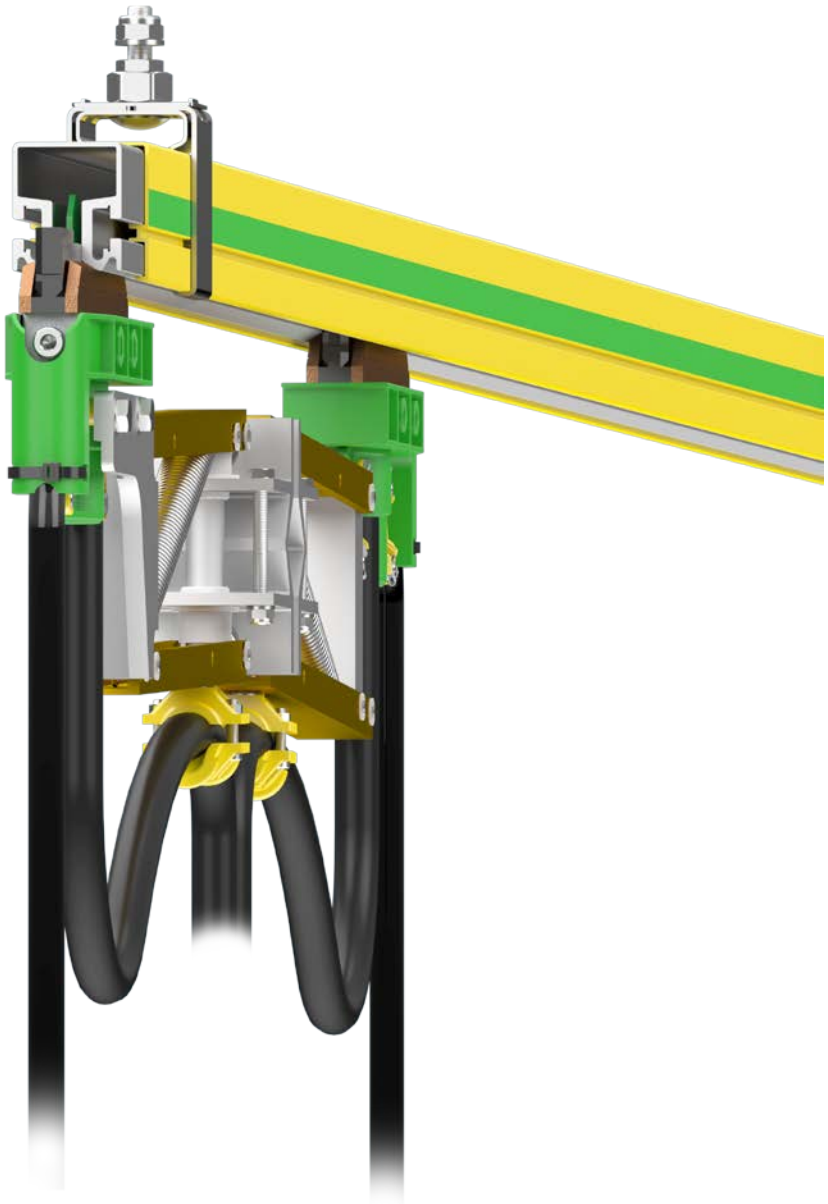
Mounting Instructions

ProfiDAT Data Transmission System
Program 0514



CE

Contents

1 General Information 6
1.1 About this document 6
1.2 Limitation of liability 6
1.3 Copyright 7
1.4 Spare parts 7
1.5 Material defects 7
1.6 Technical support 7
2 Safety Information 8
2.1 Explanation of symbols 8
2.2 Personnel requirements 9
2.2.1 Qualifications 9
2.3 Unauthorized persons 10
2.3.1 Training 10
2.4 Personal protective equipment 10
2.5 Intended use 11
2.6 Improper use 12
2.7 Safety measures by the operator/user 13
2.8 Special dangers 14
2.8.1 5 Safety Rules for working on electrical systems 14
2.8.2 Electrical hazards and sources of danger 15
2.8.3 Mechanical hazards and sources of danger 16
2.8.4 Danger due to dust and vapors 18
2.8.5 Danger in connection with the operational environment 19
2.8.6 Unexpected start, unexpected overrun 19
2.8.7 Emergency stop 20
2.8.8 Danger zones 20
2.9 Safety systems 21
2.10 Conduct in the event of accidents and faults 22
3 Technical Data 23
3.1 General information 23

3.2 Interfaces 24
3.2.1 Electrical 24
3.2.2 Control signal cycle times 25
3.2.3 Data transfer limitations 25
3.2.4 Network integration 25
3.2.5 Mechanical 26
3.3 Transceiver technical data 26
3.4 Technical data for HF cables 27
3.5 Operating conditions 27
3.6 Unsuitable ambient conditions 28
3.7 Type plate 28
4 Product Description and Functional Principle 29
4.1 Overview 29
4.2 Brief description 29
4.3 Assemblies description 30
4.3.1 ProfiDAT System 30
4.3.2 Electrical components 33
4.4 Modes of operation 36
4.4.1 Normal operation 36
5 Transport, Packaging and Storage 37
5.1 Transport 37
5.1.1 Safety instructions for transport 37
5.1.2 Transporting packaged parts 37
5.1.3 Transport inspection 38
5.2 Packaging 38
5.3 Storage of packaged parts 39
6 Installation and Commissioning 40
6.1 Safety 40
6.2 Preparation 41
6.3 Grounding 42
6.3.1 TN grid 43

6.3.2 Grounding implementation instructions 44
6.4 Mechanical installation 45
6.4.1 Mount the ProfiDAT rail 45
6.4.2 Mount the line feed 46
6.4.3 Mount the rail connector (standard) and PE connector 51
6.4.4 Mount and adjust the expansion unit 53
6.4.5 ProfiDAT rails in curved sections with a > 60 m 55
6.4.6 Mount the anchor point 57
6.4.7 Adjust the length of the ProfiDAT rail 60
6.4.8 Mount the outfeed 61
6.4.9 Connect the PE cable to the ProfiDAT rail 62
6.4.10 Use of the ProfiDAT rail without PE function 63
6.4.11 Heating conductor (optional) 63
6.4.12 Retrofitting of a PE rail connector (ground) 63
6.4.13 Mount the collector 66
6.5 Electrical installation 69
6.5.1 Connect the access point (stationary transceiver) 70
6.5.2 Connect the access point to line feed 71
6.5.3 Connect the client to ProfiDAT collector 72
6.6 Checklist and initial commissioning 75
7 Operation 78
7.1 Safety 78
8 Maintenance and Service 79
8.1 Safety 79
8.2 Maintenance schedule 80
8.2.1 Documentation 81
8.2.2 Replace the ProfiDAT antenna 81
8.2.3 Maximum wear of the sliding contacts 83
8.2.4 Replace the sliding contacts on the ProfiDAT collector 84
8.2.5 Replace the ProfiDAT collector head 87
9 Troubleshooting 91

10 Disassembly and Disposal 92
10.1 Safety 92
10.2 Disassembly 92
10.2.1 Disassembly of the assemblies 92
10.3 Disposal 93
11 Additional Documents 94
11.1 Declaration of Conformity 94
11.2 Applicable documents 94
12 Index 95

1 General Information

1.1 About this document

This document facilitates the safe, efficient handling of the Conductix-Wampfler ProfiDAT Data Transmission System. The data transmission system consists of components integrated into a conductor rail system by the system engineer for the transmission of data between a base unit and a mobile system component.

This document is a component of the data transmission system and must be kept accessible to personnel at all times in its immediate vicinity. Personnel must read this document carefully and understand it before starting any work. Compliance with all safety and handling instructions provided in this document is a basic prerequisite for safe working.

Local accident protection regulations and general safety guidelines for the area of use of the data transmission also apply.

The illustrations in this document are provided for basic understanding and may deviate from the actual implementation of the individual components.

In addition to these instructions, the instructions in the appendices for the individual installed components also apply.

1.2 Limitation of liability

All data and information in these mounting instructions have been compiled while taking the valid standards and regulations as well as the state-of-the art and our long years of experience and knowledge into consideration.

The manufacturer accepts no liability for damages resulting from:

- Failure to comply with this document
- Improper use
- Use by untrained personnel
- Unauthorized modifications
- Technical changes
- Use of unauthorized spare parts or accessories

The actual scope of delivery may differ from the explanations and descriptions provided here if the model in question is a special one, if additional equipment has been ordered, or is due to recent technical changes.

The obligations agreed upon in the delivery agreement and our General Terms and Conditions of business apply, as do the delivery conditions of the manufacturer and the legal regulations applicable at the time the contract was concluded.
All products are subject to technical changes and the many years of technical expertise and experiences within the context of improvement of function and further development.

1.3 Copyright

1.4 Spare parts

WARNING!

Incorrect spare parts are a safety hazard!

Incorrect or faulty spare parts can impair safety and result in damage, malfunctions or complete failure.

→ Always use original spare parts from the manufacturer!

Order spare parts from your contracted dealer or directly from the manufacturer.
Contact information: See the last page of this document.
Spare parts list: see Section 11.2

1.5 Material defects

The terms governing material defects can be found in the General Terms and Conditions of Business.
(See also http://www.conductix.com/de)

1.6 Technical support

Our Customer Support staff are available for technical support.
Contact information: See the last page of this document.
We are also always interested in new information, experiences and feedback from the field that can help us improve our products.

2 Safety Information

2.1 Explanation of symbols

Safety information is identified in these mounting instructions using symbols. The safety information is introduced using signal words that indicate the degree of the hazard. Always follow safety information and work carefully to avoid accidents, bodily injury and material damage!

DANGER!

… indicates an immediately hazardous situation, which if not avoided, may result in death or serious injury.

DANGER!

… indicates an immediately hazardous situation due to electricity, which if not avoided, may result in death or serious injury.

WARNING!

… indicates a potentially hazardous situation, which if not avoided, may result in death or serious injury.

WARNING!

… indicates a potentially hazardous situation due to electricity, which if not avoided, may result in death or serious injury.

CAUTION!

… indicates a potentially hazardous situation, which if not avoided, may result in moderate or minor injury.

Tips and recommendations:
... refers to useful tips and recommendations as well as information for efficient and trouble-free operation.

ATTENTION!

… indicates measures that will help you avoid material damage.

2.2 Personnel requirements

2.2.1 Qualifications

WARNING!

Inadequately trained persons are at risk of injury!

Improper use can result in serious injury to persons and material damage.

→ All activities must only be carried out by qualified personnel.

- Only persons who can be expected to perform their work reliably are acceptable personnel. People whose reactions are impaired by drugs, alcohol or medications, for example, are not authorized.

- When selecting personnel, all age- and occupation-specific regulations applicable at the location of use must be observed.

The following qualifications are specified in the operating instructions for certain fields of activity.

- Trained personnel and operators
  Have been instructed in a training session by the operator with respect to the tasks assigned to them and the potential dangers arising from improper actions.
  The operator of the machine or system must document that the corresponding training has taken place.

- Specialist personnel
  Consists of persons capable of performing assigned tasks and independently identifying dangers and avoiding potential hazards based on their specialist training, knowledge and experience as well as their understanding of the applicable standards and regulations.
  Personnel are considered technically qualified if they have successfully completed training as a master electrician, apprentice electrician, electrical engineer or electrical technician. Personnel are also considered qualified, who have been employed correspondingly for several years, have been educated in theory and practice during that time and whose knowledge and skills in the trade required have been tested.
  The machine or system operator must document that the appropriate certifications or other proofs of qualification have been or are being provided.

2.3 Unauthorized persons

WARNING!

Danger due to unauthorized persons!

Unauthorized persons who do not meet the requirements described here are not acquainted with the dangers in the work area.

→ Keep unauthorized persons away from the work area.

→ In case of doubt, address the person and direct them away from the work area.

→ Stop working as long as unauthorized persons are in the work area.

2.3.1 Training

Before commissioning the equipment, personnel must be trained by the operator. Log the implementation of the training for better traceability.

Example of instruction log:

Date	Name	Type of Training	Training provided by	Signature
05.11.2009	John Doe	First safety training for personnel	Horst Müller	

2.4 Personal protective equipment

Always wear: For all tasks:

Protective headgear

For protection against falling or flying parts and materials.

Protective gloves

For the protection of hands against friction, scrapes, puncture or deeper wounds, as well as against contact with hot surfaces.

Protective clothing

Primarily for protection against ensnarement by moving machine parts. Work clothing must be close fitting with a low resistance to tearing; it must have close-fitting sleeves and no protruding parts.

Protective footwear

For protection against heavy falling parts and slipping on slippery floors.

To be worn for special tasks:

Specific protective equipment is required when conducting special tasks. Separate reference to this is made in the individual sections.

Protective eyewear
For eye protection against harmful influences such as strong light, chemicals, dust, splinters or weather effects.

Hearing protection
For protection against loud noises and to prevent acoustic trauma.

Breathing mask (FFP-3 – according to country-specific requirements)
For protection against materials, particles, and organisms. Here: for protection against the dust produced by the abrasion of sliding contacts and the PVC insulation of the conductor rail.

2.5 Intended use

The data-transmission system is designed and built exclusively for the usage described here (its intended use).

WARNING!

Danger due to improper use!

Any application that deviates from or goes beyond the intended use of the components can result in hazardous situations.

→ Strictly follow all information in these mounting instructions.

→ Refrain from improper use of the system.

→ Observe the information on improper use in Section 2.6.

Intended use

The ProfiDAT Data Transmission System is used for data communication between a stationary and a mobile system component.
In addition to the capacity to transmit data, the ProfiDAT rail can also be used as a ground conductor rail together with conductor rails in product ranges 0813/0812 (max. 1000 V / max. 1000 A).
Current transfer is not permitted.

The system comprises at least one "access point" and one "client" transceiver, together with the corresponding line feed and collector antennas.

Compliance with these technical conditions is mandatory for the installation:

- The permissible maximum travel speed of the mobile transceiver is 5 m/s.
- The rail may only be installed horizontally with the insertion opening facing downward.
  An insertion from the side can also be implemented following prior technical testing and approval by the manufacturer.

Electrical-technical operating conditions:

- The electrical system must be protected in accordance with local regulations and guidelines.
- The system may only be installed on the PE profile (protective conductor, green/yellow).

2.6 Improper use

Claims of any kind due to damage incurred during use that deviates from the intended use described above ("improper use") are excluded. The operator bears sole liability for all damage that results from improper use.

WARNING!

Danger due to improper use!

Any application that deviates from or goes beyond the intended use of the components can result in hazardous situations.

→ Strictly follow all information in these mounting instructions.

→ Refrain from improper use of the system.

Improper use particularly includes the following forms of use:

- Operation outside the specified operating conditions (see Section 3.5).
- Use of the ProfiDAT rail for current transfer.
- Use where there is a risk of explosion ("Ex" areas).
- Use of the transceiver without a rail.
- Use of transceivers not supplied by Conductix-Wampfler.
- Use of the system parallel to a conductor rail system from manufacturers and/or types not approved by Conductix-Wampfler.
- Use of the system with accessories that are not approved and not authorized by the manufacturer.
- Use of the system by untrained personnel.

Environmental conditions

The ProfiDAT Data Transmission System may only be operated under the environmental conditions described in Section 3 .
The ProfiDAT Data Transmission System may not be operated under the following environmental conditions:

- Temperatures below -25 °C and above +50 °C.
- Wind speeds above 25 m/s (10 Bft) or 32.7 m/s (12 Bft) if the system is inactive.
- Irradiance above 1120 W/m² (for components that are directly exposed to the sun).

2.7 Safety measures by the operator/user

The data transmission system is designed for use in an industrial setting. The operator of the equipment is therefore subject to compliance with the legal obligations concerning workplace safety. In addition to the safety information in this document, all safety, accident protection and environmental regulations valid in the place of operation of the data transmission system must also be observed. This particularly applies to the following:

- Work on electrical components of the system may only be carried out when disconnected from voltage.
- The operator must inform theirself of applicable workplace safety guidelines and identify any additional hazards that may arise under the specific working conditions at the location of use of the system. This knowledge must be expressed in the form of operating instructions for the operation of the data transmission system.
- During the entire time the data transmission system is in use, the operator must check that these operating instructions still correspond to the current state of regulations and adapt them as necessary.
- The operator must clearly regulate and define responsibilities for installation, operation, troubleshooting and maintenance.
- The operator must ensure that all employees involved with the system have read and understood these mounting instructions. In addition, the operator must also train the personnel at regular intervals and inform them of dangers.
- The operator must provide personnel with the necessary protective equipment.
- The operator must keep the keys for the switching cabinets in a safe place. "Safe" means that only explicitly authorized personnel may have access to the keys. The keys may only be issued to technical personnel as described in Section 2.2.1.
- The operator must verify that the operating frequency of the data transmission system is permitted in the place of use.
- The operator must observe the following standards, regulations and directives when operating the system:

EMC Directive 2014/30/EU including	EMC Directive
EN 6100-6-2	Interference immunity in industrial areas
EN 61000-6-4	Interference emissions for industrial areas
EN 61000-3-2	Limit values for harmonic currents
EN 61000-3-3	Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage power supply networks for systems with a rated current of 16 A per conductor that are not subject to special connection requirements
EN 62311	Assessment of electrical and electronic equipment with respect to limiting exposure of persons to electromagnetic fields (0 Hz – 300 GHz)

Radio Equipment Directive 2014/53/EC, including	Radio Equipment
EN 301 489-1 V1.8.1 EN 301 489-17 V2.2.1	Protection requirements with regard to EMC
EN 300 328 V1.8.1 EN 301 893 V1.7.1	Use of the radio frequency spectrum
EN 300 440-1 V1.6.1	Air interface for radio equipment 2.4 – 2.4835 GHz; 5.15 – 6.35 GHz; 5.47 – 5.725 GHz
Low Voltage Directive 2014/35/EU, including	Low Voltage Directive
EN 60950-22	Information technology equipment: Equipment for outdoor areas
EN 60529	Types of protection provided by housings (IP Code)

The operator is furthermore responsible for ensuring that the data transmission system is always in perfect working order:

- The operator must ensure that the service intervals described in this document are observed.
- The operator must have all safety systems inspected for functionality and completeness on a regular basis (once annually, if possible, but at least as often as required by applicable national regulations).
- If components or the system have been modified, the safety systems must be inspected again and adapted to the changed conditions so that the system or the system is safe again.

2.8 Special dangers

The following section lists special dangers determined on the basis of a risk assessment.

→ Follow the safety information and warnings in these mounting instructions to reduce health hazards and to avoid dangerous situations.

2.8.1 5 Safety Rules for working on electrical systems

- Work on electrical systems only when they are disconnected from the power supply. Follow the 5 Safety Rules before starting work (see DIN VDE 0150-100:2009-10 / EN 50110-1:2004-11).
  1. Disconnect the system from the voltage supply at the main switch.
  2. Secure the main switch against being switched back on.
  3. Verify disconnection from power through measurements.
  4. Ground and short-circuit components of the system on which work will be conducted.
  5. Cover or block off adjacent energized parts.
- Only electricians or personnel trained in electrical work may disconnect power or approve reconnection of power after the work is carried out in the disconnected state!

2.8.2 Electrical hazards and sources of danger

Risk of death due to electrical shock!

Risk of injury due to falling or being thrown across the room after an electrical shock!

Burns due to arcing resulting from a short circuit!

DANGER!

Contact with energized components can lead to death or severe injury due to electrical shock. There is also a risk of injury from shock reactions, falling or being thrown across the room as a result of an electrical shock.

Work on the following components is dangerous:

- Main power supply
- Live parts: Line feed, cables, connections, conductor rail, connectors, collectors, equipment and connections within switching cabinets, control systems, etc.
- Parts that have become live due to a fault

Before working on the components listed above :

→ Switch off the power supply of the conductor rail system according to the 5 Safety Rules and secure it against being switched on again. For the 5 Safety Rules, see Section 2.8.1

During work:

→ Use insulated tools.

Before switching on:

→ Every time before the system is started, test the insulation resistance according to locally applicable technical standards, directives and legal regulations. Remove and insulate all antenna cables from the rail beforehand and also remove the terminating resistors.

→ Carry out locally required electrical tests.

Maintain electrical safety:

→ Regularly test and maintain electrical equipment.

→ If dangerous deficiencies are identified, take measures to correct the deficiencies without delay. Inform the system operator immediately.

→ If it is not possible to correct the dangerous deficiency, cordon off the area involved or switch the equipment off and secure it against being switched on again. Inform the system operator immediately.

→ Immediately secure loose cables and immediately replace damaged cables.

→ Always replace blown fuses with fuses of the same rating.

Fire hazard due to overload or sparking!

Fire hazards occur due to overloaded cables, electrical arcs, short circuits or sparking. Sparking can occur with poorly serviced, soiled conductor rails or if installation does not comply with the required tolerances.

→ Compliance with permissible current ratings is mandatory.

→ Tolerances must be observed during installation.

→ Install electrical protection as specified.

→ Easily combustible materials may not be stored in close proximity to conductor rails.

→ Check, service and clean conductor rails regularly and as specified.
See Sections 8 and 11.

2.8.3 Mechanical hazards and sources of danger

Risk of injury due to crushing!

Risk of injury due to impacts!

There is a risk of crushing of skin and limbs due to:

- Collector (spring force) during assembly, disassembly and maintenance.
- Falling parts of the data transmission system after improper installation or in case of unsuitable operating conditions (for example, in areas containing solvents).
- Mobile parts (collectors, mobile components) when the system is in operation.

→ Do not enter the hazardous area of the system when in operation, except for repair and maintenance tasks.

→ Allow only trained technicians to carry out the installation.

→ When working on the data transmission system, wear protective footwear, protective gloves and protective headgear.

→ When replacing the sliding contacts, follow the instructions in Section 8.2.4.

→ Only install the system where suitable operating conditions prevail. See Section 3.5

Risk of injury due to cutting and amputation!

The ends of rails and connectors can have sharp edges, particularly if they have been cut at the construction site and have not been deburred.

→ Use protective gloves and protective footwear.

→ When installing: Carefully deburr the insulation profile and conductor bars after sawing.

→ When disassembling: Sawed through, dissembled profiles must be handled carefully and properly stored (container or transport box).

→ Be on the lookout for sharp edges near the installation area and avoid contact.

Risk of injury due to falling objects!

The ProfiDAT rails, collectors or other components (e.g., antennas), can fall down during operation or during any other works on the system. This can cause severe injuries or fatalities if they fall from great heights.

→ Wear protective headgear.

→ For installation, commissioning, troubleshooting and maintenance: Cordon off the entire danger zone.

→ For decommissioning, disassembly and disposal: Cordon off the entire danger zone. When disassembling: Sawed through, dissembled profiles must be handled carefully and properly stored (container or transport box).

Risk of injury due to ensnarement, pulling in and catching!

There is a risk of being ensnared by moving parts when the system is in operation during installation, commissioning or service. Moving parts include, e.g., the crane itself and the collector attached to it.

→ Do not enter the hazardous area of the system when in operation, except for repair and maintenance tasks.

→ Travel at reduced speed!

→ Before working on the system, **disconnect the system according to the 5 Safety Rules and secure it against being switched back on**. For the 5 Safety Rules, see Section 2.8.1.

→ Wear close-fitting work clothing.

2.8.4 Danger due to dust and vapors

Risk of sensitization, mucous membrane irritation and respiratory disease due to dust!

Abrasion from the sliding contacts collects in the ProfiDAT rails and the guideway profile. This dust is very fine and is a health hazard. Frequent handling can result in sensitization. Persons who frequently spend longer periods near a heavily used system without protective equipment must reckon with the **following consequences**:

- Irritations of the mucous membranes
- Respiratory diseases
- Cancer

These consequences must also be expected if accumulations of dust are handled without proper care (e.g., removal of dust with compressed air).

→ In workplaces with long-term exposure and heavily visited systems, take effective measures to protect employees from the dust.

→ Wear personal protective equipment during all work on the data transmission system in which collected dust can be stirred up. In particular, wear personal protective equipment when cleaning the system.

- Protective eyewear
- Dust mask Class FFP3
- Protective gloves
- Disposable coveralls

→ Before starting work, clean the profile in accordance with requirements. There are special instructions for this task; see Section 11.

→ During cleaning operations, protect the surrounding area, e.g. by covering or removing stored materials and cordoning off areas in which dust could fall down on persons.

→ Do not blow out dust with compressed air, but rather vacuum it away. The vacuum cleaner must be equipped with a Class H fine filter.

→ Do not eat, drink or smoke during the work!

Poisonous gases during fire!

In the even of a fire in the facility, the plastic parts of the data transmission system (PVC) will emit toxic gases (HCl).

→ The facility must be evacuated immediately.

→ Notify the fire department.

2.8.5 Danger in connection with the operational environment

Danger due to slipping and falling!

When entering the system, there is a danger of slipping and falling due to environmental conditions such as moisture, snow, water, contamination, and wind.

→ Personal protective equipment should be worn at all times, when accessing the system and during all works on the ProfiDAT System.

→ Stop work on the ProfiDAT System in strong winds: Danger of falling!

→ Clean heavily soiled system components before entering.

The following characteristics of the ProfiDAT® System can create hazards if the ProfiDAT System is installed in its operational environment:

- Electrical power
- Sparking
- Dust produced by abrasion (from the sliding contacts)
- Material composition of the insulation profiles, which release toxic vapors if burned

The most important measure to protect against these hazards is to only install the ProfiDAT System where suitable operating conditions prevail. See Section 3.5

2.8.6 Unexpected start, unexpected overrun

Control system failure/fault, software error!

The failure of the data transmission system or a software error can lead to uncontrolled movement of the system.

→ A plausibility check of the signals must be carried out through the customer's superordinate control system. We recommend the use of PROFIsafe Controllers.

→ Complete the Start-up Checklist, see Section 6.6

Restore the energy feed after failure of the energy supply!

Failure of the energy feed can lead to uncontrolled movements of the system.

→ Initialization of the RAM memory (carried out automatically).

External influences on electrical equipment due to external interference sources!

External interference sources, such as radio or radar, can cause faults in the components and the WLAN network.

→ Use only shielded aluminium profiles made by the manufacturer.

→ A plausibility check of the signals must be carried out through the customer's superordinate control system.

2.8.7 Emergency stop

The ProfiDAT Data Transmission System is used for transparent transmission of safety-relevant signals. These signals must be generated by a superordinate component. Suitable safety components must be incorporated to ensure the emergency stop function. The emergency stop must be provided by the customer's safety systems and depends on the type of power supply.

We recommend the use of a PROFIsafe System.

2.8.8 Danger zones

WARNING!

Risk of injury due to moving components!

When the system is operating, severe injuries can result if persons or objects are within the range of motion (danger zone!).

→ Do not start the system if there are persons or objects within the range of motion (danger area!).
Exception: Repair and maintenance work. Travel is only permitted at reduced speed.

→ Ensure that the system cannot start up in an uncontrolled manner.

→ Do not reach into moving parts.

→ Cordon off the danger zone around the entire system.

WARNING!

Risk of injury due to moving components!

Serious injuries may occur if the system moves in an uncontrolled manner.

→ Corden off work and danger areas.

→ Do not reach into moving parts. The interfaces between collector and rail fastenings are particularly dangerous.

CAUTION!

Risk of crushing due to stored energy!

When working on the collector, there is the risk of crushing extremities due to uncontrolled movements as a result of the energy stored in the spring.

→ Pay attention to spring force during all work on the collector. Do not reach between the profile and the collector (see Fig. 1).

→ With installation, maintenance and repair: Carefully check the spring force.

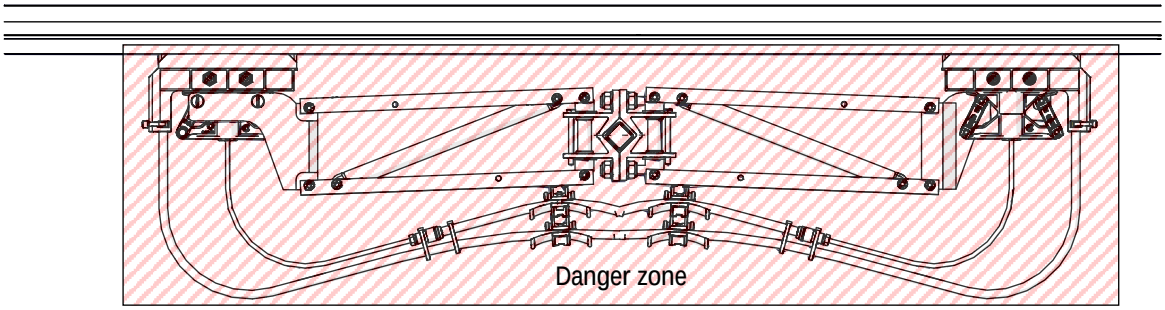


Fig. 1: Danger zone at collector sketch

2.9 Safety systems

The data transmission system has no safety systems. The operation of the system always takes place in connection with the facility in which the data transmission system is installed. Therefore, pay attention to the safety systems of the respective facility!

WARNING!

Risk of death due to inoperative safety systems!

Safety is only ensured if the safety systems are intact.

→ Before starting work, check that the safety systems are functional and properly installed.

→ Never disable or deactivate safety systems.

2.10 Conduct in the event of accidents and faults

Measures to be taken in the event of accidents:

- Shut down the system and secure it against unauthorized, unintentional and/or erroneous reactivation.
- Secure the danger zone.
- Remove persons from the danger zone.
- Initiate first aid measures.
- Alert the rescue services.
- Inform responsible parties at the operating site.
- Make access available to rescue vehicles.

Measures in the event of faults:

- Shut down the system and secure it against unauthorized, unintentional, and/or erroneous reactivation.
- Secure the work area against entry.
- Consult qualified personnel when analyzing the fault.
- Consult authorized personnel for maintenance and repair.
- Check for disconnection from power.
- Remove the component and replace with a new component.
- Determine the cause of the fault and repair the component
- Conductix-Wampfler must be informed immediately if personal injury or material damage can/does occur during breakdowns.

Conductix-Wampfler GmbH
Rheinstraße 27 + 33
79576 Weil am Rhein – Märkt
Germany

Telephone: +49 (0) 7621 662 – 0
Fax: +49 (0) 7621 662 – 144
info.de@conductix.com
www.conductix.com

3 Technical Data

3.1 General information

Specification	Value, Unit
Maximum length of a rail segment (supplied with an access point)	500 m
Rail length	5000 mm
External profile dimensions (width x height)	50 mm x 56 mm
Power supply: ProfiDAT Transceiver	-24 V DC, 4-pole, with clamping screws -48 V DC, PoE (RJ45), (according to IEEE802.3at for Type 1 and IEEE802.3af / typical)
Maximum data transmission rate	100 Mbps
Maximum travel speed of the mobile transceiver (collector trolley)	5 m/s
Interface	100 Mbps, RJ45
System service life (except wear parts and electrical components)	10 years
Permitted rated current for the conductor rail system (L, N)	1000 A

* Deviations may occur, see manufacturer's documentation (Section 11.2 "Applicable documents")

3.2 Interfaces

The interfaces to the customer's system are:

- Data interface
- Power supply/control voltage
- Grounding (PE)
- Collector

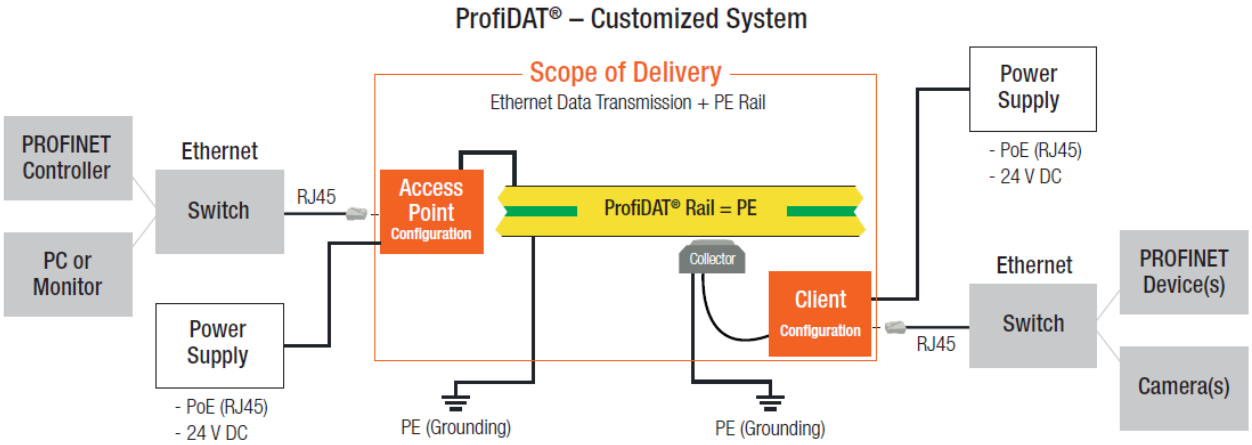


Fig. 2: Overview of ProfiDAT interfaces and scope of delivery (simplified)

3.2.1 Electrical

Data interface: 100 Mbps, RJ45
Data is fed to the rail (slotted waveguide) via the line feed. A data cable (HF cable) is connected to the stationary antenna.
The HF cable is connected to the antenna connector of the transceivers (access point). The access point is connected to the customer network via an RJ45 connector.

Collector (including mobile antenna):
The collector head is connected to the on-board electrical system of the mobile consumer of the machine via two flexible cables (HF cable and PE cable). The data cables (HF cables) between the collector and the transceiver (client) are included in the scope of delivery of both components. The PE cable with variable length and open end is installed in the collector. The PE cable between the collector and the consumer must be provided by the customer. The manufacturer/operator of the machine/system must observe the required conductor cross-sections and when applicable, the design of the power cable and ensure that the power cable is installed flexibly and free of directional forces. The connections are made via screw terminals or plug connectors.

PE interface:
The interface for the PE cable on the customer side is located on the PE connector (see Section 4.3.1). The PE cable must be connected according to applicable standards.

Transceiver power supply:
The transceiver of the ProfiDAT Data Transmission System requires the following power supply (see also Section 3.3):

Name	Voltage / Frequency
Power supply DC	
Transceiver	-24 V DC, 4-pole, with clamping screws -48 V DC, PoE (RJ45), (according to IEEE802.3at for Type 1 and IEEE802.3af / typical)

* Deviations may occur, see the manufacturer's documentation. (Section 11.2 "Applicable documents")

WARNING!

Risk of injury due to collectors!

Failure to comply with the specified supply voltages for the controller can cause a controller failure and electrical components may be destroyed. As a result, the collector may run jerkily and hit persons or objects.

→ Observe and maintain the specified supply voltages.

→ Keep persons and objects out of the danger zone (see Section 2.8.6).

3.2.2 Control signal cycle times

When commissioning the transceiver systems, it must be taken into account that the PROFINET I/O cycle times of all systems connected to the ProfiDAT System must be adapted.

The cycle time must be at least 32 ms (may vary depending on the application) and set accordingly in the superordinate control module.

In the following cases, the cycle time must be set to at least 64 ms:

- For line feed with more than one transceiver (client).
- When using the iPCF protocols (used for applications with more than 3 participants or segment changes or rapid roaming).

A cable-connected PROFIsafe connection requires an F-monitoring time that corresponds to at least 6 times the PROFINET I/O cycle time. A minimum 2s F-monitoring time via WLAN is recommended (for details, see SIEMENS FAQ 109475919).

3.2.3 Data transfer limitations

The Layer 2 Tunnel function (activated by default) allows for a maximum of 8 Ethernet devices to be operated behind a client. With the iPCF function (system-specific activated) in connection with the Layer 2 Tunnel, the sum of all data, including the Ethernet header, per transceiver (Client) and per iPCF cycle must not exceed 2300 bytes (for details, see SIEMENS FAQ 26562314).

3.2.4 Network integration

ATTENTION!

Instructions regarding the network integration of ProfiDAT in PROFINET are described in TI0514-0001!

3.2.5 Mechanical

The interface between the data transmission system and the facility is:

- Collector

The collector on the ProfiDAT rail fulfills a double function. The collector is guided on the ProfiDAT rail via two split sliding contacts. The sliding contacts ensure the connection to the ground conductor rail (ProfiDAT rail), while the data transmission occurs via the two built-in antennas. The antennas are inserted into the slot in the ProfiDAT rail and are electrically insulated from the sliding contacts.

3.3 Transceiver technical data

Specification	Value, Unit
Dimensions (width x height x depth)	20 x 156 x 127 mm
Weight	0.52 kg
Installation	S7-300 profile S7-1500 profile 35 mm DIN top-hat rail Wall mounting
Protection class	IP30
Data connection	RJ45, 100 Mbps
Power supply	PoE (RJ45), (according to IEEE802.3at for Type 1 and IEEE802.3af / typical) 4-pole with clamping screws
Operating frequency	5.2 – 5.8 GHz
Operating voltage / 1 – from clamping bar	19.2 V DC
Operating voltage from clamping bar	28.8 V DC
Operating voltage – through Power over Ethernet	48 V DC
Power consumption: – at 24 V DC (typical) – with Power-over-Ethernet	 0.25 A 0.125 A
Energy loss: – at 24 V DC (typical) – with Power-over-Ethernet	 6 W 6 W

Observe the information in the transceiver documentation, see Section 11.2 "Applicable documents".

3.4 Technical data for HF cables

The following values must not be exceeded:

Specification	Value, Unit
Min. bending radius	40 mm
Tensile force	50 N
Recommended coupling torques:	
N connectors	4 – 6 Nm
SMA/R-SMA	79 – 113 Ncm

ATTENTION!

The HF cables must not be crimped (e.g. by pulling too tightly on the cable tie).

→ Comply with the bending radius of the HF cables.

→ Maintain the recommended coupling torque.

3.5 Operating conditions

Specification	Value			Notes
	Minimum	Maximum	Conditions	
Ambient temperature	-25 °C	+50 °C	At a relative humidity of [100 % at +20 °C]	
Wind speed during operation		25 m/s (10 Bft)		
Wind speed at standstill		32.7 m/s (12 Bft)		

ATTENTION!

Faults due to incorrect operating conditions!

Operating conditions outside the specified range can lead to malfunctions due to short circuits, premature aging and damage to electrical and mechanical components.

Important parameters are:

- Dust and deposits
- Humidity/condensation
- Cold/hot temperatures
- Corrosion
- Chemical substances

3.6 Unsuitable ambient conditions

The data transmission system must not be installed or operated under the following ambient conditions:
(see also Section 2.5, Section 2.8 and Section 3):

- In environments containing chemical substances or gases that can potentially permanently damage the conductor rail's materials (corrosion) or drastically impact on the insulation.
- In ambient air that contains solvent vapors or aromatic compounds
- In ambient air that contains flammable or explosive gases or dusts
- In dusty environments
- Outside closed rooms
- Relative humidity above 50 % rel. at +40 °C
- In close proximity to splashing water
- In environments that require a higher protection class than IP 2X

3.7 Type plate

The transceivers have a type plate.

It contains the following details:

- Type
- Serial number
- Model
- Manufacturer
- Manufacturer address
- Year of manufacture

Additional identifiers:

- Order number
- Access point or client number

Please always include the information on the type plate when inquiring about the product!

4 Product Description and Functional Principle

4.1 Overview

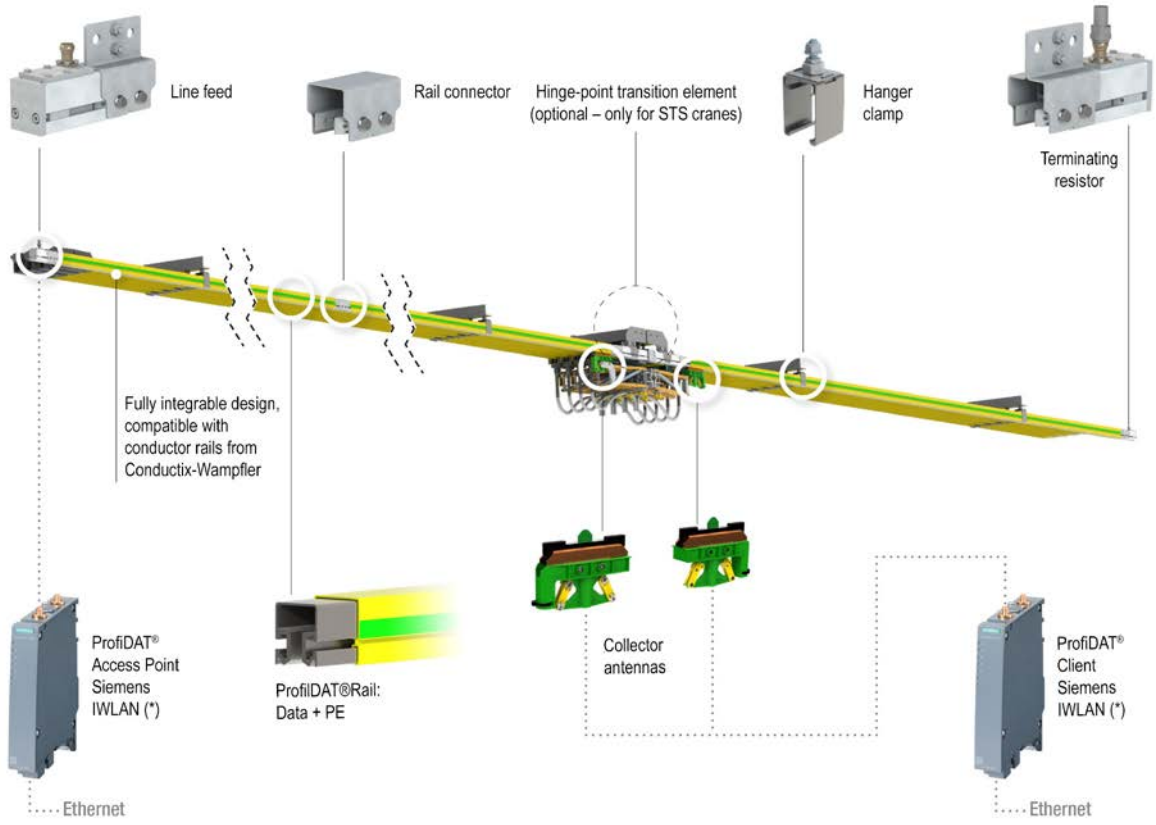


Fig. 3: Overview

4.2 Brief description

The ProfiDAT Data Transmission System is a system that facilitates the communication between a stationary network and one or more mobile consumers. The mobile consumers move along the guideway in a linear, track-guided manner. The collector follows the movement of the mobile consumer and compensates for guideway deviations between the mobile consumer and the ProfiDAT rails (horizontally and vertically).

In addition to data transmission, the ProfiDAT rail can also be simultaneously used as a ground conductor rail. The system is variable in length. It consists of at least one fixed and one mobile transceiver, the line feed and the collector antenna. The hanger clamps are used to fasten the rails to the supporting construction provided by the customer. The rails are mechanically attached using connectors that ensure the stability and secure connection of the rails. The data is fed in or out at the rail by means of a line feed, which is installed at one end (end line feed) or within the system (section power feed). The mobile collector antenna can continuously receive and transmit data.

Examples of applications are:

- High-performance crane systems

- Rope-drawn STS crane trolley systems
- People movers/passenger transport systems
- Portable electrical consumers

4.3 Assemblies description

4.3.1 ProfiDAT System

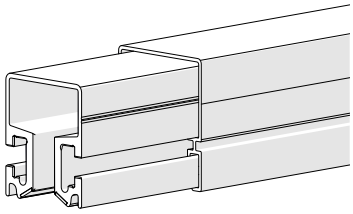


Fig. 4: Rail

- Rail (slotted waveguide)
  The rails are used as a data channel. They are electrically conductive and are simultaneously used as a protective conductor (PE).
  The standard length of a rail is 5000 mm. The outer dimensions are 50 x 56 mm (width x height). The conductor cross-section is at least 585 mm².

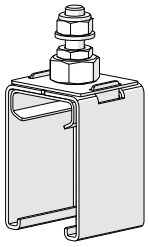


Fig. 5: Hanger clamp

- Hanger clamp
  The hanger clamps are attached to the supporting construction with nuts and bolts, which are provided by the customer.
  The hanger clamps are pushed onto the rails. Two hanger clamps are mounted for each rail. The distance between the hanger clamps is 2500 mm.

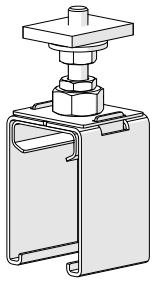


Fig. 6: Hanger clamp for mounting on C-rail

Hanger clamp for mounting on a 40 x 40-mm C-rail

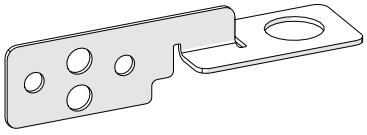


Fig. 7: Anchor point

- Anchor point
  The anchor point is fixed to the hanger clamp and the PE rail connector and is used to create an anchor point.

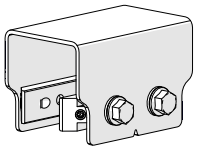


Fig. 8: Rail connector

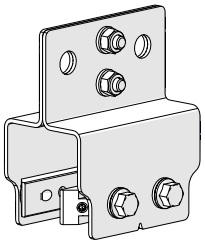


Fig. 9: PE rail connector

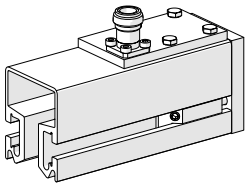


Fig. 10: Line feed/outfeed

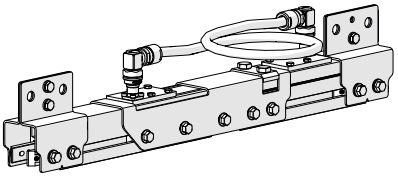


Fig. 11: Expansion unit

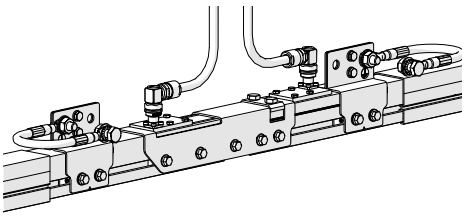


Fig. 12: Section power feed

- Rail connector

  The rail connector joins two rails together and is mounted on the rail using screws.

  There are two types of connectors:
  - Simple connector
  - PE connector, with a connection to the ground conductor

  The ground conductor is attached to the mounting link (PE rail connector). A PE connector must be used every five rails (every 25 m) and at each expansion unit.

- Line feed/outfeed with cable

  The line feed or outfeed is installed at the ends (for outfeed) of the system. It is used to couple and decouple the data signals. At the beginning of a segment, this component is connected to the access point with an HF cable and at the end with a terminating resistor.

- Expansion unit and section power feed

  The expansion unit connects two ProfiDAT rails together and is used to compensate for the change in length of the rail due to temperature fluctuations.

  The expansion unit is fastened to the ProfiDAT rail using PE rail connectors as well to the load-bearing profile using screws. A flexible cable transmits the data signal between the two antennas.

  The expansion unit can also be used as a section power feed, which increases the length of a data segment (Fig. 12).

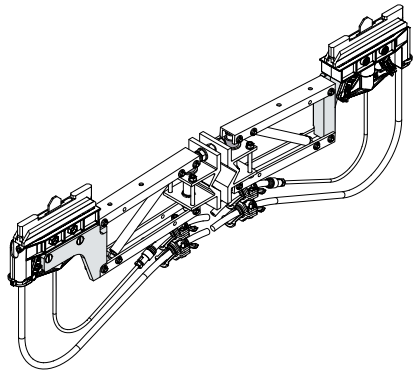


Fig. 13: Collector (dual collector)

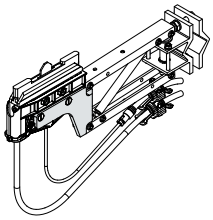


Fig. 14: Collector (single collector)

- Collector

  The collector is guided on the ProfiDAT rail via two split sliding contacts. The antennas are inserted into the slot in the ProfiDAT rail and are electrically insulated from the sliding contacts.

  Use of the single collector:
  - If there are no transitions in the travel range
  - If there are no expansion joints in the system
  - With end feed

4.3.2 Electrical components

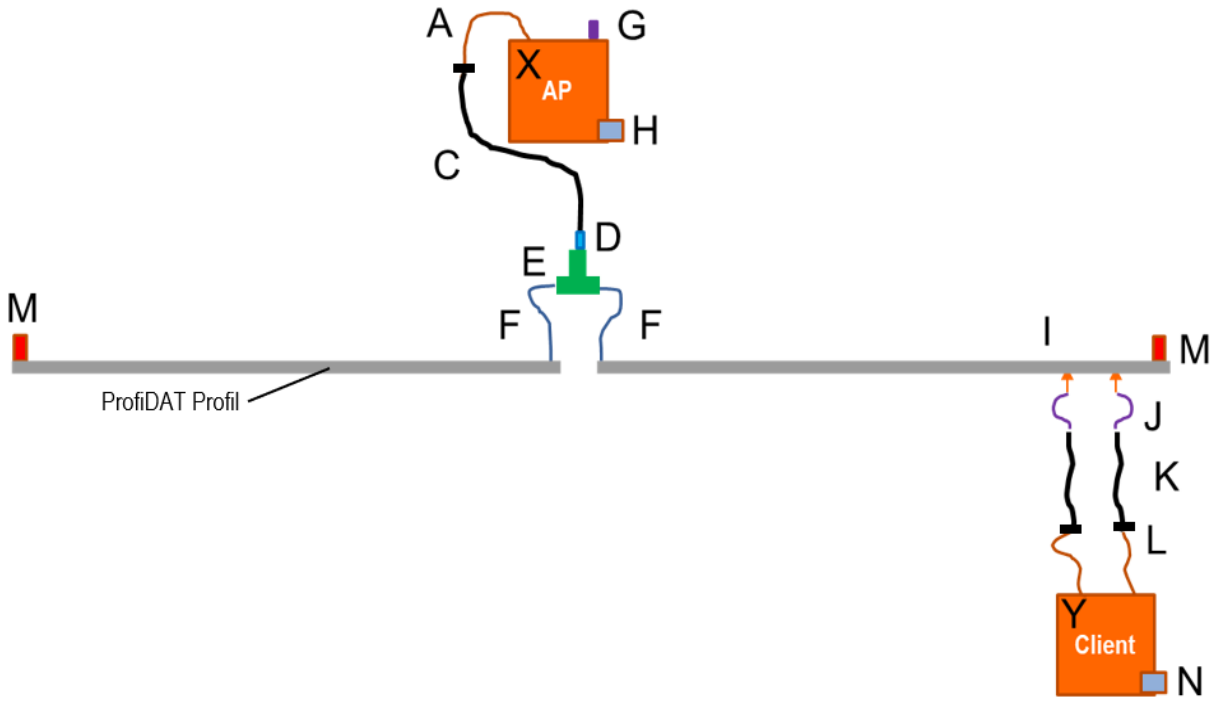


Fig. 15: Overview and arrangement of electrical components

Position	Description
X	Access point (AP)
A	ProfiDAT adapter cable with feed-through
C	Line feed connecting cable (1 m)
D	Attenuator
E	Splitter
F	Line feed connecting cable (10 m)
G	RSMA terminating resistor
H	Key-plug or C-plug access point
M	Terminating resistor N

Position	Description
Y	Client
I	ProfiDAT Collector
K	Collector connecting cable (10 m)
J	Antenna cable (0.4 m)
L	Adapter cable with feed-through (1 m)
N	Key-plug or C-plug client

4.3.2.1 Transceiver

Fig. 16: Transceiver (example photo)

The transceiver is a PROFINET/PROFIsafe compatible communication system based on the IEEE 802.11n standard. Communication with PROFINET-IO uses a Layer 2 Tunneling Protocol (L2TP).

Installation can be on a wall, profile or top-hat rail.

The figure is an example since various transceiver types are available. See the manufacturer's documentation for a detailed description of the transceiver (Section 11.2 "Applicable documents").

4.3.2.2 Transceiver switch cabinet for outdoor applications (metal)

ProfiDAT transceivers must be installed in a switch cabinet if they are to be used outdoors. If the switch cabinet is not provided by the customer, it can also be obtained directly from Conductix-Wampfler. This switch cabinet can be selected via the transceiver configurator (Order Numbers: 051450-10# and 051450-20#).

Specification	Value
Material	Stainless steel AISI 304 (V2A)
Fastening	Via rear M6 internal thread
Protection class	IP66
Permitted ambient temperature	-40 °C to 55 °C (no direct sunlight)
Cable feed-throughs	• M25 for cable 3G2.5mm² (6 A preliminary fuse) • 3xM20 for L1+L2+PE directly from the conductor rail • M20 for Ethernet / Fiber Optic

Scope of delivery:

- Switch cabinet
- Power supply unit (input 120-500 V AC 50/60 Hz + PE, 300 W)
- Fuse (6 A)
- Heating
- Thermostat
- All necessary cable feed-throughs
- RJ45 plug for quick assembly

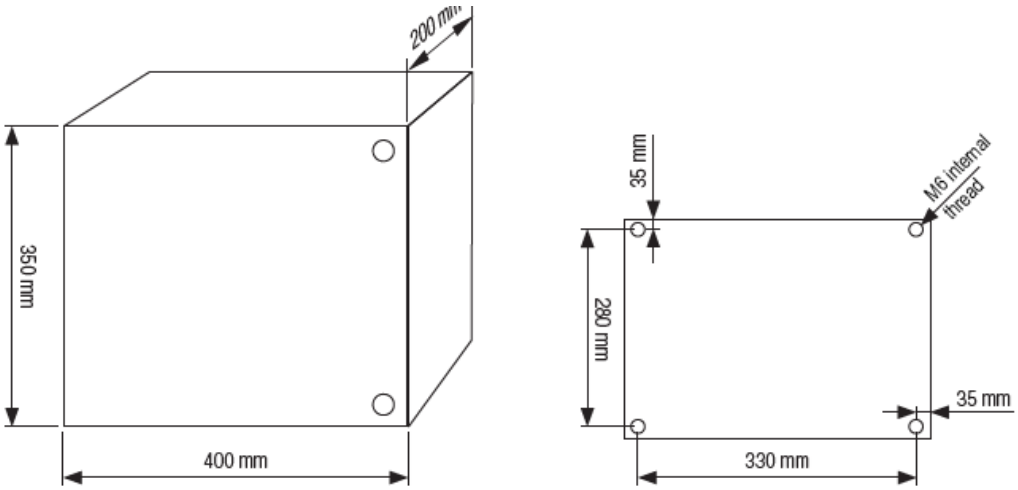


Fig. 17: Transceiver switch cabinet dimensions

4.3.2.3 Transceiver plastic housing

Alternatively, there is an inexpensive plastic housing that can be ordered as a separate material (Order Number: 051450-11)

Specification	Value
Material	Glass fiber reinforced polycarbonate
Fastening	Insulating plugs for wall mounting screws
Protection class	IP66

Scope of delivery:

- Drilled plastic housing
- Mounting plate, top-hat rail, end bracket (already mounted)
- All necessary cable feed-throughs
- RJ45 plug for quick assembly

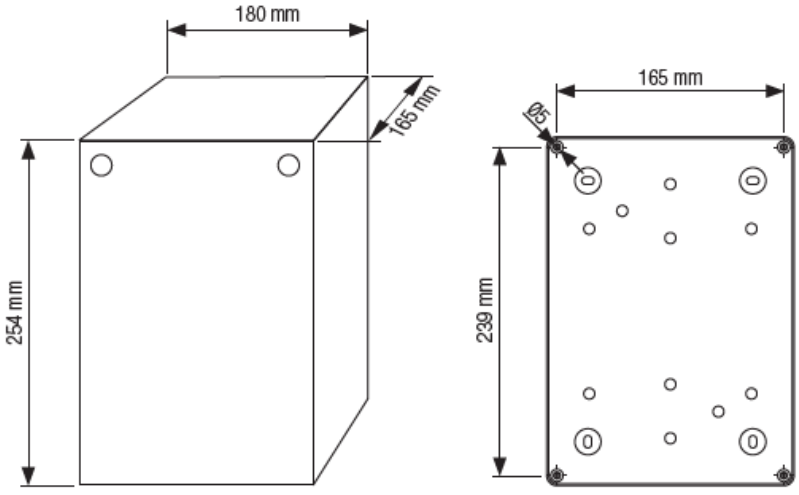


Fig. 18: Transceiver plastic housing dimensions

4.4 Modes of operation

The ProfiDAT Data Transmission System is used in the “normal operation” mode.

4.4.1 Normal operation

The operator controls the system during normal operation. No person may be present in the system work area to monitor the working process during normal operation. Travel commands are exclusively given by the operator.

5 Transport, Packaging and Storage

5.1 Transport

5.1.1 Safety instructions for transport

WARNING!

Risk of death due to suspended loads!

When lifting loads, there is a risk of death due to parts falling or swinging out of control.

→ Never walk under suspended loads.

→ Follow the specifications for the attachment points provided.

→ Do not lash onto protruding machine parts or eyes on installed components. Ensure that lashing components are properly seated.

→ Only use authorized lifting gear and lashing components with sufficient load capacity.

→ Do not use torn or worn ropes or straps.

→ Do not attach ropes or straps to sharp corners and edges and do not knot or twist them.

Damage due to improper transport!

Damage due to improper transport!

Improper transport can result in significant material damage.

→ Unload packaged parts upon delivery and during internal transport with care and observe the symbols and the information on the packaging.

→ Only use the attachment points provided.

→ Only remove packaging shortly before installation.

5.1.2 Transporting packaged parts

Transport packaged parts under the following conditions:

- Dry and dust-free
- Do not expose to aggressive media
- Protect from direct sunlight
- Avoid mechanical vibrations
- Transport temperature: -25 °C to +50 °C
- Relative humidity max. 60%

5.1.3 Transport inspection

Immediately upon delivery, check the delivery for completeness and transport damage.

In the event of visible damage proceed as follows:

- Do not accept delivery or accept it only with reservations.
- Note the scope of damage on the transport documents or on the transporter's delivery note.
- File a complaint.

ATTENTION!

File a complaint on each defect as soon as it is detected. Damage compensation claims may only be made within the applicable claim periods.

5.2 Packaging

The individual packages are packed appropriately for the expected transportation conditions. We exclusively use environmentally friendly packaging materials.
The packaging has the function of protecting the individual components against transport damage, corrosion and other damage until they are installed. Hence, do not destroy the packaging; remove it only shortly before installation.

Handling packaging materials:

Dispose of packaging material according to applicable legal regulations and local guidelines.

WARNING!

Environmental damage due to improper disposal!

Packaging materials are valuable resources and can be reused or usefully processed and recycled in many cases.

→ Dispose of packaging materials in an environmentally appropriate manner.

→ Comply with locally applicable disposal guidelines; if necessary, engage a specialist to handle the disposal.

5.3 Storage of packaged parts

Store packaged parts under the following conditions:

- Do not store outdoors
- Store in a clean and dust-free area
- Do not expose to aggressive media
- Protect from direct sunlight
- Avoid mechanical vibrations
- Storage temperature: 15 to 35 °C
- Relative humidity max. 60%
- When storing for more than 3 months, check the general condition of all parts and the packaging at regular intervals. If necessary, refresh or replace the preservative. This does not apply to ProfiDAT rails. Opening will cause damage to the foil.
- If the ProfiDAT rails are stored for more than 6 months, comply with the following conditions:
  - Store at room temperature (18 °C to 22 °C)
  - Open box and foil
  - Remove desiccant

ATTENTION!

In some cases, there may be instructions for storage on the packaged parts that go beyond the requirements listed here. Comply with them accordingly.

6 Installation and Commissioning

6.1 Safety

Personnel:

- Installation and commissioning may only be carried out by specially trained technicians!

Wear the following personal protective equipment for all installation and commissioning work:

- Protective clothing
- Protective headgear
- Protective footwear
- Protective gloves

WARNING!

Risk of death due to suspended loads!

Falling loads can cause serious injuries or even death.

→ Never walk under suspended loads.

→ Only move loads under supervision.

→ Set down the load before leaving the work area.

Risk of injury due to improper installation and initial commissioning!

Improper installation and initial commissioning can result in serious personal injury and/or material damage.

→ Before starting work, ensure sufficient space for installation.

→ Use caution when working with open, sharp-edged components.

→ Ensure that the installation area is clean and tidy! Loosely stacked or scattered components and tools are a source of accidents.

→ Install components properly. Comply with specified screw tightening torques.

6.2 Preparation

Required tools:

- Open-end wrench SW10
- Open-end wrench SW17
- Open-end wrench SW24
- Hexagon wrench set SW3
- Hexagon wrench SW5
- Cross-head screwdriver
- Torque wrench
- Lubricant
- Heat gun
- Cap saw

Required materials:

- Cable ties
- Heat-shrink tubing
- Conductive paste 080021
- Lubricant for stainless steel screws, recommended: Kluber paste 46 MR 401
  Klüber Lubrication München KG
  Geisenhausenerstr. 7
  D – 81379 Munich

Screw tightening torques:

- Cylinder head screw M6: 5 Nm
- Hexagon head screw M6: 10 Nm
- Hexagon head screw M10: 40 Nm
- Hexagon head screw M10 (PE): 20 Nm

6.3 Grounding

The system operator must ensure sufficient grounding of the supporting constructions (substructures), particularly the coated components. Safety regulations and country-specific directives for the grounding of electrical equipment (e.g. VDE/UVV/VBG4) must be followed.

The grounding of the supporting structure (substructure) must be taken into account for different applications:

- Protection against electrical shock
- Lightning protection

DANGER!

Risk of death due to electrical shock!

The supporting construction (substructure) can be under high voltage if it is not properly grounded.

Contact with the supporting construction (substructure) can lead to death or severe injury. There is also a high risk of injury from over-reaction caused by electrical shock.

Therefore:

→ Read and follow the locally applicable and international guidelines for proper grounding installation and lightning protection.

→ Provide the grounding installation that is appropriate to the architecture of the power grid of the system (TT grid or TN grid) at the installation site.

→ Connect the supporting construction (substructure) to the grounding installation.

→ Install a conductive connection between all parts of the supporting construction (substructure). Use toothed lock washers for screw connections or other suitable components to establish a conductive connection between coated components.

→ Regularly check that the supporting construction (substructure) is properly grounded.

6.3.1 TN grid

→ In the TN grid, ProfiDAT rail (ground conductor rail) is directly connected to the grounded star point of the supply transformer through a cable.

→ To ensure that the protective device of the conductor rail is switched off in the event of a fault, the total resistance of the system between the phase conductor and PE conductor must be checked. The maximum permissible total resistance is calculated using the formula:

$$Z_s \leq \frac{U_0}{I_a} \qquad Z_s \times I_a \leq U_0$$

Z_s = The impedance of the fault loop including current source of the active conductor up to the fault location and the protective conductor between the fault location and the current source.
I_a = The current that causes the protective device to switch off automatically within the specified time.
U_0 = The rated AC voltage toward the end.

For the measurement, the phase conductor and the PE conductor must be short-circuited at the end of the conductor rail; measurements are taken at the output of the protective device or the following output clamps (connection terminals of the conductor rail supply line).

Example of maximum permissible total resistance for an EHB conductor rail system with ProfiDAT:

Power supply 400 V, short-circuit current circuit breaker 100 A according to Data Sheet 500 A

$$Z_s \leq \frac{U_0}{I_a} = \frac{400V\ /\sqrt{3}}{500\ A} = 0.46\ \Omega$$

6.3.2 Grounding implementation instructions

→ The ProfiDAT rail (ground conductor rail) must be connected to the supporting construction (substructure) at the beginning and at the end as well as at every fifth data rail junction. The cross-section of the connector cable must be at least 16 mm².

→ Local standards or regulations may require different cross-sections or ground resistance values. The system operator must check the locally applicable standards and regulations and implement the grounding system accordingly. If the standard requirements and the functional aspects such as voltage drop, voltage capacities and leakage currents are complied with and verified, other cross-sections can also be used to connect the ProfiDAT rail to the supporting construction (substructure).

→ The ground resistance must be measured during installation and a test report prepared with the following content:
- Condition of the ground connection
- Corrosion degree and corrosion protection
- Fastenings on cables and components
- Measurement of grounding impedance
- Documentation of changes and extensions

Work steps:

→ Mark the ground conductor (3) with cable lug (4) green-yellow (for screw M10) at both ends (5).

→ Attach screw DIN 933 (2), fan washer DIN 6798 (6), PE conductor (3) with cable lug (4), detent-edged edge washer (7) and nut DIN 934 (8) to the PE connector (1) (20 Nm).

→ Attach the grounding symbol below the cable lug on the PE connector (1).

→ Connect the unconnected end to the supporting construction on site and mark the connection point with the grounding symbol.

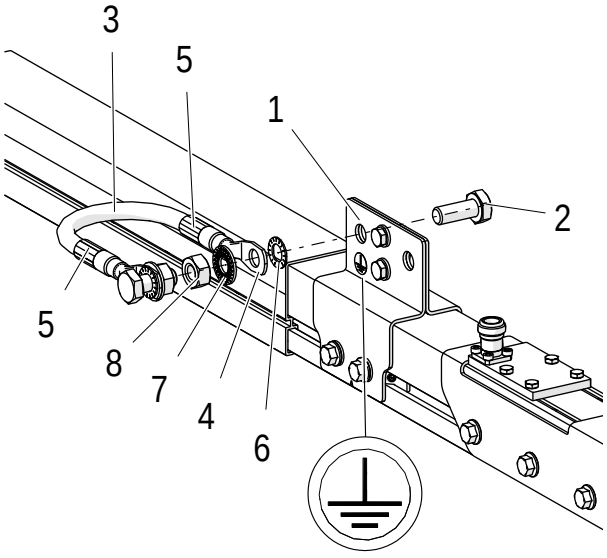


Fig. 19: Connect ground conductor

6.4 Mechanical installation

Personnel:

- Installation only by technical personnel
- At least 2 persons

The following describes the installation of the data transmission system in a step by step manner and one after the other in a practical order. Some steps may be carried out in parallel on site.

- Installation of the ProfiDAT System begins in the area of the data feed and the PE connection.
- Before the line feed can be installed, the hanger clamp and ProfiDAT rail must first be installed (Section 6.4.1).
- The exact position of the line feed must be determined prior to installation and in consultation with Conductix-Wampfler.

6.4.1 Mount the ProfiDAT rail

Work steps:

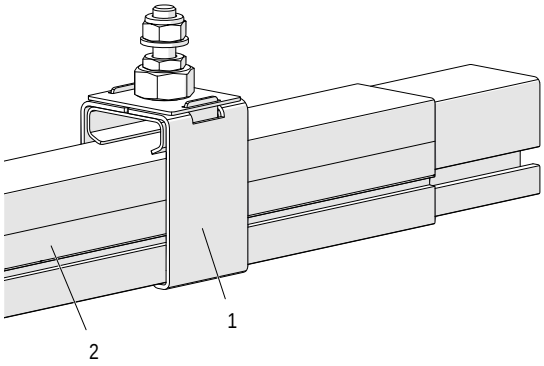


Fig. 20: Mount hanger clamps

→ Slide 2 hanger clamps (1) onto the ProfiDAT rail (2).

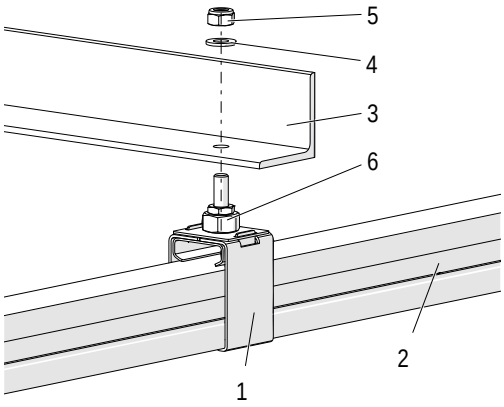


Fig. 21: Mount ProfiDAT® rail to supporting construction

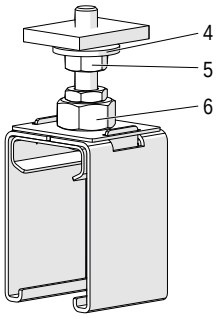


Fig. 22: Hanger clamp for C-rail mounting

→ Insert the ProfiDAT rail (2) with hanger clamps (1) into the supporting construction (3) from below, or slide it into the C-rail, and secure the hanger clamps with the nut (5) and washer (4).

Pay attention to the alignment of the ProfiDAT rails!

One side is marked with two longitudinal grooves (L). Mount the rails in such a way that the longitudinal grooves are always positioned on the same side.

→ Hold the aluminium spacer (6) with an SW24 open-ended wrench and then firmly tighten the nut (5) (40 Nm).

6.4.2 Mount the line feed

The line feed is installed either at the beginning/end of the system (end infeed) or within the system (section power feed).

6.4.2.1 Mount the end feed

Line feed to rail:

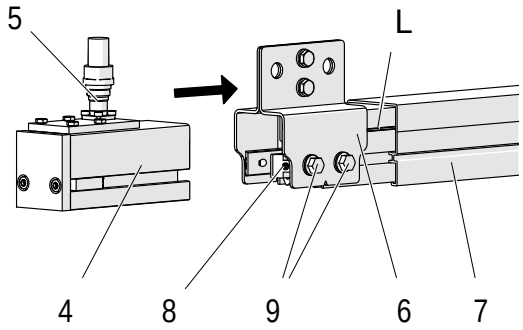


Fig. 23: Mount end feed to rail

→ Slide a connector (6) onto the first ProfiDAT rail (7) (see Section 6.4.3) and secure it with two threaded pins.

→ Insert the end feed (4) up to the mechanical stop in the connector (6) of the last ProfiDAT rail (7).

ATTENTION!

The two rails must lie directly against each other, the gap width must not exceed 0.5 mm!

The sliding surfaces for the sliding contacts must be level with each other and deburred.

→ Secure the end feed (4) to the connector using the two threaded pins (8) (5 Nm).

→ Tighten the four lateral flange screws (9) on the connector (6) (10 Nm).

→ Then additional ProfiDAT rails including connectors can be mounted (see Sections 6.4.1 - 6.4.3 and 6.4.4)

Attach the connecting cable:

→ Fasten/screw the connecting cable to the socket (5) of the end feed antenna (4).Fig. 23

Depending on the application, the connecting cable can an angled or straight plug!

ATTENTION!

Before connecting the connecting cable to the end feed, check whether there is any water in the socket or plug (e.g. due to rain during installation or storage).

Dry the socket or plug if water is present:

1. Blow into the socket or plug with your mouth or with compressed air (max. 2.0 bar!) and remove all visible water.

2. Blast the plug and socket from the open connection side with hot air (maximum 80 °C / 176°F on the object). Blow each position for 2 minutes! A distance of 10 cm from the object must be maintained.

Care must be taken to:

→ Not overheat the connecting cable and socket (maximum temperature of the connecting cable 85 °C / 185 °F, maximum temperature of the socket 100 °C/ 212 °F)!

Not burn yourself on the hot components or the hot air!

→ Slide the heat-shrink tubing over the angled plug and socket (5) on the end feed (4) and shrink it with a heat gun (Fig. 23).

→ The socket and cable must be sealed with adhesive tape to prevent moisture from penetrating and hindering data transmission.

ATTENTION!

Components must be clean and grease-free.

Scotch® 23 tape should be applied in successive, semi-overlapping, evenly wrapped layers.

To properly adhere the Scotch® 23 adhesive tape, it must be stretched under tension until just before it breaks. Air pockets between the layers must be avoided.

→ Start wrapping the socket/plug combination at the lower end of the socket, directly below the thread (1) and end behind the heat-shrink tubing (2). Ensure that all parts of the socket/plug combination are covered (see Fig. 24 illustration with angled plug).

Fig. 24: Wrap socket and cable with adhesive tape

→ Lay the cable to the line feed switch cabinet/transceiver.

→ Fasten the cable run to the supporting construction with cable ties (drive-in zone, steel construction, etc.).

ATTENTION!

The cable must not be crimped.

Maintain the bending radius of the cable (min. 40 mm).

6.4.2.2 Mount section power feed

The section power feed is identical in construction to an expansion unit. Two line feeds are already integrated here. However, the section power feed is supplied with 10 m HF cables and not with a 0.5 m bridging cable like an expansion unit.

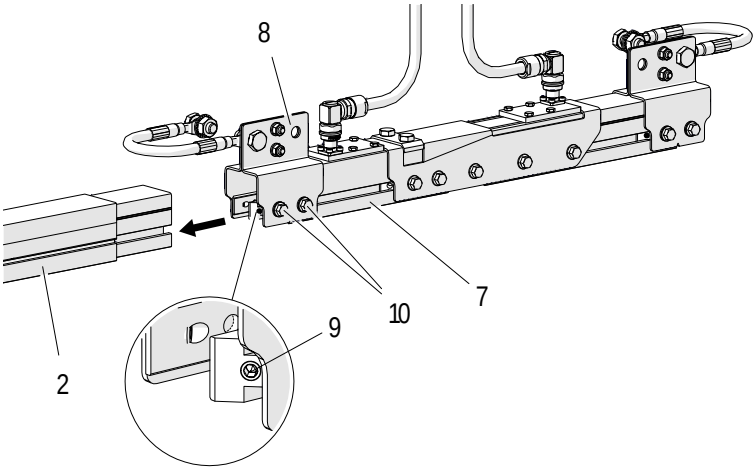


Fig. 25: Mount section power feed to ProfiDAT rail

→ Slide the section power feed (7) toward the ProfiDAT® rail (2) and insert it into the PE rail connector (8) on the line feed until it reaches the center.

ATTENTION!

The two rails must lie directly against each other, the gap width must not exceed 0.5 mm!
The sliding surfaces for the sliding contacts must be level with each other and deburred.

→ Fix the rail connector PE (8) to the ProfiDAT rail (2) using the two threaded pins (9) (5 Nm).

→ Tighten the 4 lateral flange screws (10) on the connector (10 Nm).

Connect connecting cable to section power feed:

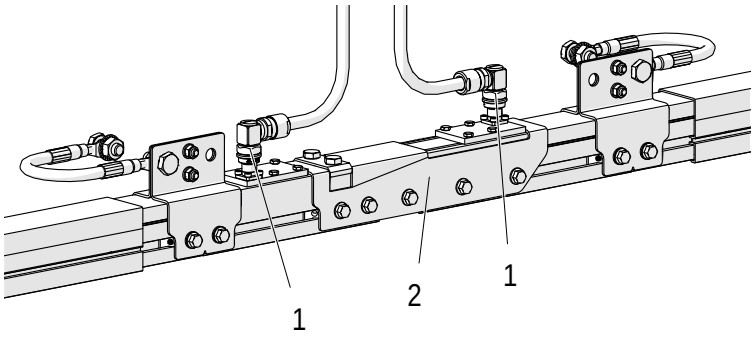


Fig. 26: ProfiDAT section power feed

→ Fasten/screw the connecting cable to the socket (1) on the line feed (2).

Depending on the application, the connecting cable can an angled or straight plug!

ATTENTION!

Before connecting the connecting cable to the end feed, check whether there is any water in the socket or plug (e.g. due to rain during installation or storage).
If water is present, dry the socket or plug as described in Section 6.4.2.1.

→ The socket and cable must be sealed with adhesive tape to prevent moisture from penetrating and hindering data transmission.

Components must be clean and grease-free.

ATTENTION!

Scotch® 23 tape should be applied in successive, semi-overlapping, evenly wrapped layers.

To properly adhere the Scotch® 23 adhesive tape, it must be stretched under tension until just before it breaks. Air pockets between the layers must be avoided.

→ Start wrapping the socket/plug combination at the lower end of the socket, directly below the thread (1) and end behind the heat-shrink tubing (2). Ensure that all parts of the socket/plug combination are covered (see Fig. 24 illustration with angled plug).

Fig. 27: Wrap socket and cable with adhesive tape

→ Lay the cable to the line feed switch cabinet/transceiver.

→ Fasten the cable run to the supporting construction with cable ties.

→ Connect the second connecting cable in the same manner.

→ Before further installation, the section power feed must be correctly adjusted like an expansion unit (see Section 6.4.4).

→ Once the section power feed has been set, the installation of the ProfiDAT rail can be continued – it is advisable to lock the gap set in the expansion connector so that the gap does not change during further installation.

Do not forget to release the locking device on the expansion connector after installation!

ATTENTION!

- When using a section power feed, an anchor point is required either directly at the section power feed or in the immediate vicinity at the nearest hanger clamp (see Section 6.4.4).

6.4.3 Mount the rail connector (standard) and PE connector

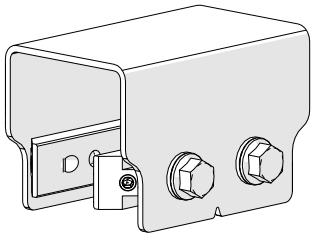


Fig. 28: Connector (standard)

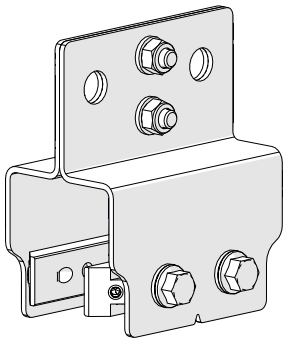


Fig. 29: PE connector

Only the connector (standard) is shown in the illustrations.

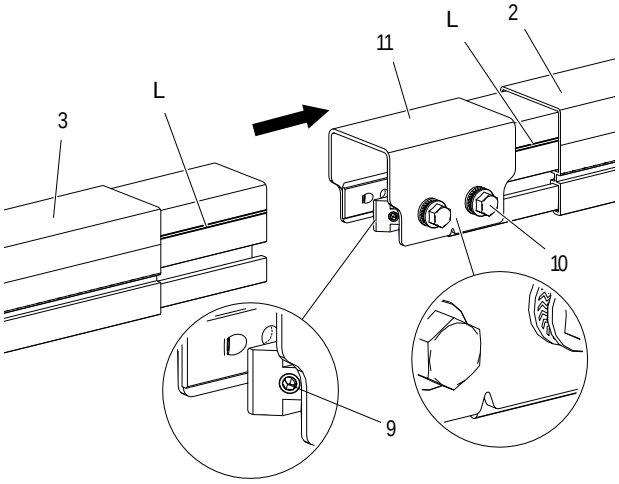


Fig. 30: Mount rail connector to ProfiDAT rail

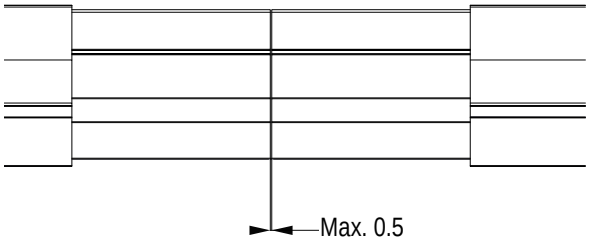


Fig. 31: Maximum offset of connection point in X-direction (direction of travel)

→ Slide a rail connector (11) onto the mounted ProfiDAT rail (2) until it reaches the center of the connector. Do not tighten the screws until both ProfiDAT rails (2, 3) have been slid into the connector.

Tips and recommendations:

- Mark the center of the rail connector with a notch.
- Always use a PE connector on both sides of the expansion unit!

→ Slide the next ProfiDAT rail (3) into the connector (11).

→ Fix the connector with the threaded pins (9) (5 Nm).

→ Tighten the four lateral flange screws (10) on the connector (10 Nm) (see Fig. 32). After tightening, mark the screws on the connector (see Fig. 33) to see whether the screws are tightened and have not come loose.

Tips and recommendations:

Check that all four flange screws (10) are secured by a detent-edged washer (4) between screw head and rail connector (11).

→ Mount all other ProfiDAT rails in the same way.

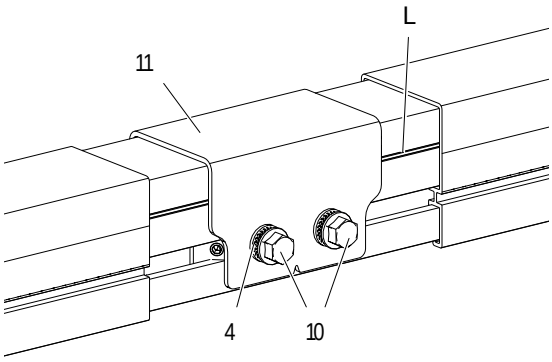


Fig. 32: Screw lock with detent-edged washer

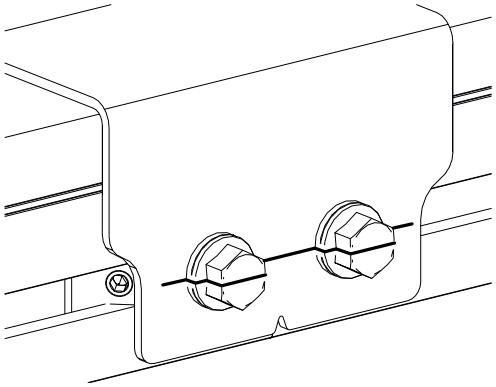


Fig. 33: Mark the screws

ATTENTION!

The two rail ends must lie directly against each other! The gap between the rails may not be more than 0.5 mm in the X-direction (travel direction) (see Fig. 31)!

The sliding surfaces for the sliding contacts must be level with each other and deburred.

Both rails must lay directly next to each other. The gap must not exceed 0,5 mm (see Fig. 34 and Fig. 35).

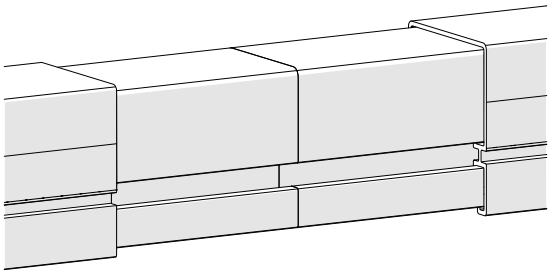


Fig. 34: Sliding surfaces without offset

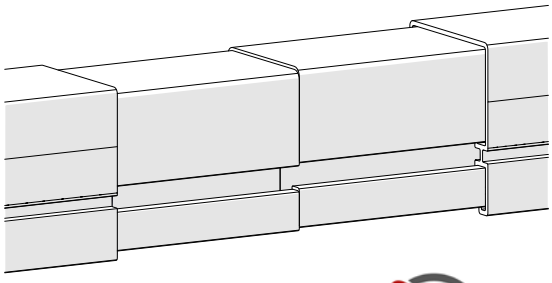
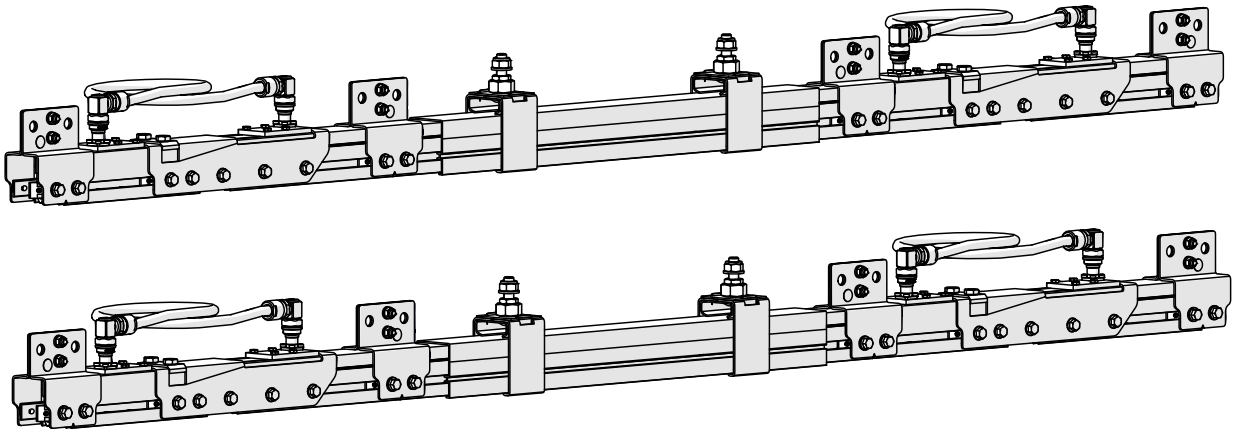


Fig. 35: Sliding surfaces with offset

6.4.4 Mount and adjust the expansion unit

Depending on the system type, the installation of one or more expansion units is necessary. The air gap in the expansion unit must be adjusted depending on the ambient temperature during installation. Both expansion joints of the expansion unit must have the same air gap.

There are 2 variants of expansion units, the single expansion unit (Fig. 36) with an expansion gap of max. 45 mm and the double, 5 m expansion unit.



(

Fig. 37: With an expansion gap of max. 90 mm).

The hanger clamps are designed as sliding suspension devices so that the rails can expand or contract as the temperature changes. *To this end, it is necessary to install defined anchor points and expansion points. Depending on the version, the expansion unit can also include the line feed for the data (see Section 6.4.2).*

*The position of expansion units and anchor points must be defined with Conductix-*Wampfler as part of the system design.

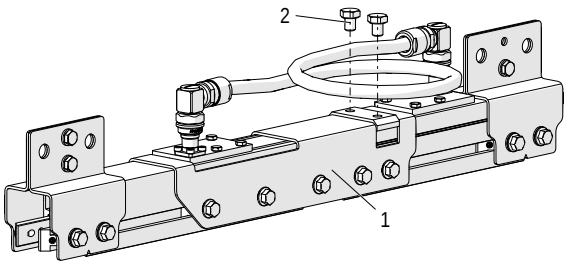


Fig. 36: Mount ProfiDAT single expansion unit

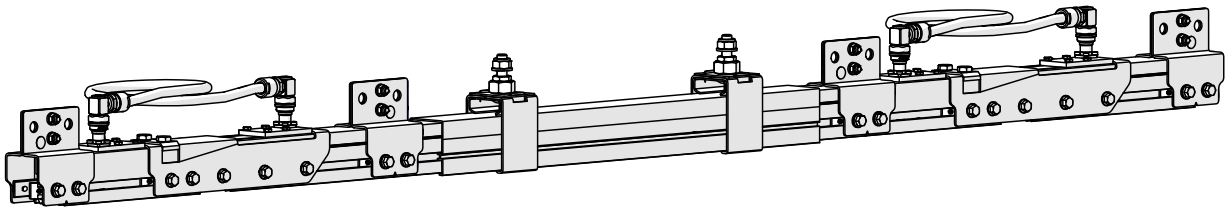


Fig. 37: Mount ProfiDAT double expansion unit

Work steps:

→ Connect the expansion unit (1) to the previously hung ProfiDAT rail (see Section 6.4.2.2).

→ If an anchor point is required on the expansion unit, there are 3 options:

1. On the nearest hanger clamp in combination with a PE connector (see Section 6.4.6).
2. Using a mounting plate (not included in the scope of delivery), connect to the supporting construction (steel construction) using the two mounting screws (2)
3. Connect to the supporting construction (steel construction) using a mounting plate (not included in the scope of delivery) via the 11 mm hole in the PE connector

ATTENTION!

Protective conductor connections and mechanical fastenings must always be carried out separately.

→ Read the air gap "s" from the table in Fig. 38 and adjust it.

Determine the air gap:

ATTENTION!

Note temperature fluctuations during installation!

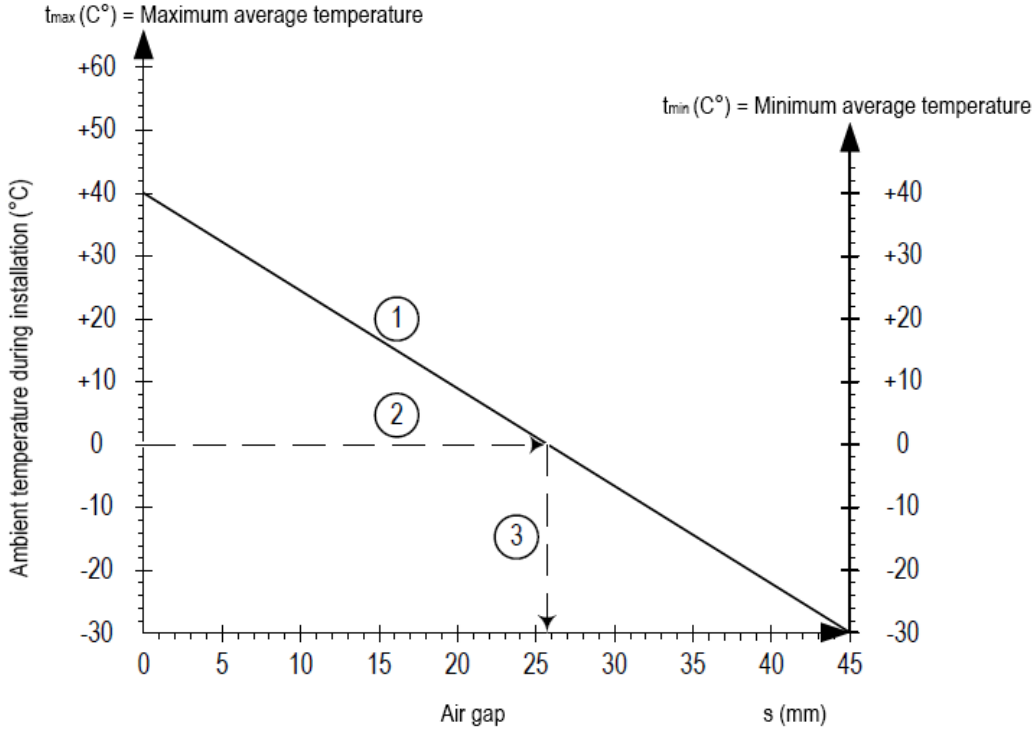


Fig. 38: Determine air gap on expansion unit

Procedure:

(1) Determine t_{max} and t_{min} and enter on the axes, draw connecting line (1) from t_{max} to t_{min} .
(2) Measure the ambient temperature during installation and mark it horizontally.
(3) Drop a line down from the intersection of the two lines and read the air gap to be installed.

Example (as entered):

(1) t_{max} = 40 °C; t_{min} = -30 °C;
(2) Ambient temperature during installation = 0 °C
(3) Air gap = approx. 26 mm

Ensure that the air gaps on the expansion units are not displaced during the further installation of the rails!

6.4.5 ProfiDAT rails in curved sections with a > 60 m

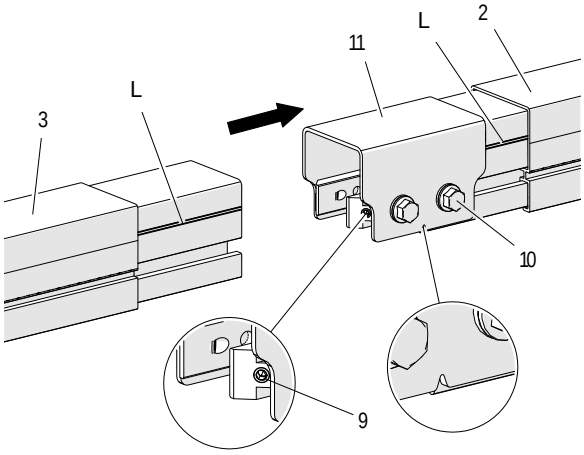


Fig. 39: Mount connector to ProfiDAT® rail

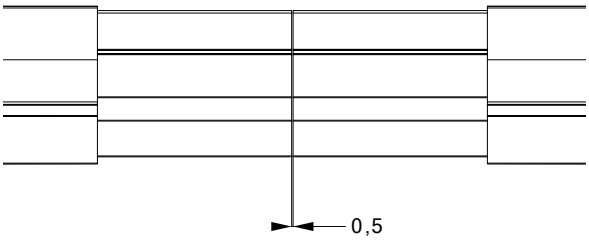


Fig. 40: Maximum offset of connection point in X-direction (direction of travel)

Work steps:

→ Slide a rail connector (11) onto the mounted ProfiDAT rail (2) until it reaches the center of the connector.

Mark the center of the rail connector with a notch.

→ Fix the rail connector (11) with the two threaded pins (9) (5 Nm).

→ Slide the next ProfiDAT rail (3) into the mounted connector (11) and fix it with the two threaded pins (9) (5 Nm).

→ Tighten the four lateral flange screws (10) on the connector (10 Nm).

Check that all four flange screws (10) are secured by a detent-edged washer (4) between screw head and rail connector (11).

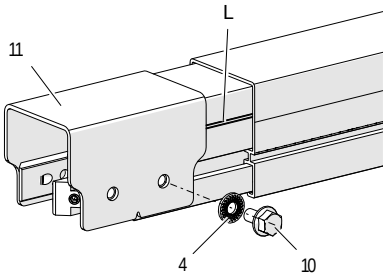


Fig. 41: Screw lock with detent-edged washer

Pay attention to the alignment of the ProfiDAT rails!

One side is marked with two longitudinal grooves (L). Mount the rails in such a way that the longitudinal grooves are always positioned on the same side.

ATTENTION!

The two rail ends must lie directly against each other! The gap between the rails may not be more than 0.5 mm in the X-direction (travel direction) (see Fig. 40)!

The sliding surfaces for the sliding contacts must be level with each other and deburred.

Both rails must lay directly next to each other. The gap must not exceed 0.5 mm (see Fig. 34 and Fig. 35).

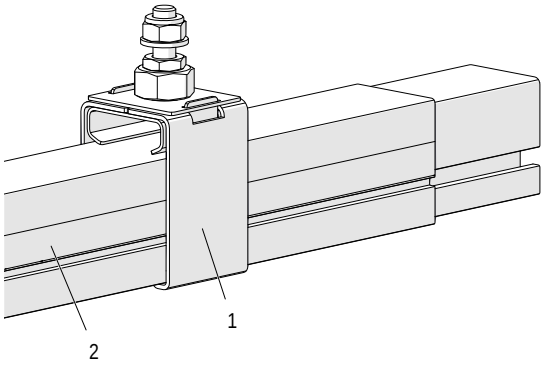


Fig. 42: Slide hanger clamp onto the ProfiDAT rail

→ Slide the hanger clamp (1) onto the mounted ProfiDAT rail (2).

→ Bend the ProfiDAT rail at the end until the hole in the supporting construction is aligned with the hanger clamp (1).

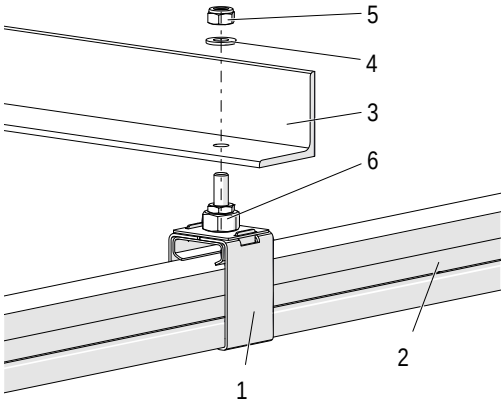


Fig. 43: Mount ProfiDAT rail onto supporting construction

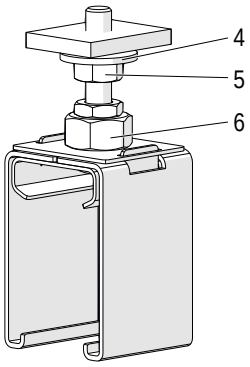


Fig. 44: Hanger clamp for mounting onto C-rail

→ Insert the ProfiDAT rail (2) with hanger clamps (1) into the supporting construction (3) from below, or slide it into the C-rail, and secure the hanger clamps with the nut (5) and washer (4).

→ Hold the aluminium spacer (6) with an SW24 open-ended wrench and then firmly tighten the nut (5) (40 Nm).

After installation, it must still be possible to freely rotate the hanger clamp.

→ Mount all other hanger clamps ProfiDAT rails in the same way.

6.4.6 Mount the anchor point

The hanger clamps are designed as sliding suspension devices so that the rails can expand or contract as the temperature changes. To this end, it is necessary to install defined anchor points and expansion units (see Section 6.4.4). The positions of the anchor points are indicated in the System Layout.

The anchor point must be installed before the hanger clamp is fastened to the supporting construction.

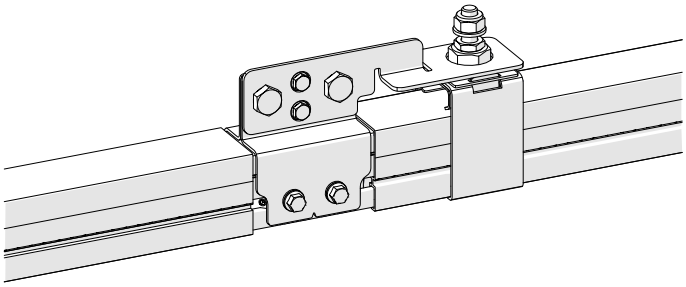


Fig. 45: Mounted anchor point

Work steps:

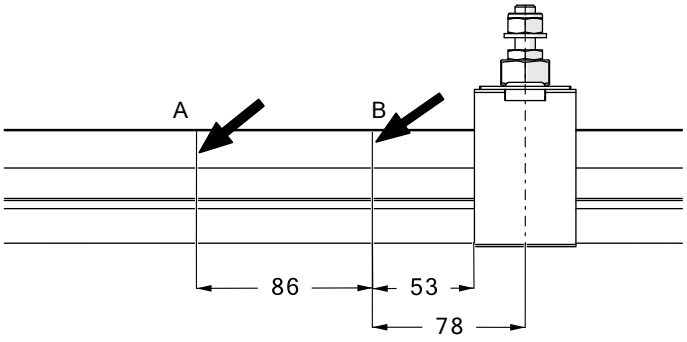


Fig. 46: Gap on insulation marking

→ Mark the distance from the hanger clamp and interfaces on the insulation profile.

Mark the two Sections A and B so that they are not confused during installation.

→ The gap must be at least 86 mm.

→ Remove the insulation profile from the aluminium profile.

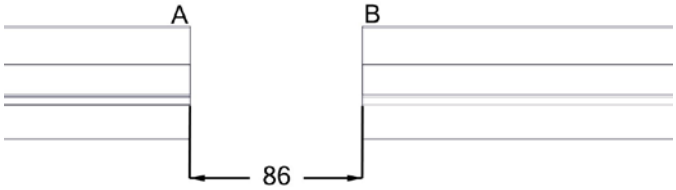


Fig. 47: Cut insulation profile to size

→ Cut the marked gap out of the insulation profile. When doing this, insert a surplus piece of ProfiDAT rail (e.g. an offcut) into the insulation profile so that it does not break during the cutting process. See also Section 6.4.7.

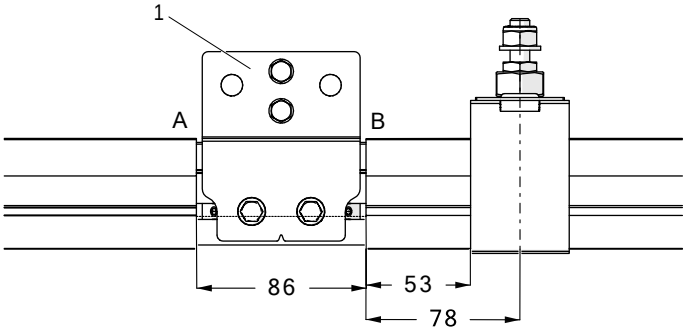


Fig. 48: Mount PE rail connectors and insulation profiles

→ Push Section A, a PE rail connector (1) and Section B onto the aluminium profile and align them. Maintain the distances specified in Fig. 48.

→ Fix the PE rail connector (11) with the two threaded pins (9) (5 Nm).

→ Tighten the four lateral flange screws on the connector (10 Nm).

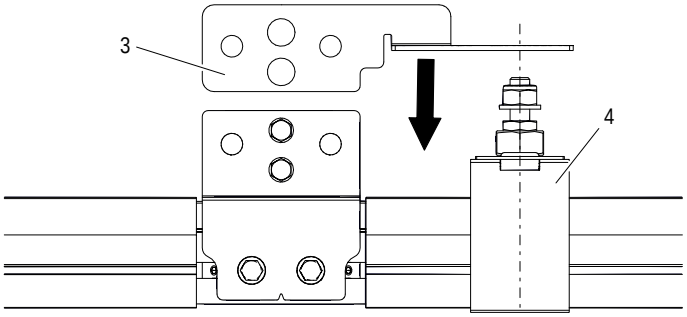


Fig. 49: Slide on anchor point

→ Slide the anchor point (3) onto the hanger clamp (4) from above.

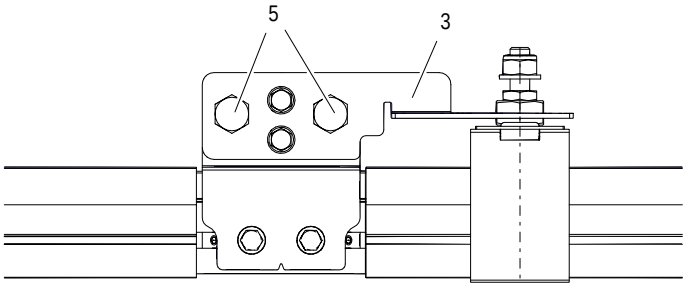


Fig. 50: Mount anchor point

→ Mount the anchor point (3) on the PE rail connector with two screws (5).

→ Mount the hanger clamp with rail on the supporting construction (see Sections 6.4.1, Fig. 21).

6.4.7 Adjust the length of the ProfiDAT rail

The ProfiDAT rails can be adjusted in length at the route ends.

The insulation profile of the ProfiDAT rail must always be 138 mm shorter than the aluminium profile.

Work steps:

→ Determine the length of the required ProfiDAT rail.

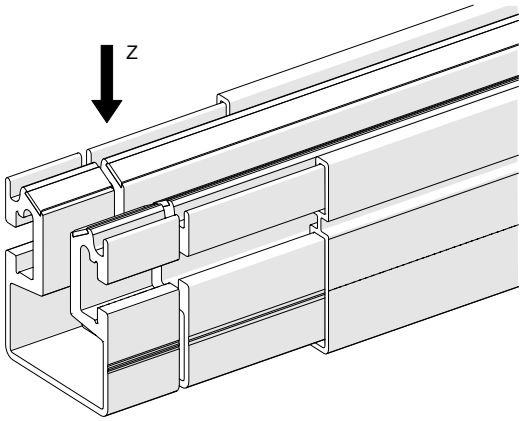


Fig. 51: ProfiDAT rail cutting direction

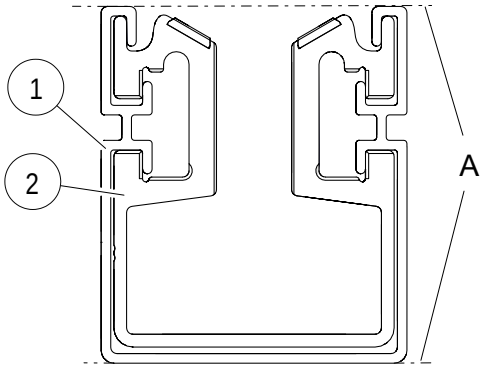


Fig. 52: Insulation profile (1), aluminium rail (2) and surface for clamping (A)

→ The cutting direction (Z) must be from the open side of the rail, i.e. from top to bottom (see Fig. 51).

→ Cut off the insulation profile and aluminium rail separately and at right angles with a cross-cut saw. Use clamping surface A (see Fig. 52) so that the interior of the aluminium rail is not deformed.

→ After cutting the aluminium rail to size, create a chamfer of max. 0.3 mm x 45° on the aluminium rail using a key file (see Fig. 53). This is important to prevent wear of the sliding contacts! File burrs off all other sharp rail edges with a key file!

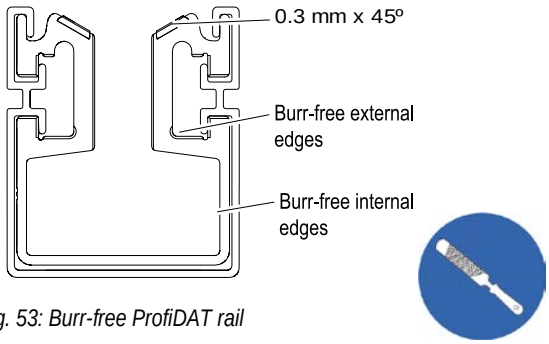


Fig. 53: Burr-free ProfiDAT rail

6.4.8 Mount the outfeed

The outfeed differs from the line feed unit in that it has a terminating resistor (pre-installed). No cable is attached here.

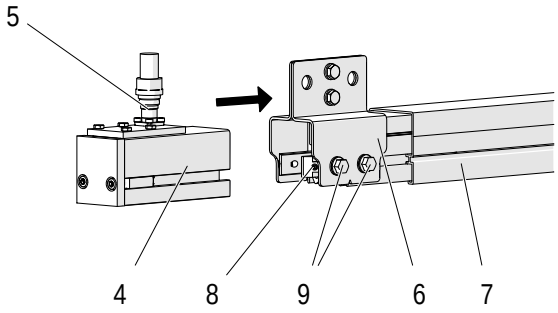


Fig. 54: Mount outfeed

Work steps:

→ Insert the outfeed (4) up to the mechanical stop in the connector (6) of the last ProfiDAT rail (7).

ATTENTION!

The two rails must lie directly against each other, the gap width must not exceed 0.5 mm!
The sliding surfaces for the sliding contacts must be level with each other and deburred.

→ Fix the outfeed to the connector using the two threaded pins (8) (5 Nm).

→ Tighten the four lateral flange screws (9) on the connector (10 Nm).

→ Slide the heat-shrink tubing over the terminating resistor (6) and the socket on the terminating unit and shrink with a heat gun.

6.4.9 Connect the PE cable to the ProfiDAT rail

The ProfiDAT rail must be connected to the customer's PE cable at the start of the system. This cable must be a PE cable and therefore marked green-yellow (see Fig. 55). The cable cross-section can be determined by the customer, but must be designed to correspond to at least half the phase current.
The PE connection can also be made at another point, such as the data feed – there are no technical specifications for this – but it is recommended that the data feed and the connection for the PE function are implemented in close proximity to each other

Work steps:

→ Attach screw DIN 933 (2), fan washer DIN 6798 (6), PE conductor (3) with cable lug (4), detent-edged washer (7) and nut DIN 934 (8) to the PE connector (1) (20 Nm).

→ Attach the grounding symbol below the cable lug on the connector (1).

A PE connector and a grounding conductor must be mounted to the steel construction at every fifth rail connection point. A section line feed can be used for this purpose.
The cable cross-section of the ground conductor may be specified by the customer, but must be at least 16 mm². The PE rail connectors are used to connect the ground conductor to the ProfiDAT rails.

Work steps:

→ Mark the PE cable (3) with cable lug (4) green-yellow (for screw M10) at both ends (5).

→ Attach screw DIN 933 (2), fan washer DIN 6798 (6), PE conductor (3) with cable lug (4), detent-edged washer (7) and nut DIN 934 (8) to the PE connector (1) (20 Nm).

→ Attach the grounding symbol below the cable lug on the PE connector (1).

→ Connect the unconnected end to the supporting construction on site and mark the connection point with the grounding symbol.

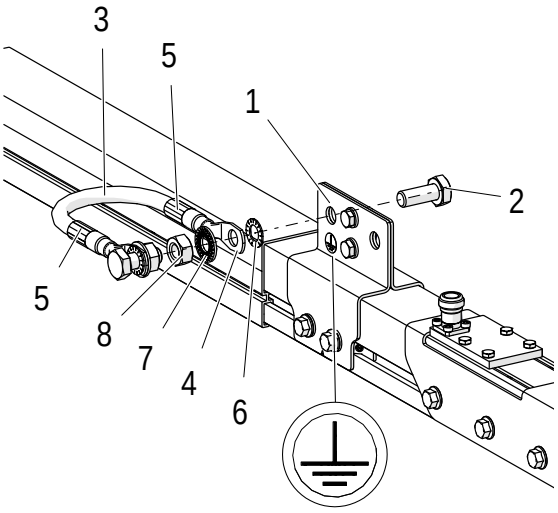


Fig. 55: PE cable is connected to ProfiDAT rail

6.4.10 Use of the ProfiDAT rail without PE function

If the ProfiDAT rail is used without the PE function, it must still be connected to the grounded crane/steel construction.

The following steps must be carried out if the PE function is not used:

→ Connect both ends to the customer's grounded crane construction.

→ Connect the green-yellow PE conductor (minimum cross-section 25 mm²) (see Fig. 55).

→ Mark PE connection points with grounding symbol.

6.4.11 Heating conductor (optional)

Install the heating conductor as described in the documentation of the 0514 Data Transmission System (see MV0514-0005).

6.4.12 Retrofitting of a PE rail connector (ground)

If the existing grounding of the rail is insufficient, a PE rail connector must be retrofitted to the ProfiDAT rail. The exact position must be determined based on the System Layout.

It is not possible to retrofit a PE rail connector in a system with C-rails!

Work steps:

→ Center the insulation profile on the aluminium profile so that both ends of the insulation profile are at the same distance from the ends of the aluminium profile.

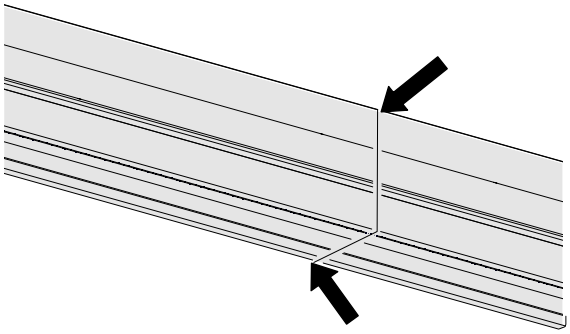


Fig. 56: Mark profile

→ Measure the required distance to the cable feed-through in the supporting construction and mark the position on the Profi-DAT rail. Make markings on the insulation profile and the aluminium profile!

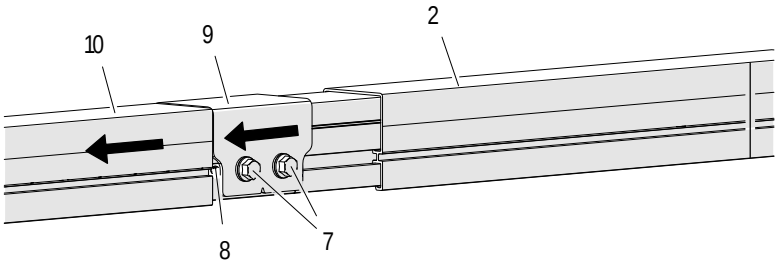


Fig. 57: Loosen connector on ProfiDAT rail

→ Remove the marked conductor rail (2). To do this, loosen the four M6 lateral flange screws (7) (10 Nm) and M6 threaded pins (8) (5 Nm) of the two rail connectors (9) on the left and right of the rail.

→ Move the rail connectors (9) so that the marked profile (2) can be removed. The insulation profiles (10) of the two adjacent profiles to the left and right may also need to be moved.

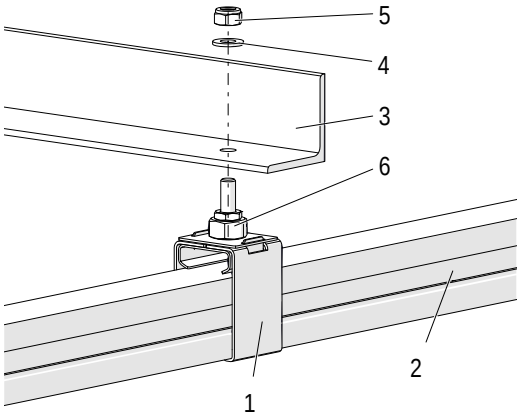


Fig. 58: Dismount ProfiDAT rail

→ Dismount the hanger clamps (1) with the marked rail (2). To do this, loosen the nut (5) and washer (4) and remove the hanger clamp from the supporting construction (3).

→ Pull the ProfiDAT rail (2) out of the hanger clamps (1).

→ Pull the insulation profile from the aluminium profile.

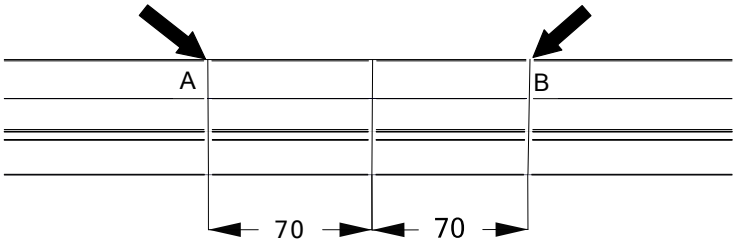


Fig. 59: Mark cutting points on insulation profile

→ Starting from the marked position, make one marking to the left and another to the right at 70 mm each.

Mark the two Sections A and B so that they are not confused during installation.

→ Cut the marked gap out of the insulation profile. When doing this, insert a surplus piece of ProfiDAT profile (a profile offcut, for example) into the insulation profile so that it does not break during the cutting process. See also Section 6.4.7.

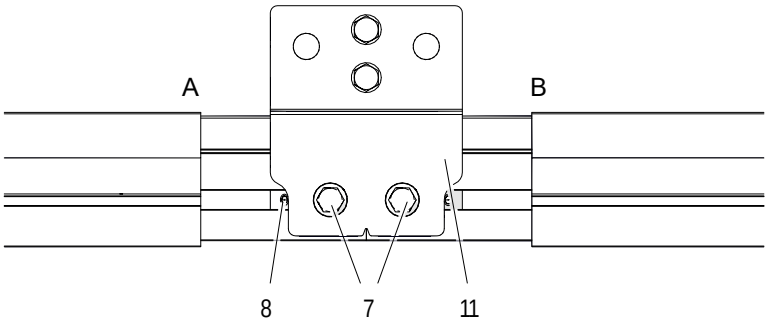


Fig. 60: Mount PE rail connector

→ Slide Section A onto the aluminium profile.

→ Slide a PE rail connector (11) onto the aluminium profile and align it with the marking.

→ Fix the PE rail connector (11) with the M6 threaded pins (8) (5 Nm).

→ Tighten the four M6 lateral flange screws (7) (10 Nm) on the connector.

→ Slide Section B onto the aluminium profile.

→ Slide the hanger clamps (1) back onto the ProfiDAT rail (2).

→ Insert the ProfiDAT rail (2) with hanger clamps (1) into the supporting construction (3) from below and secure the hanger clamps with the nut (5) and washer (4) (see Fig. 58).

→ Reconnect the rail to the adjacent rails on the right and left. To do this, slide the rail connector onto the rail up to center of the connector, fix it in place with the M6 threaded pins (5 Nm) and then tighten the four M6 lateral flange screws (10 Nm) on the connector. See Section 6.4.1.

→ Connect the PE cable, see Section 6.4.9.

6.4.13 Mount the collector

There are two versions of the collector: Single and dual collectors.

6.4.13.1 Mount the dual collector

The dual collector consists of 2 identical collector arms. A distinction is made between short arm and long arm collectors (see Fig. 63 and Fig. 64). The collector arms are connected and attached to the towing arm with the supplied screws. Minimum pole spacing 50 mm.

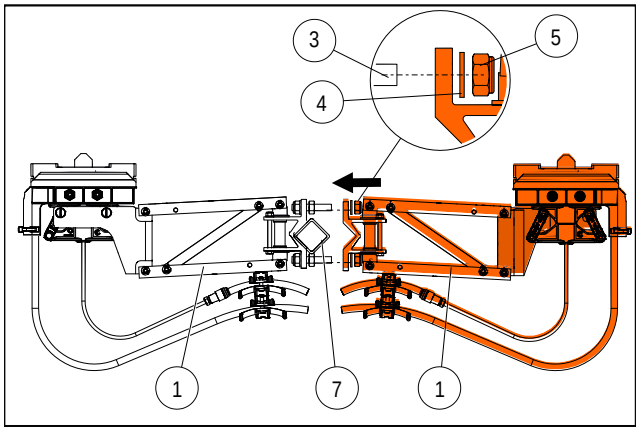


Fig. 61: Mount dual collector

Work steps:

→ Position the two collector arms (1) on the towing arm (7).

→ Fix the collector arms (1) with the two screws (3), washers (4) and nuts (5) (40 Nm).

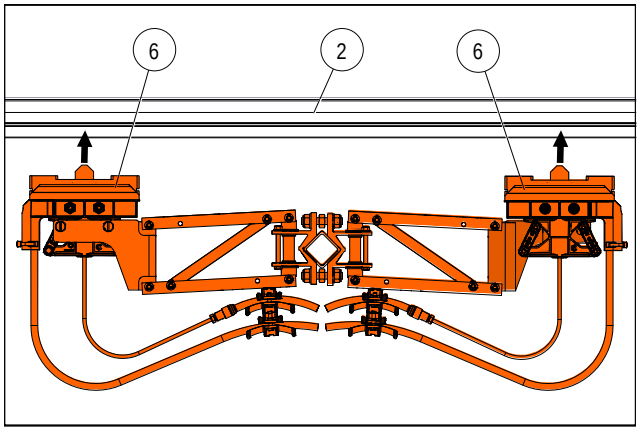


Fig. 62: Insert dual collector into rail from below

→ For systems without a pickup guide: Insert the collector heads (6) into the ProfiDAT rail (2) from below.

→ Align the collector toward the rail.

ATTENTION!

It must be ensured that the center axis of the collector is mounted exactly on the center axis of the ProfiDAT rail and that the specified mounting distance between the towing arm and the sliding surface is maintained (see System Layout).
In order to ensure the full functional freedom of the collector, the connecting cables must be highly flexible and, with the help of the cable clamps located on the collector, are fixed in such a way that no tensile or torsional forces are transferred to the collector head.

Check the dimensions of the long arm collector (the adjustment dimension is measured from the lower edge of the ProfiDAT rail):

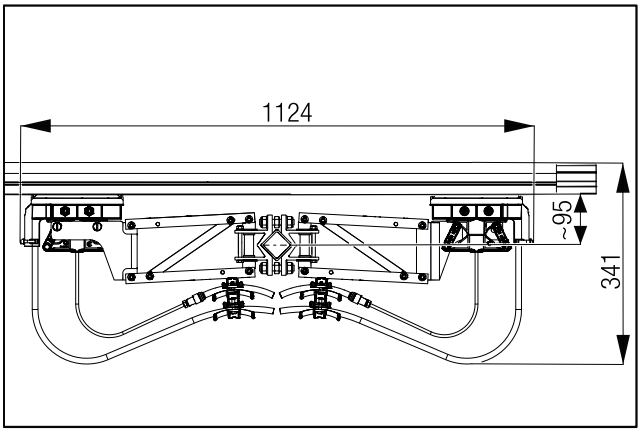


Fig. 63: Long arm collector (short arm collector illustration)

Check the dimensions of the short arm collector (the adjustment dimension is measured from the lower edge of the ProfiDAT rail):

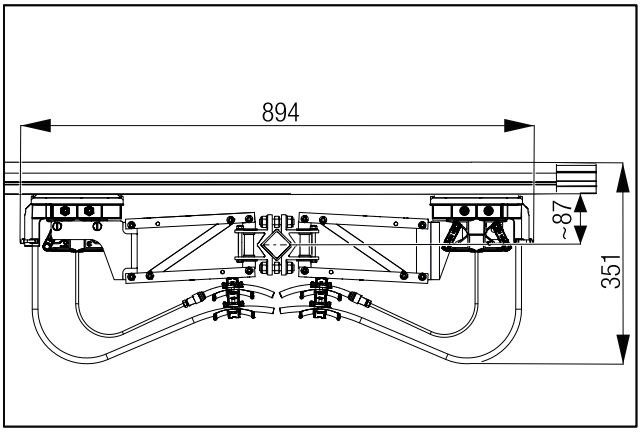


Fig. 64: Short arm collector

6.4.13.2 Mount the single collector

The single collector only has one collector arm. This is fastened to the counterpart on the towing arm with the screws supplied.

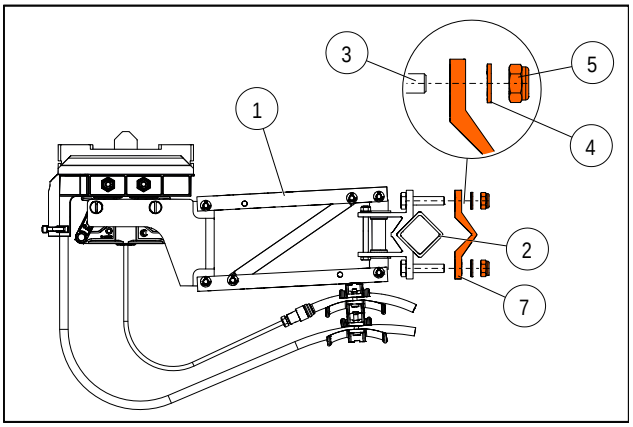


Fig. 65: Mount single collector

Work steps:

→ Position the collector arm (1) and the counterpart (7) on the towing arm (2).

→ Fix the collector arm (1) with the two screws (3), washers (4) and nuts (5) (40 Nm).

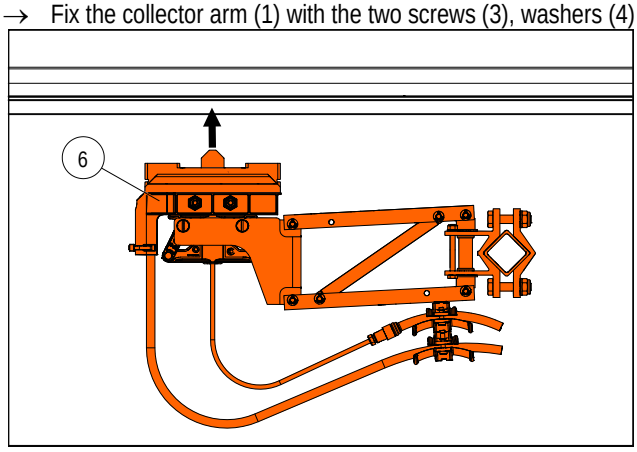


Fig. 66: Insert single collector into rail from below

→ For systems without a pickup guide: Insert the collector head (6) into the ProfiDAT rail from below.

→ Align the collector toward the rail.

ATTENTION!

It must be ensured that the center axis of the collector is mounted exactly on the center axis of the ProfiDAT rail and that the specified mounting distance between the towing arm and the sliding surface is maintained (see System Layout).
In order to ensure the full functional freedom of the collector, the connecting cable must be highly flexible and, with the help of the cable clamps located on the collector, are fixed in such a way that no tensile or torsional forces are transferred to the collector head.

6.5 Electrical installation

DANGER!

Risk of death due to electrical shock!

Contact with energized components can lead to death or severe injury due to electrical shock. There is also a risk of injury from shock reactions, falling or being thrown across the room as a result of an electrical shock.

- → Disconnect the system from the voltage supply at the main switch.
- → If there is no main switch, disconnect the power source from the system according to the system manufacturer's instructions.
- → Secure the system against being switched back on again.
- → Confirm that the power has been disconnected.
- → Ground and then short-circuit components of the system that have been disconnected from the power supply.
- → Cover or block off adjacent energized parts.
- → Before each start-up, test the insulation resistance according to locally applicable technical standards, directives and laws.

ATTENTION!

Damage due to potential difference

The following components must be connected to the same ground potential and may require additional potential equalization:

- → Transceiver housing (grounding via top-hat rail or paint-free eye)
- → Shielding of antenna cables (grounding via switch cabinet feed-through)
- → Shielding of Ethernet cable
- → Connected Ethernet devices
- → ProfiDAT data rail

6.5.1 Connect the access point (stationary transceiver)

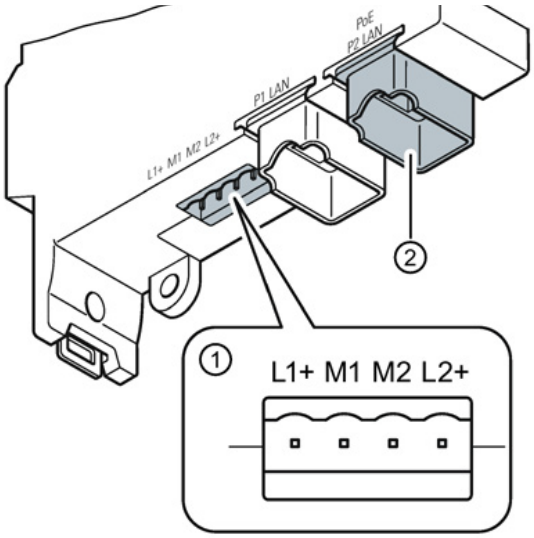


Fig. 67: Transceiver connection for Ethernet

Work steps:

→ Clamp the ProfiDAT transceiver on a top-hat rail (35 mm, DIN) in the vicinity of the line feed. Installation of transceivers in a metal switch cabinet is recommended.

→ Connect data cable (HF cable) (see Section 6.5.2 for access point and 6.5.3 for client).

→ Ensure equipotential bonding with the transceiver housing (via top-hat rail or paint-free eye).

→ Follow the information and safety instructions in the manufacturer's documentation!

For power supply via 4-pole socket (Option 1):

→ Insert the Ethernet connector (RJ45) into the P1 socket on the transceiver (see Fig. 67). Follow the information and safety instructions in the manufacturer's documentation!

- Direct line feed via the 4-pin connection socket: Pin assignment (see Fig. 67):
  L1+ = DC 24 V
  M1 = ground
  M2 = ground
  L2+ = DC 24 V

ATTENTION!

Do not reverse the polarity of the connections!

For power supply via Power over Ethernet (Option 2):

→ Insert the Ethernet connector (RJ45) into the P2 socket.

6.5.2 Connect the access point to line feed

The connecting cable for the line feed on the ProfiDAT rail is installed between the transceiver in the line feed switch cabinet and the connection on the line feed.

Line feed sockets (5)

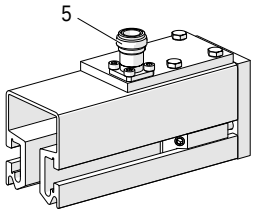


Fig. 68: Line feed/outfeed

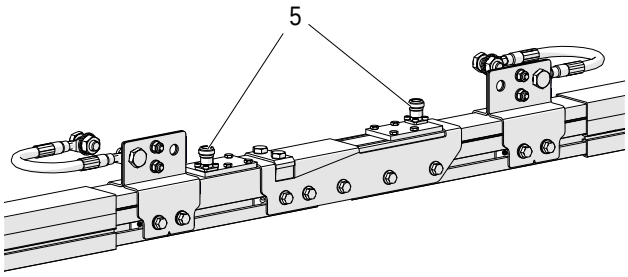


Fig. 69: Section power feed

Connection with section power feed

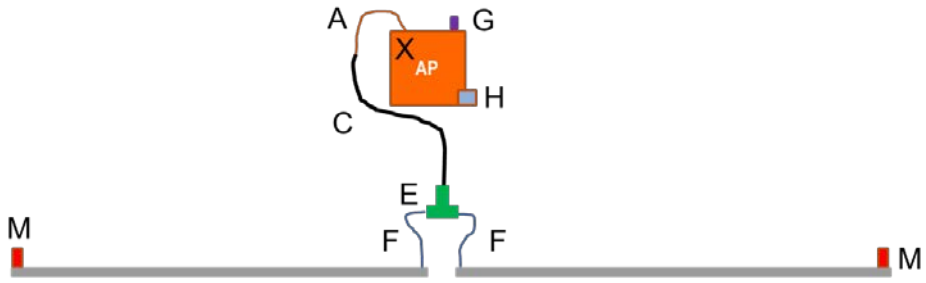


Fig. 70: Connection diagram for section power feed

Position	Description
X	Access point (AP)
A	ProfiDAT adapter cable with feed-through
C	Line feed connecting cable (1 m)
E	Splitter

Position	Description
F	Line feed connecting cable (10 m)
G	RSMA terminating resistor
H	Key-plug or C-plug access point
M	Terminating resistor N

Work steps:

→ Attach the adapter cable (A) to the socket (RSMA) on the transceiver (X) and connect it with the antenna connecting cable (C) (via N plug). The N plug of the adapter cable (A) can also be used as a switch cabinet feed-through.

→ The adapter cable (A) must be grounded. The integrated switch cabinet feed-through can be used for this purpose.

→ Connect the line feed connecting cable (C) to the splitter (E).

→ Connect the two line feed connecting cables (10 m) (F) to the splitter (E).

→ Guide the line feed connecting cables (F) to the line feeds (see Fig. 70) and connect them. Align the angled plugs parallel to the rails.

→ Connect a terminating resistor (M) to both segments on the stationary antenna.

ATTENTION!

Do not crimp the cable!

Comply with the bending radius of the cable.

Connection at end feed

Position	Description
X	Access point (AP)
A	ProfiDAT adapter cable with feed-through
B	Attenuator
E	Line feed connecting cable (10 m)
M	Terminating resistor N

Fig. 71: End feed connection diagram

Work steps:

→ Attach the adapter cable (A) to the socket (RSMA) on the transceiver (X) and connect it with the antenna connecting cable (C) (via N plug). The N plug of the adapter cable (A) can also be used as a switch cabinet feed-through.

→ The adapter cable (A) must be grounded. The integrated switch cabinet feed-through can be used for this purpose.

→ Connect attenuator (B) with adapter cable (A).

→ Connect the line feed connecting cable (10 m) (E) to the attenuator (B).

→ Guide the line feed connecting cables (10 m) (E) to the line feeds (see Fig. 71) and connect them. Align the angled plugs parallel to the rails.

→ Connect a terminating resistor (M) to the segment end on the stationary antenna.

ATTENTION!

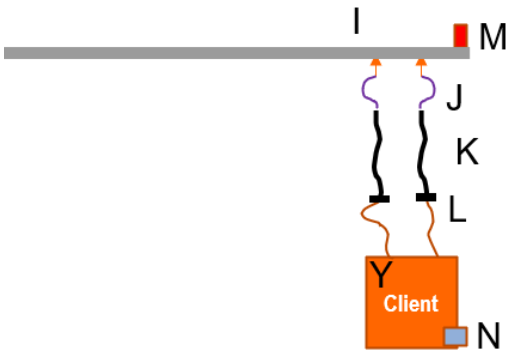
Do not crimp the cable!

Comply with the bending radius of the cable.

6.5.3 Connect the client to ProfiDAT collector

The connecting cables of the antenna on the collector are mounted between the collector and the client.

Also observe the information and safety instructions in the manufacturer's documentation when installing the connecting cables!



Position	Description
I	ProfiDAT collector
J	Antenna cable (0.4 m)
K	Collector connecting cable (10 m)
L	Adapter cable with feed-through (1 m)
Y	Client
N	Key-plug or C-plug client

Fig. 72: Collector connection diagram

Work steps:

→ Mount the adapter cable (L) (1 m) onto the client (Y).

→ The adapter cable (L) must be grounded. The integrated switch cabinet feed-through can be used for this purpose.

→ Lead the connecting cable (10 m) (K) to the adapter cable (L) and connect it.

→ Fix the cable routing with cable ties, etc.

→ Route the connecting cable (K) to the ProfiDAT collector (I).

→ Connect the connecting cable (K) to the antenna cable (0.4 m) (J) mounted on the ProfiDAT collector (I).

ATTENTION!

Do not crimp the cable!

Comply with the bending radii of the cables.

→ Fasten the connecting cable (K) near the connection point to the antenna cable (J) using the device on the collector (tension relief).

ATTENTION!

Avoid tensile load on antenna cable (J)!

→ Mount the second connecting cable in the same manner.

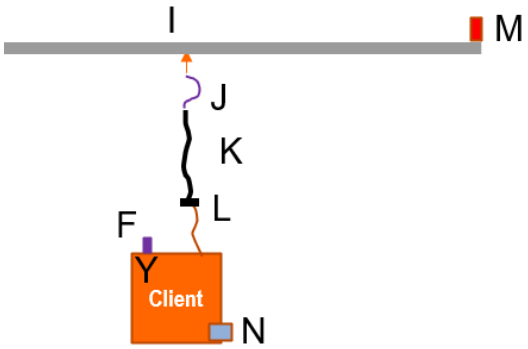


Fig. 73: Collector connection diagram

Work steps:

→ Mount the adapter cable (L) (1 m) onto the client (Y).

→ The adapter cable (L) must be grounded. The integrated switch cabinet feed-through can be used for this purpose.

→ Lead the connecting cable (10 m) (K) to the adapter cable (L) and connect it.

→ Fix the cable routing with cable ties, etc.

→ Route the connecting cable (K) to the ProfiDAT collector (I).

→ Connect the connecting cable (K) to the antenna cable (0.4 m) (J) mounted on the ProfiDAT collector (I).

ATTENTION!

Do not crimp the cable!

Comply with the bending radii of the cables.

→ Fasten the connecting cable (K) near the connection point to the antenna cable (J) using the device on the collector (tension relief).

ATTENTION!

Avoid tensile load on antenna cable (J)!

6.6 Checklist and initial commissioning

 WARNING!	This checklist serves as a guide to ensure the safe operation of the electrification system. The checklist is intended for qualified professionals who install and commission electrification systems and are familiar with the regulations on safety at work and accident prevention. The report on the following pages must be filled out during the initial commissioning.

End customer		Customer No.	
		Order No.	

Location of Commission-ing	
Address	
Country	

Business Premises No.		System No.	
Serial Number ProfiDAT Transceiver			
Start of Commissioning		Commissioner	
End of Commissioning		Name	
		Date	
		Signature	

No.	Description	Comment: OK/NOK
1.	Installation	
1.1.	Number of hanger clamps is correct (with max. distance 2500 mm).	
1.2.	The expansion units are correctly installed.	
1.3.	The ProfiDAT rails are correctly aligned.	
1.4.	The collector is correctly mounted. The force between the sliding contacts and the ProfiDAT rail is 28 N.	
1.5.	The collector is correctly aligned with the ProfiDAT rail.	
1.6.	No blocking objects are in the movement area of the collector.	
1.7.	The ProfiDAT connectors are correctly mounted (maximum gap between the rails is 0.5 mm. No vertical or horizontal offset).	
1.8.	The line feed assemblies/line feed unit are/is correctly mounted.	
1.9.	The outfeed assembly is correctly mounted.	
1.10.	The protective conductor cable at the beginning of the ProfiDAT rails is correctly mounted.	
1.11.	The protective conductor cables are correctly mounted on the PE connectors.	
1.12.	The sliding contacts are free of grease.	
1.13.	The heating system has been correctly installed (if an optional heating system has been installed).	
1.14.	All screws have been tightened according to specifications.	
1.15.	The ProfiDAT transceivers have been correctly mounted.	
1.16.	The ProfiDAT line feed cabinet has been correctly mounted.	
1.17.	All electrical connections are correctly completed by specialist personnel.	
1.18.	All cables for data transmission have been correctly mounted.	
1.19.	The operating personnel are trained.	
2.	ProfiDAT Connection	
2.1.	The stationary ProfiDAT transceiver is switched on and the LAN is connected. Switch on the 24 V power supply to the ProfiDAT transceiver and connect the ProfiDAT® transceiver and allow at least 1 minute to start. Requirement: LED "L1" or "L2" or "PoE" lights up green. LED "R1" lights up green or flashes green to orange. LED "P1" and/or "P2" light up green or flash green to orange. LED "F" is off.	

No.	Description	Comment: OK/NOK
2.2.	The ProfiDAT transceiver on the vehicle is turned on and the LAN is connected. Switch on the 24 V energy supply to the ProfiDAT transceiver and supply the ProfiDAT transceiver and allow at least 1 minute to start. Requirement: LED "L1" or "L2" or "PoE" lights up green. LED "R1" lights up green or flashes green to orange. LED "P1" and/or "P2" light up green or flash green to orange. LED "F" is off.	
2.3.	The ProfiDAT connection is established. Requirement: LED "R1" lights up green or flashes green to orange.	

*The initial commissioning of the transceiver must occur **simultaneously** with the commissioning of the system into which the data transmission system is integrated. The connection establishment and the data transmission can only take place when the system is turned on and a connection between the antenna on the collector and the line feed via the ProfiDAT rail is established.*

No.	Description	Comment: OK/NOK
3.	Commissioning	
3.1.	Collector test – low speed Test: Travel the entire guideway at 10% of the maximum speed. Observe the activity of the collectors on the ProfiDAT rail, particularly at the joints and on the expansion unit. Required result: The connections and transfers over the entire length of the ProfiDAT rails are smooth and the activity of the collector is trouble-free at all times.	
3.2.	Collector test – increased speed Test: Increase the speed to 30 %, 50 %, 80 %, and finally 100 % of the full speed. Required result: Collector activity is trouble-free at all times.	
3.3.	Additional functional tests Required result: All other functions are carried out according to the collector's requirements.	

7 Operation

7.1 Safety

WARNING!

Risk of death due to suspended loads!

Falling loads can lead to severe injuries or even death.

→ Never walk under suspended loads.

→ Only move loads under supervision.

→ Set down the load before leaving the work area.

Risk of injury due to improper operation!

Improper operation can result in serious personal injury and material damage.

→ Conduct all operating steps in accordance with the specifications of these operating instructions.

→ Before starting work, ensure that all covers and safety systems are installed and working properly.

→ Never disable the safety systems during operation.

→ Maintain order and cleanliness in the work area! Loosely stacked or scattered components and tools are a source of accidents.

Unauthorized personnel are at risk!

Unauthorized persons who do not meet the requirements described here are not acquainted with the dangers in the work area!

→ Keep unauthorized persons away from the work area.

→ In case of doubt, address the person and direct them away from the work area.

→ Stop working as long as unauthorized persons are in the work area.

Electrical

Do not exceed the rated voltage specified in Section 3! The data transmission system can be overloaded due to excessive current or voltage. Risk of fire and/or destruction of the data transmission system!

Personnel:

- The system may only be operated by trained personnel!

Personal protective equipment (these items must be worn during all work):

- Protective clothing
- Protective footwear

8 Maintenance and Service

8.1 Safety

WARNING!

Risk of injury due to improperly conducted maintenance works!

Improper maintenance can cause serious injuries to persons or material damage.

- → Before starting work, ensure sufficient space for installation.
- → Ensure that the installation area is clean and tidy! Loosely stacked or scattered components and tools are a source of accidents.
- → If components have been removed, be careful to reinstall them properly, replace all fastenings and comply with screw tightening torques.
- → Switch off the main power supply line and secure it against unauthorized reactivation.
- → Use the climbing aids and working platforms provided when installation tasks are carried out above eye level.
- → Do not use machine components as climbing aids.
- → Ensure the safe and environmentally friendly drainage, collection and disposal of operating and auxiliary materials.
- → Safety systems that have been removed for installation, service or repair work must be reinstalled and inspected immediately after the work is complete.
- → Observe the intervals for inspection and maintenance work specified in the maintenance instructions.
- → Ensure that sufficient space for maintenance work is available.
- → Ensure that powered components are not inadvertently activated during maintenance work.
- → Secure detached parts against falling.
- → Screw joints that were loosened during maintenance work must be retightened and secured according to instructions.
- → Fastenings and seals that cannot be reused are to be replaced (such as self-locking nuts, washers, splints, O-rings, glued or micro-encapsulated screws).
- → Lubrication or greasing points that are cleaned or wiped during maintenance and repair work must be re-lubricated as instructed.
- → After finishing work, collect all tools and materials and check that all are present.
- → Disassembled parts and components that were exchanged are to be collected, stored in a safe place, recycled or returned.
- → Before entering systems, they must be disconnected from power using the main switch and secured against unauthorized, unintentional, and/or erroneous switching on.

8.2 Maintenance schedule

The following sections describe the maintenance work required for optimal, trouble-free operation. The work carried out according to the maintenance plan must be logged.
If signs of heavier wear are revealed during regular inspections, reduce the maintenance intervals according to the actual signs of wear.
Contact the manufacturer in case of any questions regarding maintenance tasks and intervals. See the service address on the last page.

Interval	Maintenance work	Conducted by
Every 14 Days: 3 and 4 shift operation Every 30 Days: 2 shift operation; after 300 hours at the latest	Visual inspection of ProfiDAT System components ■ Proper condition ■ Proper function ■ Firm seating of screws and nuts ■ Deformation ■ Wear and tear ■ Damage ■ Level of soiling ■ Corrosion	Users
Every 4 weeks	Visual and functional inspection ■ Wear of the sliding contacts	Specialist technician
Every 6 months	Visual and functional inspection ■ Check for ease of motion ■ All electrical connections and cables Visual inspection of ProfiDAT System components ■ Proper condition ■ Proper function ■ Deformation ■ Wear and tear ■ Damage ■ Level of soiling ■ Corrosion	Specialist technician
	Check the screw connections ■ Check for firm seating of screws ■ If necessary, tighten to torque (see Section 6).	Specialist technician
Every 6 months	Check the collector ■ Installation dimensions ■ Contact force of the sliding contacts ■ Connector cables ■ Oil joints and/or bolts	Specialist technician
Once a year	Check expansion unit, line feed, outfeed and collector ■ Condition of the adhesive tape used to seal the socket and cable	Specialist technician

8.2.1 Documentation

→ The results of inspections and the measures taken are to be documented in written reports.

→ Conductix-Wampfler must be immediately informed of any defects or malfunctions that occur during the test phase and within the warranty period.

8.2.2 Replace the ProfiDAT antenna

Required tools:

- Hexagon wrench SW5

Work steps:

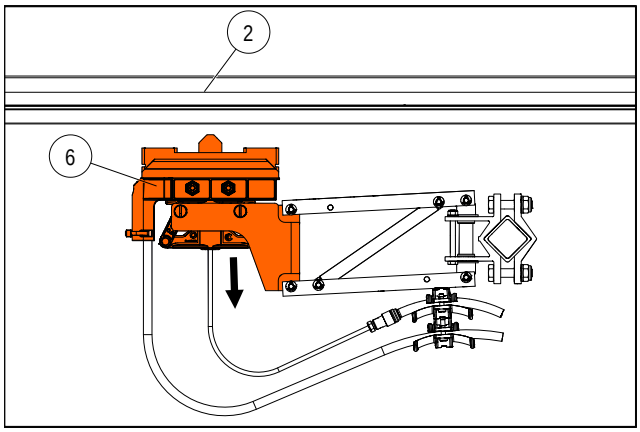


Fig. 74: Pull collector head out of ProfiDAT rail

→ Pull the collector head (6) downward out of the ProfiDAT rail (2).

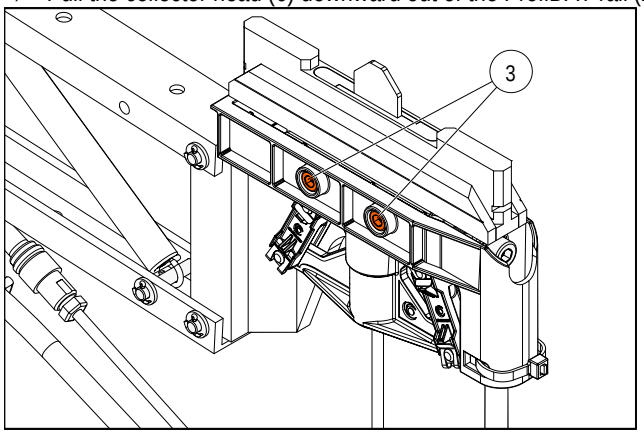


Fig. 75: Loosen screws

→ Loosen the 2 cylinder head screws (3) (without removing them).

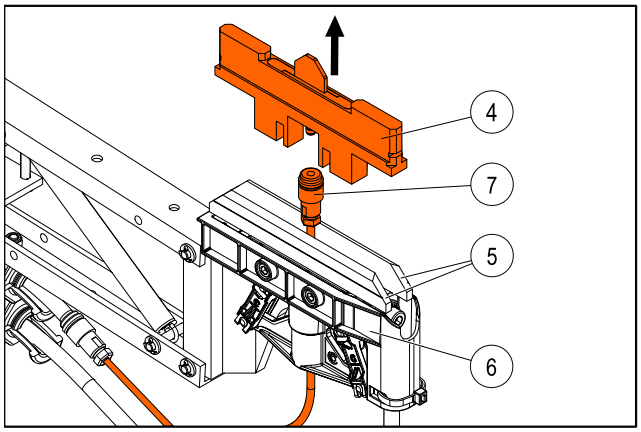


Fig. 76: Pull out antenna

→ Pull out the antenna (4) from above.

ATTENTION!

Ensure that the sliding contacts (5) do not fall out.

→ Loosen the coupling ring of the cable (7) and disconnect the cable from the antenna (4).

→ Clean the collector head (6) with a clean cloth.

→ Connect the cable (7) with the coupling ring to the new antenna.

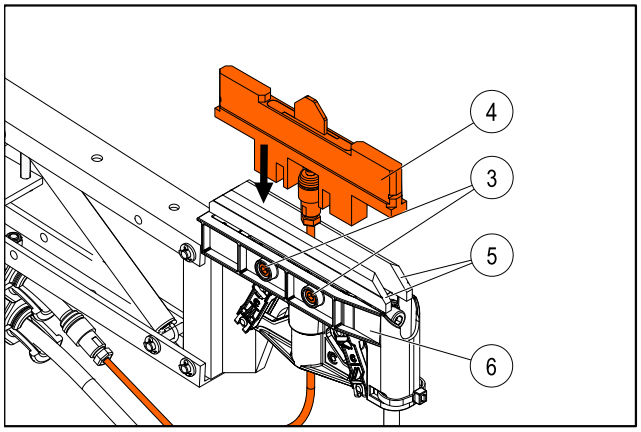


Fig. 77: Insert antenna into collector head

→ Insert the antenna (4) between the 2 sliding contacts (5) from above.

ATTENTION!

Ensure that the antenna (4) and the sliding contacts (5) are in contact with the collector head (6).

→ Tighten the 2 cylinder head screws (3).

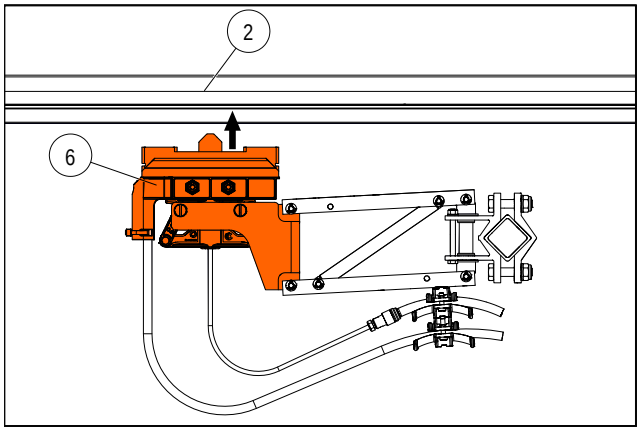


Fig. 78: Insert collector head into ProfiDAT rail

→ Insert the collector head (6) into the ProfiDAT rail (2) from below.

8.2.3 Maximum wear of the sliding contacts

WARNING!

Destruction of the system due to lack of grounding!

Sliding contacts that have been worn down beyond the permitted limit are unable to establish good contact with the ProfiDAT rail. Poor contact between sliding contacts and rail leads to loss of the PE connection (grounding)! In case of a short circuit, the system is not grounded.

→ Check the level of wear of the sliding contacts regularly.

→ Under no circumstances continue to use defective or worn sliding contacts. Replace worn sliding contacts immediately.

The wear limit is visibly marked on the collector shoe and the sliding contact:

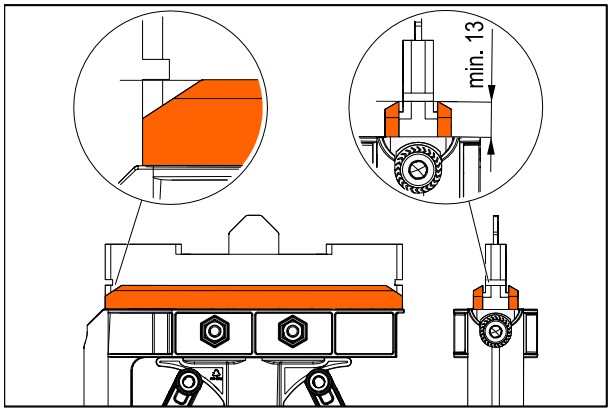


Fig. 79: Upper edge of sliding contact must not fall below notch in collector shoe

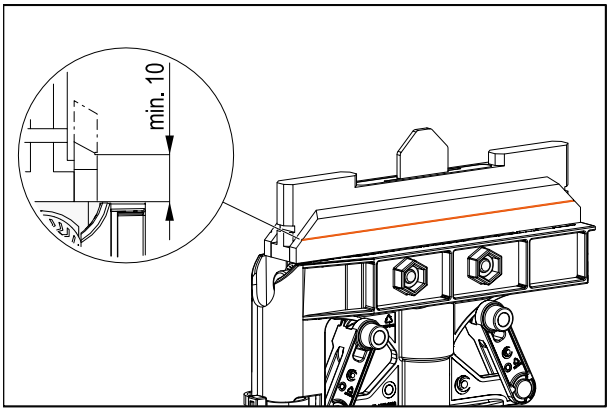


Fig. 80: Lower edge of sliding contact chamfer must not fall below notch in sliding contact

8.2.4 Replace the sliding contacts on the ProfiDAT collector

Required tools:

- Hexagon wrench SW5

Work steps:

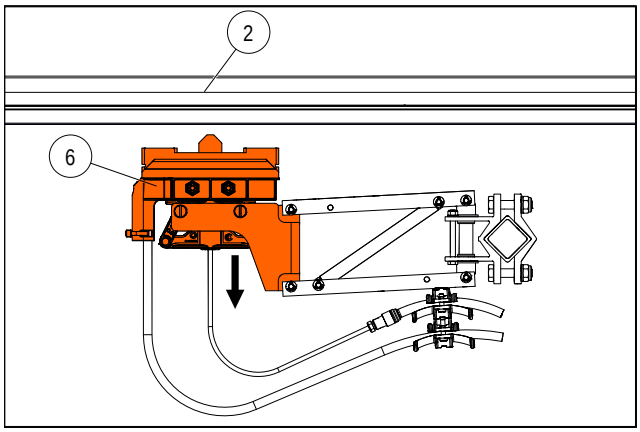


Fig. 81: Pull collector head out of ProfiDAT rail

→ Pull the collector head (6) downward out of the ProfiDAT rail (2).

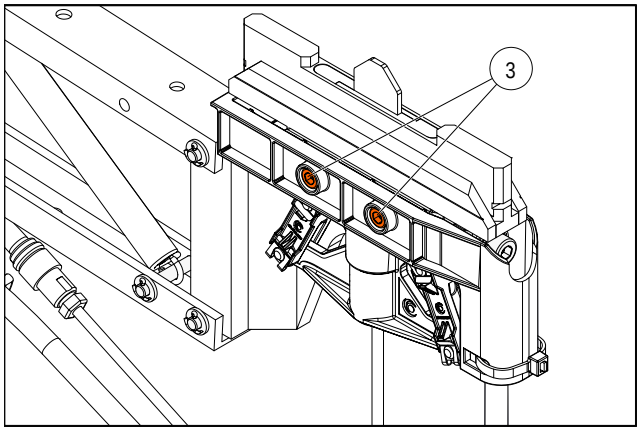


Fig. 82: Loosen screws

→ Loosen the 2 cylinder head screws (3) (without removing them).

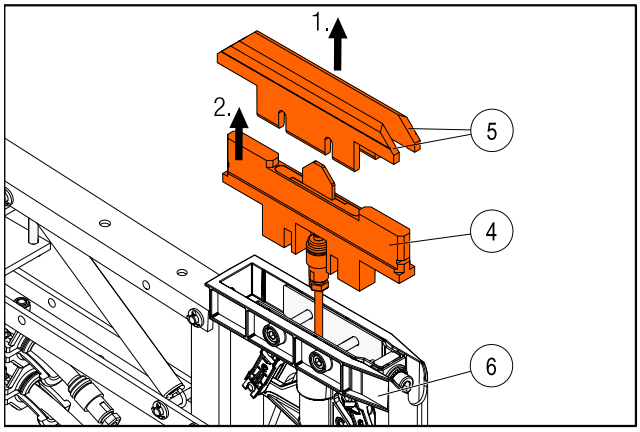


Fig. 83: Pull out sliding contacts

→ Pull out the sliding contacts (5) from above.

→ Pull out the antenna (4) from above.

The cable on the antenna does not need to be dismounted.

→ Clean the collector head (6) with a clean cloth.

→ Insert both sliding contacts (5) into the collector head (6) from above.

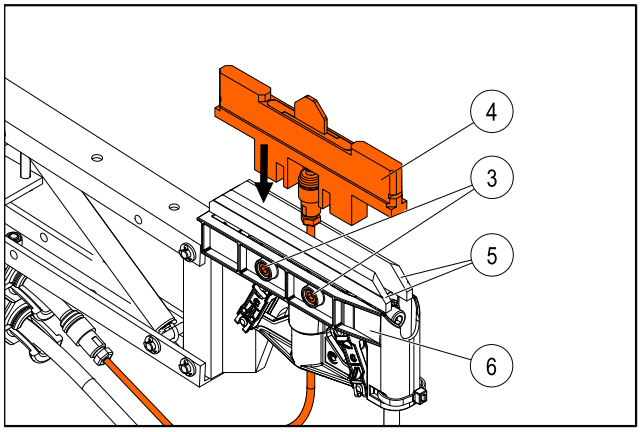


Fig. 84: Insert antenna between sliding contacts

→ Insert the antenna (5) between the 2 sliding contacts (4) from above.

ATTENTION!

Ensure that the antenna (5) and the sliding contacts (4) are in contact with the collector head (6).

→ Tighten both cylinder head screws (3) (see Fig. 84).

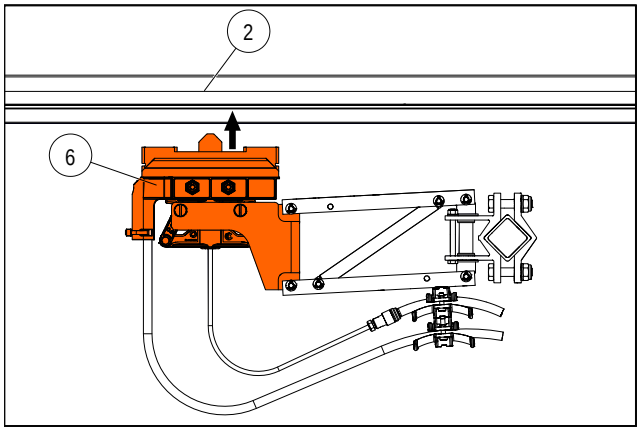


Fig. 85: Insert collector head into ProfiDAT rail

→ Insert the collector head (6) into the ProfiDAT rail (2) from below.

8.2.5 Replace the ProfiDAT collector head

CAUTION!

Risk of injury!

→ Read and observe the safety instructions in Section 2.

→ Protect the electrification unit against being inadvertently switched on.

→ Safety systems that have been removed must be reinstalled and checked immediately after work is completed.

→ After finishing, collect all measuring tools and check that everything is present.

Required tools:

Cross-head screwdriver

Work steps for dismounting collector head:

→ Remove cable ties

→ Loosen PE cable (1) and remove from cable bracket (6)

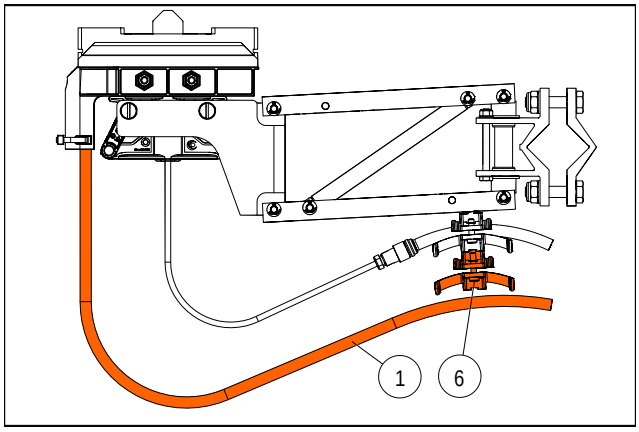


Fig. 86: Remove PE cable (1) from cable bracket (6)

→ Remove the adhesive tape at the data cable connection point

→ Disconnect connection to data cable

ATTENTION!

When removing the adhesive tape, ensure that the feed cable (2) is not damaged.

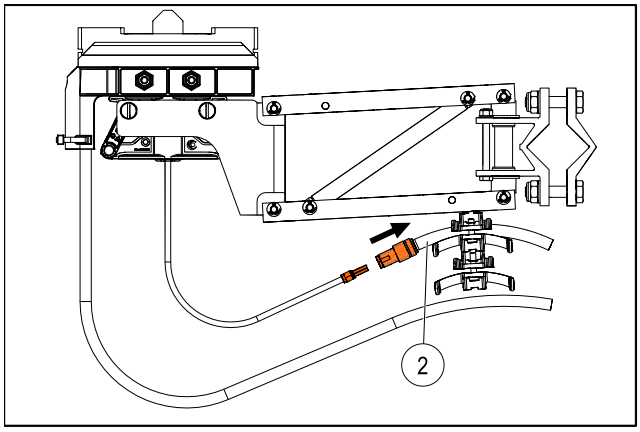


Fig. 87: Disconnect connection

→ Slide the spring clips (3) from the screw ends (4)

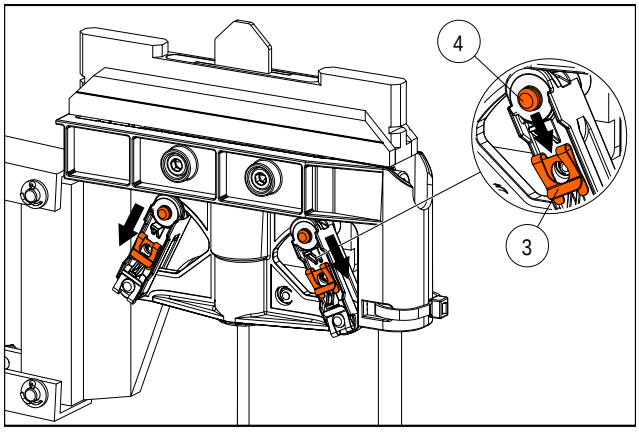


Fig. 88: Slide spring clips (3) from screw ends (4)

→ Loosen the screws (4) and remove the collector head (5) from the collector arm

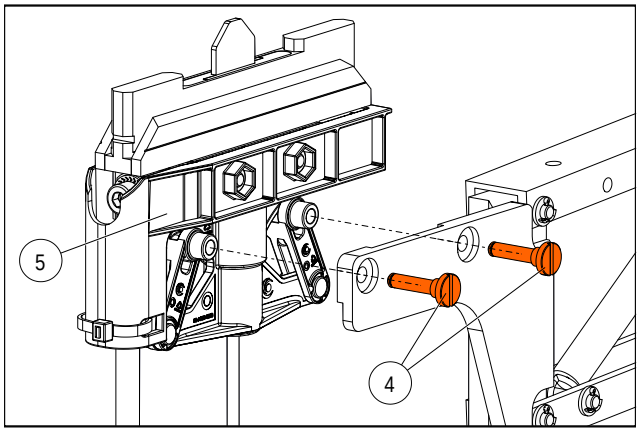


Fig. 89: Loosen screws (4) and remove collector head (5)

Work steps for mounting collector head:

→ Fix the new collector head (5) to the collector arm with screws (4).

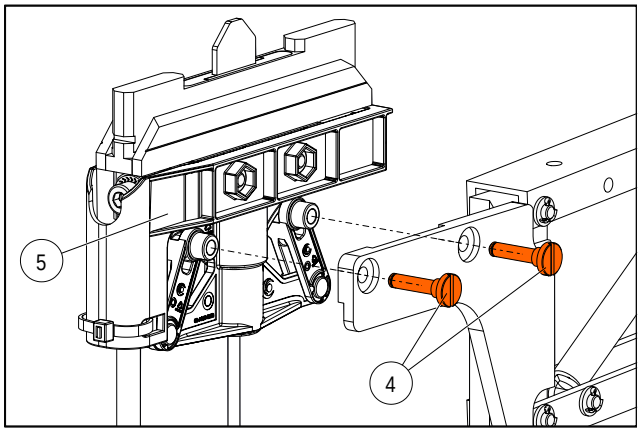


Fig. 90: Fix new collector head (5)

→ Slide the spring clips (3) onto the screw ends (4) and into the groove.

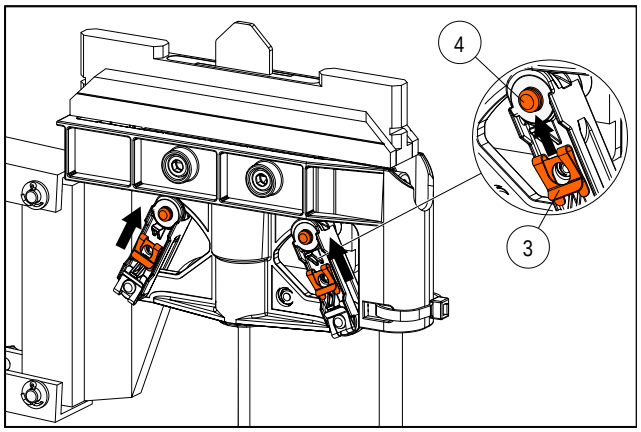


Fig. 91: Slide spring clips (3) onto screw ends (4)

→ Plug in data cable connection

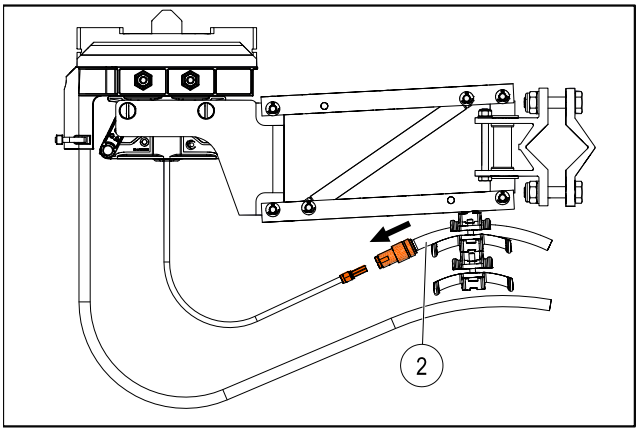


Fig. 92: Plug in connection

→ Wrap and seal the data cable connection point with Scotch® 23 adhesive tape.
→ Start wrapping before the heat-shrink tubing at one end of the data cable and finish after the heat-shrink tubing at the other end.
Ensure that all parts in this area are covered.

ATTENTION!

Components must be clean and grease-free.

Scotch® 23 tape should be applied in successive, semi-overlapping, evenly wrapped layers.

To properly adhere the Scotch® 23 adhesive tape, it must be stretched under tension until just before it breaks. Air pockets between the layers must be avoided.

Fig. 93: Connection point sealing

→ Fasten PE cable (1) in cable bracket (6) and connect.

→ Fix PE cable (1) and data cable (8) together with cable ties (7)

ATTENTION!

Ensure that the cable ties are **not** attached in the data cable (8) area. Attach one cable tie to the fitting and the second to the data cable connection (2).

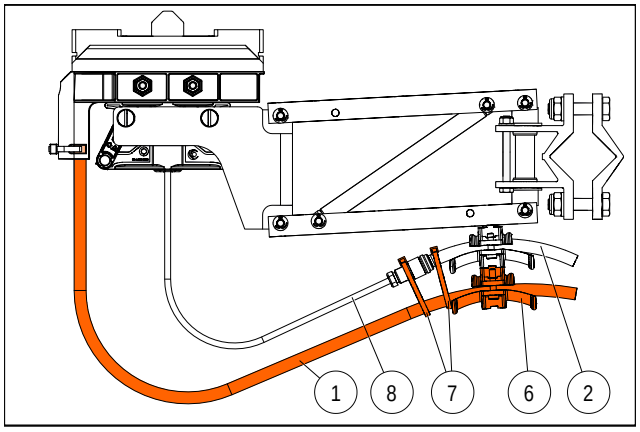


Fig. 94: Fasten PE cable (1) in cable bracket (6)

9 Troubleshooting

WARNING!

Risk of injury due to improper fault correction!

Improper fault correction can result in serious injury to persons or material damage.

→ Contact the manufacturer in case of faults.

→ Only allow fault correction to be conducted by personnel from or authorized by the manufacturer.

ATTENTION!

In case of frequently occurring PROFINET faults:

→ Check the mechanical system.

Ensure that the data load on the ProfiDAT System does not exceed the limit specified on Page 23. This depends on the respective system and must be agreed with Conductix Wampfler in advance of the project planning.

10 Disassembly and Disposal

10.1 Safety

WARNING!

Risk of injury due to improper disassembly!

Stored residual energy, sharp components, points and edges on and in the data transmission system or the tools needed can cause injuries.

- → Ensure sufficient space before starting work.
- → Use caution when working with open, sharp-edged components.
- → Ensure that the work area is tidy and clean! Loosely stacked or scattered components and tools are a source of accidents.
- → Disassemble components properly. Observe the high dead weight some components. Use lifting gear, if necessary.
- → Secure components so they cannot fall or topple over.
- → Consult the manufacturer in case of doubt.

10.2 Disassembly

After the end of its service life, the data transmission system must be disassembled and disposed of in an environmentally friendly manner.

→ Remove operating and auxiliary materials, as well as residual processing materials, and dispose of them in an environmentally appropriate manner.

WARNING!

Observe the dangers due to electrical shock, harmful dusts, sharp edges and moving parts!

→ Clean the assemblies and components properly and disassembly and dispose of them in compliance with locally applicable occupational safety and environmental protection regulations.

10.2.1 Disassembly of the assemblies

DANGER!

Risk of fatal injury due to falling parts!

Falling parts can cause serious injuries or even death.

There is a risk of components falling down while disassembling the data transmission system. These can lead to extremely serious injuries or even death.

- → Secure all components against falling during disassembly work.
- → Never walk underneath the disassembly area.
- → Cordon off the disassembly area.

Personnel

- May only be carried out by trained technicians
- At least 2 persons

Required tools

- Open-end wrench SW10
- Open-end wrench SW17
- Open-end wrench SW24
- Hexagon wrench SW3
- Hexagon wrench SW5
- Cross-head screwdriver
- Tools for securing

10.3 Disposal

In the absence of return and disposal agreements, recycle the disassembled components:

- All metal parts must be scrapped
- Plastic components must be sent for recycling
- All other components are to be disposed of according to their material composition.

CAUTION!

Environmental damage due to improper disposal!

Electrical scrap, electronic components, lubricants, and other auxiliary materials are subject to hazardous waste treatment and may only be disposed of by authorized specialists!

Local authorities or disposal specialists can provide information regarding environmentally appropriate disposal.

11 Additional Documents

11.1 Declaration of Conformity

The Declaration of Conformity for this product can be obtained from Conductix-Wampfler upon request.

11.2 Applicable documents

Seq.No.	Document No.	Document Name
01	C79000-G8900-C322-03	Industrial Wireless LAN, SCALANCE W760/W720 Operating Instructions
02	C79000-G8900-C325-04	Industrial Wireless LAN, SCALANCE W770/W730 Operating Instructions
03	A5E03678337-09	Industrial Wireless LAN SCALANCE W786-x Operating Instructions
04	WV0800-0001	Cleaning of conductor rails
05	TI0514-0001	Network Integration of ProfiDAT in PROFINET
06	MV0514-0005	Heating Conductor 0514

12 Index

Accidents 22
Assemblies description 30
Brief description 29
Checklist and initial commissioning 76
Copyright 7
Dangers 14
Declaration of Conformity 95
Disassembly 93
Disposal 93, 94
Documents 95
Electrical installation 70
Explanation of symbols 8
Faults 22
Functional principle 29
General information 6
Installation and commissioning 40
Intended use 11
Interfaces 24
Limitation of liability 6
Maintenance and service 80
Maintenance schedule 81
Material damage 7
Mechanical installation 45
Modes of operation 36
Operating conditions 27
Operation 79
Operator 13
Overview 29
Packaging 38
Personal protective equipment 10
Personnel 9
Preparation 41
Product description 29
Safety 40, 79, 80, 93
Safety measures 13
Safety systems 21
Spare parts 7
Storage 39
Technical data 23
Technical support 7
Training 10
Transport 37
Troubleshooting 92
Type plate 28
Unauthorized persons 10
Unsuitable ambient conditions 28

Conductix-Wampfler GmbH
Rheinstraße 27 + 33
79576 Weil am Rhein - Märkt
Germany

Telephone: +49 (0) 7621 662-0
Fax: +49 (0) 7621 662-144
info.de@conductix.com
www.conductix.com

Importer for the United Kingdom:
Conductix-Wampfler Ltd.
1, Michigan Avenue
Salford
M50 2GY
United Kingdom

Phone: +44 161 8480161
Fax: +44 161 8737017
info.uk@conductix.com
www.conductix.com