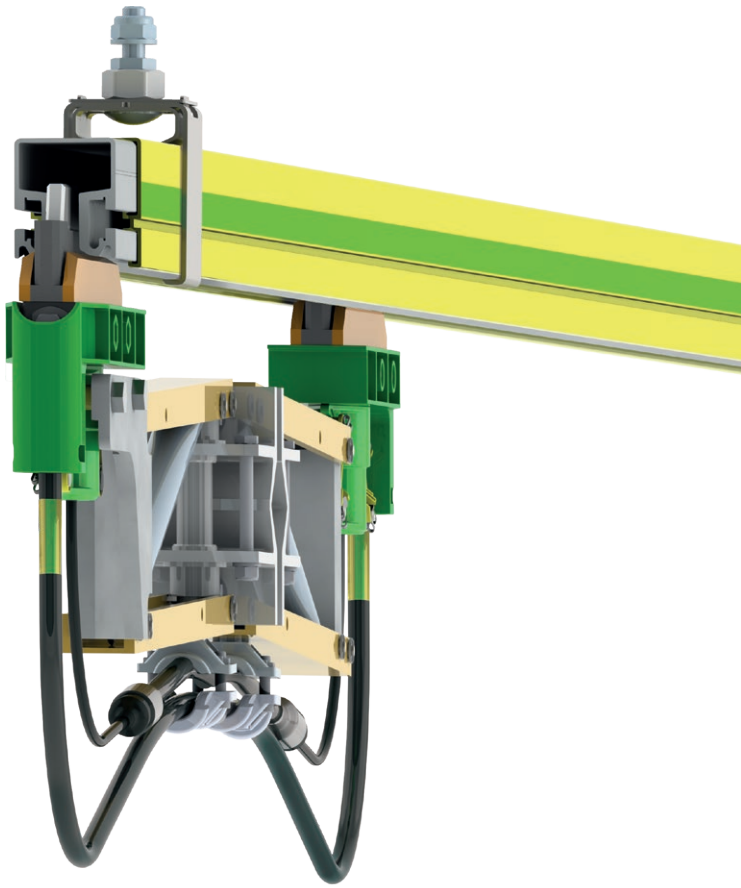
ProfiDAT®
Data Transmission System
Program 0514



CONDUCTIX wampfler

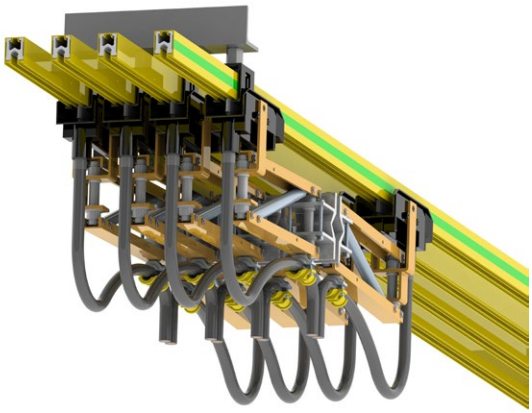
Contents

System Description

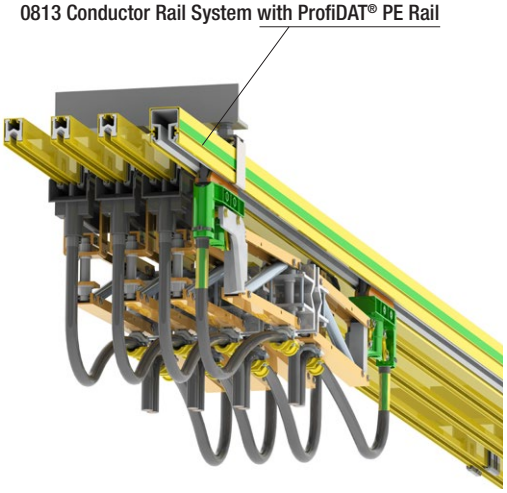
General Information

ProfiDAT® is a system for communicating data between fixed and mobile consumers such as crane systems or storage and retrieval units. The ProfiDAT® System is installed in parallel with the electrification system (the conductor rail system).
The data transmission system consists of at least one fixed (Access Point) and one mobile (Client) transceiver, the feed-in antenna and the collector antenna. The data can be continuously received and sent using the mobile collector antenna. In addition to data transmission, the ProfiDAT® Profile can be simultaneously used as a ground conductor rail (PE). The data transmission antenna is an integral part of the current collector head in the PE profile.

0813 Conductor Rail System without ProfiDAT®



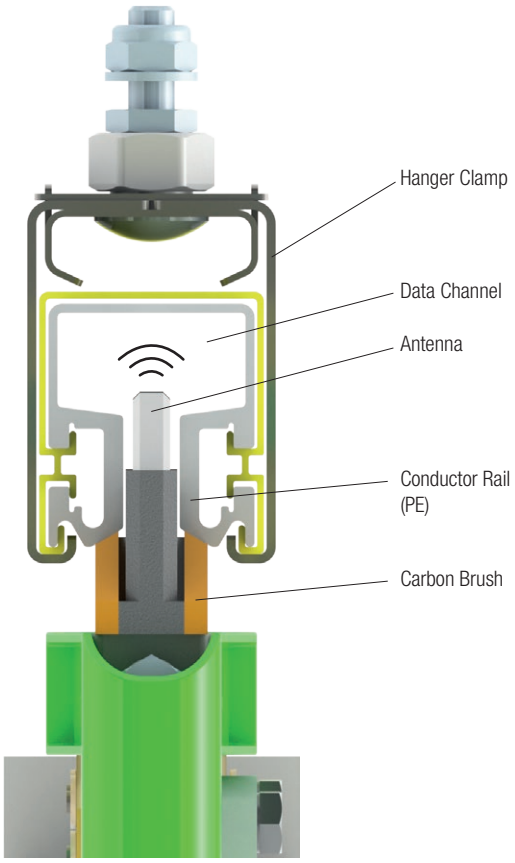
0813 Conductor Rail System with ProfiDAT® PE Rail



The illustration above shows that the dual function of the ProfiDAT® Profile results in a compact and fully integrated solution. Furthermore, it clearly shows that an existing ground conductor rail can be replaced by the ProfiDAT® System without additional space requirements or attachments.

The contactless wireless system for data transmission allows data (video, audio and control data) to be reliably transmitted through a slotted waveguide at very high data rates (real-time data). Data rates up to 100 Mbit/s with very low latencies can be transmitted safely and reliably. The special design of the conductor profile and the mobile antenna permit a secure transmission of data in a shielded system even in the most difficult radio environments (such as a harbor environment).
The ProfiDAT® Data Transmission System can be combined with a large number of Conductix-Wampfler conductor rail programs.

- Simultaneous use as a data and grounding profile enables full integration of the data transmission system into a conductor rail system
- Fewer parts and components have a positive effect on the space requirement in a complete supply system (power and data)
- The data antenna is reliably guided in the profile slot by the staggered carbon brushes. No additional antenna guide is required



System Description

Main Applications

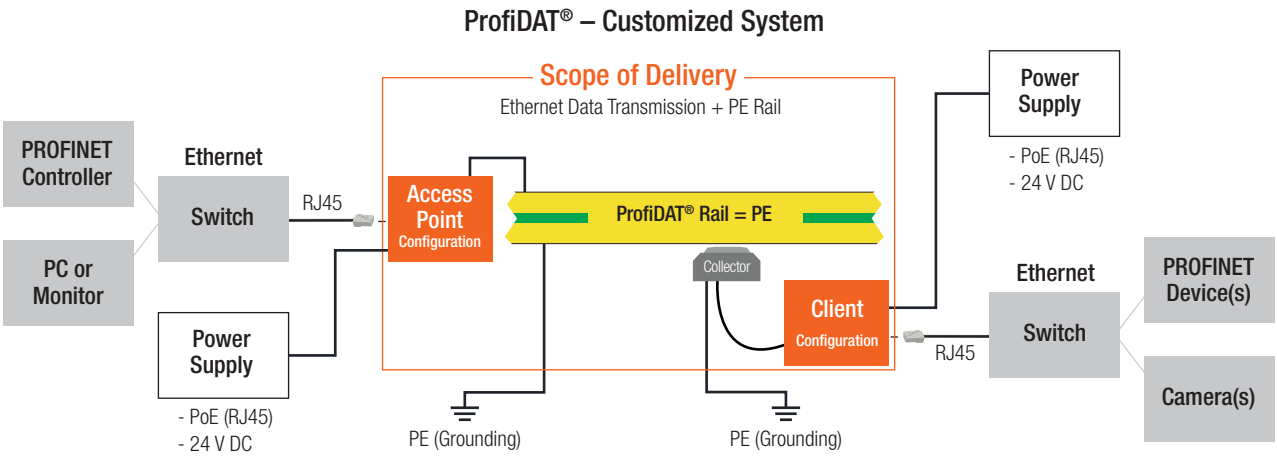
- STS Cranes (Ship-to-Shore)
- RTG/E-RTG Cranes (Rubber-tired gantries / Electrified rubber-tired gantry cranes)
- Process Cranes
- Storage and Retrieval Units, Transfer Cars
- Other mobile machines

Your Benefits

- Data transmission with the highest **security and reliability**
- **Lowest interference potential** with other radio systems through slotted waveguide technology
- **Real-time data transmission** via PROFINET/ PROFIsafe prioritization
- **Smart and fully integrated solution** with a unique 2-in-1 functionality:
  - **Data transmission**
  - **PE Rail**
    - **Significant space savings**
    - **Significant savings in assembly time**
- Use of widely used **SIEMENS IWLAN transceivers** and their **iFeatures**
- **Parallel** transmission of **control and video/audio data**
- **Unlimited system lengths** through Rapid Roaming
- **Easiest integration into** the customer network

Scope of Delivery and Interfaces

The main function of ProfiDAT® is the reliable and interference-free Ethernet data transmission. The following illustration describes the scope of delivery of the system (orange) as well as its interfaces for data transmission and more. Access Points and Clients, which are integrated via RJ45 plugs, serve as the interface to the customer network (gray). An Ethernet connection is a prerequisite for integrating a ProfiDAT® System into a network. Control signals can be transmitted via PROFINET/PROFIsafe or Ethernet/IP. Data packets transmitted via ProfiDAT® are not influenced by the system, but simply passed on. All transceivers are delivered fully configured according to individual customer requirements and the application layout.



Note

- The slotted waveguide profile must not be used as a power terminal (phase)!

System Description

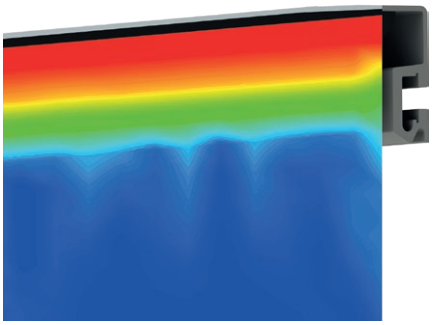
Functional Principle of the Slotted Waveguide

A waveguide is a hollow body with conducting walls, in which electromagnetic waves can be propagated. Rectangular and circular cross-sections are primarily used for this. How the electromagnetic waves propagate in the waveguide depends on the geometry and the excitation of the wave. The geometry determines a lower frequency threshold above which a wave can propagate.

The underlying principle of a slotted waveguide is based on a rectangular waveguide. A radio wave is fed into this and travels orthogonally to the antenna through the profile. The slotted waveguide has a longitudinal slot on one side. A coupling element (antenna) can be inserted into the rectangular waveguide through the opening. The inserted coupling element can be moved along the slot. By mechanical means, the slotted waveguide is dimensioned such that a coupling of the radio wave and the electromagnetic waves in the vicinity of the slotted waveguide is ruled out.

System Advantages

The greatest advantage of the system is that the radio wave in the slotted waveguide (SWG) is electromagnetically decoupled from the vicinity of the SWG. This renders interference with the electromagnetic environment of the SWG as nearly impossible, so the available frequency spectrum can be more efficiently used. Furthermore, the distance-dependent signal attenuation is significantly less than with comparable communication systems, so that broad signal-transmission ranges and longer segment lengths are achievable.



Electromagnetic emissions in the slotted waveguide

High emission rate

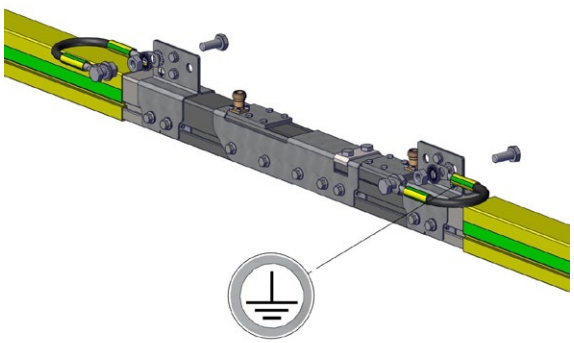
Low emission rate

- Lowest interference potential compared to other radio systems

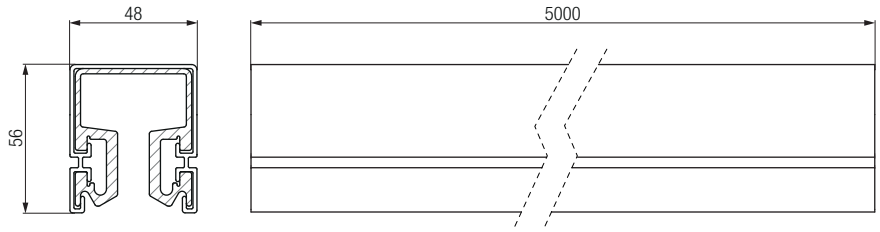
The field distribution image shows the exponential decay in the slot. The function of the slot is to attenuate the electromagnetic emission of the radio wave into the surroundings of the slotted waveguide.

PE Connection

The ProfiDAT® Profile must be connected to the customer's PE cable at the power feed points using the PE connector (see illustration). This cable must be a PE cable and therefore marked green-yellow. In addition, all PE connection points must be marked with a grounding symbol. The cable cross-section can be determined by the customer and must be designed as at least equal to half the phase current. The PE connection is to be implemented in accordance with the steps in the mounting instruction (MAL) for ProfiDAT® as well as the applicable standards.



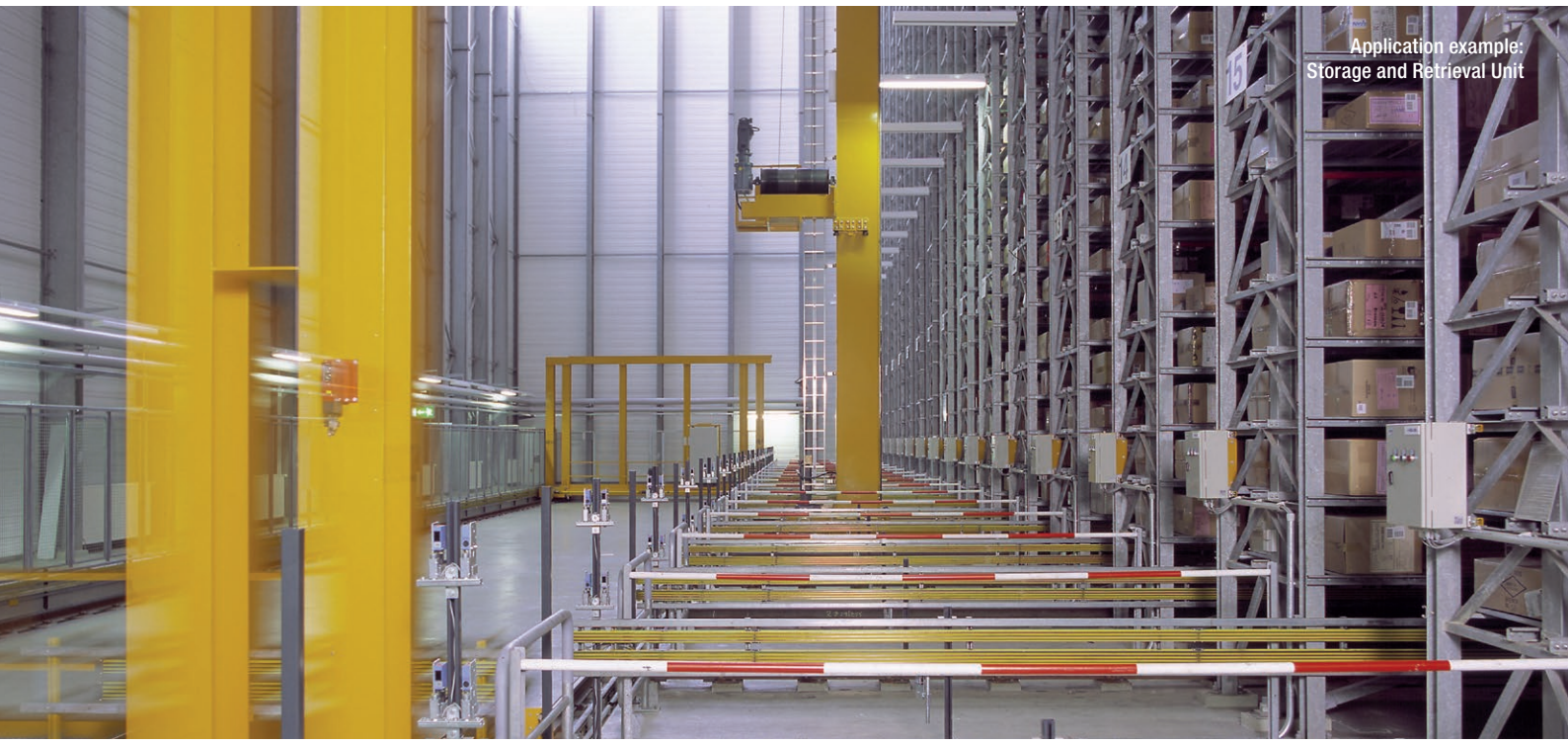
Technical Specifications

ProfiDAT® Profile Type 051411	
	
Ethernet data rate [Mbit/s]	100 Mbit/s
Frequency	5 GHz, IEEE 802.11
Data interface	Ethernet-based, RJ45 (optional: Fiber optic with control cabinet and media converter)
Compatible Communication protocols	· Ethernet (TCP/IP, UDP) · PROFINET/PROFIsafe, Conformance Class A · Ethernet/IP · PROFIBUS (via additional Gateway)
Environment	Indoor area and protected outdoor area
Installation orientation	Insertion from below: Indoor and outdoor areas; lateral insertion: In indoor areas
Max. Suspension interval [m]	2.5/3 (for E-RTG)
Rail length [mm]	5000 (Nominal size at 20° C / Tolerance ±3 mm)
System length [m]	No limit; maximum segment length with one Access Point: 500 m
External dimensions [mm]	48 × 56
Nominal rail spacing [mm]	80 (minimum spacing extendable as required)
Travel speed [m/min]	300 (straight, uninterrupted stretches) - higher speeds possible by arrangement
Max. Current as PE rail [A]	1000 (as a PE rail in combination with a conductor rail system with a max. Phase current of 1000 A, at 35° C ambient temperature)
Ambient temp. (System) [°C]	-20 to +55 *
Maximum insulation temp. [°C]	Standard (PVC-U): 85 / Heat-resistant variant (PPE + PS-I): 115
Storage temperature [°C]	-25 to +50 (store in a dry place, avoid condensation)
Conductor material	Aluminum with surface coating
Rail insulation	PVC-U (standard material) / PPE + PS-I (heat-resistant variant, halogen-free)
Flammability	PVC-U: Compliant with requirements for insulating materials in accordance with UL94 V-0; flame-retardant and self extinguishing (IEC 60695-11-10) PPE + PS-I: Compliant with requirements for insulating materials in accordance with UL94 V-1; flame-retardant and self-extinguishing (IEC 60695-11-10), halogen-free
Local approvals	CE
Coloring	Rail insulation in safety warning color according to RAL 1018 (lemon yellow) or RAL 1004 (gold yellow) for a heat-resistant version; green stripe (PE rail) in RAL 6025 (fern green)

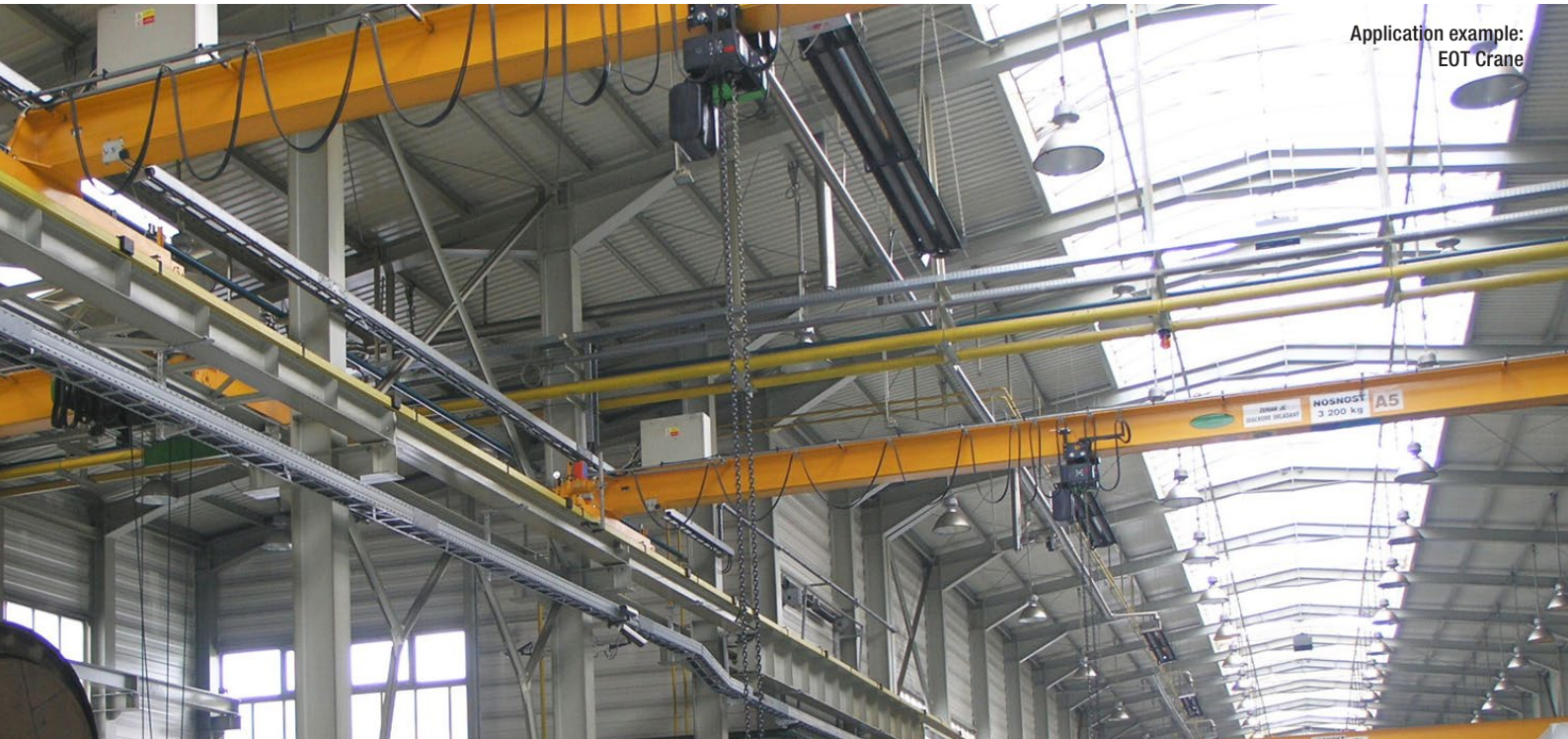
** Other temperature ranges according to technical clarification – IWLAN transceivers can be installed in an air-conditioned control cabinet; Anti-condensation heating for the rail optionally available.*

Relevant Standards	
DIN EN 60664-1, VDE 0110-1:2008-1	Insulation coordination for electrical equipment in low-voltage systems - Part 1: Principles, requirements and tests (IEC 60664-1: 2007); German version EN 60664-1: 2007
DIN EN 60204-1, VDE 0113-1:2007-06	Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204 - 1: 2005, modified); German version EN 60204-1: 2006
DIN EN 60529, VDE 0470-1:2000-09	Degrees of protection provided by enclosures (IP-Code) (IEC 60529:1989 + A1:1999); German version EN 60529:1991 A1:2000
DIN EN 60204-32, VDE 0113-32: 2009-03	Safety of machinery - Electrical equipment of machines - Part 32: Requirements for lifting equipment (IEC 60204-32: 2008); German version EN 60204-32: 2008
Radio approval	The SIEMENS IWLAN transceivers used in our ProfiDAT®Systems have approvals for all countries to which we deliver our systems.

Application example:
STS Container Crane



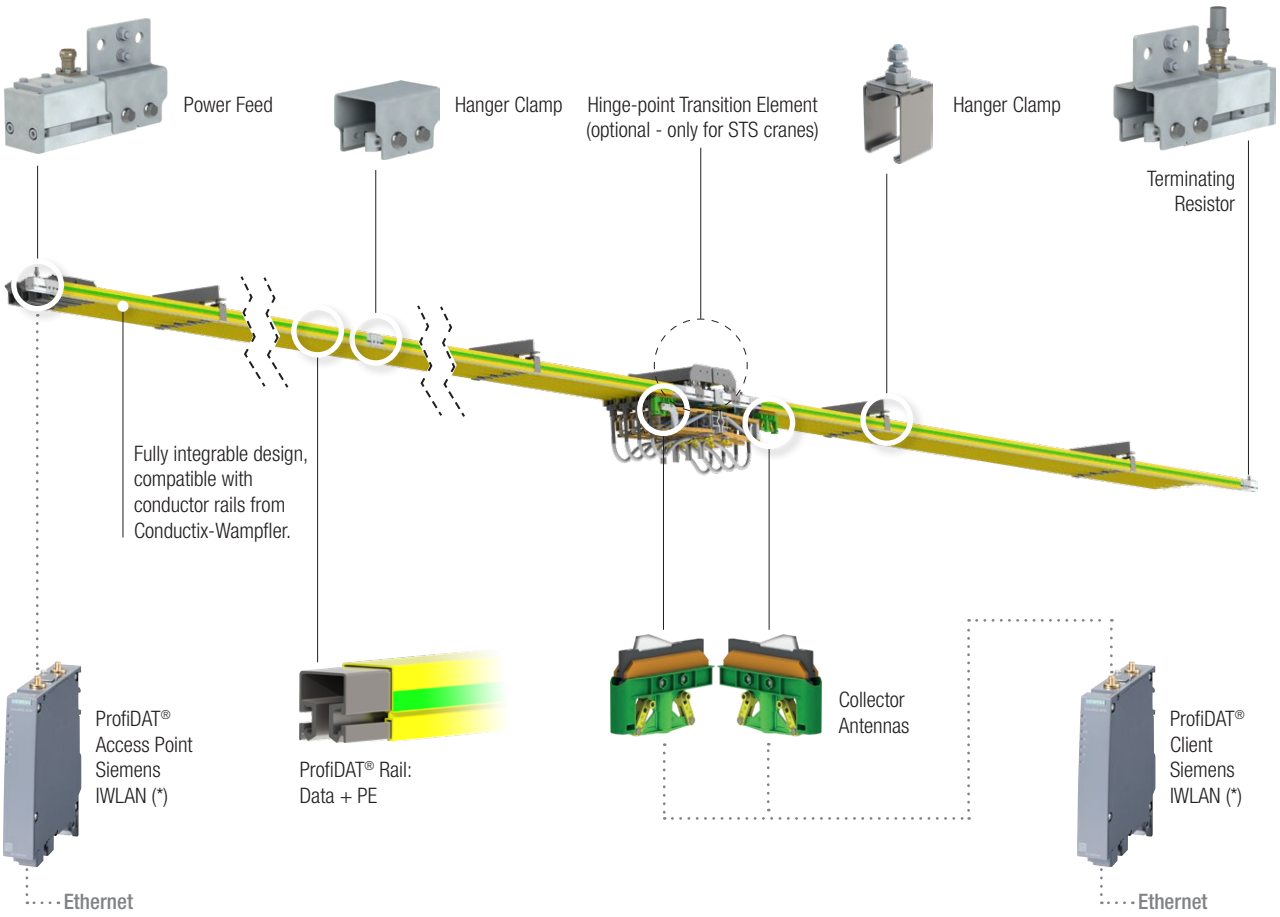
Application example:
Storage and Retrieval Unit

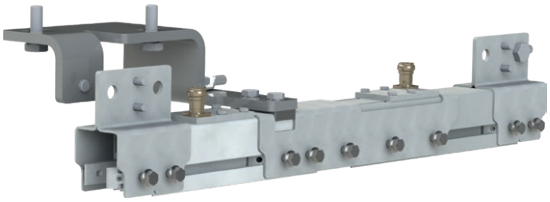


Application example:
EOT Crane

System Structure and Performance
ProfiDAT®

System Overview





Expansion Unit - Order-dependent and recommended for larger system lengths (see Page 28 for calculation of the air gap).

Layout-Specific Performance of the Data Transmission – ProfiDAT®

System Layouts	Example 1	Example 2	Example 3
Number of mobile consumers per segment[1)]	1	3	1
Communication cycle time	32 ms	64 ms	32 ms
Number of retries	3	3	3
Cycle time x Number of retries	96 ms	192 ms	96 ms
Process data	Yes	Yes	Yes
Video/Audio data	Yes	Yes	Yes
Max. Segment length[2)]	430 m	320 m	500 m[3)]

[1)] Segment = Rail segment that is supplied by an Access Point. Two antennas per mobile consumer are assumed.
[2)] All lengths refer to the central feed-in without the use of expansion units.
[3)] Extension of the segment length compared to Example1 by reducing the maximum possible data rate.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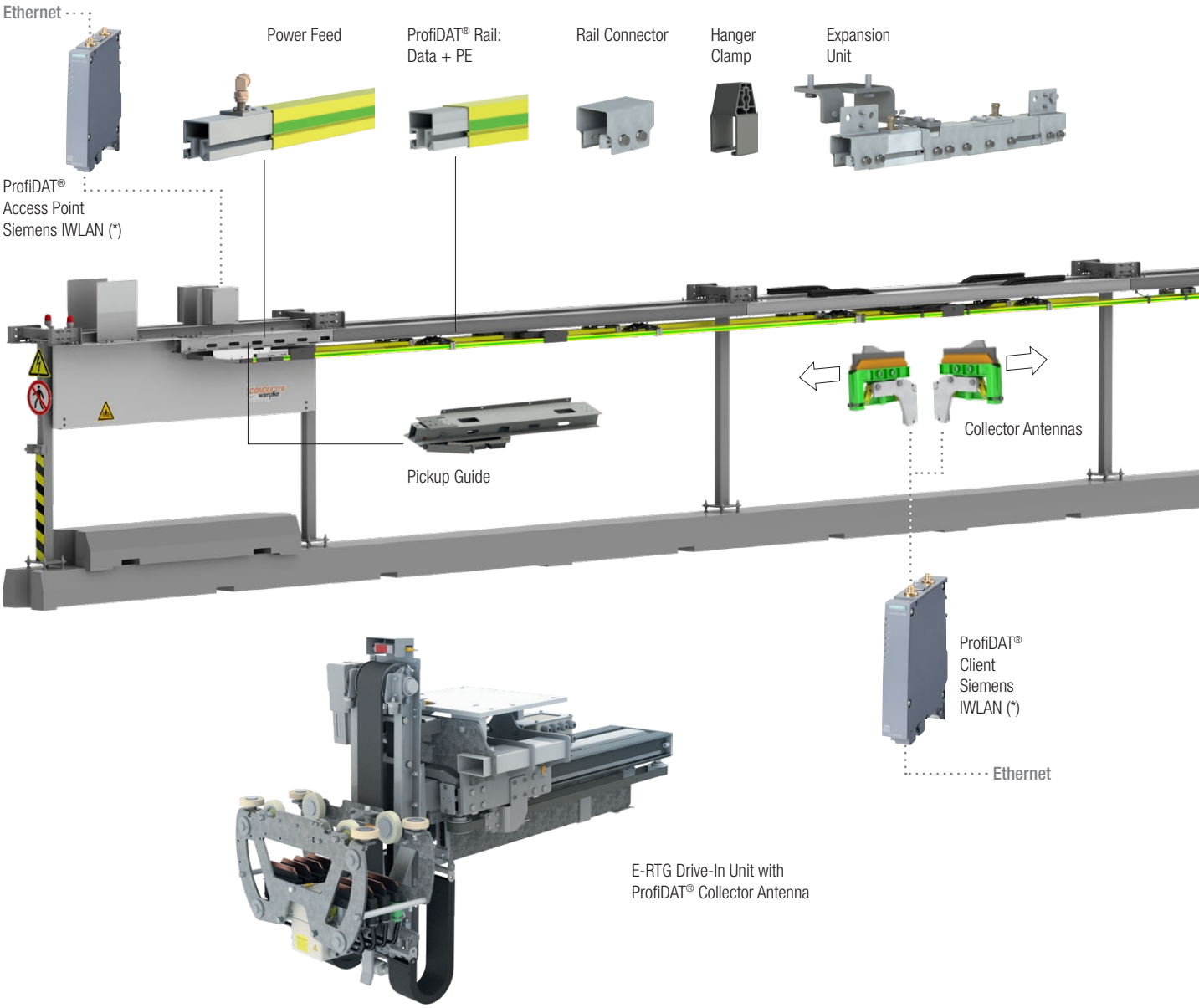
System Structure
ProfiDAT® for E-RTG Cranes

System Overview



E-RTG Drive-In Unit with
ProfiDAT® Collector Antenna

The collector trolley on the drive-in unit supplies the crane with power. The collector trolley picks up the power from conductor rails permanently installed on a steel structure along the container lane. To bring the current collector into contact with the conductor rails, there is an entry/exit zone at each end of the container lane. In the entry zone, a driven extension and vertical unit positions the collector trolley. Once the collector trolley is completely driven into the conductor rails, the crane can be supplied with power during its travel along the container lane.

System Components

ProfiDAT® Profile

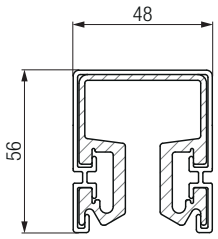
Part No.: 051411-3512 (5 m rail, PVC insulation)
Part No .: 051411-3522 (5 m rail, PPE+PS insulation - minimum order quantity: 50 pieces/250 m)

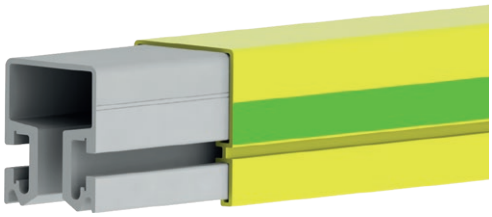
The profiles are used as a data channel. They are electrically conductive and are simultaneously used as a protective conductor (PE). The standard length of a profile is 5000 mm. The conductor cross-section is at least 585 mm². For the insulating material, PVC is used in standard areas and halogen-free PPE+PS is used for higher ambient temperatures up to 85° C.

The overall profile consists of the aluminum slotted waveguide and the insulating profile.

Color: Safety warning color RAL 1018 (PVC) or RAL 1004 (PPE+PS) / RAL 6025 Fern green (stripes)
Material: Aluminum

Optionally available with heating (see Page 33).
The profile surface can change color over time.
This has no technical effect on the functioning!





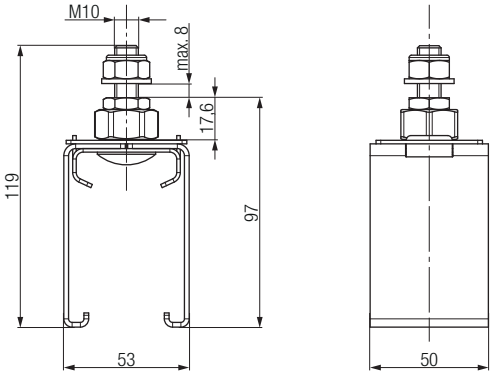
Technical Specifications – Rail length 5000 mm ± 3 mm

DC resistance [Ω / 1000 m] 20° C	0.063
DC resistance [Ω / 1000 m] 35° C	0.067
Impedance [Ω / 1000 m] 20° C / 50Hz	0.131
Impedance [Ω / 1000 m] 35° C / 50Hz	0.133
Max. Insulation temperature PVC in ° C	85
Max. Insulation temperature PPE + PS in ° C	115
Weight [kg]	11.04

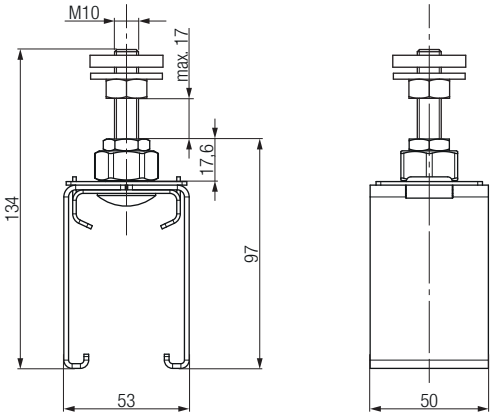
Hanger Clamps

Part No.: 051414-03
The hanger clamps are attached to the support structure with nuts and bolts, which are provided by the customer. The hanger clamps are pushed onto the profiles. Two hanger clamps are installed for each profile. The spacing between the hanger clamps is a maximum of 2500 mm.

Material: Aluminum, Stainless steel



Part No.: 051414-04
Hanger Clamp for C-rails
The suspension occurs via freely rotating stainless steel hanger clamps that self-align and enable low-friction sliding in case of thermal expansion. The hanger clamps are available with hexagon nuts or square nuts for the cross arm / C-rail assembly.

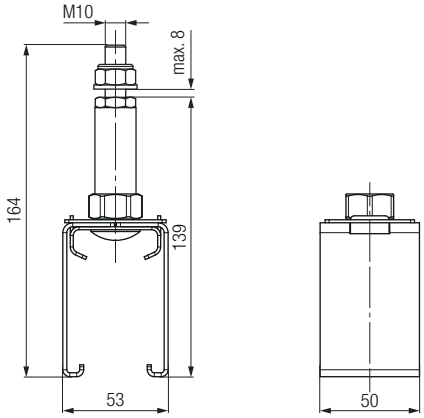


System Components

Hanger Clamps (Cont.)

Part No.: 05-S280-0004
Hanger clamp with spacer
for combination with a hanger clamp with insulators on the phase conductor rail.

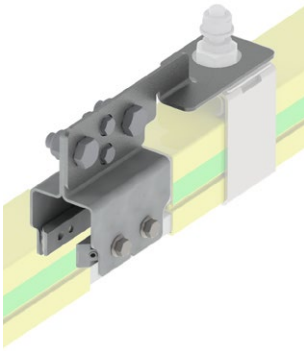
In stainless steel with hexagon nut
Nominal suspension distance: Max. 2500 mm
Installation note: For hanging installation

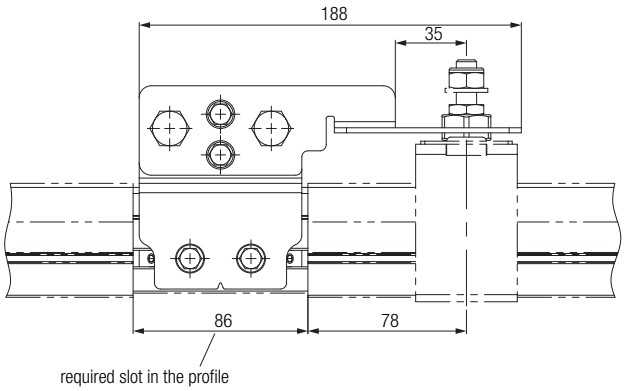


Anchor Clamp

Part No.: 05-F080-0002
The rail is fixed at a point by means of an anchor clamp and can freely extend from this point. The anchor point is usually located near the feed-in. Attachment occurs with a fastening plate from the PE rail connector to the hanger clamp.

Hanger clamp not included in the scope of delivery.





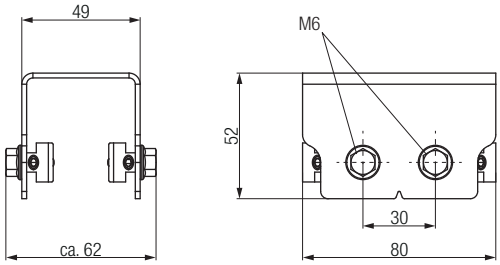
Rail Connectors

Part No.: 051412-01 (Connector)
Part No.: 051412-02 (PE Connector)
There are two types of connectors:
- Connector
- PE connector, with grounding cable – to be used every 25 m!

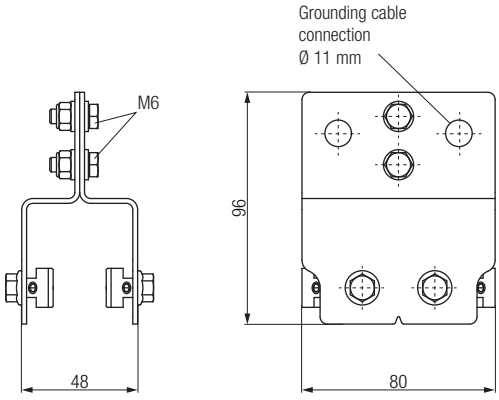
The rail connector connects two profiles together and is screwed onto the profile. The grounding cable is connected to the lug of the PE connector (051412-02) (Not included in the scope of delivery).

Material: Aluminum, Stainless steel

Connector 051412-01



Connector PE 051412-02



Grounding Set
Part No.: 05-Z009-0004
- Grounding cable 16 mm² with cable lug M10, Length: 2 m
(see Accessories on P. 32)

System Components

Feed-in/Feed-out Set (for end Feed-in)

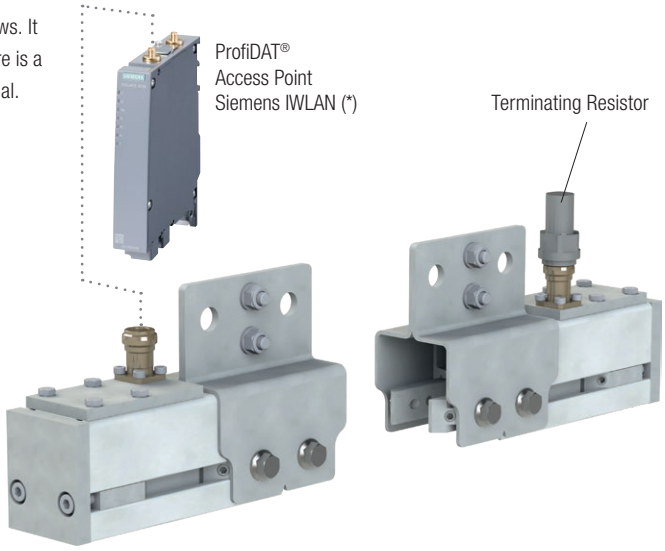
Part No.: 051415-01

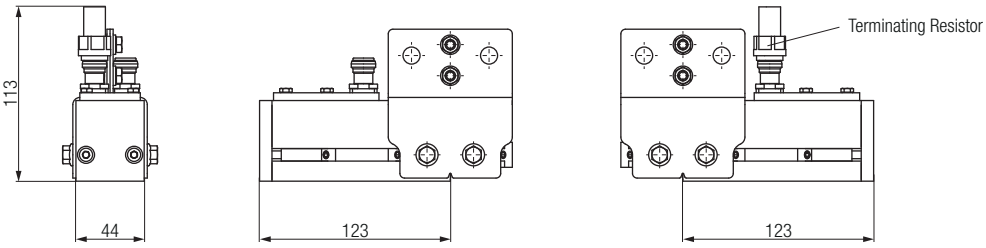
The feed-in unit is attached to the profile at both ends of the system using screws. It is used to feed data signals in and out. At the end of the ProfiDAT® system, there is a terminating element with a terminating resistor that strongly attenuates the signal.

Material: Aluminum, Stainless steel

Set includes:

- Feed-in unit
- Feed-out unit (with terminating resistor)
- Coaxial cable (Length: 10 m, Diameter: 10.2 mm)
- 2 x PE connector





Central Feed-in

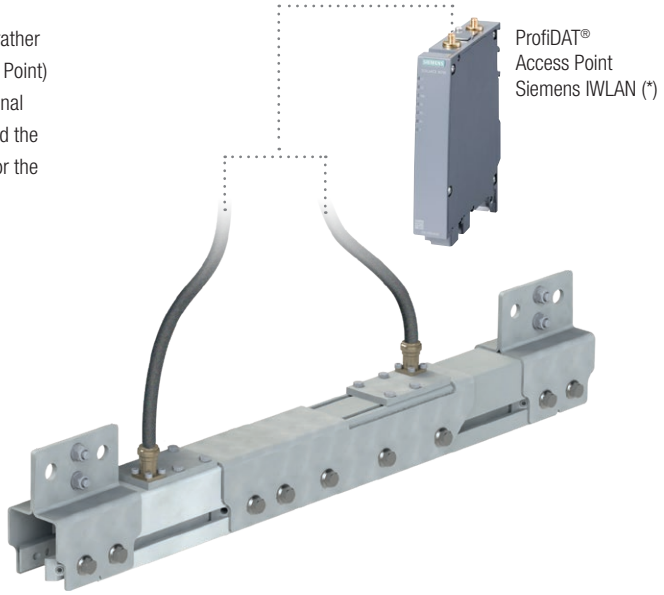
Part No.: 051415-04

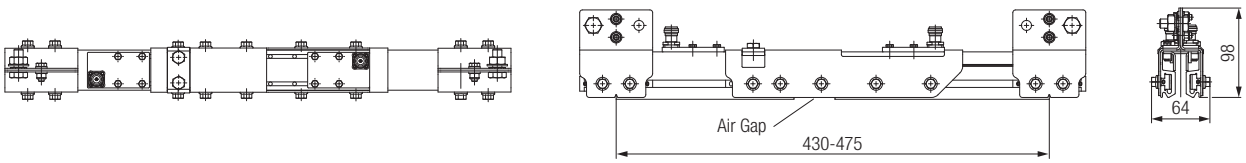
In order to extend the segment lengths, a central feed-in can be implemented rather than an end feed. Here, a signal feed-in point or stationary transceiver (Access Point) is positioned in the middle of the traversing range. In order to feed the radio signal from the transceiver into the ProfiDAT® Profile, an expansion unit is used to feed the signal. This means that the expansion unit, which is designed to compensate for the temperature-dependent change in length of the profiles, fulfills two functions.

Material: Aluminum, Stainless steel

Set includes:

- Expansion unit (Expansion distance 45 mm)
- 2 x PE connector
- 2 x Coaxial cable (Length: 10 m, Diameter: 10.2 mm)





System Components

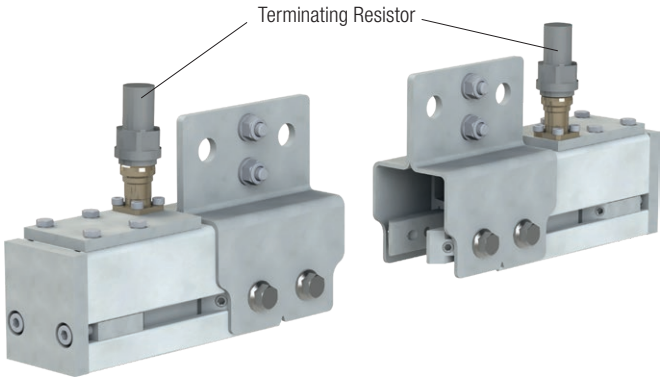
Feed-out Set (for use with Central Feed-in)

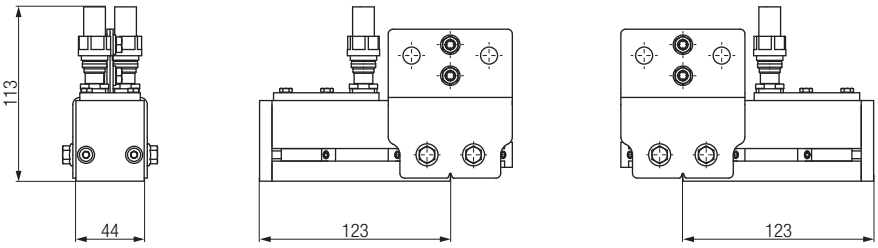
Part No.: 05-E015-0007

The feed-out set, consisting of two components, is used to complete the system for a line feed. With these components, the signal is strongly attenuated at the end of the line.

Set includes:

- Feed-out unit (with terminating resistor)
- 2 x PE connector





Central Feed-in + Expansion Unit Set

PVC Set - Part No.: 051415-10

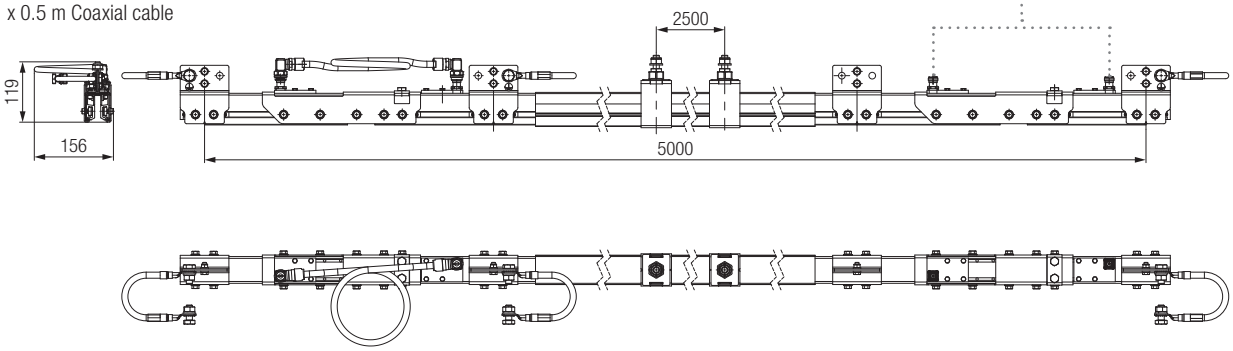
PPE Set - Part No.: 051415-11 (Minimum order quantity PPE insulation: 250 mm)

The 5 m long set combines an expansion unit with a central feed-in, so the set enables an expansion length of 90 mm (2 x 45 mm).

Set includes:

- Expansion unit
- Central feed-in
- 2 x Hanger clamp
- 2 x 10 m Coaxial cable
- ProfiDAT® Profile
- 3 x 1.5 m Grounding cable (16 mm²)
- 4 x PE connector
- 1 x 0.5 m Coaxial cable

ProfiDAT®
Access Point
Siemens IWLAN (*)

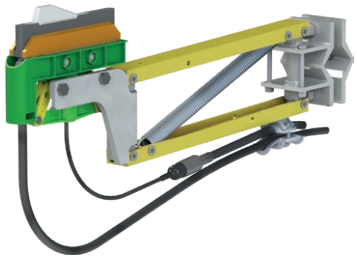


System Components

Single Collector S - Insertion from below

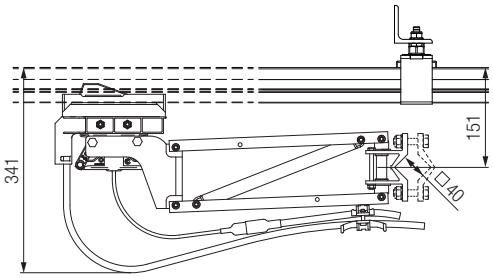
Configuration No.: 051410-1011#

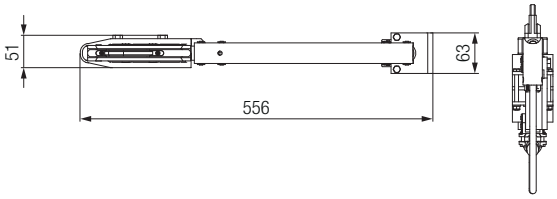
The current collector is guided on the ProfiDAT® Profile via two separate sliding contacts. The antennas are inserted into the slot of the ProfiDAT® Profile and are electrically insulated from the sliding contacts.



Use:

- For end feeds
- No transfers
- No expansion units



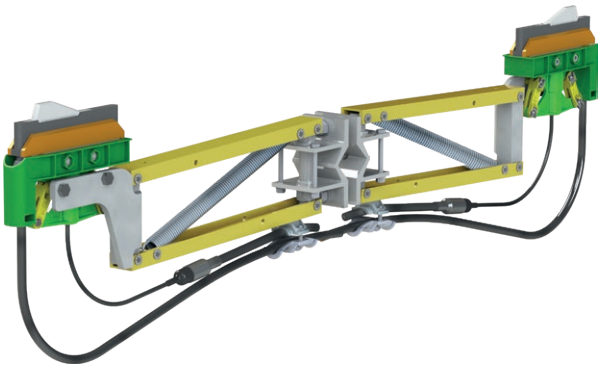


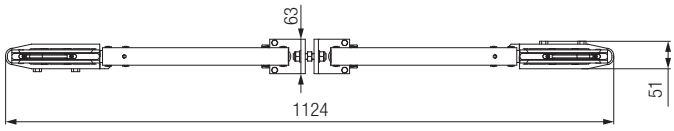
Double Collector D – Insertion from below

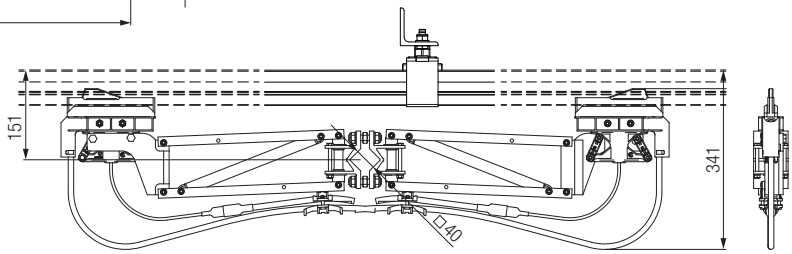
Configuration No.: 051410-1012#

Use:

- With central feeds
- With transfers
- With expansion units
- With higher current loads







Technical Specifications		Single Collector	Double Collector
Max. Current load per cable cross-section*	70 mm²	245 A	490 A
	35 mm²	158 A	316 A
	16 mm²	98 A	196 A
Max. Travel speed		300 m/min; higher travel speeds upon request	
Contact force		28 N	
Lateral displacement		± 100 mm	
Working stroke in the direction of insertion		± 35 mm	
Connecting cable (PE cable)		Configurable length (0-10 m), highly flexible; longer connecting cables upon request	
Max. Ambient temperature		80° C	
Distance between the outrigger axis and the upper edge of the ProfiDAT® Conductor Rail		151 mm	

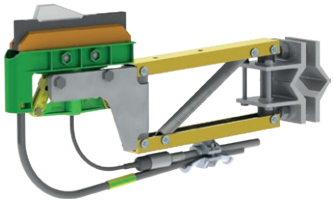
The determining factors for the maximum current load are the type of conductor used, the cross-section, the installation method and the ambient temperature. **Note:** Incorrect cables and incorrect cable routing lead to high contact wear and can lead to overloading and consequential damage due to strand fractures. Caution! Fire Hazard!

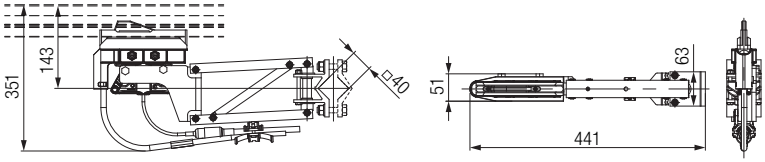
System Components

Single Collector S (Short-arm) - Insertion from below

Configuration No.: 051410-1011#

Use:
- Arm length: Short-arm version for compact installation situations and limited rail deviation from the ideal line.
- For end feeds
- No transfers
- No expansion units

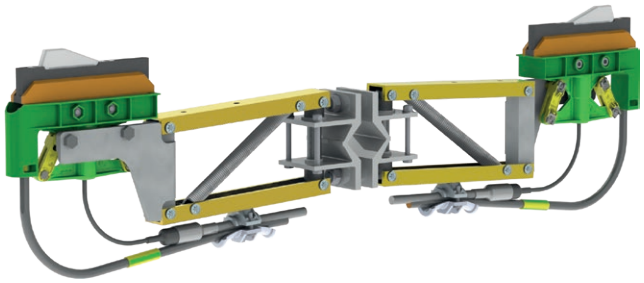


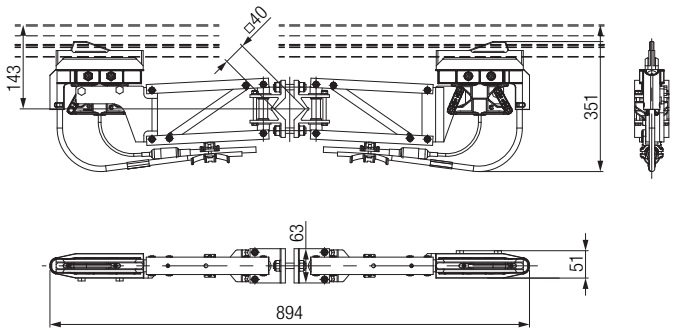


Double Collector D (Short-arm) – Insertion from below

Configuration No.: 051410-1012#

Use:
- Arm length: Short-arm version for compact installation situations and limited rail deviation from the ideal line.
- With central feed-in
- With transfers
- With expansion units
- With higher current loads





Technical Specifications		Single Collector	Double Collector
Max. Current load per cable cross-section*	70 mm²	245 A	490 A
	35 mm²	158 A	316 A
	16 mm²	98 A	196 A
Max. travel speed		300 m/min; higher travel speeds upon request	
Contact force		28 N	
Lateral displacement		± 35 mm	
Working stroke in the direction of insertion		± 30 mm	
Connecting cable (PE cable)		Configurable length (0-10 m), highly flexible; longer connecting cables upon request	
Max. Ambient temperature		80° C	
Distance between the outrigger axis and the upper edge of the ProfiDAT® Conductor Rail		143 mm	

The determining factors for the maximum current load are the type of conductor used, the cross-section, the installation method and the ambient temperature. **Note:** Incorrect cables and incorrect cable routing lead to high contact wear and can lead to overloading and consequential damage due to strand fractures. Caution! Fire Hazard!

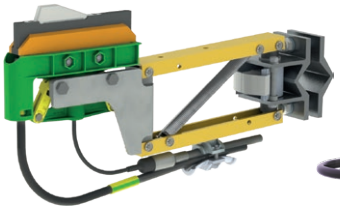
System Components

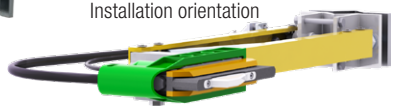
Single Collector S (Short-arm) – lateral insertion

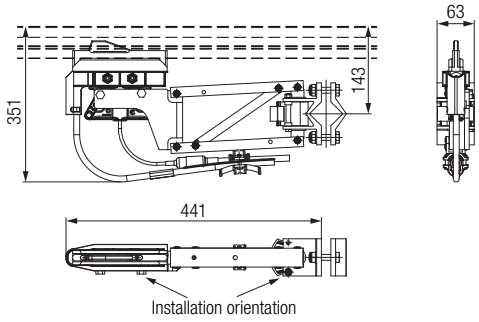
Configuration No.: 051410-1011#

Use:

- Lateral installation of the conductor rail with current collector insertion from the side. Regarding outdoor areas in general, insertion of the current collector from below is preferable to an insertion from the side
- No transfers





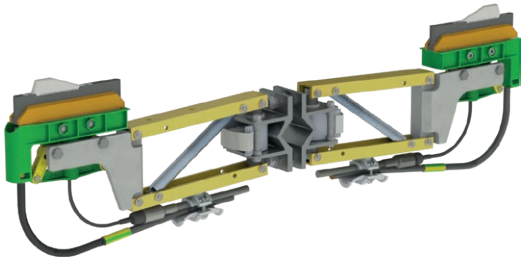


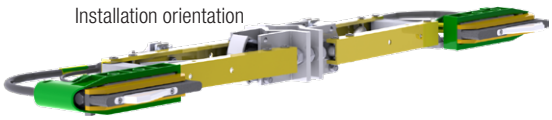
Double Collector D (Short-arm) – lateral insertion

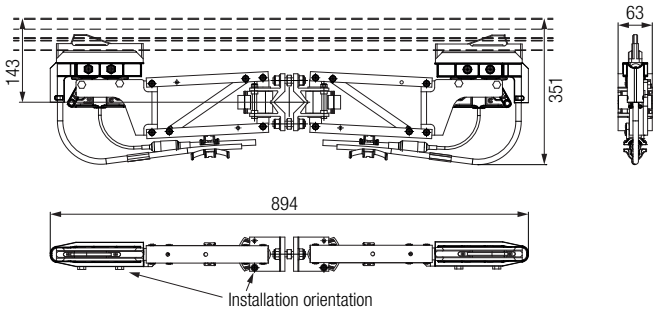
Configuration No.: 051410-1012#

Use:

- Lateral installation of the conductor rail with current collector insertion from the side. Regarding outdoor areas in general, insertion of the current collector from below is preferable to an insertion from the side
- No transfers







Technical Specifications		Single Collector	Double Collector
Max. Current load per cross-section*	70 mm²	245 A	490 A
	35 mm²	158 A	316 A
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Max. travel speed		300 m/min; higher travel speeds upon request	
Contact force		28 N	
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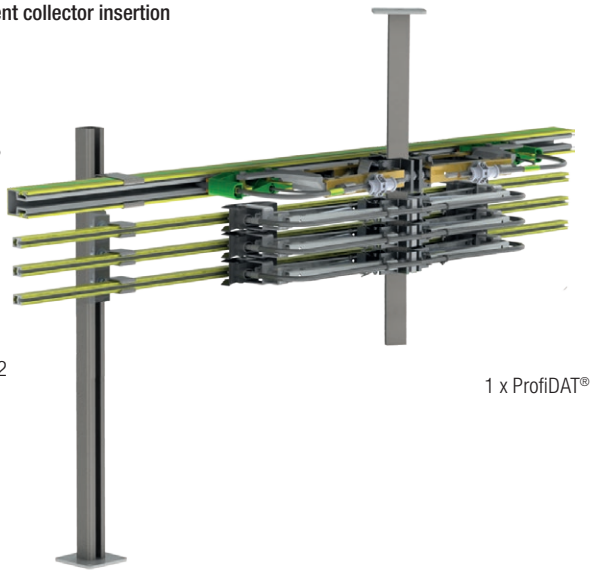
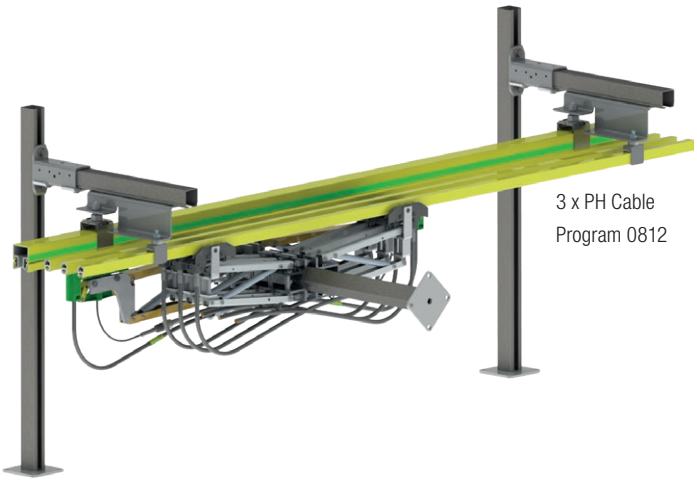
Working stroke in the direction of insertion		± 30 mm	
Connecting cable (PE cable)		Configurable length (0-10 m), highly flexible; longer connecting cables upon request	
Max. Ambient temperature		80° C	
Distance between the outrigger axis and the upper edge of the ProfiDAT® Conductor Rail		143 mm	

The determining factors for the maximum current load are the type of conductor used, the cross-section, the installation method and the ambient temperature. **Note:** Incorrect cables and incorrect cable routing lead to high contact wear and can lead to overloading and consequential damage due to strand fractures. Caution! Fire Hazard!

Lateral Current collector insertion



Current collector insertion from below



System Components

ProfiDAT® Transceiver

ProfiDAT® IWLAN Transceiver background:
The ProfiDAT® Transceivers (Access Points or Clients) send and receive data using MAC-based data transmission in accordance with the IEEE 802.11 standard. The Access Points are installed as stationary near the power feed units. They act as an interface between a stationary Ethernet network and the wireless data transmission through the ProfiDAT® Profile. In addition, they coordinate communication with and between the Clients (transceivers installed on the mobile consumers). This also means that a ProfiDAT® System requires at least two transceivers: An Access Point and a Client for the data communication.
An Access Point can communicate with several Clients, while Clients can only communicate with one Access Point within a defined cycle time. However, Clients can switch from one Access Point to another by following a defined transfer process and using the iPCF protocol.
With this function, it is possible to realize unlimited system lengths with ProfiDAT®, because Clients can switch between different rail segments. In addition, the prioritization of PROFINET (PROFIsafe) data ensures real-time data communication with maximum security and reliability.
All transceivers are configured for customer-specific applications and layouts ,as well as for use in conjunction with ProfiDAT®.Transceivers other than those configured by Conductix-Wampfler are not compatible with the ProfiDAT® Profile. In addition, configured transceivers can only be used within a defined system and segment.
In order to offer our customers a convenient solution in the event of a transceiver exchange, all ProfiDAT® Transceivers are equipped with a so-called C-Plug or Key-Plug, on which the individual configuration is stored. These plugs can be plugged into a compatible replacement device and automatically transfer the configuration to the new device. Even if these plugs are lost or damaged, Conductix-Wampfler is able to deliver a new transceiver with the required configuration as long as the serial number of the original device is known. The supplied transceivers may only be used in conjunction with the ProfiDAT® Profile.

Access Points - Configuration No.: 051450-10#
Clients - Configuration No.: 051450-20#

Transceiver scope of delivery:
- Access Point or Client
- Selected HF Components
  (Ex. HF cables, Key- or C-Plugs)
- Customer and layout specific configuration
  of the Access Points
- Control cabinet for outdoor applications (optional)
- Media converter for fiber optic (optional)

ProfiDAT®Transceiver
Siemens IWLAN (*)

+

Selected HF components
(Illustration as an example)

+

Customer and layout specific configuration

Technical Specifications	
Transceiver dimensions	Height: 156 mm / Depth: 127 mm / Width: 26 mm
Weight	0.52 kg
Attachment Options	S7-300 Carrier rail S7-1500- Carrier rail 35 mm DIN top-hat rail Wall mounting with flat attachment (screwed)
Protection class	IP30
Permissible ambient temperature	-20° C to 60° C
Data connection	RJ45, 100 Mbit/s BFOC (ST) Duplex connector, 1310 nm Multimode, 100 Mbit/s (for fiber optic connection via media converter)
Power supply (24 V DC)	- Power-over-Ethernet (RJ45), acc. IEEE802.3at for Type 1 and IEEE802.3af - 4-pin terminal strip with screw connector (24 V)
Supply type / Supply voltage	DC
Supply voltage via terminal strip **Supply voltage via Power-over-Ethernet**	19.2 V - 28.8 V 48 V
Power consumption from terminal strip **Power consumption over Power-over-Ethernet**	0.25 A 0.125 A
Power loss from terminal strip **Power loss from Power over Ethernet**	6 W 6 W
Radio approval	The SIEMENS IWLAN transceivers used in our ProfiDAT® Systems have approvals for all countries to which we deliver our systems.

** Other temperature ranges according to technical clarification - IWLAN transceivers can be installed in an air-conditioned control cabinet*

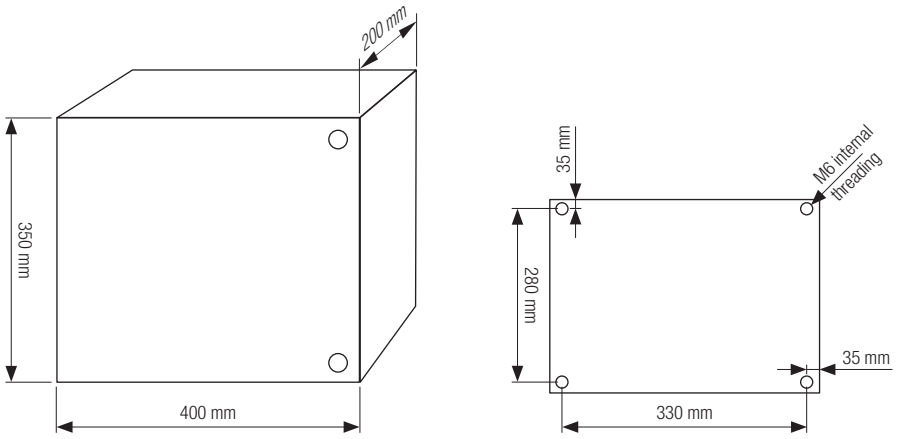
System Components

Transceiver Control Cabinet for Outdoor Applications (Metal)

For outdoor use, the ProfiDAT® Transceiver must be installed in a control cabinet. If the control cabinet is not provided by the customer, it can also be obtained directly from Conductix-Wampfler.
The follow control cabinet can be **selected using the transceiver configurator** (see Page 20):

- Material: Stainless steel AISI 304 (V2A)
- Fastening: Via rear M6 internal threading
- Protection class: IP66
- Permissible ambient temperature: - 40° C to 55° C (no direct sunlight)
- Cable bushings: - M25 for Cable 3G2.5mm² (6 A pre-fuse)
  - 3xM20 for L1 + L2 + PE directly from the conductor rail
  - M20 for Ethernet / Fiber Optic

Scope of delivery:
- Control cabinet
- Power supply (Input 120-500 V AC 50/60 Hz + PE, 300 W)
- Fuse (6 A)
- Heater
- Thermostat
- All necessary cable bushings
- RJ45 Plug for quick assembly

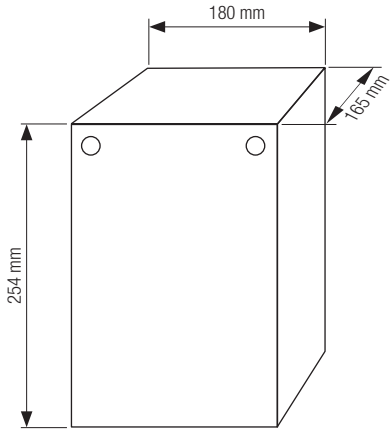


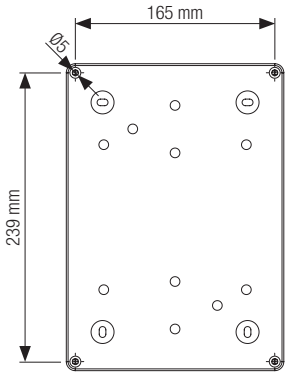
Plastic Transceiver Housing

Alternatively, there is an inexpensive plastic housing that can be ordered as a separate material
Part No.: 051450-11

- Material: Glass fiber reinforced polycarbonate
- Attachment: Insulating plugs for wall fastening screws
- Protection class: IP66

Scope of delivery:
- Drilled plastic housing
- Mounting plate, top-hat rail, end bracket (already installed)
- All necessary cable bushings
- RJ45 Plug for quick assembly





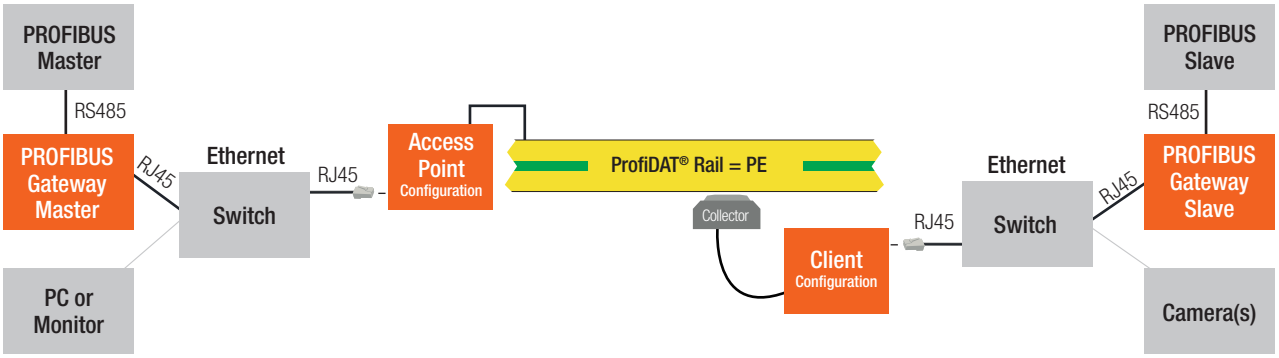
System Components

PROFIBUS Gateways

PROFIBUS Gateway Master - Part No.: 051450-31
PROFIBUS Gateway Slave - Part No.: 051450-32

Optionally, there is the possibility of using specially developed translation modules to transfer the PROFIBUS Protocol via ProfiDAT®. Here, the customer's PROFIBUS Protocol is translated transparently. To do this, a PROFIBUS Gateway must be connected upstream of every ProfiDAT® Access Point and every ProfiDAT® Client (see schematic diagram below). The use of the PROFIBUS Gateway changes the communication cycle time of the system and must be adapted accordingly on all controllers that are connected to ProfiDAT®. More detailed data regarding this depends on the project and will be clarified according to specific requests.

Dimensions (H x D x W) / Weight:	100 x 115 x 23 mm / 130 g
Protection class:	IP20
Power supply:	24V DC, 2-pin; 0.15 A
Data interfaces:	RJ45 Ethernet and RS485 PROFIBUS
Mounting options:	35 mm DIN rail

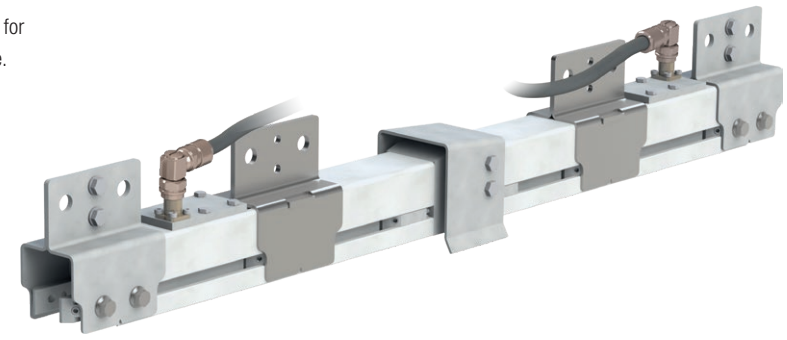


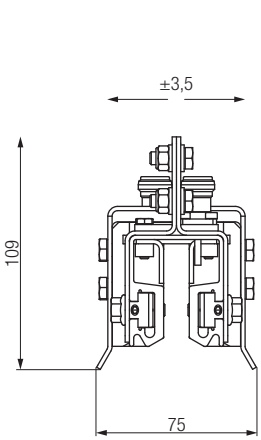
Hinge-point Transition Element (for STS cranes)

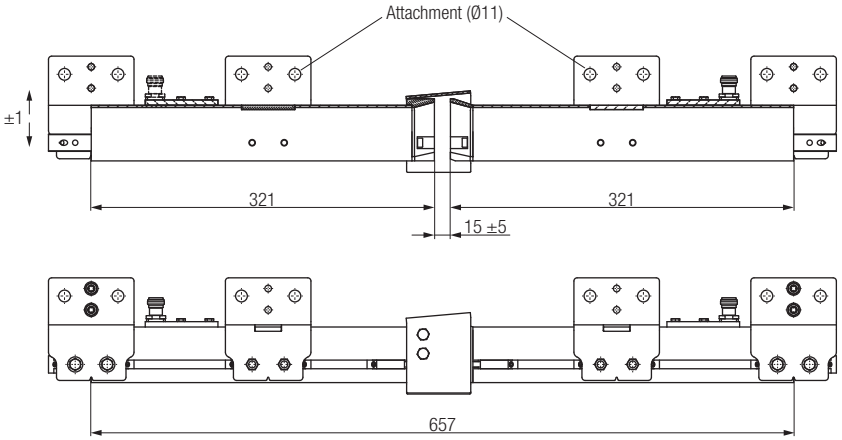
Part No.: 051413-01

The hinge-point transition element ensures the data connection for STS cranes between the foldable and the fixed part of the crane. The hinge-point transition element is attached to the support structure by screw at the two anchor points.

Includes:
- 20 m Coaxial cable with angled plug
- 2 x PE connector







System Components

Transfer Element

Part No.: 051413-10

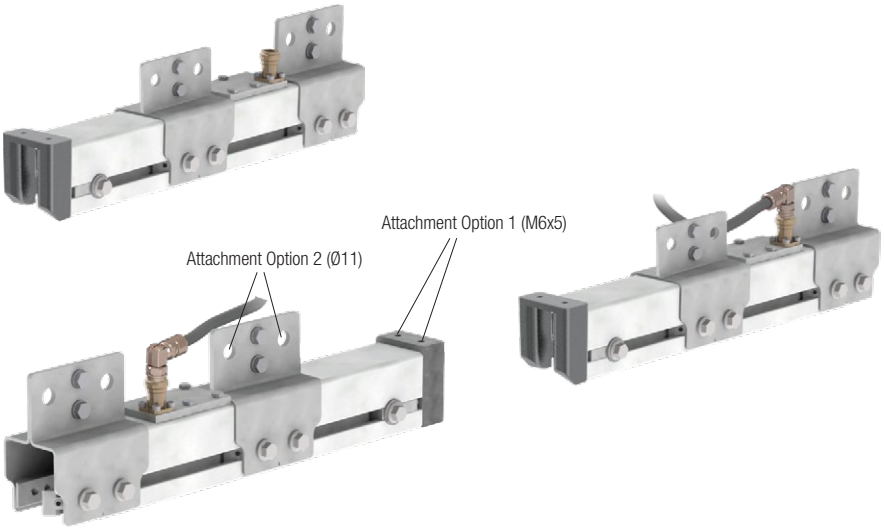
The transfer element enables the ProfiDAT® Collector to pass between two mechanically separated ProfiDAT® Rail segments. The transfer element is attached to the support structure using one of the two attachment options (see illustration below). Depending on the application, the transfer element can serve as a segment termination or transmit the data signals to the opposite transfer element via an HF cable.

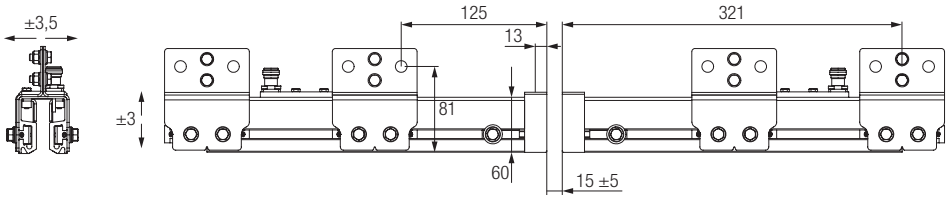
Scope of delivery:

- Transfer element (one-sided)
- PE connector

Accessories (see Page 33)**:**

- Terminating resistor #05-3170540 (required for segment terminations)
- HF cable 10 m #051451-005-10000 (with straight plugs, required if the data signal of an Access Point is to be transmitted from one rail segment to the next via the mechanical separation point)



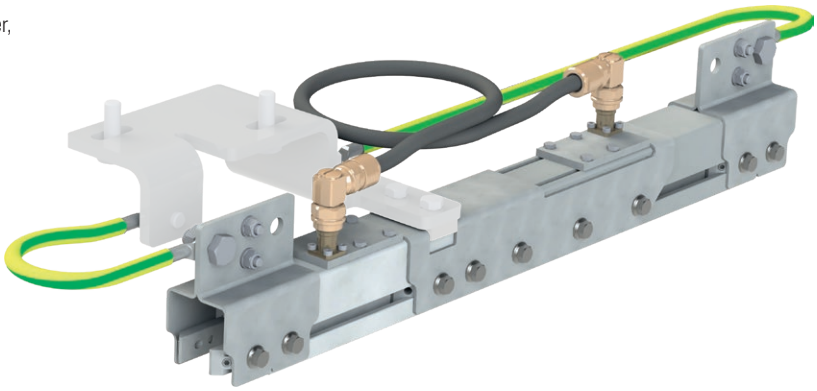


System Components

Expansion Unit (without Anchor Plate)

Part No.: 051416-01

The expansion unit connects two ProfiDAT® Profiles together, compensating for changes in the length of profiles due to temperature fluctuations.



Set includes:

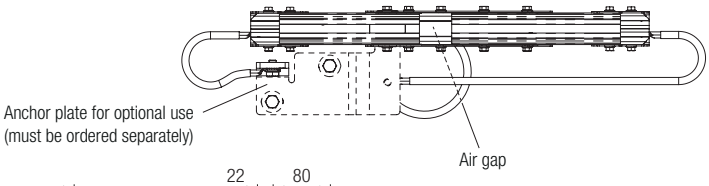
- Expansion unit (Expansion distance 45 mm)
- 2 x PE connector
- 1 x 0.5 m Coaxial cable
- 2 x 16 mm² Grounding cable (1.5 m)

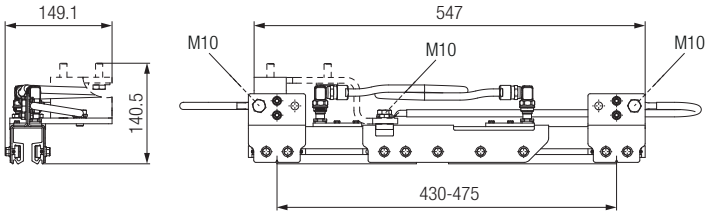
Anchor Plate – Part No.: 05-F080-0014

Optional set for use on E-RTG cranes

Set includes:

- Anchor plate
- 2 x screws DIN933 M10X25
- 2 x screws DIN9021-A10,5





Technical Specifications

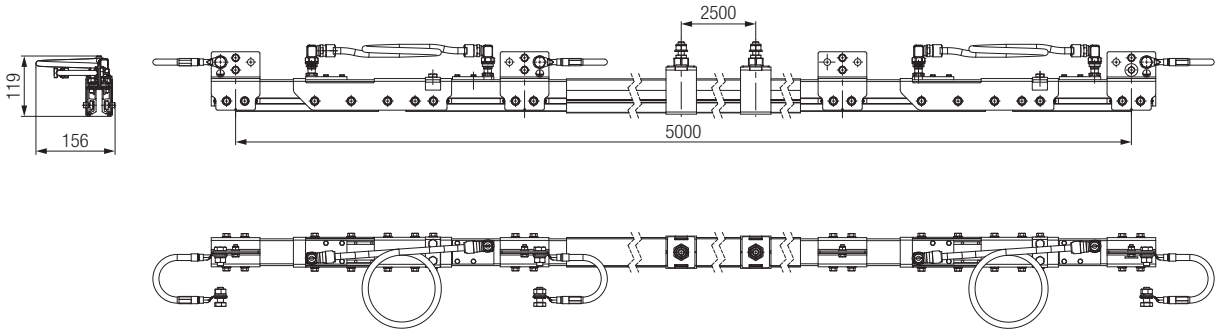
DC resistance [Ω/piece] 20° C	0.000126
DC resistance [Ω/piece] 35° C	0.000134
Impedance [Ω /piece] 20° C / 50Hz	0.000262
Impedance [Ω /piece] 35° C / 50Hz	0.000266
Weight [kg]	4.4

Two Expansion Units in a 5 m Rail Set

PVC Set - Part No.: 051416-10

PPE Set - Part No.: 051416-11 (minimum order quantity PPE insulation: 250 m)

The 5 m long set consists of two expansion units, the expansion gap adds up to a total of 90 mm (2 x 45 mm).
Ideal for combination with the Conductor Rail Program 0813 expansion unit, which also has a total expansion gap of 90 mm.
Includes 3 x 1.5 m 16 mm² grounding cable and 2 x hanger clamp, without anchor point.



System Components

Thermal Expansion

L_{Tot} = *total system length*

ΔL_{EX} = *max. possible expansion per expansion unit*

ΔL = *thermal expansion of the system*

α = *expansion coefficient*

α *aluminum = 0,0000238 1/K*

$\Delta L = L_{Tot} \times \Delta T \times \alpha$

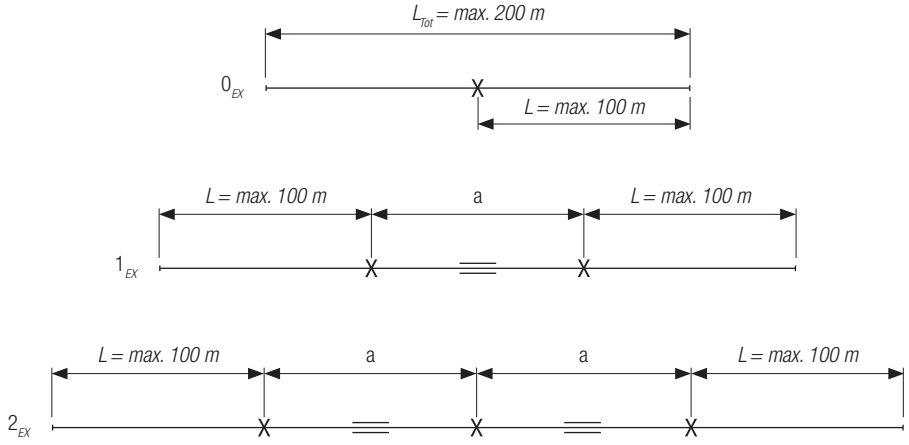
Available expansion units:

- ΔL_{EX1} = 45 mm*
- ΔL_{EX2} = 90 mm**
- $\Delta L_{ERTG\ Pickup\ guide}$ = 22.5 mm

ΔT	a L_{EX1}	a L_{EX2}	a $L_{ERTG\ Guide}$
10 K	100	200	50
20 K	90	180	45
30 K	60	120	30
40 K	45	90	23
50 K	35	70	17
60 K	30	60	15
70 K	25	50	12
80 K	20	40	10

* Example: 051415-04, p.14; 051416-01, p.24 ** Example: 051415-10/11, p.15 ; 051416-10/11, p.24

Case 1: open-ended

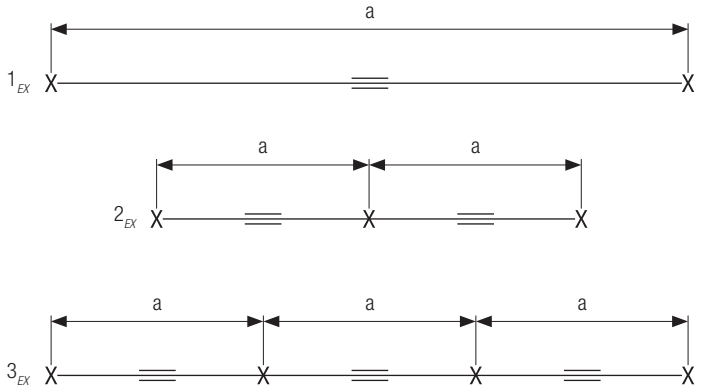


a = distance between anchor points → arranged symmetrically as much as possible

Number of expansion units = $\frac{L_{Tot}-200}{a}$

= Expansion Unit X = Anchor Point

Case 2: anchored ends



a = distance between anchor points → arranged symmetrically as much as possible
Segments with E-RTG pickup guide deviate from this – see table for figure "a" on top

Number of expansion units = $\frac{L_{Tot}}{a}$

= Expansion Unit X = Anchor Point

The table functions only as a guideline. We recommend designing the thermal expansion together with us – depending on your system, and taking into account the substructure/steel structure.

Interfaces
Mechanical Interfaces

Mechanical Installation of the ProfiDAT® Rail

The ProfiDAT® Rail is attached to the support structure with the aid of hanger clamps (see Pages 12 and 13) or screws and nuts. The hanger clamp must be mounted at a distance of 3 m for E-RTG or 2.5 m for all other applications.

Mechanical Installation of the Transceiver

With flat mounting, transceivers can be screwed directly to a wall or mounted on the following mounting rails (see Page 20 for details):

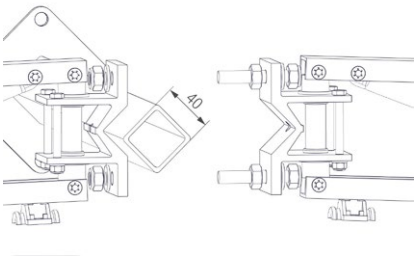
- S7-300 mounting rail
- S7-1500 mounting rail
- 35 mm DIN top-hat rail

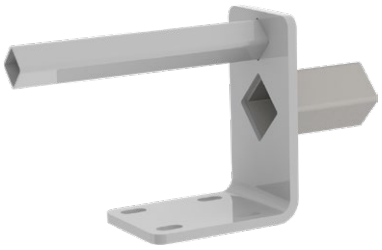
Control Cabinets and Housings

For protection against mechanical and environmental influences, we recommend installing the ProfiDAT® Transceivers in a control cabinet or housing. These can be provided by the customer or obtained from Conductix-Wampfler. The options available from Conductix-Wampfler are shown on Page 21 and can be screwed onto the mounting surface.

Mechanical Installation of the ProfiDAT® Collector

The ProfiDAT® Collector is attached to a customer-provided towing arm using the screws supplied. The square towing arm must have a side length of 40 mm.





Towing arm 0812 4-pin + ProfiDAT®
Part No.: 08-M001-0096

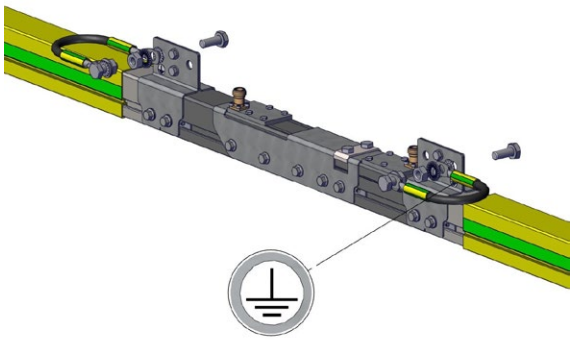
Interfaces
Electrical and Data Interfaces

Transceiver Power Supply

The transceivers are powered via a Power-over-Ethernet port and a RJ45 plug, or via a separate 24 V port. The plug for this separate 24 V port is included in the scope of delivery and is implemented using a 4-pin clamp connection. Details on this can be found in the transceiver technical data on Page 20.

PE Connection

The ProfiDAT® Profile must be connected to the customer's PE cable at the power feed-in points using the PE connector (see illustration). This cable must be a PE cable and therefore marked green-yellow. In addition, all PE connection points must be marked with a grounding symbol. Customers can define the cable cross-section; it must be designed as at least equal to half the phase current. The PE connection is to be implemented in accordance with the steps in the mounting instruction (MAL) for ProfiDAT® as well as the applicable standards.



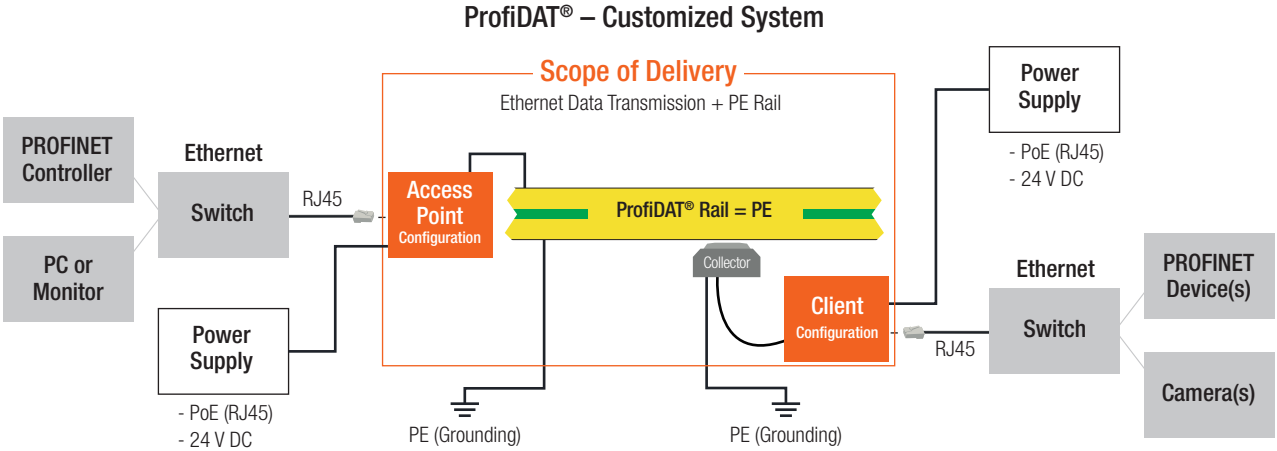
Data Interfaces

The transceivers act as an interface between the customer network and the ProfiDAT® System (see illustration below). The transceivers are connected to the customer network via RJ45 plugs. A media converter can optionally be selected to connect a fiber optic cable.
Compatible communication protocols:

- Ethernet (TCP/IP, UDP)
- PROFINET / PROFIsafe, Conformance class A
- Ethernet/IP
- PROFIBUS (via additional Gateway)

Scope of Delivery and Interfaces

The main function of ProfiDAT® is a reliable data transmission via ethernet, free from interferences. The following illustration describes the scope of delivery of the system (orange) as well as its interfaces for data transmission and more. Access Points and Clients, which are integrated via RJ45 plugs, serve as the interface to the customer network (gray). An Ethernet connection is a prerequisite for integrating a ProfiDAT® System into a network. Control signals can be transmitted via PROFINET/PROFIsafe or Ethernet/IP. Data packets transmitted via ProfiDAT® are not influenced by the system, but simply passed on. All transceivers are delivered fully configured according to individual customer requirements and application layout.




UAFL
MAERSK
MAERSK
MAGELLAN
P&O Nedlloyd

System Configuration
Example

Sample Order – Required Information (Basis for the Quotation)

Data Transmission

- Type of power feed ☐ Central ☒ End
- Number of consumers on a route 1 [Pc.]
- Max. Number of consumers per segment 1 [Pc.]
- Combination with conductor rail ☐ No ☒ Yes
- Type of application ☐ STS Crane ☐ RTG / E-RTG ☒ Other Bridge crane
- System length 100 [m]
- Max. Segment length 100 [m]
- If yes, type 0813 Number of poles 3 [Pc.]

Application Data

- Current collector insertion ☒ from below ☐ from side
- Travel speed 2 [m/s]
- What data rate is required?[2] min. 25 Mbit/s

[2] Control and Video/Audio data, Net data rate

- What data should be transferred?
  ☒ Video/Audio ☒ Control signal

Control signal type (Recommendation: PROFINET/PROFIsafe):
PROFINET/PROFIsafe

Required control signal cycles (via ProfiDAT):
64 ms

Operating Conditions

- Location: ☒ Indoor ☐ Outdoor ☐ Harbor ☐ Tropics ☐ Subtropics
- Aggressive media?: ☐ Yes ☒ No

Type: _____

Concentration: _____

- Ambient temperature: min. 10 [° C] max. 40 [° C]
- Is a control cabinet housing for transceivers needed? ☐ Yes ☒ No
- Direct sunlight on the control cabinet? ☐ Yes ☒ No
- Special chemical influences, for example:
  ☐ Phosphates ☐ Sulfur ☐ Urea ☐ _____
  ☐ Humidity ☐ Wetness ☐ Dust
  If yes, what are they? ☐ Corrosive ☐ Not corrosive

Electrical Data

Connection type Ethernet connection: ☒ RJ45 ☐ ST [Fiber Optic Multimode 1300 nm]

Required cable length feed-in point to transceiver approx. 5 [m][3] PE function? ☒ Yes ☐ No

Required cable length from antenna to transceiver approx. 4 [m][3]

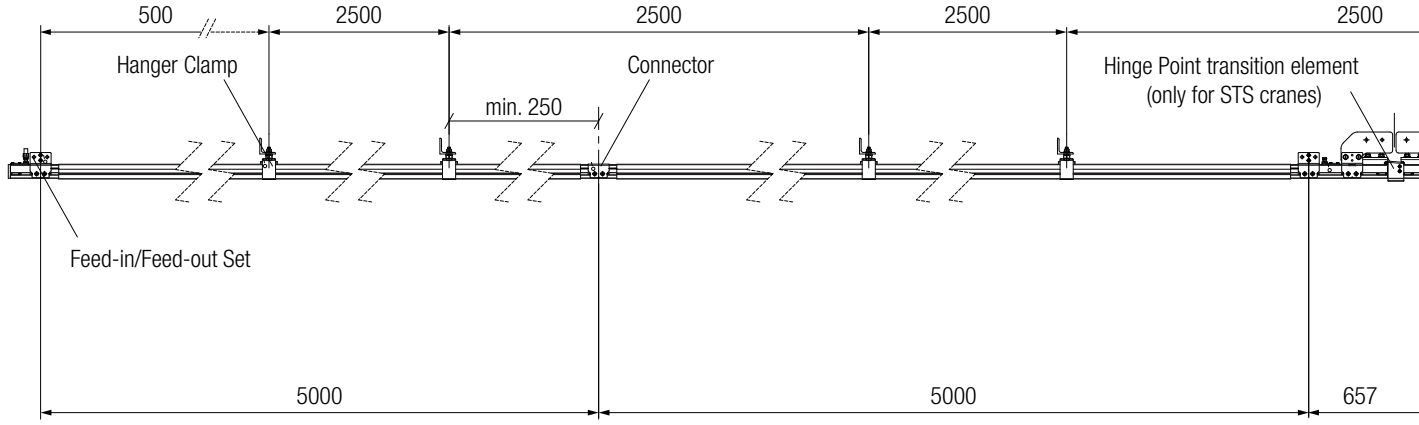
[3] Max. 10 meters

Max. Voltage per collector (PE) 100 [A]

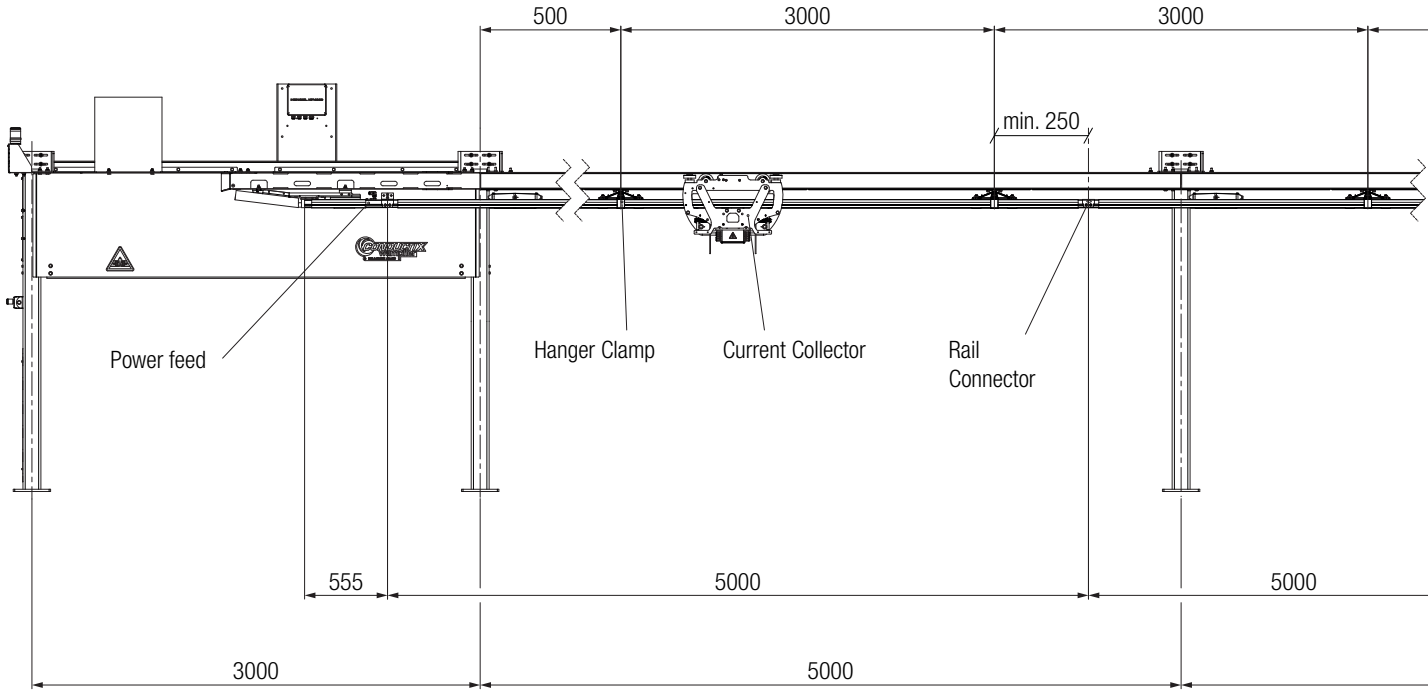
Max. Voltage per collector (power supply) 200 [A]

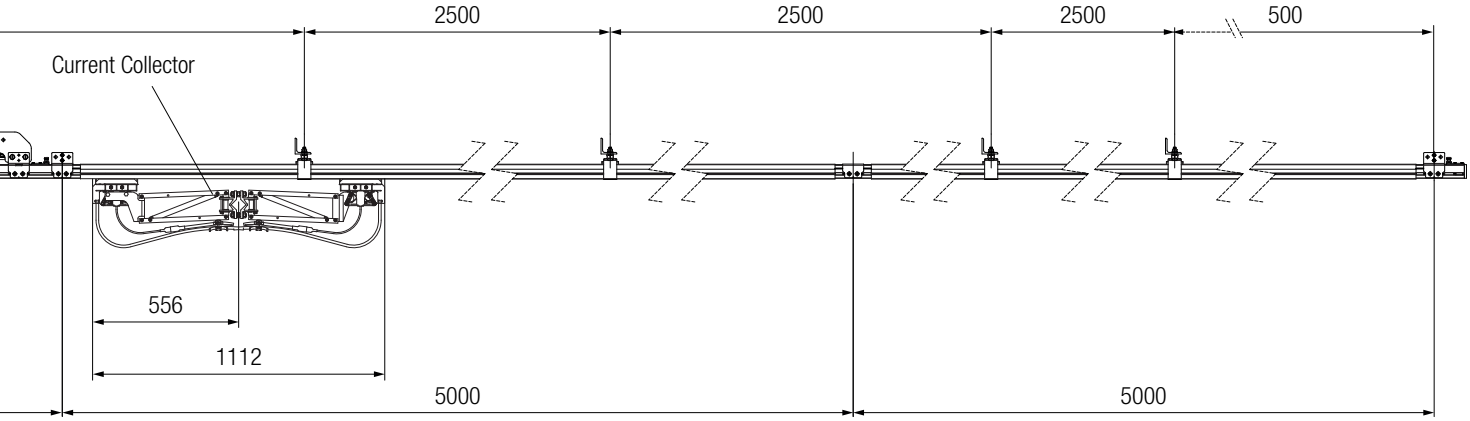
Part No.:	Qty.	Description	Comment
051415-01	1	Feed-in/Feed-out Set	For end feed
051450-10#	1	Access Point	Configured Access Point including HF cables and accessories
051411-3512	20	ProfiDAT® Profile	5 m rail, PVC insulation
051414-03	42	ProfiDAT® Hanger Clamp	Oversupply two pieces
051412-01	18	Connector	Oversupply two pieces
051412-02	3	PE Connector	Rail connector with connection option for a PE or grounding cable (Use every 25 m)
05-Z009-0004	4	Grounding Set	Grounding cable 16 mm² (PE cables must be provided by the customer)
05-F080-0002	1	Anchor Clamp	For fastening the rails
051410-1011#	1	Single Collector S	Insertion from below
051450-10#	1	Client	Configured Client including HF cables and accessories
-		Installation	
-		Commissioning	

System Layout

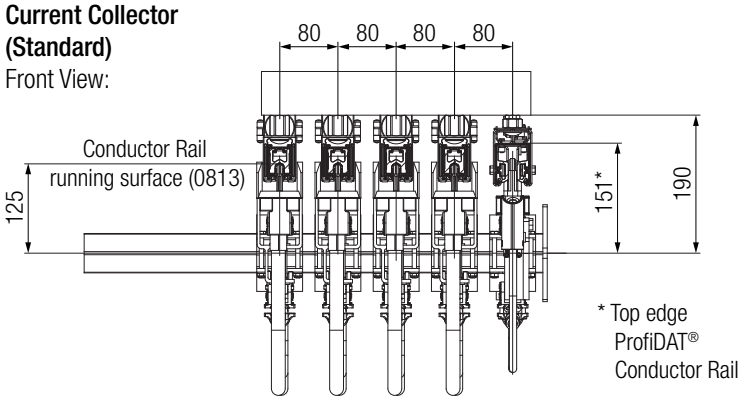


System Layout
E-RTG Crane

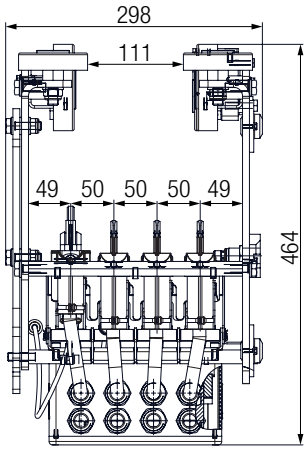


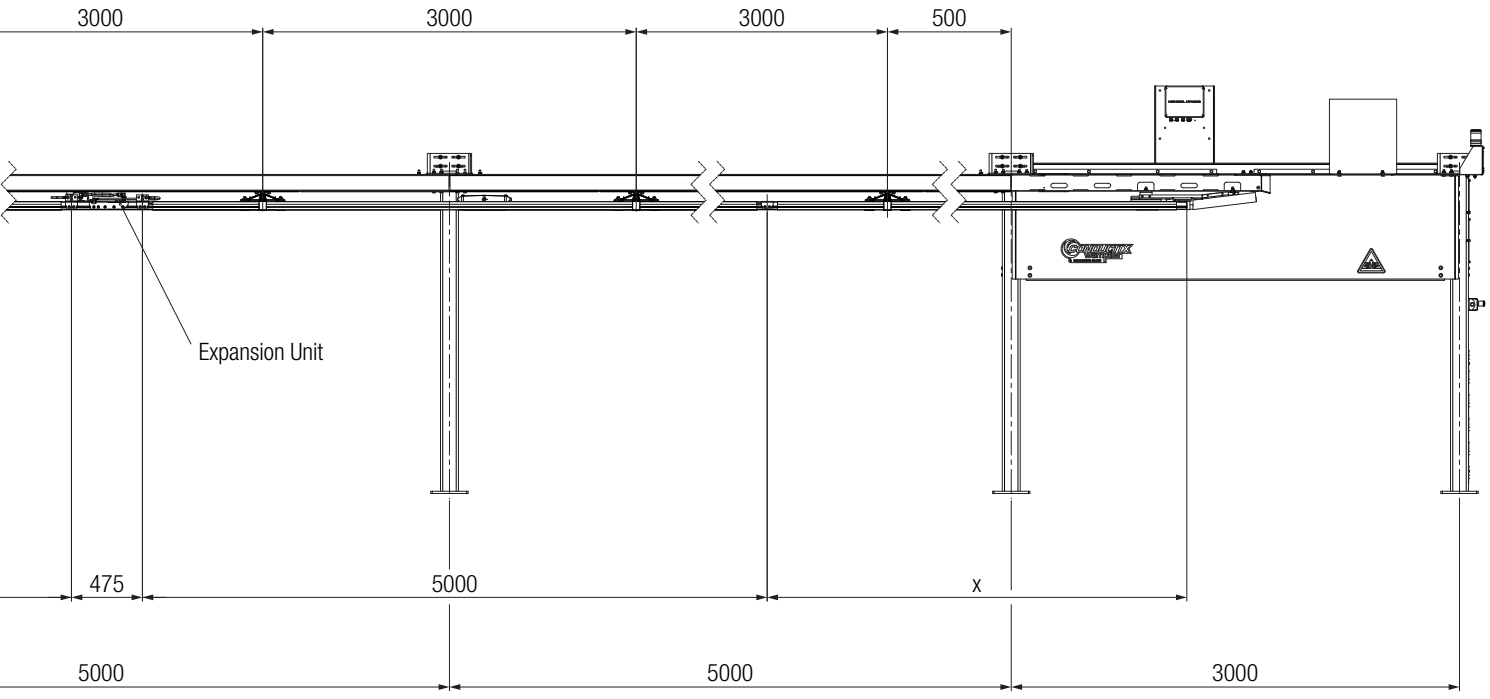


Current Collector (Standard)
Front View:



Collector Trolley (E-RTG only)
Front View:





Replacement Parts/Accessories

Small Parts Replacement Package

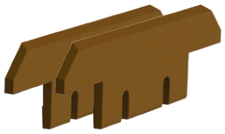
Part No.: 051419-01
Small Parts for replacement needs
Recommended quantity: 1 × Small parts replacement package per ProfiDAT® lane

Contents:

2 × Sliding contact	2 × Socket-head cap screw M5
1 × Shrink sleeve	4 × Hexagon screw M4
1× Terminating resistor	2 × Nut M4
2 × Hanger clamp	1 × Cable lug 16 mm² M8
2 × Rail connector	4 × Threaded pin
4 × Socket-head cap screw M3	2 × ProfiDAT® Connector

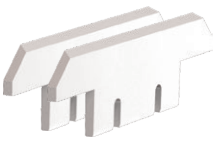
Current Collector Replacement Parts

Part No.: 051410-301
Sliding Contact Set (copper-graphite)

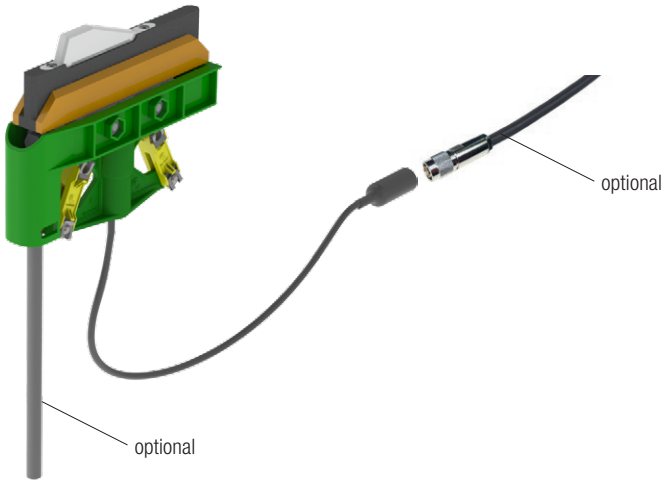


Part No.: 05-A150-0002
Antenna

Part No.: 051410-310
Slider Set (plastic set)
(Plastic sliders as an alternative to contacts when the PE function of ProfiDAT® is not used)



Configuration No.: 051410-2#
Collector Head Replacement
- Contact insulation (green base unit)
- Sliding contact or slider set
- Antenna
- 400 mm HF cable Aircell
- PE cable (optionally in various lengths and cross-sections)
- 10 m Connection cable Ecoflex (optional)

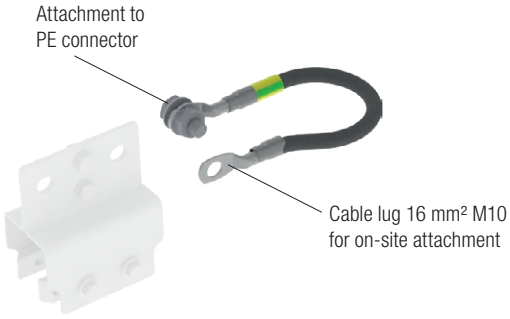


Grounding Set

Part No.: 05-Z009-0004
Connection cable 16 mm², length 2 m

For grounding connection of the hanger clamp (PE) # 051412-02 and steel construction

Incl. Cable lug M10
Incl. attachment material for PE connector



Replacement Parts/Accessories

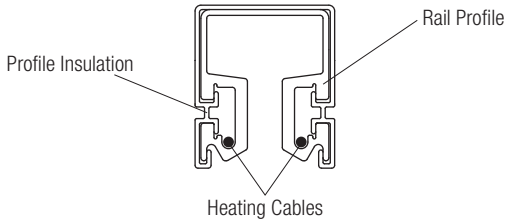
HF cable (pre-assembled)

Part No.: 051451-002-10000
(one side angled plug, one straight plug)
Part No.: 051451-005-10000 (straight plug on both sides)

Coaxial cable
Length: 10 m
Diameter: 10.2 mm
Impedance: 50 Ω

Anti-condensation Heater

In outdoor areas, the conductor rail should be installed as protected as possible against environmental influences. Condensate, frost or ice can lead to insulation faults and oxidation of the rail, which increases the wear on the sliding contacts. With the help of an anti-condensation heater, weather-related deposits can be largely prevented. Further information available on request.



Terminating Resistor

Part No.: 05-3170540
The N terminating resistor is also available individually and as a replacement part.
It can be easily screwed on using the N connection.

Wave impedance: 50 Ω
Signal attenuation: 26 dB / 6GHz

Service Packages
Customized for our ProfiDAT® System

Technical Consulting for ProfiDAT® Systems

For maximum performance and reliability of the ProfiDAT® System, the appropriate system components must be selected and a suitable system layout must be designed. Likewise, each system is also adapted to the individual customer-specific application, the layout, and the respective requirements. Our experienced Application Support Teams will be happy to assist you with this fundamental task!
With our comprehensive experience, we can help you design a stable system to make your project a success. During the planning, we will recommend the optimal product range and layout for achieving your goals. Intensive coordination and exchange of information are essential in order to be able to adapt each ProfiDAT® System to your individual needs.

Project Service

In the event of an upgrade or extension of a running application within a limited timeframe, Conductix-Wampfler can provide a project manager and offer special services. When time-critical insertions must be planned and carried out in production processes, close consultation and coordination is the key to successfully completing the order and putting the system back into operation within the planned timeframe.
Our project managers will take responsibility for the Conductix-Wampfler scope of delivery and coordinate with everyone involved.

Installation

Accurate and professional installation is extremely vital to ensuring the reliability and full performance of the ProfiDAT® Systems.
Gaps caused by inaccurate cutting or mounting of the ProfiDAT® Rail lead to a considerable increase in signal attenuation as well as emission. As a result, the data transmission may become unreliable and operational problems may occur.
To ensure a trouble-free operation of your system and utilize the full potential of ProfiDAT®, we recommend that you have the installation carried out by our experienced service team or have it monitored by one of our supervisors.

Range of services:
- Mechanical installation of all ProfiDAT® components according to the system layout
- Measurement of data transmission (/attenuation) after installation
- Documentation and delivery of the test results

Your benefits:
- Peace of mind - Assembly by the experienced Conductix-Wampfler service experts
- Proven and guaranteed results - Delivery of test results

Commissioning

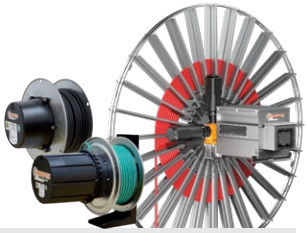
In order to achieve the best performance and reliability of the ProfiDAT® System, it may be necessary to adapt and fine-tune the system configuration to the installation conditions and the environment on site. We know from our many years of experience that the actual conditions on site can frequently differ from the theoretical system configuration of the planning phase.
Considering this, we recommend (particularly with large and complex systems) including Conductix-Wampfler in the commissioning process.
Our product experts and experienced service technicians are able to perfectly adapt the properties of the systems to the actual conditions on site.

Range of services:
- Commissioning of the ProfiDAT® System when the system is electrically implemented in the application and all mobile consumers are available
- Adaptation and fine-tuning of the systems and their components to the real on site conditions
- Documentation and delivery of the test results

Your benefits:
- Peace of mind - Commissioning by the experienced Conductix-Wampfler service technicians
- Assurance of the best possible performance of your system
- Proven and guaranteed results

Your Applications – our Solutions

The solutions we deliver for your applications are based on your specific requirements. In many cases, a combination of several different Conductix-Wampfler systems can prove advantageous. You can count on Conductix-Wampfler for hands-on engineering support together with the optimum solution to safely meet your needs.

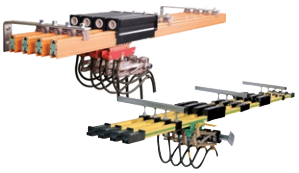


Cable and Hose Reels

Motor driven and spring driven reels by Conductix-Wampfler provide energy, data and media over a variety of distances, in all directions, fast and safe.

Festoon Systems

Conductix-Wampfler cable trolleys can be used in virtually every industrial application. They are reliable, robust and available in an enormous variety of dimensions and designs.

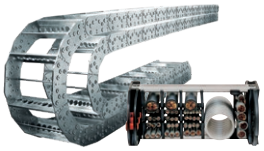


Conductor Rails

Available as enclosed or multiple unipole systems, Conductix-Wampfler conductor rails reliably move people and material.

Inductive Power Transfer IPT®

The no-contact system for transferring energy and data. For all tasks that depend on high speeds and absolute resistance to wear. Flexible installation when used with Automated Guided Vehicles.



Energy Guiding Chains

Covering a wide range, energy guiding chains are the ideal solution for transferring energy, data, air and fluids for many industrial applications.

Radio Remote Controls

Safety remote control solutions customized to meet our customer needs with modern ergonomic design.

Reels, Retractors and Balancers

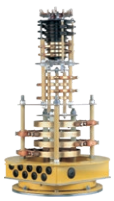
Available for hoses and cables, as classical reels or high-precision positioning aids for tools, we offer a complete range of reels and spring balancers.

Jib Booms

Complete with tool transporters, reels or an entire media supply system – safety and flexibility are key to the completion of difficult tasks.

Non-insulated Conductor Rails

Robust, non-insulated aluminum conductor rails with stainless steel cap provide the ideal basis for power supply of people movers and transit networks.



Slip Ring Assemblies

Whenever things are really “moving in circles”, the proven slip ring assemblies by Conductix-Wampfler ensure the flawless transfer of energy and data. Here, everything revolves around flexibility and reliability!

Mobile Control Systems

Mobile control solutions for your plant – wether straightforward or intricate. Control and communication systems from LJU have been tried and tested in the automotive industry for decades.

ProfiDAT

This data transfer system is a compact slotted waveguide and furthermore can be used as Grounding rail (PE) as well as positioning rail at the same time.

www.conductix.com

Conductix-Wampfler
has just one critical mission:
To provide you with energy and data transmission systems that will keep your operations up and running 24/7/365.

To contact your nearest sales office, please refer to:
www.conductix.contact

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