# Manual
# DATAEAGLE 6000 Series - Wireless CAN

Schildknecht AG

29. Juli 2026




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This document applies to the following products:

| Name | Article number |
|---|---|
| DATAEAGLE Compact 6710 | 11166 |
| DATAEAGLE X-treme 6710 | 11361 |
| DATAEAGLE Compact 6730 | 11268 |
| DATAEAGLE X-treme 6730 | 11278 |
| DATAEAGLE Compact 6330 | 11145 |
| DATAEAGLE X-treme 6330 | 11373 |
| DATAEAGLE Compact 6340 | 11159 |
| DATAEAGLE X-treme 6340 | 11375 |


| | |
|---|---|
| Version | 1.1 |
| Language | EN |
| Date | 29. Juli 2026 |



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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:

**CAN** CAN in AUTOMATION e.V.

# 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 6000 series have been specially developed for the transparent transmission of CAN via radio.

Different radio technologies, such as Bluetooth 2.4 GHz or 869 / 915 MHz in the licensed band, are used for transmission. CAN transmission speeds of up to 500 kbit/s can be configured using integrated data preprocessing.
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.
11 bit and 29 bit are supported.
Our software DATAEAGLE Wizard allows a quick set-up of the essential settings, such as CAN speed, CAN type, CAN whitelist and radio parameters. The commissioning is therefore done in a very short time.

## 3.2 Operating principle DATAEAGLE 6000

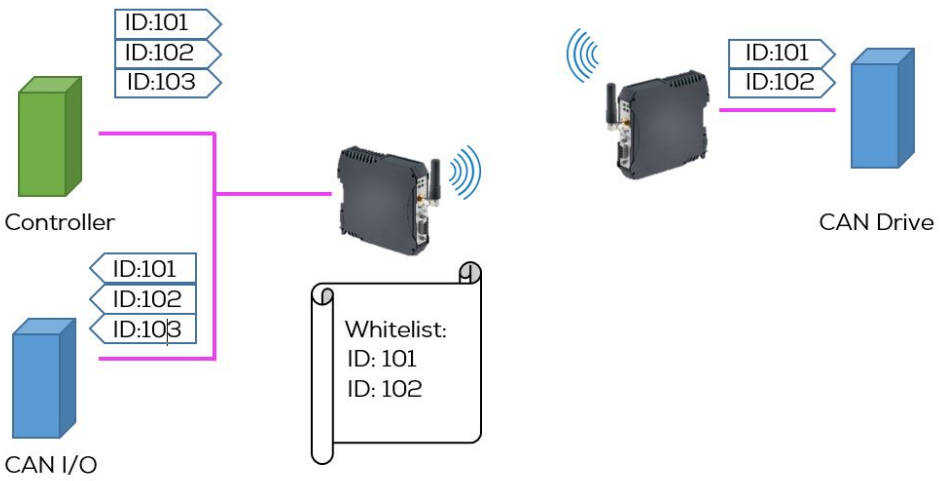
The DATAEAGLE 6000 is suitable for the transparent transmission of CAN data via radio. All CAN protocols are supported.
Point-to-point as well as multipoint systems can be configured.



### 3.2.1 Operating principle Whitelist

If the whitelist is not activated, all CAN telegrams received on the CAN interface are transmitted by radio. In case of high bus load, data loss may occur, since the bandwidth available via radio is limited.
Therefore, it is optionally possible to configure a whitelist using the DATAEAGLE Wizard configuration software.
This is used to filter out the CAN telegrams that are to be transmitted by radio. The whitelist defines by means of the identifier which telegrams are to be transmitted by radio.

Example:

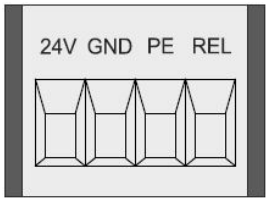



The whitelist contains the message IDs for the station „CAN Drive“ (ID:101 + ID:102).
All other message IDs are forwarded locally.

## 3.3 DATAEAGLE Compact

### 3.3.1 Connections

**Power supply**

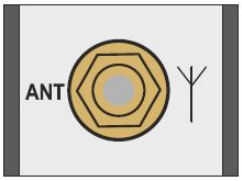



| Clamps | Description |
|---|---|
| 24V | 24 V DC |
| GND | 0V |
| PE | PE |
| REL | Switching output |

**USB port**

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

**Antenna connection**




SMA connector for antenna

**CAN Interface**

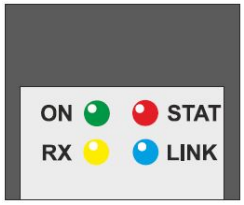



9 pin SUB-D connector for CAN

**Pin assignment**

| PIN | Description |
|---|---|
| 1 | do not connect |
| 2 | CAN_L |
| 3 | do not connect |
| 4 | do not connect |
| 5 | do not connect |
| 6 | do not connect |
| 7 | CAN_H |
| 8 | do not connect |
| 9 | do not connect |

### 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 |

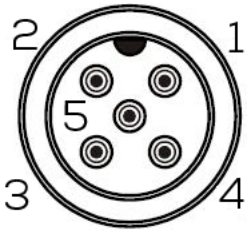
**STAT LED - No function**

## 3.4 DATAEAGLE X-treme

### 3.4.1 Connections

**Power supply**

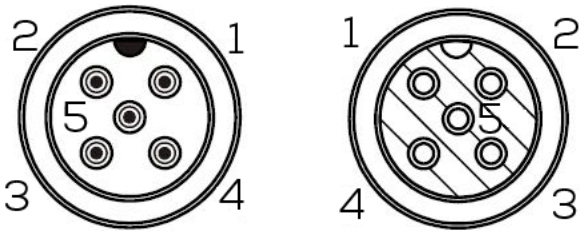
M12, A-coded, 5 pin (male)




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

**CAN Bus**

M12, A-coded, 5 pin (male), 5 pin (female)

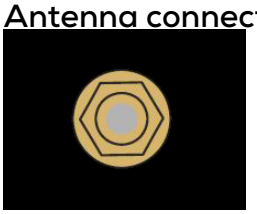



| PIN | Description |
|---|---|
| 1 | PE |
| 2 | not connected |
| 3 | not connected |
| 4 | CAN_H |
| 5 | CAN_L |

**USB port**

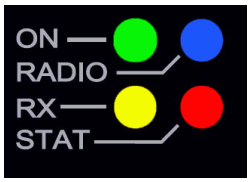
The DATAEAGLE X-treme has a USB port for configuration and software updates via the DATAEAGLE Wizard tool. This is located behind the PG screw.

**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 |

**LINK LED**

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

**STAT LED - No function**

# 4 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

## 4.1 DATAEAGLE Compact 6710 - Article number: 11166

**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. CAN transmission rate | 500 kBit/s |
|---|---|
| CAN connection | 9 pol. SUB-D |

## 4.2 DATAEAGLE X-treme 6710 - Article number: 11361

**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. CAN transmission rate | 500 kBit/s |
|---|---|
| CAN connection | M12, A-coded, 5 pin (male), 5 pin (female) |

## 4.3 DATAEAGLE Compact 6730 - Article number: 11268

**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 |
| Max. Number of radio slaves | 4 |
| Antenna connection | SMA Anschluss (female) - 50 Ohm |

**Interface**

| Max. CAN transmission rate | 500 kBit/s |
|---|---|
| CAN connection | 9 pol. SUB-D |

## 4.4 DATAEAGLE X-treme 6730 - Article number: 11278

**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 |
| Max. Number of radio slaves | 4 |
| Antenna connection | SMA Anschluss (female) - 50 Ohm |

**Interface**

| Max. CAN transmission rate | 500 kBit/s |
|---|---|
| CAN connection | M12, A-coded, 5 pin (male), 5 pin (female) |

## 4.5 DATAEAGLE Compact 6330 - Article number: 11145

**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 |
| Antenna connection | SMA Anschluss (female) - 50 Ohm |

**Interface**

| Max. CAN transmission rate | 500 kBit/s |
|---|---|
| CAN connection | 9 pol. SUB-D |

## 4.6 DATAEAGLE X-treme 6330 - Article number: 11373

**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 |
| Antenna connection | SMA Anschluss (female) - 50 Ohm |

**Interface**

| Max. CAN transmission rate | 500 kBit/s |
|---|---|
| CAN connection | M12, A-coded, 5 pin (male), 5 pin (female) |

## 4.7 DATAEAGLE Compact 6340 - Article number: 11159

**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 |
| Antenna connection | SMA Anschluss (female) - 50 Ohm |

**Interface**

| Max. CAN transmission rate | 500 kBit/s |
|---|---|
| CAN connection | 9 pol. SUB-D |

## 4.8 DATAEAGLE X-treme 6340 - Article number: 11375

**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 |
| Antenna connection | SMA Anschluss (female) - 50 Ohm |

**Interface**

| | |
|---|---|
| Max. CAN transmission rate | 500 kBit/s |
| CAN connection | M12, A-coded, 5 pin (male), 5 pin (female) |

# 5 Mounting

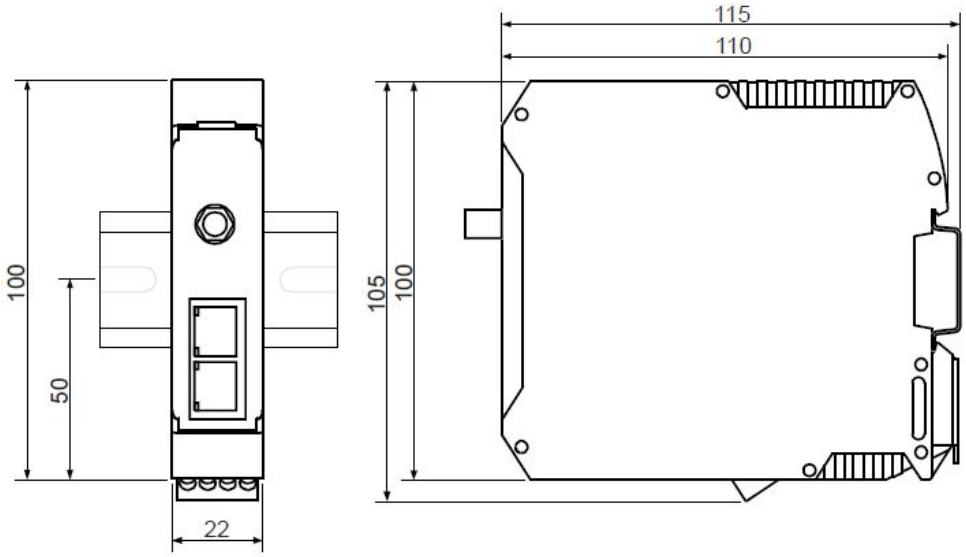
## 5.1 Requirements

- 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

## 5.2 Dimensions

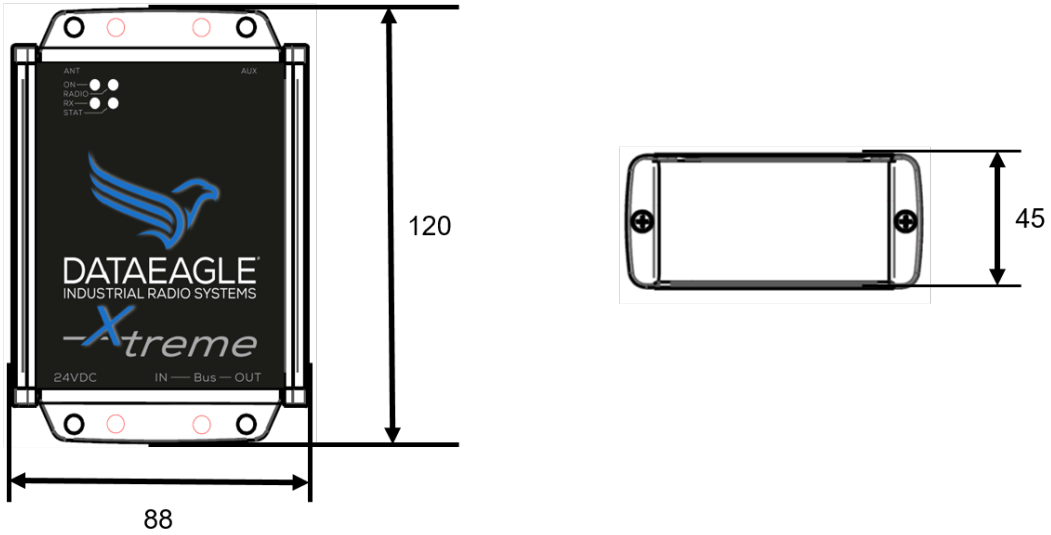
### DATAEAGLE Compact

Dimensions in mm



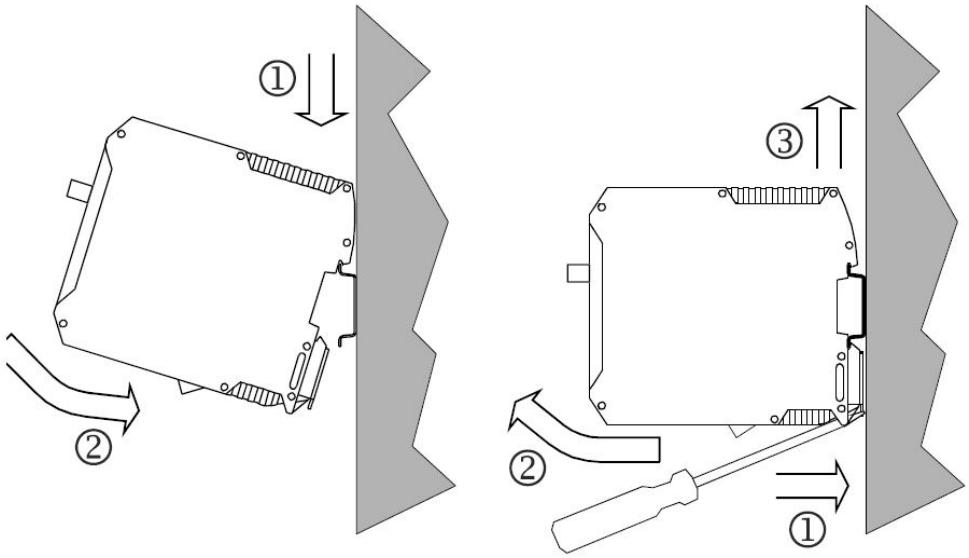

### DATAEAGLE X-treme

Dimensions in mm



## 5.3 Mounting the components

### DATAEAGLE Compact




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

***Mount:***

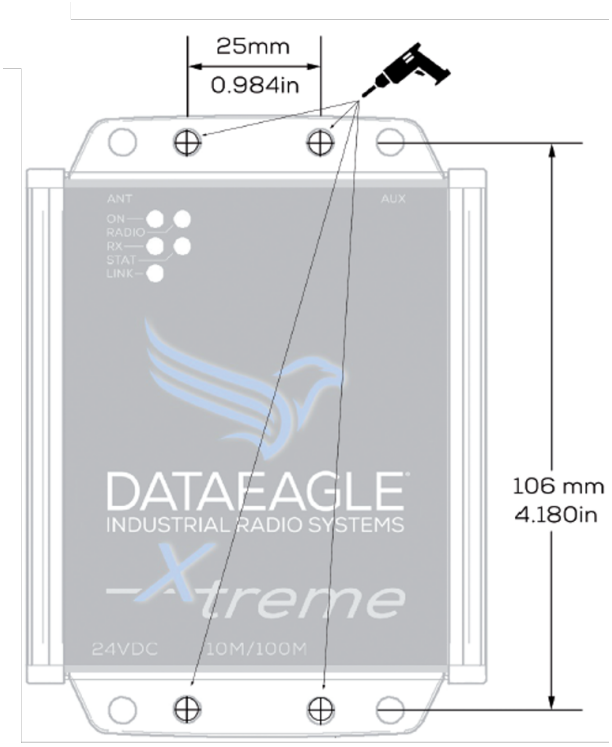
1. Place the module from diagonally above onto the top-hat rail.
2. Press the module down firmly.

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

Example:



**DATAEAGLE X-treme**

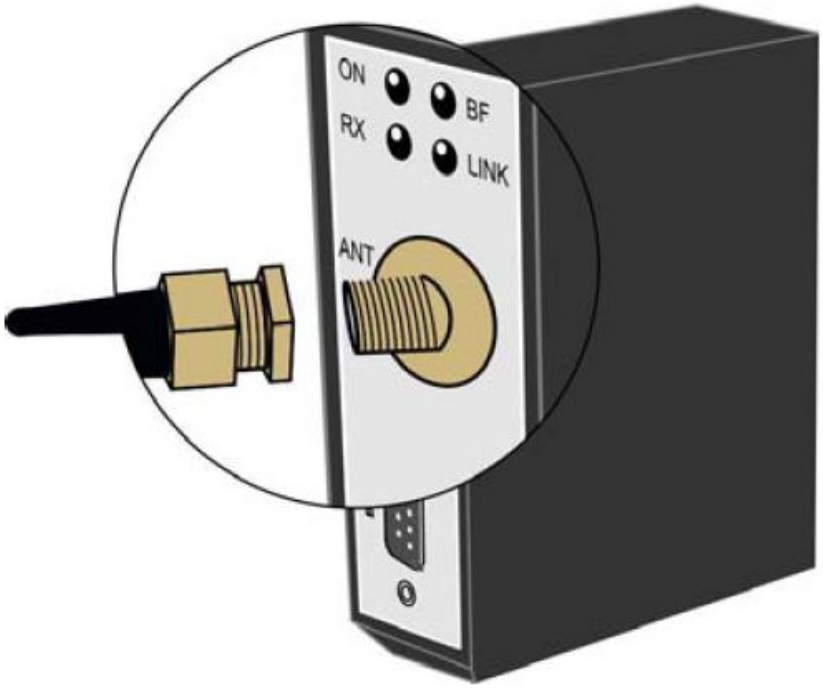



→ Attach the module to the designated location according to its mounting method.

***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.

## 5.4 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**

## 5.5 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).

# 6 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 8.1 during all installation steps.**

**NOTE**
Connected cables must be approved for 60°C.

## 6.1 Power supply connection

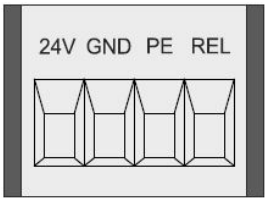
WARNING!

**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

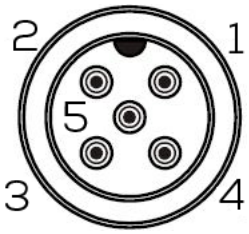
### Power supply - DATAEAGLE Compact




| 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 |

## 6.2 CAN bus connection

**CAN Bus - DATAEAGLE Compact**




9 pin SUB-D connector for CAN

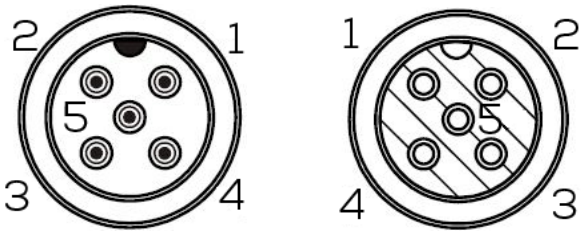
**Pin assignment**

| PIN | Description |
|---|---|
| 1 | not connected |
| 2 | CAN_L |
| 3 | do not connect |
| 4 | not connected |
| 5 | do not connect |
| 6 | do not connect |
| 7 | CAN_H |
| 8 | do not connect |
| 9 | not connected |

**CAN bus termination**

If the DATAEAGLE Compact is the fist or last participant on the physical CAN bus, the SUB-D socket of the connection cable must contain a terminating resistor (120 Ohm between CAN_L and CAN_H).

**CAN Bus - DATAEAGLE X-treme**
M12, A-coded, 5 pin (male), 5 pin (female)




| PIN | Description |
|---|---|
| 1 | not connected |
| 2 | not connected |
| 3 | not connected |
| 4 | CAN_H |
| 5 | CAN_L |

**CAN bus termination**

If the DATAEAGLE X-treme is the first or last station on the physical CAN bus, an M12 terminating resistor (e.g. article no.: 11888) must be screwed onto one of the two M12 connections.

# 7 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.

## 7.1 Delivery state of the modules

**NOTE**
New devices are preconfigured at the factory.

In the delivery state, the device is in autobauding mode. This means that the DATAEAGLE searches for the correct CAN baud rate after switching on.

ATTENTION

**The search process can lead to CAN errors, which should be considered in the application. If an error-free switch-on process is required, please set a fixed baud rate!**

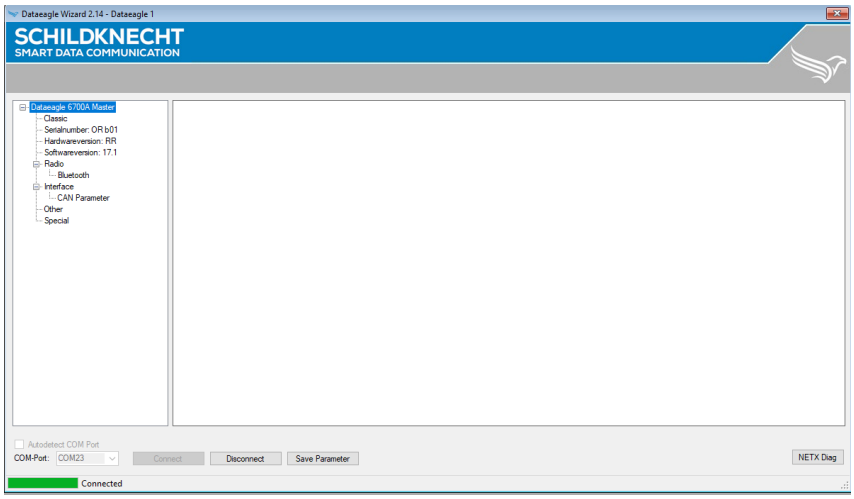
## 7.2 Configuration CAN-Interface parameter

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

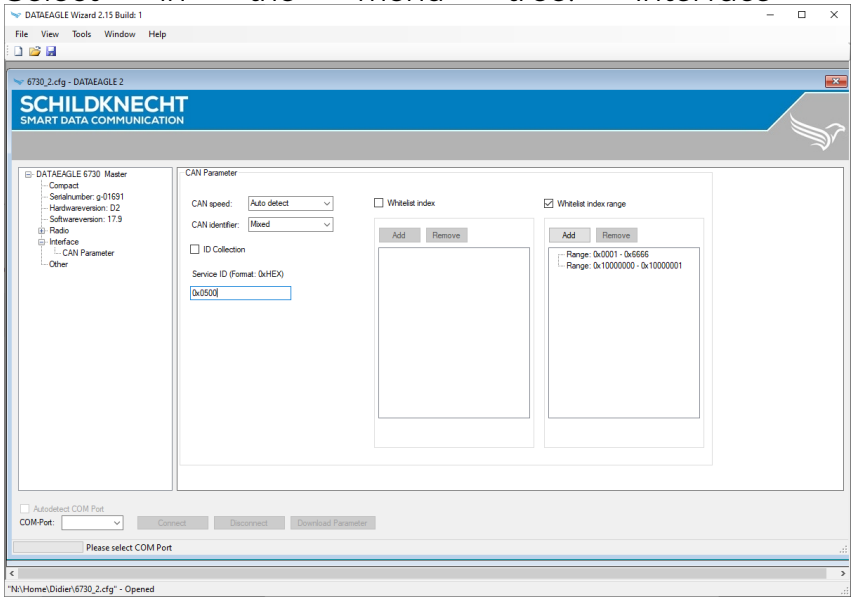
- USB driver CDM21228 (Download Link) - Installed on PC
- Configuration Tool DATAEAGLE Wizard (Download Link) - Installed on PC
- USB cable - between PC and DATAEAGLE

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 → CAN Parameter*



**Configuration parameters**

| Label | Description | Comment |
|---|---|---|
| CAN Speed | Setting the CAN baud rate | 10kBit/s, 50kBit/s, 250kBit/s, 500kBit/s, Auto detect |
| CAN Identifier | CAN 2.0A oder CAN 2.0B | 11 Bit, 29 Bit, Mixed (11/29 Bit) |
| ID Collection | CAN ID preprocessing (See 7.2.1 ID Collection) | Enabled/Disabled |
| Whitelist | The whitelist contains message IDs that are to be transmitted via radio. (See 7.2.2 Whitelist) | Reduction of the load on radio transmission from local cross traffic |
| Service ID | CAN Message ID for diagnosis and control of the DATAEAGLE. (See 7.2.3 Service ID) | CAN Message ID |

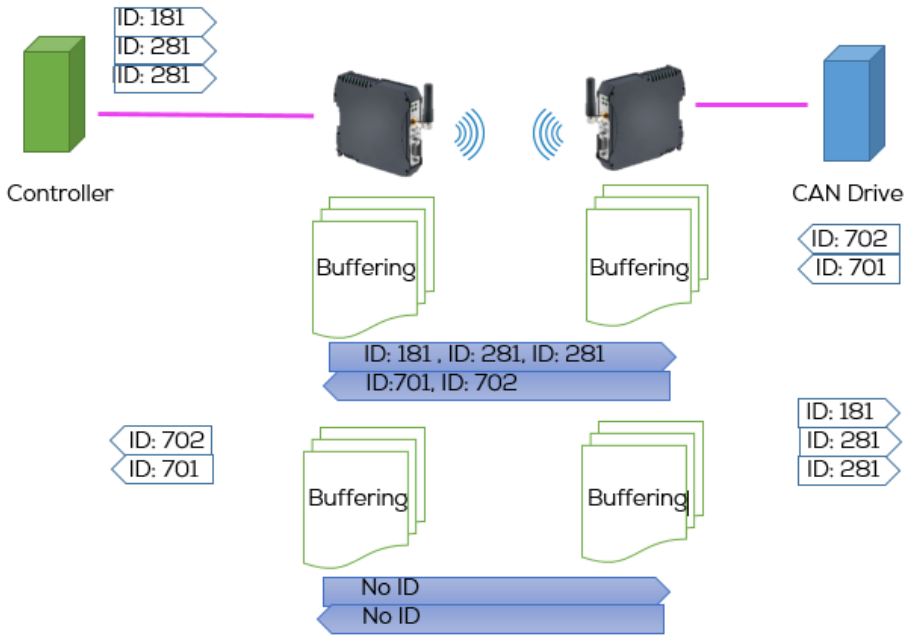
### 7.2.1 ID Collection

2 variants of CAN ID preprocessing are supported. "ID Transparent" or "ID Collection".

If the "ID Collection" option is not selected in the configuration, DATAEAGLE operates in the "ID Transparent" mode.

In the operating mode "ID Transparent" all CAN IDs received on the cable side are collected and transmitted via radio.

Example:

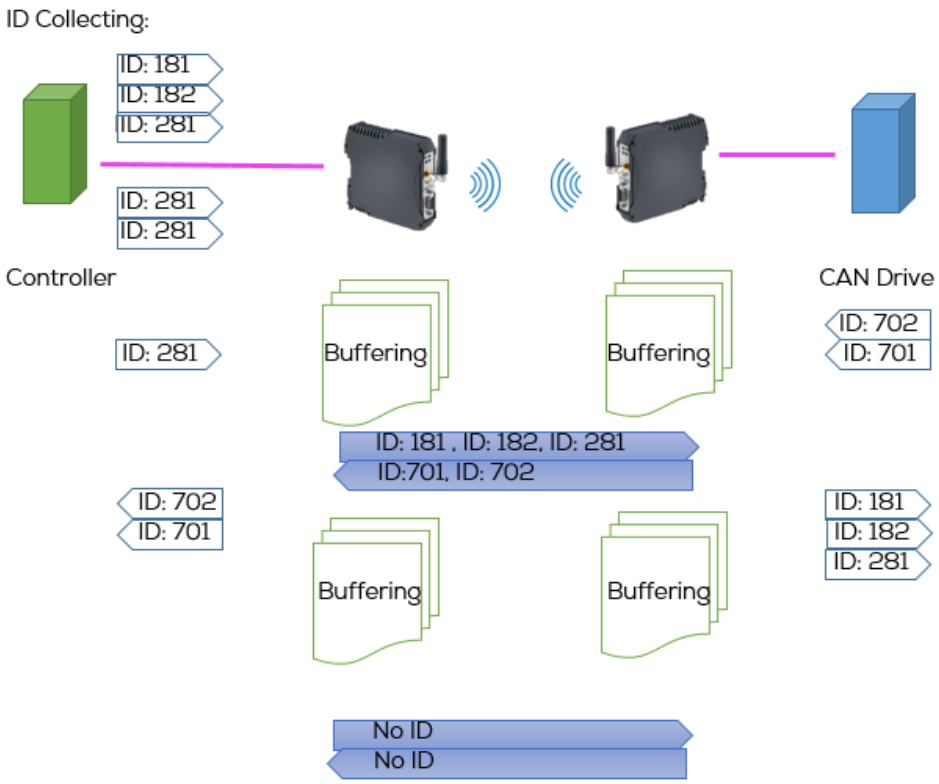



The "Controller" sends CAN messages for the station „CAN Drive" (ID:181 + ID:281 + ID:281).
All message IDs (including those received twice) are transmitted.

**NOTE**
The operating mode "ID Transparent" is recommended e.g. for CANopen applications.

In the operating mode "ID Collection" all CAN IDs received on the cable side are collected and identical IDs are overwritten until the next radio transmission.

Example:




The "Controller" sends CAN messages for the station „CAN Drive" (ID:181 + ID:182 + ID:281 - multiple).
Identical message IDs are overwritten before transmission and only the last received value is transmitted.

**NOTE**
The "ID Collection" mode is recommended for applications with fast changing data (e.g. sensor data).

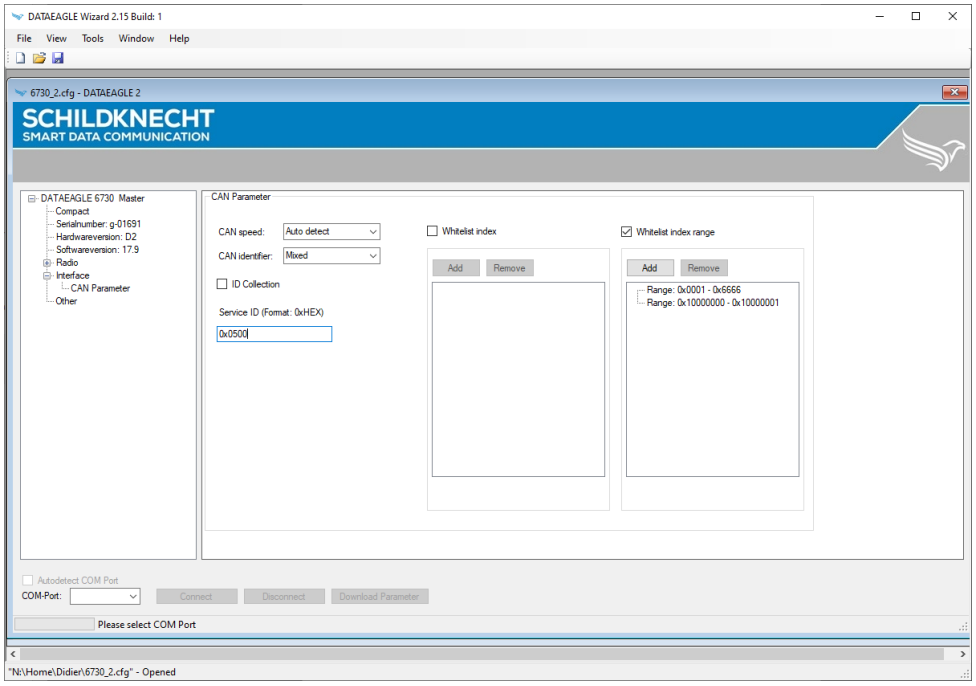
### 7.2.2 Whitelist

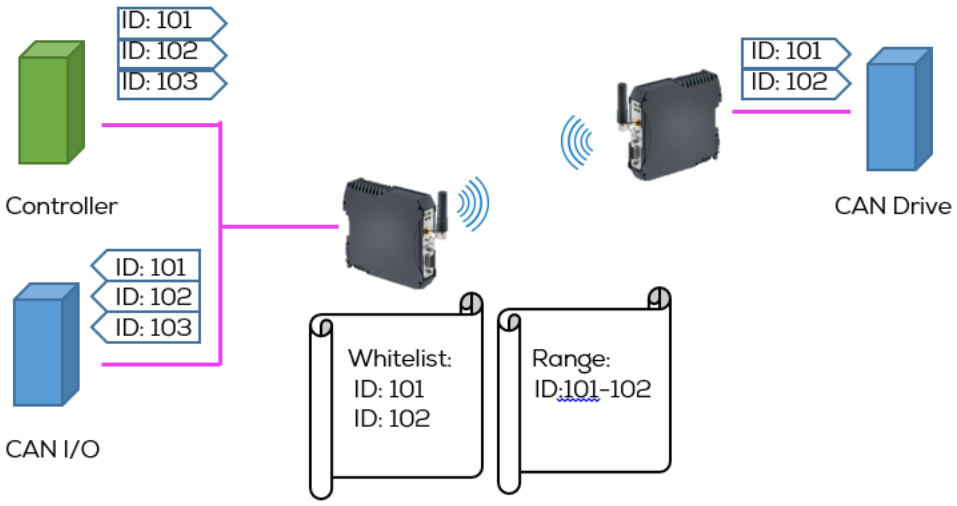
Message IDs can be added to the whitelist that are to be transmitted via radio. Message IDs that are not entered are ignored.

The message ID is entered and added in hexadecimal form.

It is possible to configure individual CAN message IDs (select "Whitelist index") or to specify a range (select "Whitelist range").

Example:



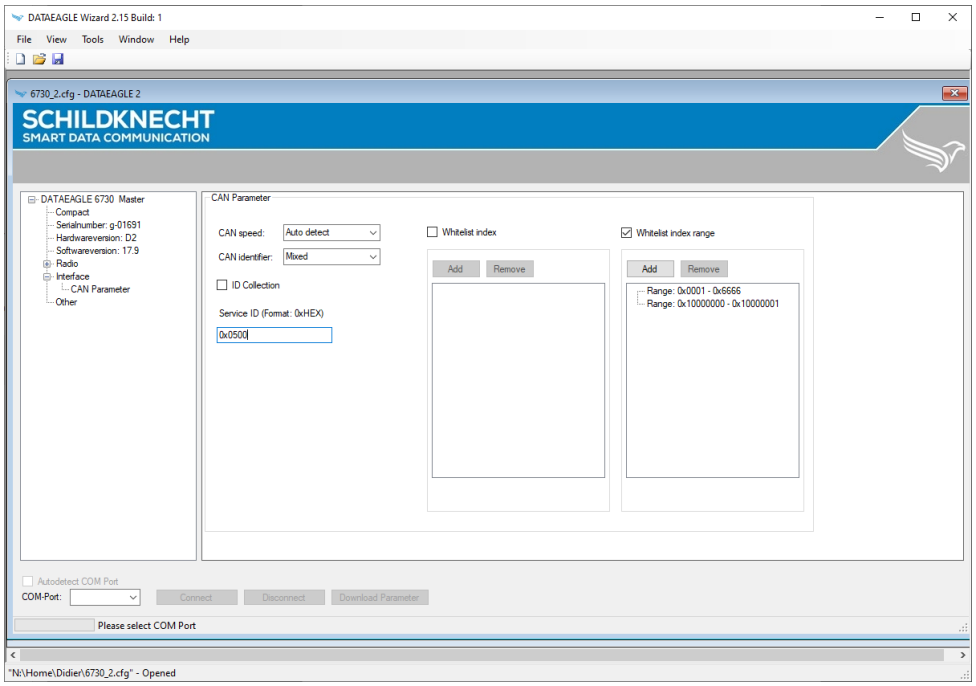




Only messages with a CAN ID that are included in the whitelist are transmitted via radio.

### 7.2.3 Service ID (Currently only for 2.4 GHz Bluetooth)

The service ID can be used to control the radio links, set the whitelist and read diagnostic data.
The response message is sent with the service ID +1.

The message ID is entered and added in hexadecimal form.



Structure of the CAN messages via the service ID:

| Command Byte 1 (dez) | Function | CAN Payload example Byte 1 - Byte 8<br>→ Request - Service ID<br>← Response - Service ID + 1 |
|---|---|---|
| 0 | Request diagnostic data radioretries | →0,0,0,0,0,0,0,0<br>←0,0x01,0x01,0x01,0x01,0,0,0 |
| 1 | Request deviceinformation | →1,0,0,0,0,0,0,0<br>←1,RR,DA,A1,A2,A3,A4<br>RR: Master=0, Slave=1<br>DA: Deviceaddress<br>A1: Partner 1 deviceaddress (FF off)<br>A2: Partner 2 deviceaddress (FF off)<br>A3: Partner 3 deviceaddress (FF off)<br>A4: Partner 4 deviceaddress (FF off) |
| 2 | Save settings and reset device. Autobauding will start if set | →2,0,0,0,0,0,0,0<br>←2,0,0,0,0,0,0,0 |
| 100 | Device is radioslave | →100,0,0,0,0,0,0,0<br>←100,0,0,0,0,0,0,0 |
| 101 | Device is radiomaster Device- and MAC address of 1. radio partner 0xFF Erase partner | →101,2,0xD4,0xCA,0x12,0x34,0x56,0x11<br>→ 101,2,0xFF,0,0,0,0,0 Erase partner<br>← 101,0,0,0,0,0,0,0 |
| 102 | of 2. radio partner 0xFF Erase partner | →102,3,0xD4,0xCA,0x12,0x34,0x56,0x12<br>→ 102,3,0xFF,0,0,0,0,0,0 Erase partner<br>← 102,0,0,0,0,0,0,0 |
| 103 | of 3. radio partner 0xFF Erase partner | →103,4,0xD4,0xCA,0x12,0x34,0x56,0x13<br>→ 103,4,0xFF,0,0,0,0,0,0 Erase partner<br>← 103,0,0,0,0,0,0,0 |
| 104 | of 4. radio partner 0xFF Erase partner | →104,5,0xD4,0xCA,0x12,0x34,0x56,0x14<br>→ 104,5,0xFF,0,0,0,0,0,0 Erase partner<br>← 104,0,0,0,0,0,0,0 |

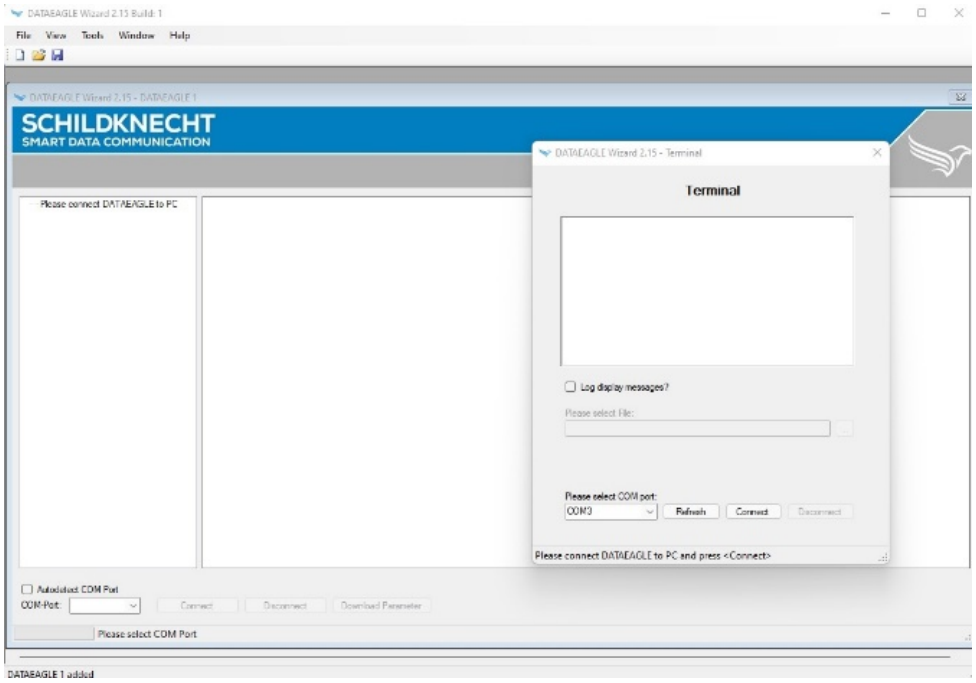
| Command Byte 1 | Function | CAN Payload example Byte 1 - Byte 8<br>→ Request - Service ID<br>← Response - Service ID + 1 |
|---|---|---|
| 200 | Whitelist Range 1 | → 200,0,0,0,0x01,0x02,0x03,0x04 |
| | Start ID (4 Byte) | ←200,0,0,0,0x01,0x02,0x03,0x04 |
| 201 | Whitelist Range 1 | → 201,0,0,0,0x01,0x02,0x03,0x04 |
| | End ID (4 Byte) | ←201,0,0,0,0x01,0x02,0x03,0x04 |
| 202 | Whitelist Range 2 | → 202,0,0,0,0x01,0x02,0x03,0x04 |
| | Start ID (4 Byte) | ←202,0,0,0,0x01,0x02,0x03,0x04 |
| 203 | Whitelist Range 2 | → 203,0,0,0,0x01,0x02,0x03,0x04 |
| | End ID (4 Byte) | ←203,0,0,0,0x01,0x02,0x03,0x04 |
| ... | | |
| 209 | Whitelist Range 5 | → 209,0,0,0,0x01,0x02,0x03,0x04 |
| | End ID (4 Byte) | ←209,0,0,0,0x01,0x02,0x03,0x04 |

**NOTE**
After writing the service ID with the commands "101"-"209" the setting must be saved with the command "02 - Save settings".

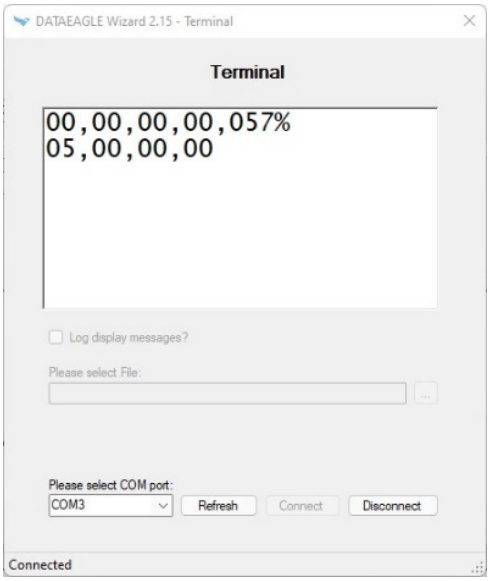
### 7.2.4 Diagnosis via terminal mode

CAN diagnostics is possible via the terminal function of DATAEAGLE Wizard. The following steps are necessary for this.

In the DATAEAGLE Wizard, use the "Tools" menu to select "Terminalmode". A new window opens. Check the COM port and select "Connect".




Press the "Esc" key on the PC keyboard. The diagnostic information appears in the terminal window.



The diagnostic values have the following meaning.

| Value | Descriptin |
|---|---|
| 1 | Retries radiopartner 1 |
| 2 | Retries radiopartner 2 |
| 3 | Retries radiopartner 3 |
| 4 | Retries radiopartner 4 |
| 5 | Radio/CAN load (%) |
| 6 | CAN Baudrate |
| | 0 ... Auto |
| | 1 ... 10 kBaud |
| | 2 ... 20 kBaud |
| | 3 ... 50 kBaud |
| | 4 ... 125 kBaud |
| | 5 ... 250 kBaud |
| | 6 ... 500 kBaud |
| 7 | CAN Error State |
| | 0 ... No Errors |
| | 0x01 ... Stufferror |
| | 0x02 ... Formerror |
| | 0x04 ... ACK Error |
| 8 | CAN RX Error Counter according ISO11898-1 |
| 9 | CAN TX ERROR Counter according ISO11898-1 |

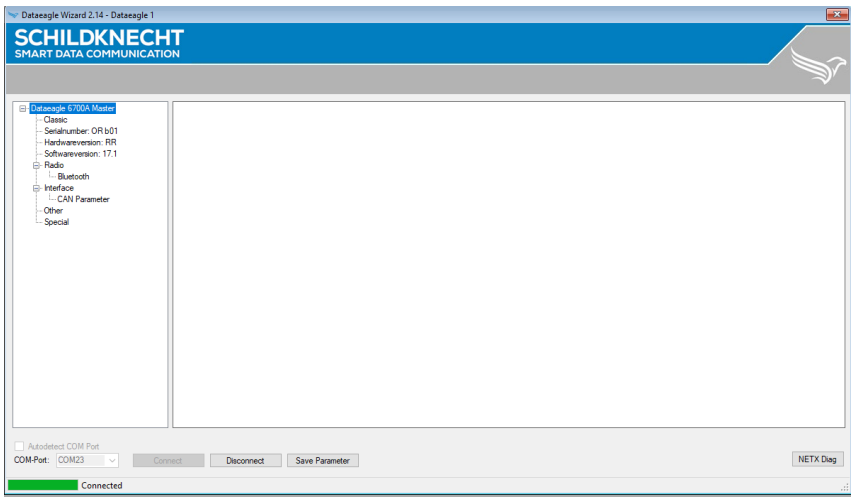
## 7.3 Configuration radio parameters

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

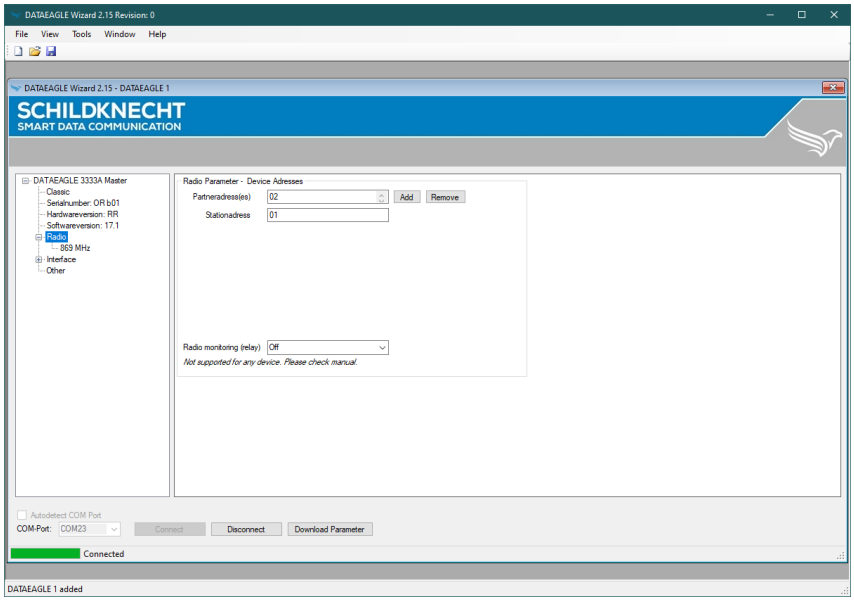
- USB driver - installed on PC
- DATAEAGLE Wizard configuration tool - installed on PC
- USB cable - between PC and DATAEAGLE

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.

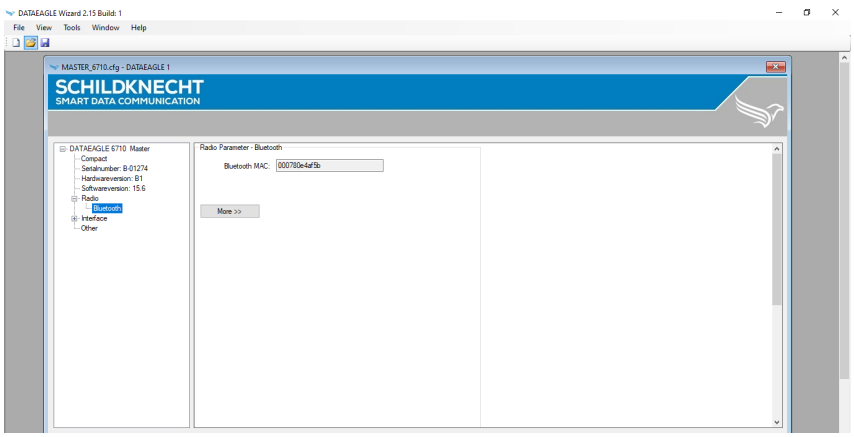
> **NOTE**
> If a radio system was ordered as a set (set configuration), no change is necessary here.

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.

### 7.3.1 2,4 GHz Bluetooth - DATAEAGLE Compact/X-treme 6710

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

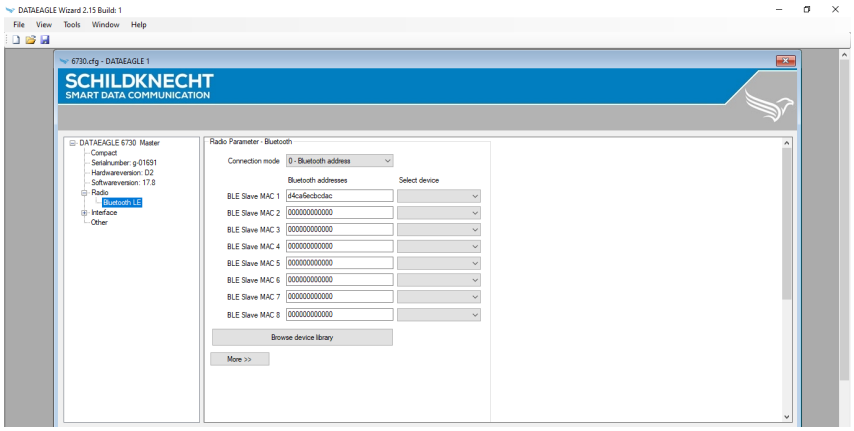



**NOTE**
If a radio system was ordered as a set (set configuration), no change is necessary here.

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

### 7.3.2 2,4 GHz Bluetooth 5 - DATAEAGLE Compact/X-treme 6730

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



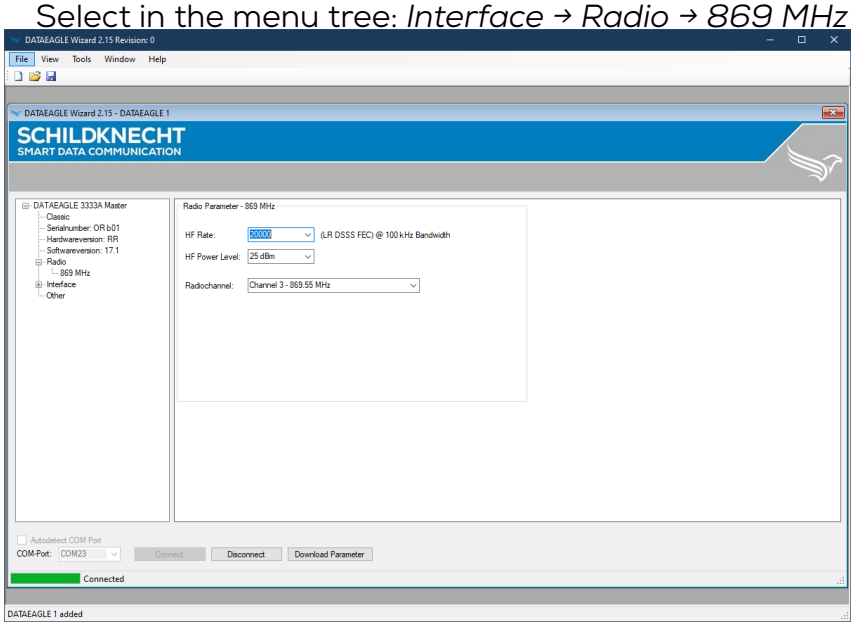

**NOTE**
If a radio system was ordered as a set (set configuration), no change is necessary here.

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, ...).

### 7.3.3 869 MHz - DATAEAGLE Compact/X-treme 6330

**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**

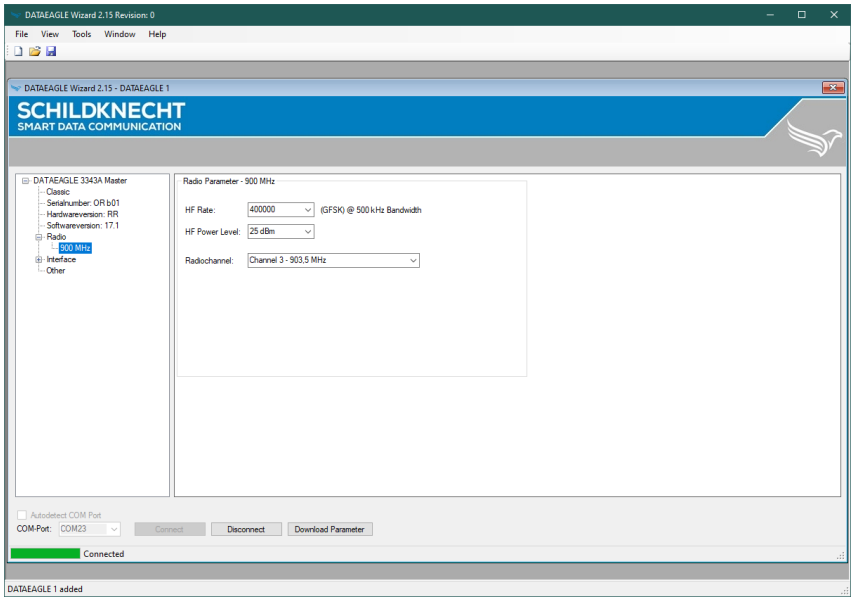
All devices in a radio system must be set to the same radio channel. DATAEAGLE radio systems in parallel operation are to be operated with different radio channels! However, it should be noted that at high RF rate only 1 system is possible due to the available bandwidth!

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

### 7.3.4 915 MHz - DATAEAGLE Compact/Xtreme 6340

**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!

# 8 Tips and tricks

## 8.1 Improvement of EMC resistance

### 8.1.1 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

### 8.1.2 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.

## 8.2 Optimal antenna mounting

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

# 9 Legal notice

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