

## INSTABUS EIB system characteristics

INSTABUS EIB consists of a twin-core bus line and bus-compatible installation devices such as sensors, actuators and system components, that are connected to it.

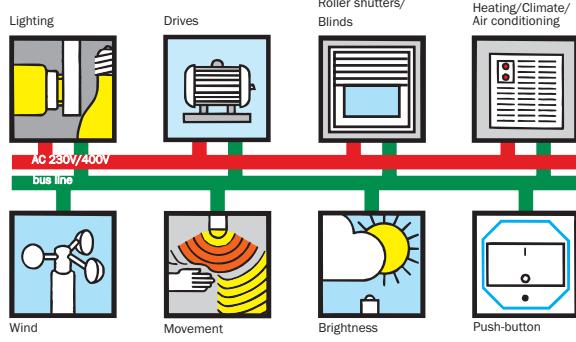
Sensors record information that is transmitted to the bus in the form of a data telegram. Sensors are e.g. INSTABUS push-buttons and binary inputs for connecting floating contacts.

Actuators receive data telegrams and convert these e.g. into switching or dimming signals.

System devices and components are required for the basic system functionality. They consist essentially of power supply units for generating bus voltage, couplers for connecting bus segments and interfaces for connecting programming devices.

Both power for the bus device electronics and information are transmitted via the twin-core bus line. The bus line leads to every bus device. As a rule, sensors require only the bus line. Actuators usually also need the 230/400 V mains supply for controlling loads. Bus line and mains supply are separated strictly from each other.

### Actuators



### Sensors

Sensors and actuators are selected depending on the required application and consist of a bus coupler and an application module with the corresponding application program. The application programs are part of the Merten product database. They are loaded into the devices together with the project design and commissioning software ETS via the serial interface of a PC and the bus.

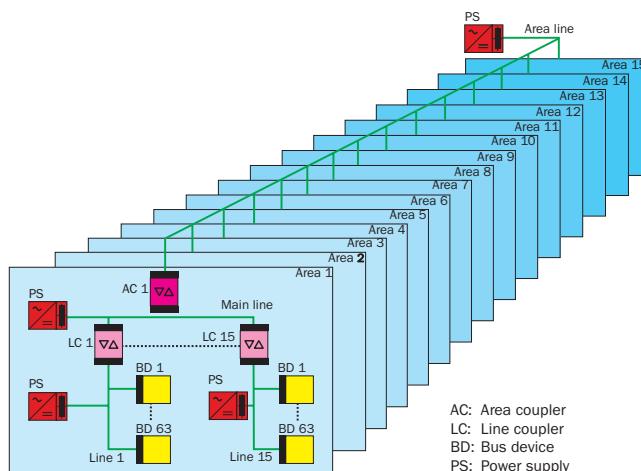
INSTABUS EIB is a decentralised bus system. Every INSTABUS device has its own microcontroller. The devices can exchange information directly, i.e. without a central unit, using the serial bus. All devices are equal bus devices (multi-master operation). To avoid telegram collision and the destruction of data, the CSMA/CA procedure is used.

INSTABUS EIB is operated using safety extra-low voltage SELV. The bus voltage is DC 24 V (+6/-4 V). If the voltage falls below 20 V, the devices are disconnected from the bus. The data transmission speed is 9.6 kbit/s, so terminating resistors are not required.

## INSTABUS EIB topology

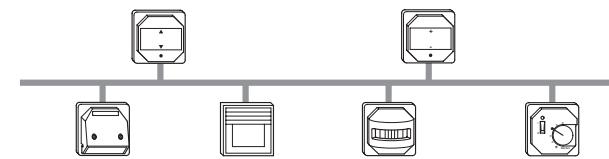
INSTABUS EIB is divided into segments in a hierarchical structure. The line is the smallest unit. A line can include up to 64 bus devices (TLN) as well as a power supply with choke (PSU). Using line couplers (LC), that are connected to a main line, up to 15 lines can be coupled. This forms the area. For larger installations, backbone couplers can be used to connect another 15 areas via a backbone line. Main and backbone lines also require a power supply with choke.

If all lines and areas are used, over 1200 bus devices can be connected to the INSTABUS.

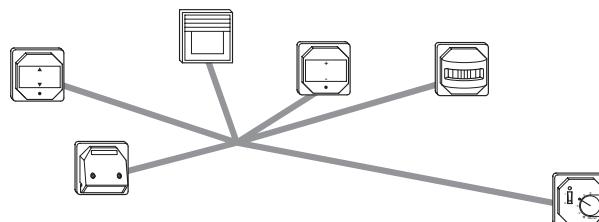


## INSTABUS cable routing

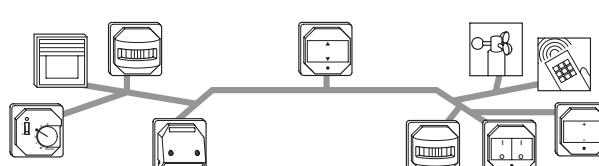
Cable routing within a line can be implemented in a line, star or tree structure. However, all kinds of other combinations are also possible.



Line structure



Star structure

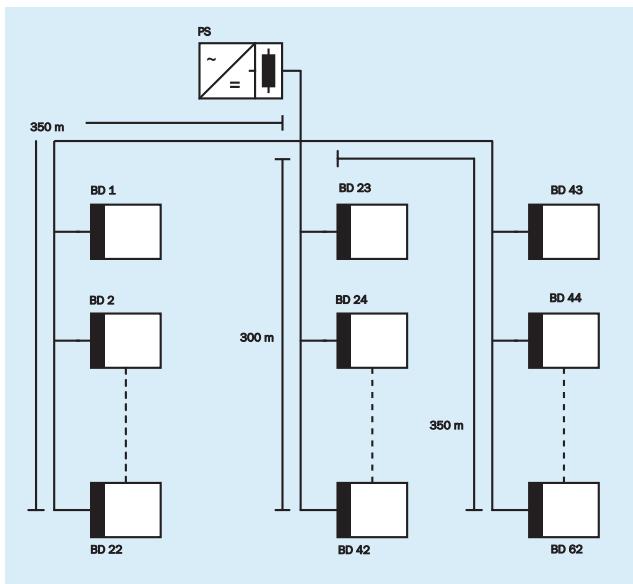


Tree structure

5

When bus lines are laid, the following limit values should be observed:

- Max. cable length between power supply and bus device: 350 m
- Max. cable length between two bus devices: 700 m
- Total length of all cables within a line: 1000 m



The INSTABUS EIB devices are connected in parallel using the red/black core pair of the bus cable with the help of bus connecting terminals. Up to four bus cable pairs (red and black) can be connected to each bus connecting terminal. The bus connecting terminal (art. no. 689701) can also be used as a junction terminal in the switch terminal boxes. Make sure that the polarity is correct when installing.

## INSTABUS cables

The following cable types can be used as bus lines:

Type	Structure	Cabling
<b>YCYM 2 x 2 x 0.8</b>	EIBA guideline (Basis: DIN VDE 0207 and 0815)  Cores red (+EIB) black (-EIB) yellow (free) white (free)	Fixed cabling: in dry, damp and wet rooms, for surface mounting, flush mounting, in pipes. Outdoors, if protected from direct sunlight.
<b>J-Y (St) Y 2 x 2 x 0.8 EIB version*</b>	DIN VDE 0815 (Basis: DIN VDE 0815)  Cores red (+EIB) black (-EIB) yellow (free) white (free)	Fixed cabling: in dry and damp operating areas, surface mount- ing, flush mounting, in pipes outdoors, in and beneath plaster.

\* The DIN VDE 0829 standard determines the testing voltage for an additional test between the cores and outer casing surface in accordance with DIN VDE 0472 part 508 as 4 kV. It is to be expected that this value will be changed to 2.5 kV as a result of European harmonisation efforts.

If the second, free core pair of the bus cable is used, observe the following:

- Only safety extra-low voltage SELV allowed
- Max. continuous current 2.5 A (short-circuit and overload protection required)
- Voice transmission is allowed, but not for public telephone lines
- Avoid confusing them with cores which must be assigned to the INSTABUS.

## INSTABUS addressing

INSTABUS addressing distinguishes between physical addresses and group addresses. The physical address is the name of the bus device and is written in the form "Area . Line . Device" (e.g. 5.4.23). The group address determines the assignment of the bus devices to each other. Apart from servicing and programming procedures, a device is always addressed using its group address(es). The group address is divided into up to 15 main groups each with maximum 2048 subgroups. It is written in the form "Main group / Subgroup" (e.g. 1/127).

## INSTABUS flush-mounted devices with application interface

The insert with integrated bus coupler and application interface is located directly at the retaining ring, to which it is attached to the flush-mounted box. The frame in the desired switch design is then clipped on and finally the application module to suit the design.

### Available INSTABUS flush-mounted inserts with application interface:

- Bus coupler, flush-mounted (Art. no. 690099)
- Bus coupler, flush-mounted 2 (Art. no. 690299)
- Switch actuator, flush-mounted/230/10 (Art. no. 627099)
- Series actuator, flush-mounted/230/6 (Art. no. 697199)
- Blind actuator, flush-mounted/230/6 (Art. no. 697299)

Apart from push-buttons, the 10-pole plug-in connection also connects other INSTABUS application modules. For example, the movement detector or the room temperature control unit can be plugged in.

### Available application modules:

- Serial data interface, flush-mounted or flush-mounted 2
- PLANTEC multi-function push-button with IR receiver
- Push-button, 1-gang to 4-gang
- Multi-function push-button, 4-gang with/without IR receiver
- Multi-function push-button, 2-gang/4-gang with room temperature control unit
- TRANCENT control electronics, 1- to 4-gang
- Binary input, flush-mounted/2x10
- IR receiver, flush-mounted
- ARGUS 180, flush-mounted
- Info display, flush-mounted
- Room temperature control unit, flush-mounted/PI

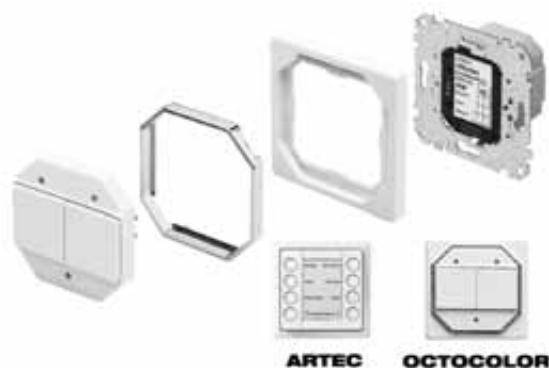
The functionality of the completely installed device is primarily determined by the software, that is loaded in the insert with integrated bus coupler. Not all combinations of insert and application modules are allowed.

### Available switch design:

- System M (M-SMART, M-ARC, M-PLAN, M-STAR)
- System Design (ARTEC, TRANCENT, ANTIK)
- OCTOCOLOR

A flush-mounted bus device with application module consists of:

- INSTABUS flush-mounted insert
- Frame (colour ring for OCTOCOLOR)
- Application module
- Application program



## INSTABUS devices in M1/ATELIER design (System Basis)

This installation principle determines that the INSTABUS insert is fully equipped with an integrated bus coupler (except for the room temperature control unit). The retaining ring for the screw fixing is attached to the installation box.

The physical address is programmed once the bus connecting terminal with push-button and LED is plugged onto the back of the module. Insert and frame are then put onto the retaining ring. The application program is loaded into the bus coupler with a programming device (e.g. PC) via the bus.

During certain building stages, pre-installations have to be carried out without the electronics being damaged during painting work later on as they are inserted last.

A switch range can be replaced by another one without any problems. So ATELIER instead of M1 or vice versa.

The rockers in the desired colour are plugged onto the push-button inserts. If you decide you want a new range or a different colour later on, only the frame and rocker are replaced.

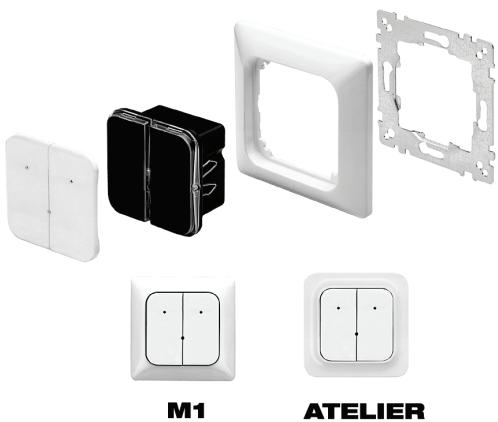
For storage purposes the modular design means: minimum space and expenses.

A System Basis insert consists of:

1. Retaining ring
2. Frame (M1 or ATELIER)
3. INSTABUS insert (push-button insert and rockers)
4. INSTABUS application program

The application program determines:

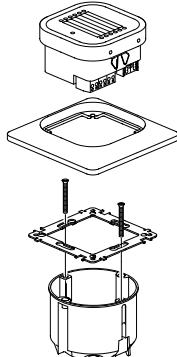
- the functionality of the bus device
- group address(es)
- parameters, like e.g. switching, dimming or blind control, LED functions, etc.
- the priority of transmitted telegrams



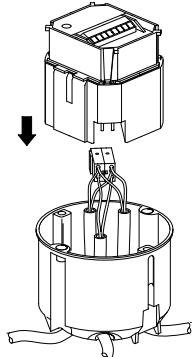
M1

ATELIER

## Flush-mounted installation:



## Bus connection:



## INSTABUS push-button with push-button module (System M / System Design)

On the basis of this installation principle, the push-button module is fully equipped with an integrated bus coupler. The retaining ring for the screw fixing is attached to the installation box.

The physical address is programmed after the bus connection terminal with push-button and LED is plugged on to the back of the push-button module.

The rocker is plugged onto the push-button module in the desired colour. Push-button module and frame are then put on to the retaining ring.

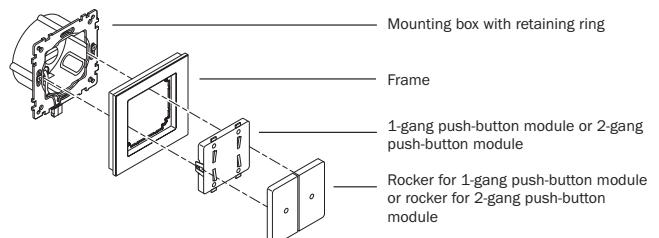
The push-button module provides you with two or four button surfaces, two in the case of 1-gang push-buttons and four in the case of 2-gang push-buttons. The keys can be programmed to carry out the following functions: switching, dimming, controlling blinds and retrieving scenes.

Available push-button modules:

- 1-gang and 2-gang for System M (art. no.. 625199, 625299)
- 1-gang and 2-gang for System Design (art. no.. 626199, 626299)

Available rockers for push-button modules

- 1-gang and 2-gang for System M each: without imprint, with imprint 1/0, with arrow imprint (art. no. 6251.., 6252.., 625419, 625619, 625519, 625719)
- 1-gang and 2-gang for System Design each: without imprint, with imprint 1/0, with arrow imprint (art. no. 6261.., 6262.., 626419, 626619, 626519, 626719)



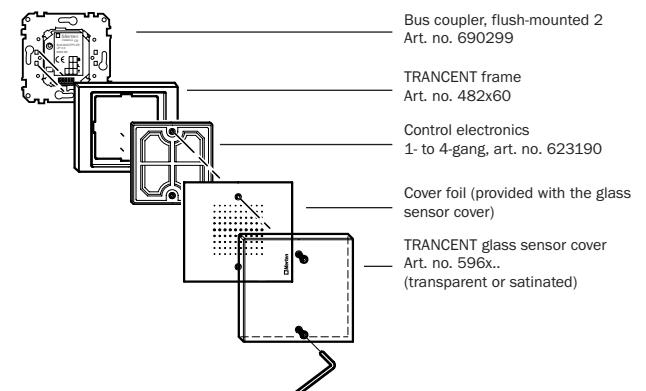
## INSTABUS devices in TRANCENT design

The bus coupler, flush-mounted 2 (art. no. 690299) is screwed onto the retaining ring on the flush-mounted box. Then a TRANCENT frame is clipped on, the control electronics 1- to 4-gang (art. no. 623190) snapped on, the fitting cover foil inserted and finally the glass sensor cover is screwed on.

The functionality of the completely installed push-button is primarily determined by the software, that is loaded in the flush-mounted bus coupler 2.

A flush-mounted push-button in TRANCENT design consists of:

1. Bus coupler, flush-mounted 2 (art. no. 690299)
2. 2-pole bus connecting terminal
3. TRANCENT frames
4. Control electronics, 1- to 4-gang
5. Cover foil
6. Glass sensor cover (transparent or satinated)
7. Application program



## Bus coupling insert, 1-gang/2-gang

Conventional rockers from Merten's switch range can be used as 1-gang and 2-gang via the bus coupling inserts.

The bus coupling insert 1-gang / 2-gang can be attached to a size 60 installation box with two screws or using removable claws. The device is connected using a bus connecting terminal and snapped onto the bus coupling insert with the desired switch cover/serial switch cover and frame.

The functionality of the completely installed device is ultimately determined by the software.

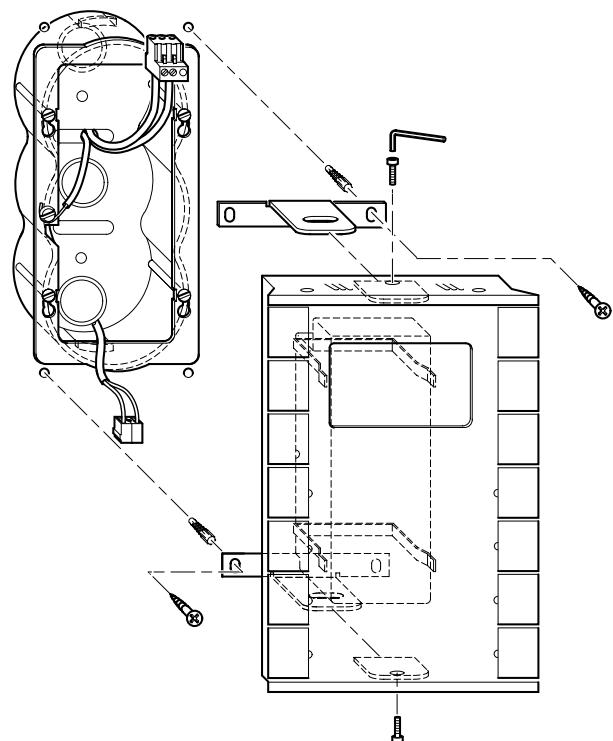
A flush-mounted bus device consists of:

1. 2-pole bus connecting terminal
2. Bus coupling insert, 1-gang or 2-gang
3. Rocker from the desired switch range
4. Frame from the desired switch range
5. Application program for bus coupling insert

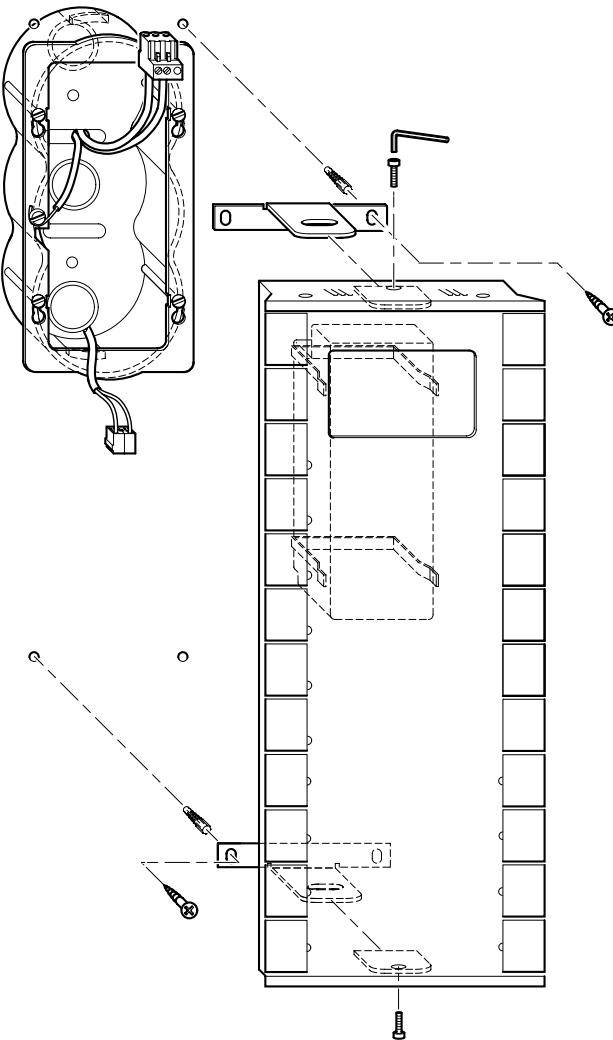
### Available switch design:

System M (M-SMART, M-ARC, M-PLAN, M-STAR)

- System Design (ARTEC, TRANCENT, ANTIK)
- System Basis (M1, Atelier)
- OCTOCOLOR
- AQUACLASSIC and ANTI-VANDALISM on request



Surface-mounted installation of 623014 with protection against dismantling 623090



Surface-mounted installation of 623024 with protection against dismantling 623090

## Surface mounting of PLANTEC appliances

PLANTEC with 8 function keys and display, art. no. 623014

PLANTEC with 18 function keys and display, art. no. 623024

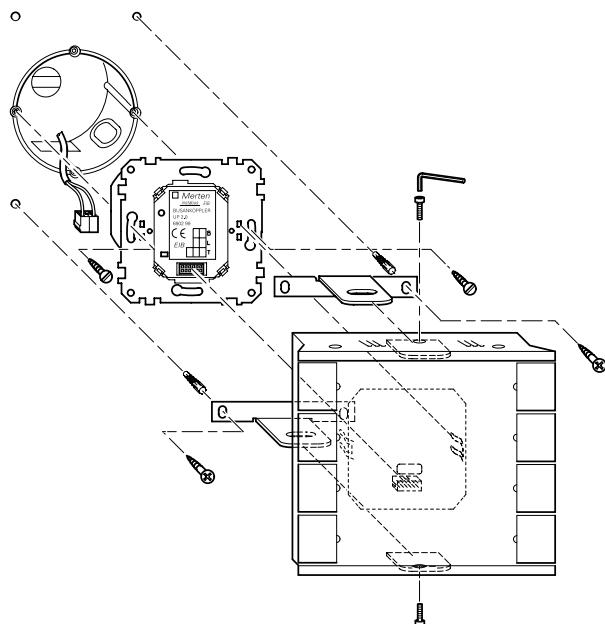
On both devices with display, the bus coupler and the supply connections for the display are located on the rear side of the device. For operation, 230 V auxiliary voltage (supply from above) and the INSTABUS (supply from below) are required in a flush-mounted double box.

The supplied supporting plate is screwed onto a flush-mounted double box and earthed. Then the PLANTEC device is snapped in place. The flush-mounted double box must be installed at a right angle. Protection against dismantling for surface-mounted PLANTEC devices is available (art. no. 623090).

The following drawings show the surface-mounted installation with protection against dismantling.

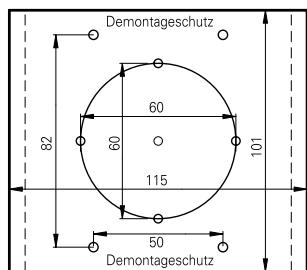
**PLANTEC multi-function push-button with IR receiver  
(art. no. 623008)**

A bus coupler, flush-mounted 2 (art. no. 690299) is screwed onto the flush-mounted box. Then the PLANTEC multi-function push-button with IR receiver is mounted.

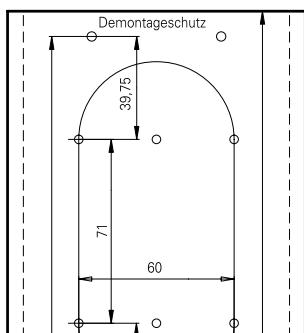


Surface-mounted installation of 623008 with protection against dismantling 623090

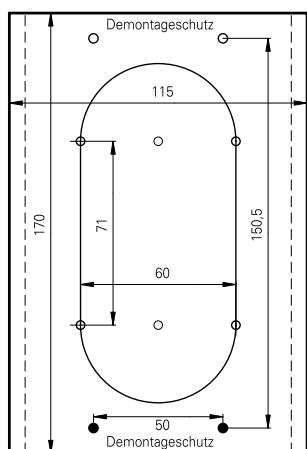
**Dimensions and bore dimensions for the protection against dismantling**



PLANTEC multi-function push-button with IR receiver  
(art. no. 623008)



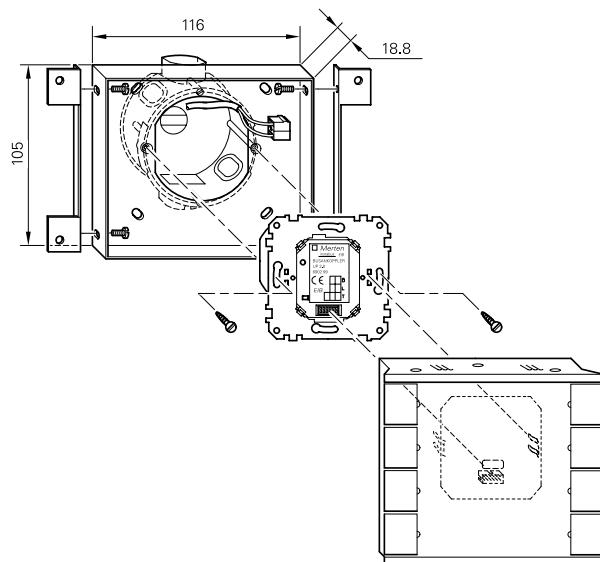
PLANTEC with 18 function keys  
and display (art. no. 623024)



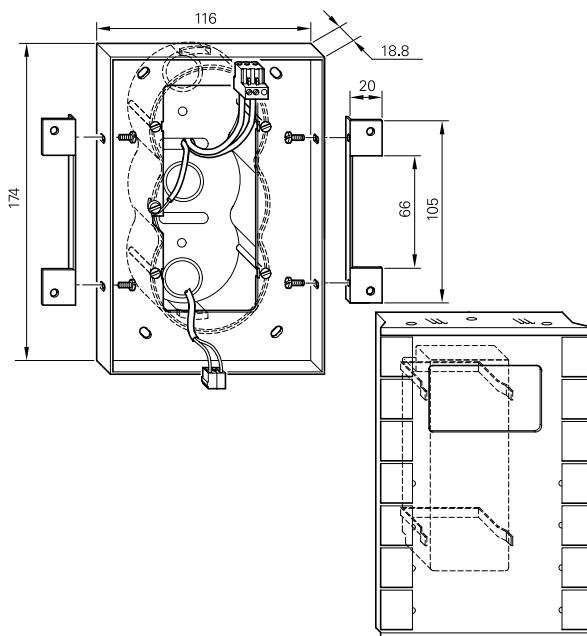
PLANTEC with 8 function keys  
and display (art. no. 623014)

**Flush-mounted installation of PLANTEC devices**

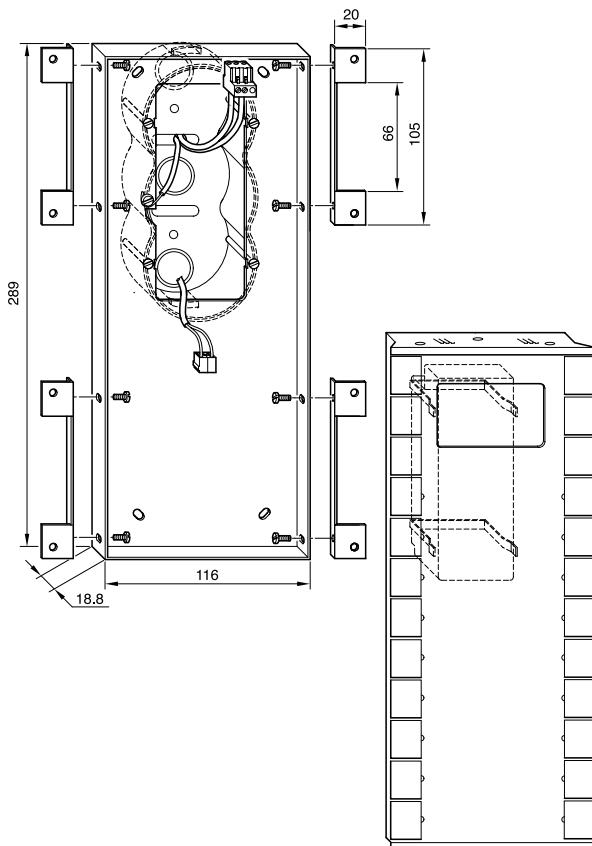
When PLANTEC devices are flush-mounted, the flush mounting box with integrated flush-mounted box, available as an accessory, is installed flush and at a right angle. The flush mounting boxes (art. no. 623098/99) for the PLANTEC devices with display are earthed.



Flush-mounted installation of 623008 with mounting box 623097

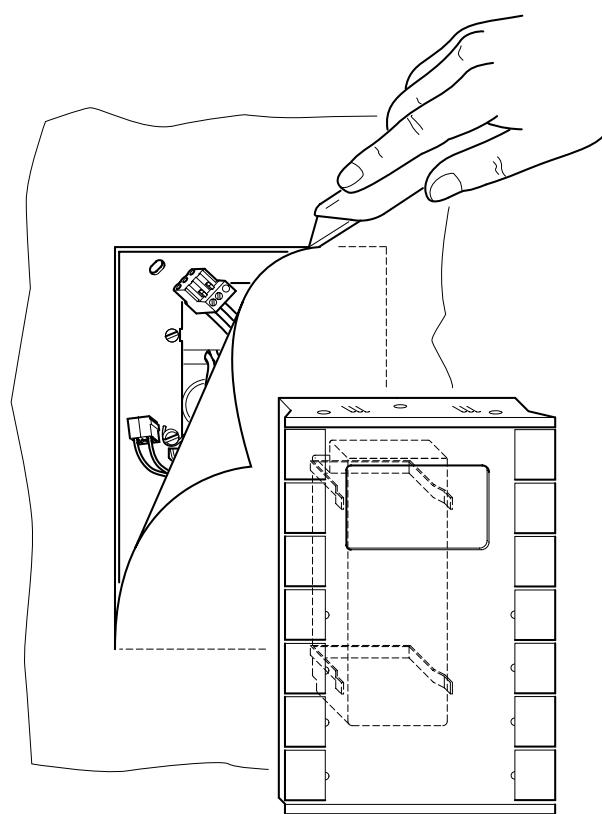


Flush-mounted installation of 623014 with mounting box 623099



Flush-mounted installation of 623024 with mounting box 623098

The mounting boxes should be papered over and cut off using a sharp knife at the inner edge of the flush mounting box.



## Design of INSTABUS surface-mounted and built-in devices

These devices consist of:

1. INSTABUS bus coupler
2. 2-pole bus connecting terminal (for surface-mounted and built-in devices)
3. Application module
4. Application program

## INSTABUS DIN rail mounted devices

The following product types of DIN rail mounted devices are available:

- REG-K
- REG-S
- REG

## REG-K devices

Merten has developed devices to be installed in series with bus connecting terminals. Data rails and connectors are thereby not required and also new flexible installation options are produced.

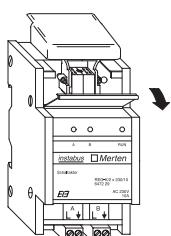
REG-K devices can be mounted on DIN rails EN 50022-35x7.5 as well as on high rails. At the same time, you can combine circuit-breakers with other switching devices on a DIN rail. As data rails are no longer required, the REG-K devices can now be installed in small distribution boards with a width of less than 12 modules. This is not allowed for REG devices with pressure contacts, as data rails which comply with the EIBA guidelines cannot be shortened or changed in any other way. The REG-K devices can be easily connected and serviced. Plug-in terminals with a screw connection make pre-wiring possible, so that devices need only be inserted during commissioning; they can be connected to the bus and the 230 V cables in no time.

All REG-K devices are equipped with control LEDs, that provide an overview of important status information regarding devices and installations at any time.

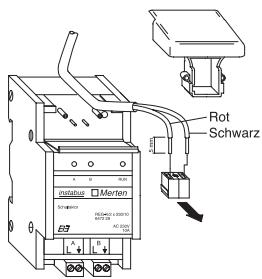


**Bus connection**

Open:



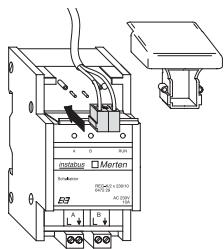
Bus connection:



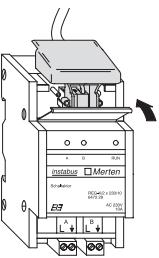
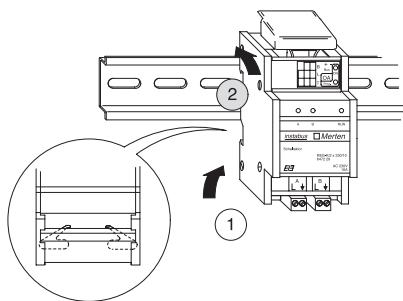
The bus connection is carried out via the bus connecting terminal supplied with the device. The cable cover is then put on to cover the bus connecting terminal, in order to make sure a safe distance is maintained between the bus line and 230 V cables. Max. 4 core pairs can be connected to one bus connecting terminal (insulation strip length: 5 mm).

**Terminal and cable cover**

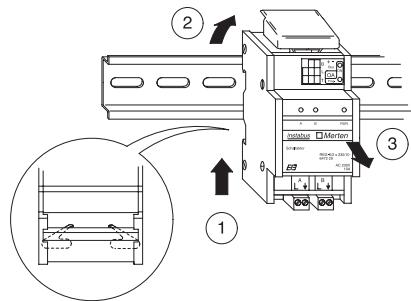
Attach:



Close:

**Snapping onto the DIN rail**

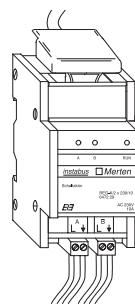
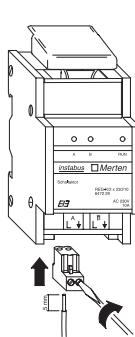
- ① Attach the device to the DIN rail from below and push upwards (press springs together).
- ② Press the device down and attach to the DIN rail.

**Removal from the DIN rail**

- ① Push the device upwards (press springs together).
- ② Hang the device off the DIN rail.
- ③ Remove the device.

**Cable connection**

Plug-in terminals with screw connection make pre-wiring possible, so that devices need only be inserted during commissioning; they can be connected to the bus and the 230 V cables.

**REG devices**

“REG” devices have pressure contacts at the back, that connect to the data line and the bus, when they are snapped onto the DIN rail. “REG” devices therefore always require a data rail with data rail connector, integrated in the DIN rail, for connecting the bus line.

**REG-S devices**

“REG-S” devices do not have their own bus coupler. They have a loo-ped application interface and are attached to the REG bus coupler from the left or to an existing “REG-S” device. Up to four sensor channels can be connected to one REG bus coupler.

