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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 mobile antenna 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 mobile antenna or current collector.

• 3-in-1 Solution:
  - Data Transmission ①
  - PE Rail* ②
  - Positioning Rail ③

* PE = Protective Earth (Grounding)

ProfiDAT® compact with 0831 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 mobile antenna 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.

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)

* PE = Protective Earth (Grounding)
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 rail without (left) and with positioning strip (right)

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. When ProfiDAT® compact rails are used with an optional sensor as part of an integrated positioning solution, a bar code or matrix code band is attached directly to the rails to detect a mobile vehicle's position.
Main Components

Mobile Unit

The mobile unit includes the ProfiDAT®compact mobile antennas and clients. The antennas pull the signal from the rail and send 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.

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.

* 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.

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**

- **Power Supply**
  - PoE (RJ45)
  - 24 V DC

- **Ethernet Data Transmission**
  + PE Rail + Positioning Rail

- **Access Point**
  - Configuration

- **Client**
  - Configuration

- **PROFINET Controller**

- **Ethernet Switch**
  - RJ45

- **PC or Monitor**

- **Power Supply**
  - PoE (RJ45)
  - 24 V DC

- **PROFINET Device(s)**

- **Camera(s)**
# Product Data

<table>
<thead>
<tr>
<th>Ethernet Data Rate</th>
<th>100 MBit/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>5 GHz, IEEE 802.11</td>
</tr>
<tr>
<td>Data Interface</td>
<td>Ethernet based (RJ45)</td>
</tr>
</tbody>
</table>
| Compatible Communication Protocols | - Ethernet (TCP/IP, UDP)  
- PROFINET/PROFIsafe, conformance class A  
- Ethernet/IP |
| Maximum System Length | No limitation |
| Maximum Segment Length (with one access point, center feed-in) | 120 m (with one client and two mobile antennas) |
| Maximum number of Mobile Vehicles/ Clients per segment | 6 (with 12 mobile antennas and 100 m max. segment length) |
| Profile Dimensions | ![Profile Dimensions](image) |
| Permissible Ambient Temperature Range | -20°C to +60°C (other limits to be clarified on request – transceivers can be installed in an air-conditioned control cabinet) |
| Max. Ambient Temperature Difference | 40 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 rail (PE function) | 400 A |
| Maximum Amperage per Mobile Antenna (PE function) | 32 A (Copper graphite); 16 A (Graphite) |
| Maximum traveling speed Mobile Antenna/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  
Radio country approvals | The SIEMENS IWLAN transceivers used in our ProfiDAT®compact systems have radio approvals for all countries we deliver our systems to |
| Radio country approvals | The SIEMENS IWLAN transceivers used in our ProfiDAT®compact systems have radio approvals for all countries we deliver our systems to |

Subject to technical changes
System Overview

Example Arrangement

Below is an example of a ProfiDAT® compact system with all its components.

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

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

<table>
<thead>
<tr>
<th>Item</th>
<th>Part No.</th>
<th>Component Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>051551-01</td>
<td>Center feed-in set, rail with positioning strip Length 1 m</td>
</tr>
<tr>
<td>20</td>
<td>051551-03</td>
<td>End feed-in set, rail with positioning strip Length 2 x 0,5 m, plus rail endcaps</td>
</tr>
<tr>
<td>30</td>
<td>051552-01</td>
<td>Access point ProfiDAT® compact Customized access point including HF cables and accessories</td>
</tr>
<tr>
<td>40</td>
<td>051521-02</td>
<td>PE connector Rail connector with PE cable; 32 A, 16 mm², cable length 5 m</td>
</tr>
<tr>
<td>50</td>
<td>051511-01</td>
<td>ProfiDAT® compact rail with positioning Standard rail length 5 m</td>
</tr>
<tr>
<td>60</td>
<td>051521-01</td>
<td>Connectors Rail connector</td>
</tr>
<tr>
<td>70</td>
<td>051541-01</td>
<td>Standard Hanger clamp Hanger clamp for the mechanical installation of the ProfiDAT® compact rail</td>
</tr>
<tr>
<td>80</td>
<td>051501-01</td>
<td>Mobile unit With 2 mobile antennas, carbon graphite, 32 A, cable length 2 m, including client and accessories</td>
</tr>
<tr>
<td>90</td>
<td>051590-01</td>
<td>Installation and spare part kit Rail endcaps, screws, standard Hanger clamps</td>
</tr>
</tbody>
</table>

Spare Parts

<table>
<thead>
<tr>
<th>Item</th>
<th>Part No.</th>
<th>Component Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>051592-01</td>
<td>Spare mobile antenna Carbon graphite, 32 A</td>
</tr>
</tbody>
</table>

Service Packages

<table>
<thead>
<tr>
<th>Item</th>
<th>Service Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td>Installation Mechanical installation &amp; measurement of the ProfiDAT® compact system (incl. reporting)</td>
</tr>
<tr>
<td>120</td>
<td>Commissioning Commissioning &amp; fine tuning of the ProfiDAT® compact system (including reporting)</td>
</tr>
</tbody>
</table>
Layout-Specific Data Transmission Performance

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<tr>
<th></th>
<th>Layout Example 1</th>
<th>Layout Example 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max no. of Consumers per Segment ¹</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Communication Cycle Time</td>
<td>64 ms</td>
<td>32 ms</td>
</tr>
<tr>
<td>No. Retries</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Cycle Time x No. Retries</td>
<td>192 ms</td>
<td>96 ms</td>
</tr>
<tr>
<td>Process Data</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Video/Audio Data</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Max. Segment Length ²</td>
<td>100 m</td>
<td>120 m</td>
</tr>
</tbody>
</table>

¹ Segment = Rail Segment supplied by one access point. All consumers (clients) assume 2 mobile antennas each.
² All lengths assume center feed-in.
System Components

Feed-In Components

Feed-In Sets

End feed-in set - rail with positioning strip (rail end caps included) – Part No.: 051551-03
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 segment 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 center feed-in. End feed-in sets are additionally equipped with rail end caps. Terminating resistors are included in the scope of delivery of the access points.

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

Center feed-in set - rail with positioning strip – Part No.: 051551-01
Center feed-in set - rail without positioning strip – Part No.: 051551-02

Note: Each ProfiDAT compact system with center feed also requires (despite the center feed-in set) an end feed-in set, to terminate the signals at both ends of a segment.

Center 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

Technical Data ProfiDAT® compact Transceivers (Access Points or Clients)

<table>
<thead>
<tr>
<th>Measures</th>
<th>Height: 156 mm / Depth: 127 mm / Width: 26 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>0.52 kg</td>
</tr>
<tr>
<td>Mounting Options</td>
<td>S7-300- Mounting rail</td>
</tr>
<tr>
<td></td>
<td>S7-1500- Mounting rail</td>
</tr>
<tr>
<td></td>
<td>35 mm DIN- Top-hat rail</td>
</tr>
<tr>
<td></td>
<td>Mounting on wall if mounted flat</td>
</tr>
<tr>
<td>Protection Class</td>
<td>IP30</td>
</tr>
<tr>
<td>Data Connection</td>
<td>RJ45, 100 MBit/s</td>
</tr>
<tr>
<td>Power Supply</td>
<td>- Power-over-Ethernet (RJ45), acc. to IEEE802.3at for type 1 and IEEE802.3af</td>
</tr>
<tr>
<td></td>
<td>- 4-pole terminal block with screw connection (24 V)</td>
</tr>
<tr>
<td>Type of Voltage / of the Supply Voltage</td>
<td>DC</td>
</tr>
<tr>
<td>Supply voltage from terminal block</td>
<td>19.2 V - 28.8 V</td>
</tr>
<tr>
<td>Consumption current from terminal block</td>
<td>0.25 A</td>
</tr>
<tr>
<td>Power loss from terminal block</td>
<td>6 W</td>
</tr>
<tr>
<td>Consumption current from Power-over-Ethernet</td>
<td>0.125 A</td>
</tr>
<tr>
<td>Power loss from Power-over-Ethernet</td>
<td>6 W</td>
</tr>
<tr>
<td>Radio country approvals</td>
<td>The SIEMENS MILAN transceivers used in our ProfiDAT® compact systems have radio approvals for all countries we deliver our systems to</td>
</tr>
</tbody>
</table>
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 shield 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 0.165
DC resistance [Ω/1000 m] 35°C 0.175
Impedance [Ω/1000 m] 20°C/50 Hz 0.236
Impedance [Ω/1000 m] 35°C/50 Hz 0.243
Weight (5 m rail) [kg] 2.94

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 0.179
DC resistance [Ω/1000 m] 35°C 0.19
Impedance [Ω/1000 m] 20°C/50 Hz 0.302
Impedance [Ω/1000 m] 35°C/50 Hz 0.309
Weight (5 m rail) [kg] 2.62

ProfiDAT® compact Rail with positioning

ProfiDAT® compact Rail without positioning
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): $r \text{ min.} = 2300 \text{ mm}$

Vertical inside curve: $r \text{ min.} = 750 \text{ mm}$

Vertical outside curve: $r \text{ min.} = 750 \text{ mm}$
**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

<table>
<thead>
<tr>
<th>Thickness of mounting surface [mm]</th>
<th>Diameter “X” of bore for mounting holes [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0</td>
<td>4.6 ± 0.05</td>
</tr>
<tr>
<td>4.0</td>
<td>4.7 ± 0.05</td>
</tr>
<tr>
<td>5.0</td>
<td>4.8 ± 0.05</td>
</tr>
<tr>
<td>6.0</td>
<td>4.9 ± 0.05</td>
</tr>
</tbody>
</table>

**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.
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.

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 separately.

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. PE or grounding cables must suitable for operating temperatures of at least 90°C and colored in green and yellow.

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)

<table>
<thead>
<tr>
<th>Connector diameter</th>
<th>Grounding cable diameter</th>
<th>Available cable lengths</th>
</tr>
</thead>
<tbody>
<tr>
<td>M8</td>
<td>6 mm²</td>
<td>1 m / 2 m / 5 m</td>
</tr>
<tr>
<td></td>
<td>16 mm²</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50 mm²</td>
<td></td>
</tr>
<tr>
<td></td>
<td>150 mm²</td>
<td></td>
</tr>
</tbody>
</table>

* PE = Protective Earth (Grounding)
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 mobile antennas (each including 600 mm HF and PE cable)
- Clients
- Selected HF components (e.g., HF cables (1 m, 2 m or 5 m), plugs, etc.)
- Customer-specific and layout-specific configuration of clients

The HF cables for the connection between mobile antenna and client are available in: 1 m, 2 m and 5 m lengths. The PE cable (length 600 mm), which is already installed inside the antenna arm, is delivered with an open end. The mobile antennas 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’s rail, and thus allowing the rail to act as a ground. Clients function as the interface between the ProfiDAT® compact’s WiFi system and the customers’ network on the mobile vehicle.

### Selected HF Components

<table>
<thead>
<tr>
<th>Max. Current</th>
<th>Carbon Brush Material</th>
<th>Cable Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>32 A</td>
<td>Copper, Graphite</td>
<td>2.5 mm²</td>
</tr>
<tr>
<td>16 A</td>
<td>Graphite</td>
<td>2.5 mm²</td>
</tr>
</tbody>
</table>

### Customer and layout-specific Configuration

![Diagram of mobile antenna](image)

**ProfiDAT® compact mobile antenna**

![Diagram of ProfiDAT® compact components](image)

**ProfiDAT® compact**

Client Siemens IWLAN (*)

(exemplary illustration)
System Components
Mobile Components / Positioning

Standard Installation Base Plate

Config. No.: 051502-01

Installation base plates connect the mobile antennas of ProfiDAT® compact and the mobile vehicles of the application. In lieu of the standard base plate, which is meant for the ProfiDAT® compact mobile antennas only, additional options can be requested from Conductix-Wampfler (e.g., combined base plates for ProfiDAT® compact mobile antennas and conductor rail collectors). The feet of a mobile antenna can be clipped on these base plates (see illustration on page 18).
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

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 Mobile Antennas

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

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 as 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.

Scope of delivery ProfiDAT® compact

* PE = Protective Earth (Grounding)
System Layout

ProfiDAT® compact combined with 0811 conductor rails

ProfiDAT® compact combined with 0815 conductor rails
Spare Parts

Installation and Spare Part Kit
Part No.: 051590-01
The installation and spare part kit consists of all smaller parts that are required for the installation of ProfiDAT® compact, such as screws for the rail connectors. It also contains sufficient material if these parts get lost or broken during mounting, commissioning or first testing.
Scope of delivery:
- 2 x Rail endcaps
- 20 x Screws for plastic (countersunk) M2,5x6 (for rail endcaps)
- 100 x Self-tapping screws DIN7500 – M (countersunk) M3x8 (for rail connectors and PE connectors)
- 10 x Standard hanger clamps

Mobile Antenna
Complete Mobile Antenna copper-graphite brushes - Part No.: 051592-01
Complete Mobile Antenna graphite brushes - Part No.: 051592-02
To ensure highest reliability and convenience for our customers the spare mobile antenna consists of a completely assembled mobile antenna 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 mobile antenna.
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)

Profidata Compact Mobile Antenna

Mobile Antenna Head copper-graphite brushes - Part No.: 051592-11
Mobile Antenna Head graphite brushes - Part No.: 051592-12
Besides the complete mobile antenna, 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.

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 mobile antenna head (Part No.: 051592-12) must be replaced once the graphite brushes are worn.

<table>
<thead>
<tr>
<th>Max. Current</th>
<th>Carbon Brush Material</th>
<th>Cable Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>32 A</td>
<td>Copper Graphite</td>
<td>2.5 mm²</td>
</tr>
<tr>
<td>16 A</td>
<td>Graphite</td>
<td>2.5 mm²</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ampacity</th>
<th>Graphite</th>
<th>Copper Graphite</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>++</td>
<td>+</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Lifetime</th>
<th>Graphite</th>
<th>Copper Graphite</th>
</tr>
</thead>
<tbody>
<tr>
<td>++</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Breaking resistance</th>
<th>Graphite</th>
<th>Copper Graphite</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>++</td>
<td>+</td>
</tr>
</tbody>
</table>
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 (raised cheese head) M2.5x6

± 5 mm
± 3 mm
max. 10 mm
35 mm

± 5 mm
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
Other Products from Conductix-Wampfler

The products described in the this catalog represent a few of the products from the broad spectrum of Conductix-Wampfler components and systems for the transfer of energy, data, gases, and fluids. The solutions we deliver for your applications are based on your specific requirements. In many cases, a combination of several different Conductix-Wampfler products are needed to fill the application. 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.

Motor driven cable reels
Motor driven reels by Conductix-Wampfler are the perfect solution for managing long lengths of heavy cable and hoses in very demanding industrial applications. Monospiral, level wind, and random wind spools.

Slip ring assemblies
Whenever powered machinery needs to rotate 360°, field proven slip ring assemblies by Conductix-Wampfler can flawlessly transfer energy and data. Here, everything revolves around flexibility and reliability.

Conductor bar
Whether they are enclosed conductor rails, expandable single-pole bar systems, or high amperage bar for demanding steel mill use up to 6000 amps. Conductix-Wampfler’s conductor bar is the proven solution to reliably move people and material.

Spring driven cable reels
We have 60 years experience and trusted brands such as Insul-8, Wampfler, and IER. We offer small cord reels all the way to large multi-motor units, a wide range of accessories, and hazardous location reels.

Cable Festoon systems
It’s hard to imagine Conductix-Wampfler cable trolleys not being used in virtually every industrial application. They are reliable and robust and available in an enormous variety of sizes and models.

Push Button Pendants
Our ergonomic pendants are ideally suited for industrial control applications. They are available in a wide range of configurations for overhead cranes and other machinery.

Radio remote controls
Safe, secure, and reliable radios use the latest in microprocessor technology. Available in several models for overhead crane control and other types of machinery.

Inductive Power Transfer IPT®
The contact-less system for transferring energy and data. For all tasks that depend on high speeds and absolute resistance to wear.

Data Transfer: ProfiDAT® | Nexus
Safe & reliable wireless communication using slotted waveguide technology that’s PROFIsafe compatible.
Nexus NB for narrow band signal transfer over power conductors

LJU Automation EMS Controller
Specialized controllers Programmable by parameters, ideal for Electrified Monorails at automotive plants, with over 1500 in service worldwide. Adaptable for other applications

BridgeGuard™
Prevents crane to crane and crane to end collisions. IP69K rated for indoor and outdoor use, with a 3 ft to 150 ft range. Compliant with IEC 60068-2-6:2007

Air & Spring balancers | Air hoists
Conductix-Wampfler offers the full line of ENDO positioning devices. Rugged, reliable steel construction increasing safety and decreasing fatigue and body stress.
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