Manual
DATAEAGLE 4000 Series – Wireless ETHERNET

Schildknecht AG

29. Juli 2026



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This document applies to the following products:

Name	Article number
DATAEAGLE Compact 4715	11170
DATAEAGLE X-treme 4715	11420
DATAEAGLE Compact 4713	11171
DATAEAGLE X-treme 4713	11421
DATAEAGLE Compact 4712	11174
DATAEAGLE X-treme 4712	11422
DATAEAGLE Compact 4710	11175
DATAEAGLE X-treme 4710	11423
DATAEAGLE Compact 4333	11144
DATAEAGLE X-treme 4333	11327
DATAEAGLE Compact 4343	11158
DATAEAGLE X-treme 4343	11374
DATAEAGLE Compact 473x	15475
DATAEAGLE X-treme 473x	15476

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1 Introduction

1.1 Service and Support

The members of our service team are at your disposal for all questions regarding installation and commissioning.

Call us at +49 (7144) 89718 0 or send an
E-mail to: info@schildknecht.ag
You can also find more information and documentation on our website:
https://www.schildknecht.ag

1.2 About this document

This document contains information on

- Assembly and electrical installation
- Commissioning and parameterization
- Fault diagnosis and troubleshooting
- Conformity and approval

Please note

- Read this chapter carefully, only then work with the documentation and the device.
- Read the documentation carefully before commissioning the device.
- Keep the document for the entire service life of the device in a place that is accessible to all users at all times.

General knowledge of automation technology is required to understand the document. In addition, the planning and use of automation systems requires technical expertise that is not provided in this document.

Function of this documents
This document instructs the technical personnel of the machine manufacturer or the machine operator on the safe use of the described devices. It instructs **not** on the safe use of the machine in which the devices are or will be integrated. Information on this can be found in the operating instructions for the machine.

1.3 Trademark

In this documentation the trademarks of the following companies and institutions are used:

PROFINET	PROFIBUS Nutzerorganisation e.V. (PNO)
PROFIsafe	PROFIBUS Nutzerorganisation e.V. (PNO)
EtherNet/IP	Open DeviceNet Vendor Association, Inc (ODVA)
openSAFETY	Ethernet POWERLINK Standardization Group(EPSG)

2 For your safety

→ Read this chapter carefully.
→ Only then work with the DATAEAGLE module.

2.1 General safety instructions

ATTENTION!

High electrical voltage in the machine / plant.
Death or serious injury due to electric shock.
→When working on the machine / modules, observe the five safety rules of electrical engineering.
Protection of persons and property
→ According to DIN VDE 0105-100 - Operation of electrical installations - Part 100: General requirements

The five safety rules
Protect from high electrical voltage
1. unlocking
2. securing against reconnection
3. establishing absence of voltage on all poles
4. grounding and short-circuiting
5. covering or isolating adjacent live parts

Qualified personnel
The module may only be installed, commissioned and operated by qualified personnel who have been instructed in safety technology.

You are knowledgeable if you meet the following conditions:

- have a suitable electrotechnical training.
- have been instructed by the machine operator in the operation of the equipment and the valid safety regulations
- have access to the operating instructions and the manual
- are familiar with the safety standards of automation technology
- are familiar with the basic and technical standards applicable to the specific application

Use of the module

- Observe all regulations on safety and accident prevention during project planning, installation, commissioning, operation and testing of the module.
- When using aggressive medium, check the material resistance.

NOTE: Only qualified Schildknecht AG personnel may intervene in the hardware and software.

WARNING!

High electrical voltages!
Death or serious injury due to electric shock. Due to a defect of the power supply unit, voltages higher than 120 V DC or 50 V AC may be applied to touchable parts.
→ Only use a power supply that allows max. 60 V DC or 25 V AC in the event of a fault. It must conform to SELV or PELV.
→ The power supply must be SELV and LPS compliant according to UL/IEC 60950-1 or ES1 and PS2 compliant according to UL/IEC 62368-1.

Protective measures of the operator of the machine

- Observe the instructions in this manual.
- Observe the test specifications in the operating instructions of all connected components.

Electromagnetic radiation Keep a minimum distance of 20 cm from the antennas while operating the equipment.

2.2 Intended use

The DATAEAGLE transmits data in industrial applications. It is designed according to EN 60529 for protection class IP20 (Compact) or IP65 (X-treme) and can be used in control cabinets up to protection class IP67.
The DATAEAGLE may only be used for the cases provided for in the operating instructions and manual and only in conjunction with the third-party devices and components recommended or approved by Schildknecht AG.

Correct and safe operation of the product requires proper transport, storage, assembly and installation, as well as careful operation.

Intended use also includes EMC-compliant electrical installation. The module is intended for use in an industrial environment. Radio interference may occur when used in residential areas.

- When using the module in residential and mixed areas, observe the applicable standards.

Foreseeable misuse

- Do not modify the module structurally, technically or electrically.
- Do **not** use the module outside the areas described in this manual, the technical data and the operating instructions.
- Do **not** use the module as a safety-related device. It does not comply with the relevant standards. Safety functions of the system are not guaranteed!
- Do **not** use the off-state of the outputs of the module for safety-related requirements of the plant/machine!
- Do **not** use the module for permanent operation in liquids.
- Do **not** clean the module with a high-pressure cleaner.

2.3 Environmentally friendly disposal

Observe country-specific waste disposal regulations!

- Always dispose of unusable devices in accordance with the applicable country-specific regulations for waste disposal (e.g. according to European waste code 16 02 14).

Material separation only by qualified personnel!

- Be careful when disassembling the device, you may injure yourself.
- Take the separated components to the appropriate recycling.

Disposal

The product can be returned to Schildknecht AG in case of disposal. This also applies to the original packaging and any batteries or rechargeable batteries. Devices contaminated with hazardous substances will not be taken back for repair or disposal.



Return

- Mark the product and packaging with **'For disposal'**.
- Pack the product
- Send the package to:
  Schildknecht AG
  Haugweg 26
  71711 Murr | GERMANY

We ensure disposal in accordance with German statutory regulations. The last owner is responsible for the transport to the return point up to the destination.

2.4 CE Declaration of Conformity

For information on the Declaration of Conformity and EC Directives, see:
https://www.schildknecht.ag/download/dataeagle-konformitaetserklaerung/
Alternatively, on our website https://www.schildknecht.ag in the Downloads section.

2.5 Warranty and liability claims

Warranty and liability claims are lost if

- the product is not used as intended,
- damage is due to failure to observe the operating instructions,
- the staff was/is not knowledgeable.

3 Description

3.1 Introduction

The modules of the DATAEAGLE 4000 series have been specially developed for the transmission of Ethernet via radio.

Depending on the device type, transmission has been optimised for Ethernet, PROFINET, PROFIsafe, EtherNet/IP and openSAFETY via UDP. Some device variants are multi-protocol compliant. Details on this can be found in the chapter 8

Different radio technologies, such as Bluetooth 2.4 GHz or 869 / 915 MHz in the unlicensed band, are used for transmission. Due to the integrated data pre-processing, the fieldbus communication can be configured like a cable. For example, with PROFINET the IO cycle can be set to 1 ms.
In addition, the wireless systems are easy to connect and put into operation like a cable - plug & play.
There are 2 different housing variants Compact (IP 20) for control cabinet mounting and X-treme (IP65) for use in direct industrial environments or outdoors.
Our software DATAEAGLE Wizard allows a quick set-up of the essential settings, such as radio parameters. The commissioning is therefore done in a very short time.

3.2 Operating principle DATAEAGLE 4000

The DATAEAGLE 4000 is suitable for the transparent transmission of Ethernet data via radio.
Point-to-point as well as multipoint systems can be configured.

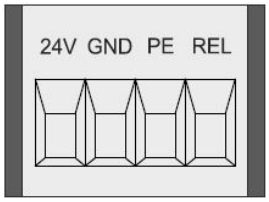


Radio interference can be suppressed via the filter time that can be configured in the master. Only after this time has elapsed do the fieldbus stations detect a bus fault. All interruptions of the communication within the filter time are suppressed and the plant availability is thus increased.
A too high configured filter time (factory setting: 2 seconds), can lead to a delayed shutdown reaction of the connected devices in case of an error. Therefore, please check whether the system with the set filter time matches the required reaction speed.

3.3 DATAEAGLE Compact

3.3.1 Connections

Power supply

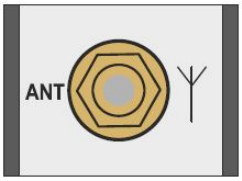


Clamps	Description
24V	24 V DC
GND	0V
PE	PE
REL	Switching output

USB port

DATAEAGLE Compact has a USB port for configuration and software updates via the DATAEAGLE Wizard tool.

Antenna connection



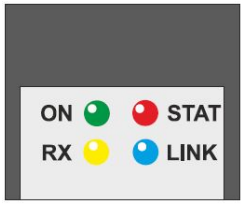
SMA connector for antenna

Ethernet Interface



2 x RJ45 (integrated Switch) 10/100 MBit Ethernet

3.3.2 LEDs



ON LED

LED	Indication	State	Description
ON	Green	Permanently lit	Power ok
	Off	Off	Power not ok

RX LED

LED	Indication	State	Description
RX	Yellow	Flashing	Radio reception
	Off	Off	No radio reception

LINK LED

LED	Indication	State	Description
LINK	Blue	On/Blinking	Radio connection(s) active
	Off	Off	Radio Connection(s) inactive

STAT LED

LED	Anzeige	Zustand	Beschreibung
STAT	Red	On (Master)	no Ethernet connection
	Red	Blinking (Master)	Ethernet error detected
	Off	Off	no Error detected

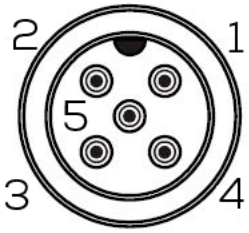
For more information, check the device diagnostics.

3.4 DATAEAGLE X-treme

3.4.1 Connections

Power supply

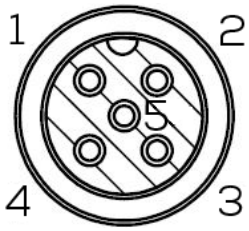
M12, A-coded, 5 pin (male)



PIN	Description
1	+24 VDC
2	not connected
3	GND
4	not connected
5	PE

Ethernet Interface

M12, D-coded, 4 pin (female)

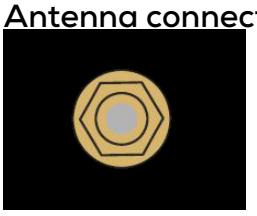


PIN	Description
1	TD+
2	RD+
3	TD-
4	RD-

USB port

The DATAEAGLE X-treme has a USB port for configuration and software updates via the DATAEAGLE Wizard tool. This is located behind the PG screw.

Antenna connection



SMA connector for antenna

3.4.2 LEDs



ON LED

LED	Indication	State	Description
ON	Green	Permanently lit	Power ok
	Off	Off	Power not ok

RX LED

LED	Indication	State	Description
RX	Yellow	Flashing	Radio reception
	Off	Off	No radio reception

RADIO LED

LED	Indication	State	Description
RADIO	Blue	On/Blinking	Radio connection(s) active
	Off	Off	Radio Connection(s) inactive

STAT LED

LED	Anzeige	Zustand	Beschreibung
STAT	Red	On (Master)	no Ethernet connection
	Red	Blinking (Master)	Ethernet error detected
	Off	Off	no Error detected

For more information, check the device diagnostics.

LINK LED

LED	Indication	State	Description
LINK	Yellow	On/Blinking	Ethernet connection(s) active
	Off	Off	No Ethernet Connection(s)

4 Mounting

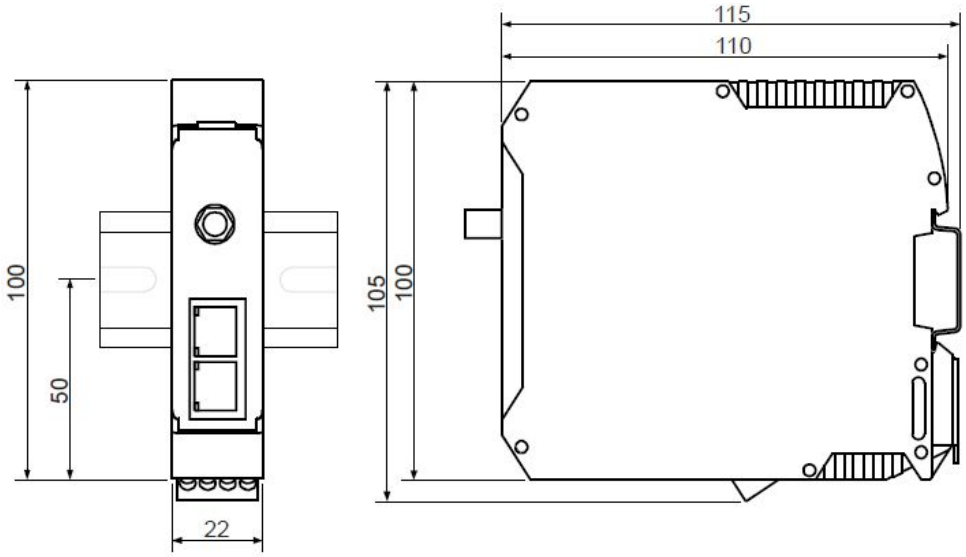
4.1 Requirements

- Mounting site in the immediate vicinity of the plant
- Flat mounting surface for mechanically stress-free mounting
- Grounded mounting surface for grounding of the ground strap
- Short cable routes to all components
- Sufficient space for easy device replacement and for the connection of the plug-in connectors
- Suitable mounting location with regard to vibration and shock load, temperature and humidity (see "4. Technical data")
- Protected to prevent disconnection of the connecting cables by personnel or equipment.
- Diagnostic LEDs of the device can be viewed during operation

4.2 Dimensions

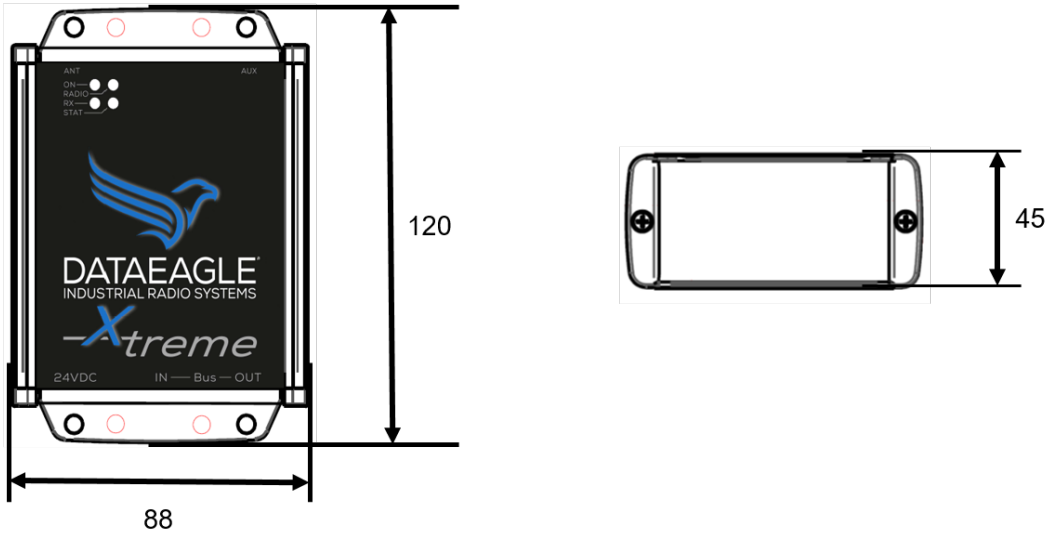
DATAEAGLE Compact

Dimensions in mm



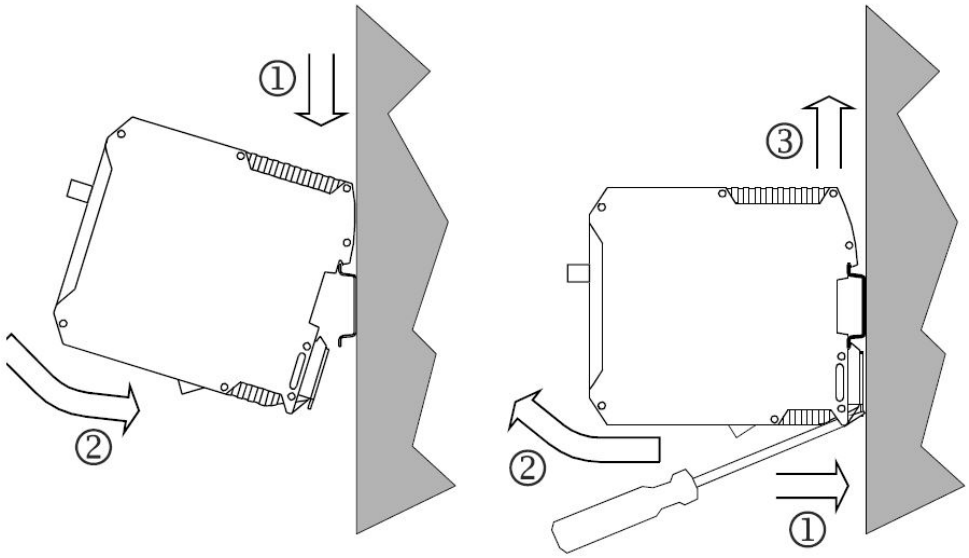
DATAEAGLE X-treme

Dimensions in mm



4.3 Mounting the components

DATAEAGLE Compact



→ Fasten the module at the designated place according to its fastening type.

Mount:

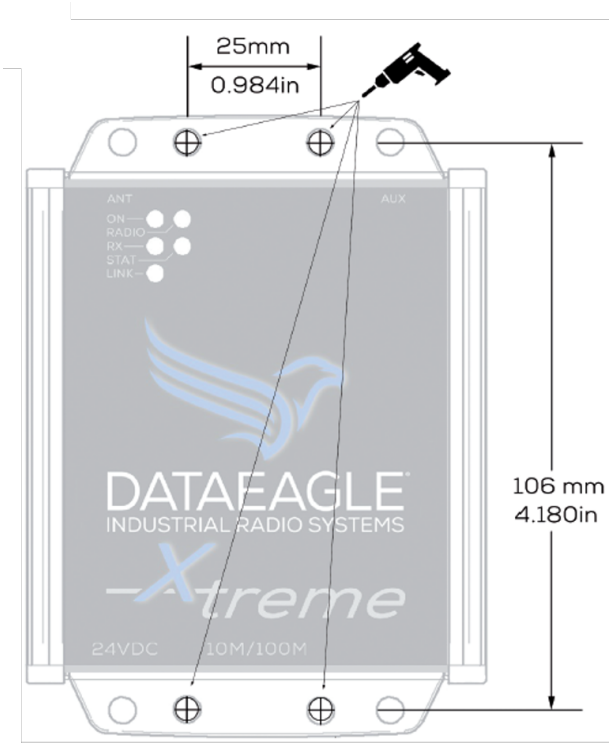
1. Place the module from diagonally above onto the top-hat rail.
2. Press the module down firmly.

The foot latch engages. The unit is firmly seated on the top-hat rail.

Example:



DATAEAGLE X-treme

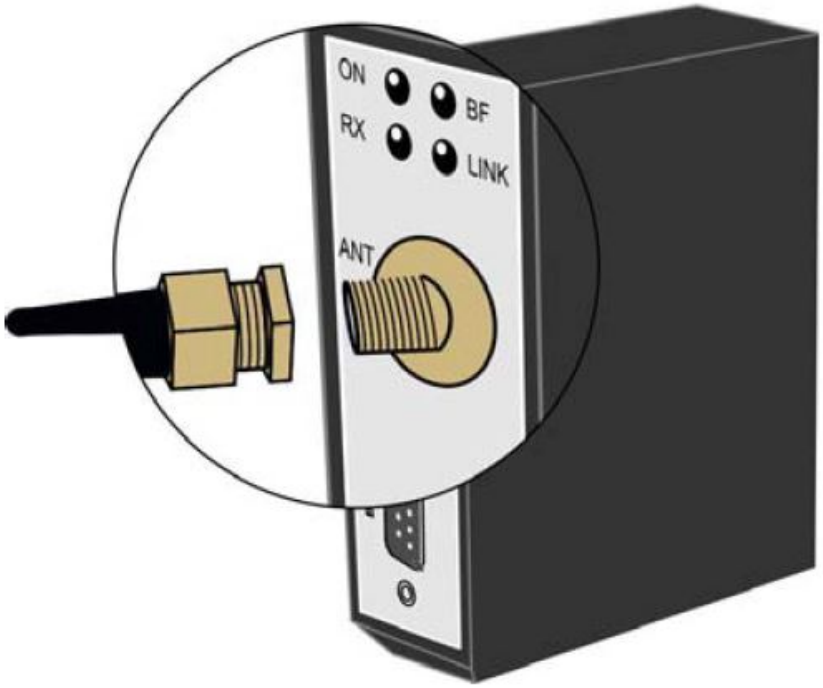


→ Attach the module to the designated location according to its mounting method.

Mount:

1. If necessary, drill holes for mounting according to the enclosed drilling template → https://www.schildknecht.ag/download/x-treme-drill-template-bohrschablone/.
2. Screw the device tightly.

4.4 Mounting the antennas



1. Connect the SMA connectors of the antennas or antenna cables.
2. Attach the antennas to the designated locations.

ATTENTION!

Tighten the screw connections of the antennas or antenna cables only hand-tight.

FURTHER NOTES ON ANTENNA INSTALLATION!

You will find further information on antenna mounting and alignment in our Antenna 101 → https://lp.schildknecht.ag/en/whitepaper-antenna101

4.5 Disassembly and module replacement

Remove line connections

1. Remove the power supply.
2. Unscrew the antenna cable/antenna.

Remove module (See assembly of the module)

Mount new module (See assembly of the module)

1. Mount the new module.
2. Connect the wires to the new module (See Connection power supply).

5 Installation

WARNING!

Danger to life due to electric shock.
Operation of the device only intended on 24V DC voltage (safety extra-low voltage)
Death and serious injuries as well as considerable property damage can be the result.
→ Connection of the device may only be carried out by an electrician in accordance with IEC 60364!
→ Do not connect this equipment directly to other networks!
→ Observe five safety rules! See chapter 2.1

CAUTION!

Electromagnetic interference!
Uncontrolled processes and damage due to disturbed data transmission!
→ Observe the chapter **Improving EMC resistance 7.1 during all installation steps.**

NOTE
Connected cables must be approved for 60°C.

5.1 Power supply connection

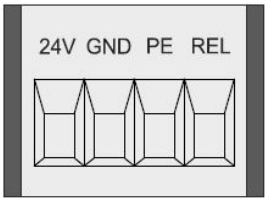
WARNING!

Fire hazard due to short circuit!
Supply lines and/or modules damaged by short circuits can overheat and cause fires!
→ Provide intelligent current monitoring and fuse. The fuse protection must be designed for max. 2A.

ATTENTION!

Electromagnetic interference due to incorrect voltage supply!
Electromagnetic interference may occur if rated operating voltages other than 24 V DC of the SELV (safety extra low voltage) category are used.
→ Only use power supplies that comply with the SELV category.
→Note technical data

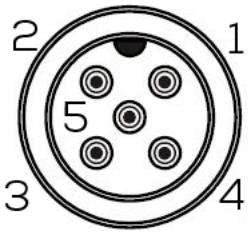
Power supply - DATAEAGLE Compact



Clamps	Description
24V	24 V DC
GND	0V
PE	PE
REL	Switching output

Power supply - DATAEAGLE X-treme

M12, A-coded, 5 pin (male)



PIN	Description
1	+24 VDC
2	not connected
3	GND
4	not connected
5	PE

5.2 Ethernet connection

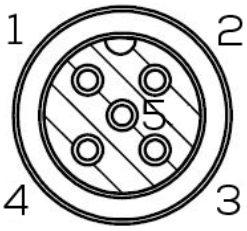
Ethernet - DATAEAGLE Compact



2 x RJ45 (integrated Switch) 10/100 MBit Ethernet

Ethernet - DATAEAGLE X-treme

M12, D-coded, 4 pin (female)



PIN	Description
1	TD+
2	RD+
3	TD-
4	RD-

6 Commissioning

WARNING!

Risk of burns

Loosening or making electrical connections during operation is prohibited! In case of non-observance, there is a risk of electric arcs which can lead to burns.
→ Disconnect the module from the power supply.

CAUTION!

Uncontrolled processes

Material damage and personal injury due to incorrectly performed commissioning phases (e.g. initial commissioning, recommissioning and in the event of changes to the configuration).
Always carry out commissioning in this order:

1. insert module
2. have the system checked and approved by a qualified person
3. commission

ATTENTION

Dysfunctions in the living area
The devices of EMC class A can cause disturbances in the living area.
→ The operator must take appropriate measures.

6.1 Delivery state of the modules

NOTE
New devices are preconfigured at the factory.

In the delivery state, the units are configured as a radio network. The Ethernet participants/connections that are connected after the radio link are automatically detected.

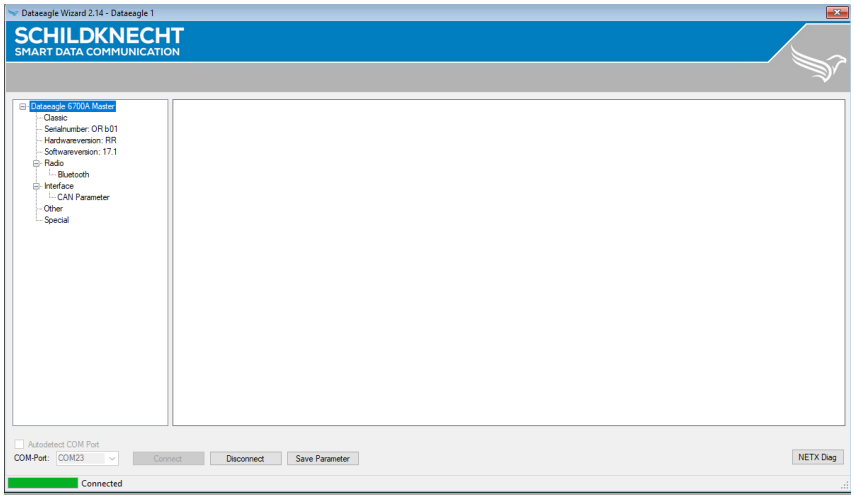
6.2 Configuration Filtertime

The following must be available for the device configuration:

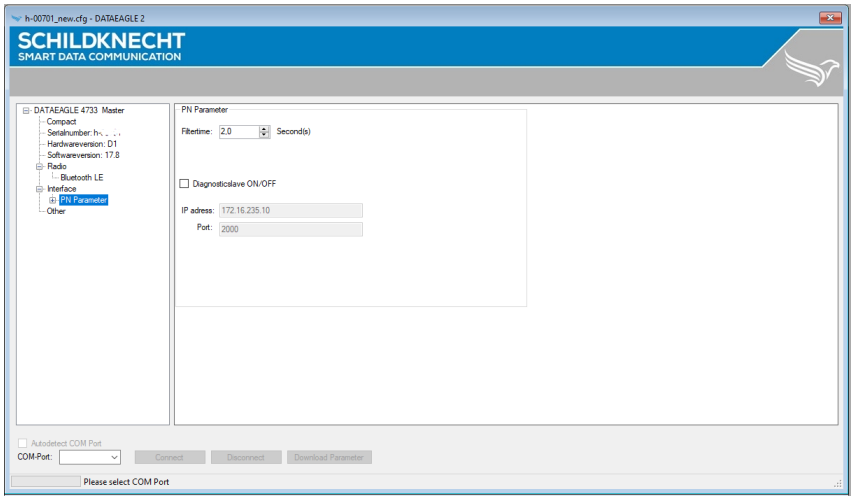
- USB driver CDM21228 (Download Link) - Installed on PC
- Configuration Tool DATAEAGLE Wizard (Download Link) - Installed on PC
- USB cable - between PC and DATAEAGLE

Connect DATAEAGLE to the PC via the USB cable and start the DATAEAGLE Wizard configuration software.

Select *Autodetect COM Port* and then *Connect* to connect to DATAEAGLE and read the configuration. The DATAEAGLE must be switched on for this.



Select in the menu tree: *Interface → PN Parameter*



Set the filter time to the desired value.

NOTE
The filter time is configured to 2 seconds at the factory.
A too high configured filter time can lead to a delayed shutdown reaction of the connected devices in case of an error. Therefore, please check whether the system with the set filter time matches the required reaction speed.

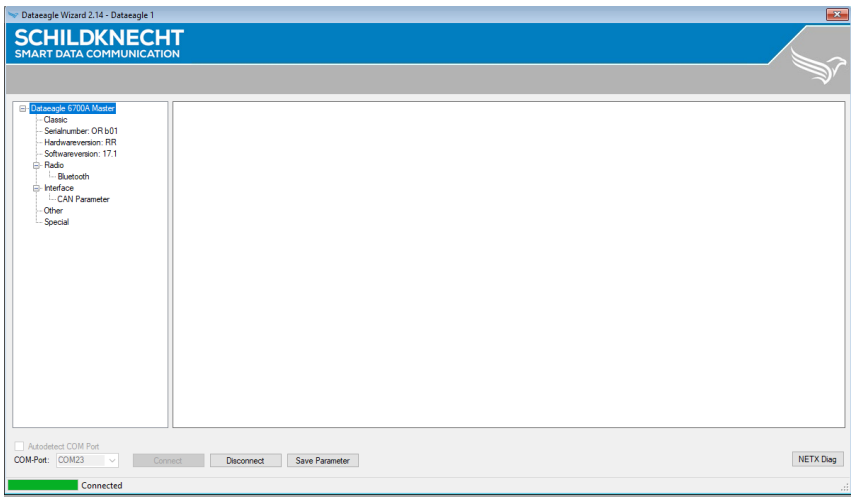
6.3 Configuration radio parameters

The following must be available for the device configuration (all components included in the scope of delivery):

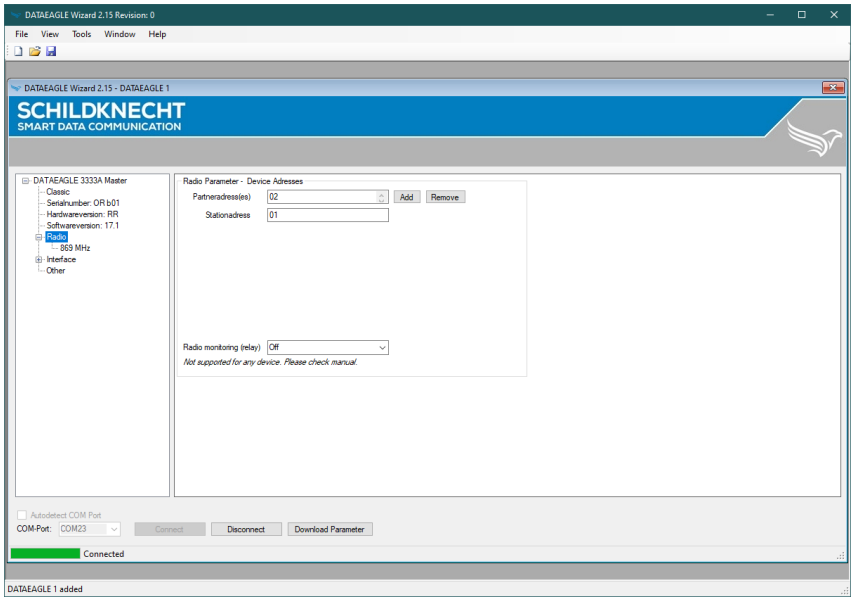
- USB driver - installed on PC
- DATAEAGLE Wizard configuration tool - installed on PC
- USB cable - between PC and DATAEAGLE

Connect DATAEAGLE to the PC via the USB cable and start the DATAEAGLE Wizard configuration software.

Select *Connect* to connect to DATAEAGLE and read the configuration. The DATAEAGLE must be switched on for this.



Select in the menu tree: *Interface → Radio*



The logical radio device addresses, such as the partner and station address, are set under Radio. These are used independently of the radio technology used for logical addressing within the radio network.

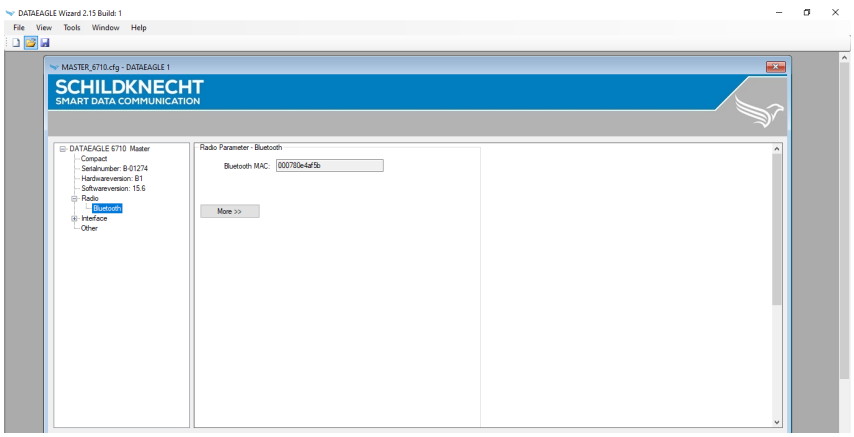
> **NOTE**
> If a radio system was ordered as a set (set configuration), no change is necessary here.

Each device has its own logical radio device address (station address) and one or more radio partner addresses in the radio network.

Example:
Master has the station address 01 and the partner addresses 02 and 03.
Slave 1 has the station address 02 and the partner address 01.
Slave 2 has the station address 03 and the partner address 01.

6.3.1 2,4 GHz Bluetooth - DATAEAGLE Compact/X-treme 471x

Select in the menu tree: *Interface → Radio → Bluetooth*

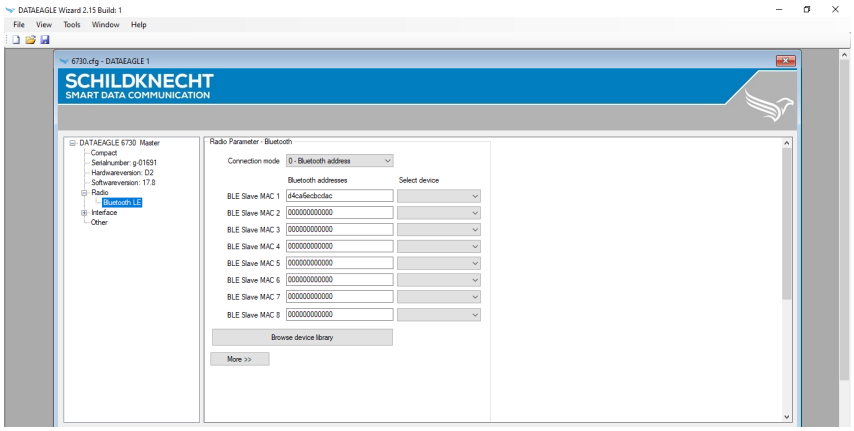


NOTE
If a radio system was ordered as a set (set configuration), no change is necessary here.

The Bluetooth MAC address must be read out at the master and entered at the slave.

6.3.2 2,4 GHz Bluetooth 5 - DATAEAGLE Compact/X-treme 473x

Select in the menu tree: *Interface → Radio → Bluetooth LE*



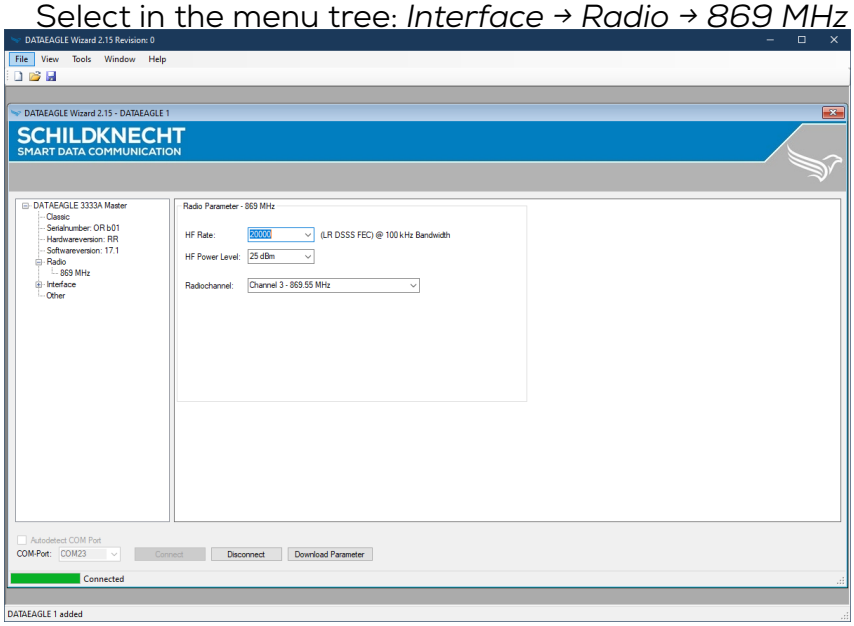
NOTE
If a radio system was ordered as a set (set configuration), no change is necessary here.

The Bluetooth MAC address must be read out at the slave and entered at the master.
If a radio network is configured, several Bluetooth MAC addresses must be configured in the master (BLE slave MAC 1, BLE slave MAC 2, ...).

6.3.3 869 MHz - DATAEAGLE Compact/X-treme 433x

NOTE
If a radio system was ordered as a set (set configuration), no change is necessary here.

Select in the menu tree: *Interface → Radio → 869 MHz*



Configuration parameters 869 MHz

Value	Description	Comment
HF Rate	Modulation	20k (LR DSSS FEC) @ 100 kHz
	method	Channel 1 or 3 only
		Highest range, slow
		38.4k (GFSK) @ 100 kHz Bandwidth- Channel 1 or 3 only
		50k (GFSK) @ 200 kHz Bandwidth - Channel 3 only
		100k (GFSK) @ 200 kHz Bandwidth - Channel 3 only
		Low range, fast
Channel	Radio channel	00: 869.40 MHz Not allowed
	(Frequency)	01: 869.45 MHz
		02: 869.50 MHz
		03: 869.55 MHz
		04: 869.60 MHz
HF Power Level	Transmitting power	12-25 dBm

ATTENTION!

Selectable settings are CE compliant according to EN 300 220 standard. Other combinations are not permitted!

NOTE: The higher the RF rate, the faster the transmission but the range is shorter

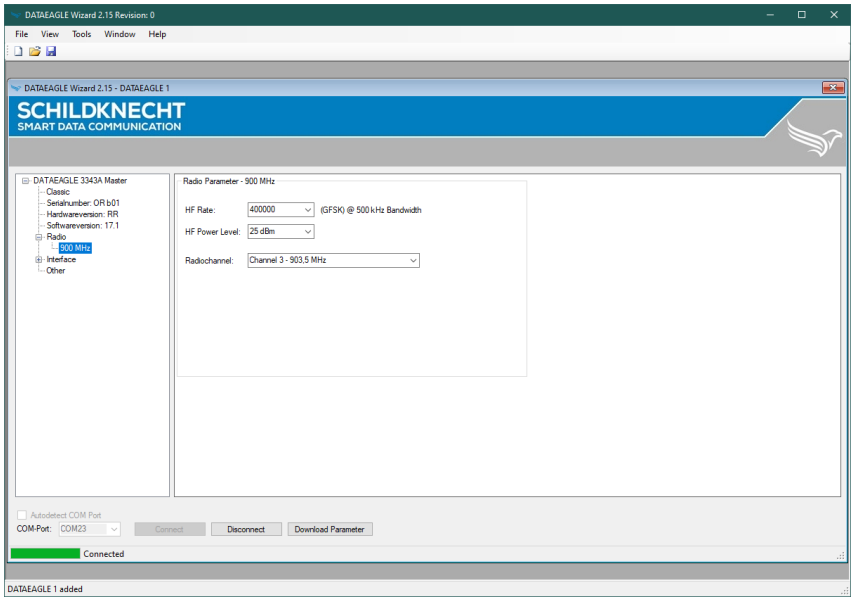
All devices in a radio system must be set to the same radio channel. DATAEAGLE radio systems in parallel operation are to be operated with different radio channels! However, it should be noted that at high RF rate only 1 system is possible due to the available bandwidth!

It makes sense to reduce the transmitting power in order not to influence neighboring radio systems in the same frequency band!

6.3.4 915 MHz - DATAEAGLE Compact/Xtreme 434x

NOTE
If a radio system was ordered as a set (set configuration), no change is necessary here.

Select in the menu tree: *Interface → Radio → 900 MHz*



Configuration parameters 915 MHz

Value	Description	Comment
HF Rate	Modulation method	30k (LR DSSS FEC) @ 500kHz Bandwidth - Channel 1-51
		240k (LR DSSS FEC) @ 500 kHz Bandwidth - Channel 1-51
		400k (GFSK) @ 500 kHz Bandwidth - Channel 1-51
Channel	Radio channel	01: 902.5 MHz
		02: 903 MHz
		..... 500 kHz / Channel
		51: 927,5 MHz
HF Power Level	Transmitting power	12-25 dBm

ATTENTION!

Selectable settings are FCC Part 15 compliant. Other combinations are not permitted!

NOTE: The higher the RF rate, the faster the transmission but the range is shorter

All devices in a radio system must be set to the same radio channel.
DATAEAGLE radio systems in parallel operation are to be operated with different radio channels!
It makes sense to reduce the transmitting power in order not to influence neighboring radio systems in the same frequency band!

6.4 Diagnosis

2 variants of device diagnostics are available:

- Diagnosis via UDP
- Diagnosis via the DATAEAGLE Wizard configuration tool

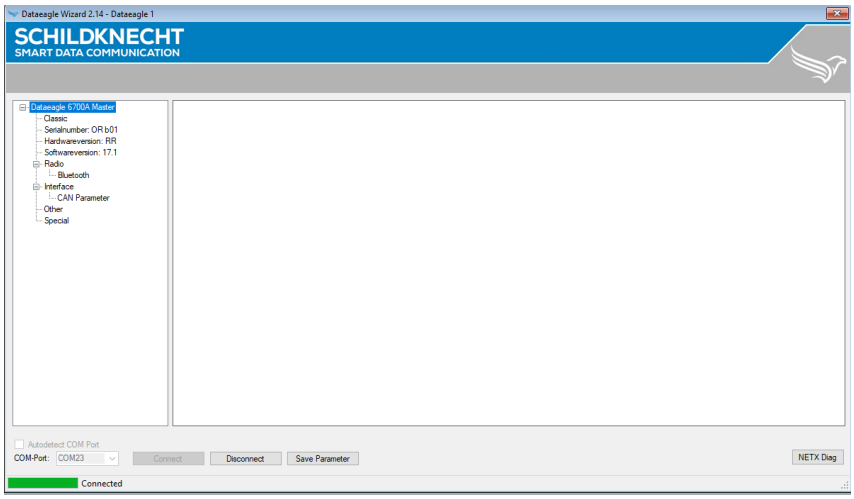
6.4.1 Integrated UDP diagnostic slave

The integrated UDP diagnostic slave can be used to monitor the radio link and the connected fieldbus devices.

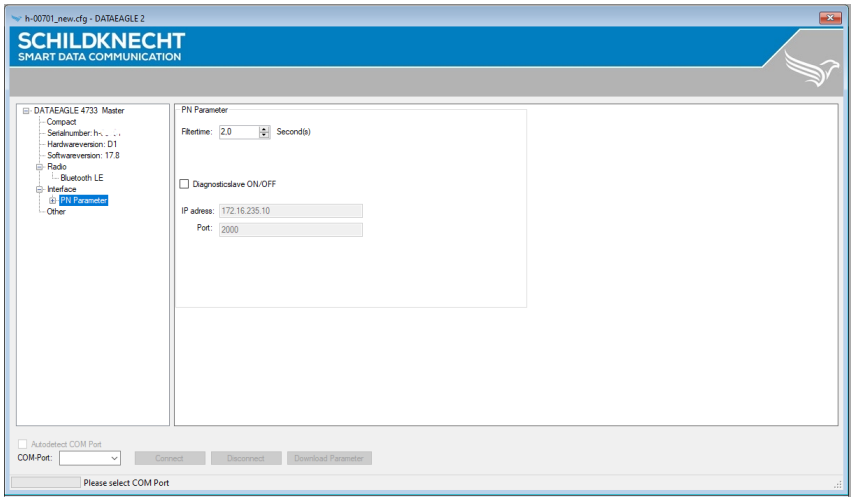
In order to access the data of the diagnostic slave, an IP address and a UDP port must be configured on the DATAEAGLE master for the diagnostic slave.

To do this, connect DATAEAGLE to the PC via the USB cable and start the DATAEAGLE Wizard configuration software.

Select *Autodetect COM Port* and then *Connect* to connect to DATAEAGLE and read the configuration. The DATAEAGLE must be switched on for this.



Select in the menu tree: *Interface → PN Parameter*



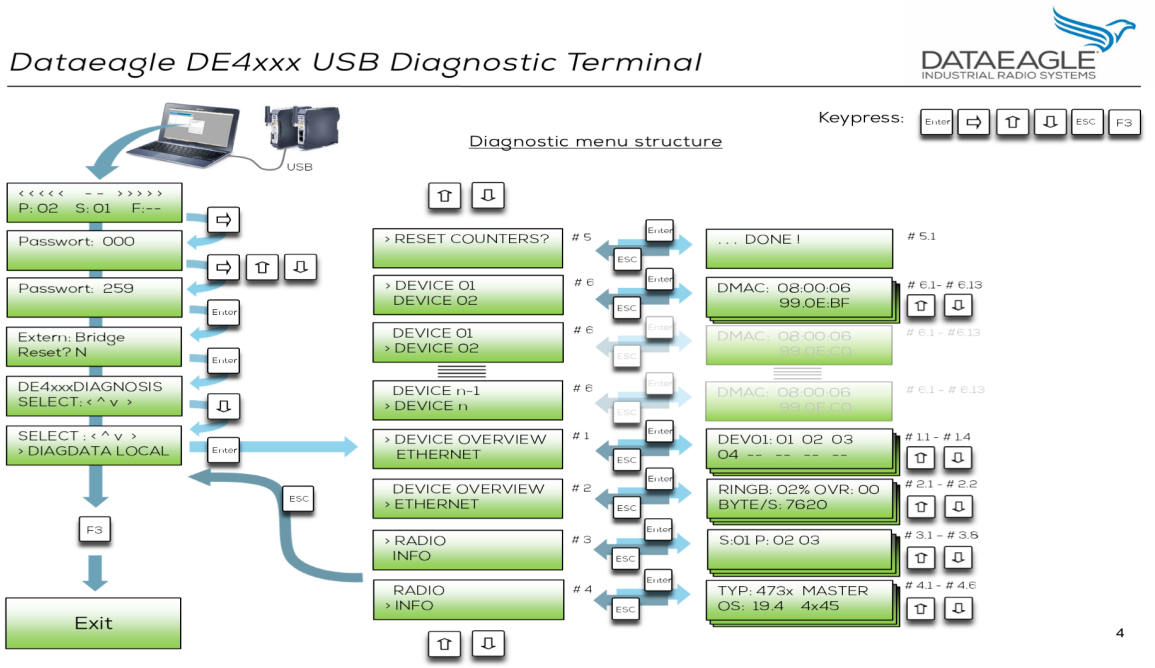
The document (DATAEAGLE 4000 Series - Dignostic via UDP - EN.pdf) describes and explains the diagnosic via UDP.

6.4.2 Diagnostic via terminal mode

A detailed diagnosis of the DATAEAGLE 4000 is possible via the terminal function of the DATAEAGLE Wizard.

Procedure:

1. Connect DATAEAGLE 4000 Master to PC via USB and apply 24 V DC.
2. In DATAEAGLE Wizard: *Tools* → *Terminalmode*. A new window opens.
3. Select COM port, optionally activate *Log Display messages*, click *Connect*.
4. Press **cursor right** → enter password **259** → press **Enter**.
5. Press **Enter** again → press **cursor down** → select *Diagnostic Data* → press **Enter**.



Device overview Ethernet (#1)		
Display / Meaning	**Note / Check**	
#1.1	Number of DATAEAGLE gateways (DE4000-GW, SKS system)	Shows the number of detected gateways in the system
#1.2	Number of PROFIBUS slaves	Total number of active DP slaves
#1.3	IP address of the system	IP address of the DATAEAGLE 4000 master
#1.4	System status	Shows the current operating status of the system

Local Ethernet interface (#2)		
Display / Meaning	**Note / Check**	
#2.1	IP address of the local Ethernet port	Local IP address of the device
#2.2	MAC address of the local Ethernet port	Unique hardware address of the Ethernet port

Radio information (#3)		
Display / Meaning	**Note / Check**	
#3.1	Frequency channel	Currently used radio channel
#3.2	Radio RSSI	Received signal strength; lower values (more negative) indicate weaker signal
#3.3	Radio synchronization status	Shows whether radio synchronization is active
#3.4	Number of radio connection drops since reset	Increments on connection drops; check radio link if frequent
#3.5	Number of radio retries since reset	Counts retransmissions due to poor connection quality
#3.6	Average response time [ms]	Average response time of radio slaves
#3.7	Max. response time [ms]	Maximum response time observed
#3.8	Min. response time [ms]	Minimum response time observed

Device parameters (#4)		
Display / Meaning	**Note / Check**	
#4.1	DATAEAGLE device type	Product designation
#4.2	OS version	Firmware version; provide for support requests
#4.3	Serial number	Unique device identifier
#4.4	HW version	Hardware revision level
#4.5	MAC address	Ethernet MAC address of the device
#4.6	Firmware upload counter	Counts completed firmware updates

Reset counters (#5) / Detail info per device (#6)		
Display / Meaning	**Note / Check**	
#5	Reset counters	Resets all error counters. Recommended before each diagnostic session. Confirm with Enter → ... DONE!
#6.1	Device IP address	IP address of the individual slave
#6.2	PROFIBUS address / Slave status	DP address and current status of the slave
#6.3	Slave response time [ms]	Response time of the individual DP slave via Ethernet
#6.4	Slave request counter	Counts telegrams sent to the DP slave
#6.5	Slave response counter	Counts telegrams received from the DP slave
#6.6	Slave retry counter	Increments on retransmissions
#6.7	Bus timeout counter	Counts when DP slave is not addressed by DP master
#6.8	Slave restart counter (by radio)	Counts connection drops due to radio interference
#6.9	Slave restart counter (by master)	Counts connection drops triggered by the DP master
#6.10	Slave timeout counter	Counts timeout events of the slave
#6.11	Radio retry counter	Counts radio retransmissions for this slave
#6.12	Device restart counter	Counts restarts/power-ons of this device
#6.13	PGS/PGR, GCR, LAS	PG telegrams / Global control / LAS telegrams

7 Tips and tricks

7.1 Improvement of EMC resistance

7.1.1 Introduction

Industrial use
The device is manufactured and developed according to the latest state of the art. Both the robust mechanical construction and the design of the electronic components are designed for industrial use.

To ensure trouble-free operation, rules must be observed when installing the devices in systems. If these are not observed, the high interference and destruction resistance of the devices will be partially ineffective.

The immunity of the entire system depends largely on correct installation, location and wiring.

- Check the controller manufacturer's assembly instructions for safe operation.
- Bring these into line with the recommendations for EMC-compliant design.
- Then install the device

7.1.2 Basic rules

PE connection (protective earth)
Interference voltages coupled into the device via the supply and signal lines, as well as electrostatic voltages transmitted by touch, are discharged to the grounding point.
→ Connect the grounding point to the **PE-connector** of the device with low impedance using the shortest possible copper conductor.

Shielding
Shielded lines reduce the **probability of interference**:

- by a factor of 100 compared to unshielded cables
- by a factor of 1000 if looping is also avoided.

The density of the braided shield should be at least 85%. To prevent the interference currents coupled onto the cable shield from becoming interference sources themselves, a low-impedance connection to the grounding point is particularly important.
→ **Always** use shielded cables for interfaces and power supplies.
→ Use shielding braid with a density of at least 85 %.
→ **Always** connect the shield on both sides to the EMC ground (usually PE).

Bus and power lines

→ Lay bus lines at least 20 cm away from power lines in separate cable ducts.

Unused wires

→ Always connect all unused wires of a line to PE on both sides.

Connector housing

→ Take metallic or metallized connector housings

→ Always place the shield of the cable on the connector housing.

Mounting plate

The mounting plate forms the EMC ground (star point) and is largely responsible for interference suppression.

→ Always mount all electronic devices on a galvanized mounting plate in the control cabinet. This allows the interference energy to flow directly back to the source of interference.

→ Do not use coated surfaces, such as yellow chromated anodizing.

NOTICE:
Sufficient dissipation of the RF fields via the PE network is not possible due to the high line impedance. Therefore, the PE network is not the same as the EMC ground, although they are directly connected electrically.

EMC ground

→ Make all connections with the EMC ground as short and large as possible.

NOTICE::
Make sure that all metallic housings have good contact with the galvanized mounting surface.

Sources of interference for RF fields

ATTENTION

Danger from sources of interference for HF fields

Electronic or electrical components without a closed metal housing are a source of interference for RF fields.

→ Make sure that all electronic or electrical components that could be a source of interference from RF fields have a closed metal housing.

Protective conductor

ATTENTION

Unfavorable protective conductor connections and conductor loops

EMC measures can be bypassed and rendered ineffective by unfavorable PE conductor connections and conductor loops. PE conductor loops can act like antennas and couple interference.

→ Route protective conductors of the individual system components in a star configuration to the equipotential bonding rail.

7.2 Optimal antenna mounting

Instructions for antenna mounting and alignment can be found in our Antenna 1x1 → https://www.schildknecht.ag/download/antennen-1mal1/

8 Technical data

WARNING!

Danger to life due to electric shock.
Operation of the device only intended on 24 V DC (safety extra-low voltage).
Death and serious injuries as well as considerable property damage can be the result.

- The device may only be connected by an electrician in accordance with IEC 60364!
- No direct connection of these devices to other networks!
- Observe five safety rules! See chapter 2.1

8.1 DATAEAGLE Compact 4715 - Article number: 11170

General

Power supply	24 V DC
Power supply connection	terminals
Power consumption	100mA
Protection class	IP20
Temperature range	-20...+60 °C
Conformity	CE, FCC, IC
Weight	130g
Wide	22,5 mm
Height	99 mm
Depth	114,5 mm
Color	Black

Radio technology

Frequency	2,4 GHz Bluetooth
Transmitting power	100mW (EIRP)
Indoor range	100m
Outdoor range	300m
Max. Number of radio slaves	1
Antenna connection	SMA Anschluss (female) - 50 Ohm

Interface

Max. Ethernet transmission rate	100 MBit/s
2-port Switch	Yes
Ethernet connection	RJ 45
Optimized for	PROFINET
Max. PROFINET devices	4
PROFIsafe	No

8.2 DATAEAGLE X-treme 4715 - Article number: 11420

General

Power supply	24 V DC
Power supply connection	M12, A-coded, 5 pin (male)
Power consumption	100mA
Mounting	4-hole screw mounting
Protection class	IP65
Temperature range	-20...+60 °C
Conformity	CE, FCC, IC
Weight	280g
Wide	88 mm
Height	120 mm
Depth	42 mm
Color	Black

Radio technology

Frequency	2,4 GHz Bluetooth
Transmitting power	100mW (EIRP)
Indoor range	100m
Outdoor range	300m
Max. Number of radio slaves	1
Antenna connection	SMA Anschluss (female) - 50 Ohm

Interface

Max. Ethernet transmission rate	100 MBit/s
2-port Switch	Yes
Ethernet connection	M12, B-coded, 5 pin (male), 5 pin (female)
Optimized for	PROFINET
Max. PROFINET devices	4
PROFIsafe	No

8.3 DATAEAGLE Compact 4713 - Article number: 11171

General

Power supply	24 V DC
Power supply connection	terminals
Power consumption	100mA
Protection class	IP20
Temperature range	-20...+60 °C
Conformity	CE, FCC, IC
Weight	130g
Wide	22,5 mm
Height	99 mm
Depth	114,5 mm
Color	Black

Radio technology

Frequency	2,4 GHz Bluetooth
Transmitting power	100mW (EIRP)
Indoor range	100m
Outdoor range	300m
Max. Number of radio slaves	4
Antenna connection	SMA Anschluss (female) - 50 Ohm

Interface

Max. Ethernet transmission rate	100 MBit/s
2-port Switch	Yes
Ethernet connection	RJ 45
Optimized for	PROFINET
Max. PROFINET devices	6
PROFIsafe	No

8.4 DATAEAGLE X-treme 4713 - Article number: 11421

General

Power supply	24 V DC
Power supply connection	M12, A-coded, 5 pin (male)
Power consumption	100mA
Mounting	4-hole screw mounting
Protection class	IP65
Temperature range	-20...+60 °C
Conformity	CE, FCC, IC
Weight	280g
Wide	88 mm
Height	120 mm
Depth	42 mm
Color	Black

Radio technology

Frequency	2,4 GHz Bluetooth
Transmitting power	100mW (EIRP)
Indoor range	100m
Outdoor range	300m
Max. Number of radio slaves	4
Antenna connection	SMA Anschluss (female) - 50 Ohm

Interface

Max. Ethernet transmission rate	100 MBit/s
2-port Switch	Yes
Ethernet connection	M12, B-coded, 5 pin (male), 5 pin (female)
Optimized for	PROFINET
Max. PROFINET devices	6
PROFIsafe	No

8.5 DATAEAGLE Compact 4712 - Article number: 11174

General

Power supply	24 V DC
Power supply connection	terminals
Power consumption	100mA
Protection class	IP20
Temperature range	-20...+60 °C
Conformity	CE, FCC, IC
Weight	130g
Wide	22,5 mm
Height	99 mm
Depth	114,5 mm
Color	Black

Radio technology

Frequency	2,4 GHz Bluetooth
Transmitting power	100mW (EIRP)
Indoor range	100m
Outdoor range	300m
Max. Number of radio slaves	4
Antenna connection	SMA Anschluss (female) - 50 Ohm

Interface

Max. Ethernet transmission rate	100 MBit/s
2-port Switch	Yes
Ethernet connection	RJ 45
Optimized for	PROFINET
Max. PROFINET devices	8
PROFIsafe	Yes

8.6 DATAEAGLE X-treme 4712 - Article number: 11422

General

Power supply	24 V DC
Power supply connection	M12, A-coded, 5 pin (male)
Power consumption	100mA
Mounting	4-hole screw mounting
Protection class	IP65
Temperature range	-20...+60 °C
Conformity	CE, FCC, IC
Weight	280g
Wide	88 mm
Height	120 mm
Depth	42 mm
Color	Black

Radio technology

Frequency	2,4 GHz Bluetooth
Transmitting power	100mW (EIRP)
Indoor range	100m
Outdoor range	300m
Max. Number of radio slaves	4
Antenna connection	SMA Anschluss (female) - 50 Ohm

Interface

Max. Ethernet transmission rate	100 MBit/s
2-port Switch	Yes
Ethernet connection	M12, B-coded, 5 pin (male), 5 pin (female)
Optimized for	PROFINET
Max. PROFINET devices	8
PROFIsafe	Yes

8.7 DATAEAGLE Compact 4710 - Article number: 11175

General

Power supply	24 V DC
Power supply connection	terminals
Power consumption	100mA
Protection class	IP20
Temperature range	-20...+60 °C
Conformity	CE, FCC, IC
Weight	130g
Wide	22,5 mm
Height	99 mm
Depth	114,5 mm
Color	Black

Radio technology

Frequency	2,4 GHz Bluetooth
Transmitting power	100mW (EIRP)
Indoor range	100m
Outdoor range	300m
Max. Number of radio slaves	4
Antenna connection	SMA Anschluss (female) - 50 Ohm

Interface

Max. Ethernet transmission rate	100 MBit/s
2-port Switch	Yes
Ethernet connection	RJ 45
Optimized for	Ethernet

8.8 DATAEAGLE X-treme 4710 - Article number: 11423

General

Power supply	24 V DC
Power supply connection	M12, A-coded, 5 pin (male)
Power consumption	100mA
Mounting	4-hole screw mounting
Protection class	IP65
Temperature range	-20...+60 °C
Conformity	CE, FCC, IC
Weight	280g
Wide	88 mm
Height	120 mm
Depth	42 mm
Color	Black

Radio technology

Frequency	2,4 GHz Bluetooth
Transmitting power	100mW (EIRP)
Indoor range	100m
Outdoor range	300m
Max. Number of radio slaves	4
Antenna connection	SMA Anschluss (female) - 50 Ohm

Interface

Max. Ethernet transmission rate	100 MBit/s
2-port Switch	Yes
Ethernet connection	M12, B-coded, 5 pin (male), 5 pin (female)
Optimized for	Ethernet

8.9 DATAEAGLE Compact 4333 - Article number: 11144

General

Power supply	24 V DC
Power supply connection	terminals
Power consumption	100mA
Protection class	IP20
Temperature range	-20...+60 °C
Conformity	CE
Weight	160g
Wide	22,5 mm
Height	99 mm
Depth	114,5 mm
Color	Black

Radio technology

Frequency	869 MHz
Transmitting power	500mW (EIRP)
Indoor range	300m
Outdoor range	1-3 km
Max. Number of radio slaves	4
Antenna connection	SMA Anschluss (female) - 50 Ohm

Interface

Max. Ethernet transmission rate	100 MBit/s
2-port Switch	Yes
Ethernet connection	RJ 45
Optimized for	PROFINET
Max. PROFINET devices	6
PROFIsafe	No

8.10 DATAEAGLE X-treme 4333 - Article number: 11327

General

Power supply	24 V DC
Power supply connection	M12, A-coded, 5 pin (male)
Power consumption	100mA
Mounting	4-hole screw mounting
Protection class	IP65
Temperature range	-20...+60 °C
Conformity	CE
Weight	280g
Wide	88 mm
Height	120 mm
Depth	42 mm
Color	Black

Radio technology

Frequency	869 MHz
Transmitting power	500mW (EIRP)
Indoor range	300m
Outdoor range	1-3km
Max. Number of radio slaves	4
Antenna connection	SMA Anschluss (female) - 50 Ohm

Interface

Max. Ethernet transmission rate	100 MBit/s
2-port Switch	Yes
Ethernet connection	M12, B-coded, 5 pin (male), 5 pin (female)
Optimized for	PROFINET
Max. PROFINET devices	6
PROFIsafe	No

8.11 DATAEAGLE Compact 4343 - Article number: 11158

General

Power supply	24 V DC
Power supply connection	terminals
Power consumption	100mA
Protection class	IP20
Temperature range	-20...+60 °C
Conformity	FCC
Weight	160g
Wide	22,5 mm
Height	99 mm
Depth	114,5 mm
Color	Black

Radio technology

Frequency	915 MHz
Transmitting power	500mW (EIRP)
Indoor range	300m
Outdoor range	1-3 km
Max. Number of radio slaves	4
Antenna connection	SMA Anschluss (female) - 50 Ohm

Interface

Max. Ethernet transmission rate	100 MBit/s
2-port Switch	Yes
Ethernet connection	RJ 45
Optimized for	PROFINET
Max. PROFINET devices	6
PROFIsafe	No

8.12 DATAEAGLE X-treme 4343 - Article number: 11374

General

Power supply	24 V DC
Power supply connection	M12, A-coded, 5 pin (male)
Power consumption	100mA
Mounting	4-hole screw mounting
Protection class	IP65
Temperature range	-20...+60 °C
Conformity	FCC
Weight	280g
Wide	88 mm
Height	120 mm
Depth	42 mm
Color	Black

Radio technology

Frequency	915 MHz
Transmitting power	500mW (EIRP)
Indoor range	300m
Outdoor range	1-3km
Max. Number of radio slaves	4
Antenna connection	SMA Anschluss (female) - 50 Ohm

Interface

Max. Ethernet transmission rate	100 MBit/s
2-port Switch	Yes
Ethernet connection	M12, B-coded, 5 pin (male), 5 pin (female)
Optimized for	PROFINET
Max. PROFINET devices	6
PROFIsafe	No

8.13 DATAEAGLE Compact 473xA - Article number: 15475

General

Power supply	24 V DC
Power supply connection	terminals
Power consumption	100mA
Protection class	IP20
Temperature range	-20...+60 °C
Conformity	CE, FCC, IC
Weight	130g
Wide	22,5 mm
Height	99 mm
Depth	114,5 mm
Color	Black

Radio technology

Frequency	2,4 GHz Bluetooth 5
Transmitting power	8dBm
Indoor range	100m
Outdoor range	300m
Antenna connection	SMA Anschluss (female) - 50 Ohm

Interface

Max. Ethernet transmission rate	100 MBit/s
2-port Switch	Yes
Ethernet connection	RJ 45

8.13.1 Software Feature Ethernet Multipoint - Article number: 15480

Max. Number of radio slaves	4
Optimized for	Ethernet

8.13.2 Software Feature Multiprotokoll Point-to-Point - Article number: 15481

Max. Number of radio slaves	1
Optimized for	PROFINET, EtherNet/IP
Max. Number of participants/connections	4
Safety communication	No

8.13.3 Software Feature Multiprotokoll Multipoint - Article number: 15482

Max. Number of radio slaves	4
Optimized for	PROFINET, EtherNet/IP
Max. Number of participants/connections	6
Safety communication	No

8.13.4 Software Feature Multiprotokoll Safe Point-to-Point - Article number: 15485

Max. Number of radio slaves	1
Optimized for	PROFINET, EtherNet/IP, openSAFETY via UDP
Max. Number of participants/connections	4
Safety communication	Yes

8.13.5 Software Feature Multiprotokoll Safe Multipoint - Article number: 15483

Max. Number of radio slaves	4
Optimized for	PROFINET, EtherNet/IP, openSAFETY via UDP
Max. Number of participants/connections	8
Safety communication	Yes

8.14 DATAEAGLE X-treme 473xA - Article number: 15476

General

Power supply	24 V DC
Power supply connection	M12, A-coded, 5 pin (male)
Power consumption	100mA
Mounting	4-hole screw mounting
Protection class	IP65
Temperature range	-20...+60 °C
Conformity	CE, FCC, IC
Weight	280g
Wide	88 mm
Height	120 mm
Depth	42 mm
Color	Black

Radio technology

Frequency	2,4 GHz Bluetooth 5
Transmitting power	8dBm
Indoor range	100m
Outdoor range	300m
Antenna connection	SMA Anschluss (female) - 50 Ohm

Interface

Max. Ethernet transmission rate	100 MBit/s
2-port Switch	Yes
Ethernet connection	M12, B-coded, 5 pin (male), 5 pin (female)

8.14.1 Software Feature Ethernet Multipoint - Article number: 15480

Max. Number of radio slaves	4
Optimized for	Ethernet

8.14.2 Software Feature Multiprotokoll Point-to-Point - Article number: 15481

Max. Number of radio slaves	1
Optimized for	PROFINET, EtherNet/IP
Max. Number of participants/connections	4
Safety communication	No

8.14.3 Software Feature Multiprotokoll Multipoint - Article number: 15482

Max. Number of radio slaves	4
Optimized for	PROFINET, EtherNet/IP
Max. Number of participants/connections	6
Safety communication	No

8.14.4 Software Feature Multiprotokoll Safe Point-to-Point - Article number: 15485

Max. Number of radio slaves	1
Optimized for	PROFINET, EtherNet/IP, openSAFETY via UDP
Max. Number of participants/connections	4
Safety communication	Yes

8.14.5 Software Feature Multiprotokoll Safe Multipoint - Article number: 15483

Max. Number of radio slaves	4
Optimized for	PROFINET, EtherNet/IP, openSAFETY via UDP
Max. Number of participants/connections	8
Safety communication	Yes

9 Legal notice

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