ProfiDAT®*compact*
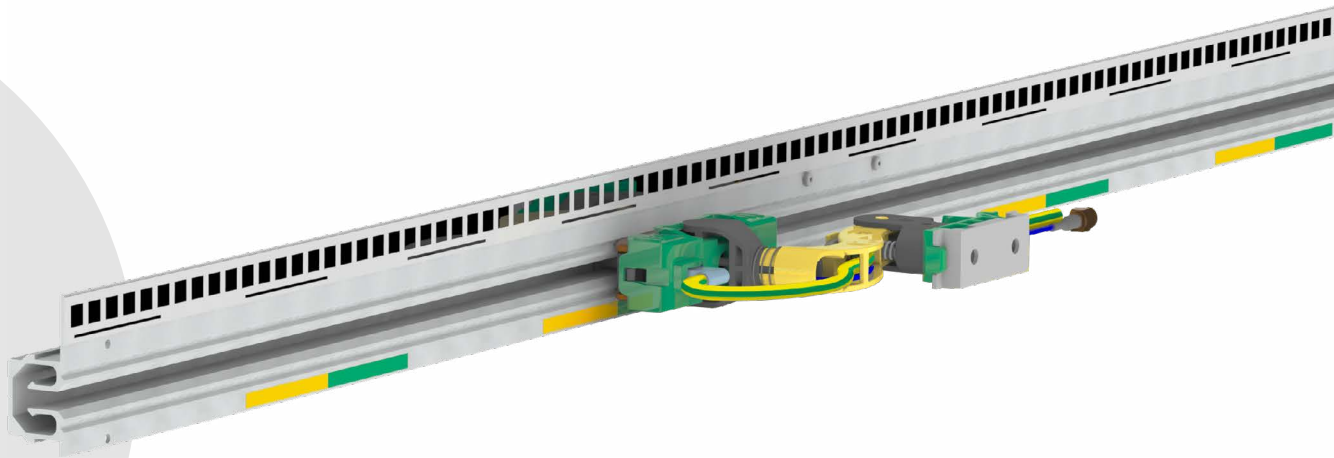# Data Transmission System
Program 0515
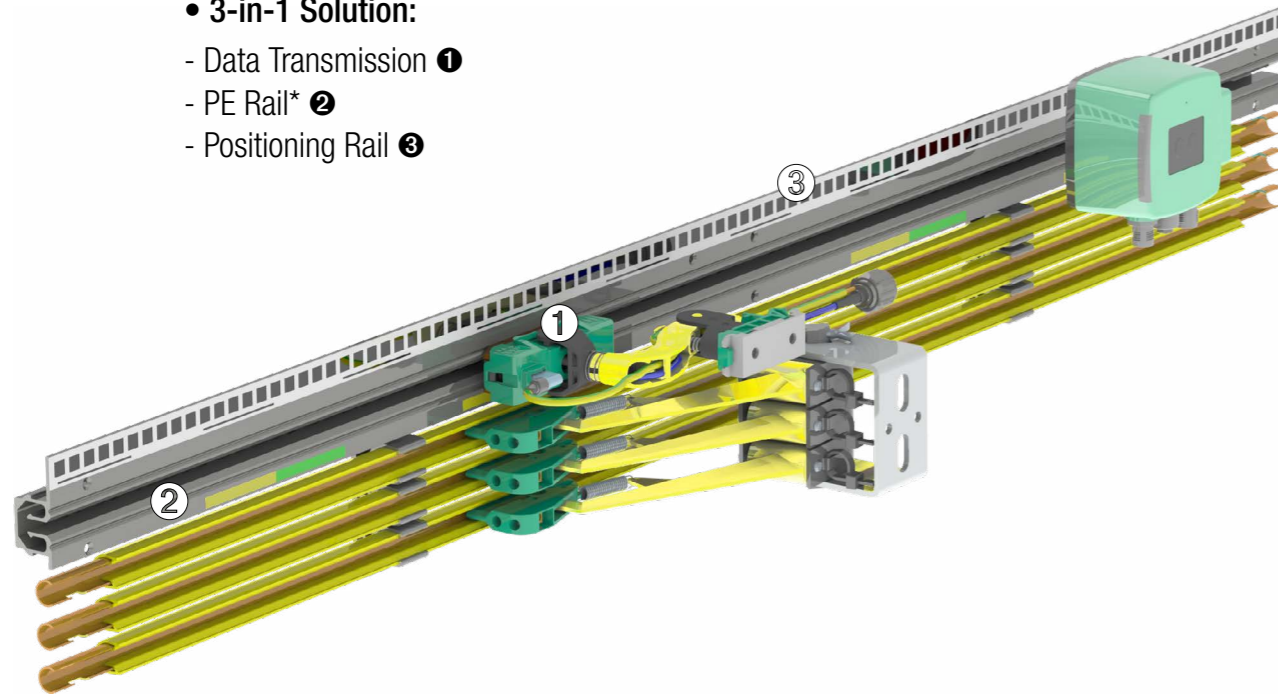
CONDUCTIX
wampfler

Contents

System Description

General Information

ProfiDAT®compact is a system for the continuous bi-directional data transmission between a local network and moving consumers. The data transmission is based on WiFi and occurs when the data signal transmits from a stationary antenna to the collector traveling along slotted waveguides.

ProfiDAT®compact system can be installed in parallel to a conductor rail system, acting as a grounding conductor rail, or with an integrated positioning system. Here, the bar or matrix code band attaches to the ProfiDAT®compact rail, with an optical sensor positioned next to the collector or current collector.

• 3-in-1 Solution:
- Data Transmission ❶
- PE Rail* ❷
- Positioning Rail ❸

ProfiDAT®compact with 0811 conductor rails and optical reading head

System Description

Functional Principle of the Slotted Waveguide

A waveguide is a hollow profile with conductive walls that conducts high frequency radio waves. The radio waves are introduced by an antenna at one end and travel down the length of the waveguide. The geometry of the profile determines which range of radio frequencies can be transmitted with low loss.

By taking into account certain electromagnetic properties, it is possible to introduce a longitudinal slot along one side without leakage of radio waves into or out of the waveguide. This slot allows a collector to run inside the waveguide, producing a continuous, robust communication channel for a moving vehicle.

Compared to communication in free space, the radio waves do not spread out, which allows a high quality signal to extend over longer distances. Furthermore, the high isolation of the waveguide means that it can operate in the vicinity of other radio systems on the same frequency without interference issues.

High signal strength
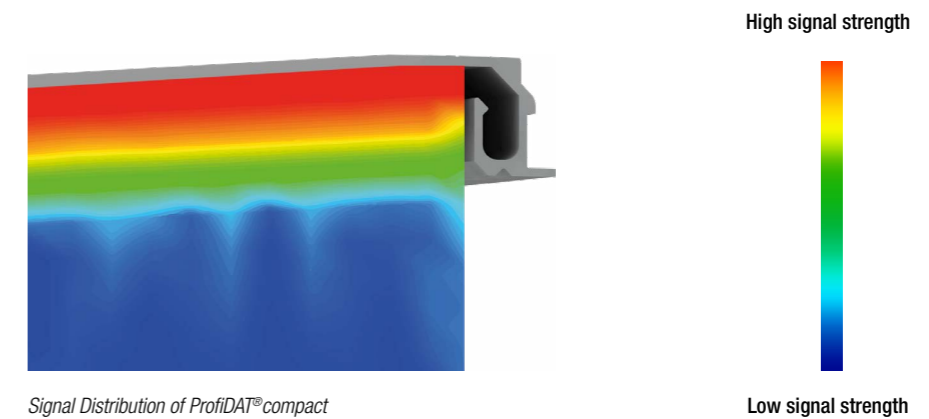
Signal Distribution of ProfiDAT®compact

Low signal strength

Benefits of ProfiDAT®compact

- **Highly safe and reliable data transmission**
  - **Lowest interference potential** with other wireless systems through slotted waveguide technology
- **Use of well-known SIEMENS IWLAN transceiver and their iFeatures**
  - **Real-time data transmission through PROFINET/PROFIsafe prioritization**
  - **Parallel** transmission **of control and video/audio data**
  - **Unlimited system lengths** through rapid roaming
  - **Easy integration** into the customer's network
- **Smart and fully integrated** solution through unique 3-in-1 functionalities:
  - Data transmission
  - PE* rail
  - Positioning rail
- **The most compact** slotted waveguide available
  - **Considerable installation space savings**
  - **Considerable reduction of installation time** (only 1 instead of 3 systems need to be installed)
- **Compatibility to lifters, transitions, curves, etc.**

Main Applications

Intralogistics:
- Automated Storage and Retrieval Systems (AS/RS)
- Shuttles
- Transfer cars
- Sorters
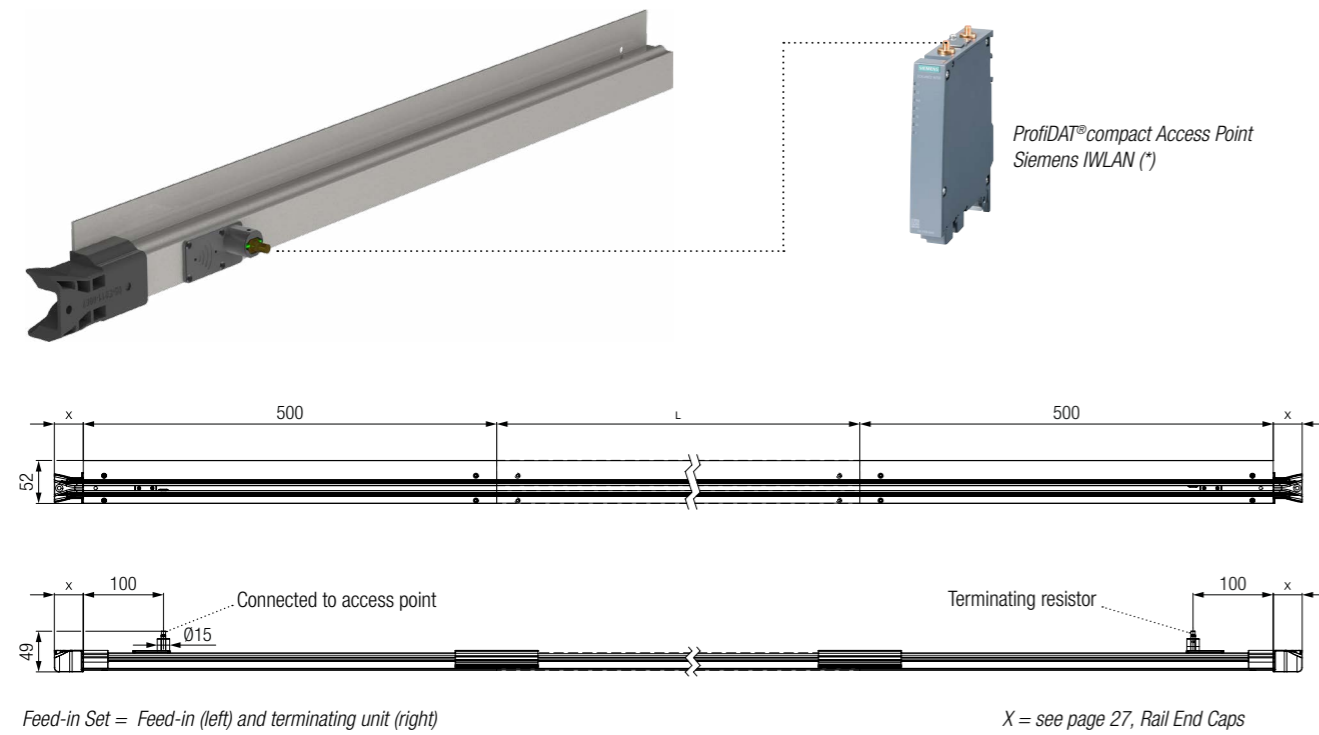- Electrified Monorail Systems (EMS)

Main Components

ProfiDAT®*compact* systems consist of three main components:

- • Feed-in sets
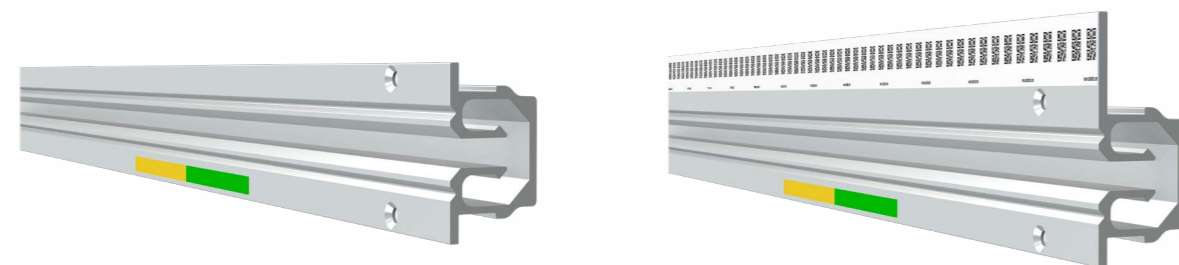- • ProfiDAT®*compact* rails
- • Mobile units

Feed-In

The stationary feed-in set introduces data signals from a local network into the ProfiDAT®*compact* rail and terminates them at the end of a segment with the help of a terminating resistor. An access point connected to the feed-in antenna functions as interface between the customer's network and the ProfiDAT®*compact* system.

ProfiDAT®*compact* Access Point
Siemens IWLAN (*)

Feed-in Set = Feed-in (left) and terminating unit (right)

X = see page 27, Rail End Caps

Connected to access point

Terminating resistor

ProfiDAT®*compact* Rail

The ProfiDAT®*compact* aluminum rails guide the WiFi signals and shields them against interference with other wireless systems. In addition, the ProfiDAT®*compact* rails can be used as grounding conductor rails. Furthermore, a version of the rail with integrated positioning strip is available. On this strip a bar code or matrix code band can be attached in order to detect a mobile vehicle's position with the help of an optical sensor.

ProfiDAT®compact rail without (left) and with positioning strip (right)

Main Components

Mobile Unit

The mobile unit includes the ProfiDAT®*compact* collectors and clients. The antennas pull the signal from the rail and sends them to the connected client mounted on a mobile vehicle. The antennas also have integrated carbon brushes that connect the mobile vehicle to the ProfiDAT®*compact*, and thus allowing the rail to act as a ground (PE). The clients interface with ProfiDAT®*compact's* WiFi system and the customers network on the mobile vehicle.

Antenna

Carbon Brush

HF cable (blue)

ProfiDAT®compact collector

PE cable

*ProfiDAT®compact Client
Siemens IWLAN (*)*
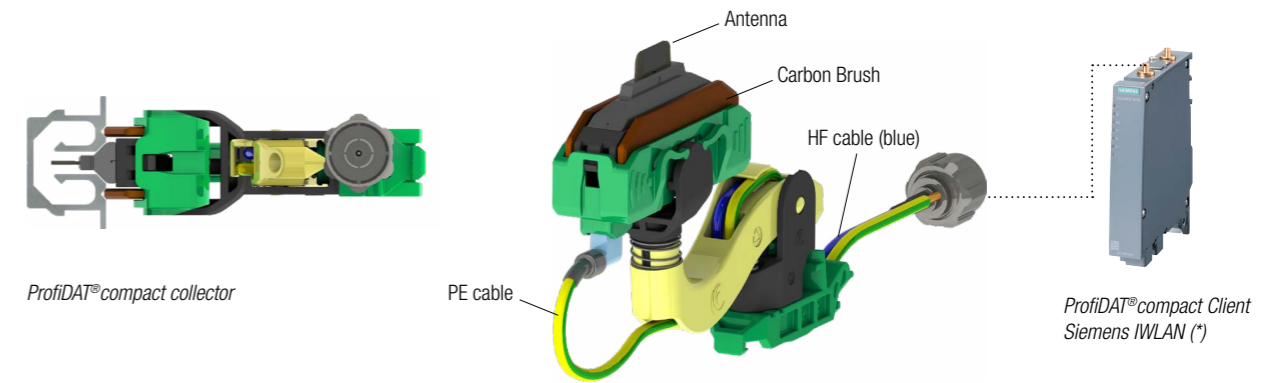
PE* Rail Functionality

For the PE functionality, the ProfiDAT®*compact* rail must be connected to the customer's PE cable. The PE connector must be installed next to the feed-in units and the cable must be marked as PE, meaning it must be colored in yellow and green. Furthermore, its diameter must be able to carry at least half of the phase current. The PE cable is connected to the PE connector using a nut screw, a washer and a cable lug. The other end of the cable must be connected to the customers' PE. All grounding and PE connection points must be marked with a grounding sign.

(*) Abb: © Siemens AG 2019, Alle Rechte vorbehalten

* PE = Protective Earth (Grounding)
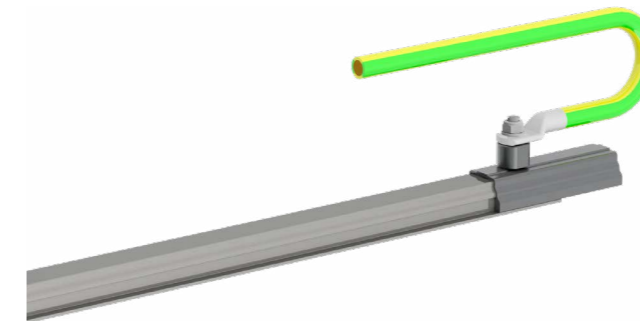
Main Components

Positioning Functionality

The ProfiDAT® *compact* rail with integrated positioning strip offers an additional space to affix a code band with a maximum height of 20 mm onto the slotted waveguide without the need to install any other components. Thus, the ProfiDAT® *compact* system saves even more space, as no additional barcode holder is required. With the addition of an optical reading head, which can be installed next to the current collectors, this code band delivers information about the position of the mobile vehicle(s). Both code band and reading head can be sourced from different suppliers (not included in the scope of delivery). If you need advice on a suitable positioning system we are pleased to help you find the best solution.
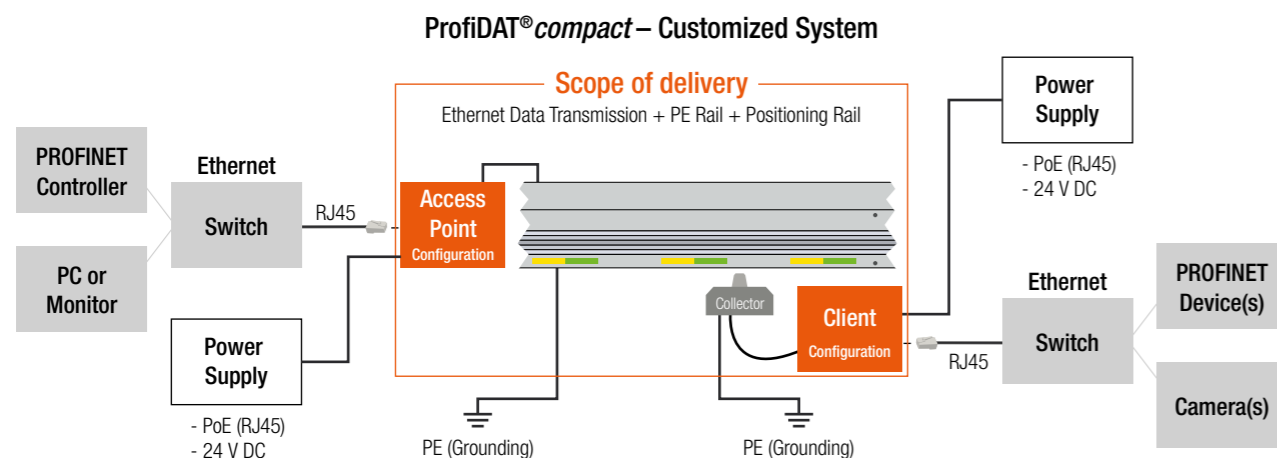
max. 20 mm
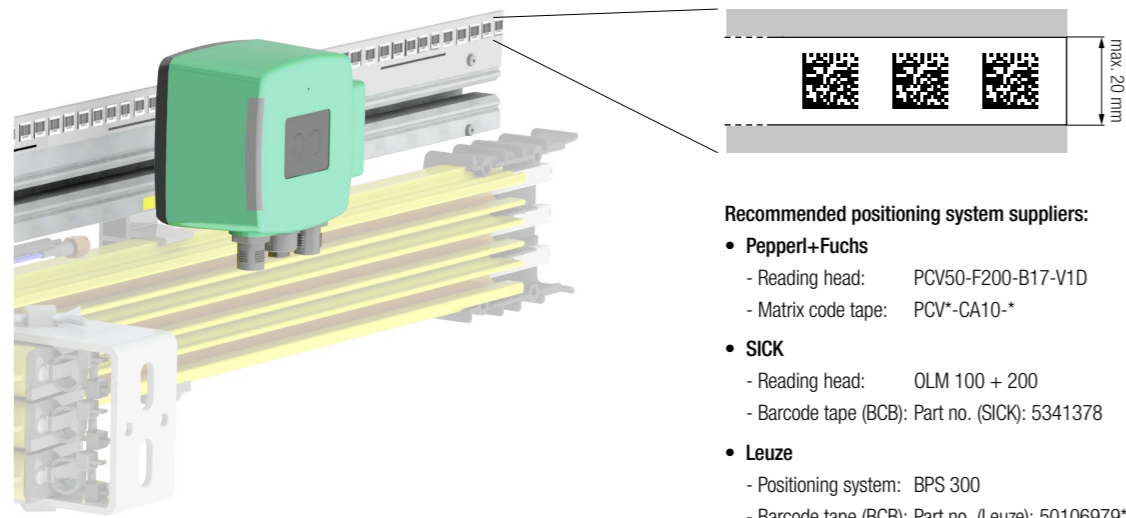
Recommended positioning system suppliers:
- **Pepperl+Fuchs**
  - Reading head: PCV50-F200-B17-V1D
  - Matrix code tape: PCV*-CA10-*
- **SICK**
  - Reading head: OLM 100 + 200
  - Barcode tape (BCB): Part no. (SICK): 5341378
- **Leuze**
  - Positioning system: BPS 300
  - Barcode tape (BCB): Part no. (Leuze): 50106979*

  - Positioning system: BPS 8
  - Barcode tape (BCB): Part no. (Leuze): 50106980*

  * Height, length, start and end readings
    must be specified when ordering

Scope of Delivery and Interface to the Customers' Network

ProfiDAT® *compact* provides reliable and interference-free Ethernet data transmission. The illustration below describes the scope of delivery of the system (orange) and the interface to the customers' network (grey) in terms of the access points and clients connected through RJ45 connectors. It also defines the prerequisites to integrate a ProfiDAT® *compact* system into an Ethernet system. Control signals must be transmitted through PROFINET (PROFIsafe) or Ethernet/IP protocols. Data packages transmitted through ProfiDAT® *compact* won't be influenced by the system. All transceivers will be delivered fully configured according to customers' requirements and application layout.

ProfiDAT® *compact* – Customized System

Scope of delivery
Ethernet Data Transmission + PE Rail + Positioning Rail

- PROFINET Controller
- PC or Monitor
- Ethernet
- Switch
- RJ45
- Access Point — Configuration
- Power Supply
  - PoE (RJ45)
  - 24 V DC
- Collector
- Client — Configuration
- RJ45
- Ethernet Switch
- PROFINET Device(s)
- Camera(s)
- Power Supply
  - PoE (RJ45)
  - 24 V DC
- PE (Grounding)
- PE (Grounding)

Product Data

Ethernet Data Rate	100 MBit/s
Frequency	5 GHz, IEEE 802.11
Data Interface	Ethernet based (RJ45)
Compatible Communication Protocols	· Ethernet (TCP/IP, UDP) · PROFINET/PROFIsafe, conformance class A · Ethernet/IP
Maximum System Length	No limitation; max. segment length supplied by one Access Point: 120 m
Maximum number of Clients per Segment / Access Point	20
Profile Dimensions	Standard Profile length: 5 m 52 With positioning strip 21 37 Without positioning strip 21
Permissible Ambient Temperature Range	-20°C to +55°C (other limits to be clarified on request – transceivers can be installed in an air-conditioned control cabinet)
Max. Ambient Temperature Difference	75 K

Environmental Conditions	Indoor applications (low humidity, non-condensing)
Curves	Min. radius vertical: 750 mm, min. radius horizontal: 2.300 mm
Distance between ProfiDAT® *compact* rail and conductor rail	Beginning from 28 mm (depending on conductor rail system)
Maximum Amperage ProfiDAT® *compact* as PE rail	400 A (as PE rail in combination with a conductor rail system with 400 A max. phase current, at 35°C ambient temperature)
Maximum Amperage per Collector (PE function)	32 A (Copper graphite); 16 A (Graphite)
Maximum traveling speed Collector/ Vehicle	600 m/min on straight rails, 40 m/min on transitions/switch points
Maximum height Code Band (for optical Positioning System)	20 mm
Rated suspension spacing (ProfiDAT® *compact* rail only)	1 m for straight rails, 500 mm for curved rails
Rated suspension spacing (ProfiDAT® *compact* rail in combination with conductor rails)	According to conductor rail system or to rated suspension spacing of ProfiDAT® *compact* rail only (whichever is smaller)

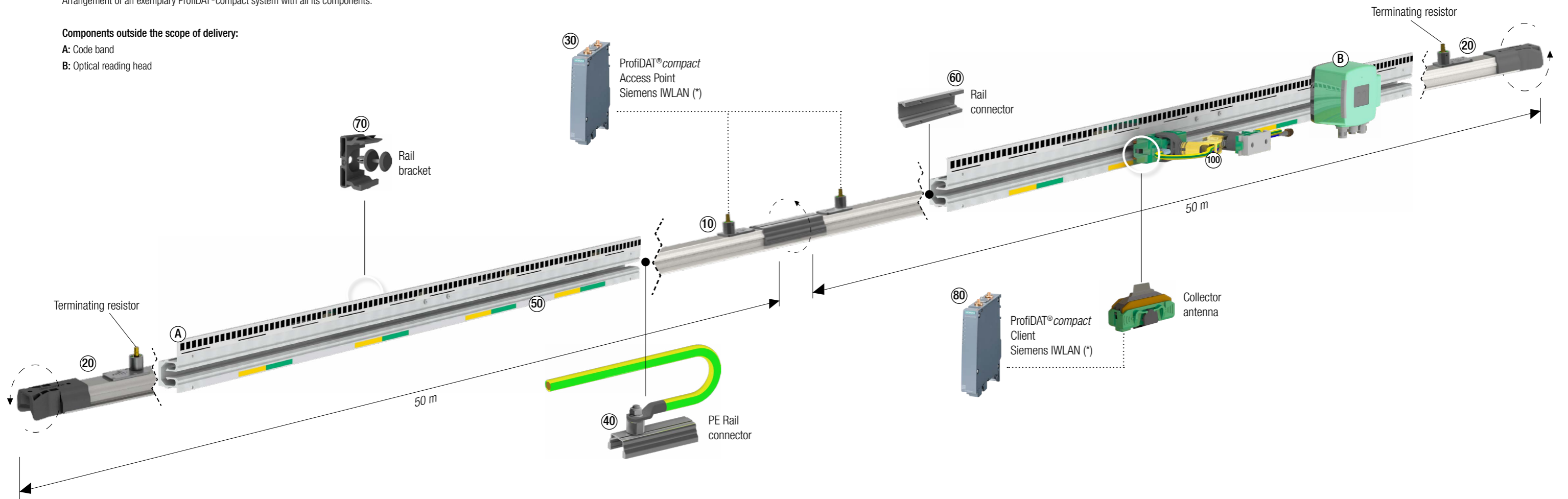| Relevant standards	
DIN EN 60664-1, VDE 0110-1:2008-1	Insulation coordination for equipment within low-voltage systems – Part 1: Basic principles, requirements and tests (IEC 60664-1:2007); German version of EN 60664-1:2007
DIN EN 60204-1, VDE 0113-1:2019-06	Safety of machines – electrical equipment of machines – Part 1: General requirements (IEC 60204-1:2016, modified); German version of EN 60204-1:2018
DIN EN 60529, VDE 0470-1:2014-09	Protection classes provided by housings (IP code) (IEC 60529:1989 + A1:1999 + A2:2013); German version of EN 60529:1991 + A1:2000 + A2:2013
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
Radio country approvals	The SIEMENS IWLAN transceivers used in our ProfiDAT® *compact* systems have radio approvals for all countries we deliver our systems to

System Overview and Performance

Exemplary Arrangement

Arrangement of an exemplary ProfiDAT®compact system with all its components.

Components outside the scope of delivery:
A: Code band
B: Optical reading head

Terminating resistor

30 — ProfiDAT®*compact* Access Point Siemens IWLAN (*)

60 — Rail connector

70 — Rail bracket

10

50

Terminating resistor

20

A

50 m

40 — PE Rail connector

80 — ProfiDAT®*compact* Client Siemens IWLAN (*)

100

B

Collector antenna

20

50 m

Sample Parts List – System length of 100 m with 1 mobile Consumer

Item	Part No.	Component	Description	Quantity
10	051551-01	Line feed-in set, rail with positioning strip	Length 1 m	1
20	051551-03	End feed-in set, rail with positioning strip	Length 2 x 0,5 m, plus rail endcaps	1
30	051552-01	Access point ProfiDAT®compact	Customized access point including HF cables and accessories	1
40	051521-03	PE connector	Rail connector with PE cable; 32 A, 16 mm², cable length 5 m	3
50	051511-01	ProfiDAT®compact rail with positioning	Standard rail length 5 m	20
60	051521-01	Connectors	Rail connector	17
70	051541-01	Standard Hanger clamp	Hanger clamp for the mechanical installation of the ProfiDAT®compact rail	104
80	051501-01	Mobile unit	With 2 collectors, carbon graphite, 32 A, cable length 2 m, including client and accessories	1
90	051590-01	Installation kit	Complete set of screws required for installation	1
Spare Parts				
100	051592-01	Spare collector	Carbon graphite, 32 A	2
Service Packages				
110	–	Installation	Mechanical installation & measurement of the ProfiDAT®compact system (including reporting)	1
120	–	Commisioning	Commisioning & fine tuning of the ProfiDAT®compact system (including reporting)	1

Layout-Specific Data Transmission Performance

	Layout Example 1	Layout Example 2	Layout Example 3
Max no. of Consumers per Segment [1]	1	6	20
Communication Cycle Time	32 ms	64 ms	64 ms
No. Retries	3	3	3
Cycle Time x No. Retries	96 ms	192 ms	192 ms
Process Data	Yes	Yes	Yes
Video/Audio Data	Yes	Yes	No
Max. Segment Length [2]	120 m	100 m	100 m

[1] Segment = Rail Segment supplied by one access point. All consumers (clients) assume 2 collectors each.
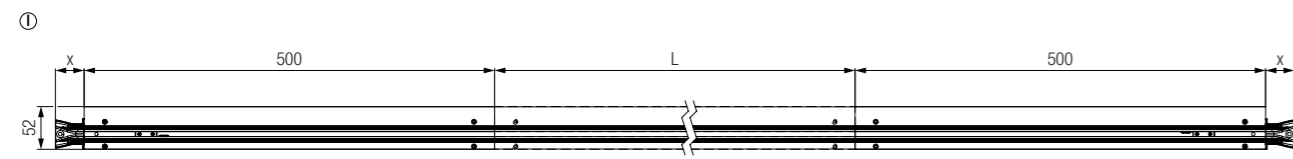[2] All lengths assume line feed-in.

System Components
Feed-In Components

Feed-In Sets

① End feed-in set - rail with positioning strip (rail end caps included) – Part No.: 051551-03

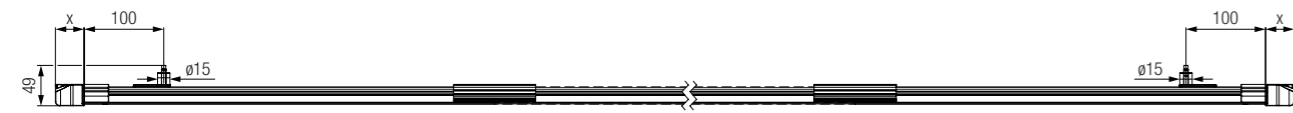② End feed-in set - rail without positioning strip (rail end caps included) – Part No.: 051551-04

Feed-in sets introduce data signals from access points into the ProfiDAT®*compact* rail and terminate them at the end of a segment with stationary antennas integrated into the rail profile. Therefore one stationary antenna is connected to an access point and the stationary antenna on the opposite side of a segement is connected to a terminating resistor. Access points function as interface between the customer's network and the ProfiDAT®*compact* system. Feed-in sets are available for ProfiDAT®*compact* systems with or without positioning and for either end or line feed-in. End feed-in sets are additionally equipped with rail end caps.
Terminating resistors will be supplied with the access points.

Set includes:
• 2 feed-in rails (one for each end)
• 2 end caps
• 2 rail connectors

End feed-in set = 2 feed-in rails with rail end caps

X = see page 27, Rail End Caps

End feed-in set = 2 feed-in rails with rail end caps

X = see page 27, Rail End Caps
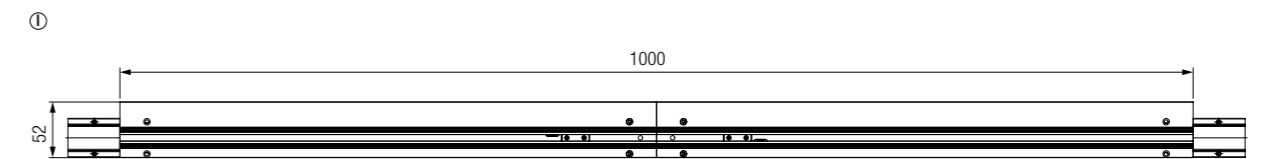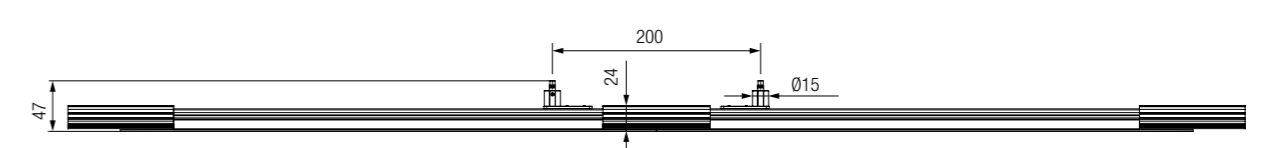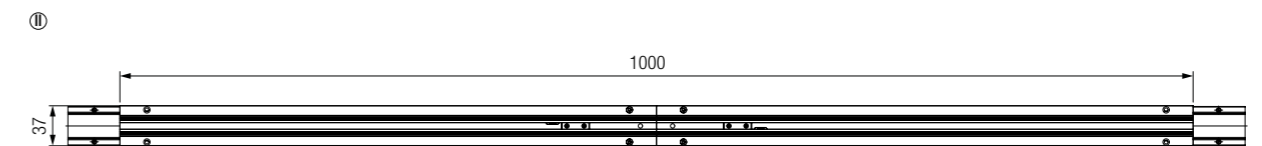
Feed-In Sets

① Line feed-in set - rail with positioning strip – Part No.: 051551-01

② Line feed-in set - rail without positioning strip – Part No.: 051551-02

Please note: each ProfiDAT®*compact* system with line feed also requires (despite the line feed-in set) an end feed-in set, to terminate the signals at both ends of a segment. Terminating resistors will be supplied with the access points.

Set includes:
• 2 feed-in rails connected by a rail connector
• 2 rail connectors (on each end)
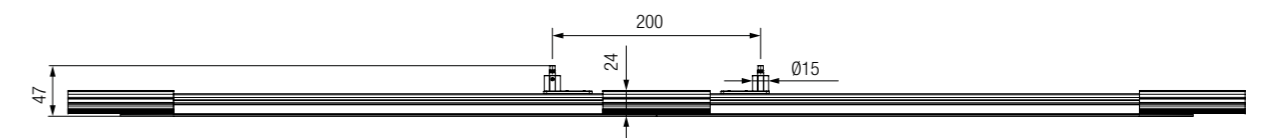
Line feed-in set = 2 feed-in rails connected with a rail connector.

Line feed-in set = 2 feed-in rails connected with a rail connector.

System Components
Feed-In Components

Access Points ProfiDAT®*compact*

Background ProfiDAT®compact IWLAN transceivers

The ProfiDAT®*compact* transceivers (access points or clients) send and receive data via MAC-based data communication in accordance with the IEEE 802.11 standard. Access points are installed stationary near the feed-in units. They function as an interface between a stationary Ethernet network and the wireless data transmission through the ProfiDAT®*compact* profile. Moreover, they coordinate the communication to and between clients (transceivers installed on the mobile vehicles). This also means a ProfiDAT®*compact* system requires at least two transceivers; one access point and one 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. Nonetheless clients can switch from one access point to another, each feeding data into one ProfiDAT®*compact* rail segment, by following a defined handover process, by using the protocol iPCF (industrial Point Coordination Function). With this feature it is possible to achieve unlimited system lengths with ProfiDAT®*compact*. Additionally, through the prioritization of PROFINET (PROFIsafe) data, real-time data communication at highest security and reliability can be guaranteed.

All transceivers are configured to customer-specific applications and layouts, as well as for the use together with ProfiDAT®*compact*. Transceivers not configured by Conductix-Wampfler will not work in combination with ProfiDAT®*compact*. Furthermore, configured transceivers are meant for the use within a defined system and segment only.

For the convenience of our customers and in case a transceiver needs to be replaced, all ProfiDAT®*compact* transceivers are equipped with a so called C-Plug or Key-Plug on which the unique configuration is stored. These plugs can be inserted into a compatible replacement device and transfer the configuration automatically to the new device. In case a plug is lost or damaged, Conductix-Wampfler can deliver a new transceiver correctly configured so long as the serial number of the original device is known. Delivered transceivers may only be used in combination with the ProfiDAT®*compact* profile.

Access Points - Config. No.: 051552-01#

Scope of delivery access points:
- Access Point
- Selected HF components
  (e.g. HF cables – length 10 m,
  Key or C plugs, terminating resistors)
- Customer and layout-specific
  configuration of access points

+

*ProfiDAT®compact Access Point
Siemens IWLAN (*)*

+

Selected HF Components
(exemplary illustration)

**Customer- and
layout-specific
Configuration**
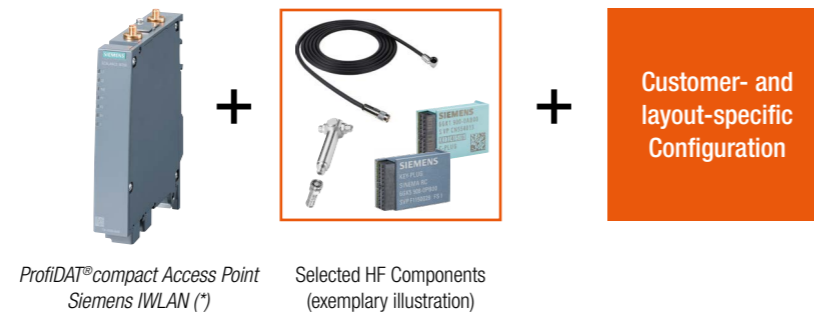
Technical Data ProfiDAT® *compact* Transceivers (Access Points or Clients)	
Measures	Height: 156 mm / Depth: 127 mm / Width: 26 mm
Weight	0.52 kg
Mounting Options	S7-300- Mounting rail S7-1500- Mounting rail 35 mm DIN- Top-hat rail On wall if mounted flat
Protection Class	IP30
Data Connection	RJ45, 100 MBit/s
Power Supply	- Power-over-Ethernet (RJ45), acc. to IEEE802.3at for type 1 and IEEE802.3af - 4-pole terminal block with screw connection (24 V)
Type of Voltage / of the Supply Voltage	DC
Supply voltage from terminal block **Supply voltage from Power-over-Ethernet**	19.2 V - 28.8 V 48 V
Consumed current from terminal block **Consumed current from Power-over-Ethernet**	0.25 A 0.125 A
Power loss from terminal block **Power loss from Power-over-Ethernet**	6 W 6 W
Radio country approvals	The SIEMENS IWLAN transceivers used in our ProfiDAT®*compact* systems have radio approvals for all countries we deliver our systems to

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System Components
Feed-In Components


Housing for Transceivers (Access Points and Clients)

Polycarbonate Housing suitable for Access Points and Clients
Part No.: 051450-11

- Material: fiber-glass reinforced polycarbonate
- Mounting: Sealing and insulating plugs for wall-mounting screws
- Protection class: IP66

Scope of delivery:
- Plastic housing with pre-drilled holes
- Mounting plate, top-hat rail, end clamps (pre-assembled)
- All necessary cable conduits
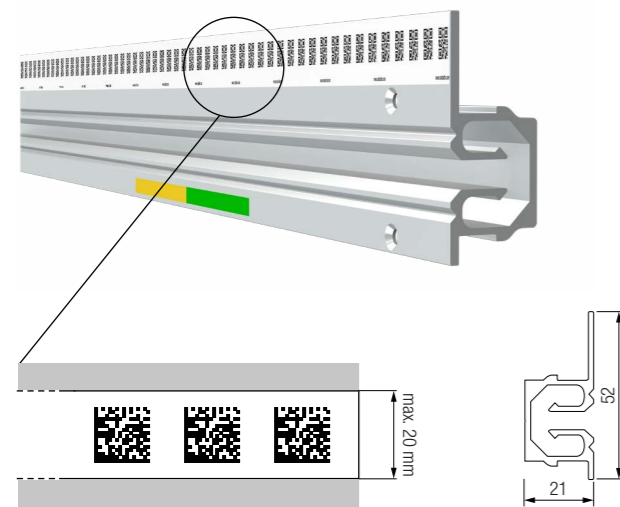- RJ45 plug for fast assembly
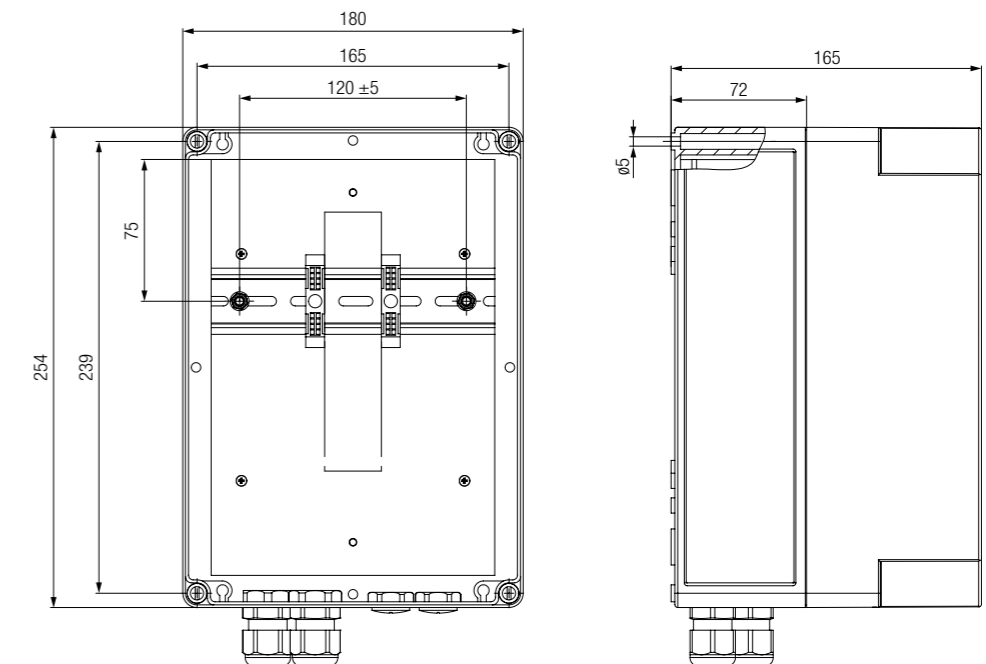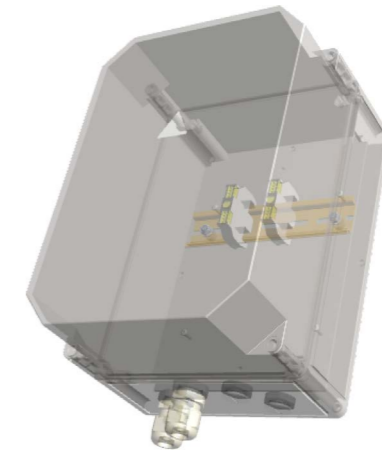
System Components
Rail Components

Straight Rail with Positioning Strip

5 m standard length – Part No.: 051511-01
Custom length – Config. No.: 051511-03#

The ProfiDAT®*compact* aluminum rails guide the WiFi signals and shields against interference from other wireless systems. In addition, they can be used as grounding conductor rails. The rails are available in two different options – with and without accommodation for position strips. The option with positioning offers additional space to attach a code band directly to the slotted waveguide while the rail without positioning offers smaller and symmetric geometry. Besides the standard length of 5 m, custom lengths can be ordered. When the ProfiDAT®*compact* rail is used in combination with an optional optical sensor as part of an integrated positioning solution, a mobile vehicle's position can be detected.

Technical specifications – system (rail + rail connector)
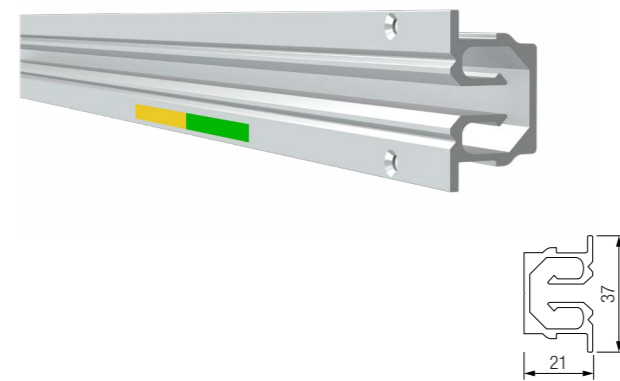
Material:	Aluminum
DC resistance [Ω/1000 m] 20°C	0.759
DC resistance [Ω/1000 m] 35°C	0.803
Impedance [Ω/1000 m] 20°C/50 Hz	1.009
Impedance [Ω/1000 m] 35°C/50 Hz	1.068
Weight (5 m rail) [kg]	2.94

max 20 mm

ProfiDAT®compact Rail with positioning

Straight Rail without Positioning Strip

5 m standard length – Part No.: 051511-02
Custom length – Config. No.: 051511-04#

Technical specifications – system (rail + rail connector)

Material:	Aluminum
DC resistance [Ω/1000 m] 20°C	0.795
DC resistance [Ω/1000 m] 35°C	0.842
Impedance [Ω/1000 m] 20°C/50Hz	1.192
Impedance [Ω/1000 m] 35°C/50Hz	1.261
Weight (5 m rail) [kg]	2.62

ProfiDAT®compact Rail without positioning

Installation Kit

Part No.: 051590-01

The installation kit consists of all screws required for the installation of ProfiDAT®*compact*. This kit is mandatory for the installation of a ProfiDAT®*compact* segment of max. 120 m

Scope of delivery:
• 10 x Screws for plastic (countersunk) M2,5x6 (for rail endcaps)
• 120 x Self-tapping screws DIN7500 – M3x8 countersunk (for rail connectors and PE connectors)
• 2 x Screws M4x20 (countersunk) incl. washer and nut (for fixing point)

System Components
## Rail Components

Curved Rails

Curved rail with positioning strip - Config. No.: 051512-01#
Curved rail without positioning strip - Config. No.: 051512-02#

Curved rails are available for either rail option, with or without positioning strip. The rails can be customized according to customer requirements. Limitation are defined by the insertion direction which is always from the side and the minimal bending radius given in the figures below.
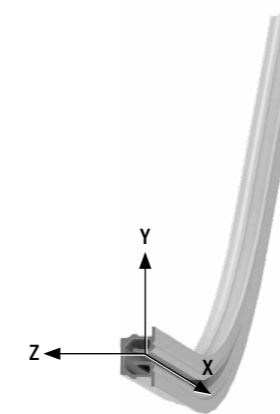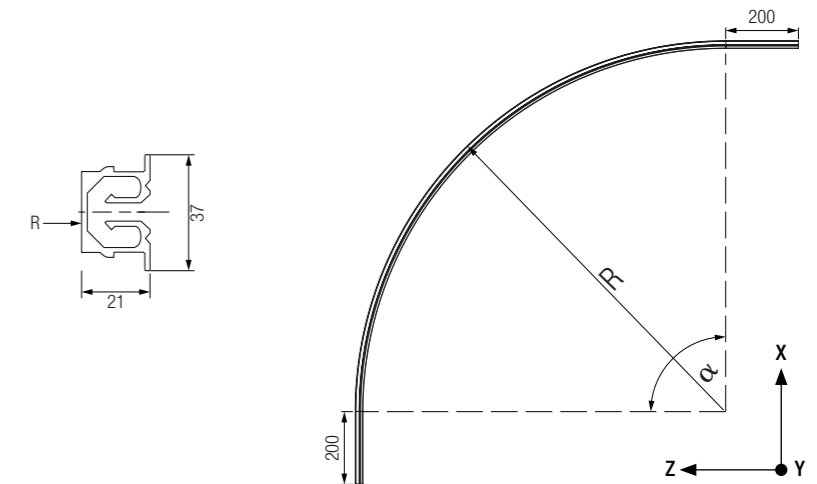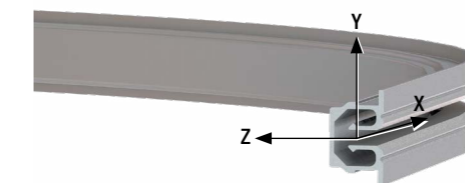
Horizontal curves (inclines/declines): R ≥ 2300 mm
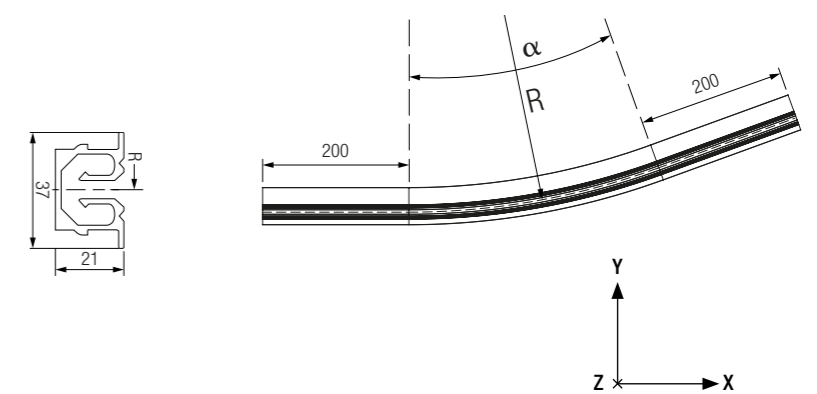
X = direction of travel
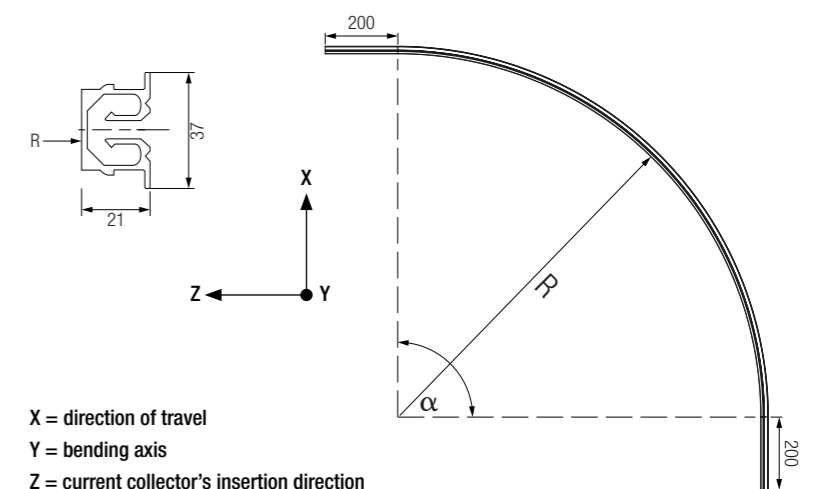Z = current collector's insertion direction
Z = bending axis
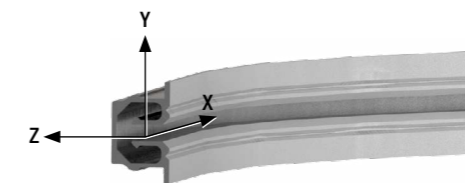
Vertical inside curve: R ≥ 750 mm

X = direction of travel
Y = bending axis
Z = current collector's insertion direction

Vertical outside curve: R ≥ 750 mm

X = direction of travel
Y = bending axis
Z = current collector's insertion direction
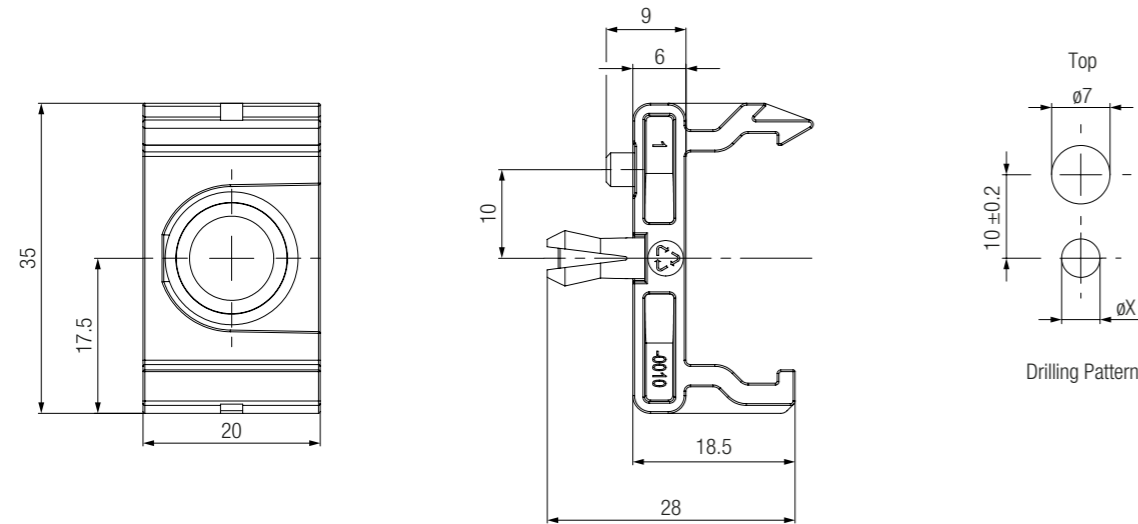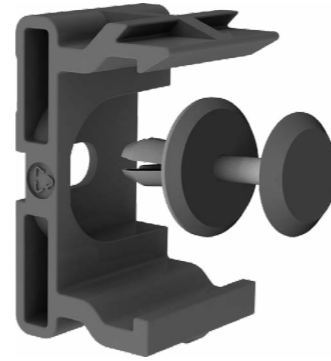
System Components
Rail Components

Standard Hanger Clamp

Part No.: 051541-01

Hanger clamps reliably mount the ProfiDAT®*compact* rail to the given support structures. The standard hanger clamps are only used for the ProfiDAT®*compact* rail.

- Thickness of mounting surface: 3-6 mm
- Rated suspension spacing (on straight rails): 1 m
- Rated suspension spacing (on curved rails): 0,5 m

Diameter "X" of bore for mounting holes [mm]	Thickness of mounting surface [mm]
ø 4,6 ± 0,05	2
ø 4,7 ± 0,05	3
ø 4,8 ± 0,05	4
ø 4,9 ± 0,05	5
ø 5,0 ± 0,05	6
ø 5,1 ± 0,05	7

Top

Drilling Pattern

Customized Hanger Clamps

Hanger clamps customized to your individual needs can be requested after technical clarification. The following examples provide an overview about different possibilities and combinations with conductor rail systems.

Hanger Clamp for ProfiDAT®compact in combination with 0811 conductor rails (3-pole)

Hanger Clamp for ProfiDAT®compact in combination with 0815 conductor rails (3-pole)

Hanger Clamp for ProfiDAT®compact in combination with 0831 conductor rails (3-pole)

# System Components
Rail Components

Rail Connector

Part No.: 051521-01

Rail connectors connect the ProfiDAT®*compact* rails to each other. They secure data as well as power transmission between the rails.

Please note: Screws are not included! For each segment (= rail segment supplied by one Access Point) one installation unit spare part kit (Part No.: 051590-01, see page 16) must be ordered, in which all required screws are included.

Rail connector
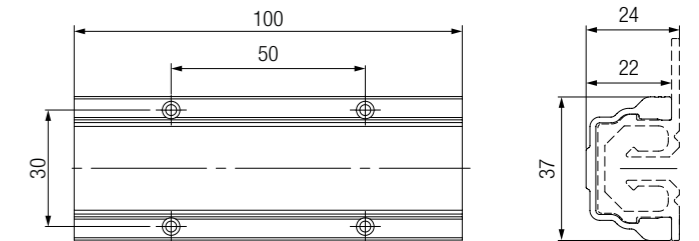
PE* Connector

PE Connector M8 – Part No.: 051521-03
Grounding cable (incl. two cable lugs) – Config No.: 051522-01#

PE connectors are required for the PE rail function of ProfiDAT®*compact*. They enable an electrical connection between the ProfiDAT®*compact* rail and the PE. Screw nuts as well as washers are included with the PE connector. PE cables with cable lugs need to be ordered seperately.

PE connectors are also used to ground the ProfiDAT®*compact* rail. The rail must be grounded according to the locally applicable regulation and standards, but at least on both ends of each rail segment with a 16 mm² cable. We recommend installing a PE connector after every 5th rail. PE or grounding cables must suitable for operating temperatures of at least 90°C and colored in green and yellow.

Please note: Screws are not included! For each segment (= rail segment supplied by one Access Point) one installation unit spare part kit (Part No.: 051590-01, see page 16) must be ordered, in which all required screws are included.

PE Connector

Connector diameter	Grounding cable diameter	Available cable lengths
M8	6 mm²	1 m / 2 m / 5 m
	16 mm²	
	50 mm²	
	95 mm²	

Scope of delivery PE connector:
- PE connector
- Screw nut
- Washers

Scope of delivery grounding cable:
- PE cable (length: 1 m, 2 m or 5 m)
- 2 cable lugs M8 (installed on both ends)
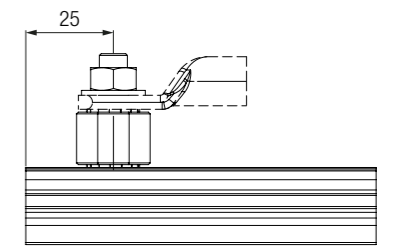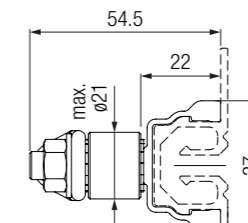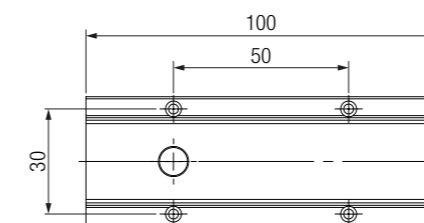
System Components
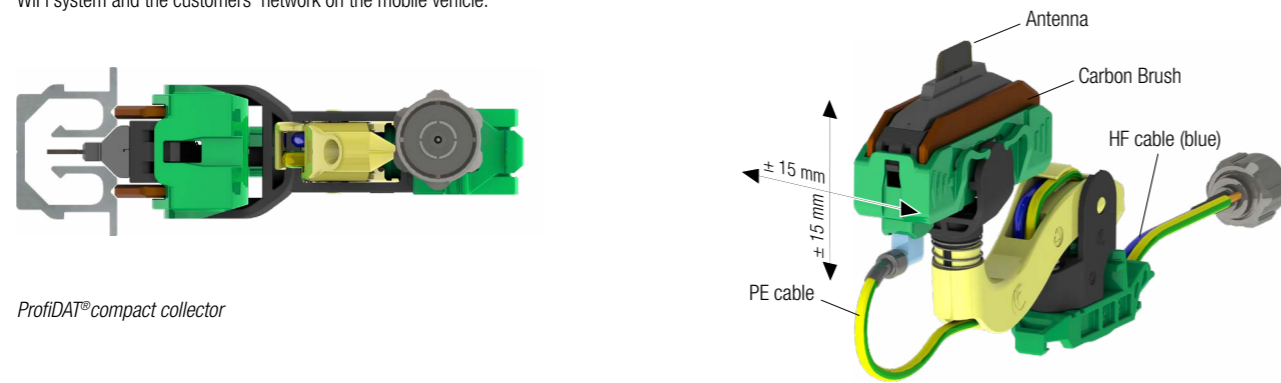## Mobile Components

Mobile Unit

Config. No.: 051501-01#

A ProfiDAT®*compact* mobile unit includes all components of the system which will be installed on a mobile vehicle.
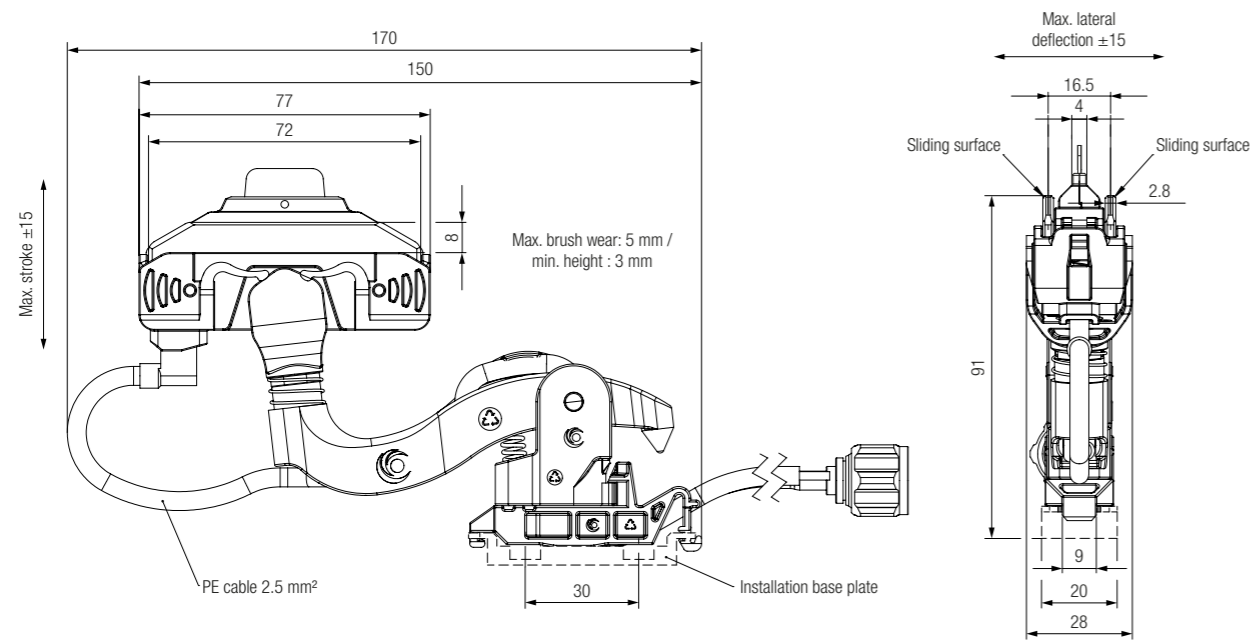
This includes:
- One or two *collectors* (each including 600 mm HF and PE cable)
- Clients
- Selected HF components (e.g. HF cables (1.5 m or 3 m), plugs, etc.)
- Customer-specific and layout-specific configuration of clients

The HF cables for the connection between collector and client are available in: 1.5 and 3 m lengths. The PE cable (length 600 mm), which is already installed inside the antenna arm, is delivered with an open end. The collectors receive the signal from the rail and send them to a transceiver (client) mounted on a mobile vehicle. The system also has bi-directional data transmission, which means the client is able to transmit as well as receive. Furthermore, the antennas have integrated carbon brushes that connect the mobile vehicle to the ProfiDAT®*compact* rail, and thus allowing the rail to act as PE. Clients function as the interface between the ProfiDAT®*compact's* WiFi system and the customers' network on the mobile vehicle.

ProfiDAT®compact collector

Antenna
Carbon Brush
HF cable (blue)
± 15 mm
± 15 mm
PE cable

Max. lateral deflection ±15

170
150
77
72
8
Max. stroke ±15
Max. brush wear: 5 mm / min. height : 3 mm
PE cable 2.5 mm²
30
Installation base plate

16.5
4
Sliding surface
Sliding surface
2.8
91
9
20
28

ProfiDAT®compact Client Siemens IWLAN (*)

+

Selected HF Components (exemplary illustration)

+

Customer and layout-specific Configuration

| Max. Current	Carbon Brush Material	Cable Diameter
32 A	Copper Graphite	2.5 mm²
16 A	Graphite	2.5 mm²

System Components
Mobile Components / Positioning

Standard Installation Base Plate

Config. No.: 051502-01

Installation base plates connect the collectors of ProfiDAT®*compact* and the mobile vehicles of the application. Instead of the standard base plate, which is meant for the ProfiDAT®*compact* collectors only, additional options can be requested from Conductix-Wampfler (e.g. combined base plates for ProfiDAT®*compact* collectors and conductor rail collectors). The feet of a collector can be clipped on these base plates (see illustration on page 20).
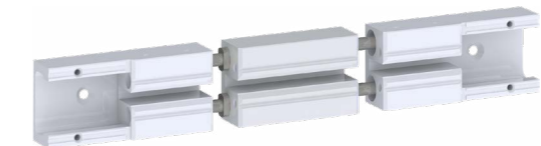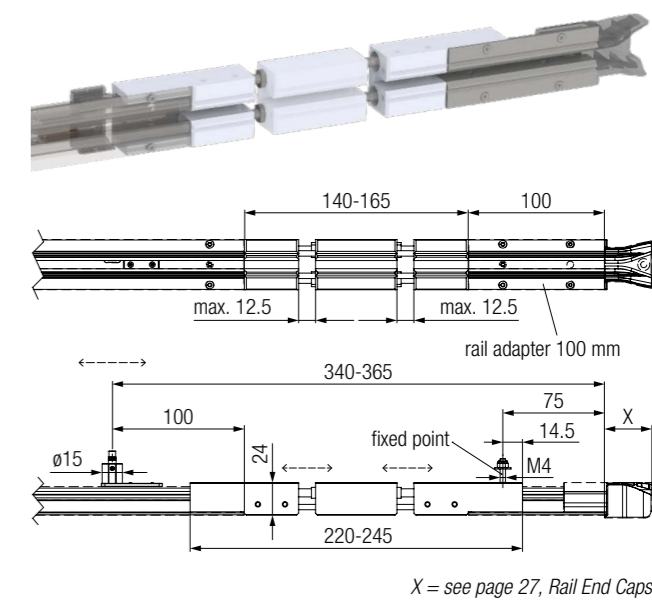
60
8.5
30
50

(2 x) DIN 933 - M5 (not included)
20
9.3
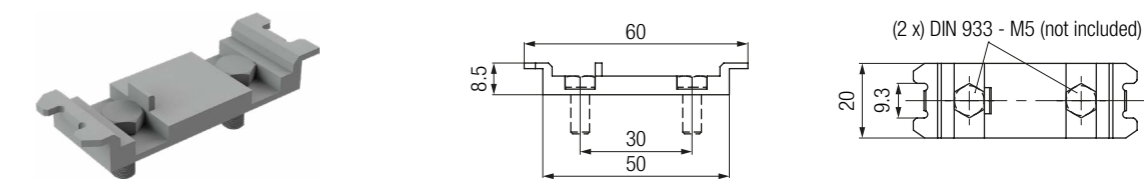
Expansion Unit (including Fixing Point)

Expansion Element – Part No.: 051561-01#

Expansion elements are used to compensate changes in the length of the ProfiDAT®*compact* rail due to temperature fluctuations. They are installed between two feed-in antennas or at segment ends. The required number of expansion elements must be calculated based on the temperature difference, the material of the supporting structure and whether the rail ends are fixed or can expand freely. Transitions, switch points or curves are considered as fixed ends. These calculations are always done by Conductix-Wampfler during dimensioning of the ProfiDAT®*compact* system.

Expansion element installed at segment end

140-165
100
max. 12.5
max. 12.5
rail adapter 100 mm

340-365
100
75
ø15
24
14.5
fixed point
M4
X
220-245

Set includes:
- Expansion element
- 1 x Screw M4x20 (countersunk) incl.washer and nut (for fixing point)
- Rail adapter 100 mm (required at segment ends only)
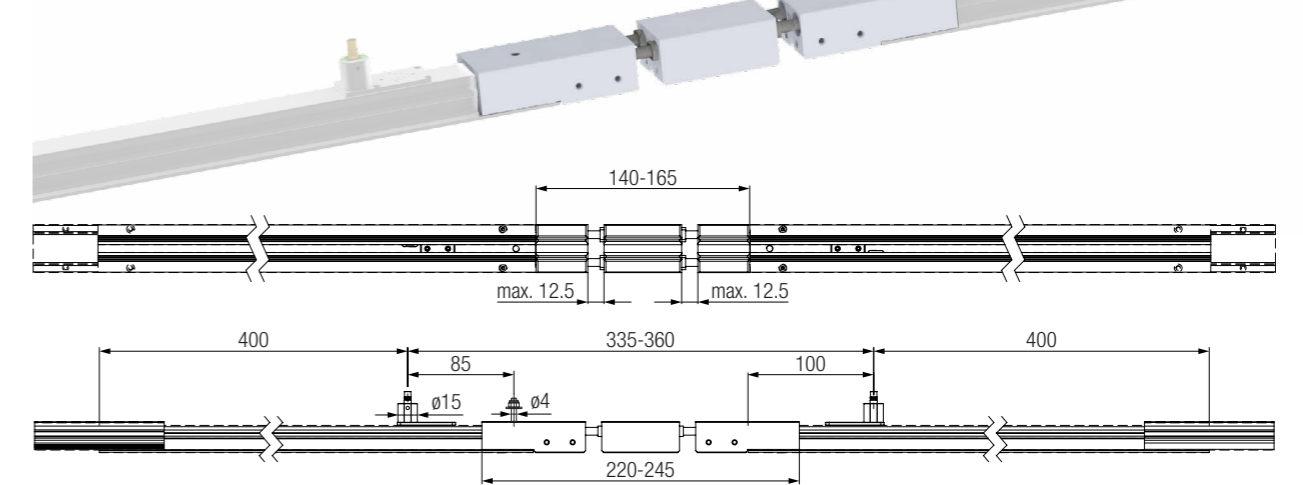
Expansion compensation/unit: 25 mm

Max. ampactity: 200 A

Expansion coefficient ProfiDAT®*compact* rail: 23.8 x 10⁻⁶ 1/K

X = see page 27, Rail End Caps

Expansion element installed at line feed-in

140-165
max. 12.5
max. 12.5

400
335-360
400
85
ø15
ø4
100
220-245

Interfaces
Mechanical Interfaces

Mechanical Installation of the ProfiDAT® *compact* Rail

The ProfiDAT® *compact* rail is mounted to supporting structures with Hanger Clamps (e.g. standard Hanger Clamp on page 16) or clips, depending on the design of the Hanger Clamp or the supporting structures. Hanger Clamps must be installed in distances of 1 m (on straight rails, in curves: 0.5 m) or according to the distances used for the conductor rails installed in parallel (whichever is smaller).

Mechanical Installation of Transceivers

Transceivers can be mounted either directly on a wall, when mounted flat, or on the following mounting rails (installation options included in the standard scope of delivery):
• S7-300- Mounting rail
• S7-1500- Mounting rail
• 35 mm DIN- Top-hat rail
• on wall if mounted flat

Control Cabinet

For mechanical as well as environmental protection, we recommend that the ProfiDAT® *compact* transceivers be installed inside a cabinet. The cabinet is not part of the standard scope of delivery of ProfiDAT® *compact.* Nonetheless, we can offer a cabinet solution upon your request and after technical clarifications.

Mechanical Installation of Collectors

Installation base plates (see page 19) define the position of the collectors and function as the mechanical connection between your mobile vehicle and the collector.

Positioning

The ProfiDAT® *compact* rail offers additional space to affix a codeband with a maximum height of 20 mm on the slotted waveguide without the need to install additional components.
Both code band and reading head can be sourced from different suppliers. If you need help choosing a suitable positioning system, we can assist in finding a solution even though the codeband as well as reading heads would not be part of our scope of delivery (see also page 8).

Interfaces
Electrical and Data Interfaces

Power Supply Transceivers

The power supply for the transceivers is provided through a Power over Ethernet Port and a RJ45 connector or through a separate 24 V port. The connector for this separate port is included in the scope of delivery and offers a 4-pole clamp screw connection. More details can be found in the technical data of the transceivers on page 13.

PE* Connection

For the PE functionality the ProfiDAT® *compact* rail must be connected to the customer's PE cable. The PE connector must be installed next to the feed-in units and the cable must be marked as PE, meaning it must be colored in yellow and green. Furthermore, its diameter must be designed for at least half of the phase current. The PE cable is connected to the PE connector with a nut screw, a washer, and a cable lug. The other end of the cable is connected to the customers PE.
All grounding and PE connection points must be marked with a grounding sign.

Data Interfaces

The transceivers function as the interface between the customers' network and the ProfiDAT® *compact* system (also see illustration below). The data connection system is accomplished with RJ45 connectors plugged to the transceivers.

Compatible communication protocols are:
• Ethernet (TCP/IP, UDP)
• PROFINET / PROFIsafe, conformance class A
• Ethernet/IP

**Scope of Delivery and Interface to the Customers' Network**

ProfiDAT® *compact* provides reliable and interference-free Ethernet data transmission. The illustration below describes the scope of delivery of the system (orange) as well the interface to the customers' network (grey) in terms of the access points and clients connected through RJ45 connectors. It also defines the prerequisites to integrate a ProfiDAT® *compact* system into a network through an Ethernet connection. Control signals must be transmitted through PROFINET (PROFIsafe) or Ethernet/IP protocols. Data packages transmitted through ProfiDAT® *compact* won't be influenced by the system. All transceivers will be delivered fully configured according to customers' requirements and application layout.

ProfiDAT®*compact* – Customized System
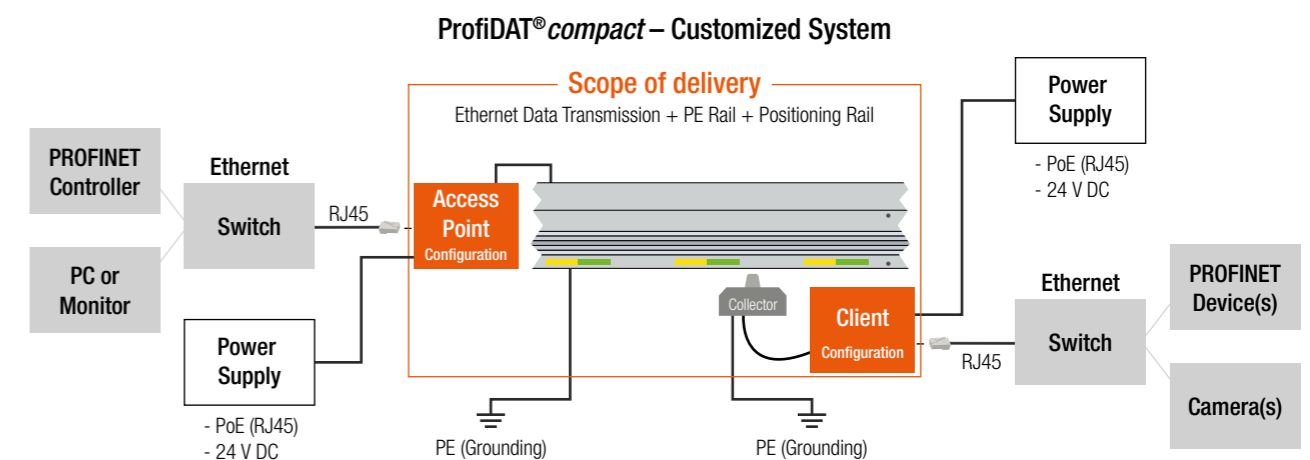
Scope of delivery ProfiDAT® compact

System Layout
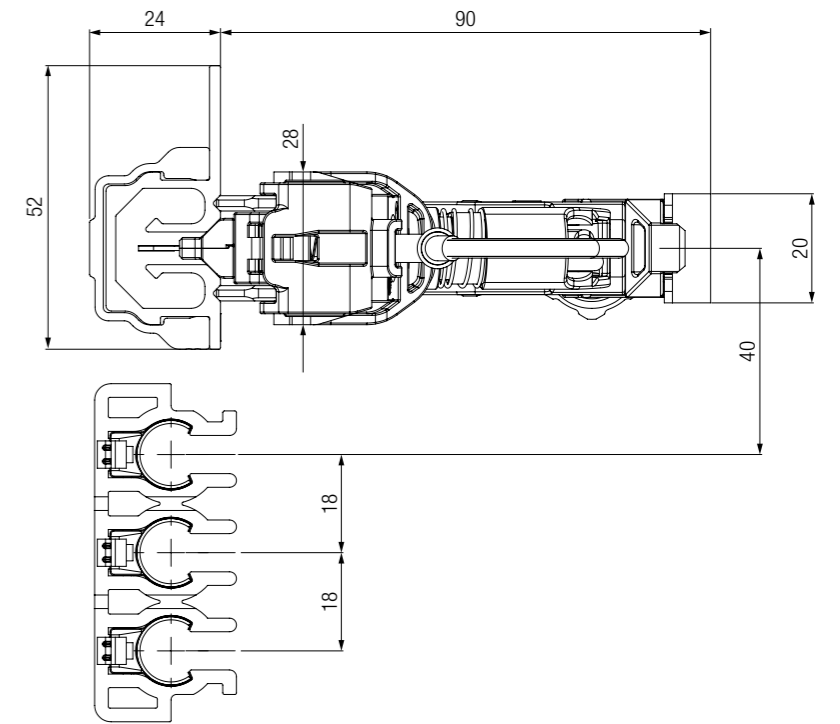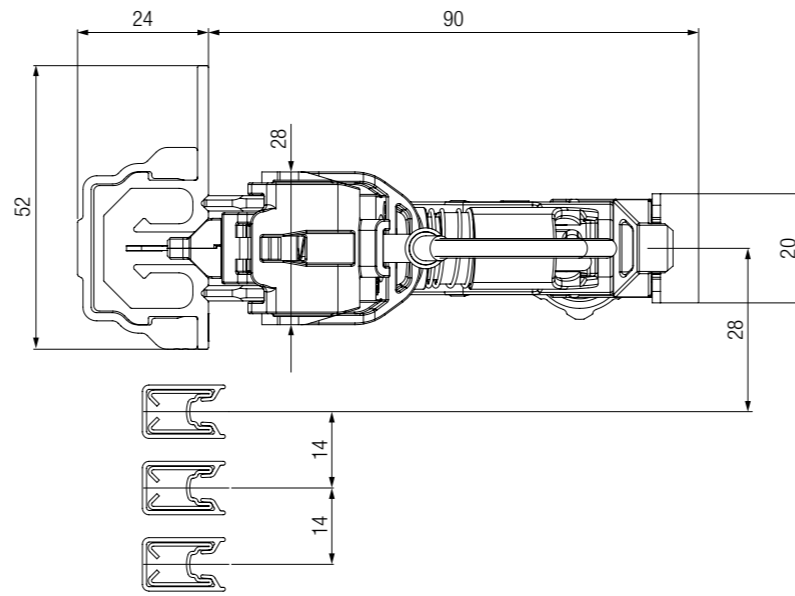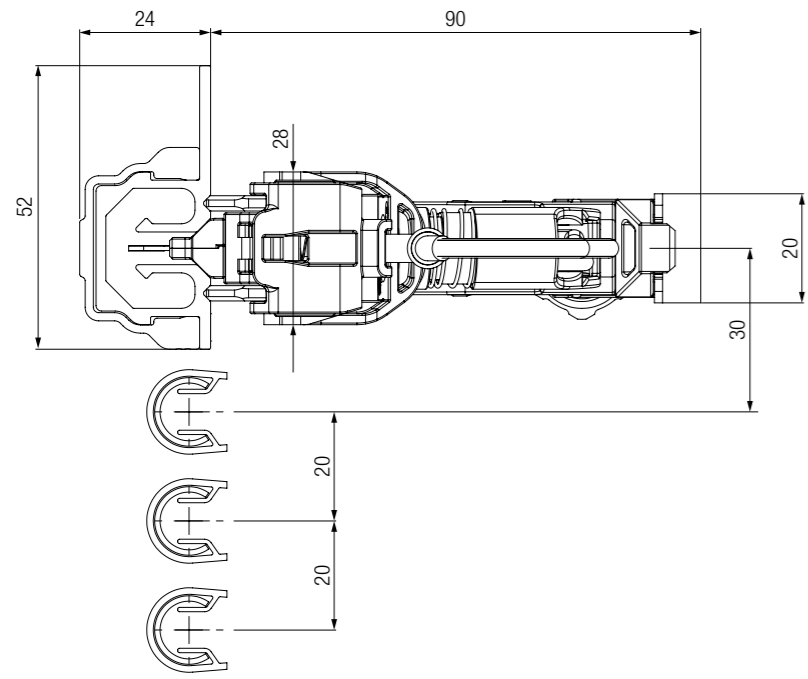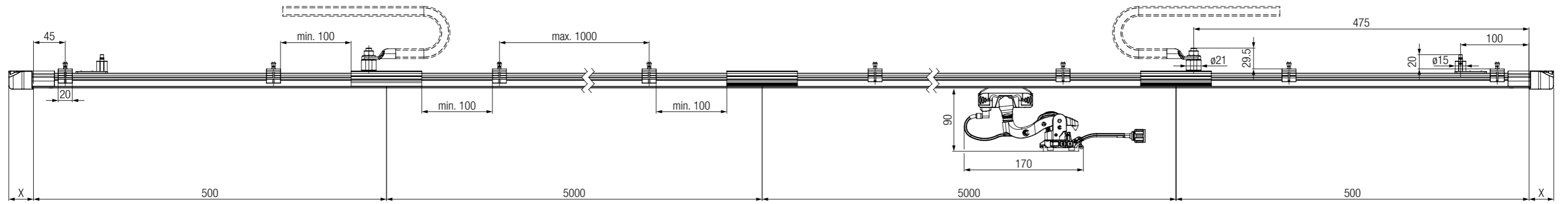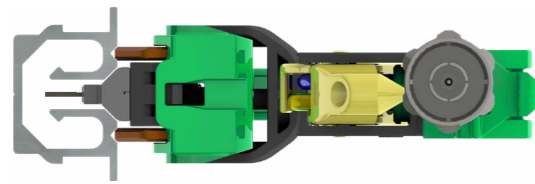
Spare Parts

Collector

Complete Collector copper-graphite brushes - Part No.: 051592-01
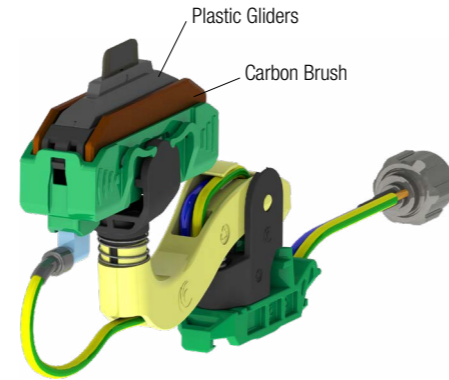**Complete Collector graphite brushes - Part No.: 051592-02**
To ensure highest reliability and convenience for our customers the spare collector consists of a completely assembled collector with simple interfaces to your installed ProfiDAT®*compact* system. You only have to clip the feet of the antenna to the already installed installation base plate and connect the cable ends of the HF and energy cables, already assembled in the collector.

Scope of delivery (completely assembled):
• Antenna head, including integrated carbon brushes
• Antenna arm
• Antenna feet (for the mechanical connection to the installation base plate)
• 600 mm HF and energy cables (for the data and PE connection)
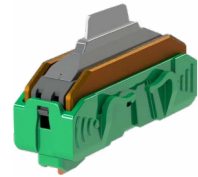
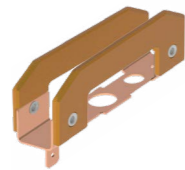Plastic Gliders

Carbon Brush

ProfiDAT®compact Collector

Collector Head copper-graphite brushes - Part No.: 051592-11
Collector Head graphite brushes - Part No.: 051592-12
Besides the complete collector, also the antenna heads (including carbon brushes) are available. The antenna head must be connected to energy and HF cables (already assembled in the antenna arm) first and then clipped on to the antenna arm.

Part No.: 051592-11
Part No.: 051592-12

Part No.: 051592-21

Copper-graphite brushes - Part No.: 051592-21
Copper-graphite brushes are available as separate spare parts.
The lifetime of graphite brushes is longer than the one of copper-graphite brushes and equals the lifetime of the antenna's plastic gliders. This means the complete collector head (Part No.: 051592-12) must be replaced once the graphite brushes are worn.

Max. Current	Carbon Brush Material	Cable Diameter
32 A	Copper Graphite	2.5 mm^2
16 A	Graphite	2.5 mm^2

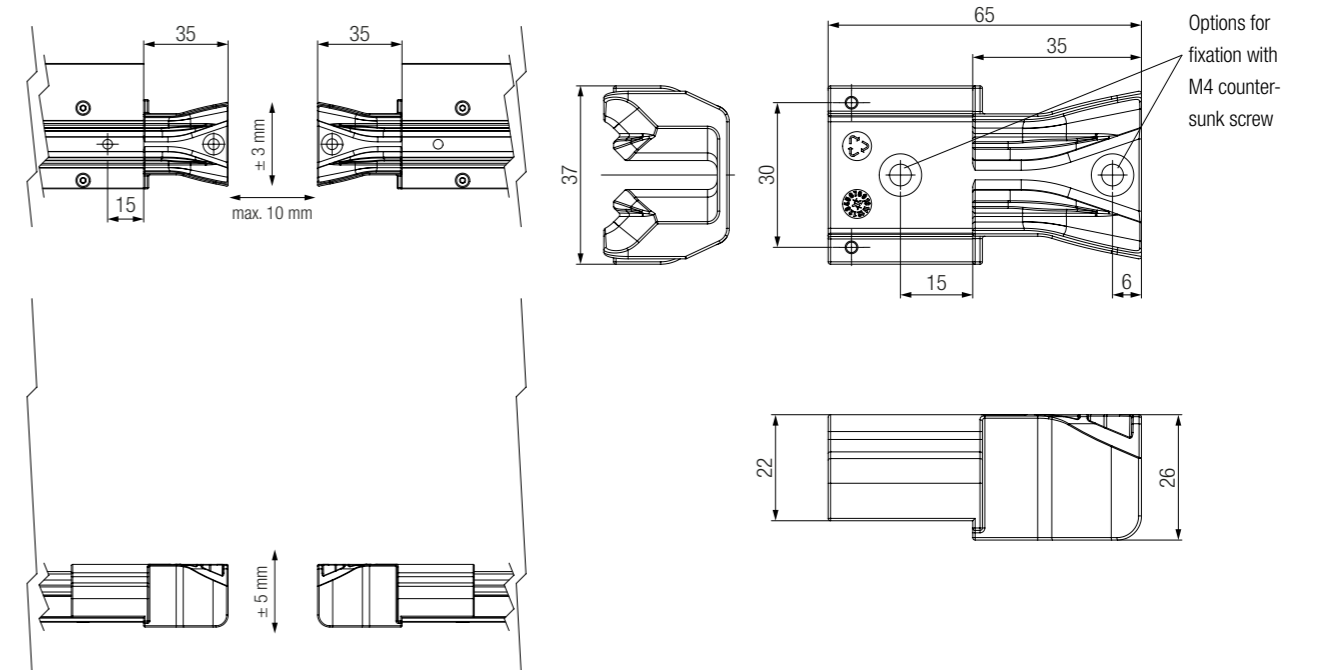|	Graphite	Copper Graphite
Ampacity	+	++
Lifetime	++	+
Breaking resistance	+	++

Spare Parts

Rail Endcap

Part No.: 051591-01
Rail endcaps are available within a set with the following scope:
• 4 x rail endcaps with pick up guidance
• 10 x Screws for plastic (countersunk) M2,5x6 (for rail endcaps)

65

35

35

37

30

Options for fixation with M4 counter-sunk screw

35

15

± 3 mm

max. 10 mm

15

6

± 5 mm

22

26

Services Packages
Tailored to our ProfiDAT®*compact* system

Engineering Consulting for ProfiDAT®*compact* Systems

Achieving the maximum performance and reliability out of your ProfiDAT®*compact* system depends on selecting suitable system components and implementing a favorable system layout. In addition each system will be individually configured to the customer specific application, layout and requirements.
Our experienced application support teams are ready to assist you in this fundamental task.
Applying our extensive experience to your needs, we can help you create a solid foundation to make your project a success. During the planning we will recommend the most suitable product offering and layout to achieve your goals. Therefore a close coordination and exchange of information is required to customize the ProfiDAT®*compact* system to your individual needs.

Project Service

In case of upgrade/extension of an application in operation within a dedicated time-slot Conductix-Wampfler can provide a project manager and offer special project services.
When time critical interventions have to be planned and executed in production processes, close alignment and coordination is key to successfully completing the job and getting the system back in operation within the planned timeframe.
Our project managers will take over responsibility concerning the scope of Conductix-Wampfler and align with other parties involved.

Installation

An accurate and professional installation is very important to ensure reliability and full performance of ProfiDAT®*compact* systems.
Gaps resulting from inaccurate cutting or mounting of the ProfiDAT®*compact* rail will lead to a considerable increase of the signal attenuation as well as reflections. As a result, the data transmission could become unreliable and disruptions would be possible within the operation.
To ensure a trouble-free operation of your system and tap the full potential out of ProfiDAT®*compact* we are ready to assist your installation by an experienced supervisor or take over the installation job with our service team.

Service Scope:
• Mechanical installation of all ProfiDAT®*compact* components according to system layout
• Measurement of the system data transmission ability (/attenuation) after installation
• Reporting of test results
Your Benefits:
• Peace of mind – assembly by the experienced service experts of Conductix-Wampfler
• Proven and guaranteed results – handover of test results of the data transmission ability (/attenuation)

Commissioning

To reach the best performance and reliability of the ProfiDAT®*compact* system an on-site adjustment and fine-tuning of the system configuration to the installation conditions and its environment is needed.
From our vast experience we know that the real on-site conditions will vary from the theoretical system configuration during planning phase.

Having this in mind, we highly recommend to involve Conductix-Wampfler in the commissioning process. Our product experts and experienced service engineers are able to perfectly adapt the characteristics of the systems to the real conditions on site.

Service Scope:
• Commissioning of the ProfiDAT®*compact* system, when the system is electrically implemented into the application and all mobile vehicles are available
• Adaption and fine-tuning of the systems and its components to the real site conditions
• Reporting of test results
Your Benefits:
• Peace of mind – commissioning by the experienced service engineers of Conductix-Wampfler
• Certainty about 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.

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.

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.

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.

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