further threshold value, the module sends an error message to the head module.

7.2 Display elements

Key:

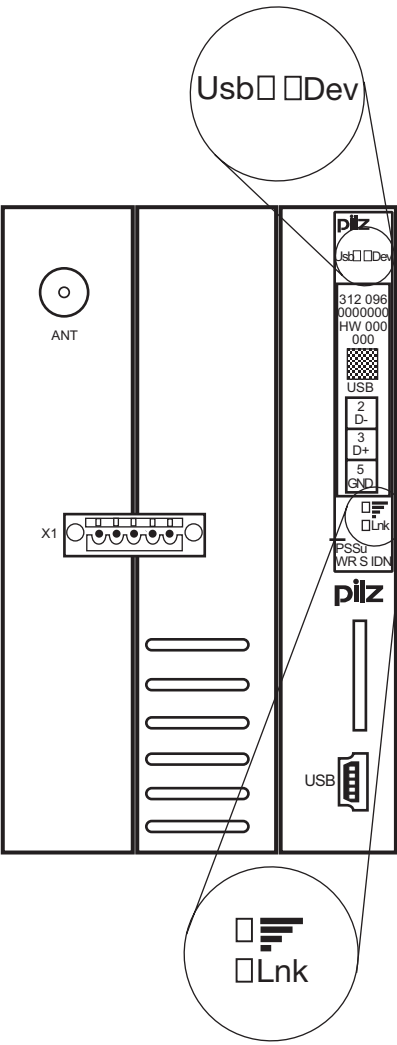
	LED on
	LED flashes
	LED off

7.2.1 Display elements for InduraNET p diagnostics

The module has LEDs to display various states on the remote station and InduraNet p:

- ▶ "Usb": Data transfer via the USB port
- ▶ "Dev": Status of the remote station
- ▶ "RF": Reception quality together with "Lnk"
- ▶ "Lnk": Data transfer via InduraNET p

7.2 Display elements



LED	Key				
	Usb	Dev		Lnk	
---	---	●	●	●	Remote station not in operation
---	---	Red	---	---	Addressing error (*1)
---	Red	Red	Red	Red	System is in a STOP condition (*2)
---	---	●	Red	●	No chip card in the remote station
---	---	●	Red	●	Chip card in the remote station belongs in a base station
---	Green	---	●	Red	No connection to the base station, waiting for a connection to be established
---	Green	---	●	Red	Connection to base station established, no data transfer
---	Green	---	●	Orange	Bad reception quality, data is being transferred
---	Green	---	●	Green	Good reception quality, data is being transferred
---	Green	Green	Green	Green	Excellent reception quality, data is being transferred
Green	Green	Irrelevant ---	Irrelevant ---	Irrelevant ---	Data transfer via the USB port

(*1) An addressing error (flashing red "Dev" LED) may be caused by one of the following factors:

- ▶ Terminating resistor is missing.
- ▶ A module is defective.

7.2 Display elements

- ▶ A module does not have valid software.
- ▶ Invalid hardware registry.

(*2) A system stop (LEDs "Dev", "  " and "Lnk" are red) may be caused by one of the following factors:

- ▶ Unable to read chip card.
- ▶ Data on the chip card is invalid.
- ▶ The hardware configuration of the remote system does not correspond to the configuration stored on the chip card.
- ▶ Invalid check sum on the chip card.
- ▶ The chip card does not contain a configuration for InduraNet p.



INFORMATION

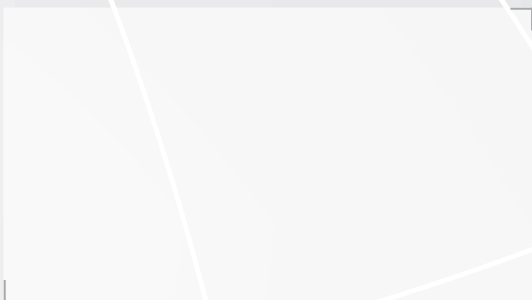
After a restart the InduraNET p configuration data is loaded from the chip card. This process lasts a maximum of 2 s. During this time the LEDs will flash in quick succession.

8.1 Technical details

Technical details	PSSu WR S IDN
Application range	Standard
Module's device code	0006h
Electrical data	
Internal supply voltage	
Supply voltage range of module supply	4.8 - 5.4 V
Current and power consumption from module supply	
Module's current consumption	215 mA
Module's power consumption	1.10 W
Infeed for	Module Supply
Voltage	24 VDC
Voltage tolerance	-30 %/+25 %
Output of external power supply (DC)	12.0 W
Max. continuous current that the external power supply must provide	0.8 A
Inrush current that the external power supply must provide	4.0 A
Infeed for	Periphery Supply
Voltage	24 VDC
Max. continuous current that the external power supply must provide	10.0 A
Voltage output	Module Supply
Voltage	5 V DC
Voltage tolerance	-2 %/+2 %
Current load capacity	2.0 A
Buffer in the case of supply interruptions in accordance with	EN 61131-2, EN 61496-1
Short circuit-proof	yes
InduraNET p interface	
Application range	Standard applications
Application in accordance with	ARIB STO-T 66 (19,2), EN 300328 V1,7,1, EN 301489-1 V1,6,1, EN 301489-3 V1,4,1, FCC Part 15-249
Working frequency range	2,405 - 2,479 MHz
Channel spacing	1 MHz
Number of channels	75
Modulation	GFSK
Frequency deviation	-160 - 160 kHz
Typ. transmitter output EIRP	18 dBm/64 mW
Max. transmitter output EIRP	20 dBm/100 mW
Receiver type	Superhet
Max. receiver sensitivity when PER=0.1%	-90 dBm
Frequency stability	-2.5 - 2.5 ppm
Intermediate frequency	$fZF=fLO-fRX=(8/7*fRX+2MHz)-fRX$
Environmental data	
Climatic suitability	EN 60068-2-14, EN 60068-2-1, EN 60068-2-2, EN 60068-2-30, EN 60068-2-78
Ambient temperature	0 - 60 °C
Condensation	no
EMC	EN 55011: class A, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-6-2, EN 61000-6-4, EN 61131-2

8.1 Technical details

Environmental data	
Vibration to EN 60068-2-6	
Frequency	10 - 150 Hz, 10 - 60 Hz, 60 - 1,000 Hz
Shock stress	11 ms
Protection type	
Mounting (e.g. cabinet)	IP54
Housing	IP20
Mechanical data	
Housing material	
Front	PC
Bottom	PC
Dimensions	
Height	128.4 mm
Width	75.2 mm
Depth	79.4 mm
Colour of front plate	dark grey
Weight	169 g



DAT - I - 010/05



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