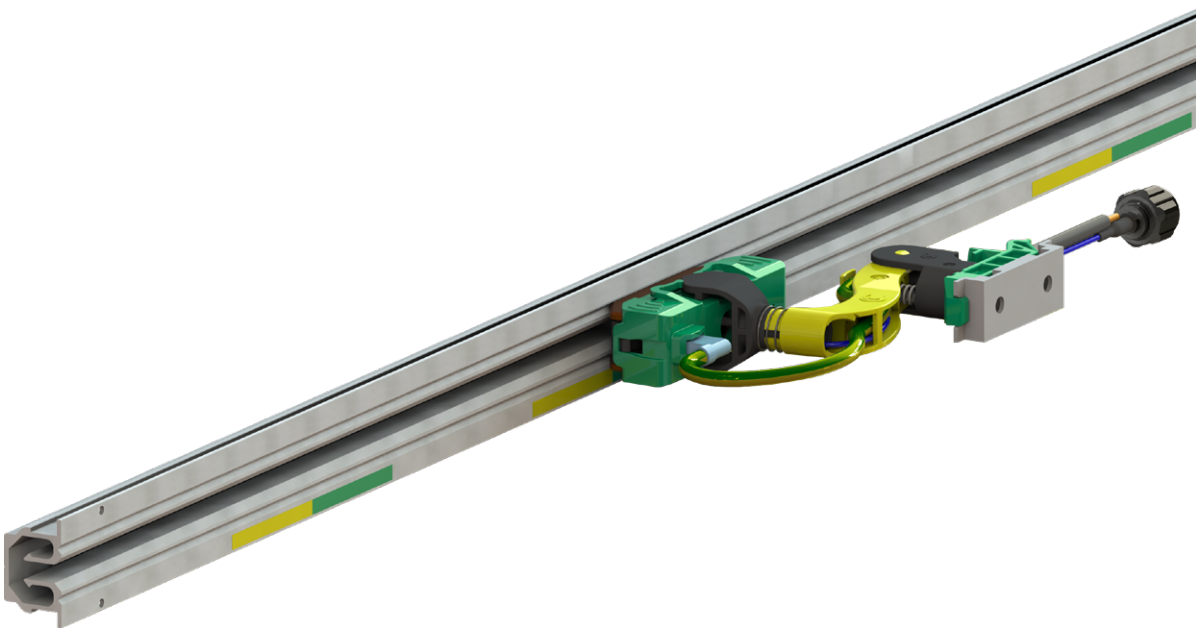
ProfiDAT®*compact*
Data Transmission System
Program 0515



CONDUCTIX wampfler

Contents

System Description

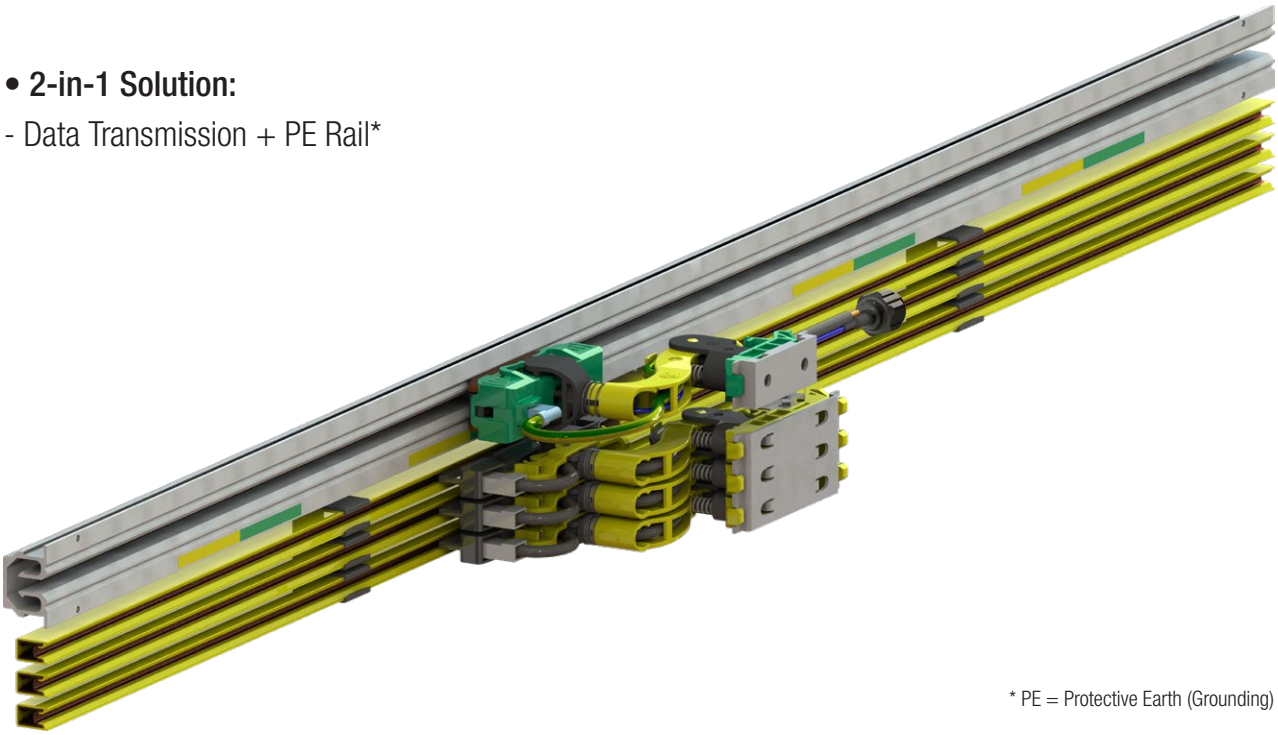
General Information

ProfiDAT®*compact* is a system for continuous, bidirectional data transmission between a local network and mobile consumers. The data transmission is based on WiFi and takes place by transmitting the data signal from a stationary antenna to the collector via slotted waveguides.

ProfiDAT®*compact* system can be installed parallel to a conductor rail system and then acts as an earthing conductor rail.

- **2-in-1 Solution:**

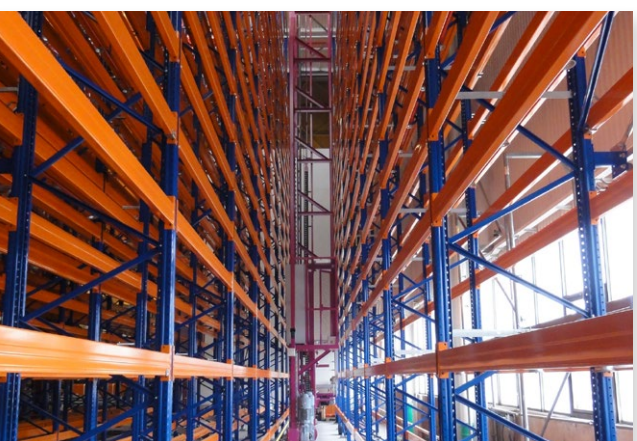
- Data Transmission + PE Rail*



* PE = Protective Earth (Grounding)

Main Applications

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



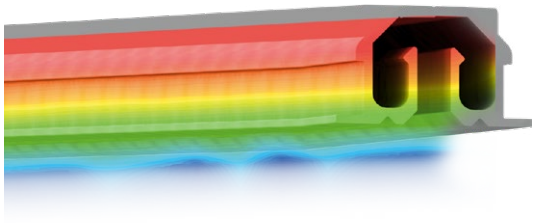
System Description

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.



Signal Distribution of ProfiDAT®compact

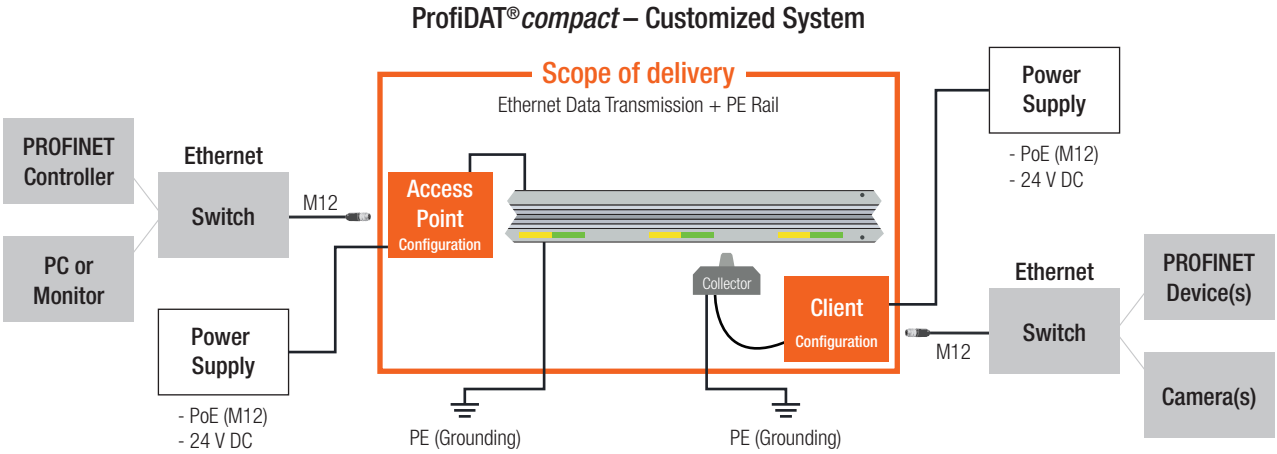
Your Benefits

- **Highly safe and reliable data transmission**
  - Lowest interference potential with other wireless systems through slotted waveguide technology
- **Use of well-known transceivers and their iFeatures (e.g. SIEMENS)**
  - 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 2-in-1 functionalities:
  - Data transmission
  - PE* rail
- **The most compact** slotted waveguide available
  - Considerable installation space savings
  - Considerable reduction of installation time (only 1 instead of 2 systems need to be installed)
- **Compatibility to lifters, transitions, curves, etc.**

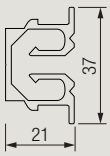
Interfaces

Scope of Delivery and Interfaces

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 M12-D connectors (other connections available on request). 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.



Technical Data

Ethernet Data Rate	1 Gbit/s
Frequency	5 GHz frequency band
Data Interface	Ethernet based (M12)
Compatible Communication Protocols	· Ethernet (TCP/IP, UDP) · PROFINET/PROFIsafe, conformance class A · Ethernet/IP · etc.
Maximum System Length	No limitation; max. segment length supplied by one Access Point: 120 m
Maximum number of Clients per Segment / Access Point	32
Profile Dimensions [mm]	*Standard Profile length: 5 m* 
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
Maximum traveling speed Collector/ Vehicle	600 m/min on straight rails, 40 m/min on transitions/switch points
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 IEC 60664-1, VDE 0110-1:2022-07	Insulation coordination for equipment within low-voltage supply systems – Part 1: Basic principles, requirements and tests (IEC 60664-1:2020); German version EN 60664-1:2020
DIN EN 60204-1, VDE 0113-1:2019-06	Safety of machinery – Electrical equipment of machines – Part 1: General requirements (IEC 60204-1:2016, modified); German version EN 60204-1:2018
DIN EN 60529, VDE 0470-1:2014-09	Degrees of protection provided by enclosures (IP code) (IEC 60529:1989 + A1:1999 + A2:2013); German version EN 60529:1991 + A1:2000 + A2:2013
DIN EN IEC 60204-32, VDE 0113-32:2025-11	Safety of machinery – Electrical equipment of machines – Part 32: Requirements for hoisting machines (IEC 60204-32:2023); German version EN IEC 60204-32:2025
Radio country approvals	Depending on the transceivers used in our ProfiDAT®*compact* systems, radio approvals exist for all countries we deliver our systems to

Subject to technical changes

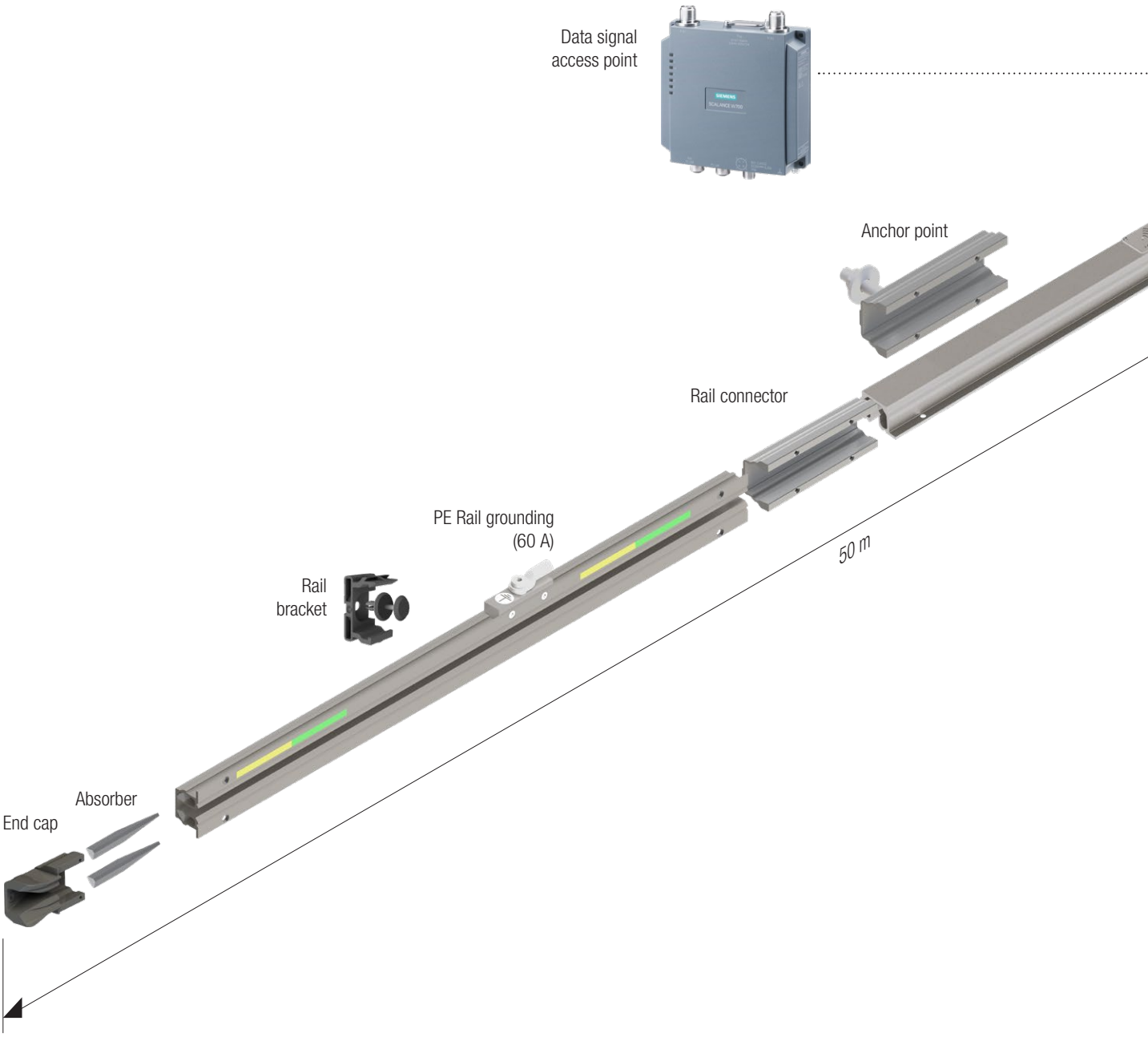
System Components
System Overview

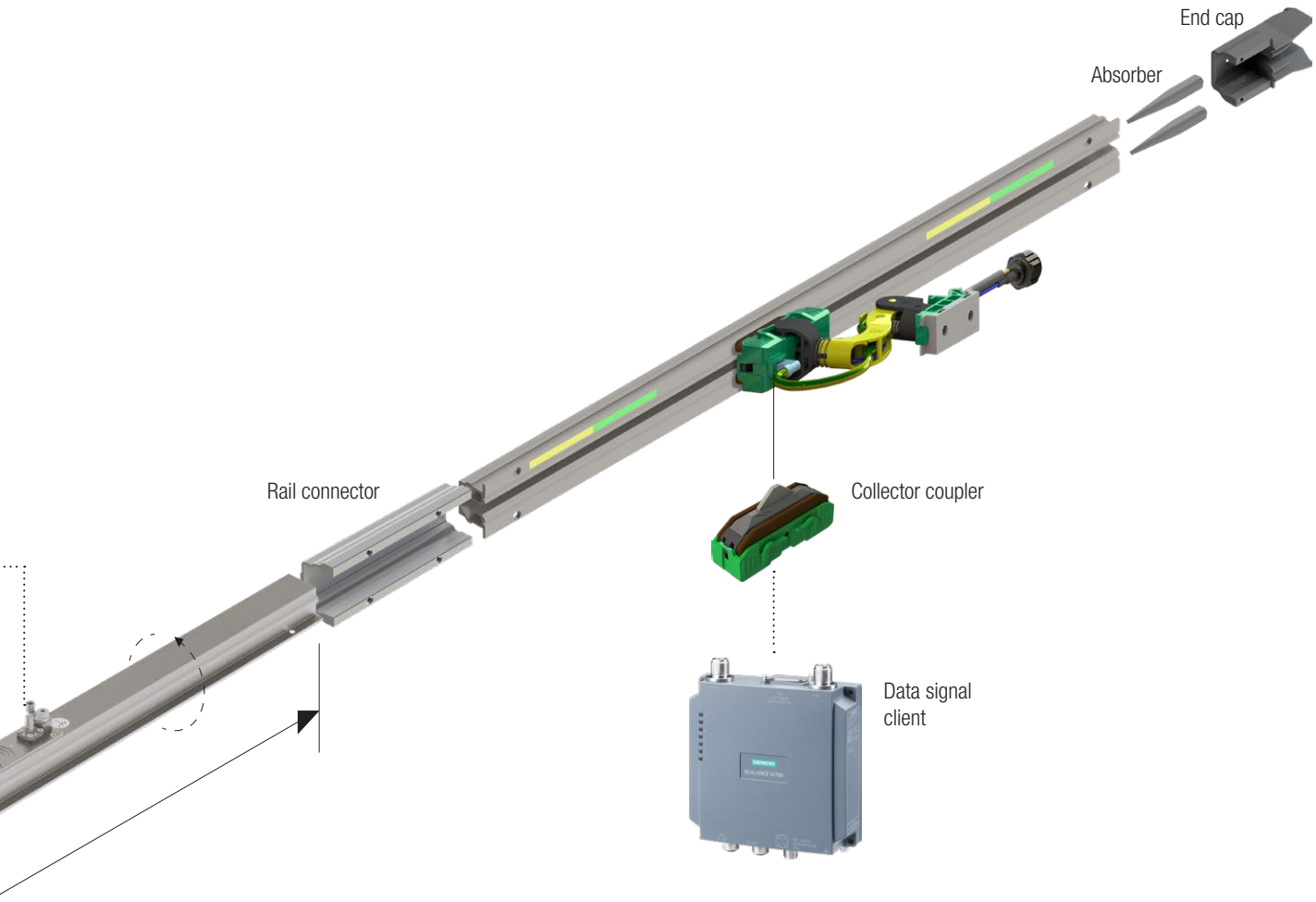
Exemplary Arrangement

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

Layout-specific Data Transmission performance	Layout Example 1	Layout Example 2	Layout Example 3
Max no. of Consumers per Segment *	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	120 m	100 m	100 m

* Segment = Rail Segment supplied by one access point. All consumers (clients) assume 2 collectors each.

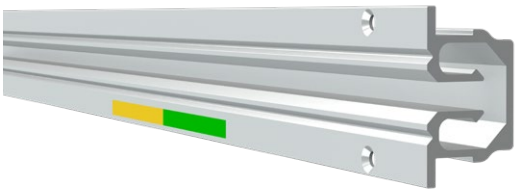


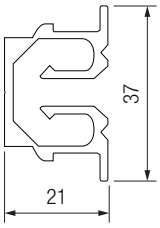

End cap
Absorber
Rail connector
Collector coupler
Data signal
client

System Components
Rails

Straight Rails

The ProfiDAT®*compact* aluminium rails guide the WiFi signals and shields against interference from other wireless systems. In addition, they can be used as grounding conductor rails. Apart from the standard length of 5 m, custom lengths can be ordered.





Technical specifications – system (rail + rail connector)

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

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

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.

See page 19 for further details.

Curved Rails

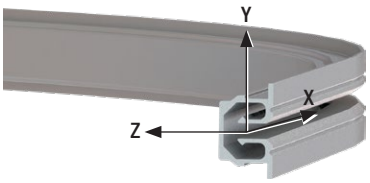
Curved Rail – Config. No.: 0515-CVXX#

Curved rails can be customized according to customer requirements.

Limitations arise due to the insertion direction, which is always from the side, and the minimum bending radius. In addition, each bend must be provided with a straight section of at least 200 mm at the ends for the connector.

The smallest possible radius for curves is 750 mm.

Inside curve

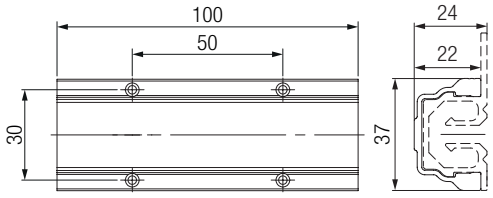


Outside curve

System Components
Rail Connectors

Standard Rail Connector

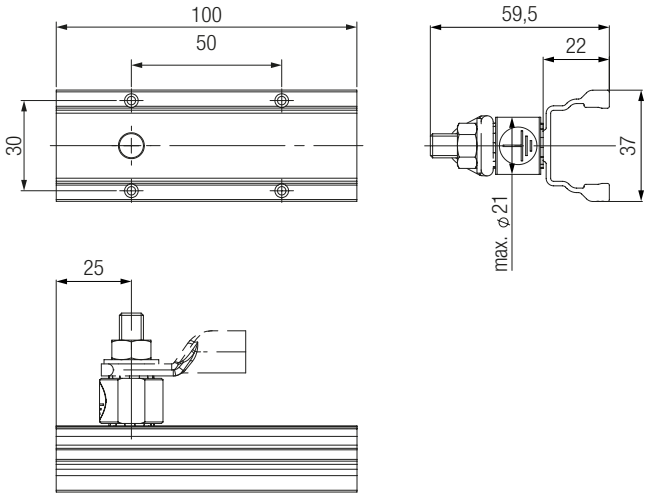
Rail connectors connect the ProfiDAT®*compact* rails to each other. They secure data as well as power transmission between the rails.
Please note: screws are not included! For each segment (= rail segment supplied by one Access Point) one installations kit (Part No: 051590-01, see page 10) must be ordered, in which all required screws are included.



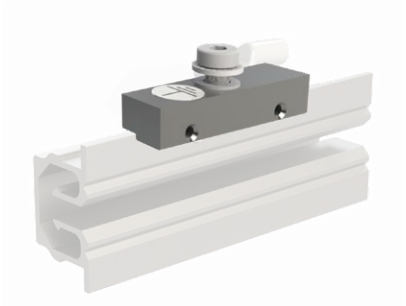
Part No.: 051521-01

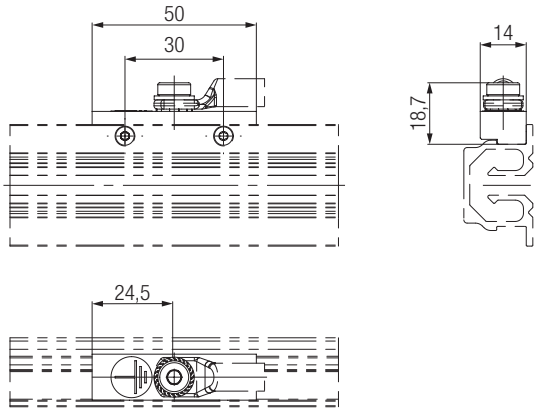
Rail Grounding

For the earthing connection of the rail and the steel structure.
Must not be used as a rail connector.



Part No.: 051521-03





Part No.: 05-E007-0002

Part No.	Screw size	Ampere
051521-03	M8	400
05-E007-0002	M6	60

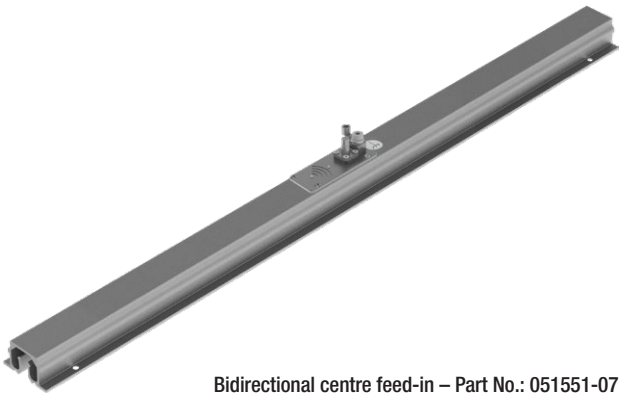
Note: a drilling template is available, see page 19 (Spare Parts/Tools)
The earth connection cable can be configurated, Mat.-No.: 051522-01#

System Components
Feed-In

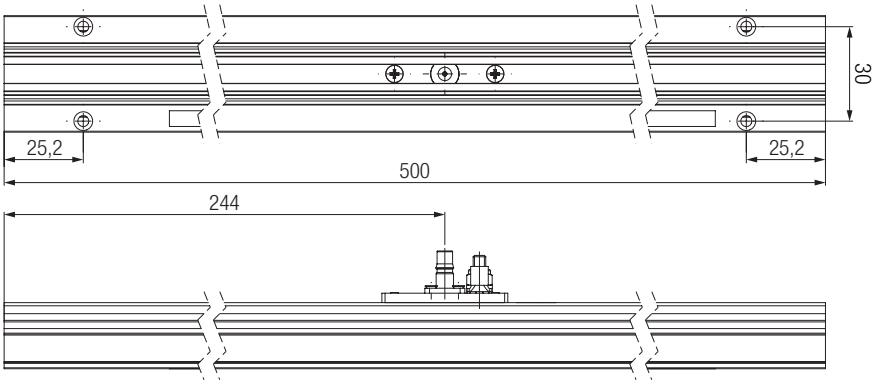
Signal Feed-In

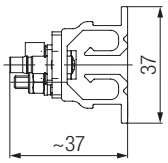
Feed-in sets feed data signals from access points into the ProfiDAT®*compact* rail. The bidirectional central feed-in transmits the signals in both directions. At the end of the section the signal must be terminated by an end segment. Two joints for connection enclosed separately.

Note: the neccessary HF cable for feed-in will be configurated, Mat.-no: 051009*#



Bidirectional centre feed-in – Part No.: 051551-07

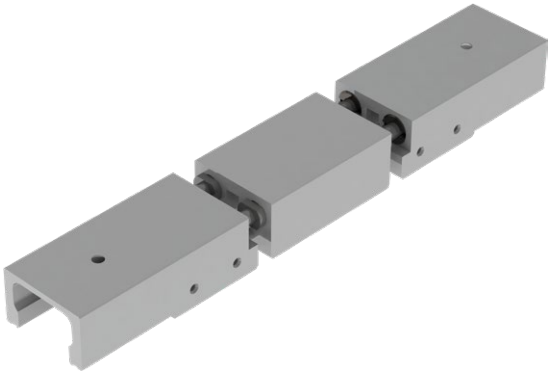




System Components

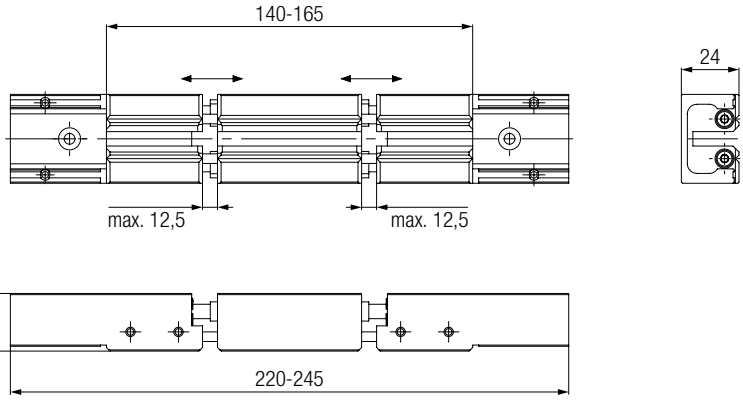
Expansion Element

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 couplers 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.



Set includes:
- Expansion element
- Rail adapter 100 mm (required at segment ends only)

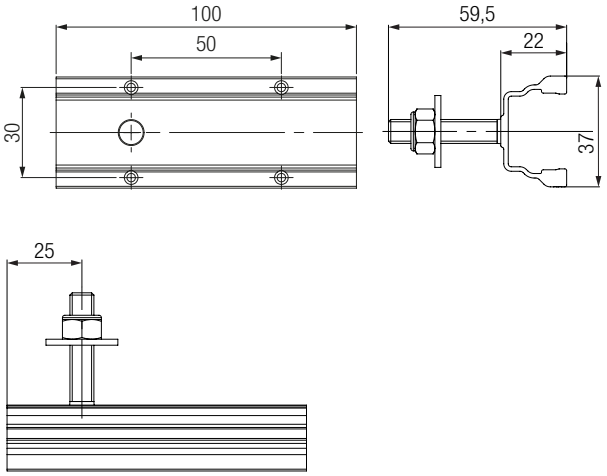
Expansion compensation/unit: 25 mm
Max. ampacity: 200 A
Expansion coefficient ProfiDAT®*compact* rail: 23.8 * 10-6 1/K



Part No.: 051561-01#

Anchor Point

The rail is fixed at one point using an anchor point. It can stretch freely from this point.



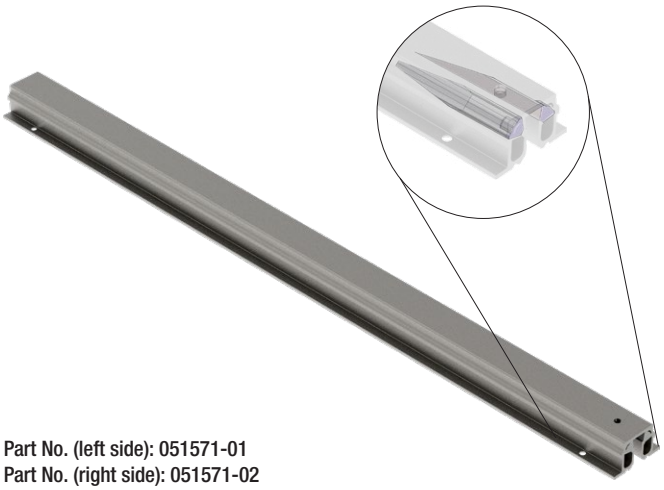
Part No.: 05-F080-0007

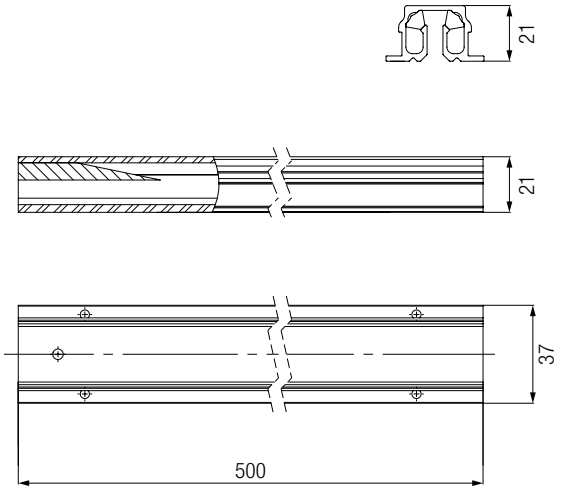
Note: to fit the ProfiDAT®*compact* profile at the anchor point, it must be screwed on.
A drilling template is available, see chapter Spare parts/Tools

System Components

Absorber Rail

The integrated absorber terminates the signal, minimises broadband interference and guarantees optimum signal termination. This ensures stable and interference-free data transmission. This rail is 500 mm long.
Available in two versions – for left and right section ends.

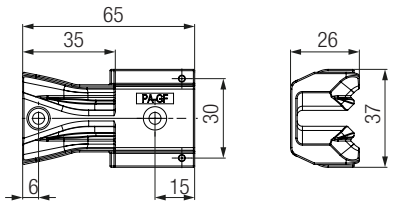


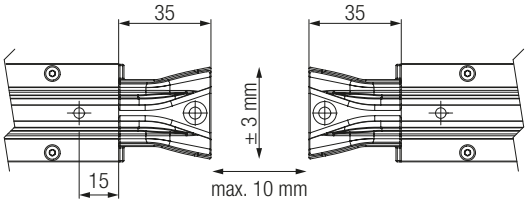


Part No. (left side): 051571-01
Part No. (right side): 051571-02

End Caps

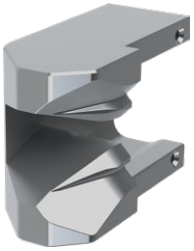
The end caps provide a mechanical end to the rail and ensure a clean and stable edge finish.
Also usable as anchor point.

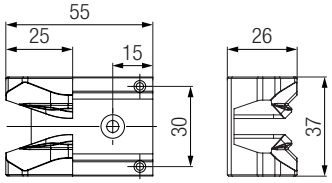


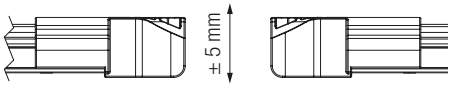


Deviation maximum

Part No.: 051591-01
End Cap (standard) Material: plastic







Deviation maximum

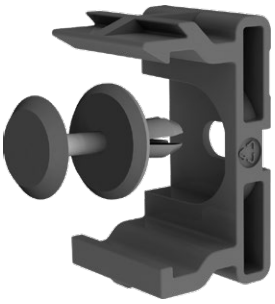
Part No.: 051591-02
End Cap (for switch points/traverses or if PE redundance is desired) Material: aluminium

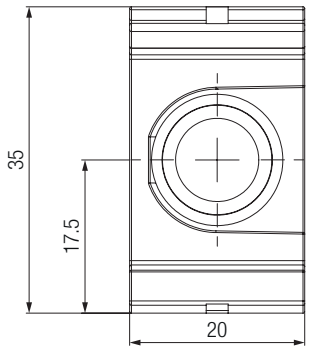
System Components

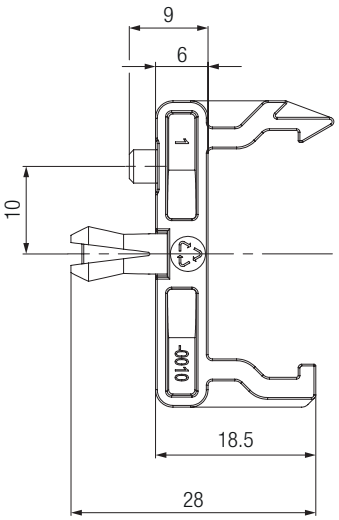
Hanger Clamp

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.

- Bore dimensions see mounting instruction MAL0515-0001-EN)
- Rated suspension spacing (on straight rails): 1 m
- Rated suspension spacing (on curved rails): 0,5 m



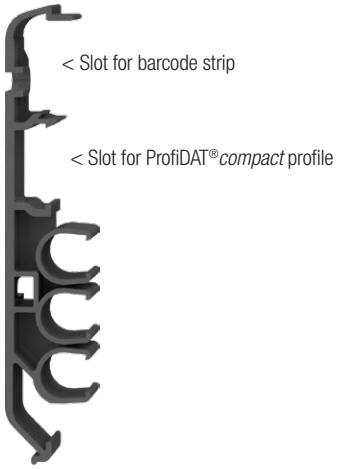




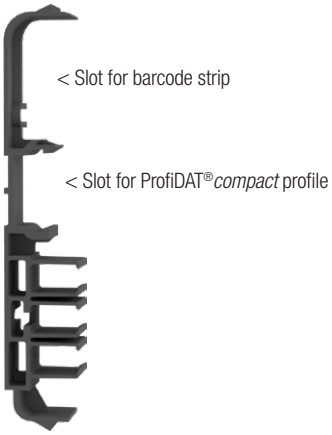
Part No.: 051541-01

Combination Holder

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)



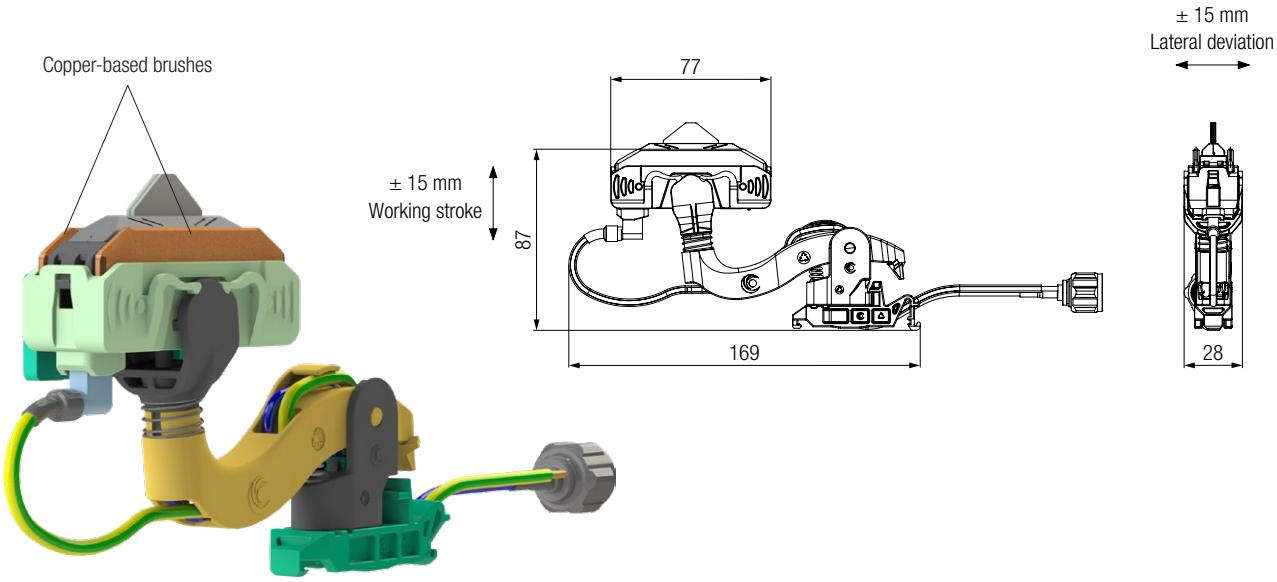
Hanger Clamp for ProfiDAT®compact in combination with 0815 conductor rails (3-pole)

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

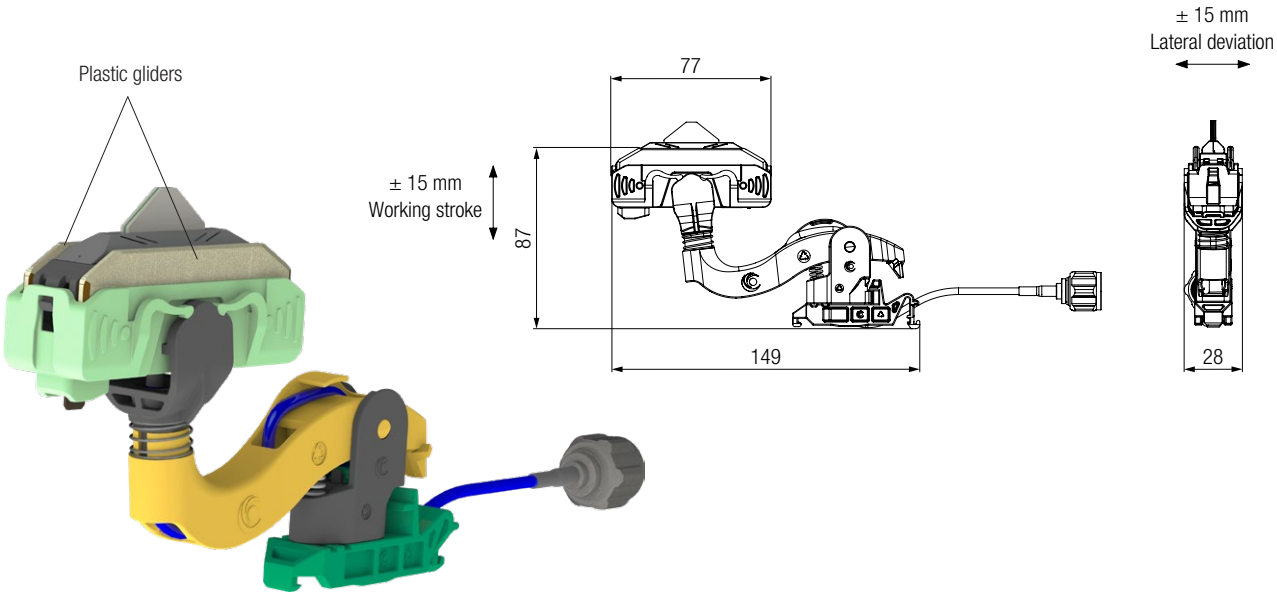
System Components
Current Collectors

Collectors

The collector receives the signal from the rail and sends it to a transceiver (client) mounted on a mobile vehicle. The system also has bidirectional data transmission, meaning that the client can both transmit and receive. A variant is also available with integrated carbon brushes that connect the mobile vehicle to the ProfiDAT®*compact* rail, allowing the rail to function as a PE. The clients act as an interface between the WiFi system of the ProfiDAT®*compact* and the customer network on the mobile vehicle.



Part No.: 051592-01-01
Collector with PE function and brush



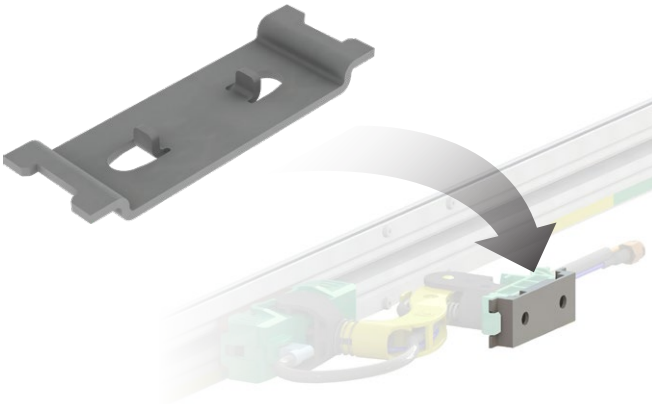
Part No.: 051592-03-01
Collector without PE function, with plastic gliders

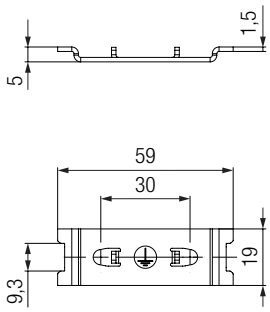
Note: the HF cable neccessary for conecting the coupler with the client transceiver will be configurated, Mat.-no: 051009*#

System Components

Standard installation Base Plate

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.

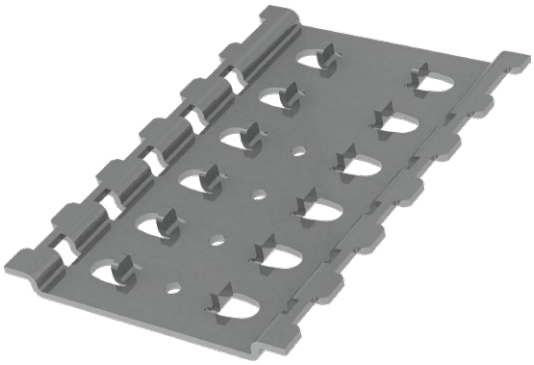


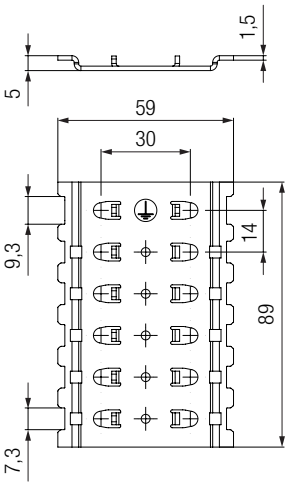


Part No.:
08105B-14X01X000X001

Base Plate for 0815

The following base plate can be used in combination with our conductor rail 0815.
The number of poles is freely selectable.





6-pole base plate

Part No.:
08105B-14x06x000x001

System Components
Feed-In Components

Access Points / Clients – ProfiDAT®*compact*

ProfiDAT®*compact* IWLAN transceivers background:

The ProfiDAT®*compact* Transceivers (Access Points or Clients) send and receive data using MAC-based data transmission in accordance with the IEEE 802.11 standard. The Access Points are installed as stationary near the power feed units. They act as an interface between a stationary Ethernet network and the wireless data transmission through the ProfiDAT®*compact* Profile. In addition, they coordinate communication with the Clients (transceivers installed on the mobile consumers). This also means that a ProfiDAT®*compact* System requires at least two transceivers: An Access Point and a Client for the data communication.

An Access Point can communicate with several Clients, while Clients can only communicate with one Access Point at the same time. Clients can switch from one Access Point to another by following a defined transfer process.

With this function, it is possible to realize unlimited system lengths with ProfiDAT®*compact*, because Clients can switch between different rail segments.
Real-time capable protocols can also be implemented in large systems.

All transceivers are configured for customer-specific applications and layouts, as well as for use in conjunction with ProfiDAT®*compact*. Transceivers other than those configured by Conductix-Wampfler are not compatible with the ProfiDAT®*compact* Profile. In addition, configured transceivers can only be used within a defined system and segment.

To offer our customers a convenient solution in the event of a transceiver exchange, all ProfiDAT®*compact* Transceivers are equipped with a so-called C-Plug or Key- Plug, on which the individual configuration is stored. These plugs can be plugged into a compatible replacement device and automatically transfer the configuration to the new device. Even if these plugs are lost or damaged, Conductix-Wampfler is able to deliver a new transceiver with the required configuration as long as the serial number of the original device is known. The supplied transceivers may only be used in conjunction with the ProfiDAT®*compact* Profile.

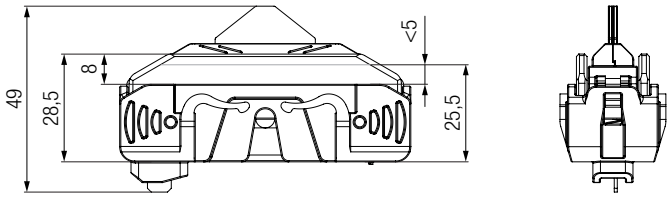
Technical Data ProfiDAT®*compact* Transceivers (Access points or clients)	
	Standard Transceiver
Material-No. Access Point	051051-01#
Material-No. Client	051001-01#
Installation	Indoor
Measures	Height: 160 mm Depth: 45 mm Width: 140 mm
Weight	0.95 kg
Mounting Options **(depending on transceiver model)**	• S7 – 300 – Mounting Rail • S7 – 1500 – Mounting Rail • 35 mm DIN-Top-hat rail • On wall if mounted flat
Protection class	IP65
Data connection	M12, 100 Mbit/s
Power supply	• Power-over-Ethernet (RJ45), acc. To IEEE802.3at for type 1 and IEEE802.3af • M12 interface (24 V)
Supply voltage from terminal block **Supply voltage from Power-over-Ethernet**	24 V DC (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	Depending on the transceivers used in our ProfiDAT®*compact* systems, radio approvals exist for all countries we deliver our systems to
Data sheet for the transceiver specifically for your system available on request.	

Spare Parts/Tools

Collector Heads

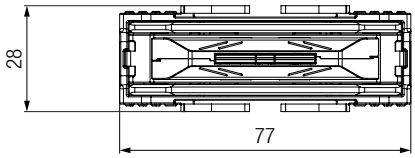
Collector Head 32 A – Part No.: 051592-11-01

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. Wear limit of the carbon brushes: 5 mm

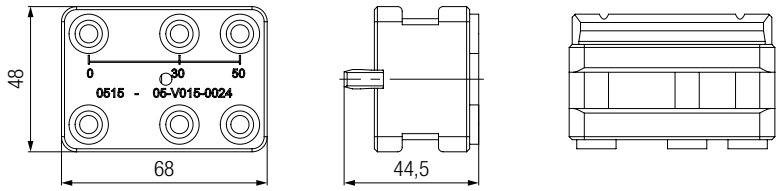


Collector Head with plastic gliders – Part No.: 051592-13-01

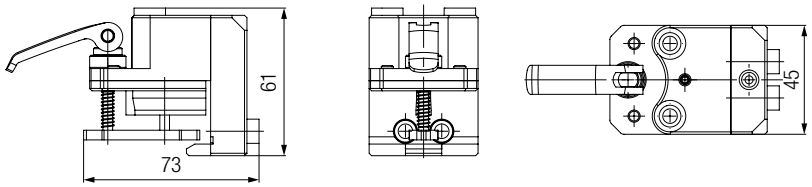
If a PE function is not desired, this collector head with gliders must be used instead. Dimensions identical to Part No.: 051592-11-01



Drilling Templates



Part No.: 05-V015-0024 (drilling template for Rail Grounding 60 A)



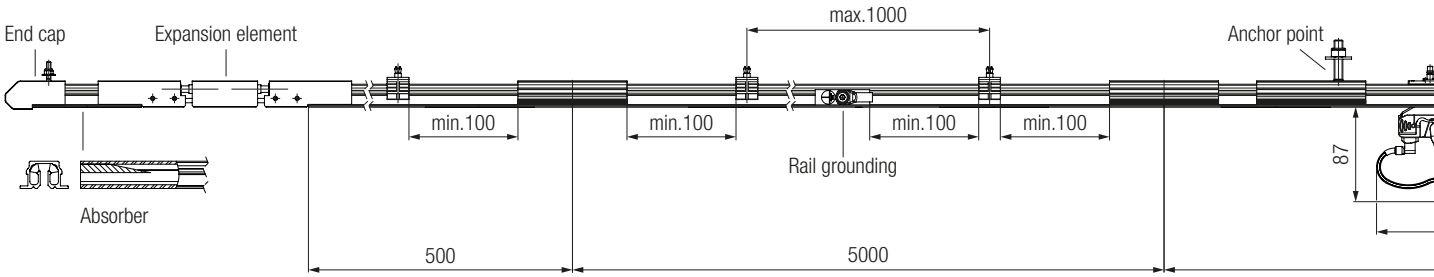
Part No.: 05-V015-0005 (drilling template for connectors/Rail Grounding 400 A)

Installation Kit

Item	Pcs.	For installation of
Screw M2, 5x6	10	plastic endcaps
Self-tapping screw DIN7500, M3x8	120	rail connectors, PE connectors
Screw M4x20 incl. washer & locking nut	2	anchor point
Positioning device	1	connector installation

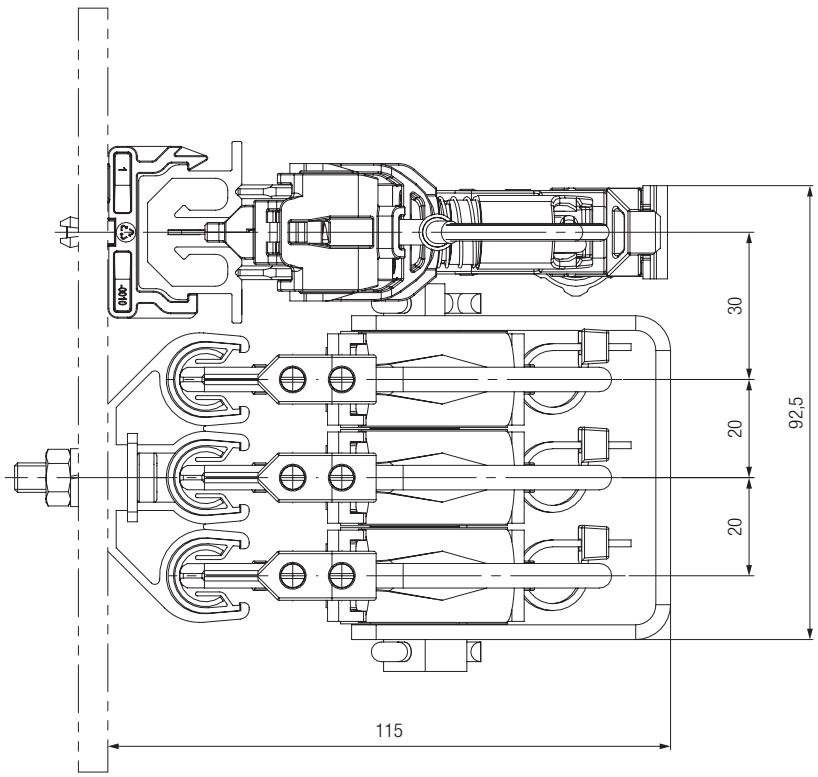
Part No.: 051590-01

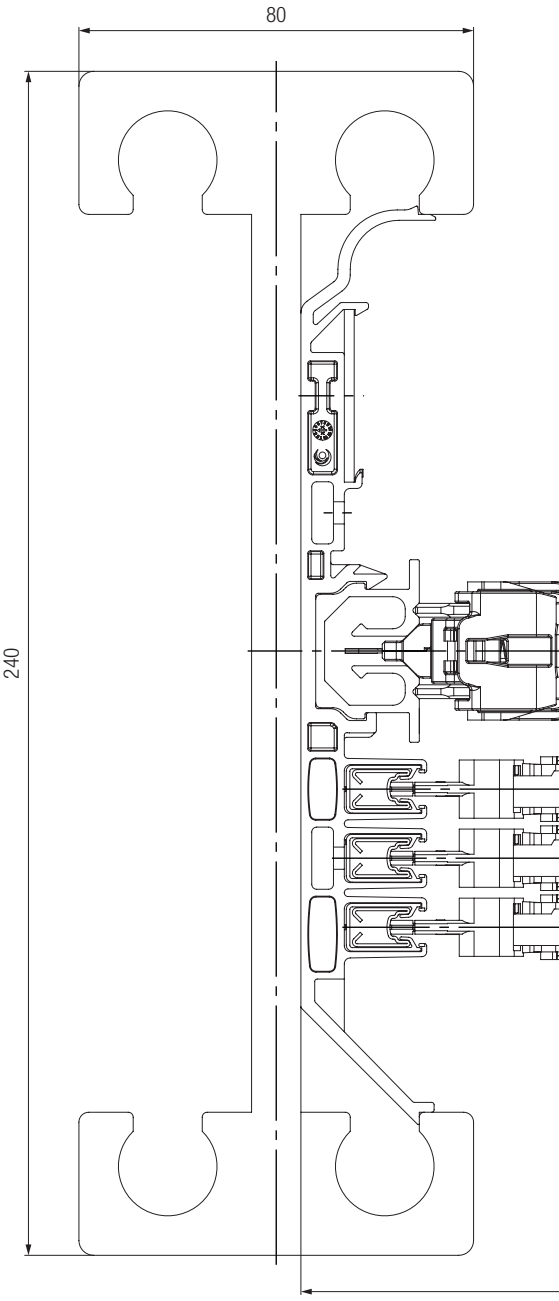
System Layout

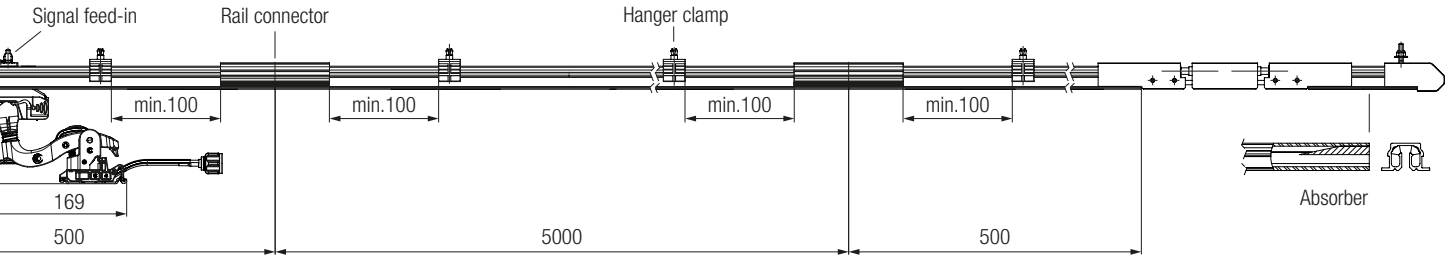


Exemplary system combinations:

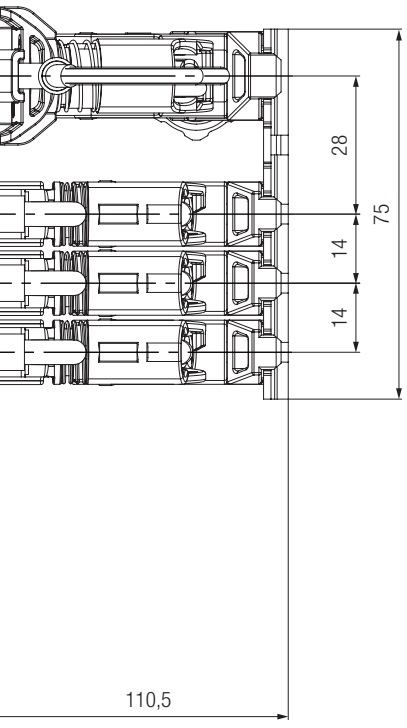
ProfiDAT®*compact* in combination with
Conductor Rail System SingleFlexLine 0811



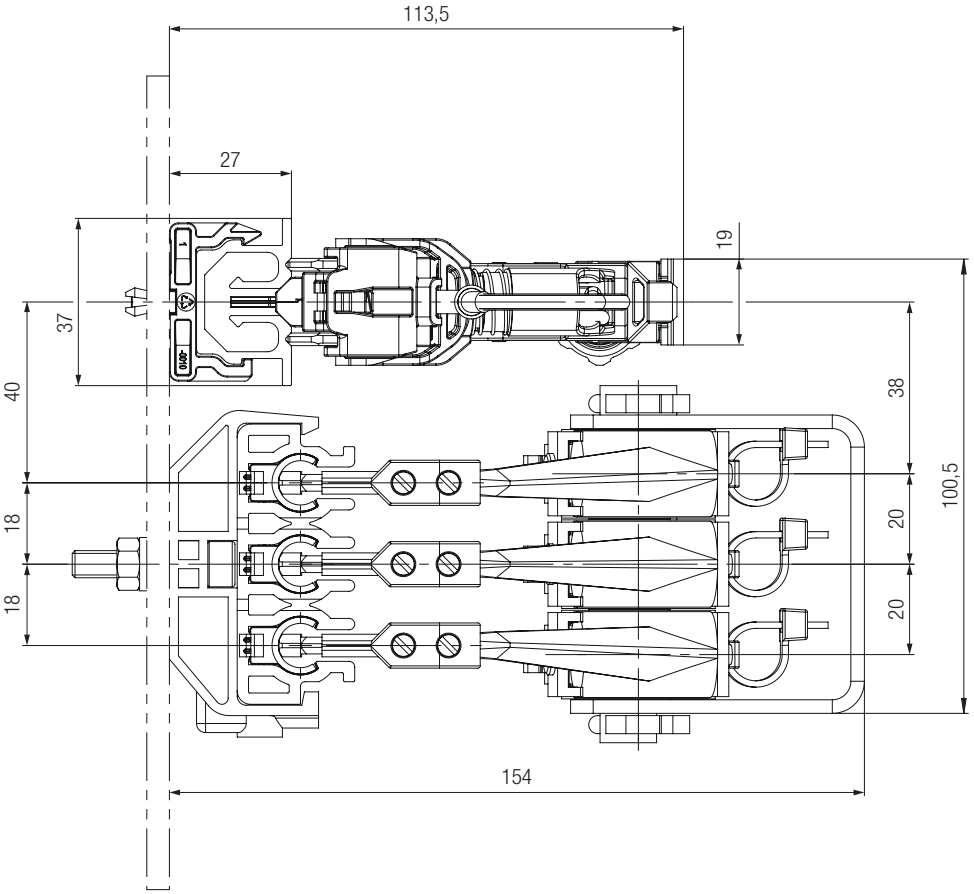




ProfiDAT®*compact* in combination with
Conductor Rail System SingleFlexLine 0815



ProfiDAT®*compact* in combination with
Conductor Rail System MultiLine 0831



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.

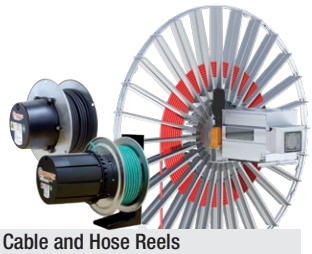
Having this in mind, we highly recommend to involve Conductix-Wampfler in the commissioning process. Our product experts and experienced service engineers are able to perfectly adapt the characteristics of the systems to the real conditions on site.

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.

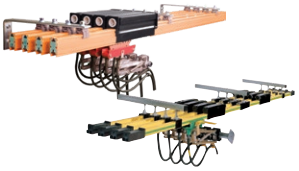


Cable and Hose Reels

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

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

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 that can also be used as grounding rail (PE) at the same time.

Charging Solutions

Whether inductive or conductive, this bundle of products offers always the perfect solution for all industrial charging tasks including the matching battery with integrated battery management system.

www.conductix.com

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

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

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