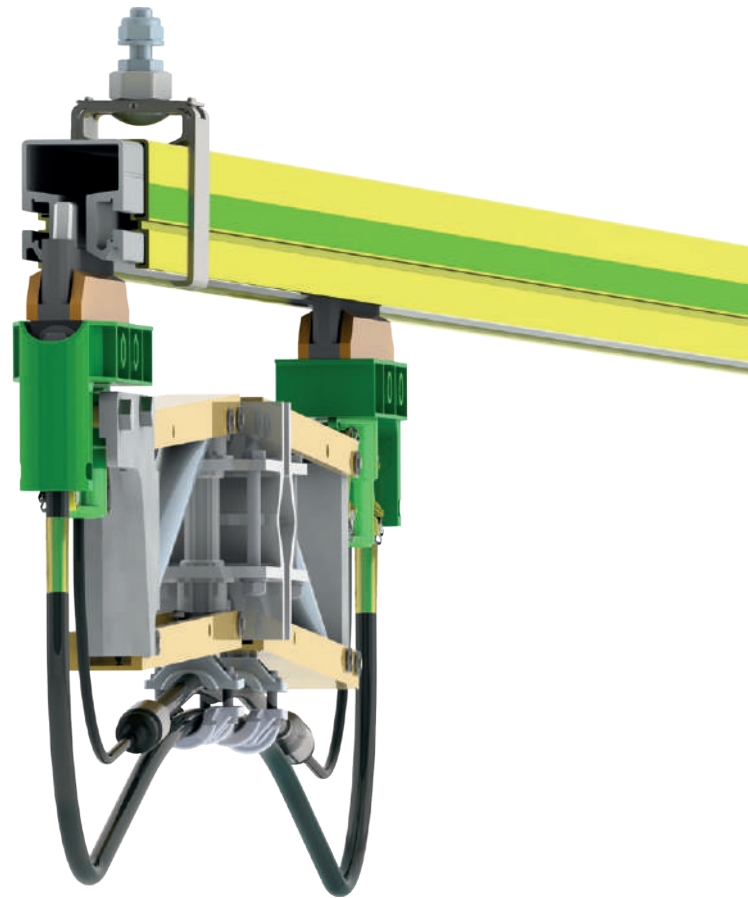


ProfiDAT®

Data Transmission System

Program 0514



CONDUCTIX
wampfler

Ⓞ DELACHAUX GROUP

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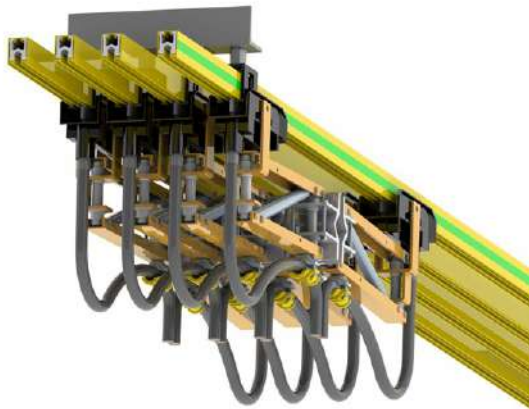
System Description

General Information

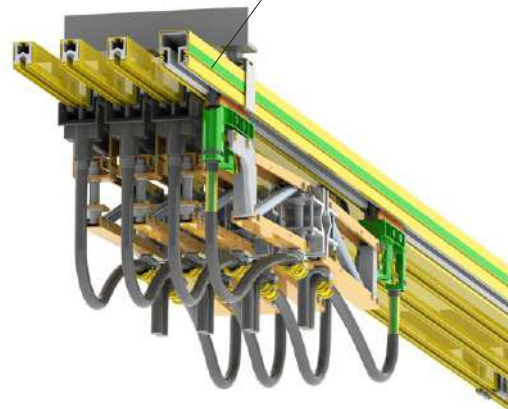
ProfiDAT® is a system for data communication between fixed and mobile consumers such as crane systems or other material handling equipment. The ProfiDAT® system is installed in parallel with the electrification (conductor rail) system.

The data transmission system consists of at least one fixed and one mobile transceiver, a feed-in antenna, and the collector antenna. The mobile collector antenna can continuously receive and transmit data. In addition to data transmission, the ProfiDAT® profile is used as a ground conductor rail (PE). The antenna for data transfer 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

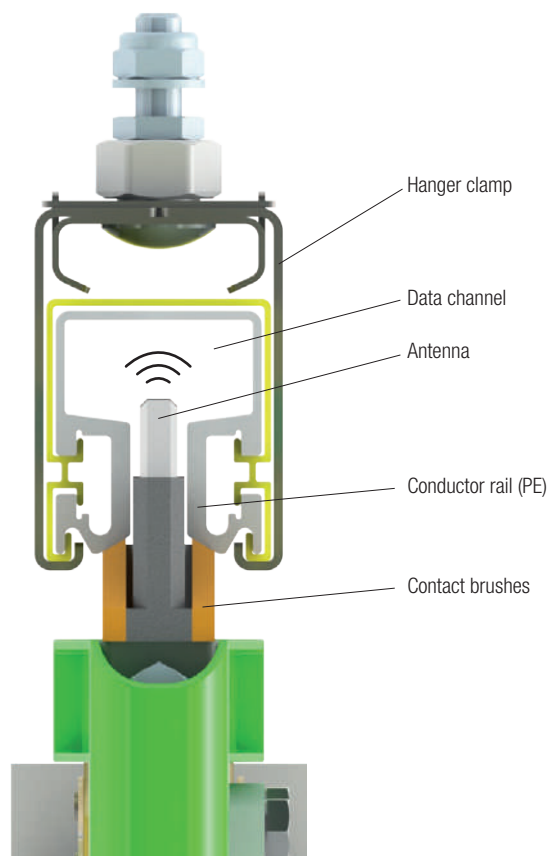


The illustration above shows that the dual function of the ProfiDAT® profile results in a compact and fully integrated solution. An existing ground conductor rail can be replaced by the ProfiDAT® system without additional space requirements or attachments.

The contactless wireless system safely and reliably transfers data (video, audio and control data) through a slotted waveguide at very high data rates in real-time. Speeds up to 100 Mbit/s with very low delays can transfer data safely and reliably. The special design of the conductor profile and the mobile antenna allows a secure transfer of data in a screened system even in difficult radio environments (such as a harbor environment).

The ProfiDAT® data transmission system can be combined with numerous Conductix-Wampfler conductor rail ranges. Additionally:

- ProfiDAT simultaneously uses data and grounding profiles to allow full integration of the data transmission system into a conductor rail system
- Fewer parts and components result in less space requirement restrictions in a complete supply system (power and data)
- The data antenna is securely guided in the profile slot by the staggered contact brushes. No additional antenna guide is required



System Description

Main Applications

- STS (ship-to-shore) cranes
- RTG/E-RTG cranes (rubber-tired/electrified rubber-tired gantry cranes)
- Process cranes
- People movers, storage–retrieval units, transfer cars, amusement-park rides
- Other mobile machines

Your Benefits

- Secure and reliable wireless transmission method due to slotted waveguide technology
- Real-time data transfer by prioritization of PROFINET® data packets
- PROFIsafe compatible
- Expansion and separation points are possible
- Cost savings and space reduction by dual usage of the ProfiDAT® profile for data transmission and grounding (PE conductor rail)
- Compact design and full integration into conductor rail systems
- Supports various protocol types
- Possible to use even in harsh environmental conditions (ports)

Product Data

Data rate:	Up to 100 Mbit/s
Real-time capable:	Yes (PROFINET®)
Average latency:	3 ms
Segment length with one access point:	Up to 500 m
Secure transmission:	Yes (PROFIsafe)
Utilization as a ground conductor rail (PE):	Yes (up to 1000 A rated current)
Max. number of nodes in a segment:	5 (more after technical clarification)
Profile length:	5000 mm
External dimensions (profile):	48 × 56 mm
Area of use:	Indoor and outdoor areas
Temperature range:	-25°C to +50°C
Installation orientation:	– Antennas/current collectors engaging from below – Antennas/current collectors engaging from the side (only for crossing ranges without transitions)

Note

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

System Description

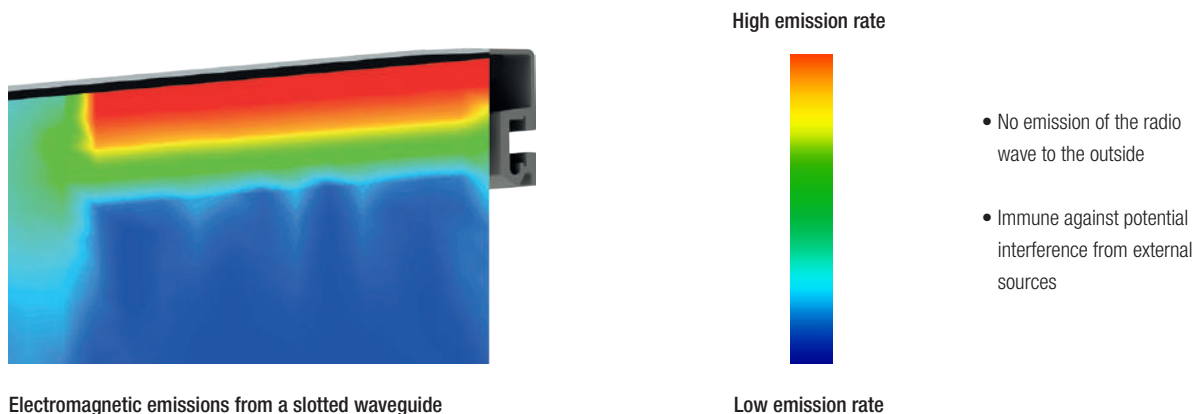
Functional Principle of the Slotted Waveguide

A waveguide is a hollow body with conducting walls where electromagnetic waves can grow. Rectangular and circular cross-sections are mostly used for this. How the electromagnetic waves grow 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 grow.

The underlying principle of a slotted waveguide is based on a rectangular waveguide. A radio wave is fed into this and travels perpendicular 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 surroundings of the SWG. This provides almost 100% protection against interference with the electromagnetic environment of the SWG, so the available frequency spectrum can be more efficiently used. Furthermore, the length-dependent signal attenuation is significantly less than with comparable communication systems, so that large signal-transmission ranges and longer segment lengths are achievable.



Electromagnetic emissions from a slotted waveguide

The field-distribution image shows the exponential decay in the slot with all waveguides.

The function of the slot is to attenuate the electromagnetic emission of the radio wave into the surroundings of the slotted waveguide.



Technical Specifications

ProfiDAT® Profile Type 051411	
Area of use	Cranes (STS cranes, E-RTG cranes and process cranes), storage–retrieval units and other mobile machinery
Environment	Harsh outdoor conditions (harbor environments) as well as indoor applications
Installation orientation	Horizontal and vertical, lateral engagement and engagement from below; indoor and outdoor areas
Maximum distance between supports	[m] 2.5/3 (for E-RTGs)
Rail length	[mm] 5000 (196.9") (nominal size at 20°C/tolerance ±3 mm)
System length	[m] up to 500 per segment
External dimensions	[mm] 48 × 56
Nominal rail spacing	[mm] 80 (3.15"; minimum spacing, expandable as required)
Traversing speed	[m/min] 300 (straight section without interruptions) – higher speeds possible by arrangement
Max. rated current	[A] 1000
Expansion / expansion joints	Compensation for up to 200 m (565') system length; above 200 m, the use of expansion elements is necessary
Permitted ambient temperature	–25°C to 50°C (85°C for heat-resistant version / PPE + SB)
Maximum conductor temperature	+85°C (115°C for heat-resistant version / PPE + SB; briefly 125°C)
Storage temperature	–25°C to 50°C (store in a dry place, avoid condensation)
Conductor material	Aluminum with surface coating
Rail insulation	Stabilized rigid PVC (standard material) and PPE + SB (heat-resistant version for indoor applications)
Flammability / fire protection	Compliant with requirements for insulating materials in accordance with UL94 V-0; flame-retardant and self-extinguishing (IEC DIN EN 60895-11-10B); PPE + SB halogen free
Local approvals	CR
Coloring	Rail insulation in safety warning color to RAL 1018 (lemon yellow) or RAL 1021 (rapeseed yellow) for the heat-resistant version; green stripes (PE rail) in RAL 6025 (fern green)

Relevant standards	
DIN EN 60664-1, VDE 0110-1:2008-1	Insulation coordination for equipment within low-voltage systems – Part 1: Basic principles, requirements and tests (IEC 60664-1:2007); German version of EN 60664-1:2007
DIN EN 60204-1, VDE 0113-1:2007-06	Safety of machines – electrical equipment of machines – Part 1: General requirements (IEC 60204-1:2005, modified); German version of EN 60204-1:2006
DIN EN 60529, VDE 0470-1:2000-09	Protection classes provided by housings (IP code) (IEC 60529:1989 + A1:1999); German version of EN 60529:1991 A1:2000
DIN EN 60204-32, VDE 0113-32:2009-03	Safety of machines – electrical equipment of machines – Part 32: Requirements for hoisting machines (IEC 60204-32:2008); German version of EN 60204-32:2008

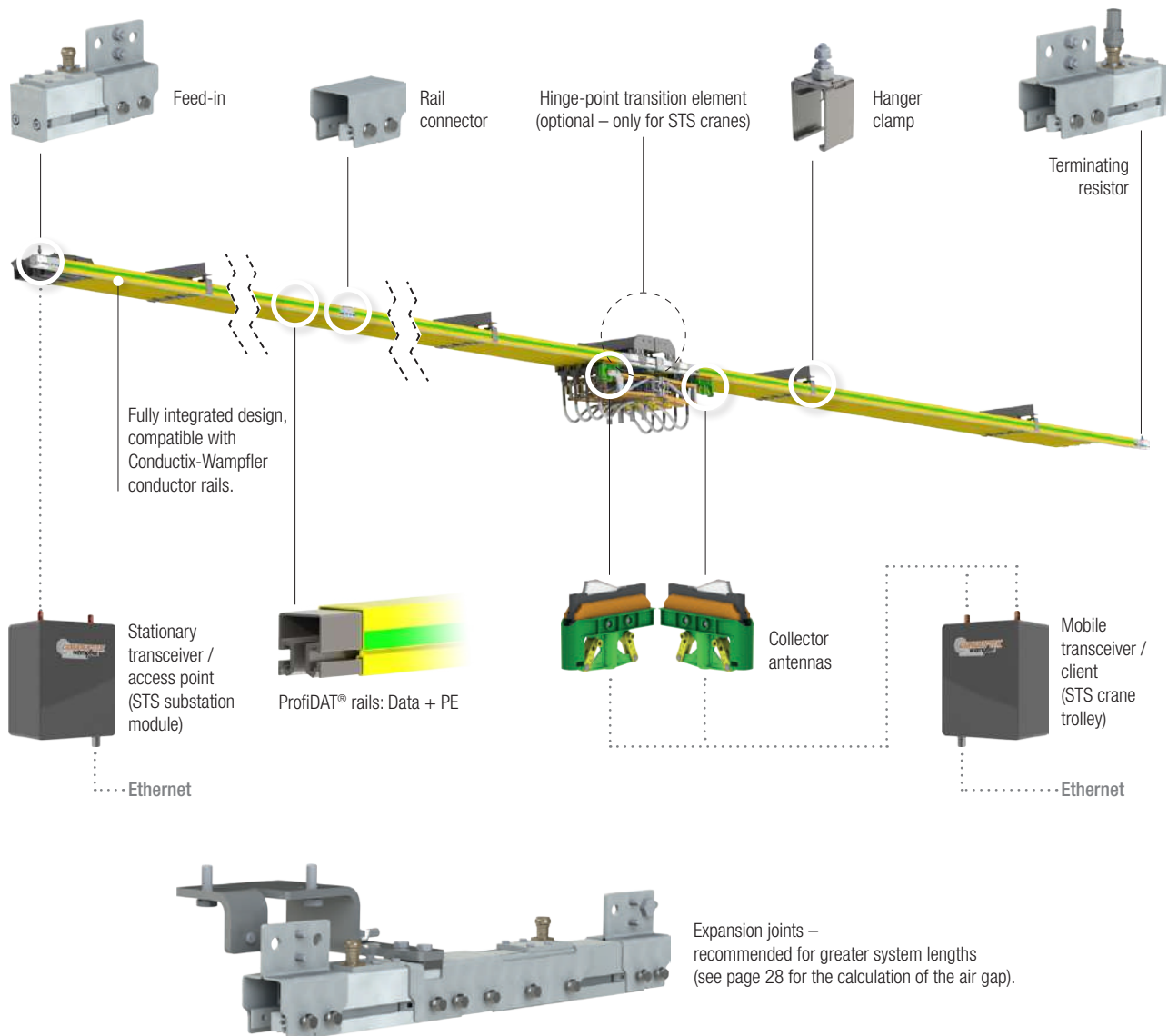
Subject to technical changes



System structure

ProfiDAT®

System Overview



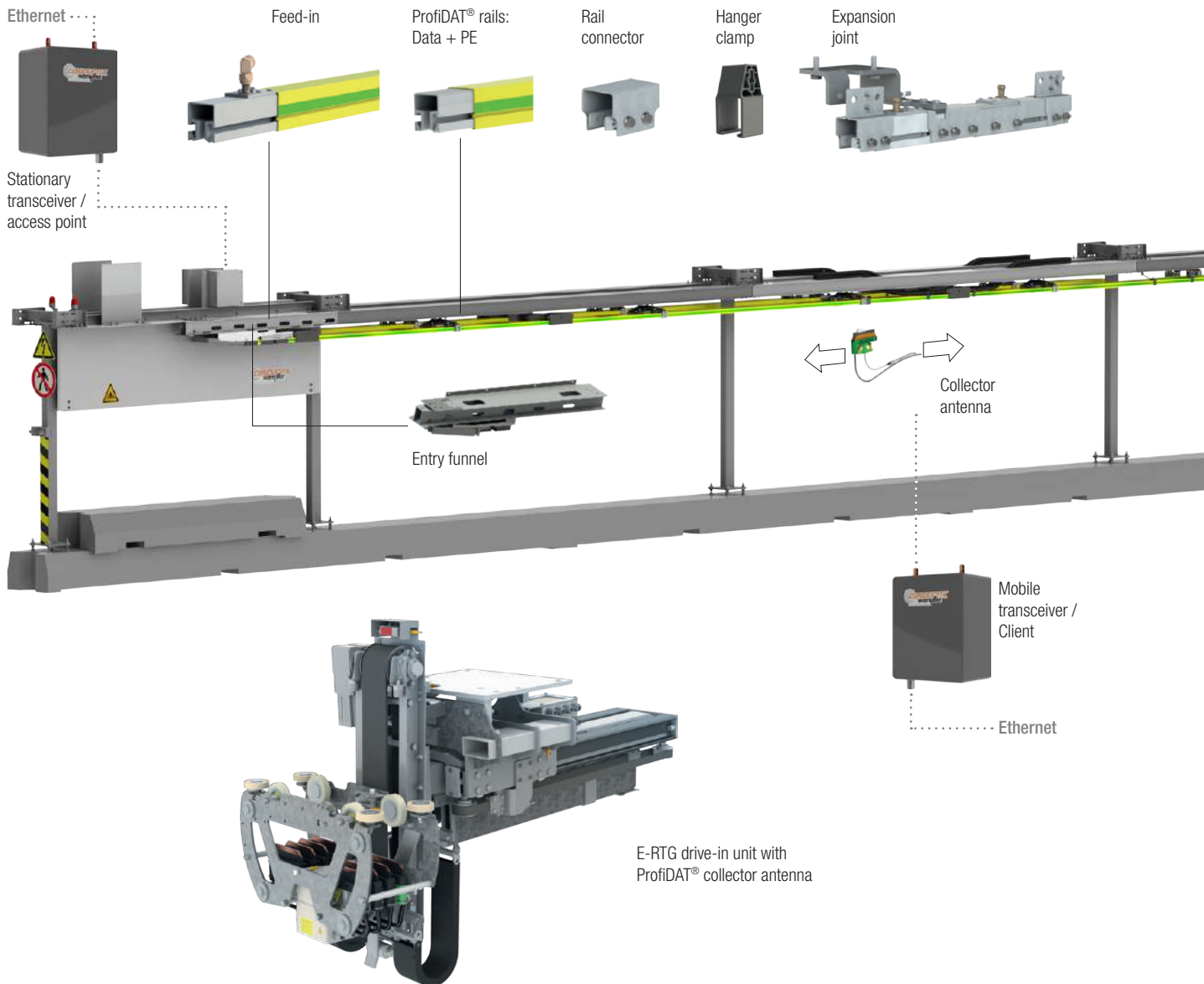
The ProfiDAT® data transmission system can be used to provide communication between a stationary data network and a mobile consumer. Additionally, the ProfiDAT® profile can simultaneously be used as a ground conductor rail. While the system can vary in length, it must consist of at least one fixed and one mobile transceiver, the feed-in unit and the collector antenna. The profiles and conductor rails are attached by hanger clamps to the steel structure provided by the customer. The profiles are mechanically joined using connectors that ensure stability and a secure connection. Feed-in antennas at one end of the system are used to feed data into the profile. With a central feed-in, the feed-in point is located in the middle of the system and therefore distributes the signal to the left and right. The mobile consumer antenna can continuously receive and transmit data. The hinge-point transition element is mounted at the interface of the crane hinge, where it serves to provide uninterrupted data transfer. The data is fed out on one side of the hinge-point transition element and fed in on the other side.



System Structure

ProfiDAT® for E-RTG Cranes

System Overview



ProfiDAT® is a data transmission system used to provide communication between the base unit and the drive-in unit of RTG container cranes. The ProfiDAT® system is installed in parallel with the E-RTG/RTG electrification system (current collector system for container-stacking cranes).

Additionally, the ProfiDAT® profile can also be used as a ground conductor rail. While the system can vary in length, it must consist of at least one fixed and one mobile transceiver, the feed-in antenna and the collector antenna. The profiles and conductor rails attach to the steel structure by hanger clamps. The profiles are mechanically joined using connectors that ensure stability and a secure connection. Data is fed into and out of the profile by a feed-in / terminating resistor at the two ends of the system. The mobile collector antenna can continuously receive and transmit data.

The current-collecting trolley on the drive-in unit supplies the crane with power. The current-collecting trolley picks up power from conductor rails fixed to a steel structure along a container corridor. There is a drive-in/drive-out zone at each end of the container corridor to bring the current collectors into contact with the conductor rails. In the drive-in zone, an extending and vertical-positioning drive positions the current-collecting trolley. Once the current-collecting trolley is completely driven into the conductor rails, the crane can be supplied with power during its travel along the container corridor.

System Components

ProfiDAT® Profile

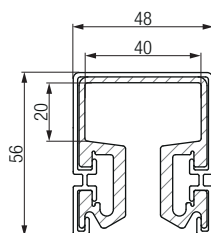
Part No.: 051411-3512

Profile (slotted waveguide). The profiles provide a channel for data. They are electrically conductive and are simultaneously used as a protective conductor (PE). The standard length of a profile is 5000 mm. The external dimensions are 48 × 56 mm (width × height). The conductor cross-section is at least 585 mm². For the insulating material, PVC is used in standard areas and halogen-free PPE + SB is used for higher ambient temperatures up to 85°C.

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

Color: Safety warning color RAL 1018 zinc yellow (PVC) or RAL 1021 canola yellow (PPE+SB) and RAL 6025 fern green (stripes)

Material: Aluminum



Optionally available with heating.

Over time, the profile surface can change color, which does not affect functionality.

Technical specifications – rail length 5000 mm ±3 mm

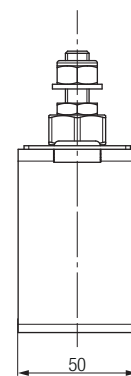
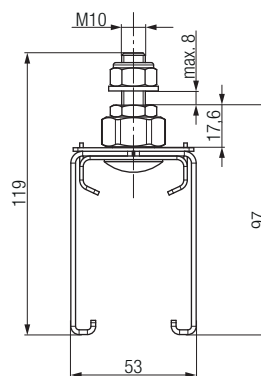
DC resistance [$\Omega/1000$ m] 20°C	0.063
DC resistance [$\Omega/1000$ m] 35°C	0.067
Impedance [$\Omega/1000$ m] 20°C/50Hz	0.131
Impedance [$\Omega/1000$ m] 35°C/50Hz	0.133
Weight [kg]	11.04

Hanger Clamps

Part No.: 051414-03

A nut and bolt secure the hanger clamp to the support structure. The hanger clamps are pushed onto the profiles. Two hanger clamps are installed for each profile. The maximum spacing between hanger clamps is 2500 mm.

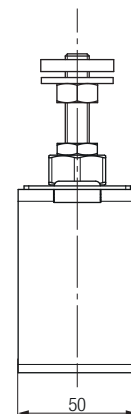
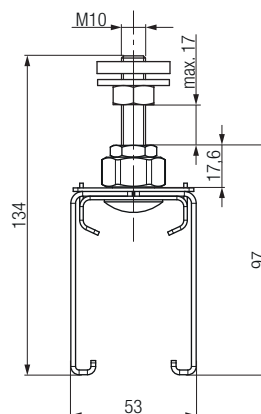
Material: Aluminum, stainless steel



Part No.: 051414-04

Hanger clamps for C-rails

The rails are suspended on free-rotating, self-aligning stainless-steel hanger clamps that allow low-friction slipping during thermal expansion. Hanger clamps are available with hexagonal or square nuts for the cross-arm/C-rail installation.



System Components

Hanger Clamps (cont.)

Part No.: 05-S280-0004

Hanger clamp with spacer

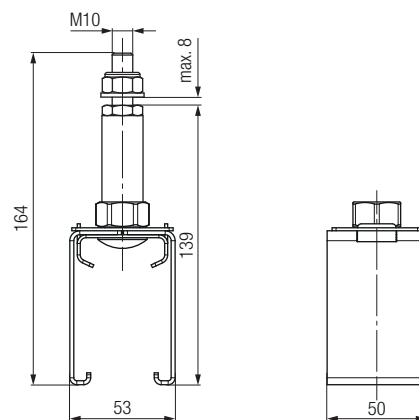
For use with hanger clamps with insulators on the phase conductor rail.

In stainless steel with hexagonal nut

Nominal distance between supports:

max. 2500 mm

Installation note: For suspended installation



Anchor Clamp

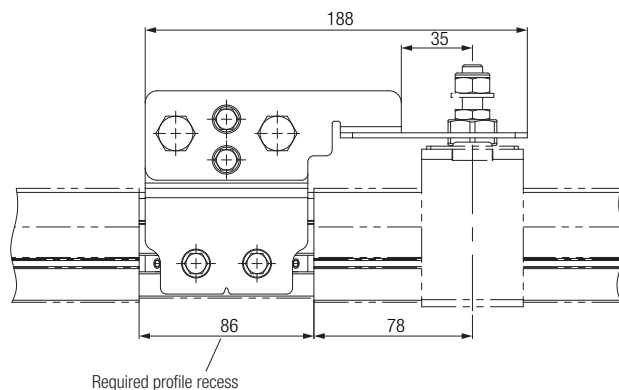
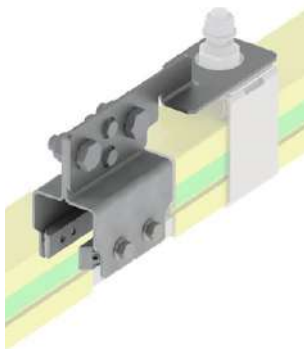
Part No.: 05-F080-0002

The rail is fixed at one point by an anchor clamp and can expand freely from this point.

The fixed point is usually installed near the feed-in.

It is secured via a connecting plate from the PE rail connector to the hanger clamp.

Hanger clamps are not included.



Rail Connectors

Part No.: 051412-01

Part No.: 051412-02

There are two types of connectors:

- Connector, simple (051412-01)
- PE connector, with connection to the grounding cable (051412-02) – to be used every 25 m!

The rail connector connects two profiles together and is screwed onto the profile. The grounding cable is attached to the lug of the PE connector (051412-02).

Material: Aluminum, stainless steel

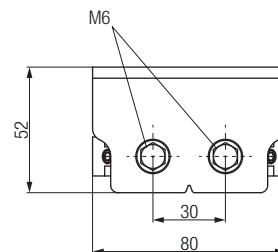
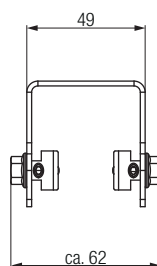
Grounding set

Part No.: 05-Z009-0004

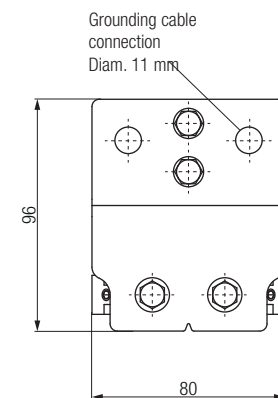
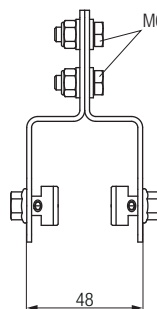
Not included in the delivery - see Accessories on page 36



051412-01



051412-02



System Components

Feed-In/Feed-Out Unit (for End Feeding of Signals)

Part No.: 051415-01

The feed-in/feed-out unit is attached with screws to the profile at both ends of the system. It is used to feed data signals in and out. At the end of the ProfiDAT® section, there is a terminating element and resistance that reduces the amplitude of the signal to the point that no interference emissions are produced for other equipment in the vicinity of the data transmission system.

Material: Aluminum, stainless steel

For system lengths up to 250 m

Unit consisting of a feed-in unit, cable, feed-out unit and terminating resistor

Includes coaxial cable: Ecoflex® 10

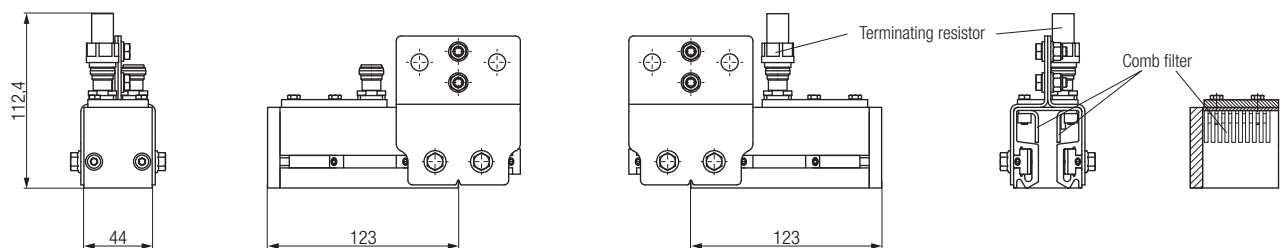
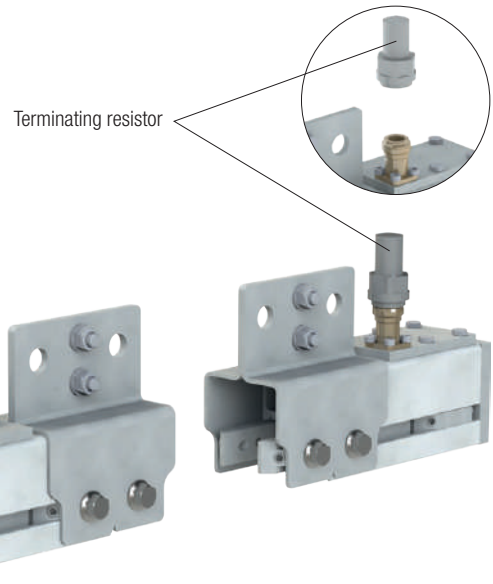
Length: 10 m

Diameter: 10.2 mm

Impedance: 50 Ω

Attenuation @ 5 GHz / 100 m: 37 dB

f_{max}: 6 GHz



HF Cable (Pre-assembled)

Part No.: 051451-002-10000

Coaxial cable: Ecoflex® 10

Length: 10 m

Diameter: 10.2 mm

Impedance: 50 Ω

Attenuation @ 5 GHz / 100 m: 37 dB

f_{max}: 6 GHz



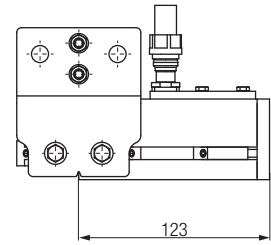
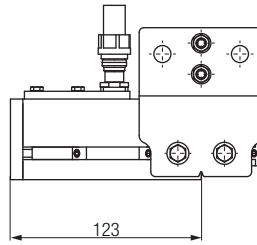
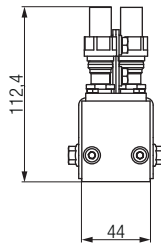
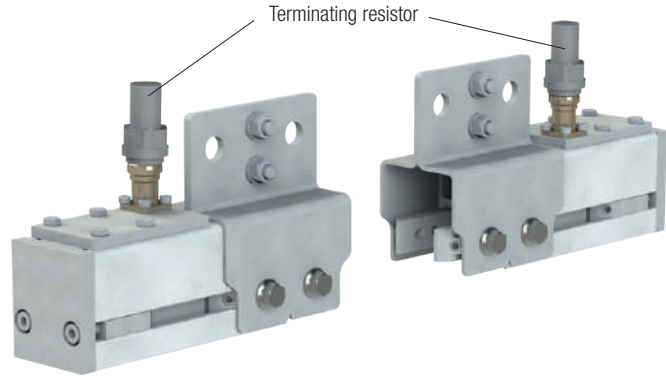
System Components

Feed-In/Feed-Out Unit (for Central Feed-In of Signals)

Part No.: 05-E015-0007

The feed-in/feed-out is used as a system termination point for a central feed-in. A comb filter and terminating resistor destroy the radio waves in a controlled manner, and eliminates the leaking of radio waves.

Set consists of two feed-out units with terminating resistor



Terminating Resistor

Part No.: 05-3170540

The N terminating resistor is also available separately and as a spare part. This can simply be screwed on by means of an N connection.

Wave impedance: 50 Ω

Signal attenuation: 26 dB / 6 GHz



System Components

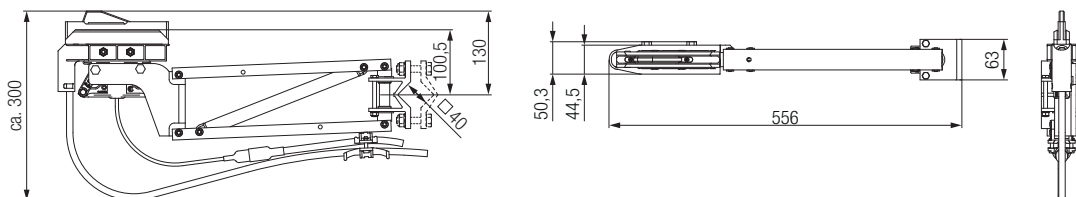
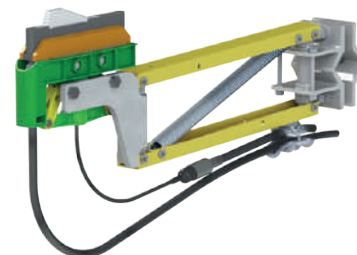
Single Current Collector S – for Engagement from Below

Part No.: 051410-1011

(Cables 10 m / 16 mm² – other lengths / cross sections configurable)

Use:

- If there are no transition points in the system
- If there are no expansion joints in the system
- When the feed-in is at the system's end
- For systems up to 200 m in length



Double Current Collector D – for Engagement from Below

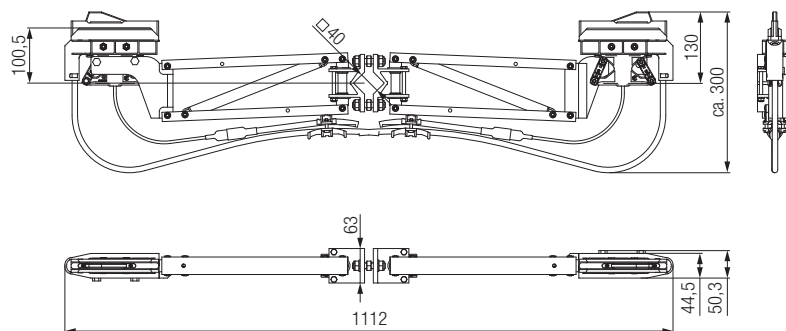
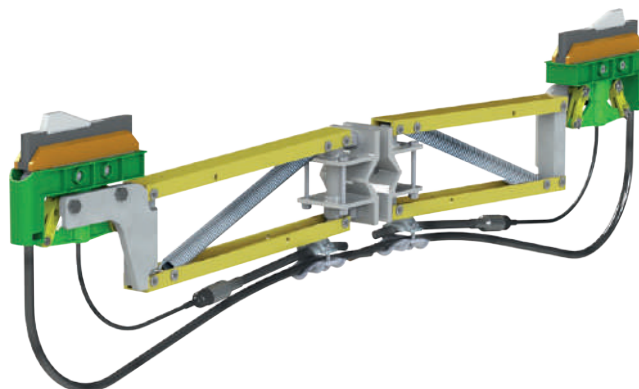
Part No.: 051410-1012

(Cables 10 m / 16 mm² – other lengths / cross sections configurable).

Two separate contact brushes guide the current collector on the ProfiDAT® profile. The antennas are inserted into the slot in the ProfiDAT® profile and are electrically isolated from the carbon brushes.

Use:

- If there are transition points in the system
- When using expansion joints
- At higher current loads
- With central feed-ins



Technical specifications	Single collector (SAP CONFIG 3192047)	Double collector (SAP CONFIG 3192070)
Maximum current load	The determining factors for the maximum current are the type of conductor used, the cross section, the installation method and the ambient temperature.	
Max. speed	300 m/min; higher speeds available on request	
Contact force	28 N	
Lateral displacement	±100 mm	
Working stroke in the direction of insertion	±40 mm	
Connecting cable (PE cable)	70/35/16 mm ² , length configurable (0–10 m), highly flexible; longer connecting cable on request	
Distance between the towing arm and the contact surface of the rail (nominal dimension on installation)	100.5 mm	

Note: Using the wrong cables and incorrectly routing them will lead to high levels of wear in the brushes; broken strands can lead to overload conditions and product damage. Caution – fire hazard!

System Components

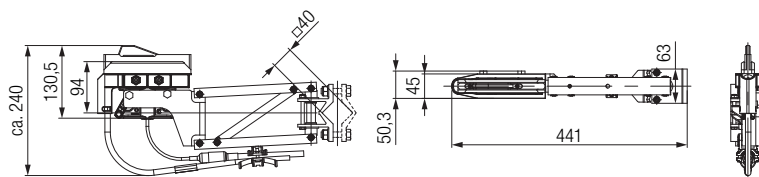
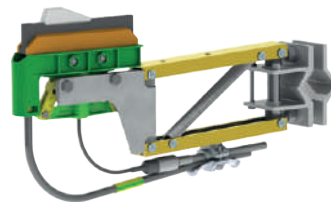
Single Current Collectors S (Short Arm) – for Engagement from Below

Part No.: 05-S265-0011

(Cables 10 m / 16 mm² – other lengths / cross sections configurable)

Use:

- Arm length: Short-arm version for compact installation situation and low rail misalignment to the ideal line
- If there are no transition points in the system
- If there are no expansion joints in the system
- When the feed-in is at the system's end
- For systems up to 200 m in length



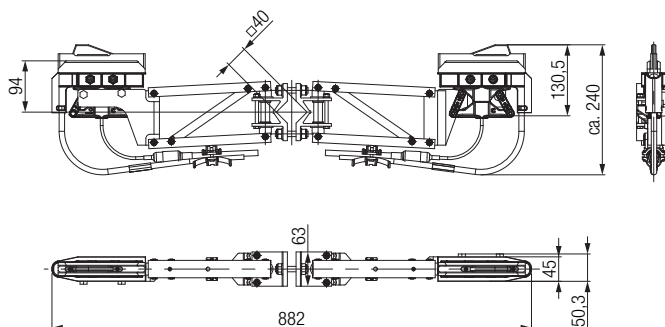
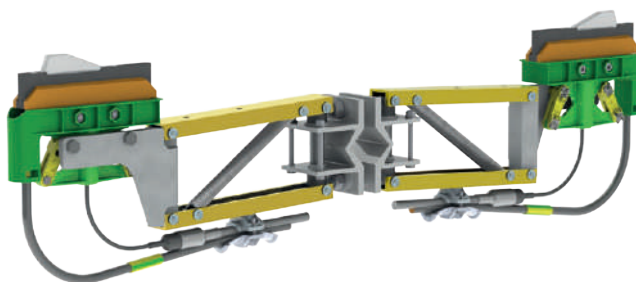
Double Current Collectors D (Short Arm) – for Engagement from Below

Part No.: 05-S265-0005

(Cables 10 m / 16 mm² – other lengths / cross sections configurable)

Use:

- Arm length: Short-arm version for compact installation situation and low rail misalignment to the ideal line
- If there are transition points in the system
- When using expansion joints
- At higher current loads
- With central feed-in



Technical specifications	Single collector (SAP CONFIG 3192047)	Double collector (SAP CONFIG 3192070)
Maximum current load	The determining factors for the maximum current are the type of conductor used, the cross section, the installation method and the ambient temperature.	
Max. speed	300 m/min; higher speeds available on request	
Contact force	28 N	
Lateral displacement	±35 mm	
Working stroke in the direction of insertion	±30 mm	
Connecting cable (PE cable)	70/35/16 mm ² , length configurable (0–10 m), highly flexible; longer connecting cable on request	
Distance between the towing arm and the contact surface of the rail (nominal dimension on installation)	94 mm	

Note: Using the wrong cables and incorrectly routing them will lead to high levels of wear in the brushes; broken strands can lead to overload conditions and product damage. Caution – fire hazard!

System Components

Single Current Collectors S (Short Arm) – for Lateral Engagement without Transition Points

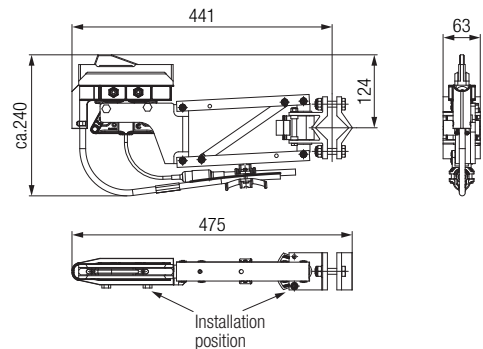
Part No.: 05-S265-0010 (right version)

Part No.: 05-S265-0012 (left version)

(Cables 10 m / 16 mm² – other lengths / cross sections configurable)

Use:

- Horizontal installation orientation of the conductor rail with current collector engagement from the side.
- In general, engagement of the current collectors from below is preferable to lateral engagement in outdoor areas.



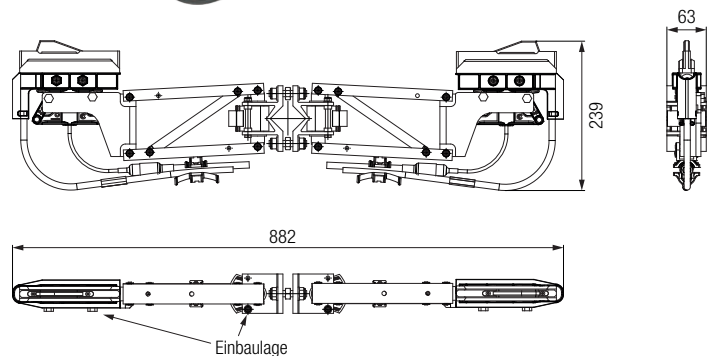
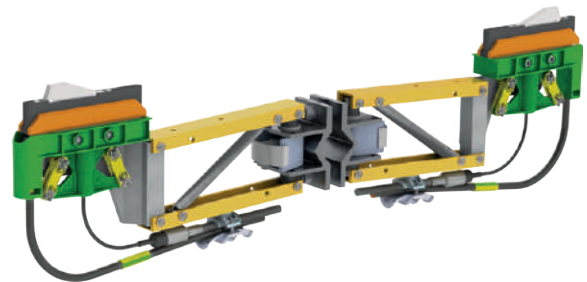
Double Current Collector D (Short arm) – for Lateral Engagement without Transition Points

Part No.: 05-S265-0007

(Cables 10 m / 16 mm² – other lengths / cross sections configurable)

Use:

- Horizontal installation orientation of the conductor rail with current collector engagement from the side.
- In general, engagement of the current collectors from below is preferable to lateral engagement in outdoor areas.

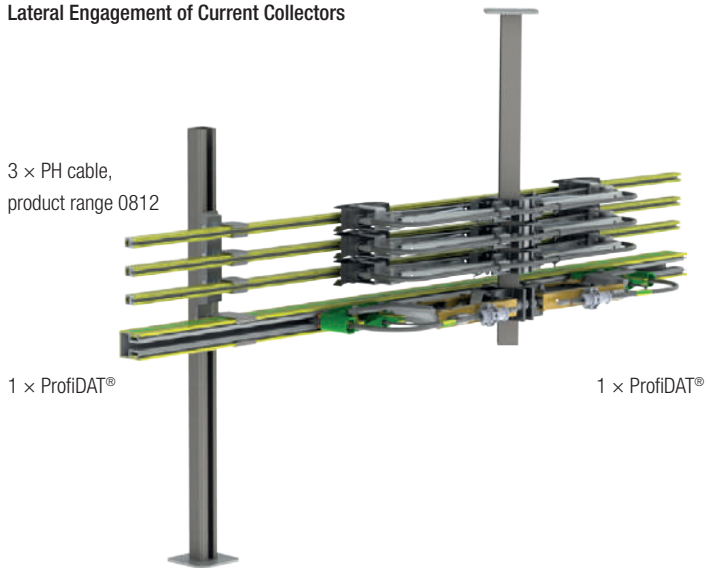


Technical specifications	Single collector (SAP CONFIG 3192047)	Double collector (SAP CONFIG 3192070)
Maximum current load	The determining factors for the maximum current are the type of conductor used, the cross section, the installation method and the ambient temperature.	
Max. speed	300 m/min; higher speeds available on request	
Contact force	28 N	
Lateral displacement	±35 mm	
Working stroke in the direction of insertion	±30 mm	
Connecting cable (PE cable)	70/35/16 mm ² , length configurable (0–10 m), highly flexible; longer connecting cable on request	
Distance between the towing arm and the contact surface of the rail (nominal dimension on installation)	94 mm	

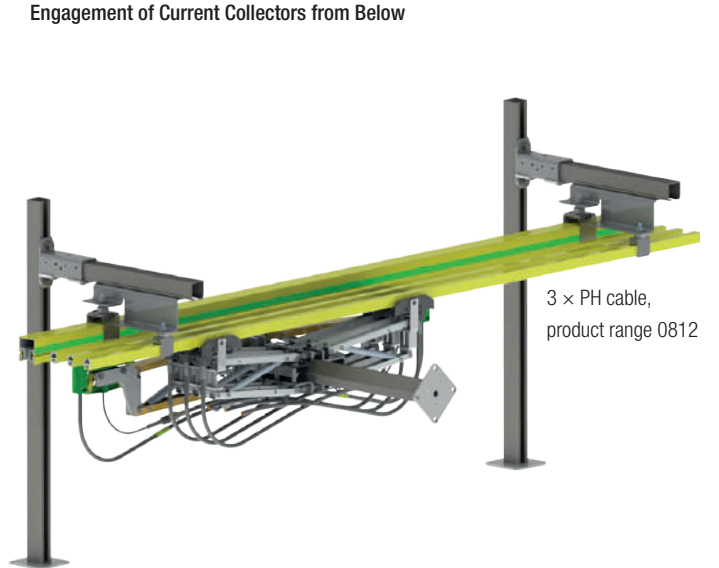
Note: Using the wrong cables and incorrectly routing them will lead to high levels of wear in the brushes; broken strands can lead to overload conditions and product damage. Caution – fire hazard!



Lateral Engagement of Current Collectors



Engagement of Current Collectors from Below



System Components

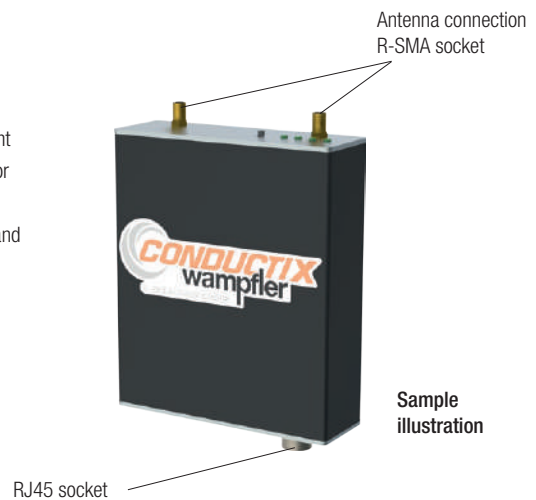
Transceivers

SAP CONFIG 3188984

The ProfiDAT® transceiver sends and receives data via MAC-based data communication in accordance with the IEEE 802.11 standard. The transceiver provides the interface between the Ethernet connection and wireless data transmission in the ProfiDAT® profile. In addition, the ProfiDAT® transceiver coordinates communication between devices configured as the access point and the client. There are at least two transceivers installed in a system: a stationary transceiver for feeding in the signal, and one mobile transceiver for each movable node. Prioritization of the PROFINET® (PROFIsafe) protocols guarantees real-time data communication and the highest security and reliability in transmission.

The ProfiDAT® transceiver may only be used in combination with the patented ProfiDAT® profile.

The ProfiDAT® transceivers are configured specifically for the application. SIEMENS industrial WLAN devices are specifically configured for use in ProfiDAT® slotted waveguides.



STANDARD Transceiver – CXW 734 / CXW 774 – Indoor

Access point and **client** modules for use in the control cabinet.

Space-saving integration through DIN-rail mounting, such as in the control cabinet. Metal housing, protection class IP30.

This transceiver is used for standard applications with a double current collector.

Access point: in a wireless local area network, an access point (AP) is a station that receives and transmits data. An access point connects users to other users in the network and can also act as a connection point between the wireless network and the local area network (LAN).

Client: a device is called a WLAN client if it connects to a wireless network via WLAN and thus can use the services offered by the WLAN.

BASIC Transceiver – CXW 721 / CXW 722 / CXW 761 – Indoor

A cost-effective solution for use in the control cabinet. For DIN-rail mounting.

Plastic housing, protection class IP20 rating.

This transceiver can only be used in conjunction with the ProfiDAT® current collector S (single), Part No.: 051410-1011.

ADVANCED Transceiver – CXW 786 – Outdoor

- Especially well suited to applications with high mechanical and climatic requirements
- Robust, impact-resistant plastic housing, shock- and vibration-proof
- Good protection against dust and water jets due to protection class IP65
- Ambient temperatures from -40°C to +60°C
- UV and salt-spray resistant
- DIN-rail, profile and mast mounting possible with additional mounting plate
- Variants designed for use with the Hipath WLAN controller
- Flexible use for 12–24 V DC or 110–230 V AC
- Optional fiber-optic connection for large distances

Transceiver Housing

See Accessories – page 37

System Components

Transceivers

	STANDARD Transceiver – CXW 734 / CXW 774 – Indoor	BASIC Transceiver – CXW 721 / CXW 722 / CXW 761 – Indoor	ADVANCED Transceiver – CXW 786 – Outdoor
Transmission rate for WLAN / maximum	100 Mbit/s	100 Mbit/s	100 Mbit/s
Number of electrical connections			
– for network components or terminals	2	1	2
– for power supply	1	1	1
– for redundant power supply	1	0	1
Design of the electrical connection for network components or terminals	RJ45 socket	RJ45 socket	RJ45 socket Fiber-optic LC
for power supply	3-pole screw terminal (24 V DC); PoE	3-pole screw terminal (24 V DC)	2-pin plug (24 V DC) or optionally available power-supply adapter (4-pole 24 V DC or 3-pole 110 V to 230 V AC)
Removable media type: C PLUG	Yes	No	Yes
Removable media type: KEY PLUG	Yes	No	Yes
Number of wireless cards / permanently installed	1	1	up to 2
Supply type / supply voltage 1	DC	DC	DC
Power supply from Power over Ethernet in accordance with IEEE802.3at with Type 1 and IEEE802.3af	48 V	–	48 V
from optionally integrable power supply with AC	–	–	100–240 V
from optionally integrable power supply with DC	–	–	12–24 V
Current consumption with DC at 24 V, typical	0.25 A	0.15 A	0.45 A
Current consumption with AC at 230 V, typical	–	–	0.05 A
with Power over Ethernet in accordance with IEEE802.3at with Type 1 and IEEE802.3af, typical	0.125 A	–	0.22 A
Power loss [W] with DC at 24 V, typical	6 W	3.6 W	10.7 W
Power loss [W] with AC at 230 V, typical	–	–	10.7 W
with Power over Ethernet in accordance with IEEE802.3at with Type 1 and IEEE802.3af, typical	6 W	–	10.7 W
Permissible ambient temperature during operation	–24°C to +60°C	0°C to +55°C	–40°C to +60°C
Permissible ambient temperature during storage	–40°C to +85°C	–40°C to +85°C	–40°C to +85°C
Permissible ambient temperature during transport	–40°C to +85°C	–40°C to +85°C	–40°C to +85°C
Relative humidity / at 25 ° C / without condensation / during operation / maximum	95%	95%	100%

System Components

Transceivers (cont.)

	STANDARD Transceiver – CXW 734 / CXW 774 – Indoor	BASIC Transceiver – CXW 721 / CXW 722 / CXW 761 – Indoor	ADVANCED Transceiver – CXW 786 – Outdoor
IP protection class	IP30	IP20	IP65
Width	26 mm	50 mm	251 mm
Height	156 mm	114 mm	251 mm
Depth	127 mm	74 mm	72 mm
Net weight	0.52 kg	0.13 kg	2.24 kg
Mounting type	Profile-rail mounting / wall mounting	Profile-rail mounting	An additional mounting plate is required for most mounting, 35 mm, DIN-rail mounting, and S7-300 profile-rail mounting
Radio frequencies for WLAN in the 5-GHz frequency band	4.9–5.8 GHz	4.9–5.8 GHz	4.9–5.8 GHz

Product characteristics, functions, components / general

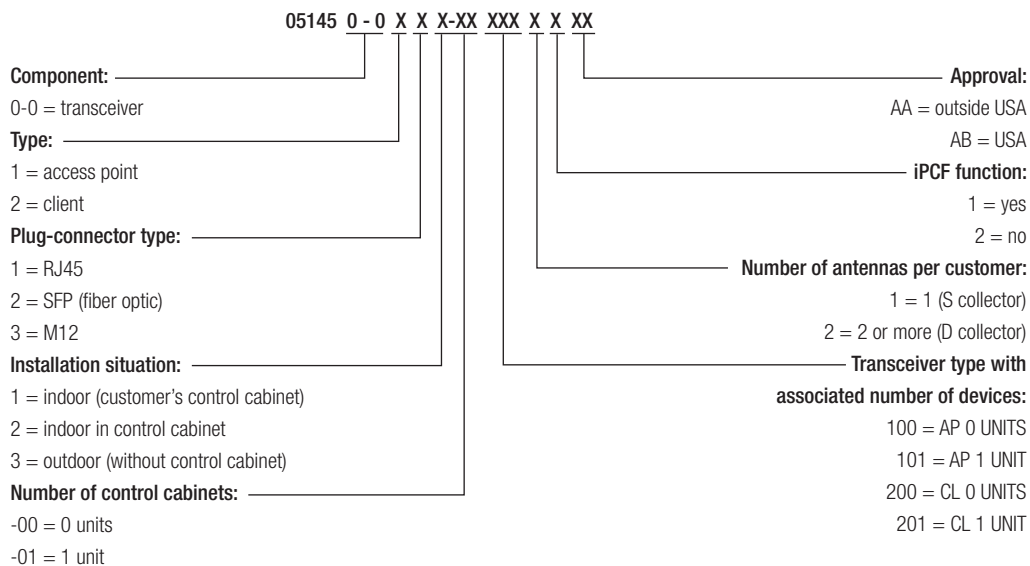
Product function / access-point mode	Yes (only CXW774)	Yes (only CXW761)	Yes
Product function / client mode	Yes	Yes (CXW722/CXW761)	Yes
Number of SSIDs	4	–	up to 16
Dual client	No	No	No
iPCF client	Yes, only in combination with KEY PLUG W780 iFeatures or KEY PLUG W740 iFeatures	Yes (only W722)	Yes, only in combination with KEY PLUG W780 iFeatures or KEY PLUG W740 iFeatures
Number of iPCF-capable wireless modules	1	1 (only W722)	up to 2

Standards, specifications and approvals

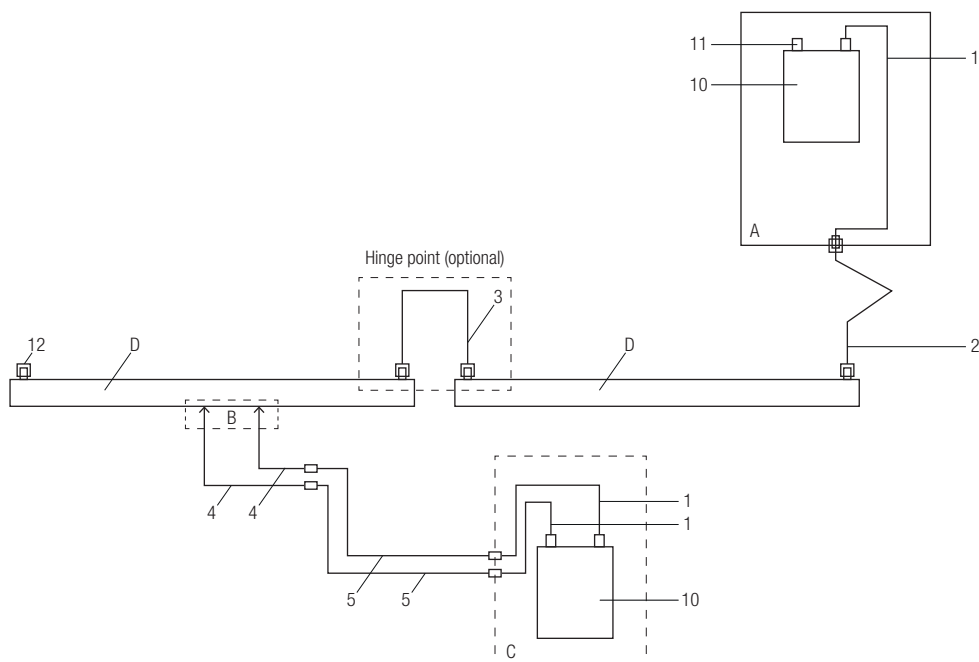
for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
for safety / CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1	UL 60950-1 CSA C22.2 No. 60950-1	UL 60950-1 CSA C22.2 No. 60950-1
Proof of suitability			
EC conformity declaration	Yes	Yes	Yes
CE mark	Yes	Yes	Yes
C tick	Yes	Yes	Yes

System Components

Key to Order Numbers



Overview and Layout of Electrical Components (End Infeed)



- | | |
|---|--|
| 1 ProfiDAT® adapter cable | 11 R-SMA plug, terminating resistor, 50 Ohm / 6 GHz / 1 W |
| 2 Feed-in connection | 12 N-connector, terminating resistor, 50 Ohm / 6 GHz / 1 W |
| 3 Hinge-point connection (optional) | A Feed-in control cabinet |
| 4 Antenna adapter cable | B Current collector |
| 5 Antenna connection | C Control cabinet (mobile side) |
| 10 ProfiDAT® transceiver with 24-V power-supply cable | D ProfiDAT® profile |

System Components

Hinge-Point Transition Element (for STS Cranes)

Part No.: 051413-01

The hinge-point transition element secures the data connection between the folding and fixed parts of the crane. The hinge-point transition element bolts to the support structure at the two fixing points.

Including Ecoflex® 10 cable

Length: 20 m

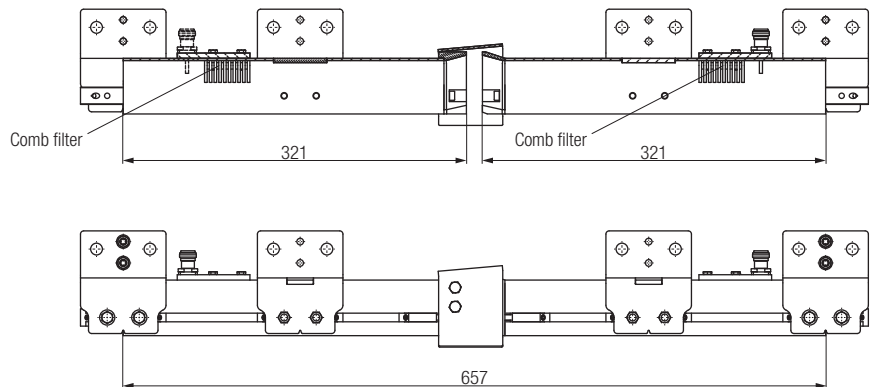
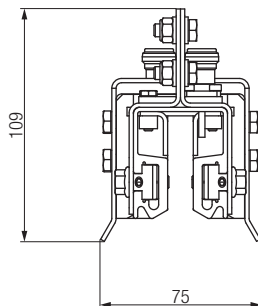
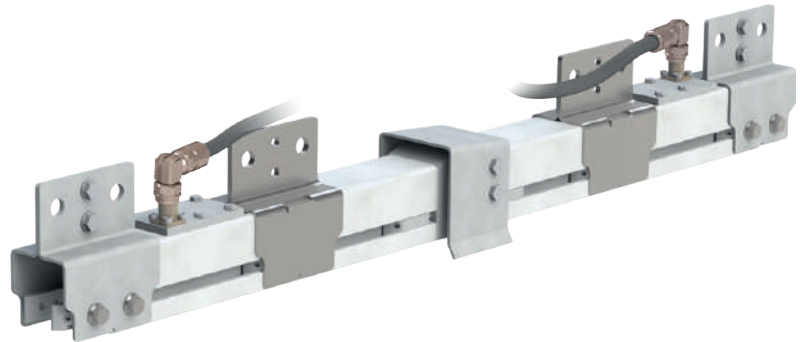
Diameter: 10.2 mm

Impedance: 50 Ω

Attenuation @ 1GHz / 100 m: 14.2 dB

f_{max}: 6 GHz

Includes 2 × angled connectors



Central Signal Feed-In

Part No.: 051415-04

Includes:

- HF coaxial cable
- Signal splitter
- Attenuator

In order to extend system lengths from 250 m to 500 m in a segment, it is possible to install a central feed-in instead of an end feed-in. In this case, the signal feed-in point or stationary transceiver (access point) is positioned in the middle of the traversing range. In order to feed the wireless signal from the transceiver into the ProfiDAT® profile, an expansion element is used for the signal feed-in. This means that the expansion element, which is designed to compensate for the temperature-dependent change in length of the profiles, fulfills two functions.

Including Ecoflex® 10 cable

Length: 2 × 10 m

Diameter: 10.2 mm

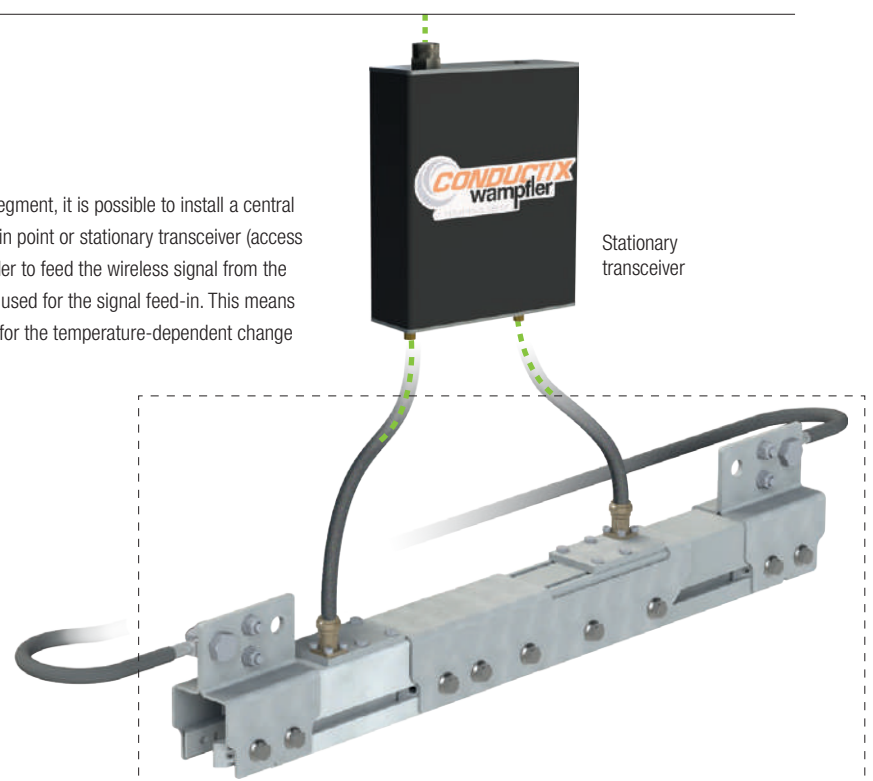
Impedance: 50 Ω

Attenuation @ 5 GHz / 100 m: 37 dB

f_{max}: 6 GHz

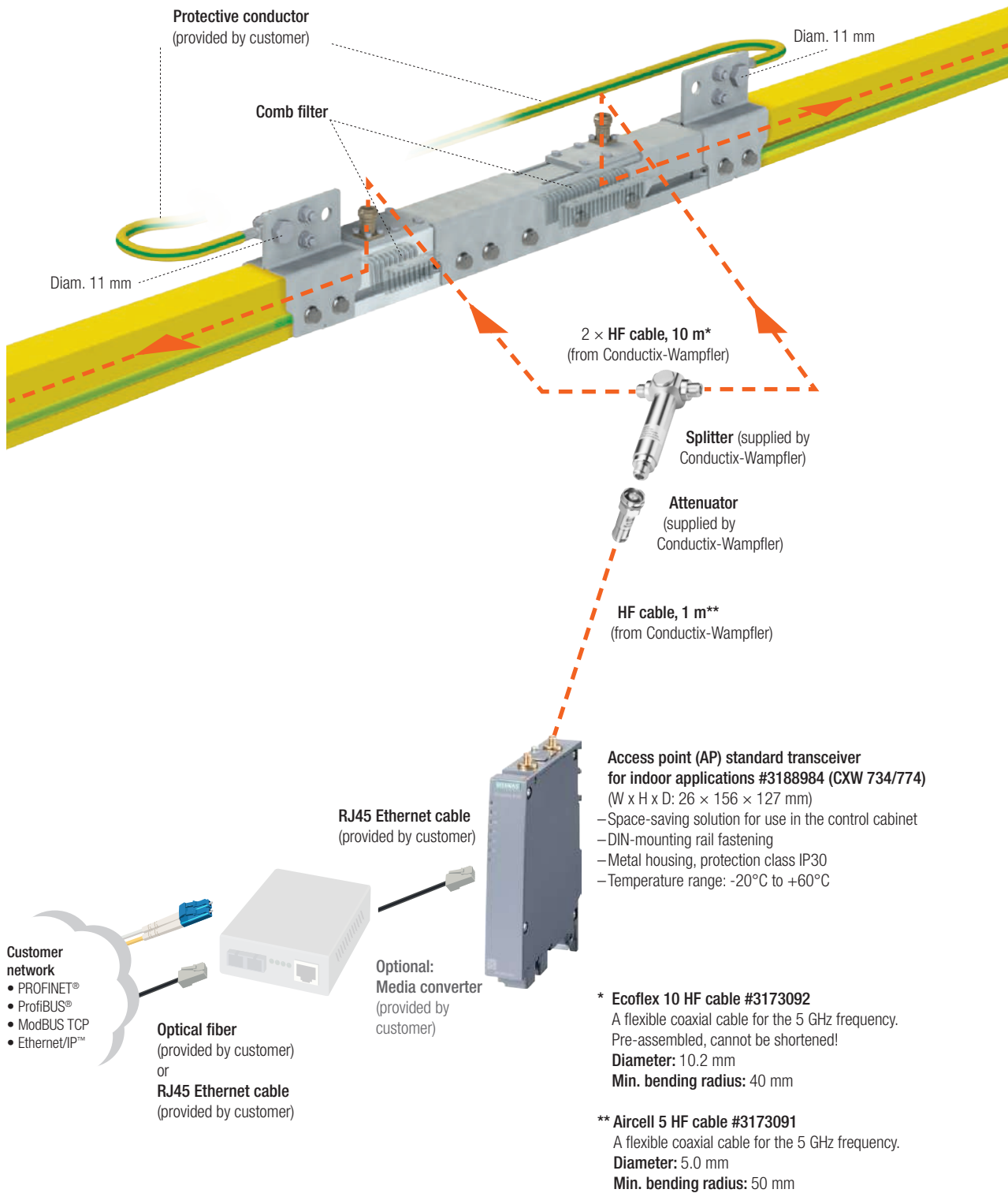
Material: Aluminum, stainless steel

For system lengths greater than 250 m



System Components

Central Signal Feed-In – Components



System Components

Expansion Element (including Fixed Point)

Part No.: 051416-01

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

Including Ecoflex® 10 cable

Cable length: 500/502/165 mm

Diameter: 10.2 mm

Impedance: 50 Ω

Attenuation @ 5 GHz / 100 m: 37 dB

f_{max}: 6 GHz

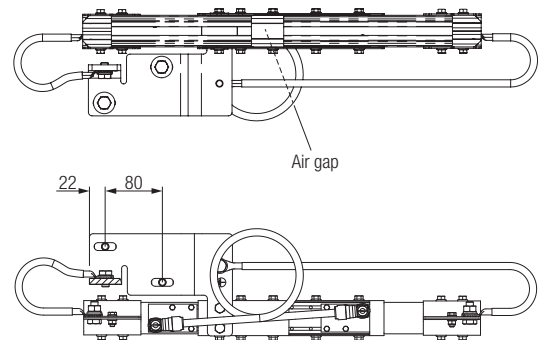
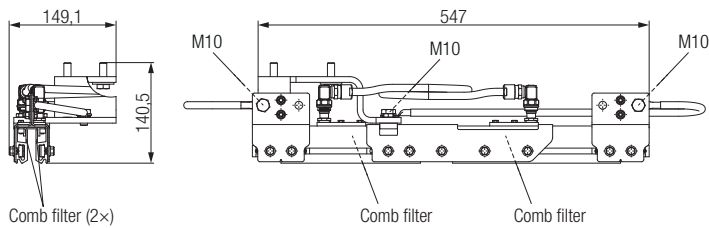
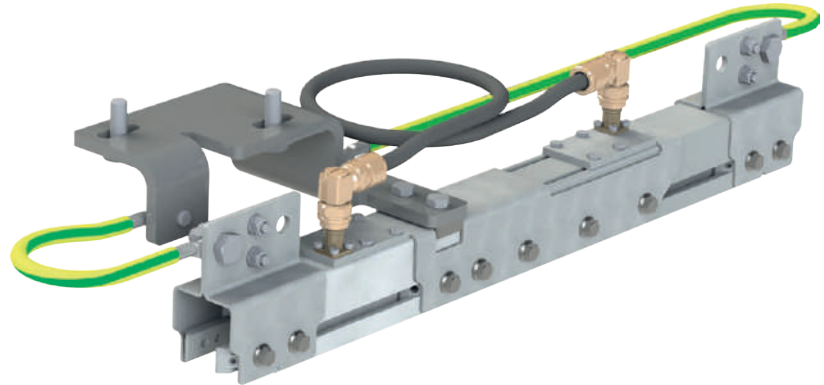
PE cable: 16 mm²

Cable length: 502/165 mm

Expansion: 0–45 mm

Includes 2 × angled connectors

Used for system lengths of 200 m or more



Technical specifications

DC resistance [Ω/1000 m] 20°C	0.000126
DC resistance [Ω/1000 m] 35°C	0.000134
Impedance [Ω/1000 m] 20°C/50Hz	0.000262
Impedance [Ω/1000 m] 35°C/50Hz	0.000266
Weight [kg]	

System Components

Central Feed-In + Expansion Element

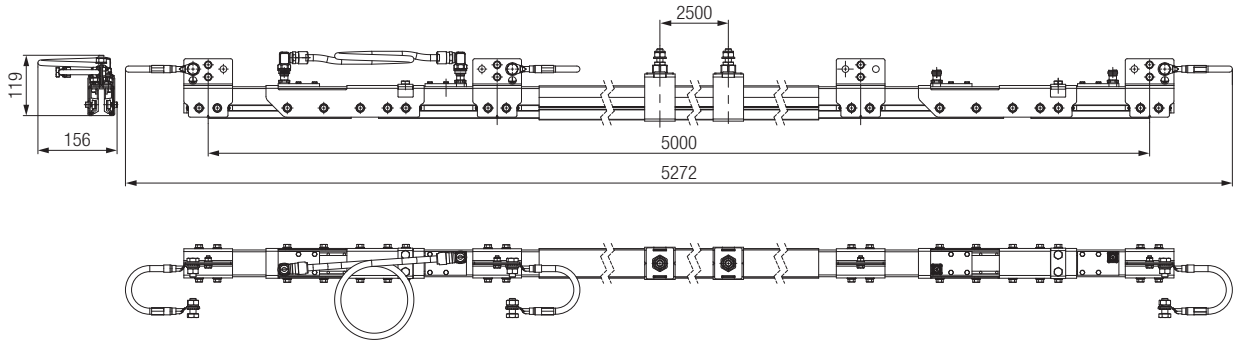
Part No.: 05-S260-0003

The 5 m rail segment consists of an expansion element, a central feed-in for the signal feed and two hanger clamps.

Since the feed-in segment also has an expansion function, the expansion gap adds up to a total of 90 mm (2×45 mm).

Includes 2×10 -m coax cable for connection to the access point transceiver.

Includes 3×1.5 -m 16-mm^2 grounding cable.



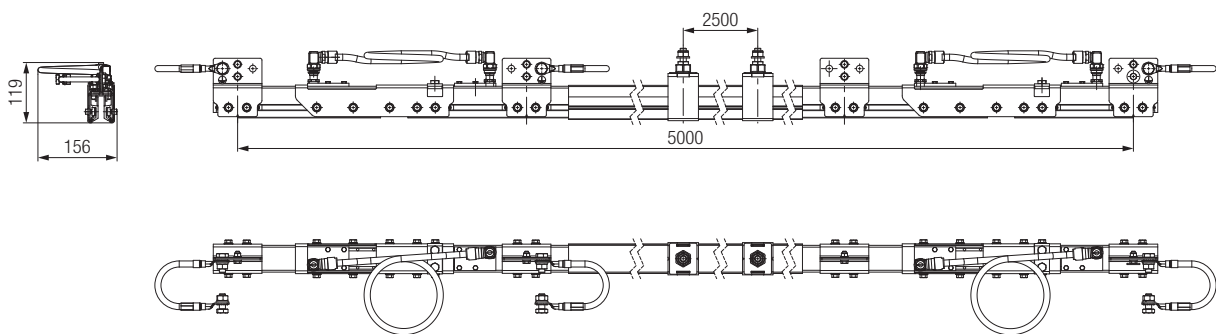
Two Expansion Elements in a 5-m Segment

Part No.: 05-S260-0004

The 5 m rail segment consists of two expansion elements, the expansion gap adds up to a total of 90 mm (2×45 mm).

This is ideal for combining with the expansion element from the 0813 conductor rail range, which also has an expansion gap of 90 mm in total.

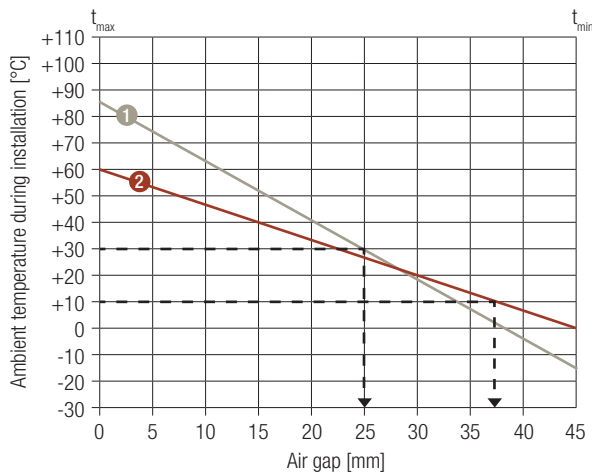
Includes 3×1.5 -m 16-mm^2 grounding cable.



System Components

Calculating the Air Gap/Expansion Elements

Determining the Air Gap



Instructions:

- t_{min} lowest temperature occurring in the given application
 t_{max} highest possible temperature in the given application
1. Enter a tie line from t_{min} to t_{max} .
 2. Enter a horizontal line at the ambient temperature during installation.
 3. Drop a line down from the intersection of the two lines, and read off the air gap to be installed.

Examples:

1. Temperature range: -15 °C to +85 °C
 Ambient temperature during installation: +30 °C
 Air gap: 25 mm
2. Temperature range: 0 °C to +60 °C
 Ambient temperature during installation: +10 °C
 Air gap: 37 mm

Number of Expansion Elements for Systems over 200 m

For conductor rail systems longer than 200 m, expansion elements must be placed at certain intervals in accordance with Diagrams 1 & 2. Specific distances must be observed for special systems and when the fixed point is located at the end of the system. Please contact us with any questions.

Number of Expansion Elements (open end)

Number of Expansion Elements	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Inter-mediate length [z]	
	Total length of the conductor rail [m]																	
Δt_{tot}	10	300	500														189	
	20	295	389	484	500												95	
	30	263	326	389	452	515											63	
	40	247	295	342	389	436	484	531										47
	50	238	276	313	351	389	427	465	503									38
	60	232	263	295	326	358	389	421	452	484	515							32
	70	227	254	281	308	335	362	389	416	443	470	497	524					27
	80	224	247	271	295	318	342	365	389	413	436	460	484	507				24
	90	221	242	263	284	305	326	347	368	389	410	431	452	473	494	515		21
	100	219	238	257	276	295	313	332	351	370	389	408	427	446	465	484	500	19

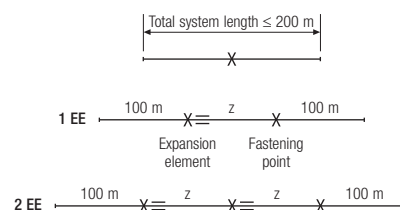
Maximum length: 500 m
 Max. expansion possible for expansion element: 45 mm
 Expansion coefficient of aluminum: 0.0000238 1/K

Gap:

$$G = L \times \Delta t \times \alpha$$

$$L = \frac{G}{\Delta t \times \alpha}$$

Diagram 1 – Open ends:



...

System Components

Calculation of Expansion Elements

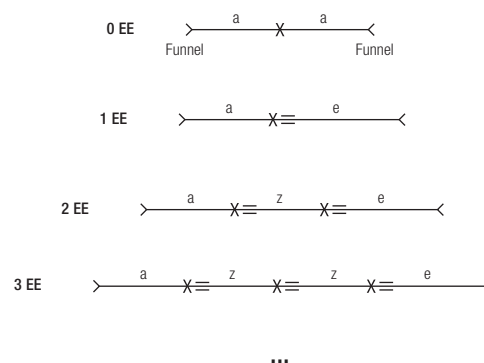
Number of Expansion Elements (Limited End/Funnel)

No. of expansion elements		0	1	2	3	4	5	6	7	8	9	10	Initial length, a	Intermediate length, z	End length, e
Total length of the conductor rail [m]															
Δt_{tot}	10	189	195	295	395	495							95	100	100
	20	95	147	242	336	431	500						47	95	100
	30	63	126	189	252	315	378	441	500				32	63	95
	40	47	95	142	189	236	284	331	378	425	473	520	24	47	71
	50	38	76	113	151	189	227	265	303	340	378	416	19	38	57
	60	32	63	95	126	158	189	221	252	284	315	347	16	32	47
	70	27	54	81	108	135	162	189	216	243	270	297	14	27	41
	80	24	47	71	95	118	142	165	189	213	236	260	12	24	35
	90	21	42	63	84	105	126	147	168	189	210	231	11	21	32
	100	19	38	57	76	95	113	132	151	170	189	208	9	19	28

Number of expansion elements		11	12	13	14	15	16	17	18	19	20	Initial length, a	Intermediate length, z	End length, e
Total length of the conductor rail [m]														
Δt_{tot}	10											95	100	100
	20											47	95	100
	30											32	63	95
	40											24	47	71
	50	454	492	500								19	38	57
	60	378	410	441	473	500						16	32	47
	70	324	351	378	405	432	459	486	500			14	27	41
	80	284	307	331	355	378	402	425	449	473	496	12	24	35
	90	252	273	294	315	336	357	378	399	420	441	11	21	32
	100	227	246	265	284	303	321	340	359	378	397	9	19	28

Maximum length: 500 m
 Max. expansion possible for expansion element: 45 mm
 Max. expansion possible for funnel: 22.5 mm
 Expansion coefficient of aluminum: 0.0000238 1/K

Diagram 2 – Limited ends/funnels
(minimum distance to limit = 50 m):



Note

- No heating by the current load as this is a ground conductor rail
- Total systems lengths greater than 500 m only after consultation

Description of Interfaces

Maximum length of the feed cable	10 m
Profile length	5000 mm
Outer dimensions of the profile (width × height)	48 mm × 56 mm
Distance between poles	80 mm
Power supply: ProfiDAT® transceiver	24 V DC
Maximum data transmission rate	100 Mbit/s
Maximum traversing speed of the mobile transceiver	300 m/min
Interface	100 Mbit/s, RJ45 or LC
Permissible rated current for the conductor-rail system (L, N)	1000 A
Maximum suspension interval for hanger clamps	2.5 m (for E-RTG: 3 m)

Electrical Interfaces

- Data interface
- Power supply/control voltage
- Power feed to conductor rails
- PE
- PE connector cable at the hinge point

Data interface:

ProfiDAT® 100 Mbit/s, RJ45 connection. At both ends of the ProfiDAT® system, customers must provide an RJ45 connector to connect the ProfiDAT® with their system.

- 1 × RJ45 socket

- TCP IP signal transmission (Ethernet protocol)

- PLC communication + safety-related control-signal communication

- Only data transmission of safety-related signals; additional safety equipment + controllers (PROFIsafe devices, etc.) are not included.

- Video/audio signals in digital Ethernet format

- Analog video signals converted into a digital format (by a multiplexer, for example)

PE interface:

The interface for the customer's grounding cable is located at the PE rail connector (Part No.: 051412-02). At the flap (M10 drilled hole), the PE cable must be connected according to the applicable standards.

Power supply / control voltage:

The controller of the ProfiDAT® data-transmission system requires the following power supply:

AC power supply for the feed-in control cabinet: 100–500 V, 50/60 Hz

DC control voltage for transceivers: 24 V

Mechanical Interface

• Current collector

The current collector on the ProfiDAT® profile performs a dual function. Two divided carbon brushes guide the current collector in the ProfiDAT® profile.

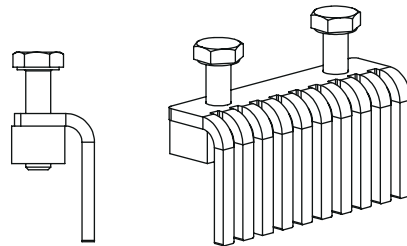
The carbon brushes guarantee the connection to the ground cable (ProfiDAT® profile), while the two built-in antennas support the data transmission.

The antennas are inserted into the slot in the ProfiDAT® profile and are electrically isolated from the carbon brushes.

Description of Interfaces

Comb Filter

A Comb filter filters certain frequencies from signal groups.
 This prevents the radio wave from escaping from the profile.
 No interference with surrounding radio systems.



Central Feed-in

When the system length exceeds 250 m (or segments the data path), the signal is fed in over stretches or by central feed-in. To this end, the signal is fed through an expansion element, in which case the maximum system length of the data path is 250 m per side.

Ethernet

"Industrial Ethernet" is the generic term for all efforts to make the Ethernet standard usable for networking devices used in industrial production. The characteristics of pure Ethernet technology include the following points:

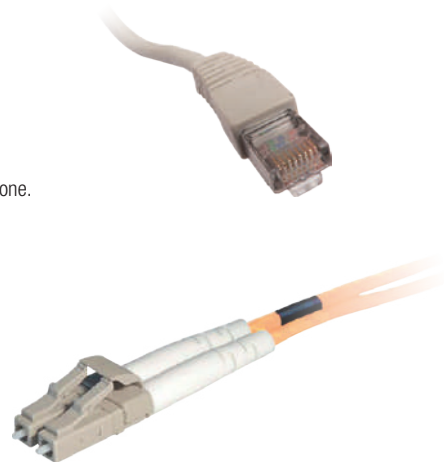
- Standardization in accordance with IEEE 802.3
- Transmission via twisted-pair or fiber-optic cable
- Connectors for copper wiring: RJ45 (see Figure on the right)
- Maximum cable length of 100 m for twisted-pair cables

Industrial Ethernet encompasses many different protocols, of which the well-known PROFINET® is only one.

Transmittable protocol types:

Industrial Ethernet protocol	Indirect transmission
Direct transmission	
EtherNet/IP™	ProfiBUS®
PROFINET® IO	
Modbus TCP	

Further protocols are possible after technical clarification.



ProfiBUS®

Optionally, the ProfiBUS® connection (DP/DP coupler) can be implemented using specially developed translation blocks. In this case, the customer's ProfiBUS® protocol is transparently translated and can be transmitted directly by the standard ProfiDAT® transceiver. To do this, a ProfiBUS® master module is connected directly to a transceiver access-point module; on the opposite side, a ProfiBUS® slave module is connected to a client transceiver.



Description of Interfaces

Power over Ethernet (PoE)

Power over Ethernet (PoE) encompasses standardized procedures for supplying power to network terminals via the network cable.

Power over Ethernet eliminates the need for the separate power connector and plug-in power-supply units.

Siemens-manufactured WLAN devices offer this option, so the WLAN access point and client can be supplied with power directly via the Ethernet cable or Ethernet interface.

Wireless LAN in an industrial environment

In many environments, a wireless network is the preferred medium due to its special characteristics.

However, the number of wireless communication devices installed will continue to increase, making it increasingly difficult to communicate wirelessly at the 2.4-GHz and 5-GHz radio frequencies.

Various radio technologies also share the same frequency band, leading to a certain coexistence of different systems. When planning and implementing the use of radio networks, special attention must be given to avoid signal interference. The slotted-waveguide technology used with ProfiDAT® eliminates this planning effort and the coexistence of other wireless systems has no interfering influence on the ProfiDAT® system. Similarly, the screened wireless signal in the slotted waveguide has no effect on the communication of nearby systems.

PROFINET®

The PROFINET® technology is developed by Siemens and the ProfiBUS® user organization. It is the implementation of ProfiBUS® for networking technology, bringing together the advantages of Ethernet and the successful field bus. It is used for applications where fast data communication is required in combination with industrial IT functions.

Performance classes:

- TCP/IP: Open communication via Ethernet TCP/IP without real-time requirements
- RT: Real-time communication for I/O data transfer in automation technology
 - Reaction times less than 10 ms for time-critical applications
 - RT data has a higher priority than TCP/IP data

The specified connectors are the RJ45 connector for data and the M12 connector for electrical transmission over copper wires, and the LC connector for optical transmission via optical fibers.

- The PROFIsafe protocol can be used for safety-related applications up to SIL3 in accordance with IEC 61508 / IEC 62061 oder PL "e" / category 4 in accordance with ISO 13849. The required safety class depends on the end use and the definition of the safety functions.

EtherNet/IP™

The Ethernet Industrial Protocol (EtherNet/IP™) is an open standard for industrial networks.

EtherNet/IP™ was developed by Rockwell Automation and the ODVA (Open DeviceNet Vendor Association) and standardized in the international IEC 61158 series of standards. EtherNet/IP™ is a widely used communication standard, especially in the US market and where Rockwell controllers are used.

ProfiDAT® makes the direct and transparent transmission of EtherNet/IP™ possible.

Modbus/TCP

Since its development by Schneider Electric in 1979, the Modbus protocol has been a de-facto standard for industrial communications. It is effective, easy to implement, and freely available both to device vendors and to users.

With ProfiDAT®, the direct and transparent transmission of Modbus/TCP is possible.

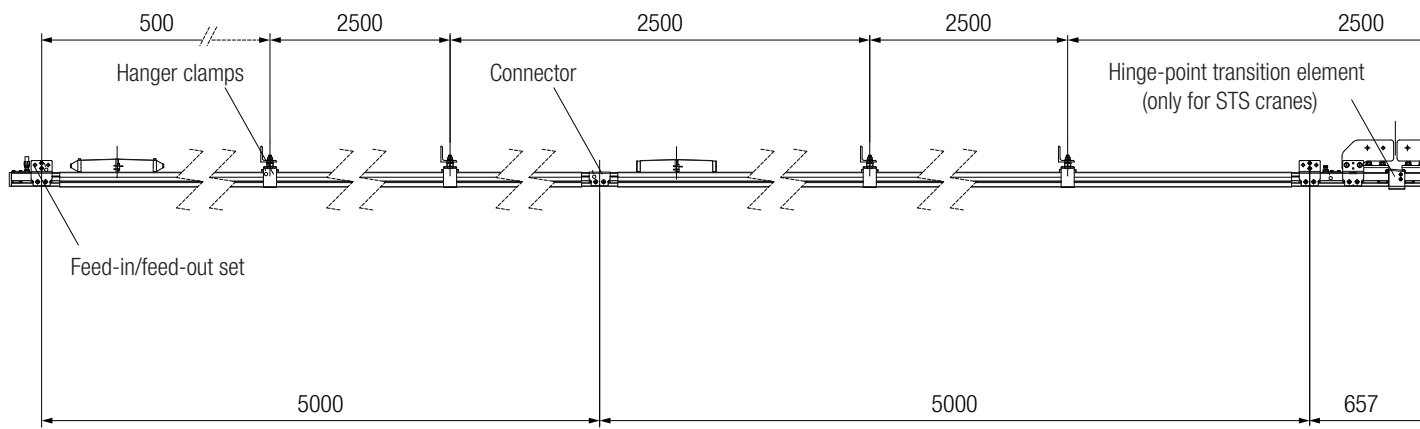
Example of the System Composition

Sample Order – Required Information (Basis for the Quotation)

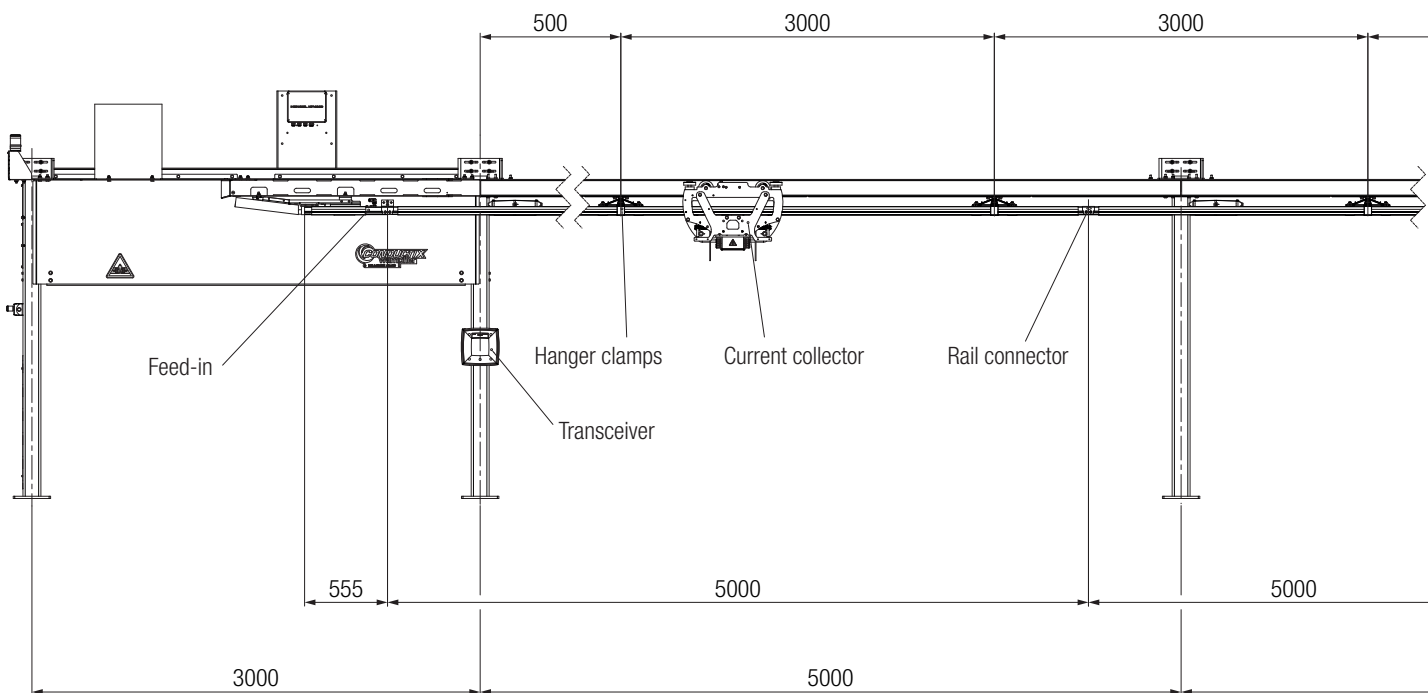
Application:	Data transmission system for an automatic gantry crane
System length:	150 m
Number of systems:	1
Number of vehicles/systems:	1
Arrangement:	Horizontal (downward-facing opening)
Number of poles:	1 × data transmission including PE (replaces PE in the 0813 energy system)
Voltage:	400 V / 50 Hz
Feed-in:	End feed-in
Traversing speed:	Approx. 60 m/min
Existing PLC system:	SIEMENS S7-400
Protocol:	Ethernet (TCP/IP; layer 2)
Bus system:	PROFINET® & PROFIsafe
Interface:	RJ45
Safety PLC integrated:	Yes (by customer)
Data to be transferred:	Control-signal data (yes) Safety-signal data (emergency stop, etc.) Video signals; digital signals
Environmental conditions:	Metal dust (scrap-metal shredder on adjacent site); Proximity to water (German inland port); grain dust
Ambient temperatures:	approx. +5°C to approx. 45°C
Energy supply:	Yes, already installed (0813 series – 500 A – 150 m – 4 pole; 3×PH + PE)
Fastening:	Suggestion: fasten to existing structure installed on site. Support interval: max. 2500 mm
Max. traversing speed:	5 m/s (300 m/min; 18 km/h) for ProfiDAT®
Cable length:	10 m transceiver to antenna; 10 m antenna cable

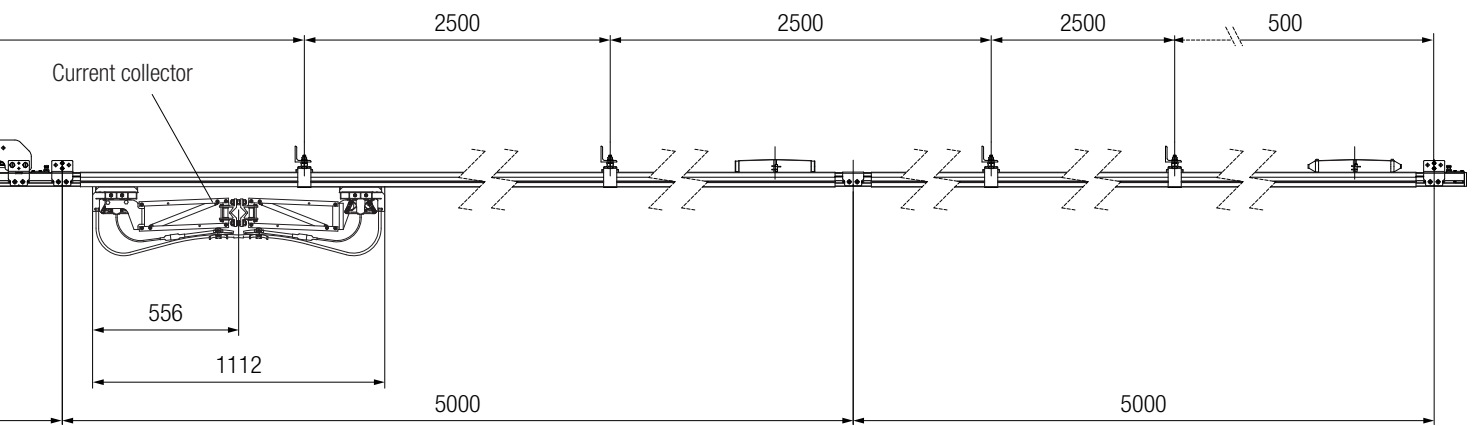
Part No.:	Quantity	Description	Comment
051411-3512	30	ProfiDAT® conductor rail, PVC PE 5 m	–
051414-03	62	ProfiDAT® hanger clamps	Oversupply of two items
051412-01	15	ProfiDAT® connectors	The feed-in/feed-out set includes connectors (2 units), take into account the number of PE connectors
051412-02	13	ProfiDAT® PE connector	Used every 25 meters
051415-01	1	Feed-in/feed-out set 0514	Use of end infeed
051410-1011	1	ProfiDAT® S collector	Since there is 1 consumer / traversing range without interruption
3188984	1	Transceiver access point	Custom configured
3188984	1	Transceiver client	Custom configured
051419-01	1	Spare parts kit	–
–	1	Commissioning	–

System Layout



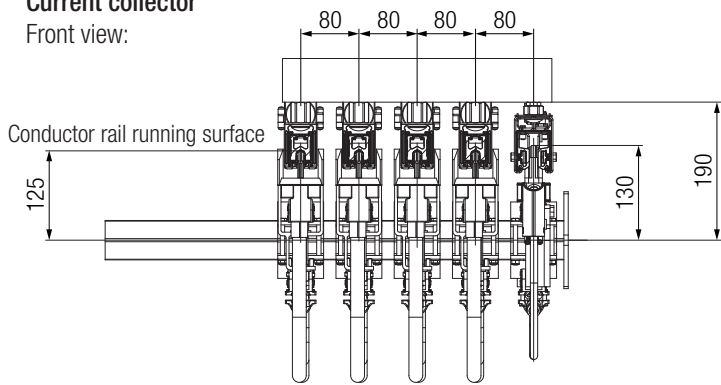
System Layout E-RTG Crane





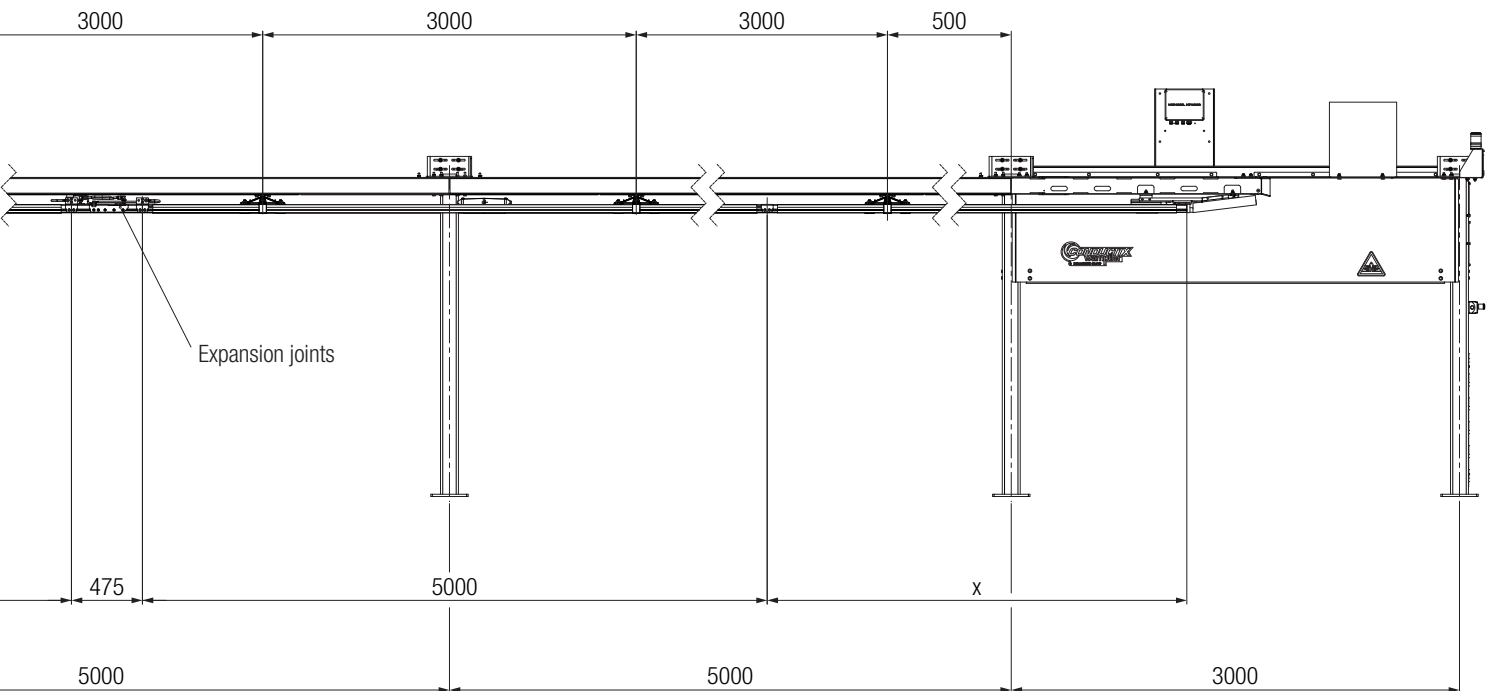
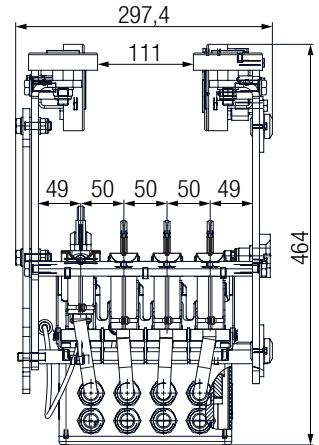
Current collector

Front view:



Collector trolley

Front view:



Spare Parts and Accessories

Small Parts Replacement Package

Part No.: 051419-01

Contents:

- 4 × Collector brush
- 1 × Heat-shrink sleeve
- 1 × Terminating resistor
- 4 × Hanger clamp
- 2 × Rail connector
- 4 × Cylinder-headed screw, M3
- 2 × Cylinder-headed screw, M5
- 4 × Hexagonal bolt, M4
- 2 × Nut, M4
- 1 × Cable lug



Spare Parts for Current Collectors

Part No.: 05-K154-0005

Set of collector brushes



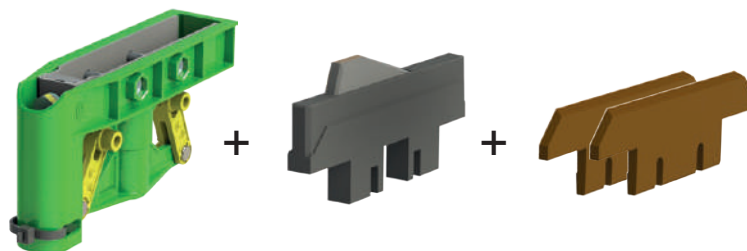
Part No.: 05-A150-0002

Antenna



Part No.: 051410-2

Replacement current collector (set of collector brushes with antenna and collector head)

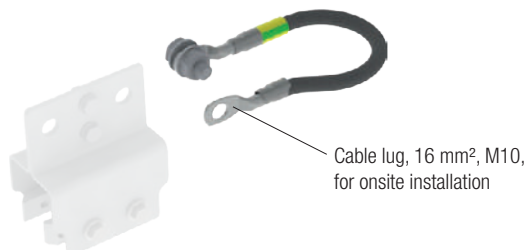


Grounding Kit

Part No.: 05-Z009-0004

Connecting cable, 16 mm², length 2 m

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



Spare Parts and Accessories

Transceiver Housing

Part No.: GE-3198151

Polycarbonate plastic housing with knockouts

Dimensions 254 × 180 × 111 mm

Temperature range: -35°C to +80°C

Material: glass-fiber-reinforced polycarbonate

Color: RAL7035

Protection class: IP66

Cable entry: 24 × M20
4 × M29/32
4 × M32/40



Anti-condensation heating

In outdoor areas, the conductor rail should be protected from the environment as much as possible when installed. The ProfiDAT® data transmission system is suitable for use in harsh environmental conditions. However, condensation, frost or ice can cause insulation faults and oxidation of the rail, which increases the wear of the contact brushes. Weather-related deposits can be largely prevented with the help of anti-condensation heating. The anti-condensation heating consists of the trace-heating cable, the wiring components and the temperature-dependent power supply. The heating power required depends on numerous parameters. It must be taken into consideration that whether ice forms on a profile or not depends on the installation situation of the profile and its environment,

A trace-heating cable is inserted into the slotted waveguide and supplied with external auxiliary power as a conductor loop. The trace-heating cable is a resistive heating cable used in different sizes. It is fitted between the profile rail and the profile insulation (see the figure below).

The controller of the profile anti-condensation heating has temperature and dew-point sensors (see the figure below right). The anti-condensation heating is switched on if the temperature falls below a certain value and reaches the dew point. Our sales department will be happy to assist you with the design.

Please contact us with your detailed inquiry.





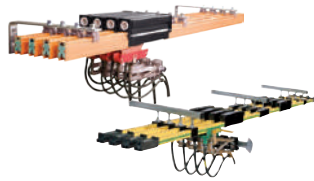
Your Applications – our Solutions

ProfiDAT® from Conductix-Wampfler represents only one of the many solutions made possible by the broad spectrum of Conductix-Wampfler components for the transport of energy, data and fluid media. 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 all of Conductix-Wampfler's Business Units for hands-on engineering support – coupled with the perfect solution to meet your energy management and control needs.



Festoon systems

It's hard to imagine Conductix-Wampfler cable trolleys not being used in virtually every industrial application. They're reliable and robust and available in an enormous variety of dimensions and designs.



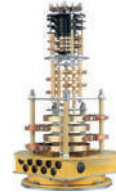
Conductor rails

Whether they're enclosed conductor rails or expandable single-pole systems, the proven conductor rails by Conductix-Wampfler reliably move people and material.



Non-insulated conductor rails

Extremely robust, non-insulated conductor rails with copper heads or stainless steel surfaces provide the ideal basis for rough applications, for example in steel mills or shipyards.



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!



Motorized Cable & Hose Reels

Motorized reels by Conductix-Wampfler hold their own wherever energy, data, media and fluids have to cover the most diverse distances within a short amount of time – in all directions, fast and safe.



Spring Cable & Hose Reels

With their robust and efficient design Spring Cable and Hose Reels from Conductix-Wampfler are unbeatably reliable in supplying energy, signals, data and fluids to a vast range of tools, cranes and vehicles.



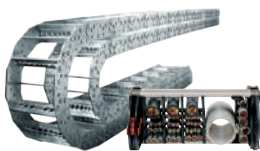
Inductive Power Transfer IPT®

The no-contact system for transferring energy and data. For all tasks that depend on high speeds and absolute resistance to wear.



Retractors and Balancers

Our wide range of high reliable retractors and balancers remove the load from your shoulders and allow you to reach top productivity.



Energy guiding chains

The "Jack of all trades" when it comes to transferring energy, data, air and fluid hoses. With their wide range, these energy guiding chains are the ideal solution for many industrial applications.



Jib booms

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



Conveyor systems

Whether manual, semiautomatic or with Power & Free – flexibility is achieved with full customization concerning layout and location.

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.com/
contact-search](http://www.conductix.com/contact-search)**



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