



## 6 FITTING


### 6.1 Safety instructions for fitting

 <b>Warning</b>	<p><b>ENDANGERING OF INTRINSIC SAFETY!</b></p> <p>If the BusRail pins are bent, this can endanger the intrinsic safety.</p> <ul style="list-style-type: none"> <li>➤ Never use a BusRail with bent pins!</li> </ul>
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 <b>Warning</b>	<p><b>ENDANGERING OF INTRINSIC SAFETY!</b></p> <p>Terminations and link cables must be firmly mounted. Loose terminations, earth clamps or link cables can endanger the intrinsic safety.</p> <ul style="list-style-type: none"> <li>➤ Firmly tighten the fixing screws on the terminations and the link cables.</li> <li>➤ Snap the earth clamps of the BusRail onto the DIN rail.</li> </ul>
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#### Connections

The BusRail has left and right connections which can be used to extend the BusRail or mechanically distribute it over two rails. Terminations are required at the ends of these connections.

	<p>The intrinsic safety of the system is only guaranteed when the terminations are securely fitted. Introductory information regarding terminations, see Chapter 4.6.15.</p>
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# OPERATING INSTRUCTIONS FOR THE I.S. 1 SYSTEM

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## 6.2 Working steps for system fitting

The components of the I.S. 1 system can be pre-assembled at any assembly site. The components that are firmly fitted in the enclosure can then be locally connected to the field devices and automation devices.

### Overview


Working step	Aim of working step
Fitting the rails	Fixing of the BusRail
Fitting the components	Fitting the components in the enclosure at any assembly site
Fitting the field station (the enclosure with the system components already firmly fitted)	Installation of the field station at the required location

**Tab. 6-1** Working steps for system fitting

## 6.3 Fitting the components

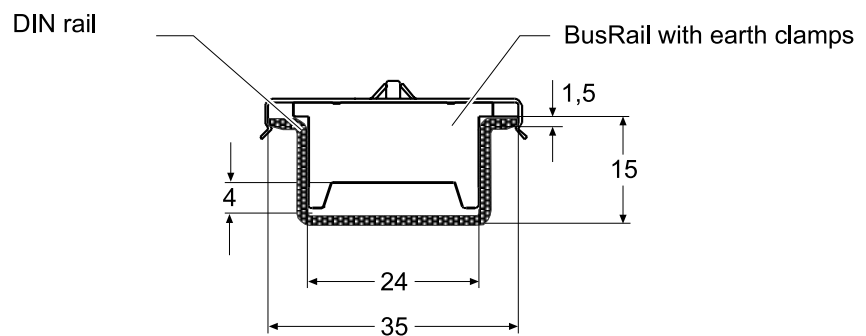
The I.S. 1 system can be externally pre-assembled at any assembly site. If the precise allocation of I/O modules to the field stations is not yet specified, the I/O modules can also be fitted at a later date.

### 6.3.1 DIN rails, BusRail and terminations


	<p>The intrinsic safety of the system is only guaranteed when the terminations are securely fitted. Introductory information regarding terminations, see Chapter 4.6.15.</p>
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#### Preparatory measures

In order that the BusRail can be correctly inserted, the rivets or screw heads used to fit the DIN rail must not be more than 4 mm high.



**Fig. 6-1** Cross-section of mounting rail NS 35/15 as in EN 50 022 (with inserted BusRail and snapped-in earth clamps)

	<p>When fitted in plastic enclosures, the DIN rail is fitted with isolation. The rail must be connected to a secure earth (potential equalization), e.g. with an earth terminal. This clamp must be an EEx e terminal.</p>
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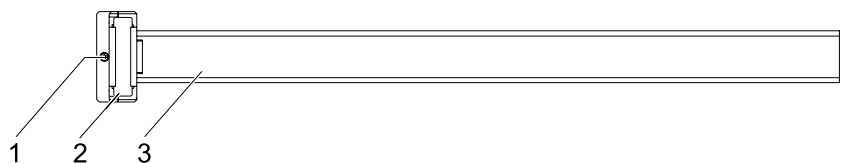
# OPERATING INSTRUCTIONS FOR THE I.S. 1 SYSTEM

## Fitting of termination "begin" or "begin-Sub-D"

To fit the DIN rail, the BusRail components and the terminations, the following steps must be implemented:

- Fit DIN rail (3) in enclosure.
- Check termination "begin-Sub-D" for any damage to the contacts.
- Insert termination "begin" (2) into the DIN rail (3).
- Tighten fixing screw (1) at termination.
- Check the tight fit of the termination.
- Press the fixing screw cover into the screw hole.

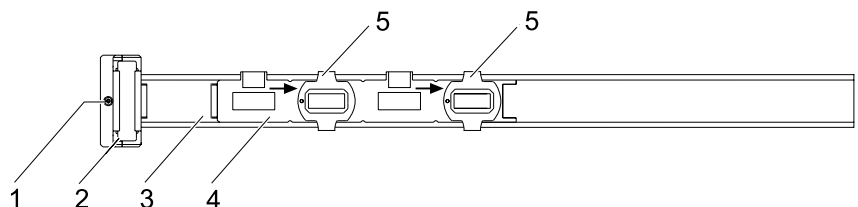
The termination is fitted.



## Inserting the BusRail into the DIN rail

- Check termination (2) for tight fit.
- Check BusRail section (4) for damage to contacts.
- Align the BusRail section (4) "begin" so that the printed arrow points in the direction of the BusRail end.
- Insert the BusRail section "begin" (4) in the DIN rail (3).

The BusRail section is positioned in the DIN rail but is not yet fixed in position.



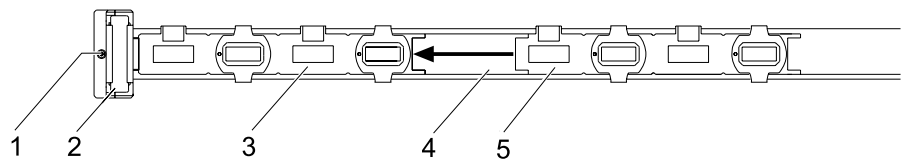
## Inserting the BusRail in the termination "begin"

- Slide the BusRail (4) into the "begin" (2) termination while pressing the left end of the BusRail slightly.
  - Snap the earth clamps (5) of the BusRail component over the DIN rail.
- The BusRail component is now fixed.

### Fitting further BusRail components

- Insert the new BusRail component (5) to the right of the previously fitted component (3) in the DIN rail (4).
- Lightly push down on the left end of the new BusRail component (5) to engage it with the previously fitted BusRail component (3) (see arrow).
- Snap the earth clamps of the new BusRail component over the DIN rail (4).

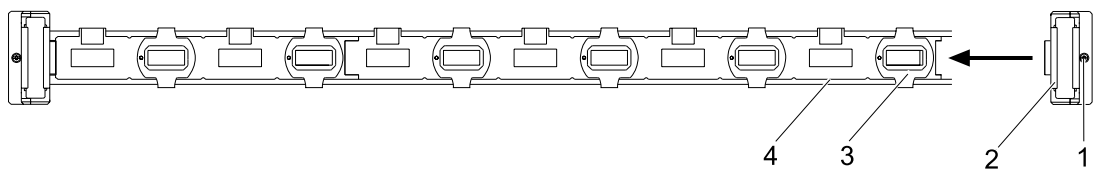
The new BusRail component is now fixed.



### Fitting the termination "end" or "end-Sub-D"

- Check termination "end-Sub-D" for any damage to the contacts.
- Insert termination "end" or "end-Sub-D" (2) into the DIN rail (4).
- Engage termination "end" (2) into the BusRail end (3).
- Tighten fixing screw (1) on termination "end" (2).
- Check the tight fit of the termination.
- Press the fixing screw cover into the screw hole.

The termination is fixed.




### Fitting the connection cable

If the BusRail is distributed over two rails, the rails are connected with a connection cable (see Chapter 5.3.5: Options for connecting the BusRail).

- Plug the connection cable into the "end-Sub-D" termination.
- Screw the plug of the connection cable to the termination "end-Sub-D".
- Check the tight fit of the connection in the termination "end-Sub-D".
- Carry out the same process for connecting the connection cable to the termination "begin-Sub-D".

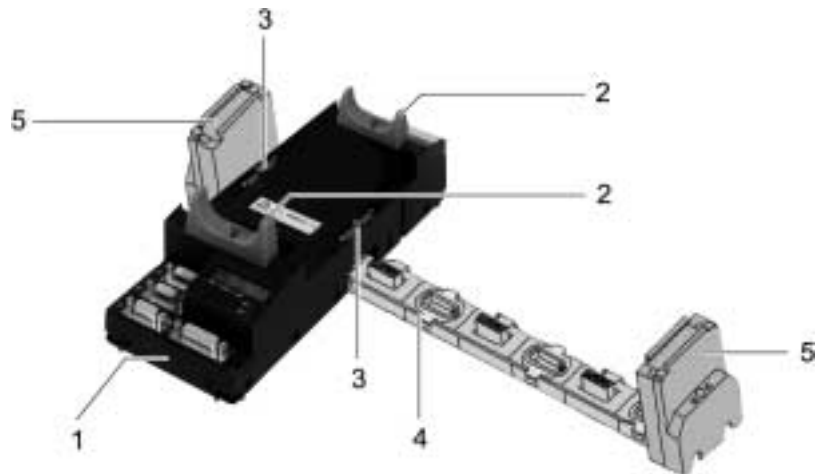
The connection cable is now fitted.

## 6.3.2 CPU & Power Modules and I/O modules

 <p><b>Warning</b></p>	<p><b>MALFUNCTION IF SLOT IS INCORRECT !</b></p> <p>The CPU &amp; Power Module must be fitted on the first slot of the BusRail, and the second slot if a redundancy is used.</p> <p>➤ Comply with slot definitions.</p>
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### Fitting the base for the CPU & Power Module

Fig. 6-2 shows the base of the CPU & Power Module for Zone 1 fitted on the BusRail.



**Fig. 6-2** Fitting the base for the CPU & Power Module for Zone 1

- 1 Base
- 2 Latch for secure removal of the CPU & Power Module for Zone 1
- 3 Holding clamps
- 4 BusRail
- 5 Terminations

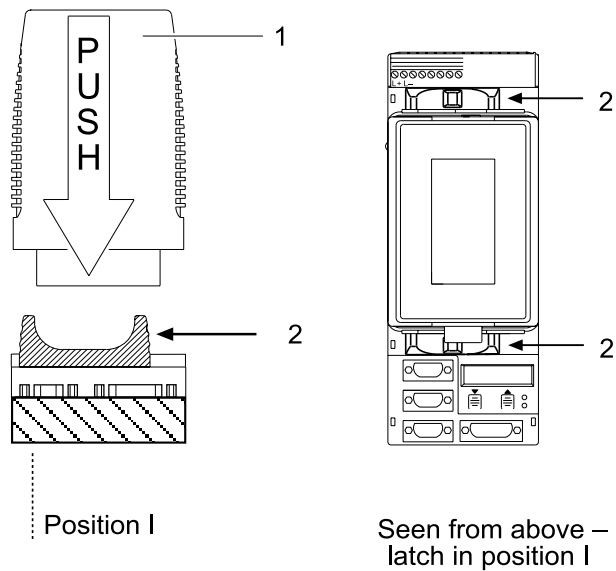
Before fitting the base ensure that the BusRail is fastened firmly in the DIN rail. The terminations (5) at the left- and right-hand ends of the BusRail (4) are fitted.

- Position base vertically over the plug connection of the BusRail (4).
- Tighten the screws of the holding clamps (3) using a torque of 0.8 .. 1.2 Nm.
- Check the tight fit of the base.

## Fitting the CPU & Power Module for Zone 1

Before the CPU & Power Module is fitted, check that both red latches are in *Position I*. If necessary, bring the latches into *Position I*.

- Insert and engage the CPU & Power Module in the plug connection of the base.
- Check the tight fit of the CPU & Power Module.




**Fig. 6-3** Engaging the CPU & Power Module in the base

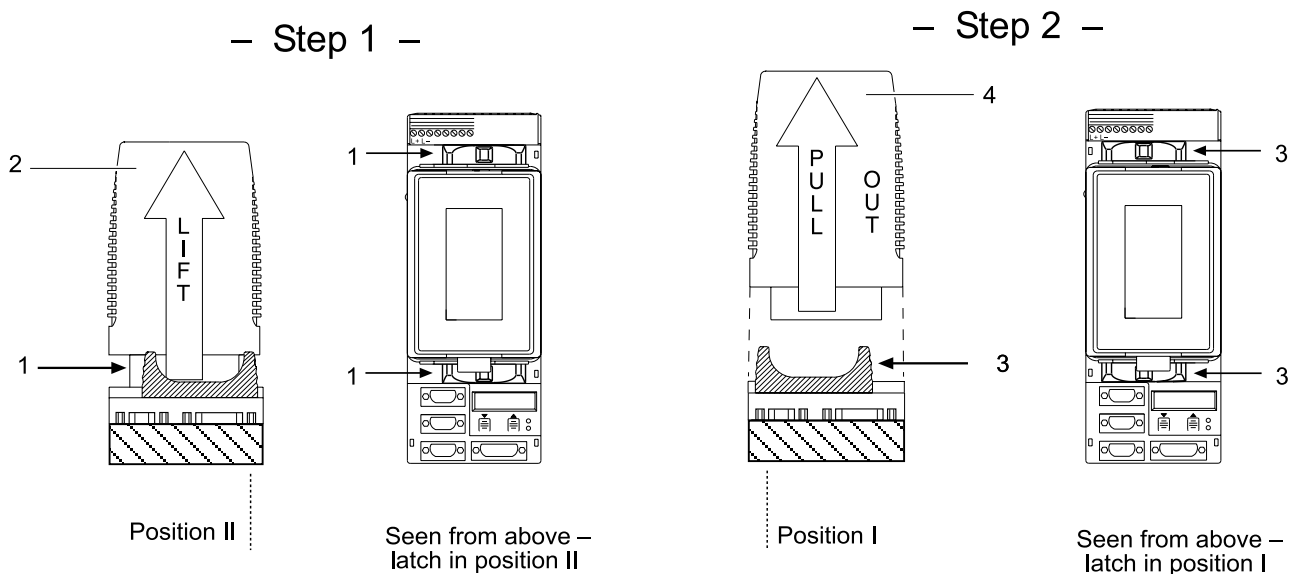
- 1 CPM & Power Module
- 2 Latch for secure removal of the CPU & Power Module for Zone 1

# OPERATING INSTRUCTIONS FOR THE I.S. 1 SYSTEM

## Removing the CPU & Power Module for Zone 1

 <b>Warning</b>	<p><b>HEAVY COMPONENT!</b></p> <p>The CPU &amp; Power Module, Type 9440/12, weights approx. 2.5 kg.</p> <p>➤ Hold the CPU &amp; Power Module firmly while removing it.</p>
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- Push both red latches in the direction of the arrow (1) up to the stop (*Position II*).
  - Pull the CPU & Power Module vertically out of the base until the stop is reached (2).
- The module engages in the intermediate level.
- Push the two latches back in the direction of the arrow (3) up to the stop in the exit position (*Position I*).
  - Remove the CPU & Power Module vertically (4).



**Fig. 6-4** Disengaging and removing the CPU & Power Module


- 1 Two latches (pushed from left to right to *Position II*)
- 2 CPU & Power Module for Zone 1 (engaged in the intermediate level)
- 3 Two latches (pushed from right to left to *Position I*)
- 4 CPU & Power Module for Zone 1 (disengaged)

If the module cannot be removed, e.g. if it has become tilted:

- Let the module engage back into the base (as when fitting it).
- Repeat removal procedure.



### Fitting the CPU & Power Module for Zone 2

 <p><b>Warning</b></p>	<p><b>ENDANGERING OF EXPLOSION PROTECTION!</b></p> <p>The open socket of the data plug at the CPU &amp; Power Module for Zone 2 may pose a hazard.</p> <ul style="list-style-type: none"> <li>➤ Ensure that the data plug is closed and protected by the blue cap!</li> </ul>
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Fit the first CPU & Power Module on the first slot of the rail.  
For redundancy, fit the second CPU & Power Module to the right of the first one.  
The CPU & Power Module and the redundant CPU & Power Module are now fitted.

Fit the CPU & Power Module as follows:

- Position module vertically over the plug connection of the BusRail.
- Engage the module by pressing it firmly into the rail.

### Removing the CPU & Power Module for Zone 2

Proceed as follows to remove the CPU & Power Module:

- Lift up red handle on module.  
This releases the catch.
- With the red handle raised, remove the module by lightly waggling it and then pulling.

### Fitting the I/O modules

Fit the specific I/O modules onto the slots of the BusRail in compliance with the fitting plan:


- Position module vertically over the plug connection of the BusRail.
- Engage the module by pressing it firmly into the rail.

### Removing the I/O module


Proceed as follows to remove the I/O module:

- Lift up red handle on module.  
This releases the catch.
- With the red handle raised, remove the module by lightly waggling it and then pulling.

## 6.3.3 Warning instruction electrostatic discharge

 <p><b>Warning</b></p>	<p><b>ENDANGERING OF EXPLOSION PROTECTION!</b></p> <p>Plastic components can become electrostatically charged during cleaning. If the field stations have been installed in Zone 1 or Zone 2, this may pose a hazard.</p> <ul style="list-style-type: none"><li>➤ Only clean modules with damp cloths!</li><li>➤ Fit the warning instruction "Clean modules with damp cloths only" on the inside of the field station.</li></ul>
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### 6.4 Fitting the I.S. 1 field station

 <p><b>Warning</b></p>	<p><b>DANGER AT INCORRECT FITTING SITE!</b></p> <p>There is a danger of explosion in the presence of an explosive gas mixture if a Zone 2 device is operated in Zone 1.</p> <p>➤ When used in Zone 1 check the field station for a corresponding CPU &amp; Power Module.</p>
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The I.S. 1 field station (enclosure with fully fitted components) is fitted at the specified location.

For fitting the system components: See Chapter 6.3.

#### 6.4.1 Intended condition of the system after fitting

Following completion of all fitting steps the system should be in the following condition:

- DIN rails securely fitted in enclosure
- BusRail inserted in the DIN rail and then fixed with the earth clamps
- Terminations inserted and screwed down in BusRail
- Connection cable securely fitted between termination "end-Sub-D" and termination "begin-Sub-D" and checked for tight fit
- Modules fitted onto BusRail in compliance with fitting plan
- Field station (enclosure with fully fitted modules) securely fitted in position.

# **OPERATING INSTRUCTIONS FOR THE I.S. 1 SYSTEM**

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