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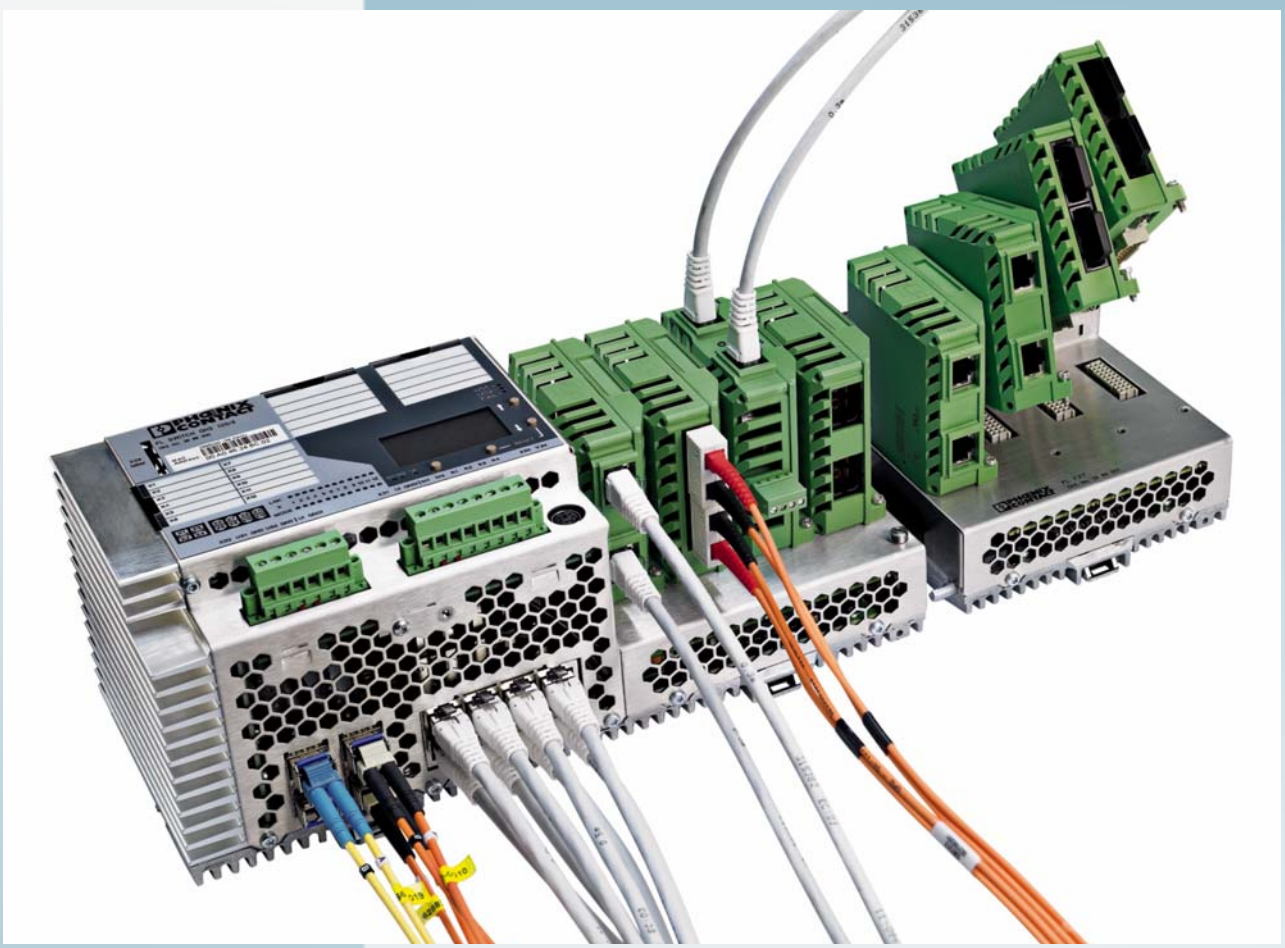

User manual for

FL SWITCH GHS 12G/8(-L3)
FL SWITCH GHS 4G/12(-L3)

User manual

UM EN FL SWITCH GHS
Order No. —

PHOENIX CONTACT
INSPIRING INNOVATIONS

User manual

Description of the hardware and software functions of Gigabit Modular Switches

2015-05-04

Designation: UM EN FL SWITCH GHS

Revision: 02

Order No.: —

This user manual is valid for:

Designation	Version	Order No.
FL SWITCH GHS 12G/8		2989200
FL SWITCH GHS 4G/12		2700271
FL FXT		2989307
FL SWITCH GHS 12G/8-L3		2700787
FL SWITCH GHS 4G/12-L3		2700786

Please observe the following notes

User group of this manual

The use of products described in this manual is oriented exclusively to:

- Qualified electricians or persons instructed by them, who are familiar with applicable standards and other regulations regarding electrical engineering and, in particular, the relevant safety concepts.
- Qualified application programmers and software engineers, who are familiar with the safety concepts of automation technology and applicable standards.

Explanation of symbols used and signal words

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety measures that follow this symbol to avoid possible injury or death.

There are three different categories of personal injury that are indicated with a signal word.

DANGER This indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING This indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION This indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

This symbol together with the signal word **NOTE** and the accompanying text alert the reader to a situation which may cause damage or malfunction to the device, hardware/software, or surrounding property.

This symbol and the accompanying text provide the reader with additional information or refer to detailed sources of information.

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Table of contents

1 Gigabit Modular Switches

Unless otherwise expressly stated, all information provided in this user manual always applies to both the FL SWITCH GHS 12G/8 and the FL SWITCH GHS 4G/12.

1.1 Properties

The Gigabit Modular Switch is a high-performance Managed Switch, which covers the port requirements of industrial applications in a modular and flexible way. It also supports all popular Gigabit and Fast Ethernet transmission standards, IT standard protocols, and the PROFINET and EtherNet/IP automation protocols.

The main elements are the two alternative head stations, FL SWITCH GHS 12G/8 and FL SWITCH 4G/12, and the FL FXT extension module.

The switches connect the IT backbone to the automation cells that are to be networked in the production environment via their Gigabit ports.

For cost-effective networking, the head stations already have twelve or four integrated Gigabit ports and support modular extension up to 28 or 24 ports.

FL SWITCH GHS 12G/8

On the FL SWITCH GHS 12G/8, the twelve Gigabit ports are divided into four Gigabit fiber optic interfaces with SFP modules and eight twisted pair Gigabit ports. In addition, a further eight 100 Mbps ports can be connected using FL IF... interface modules. An FL FXT extension module can be used to create a configuration with up to 28 ports.

FL SWITCH GHS 4G/12

The FL SWITCH GHS 4G/12 has four integrated Gigabit ports, which can either be used as fiber optic interfaces with SFP modules or as twisted pair ports (combo ports). In addition, there are a further four integrated Fast Ethernet twisted pair ports. A further eight 100 Mbps ports can also be connected on this device using FL IF... interface modules. An FL FXT extension module can be used to create a configuration with up to 24 ports.

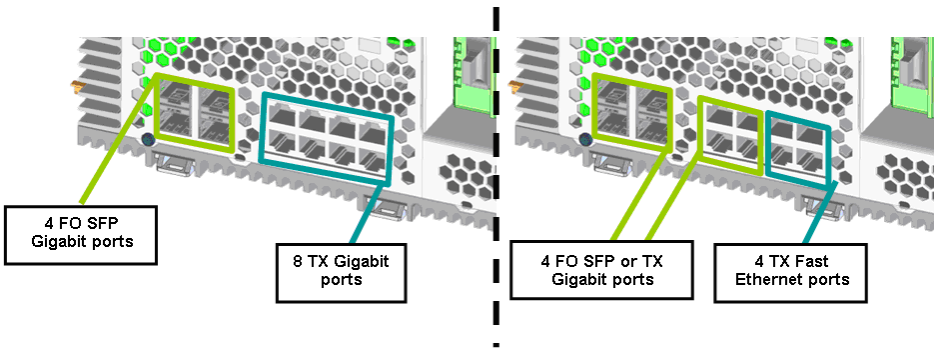

Figure 1-1 Assignment of the Gigabit ports (left: GHS 12G/8, right: GHS 4G/12)

Assignment of the Gigabit ports on the FL SWITCH GHS 4G/12

Gigabit port A: SFP slot X1 or RJ45 port X5

Gigabit port B: SFP slot X2 or RJ45 port X6

Gigabit port C: SFP slot X3 or RJ45 port X7

Gigabit port D: SFP slot X4 or RJ45 port X8

When an RJ45 port is automatically disabled by an SFP module, the Link LED on the RJ45 port lights up orange.

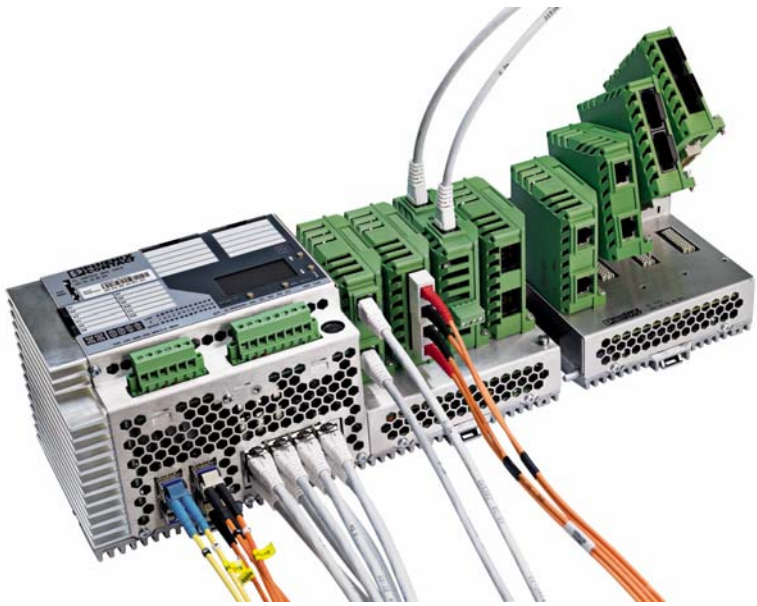

Figure 1-2 Gigabit Modular Switch including extension module and interface modules

1.2 New performance class for future-proof networks

Maximum flexibility - connection of various interfaces

- Flexible connection for IT and automation networks
- Gigabit for the backbone connection in all popular fiberglass standards and twisted pair
- TX, various FX standards, and media polymer fiber, POF-SCRJ or HCS fiber that can be assembled in the field can be connected for automation cells.
- Power over Ethernet (PoE) enables the integration of easy-to-install terminal devices such as cameras, access points or scanners.

Maximum performance and port trunking

The new performance class for industrial networks offers:

- Up to 12 integrated Gigabit ports for high-performance use in the backbone
- Support of redundant Gigabit backbones
- Link aggregation according to IEEE 802.3ad/port trunking can be used as an option to further increase the available bandwidth by bundling two to eight cables to create a single logical connection.

Security according to IEEE 802.1X	– Authentication server (RADIUS): limited network access for external users – Security in the automation network and protection against sabotage in the network – Security is controlled centrally instead of being based on MAC addresses and is easier to configure.
Display/operator interface for easy diagnostics	– Important parameters can be read and configured quickly and easily without external tools. – Smart operating modes such as PROFINET or Ethernet/IP can be set during the startup phase. – Considerable time savings for servicing – The IP address, operating modes, link status, etc. can be called and easily read on the display by means of four soft keys.
Command line interface	– Fast configuration using the favored command language of IT specialists as an alternative to proven management interfaces such as SNMP and PROFINET – Offline configuration possible
Narrow overall width	– With a overall width of 285 mm, this is the most compact modular system for DIN rails of its class. – Cost-effective control cabinet integration
Integrated control cabinet monitoring	– Control cabinet monitoring by means of integrated, digital inputs; reduces the number of components required.
Port-specific storm control	– Reliable network availability even in the event of an error (e.g., broadcast storms) – Elimination of sources of interference; broadcast, multicast, and unicast bandwidth limits – Port-specific thresholds can be configured (and can therefore be used selectively).
Easy backup	– Firmware download during runtime operation without shutting down the network – Easy to switch between two firmware images without the need for time-consuming reinstallation – Backup image in addition to the current runtime image ensures network availability.
Easy assembly	– Flexibility and cost savings thanks to connection media that can be assembled in the field, such as POF, SCRJ, and GI-HCS for distances up to 2000 m (with GI HCS)
PROFINET	– The switches can be operated in PC Worx and Step 7 environments as conformance class B PROFINET I/O devices. Connections to PLC systems can be easily implemented for diagnostic and communication applications.
Ethernet/IP	– In the Ethernet/IP environment the switches support the IGMP snooping function and multicast filtering.
Smart mode	– For easy configuration, the switches feature Smart mode in which it is possible to change the operating state without additional tools or user interfaces such as CLI, web-based management or SNMP.
Routing	Support of numerous routing methods; the additional FL SD Flash/L3/MRM license (Order No. 2700607) is required to activate them.
PROFIenergy	Support of the PROFIenergy function.

Additional product properties

- Alternative redundancy mechanisms
  - Rapid Spanning Tree Protocol (RSTP)
  - Optional Fast Ring Detection (FRD) (now also available for 1000 Mbps)
  - Optional large tree support
- Media Redundancy Protocol (MRP) function
- Ethernet IP, support of IGMP snooping
- 256 multicast groups
- 2 alarm contacts
- Backwards compatibility with existing IF modules
- Configuration can be saved on SD Flash cards
- SNMP v1, v2, v3
- User and access management

1.2.1 GHS device view

1.2.1.1 Elements of the head station

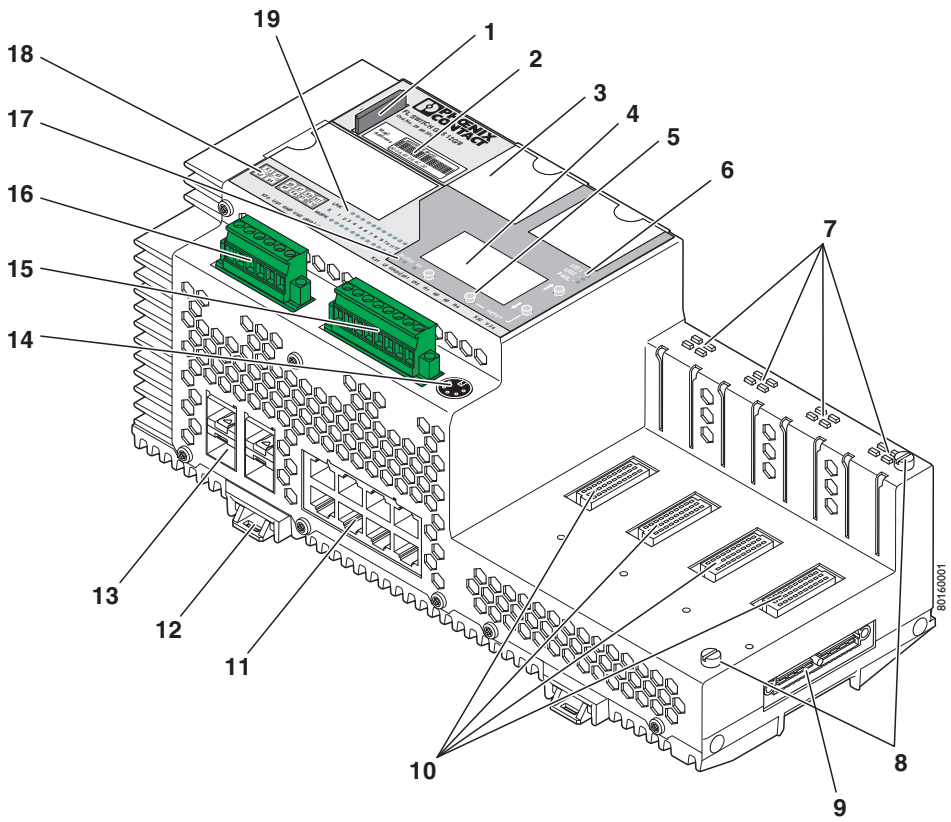

Figure 1-3 Elements of the head station

Table 1-1 Elements of the head station

No.	Function
1	SD card for saving the GHS configuration
2	MAC address in plain text and as a barcode
3	Labeling field for the GHS ports
4	Display for GHS configuration and diagnostics
5	Pushbuttons for operating the display
6	Status indicator for the supply voltage and Fail LED
7	Status indicators for the ports of the interface modules
8	Mounting screws for the extension module
9	Outgoing interface for the extension module
10	Slots for interface modules
11	Ethernet ports of the head station in RJ45 format
12	Fixing clips for snapping onto the DIN rail
13	SFP slots of the head station
14	V.24 (RS-232) interface in Mini-DIN format for configuration
15	Connection for digital sensors and alarm contacts
16	Connection for the supply voltage of the device and sensor supply
17	Status indicators for the sensors and sensor supply
18	Diagram of port numbering
19	Status indicators for the ports of the Ethernet ports

1.2.2 Dimensions of the Gigabit Modular Switch

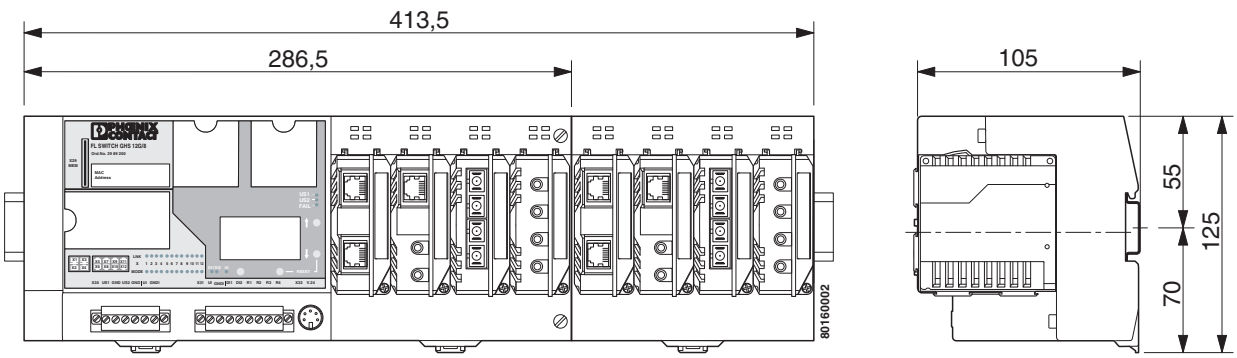

Figure 1-4 GHS housing dimensions in millimeters

1.2.3 View of the interface modules (example)

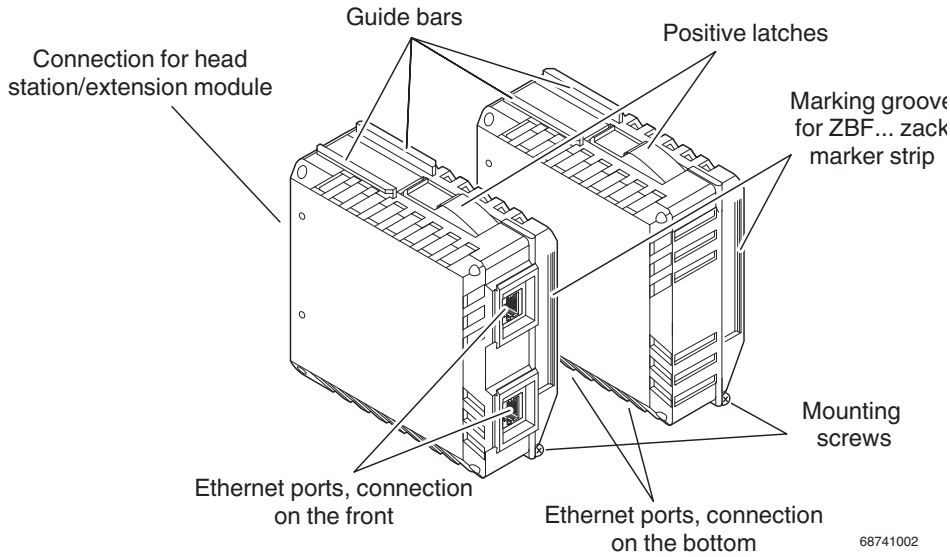

Figure 1-5 View of the interface modules (example)

– Connection for extension module/head station
  This connector is used to connect the interface module and the extension module or the head station.
– Guide bars
  These bars aid installation and hold the interface modules securely in place.
– Positive latches
  These latches must be pressed in order to remove the interface module (loosen the mounting screw first).
– Ethernet ports
  These are the ports for the various interfaces and connection directions.
– Marking groove for ZBF ... zack marker strip
– Mounting screws to lock the interface modules in place

2 Mounting and installation

2.1 Mounting and removal

NOTE: Always switch off the supply voltage when mounting/removing the head station and extension modules.

Mount the head station on a clean DIN rail according to DIN EN 50022 (e.g., NS 35 ... from Phoenix Contact). To avoid contact resistance, only use clean, corrosion-free DIN rails. To avoid impermissible loads on the switch in the event of high mechanical strain (strong vibrations or shocks), the DIN rail used should be secured tightly to prevent it from twisting. In the event of high loads when using “NS 35...” rails, the rails should be screwed/secured approximately every 75 mm.

Before mounting the modules, mount an end bracket (E/AL-NS 35, Order No. 1201662) on the left-hand side next to the head station to stop the modules from slipping on the DIN rail. Once completely installed, mount an end bracket on the right-hand side of the station.

Mounting:

1. Place the module onto the DIN rail (A) from above. The upper holding keyway of the module must be hooked onto the top edge of the DIN rail. Push the module from the front towards the mounting surface (B).

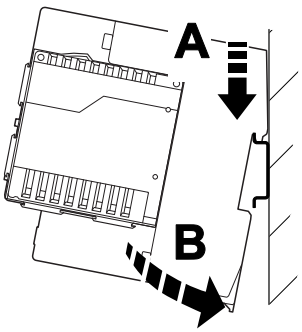

Figure 2-1 Snapping the head station onto the DIN rail

2. Once the module has been snapped on properly, check that it is fixed securely on the DIN rail. Check whether the positive latches are facing upwards, i.e., snapped on correctly.

Removal:

1. Remove all plug-in connections or interface modules.
2. Pull down the positive latches using a suitable tool (e.g., screwdriver). Both positive latches remain snapped out. Then swivel the bottom of the module away from the DIN rail slightly (A). Next, lift the module upwards away from the DIN rail (B).

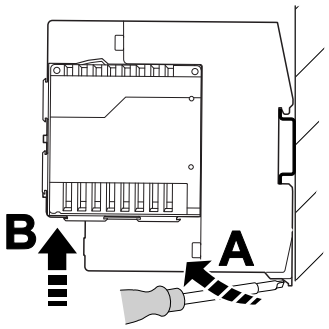

Figure 2-2 Removing the head station

2.2 Mounting and removing the extension module

NOTE: Always switch off the supply voltage when mounting/removing the extension module.

Mounting:

1. Place the module onto the DIN rail (A) from above. The upper holding keyway of the module must be hooked onto the top edge of the DIN rail. Push the module from the front towards the mounting surface (B). Check that the positive latches have snapped on properly.

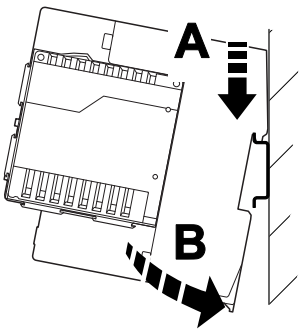

Figure 2-3 Mounting extension modules

2. Now push the extension module that is snapped onto the DIN rail along the DIN rail towards the head station (A) until the connector/socket strip of both modules snap into each other with no gap between the sides of both modules. Secure the connection using the two screws (C).

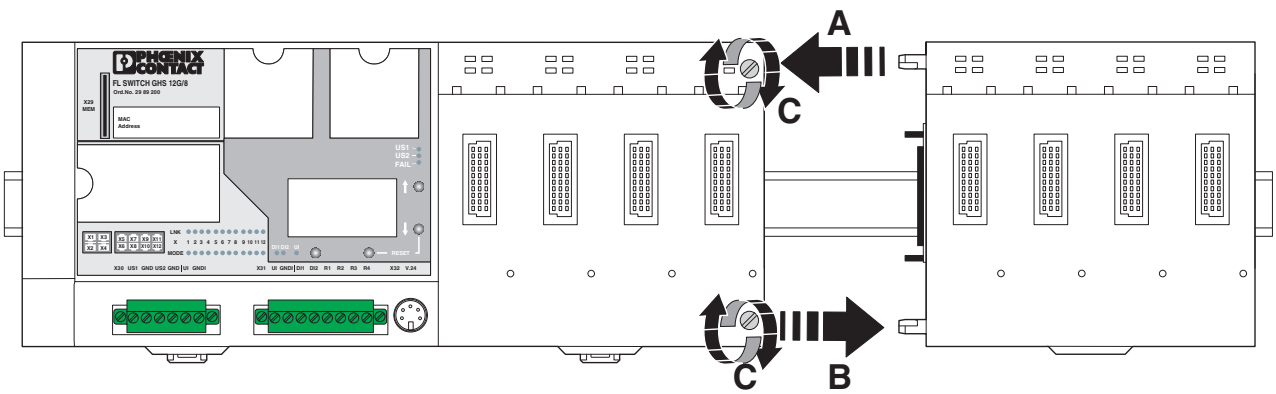

Figure 2-4 Mounting/removing extension modules

Removal:

NOTE: Switch off the supply voltage before removing the extension modules.

1. Remove all plug-in connections or interface modules.
2. Remove the two screws - see (C) in Figure 2-4.

3. Push the right-hand extension module along the DIN rail to the right until the plug-in contact is completely free - see (B) in Figure 2-4.
4. Pull down the holding latches using a suitable tool (e.g., screwdriver).
5. Then swivel the bottom of the module away from the DIN rail slightly (A). Next, lift the module upwards away from the DIN rail.

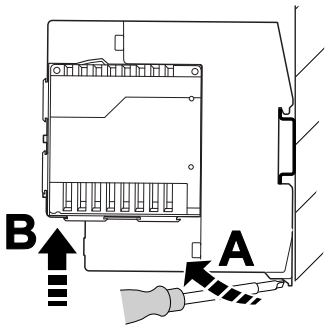

Figure 2-5 Removing extension modules

2.3 Installing the GHS

2.3.1 Connecting the supply voltage to the GHS

24 V DC

The system is operated using a 24 V DC nominal voltage, which can be supplied from separate power supply units if required.

The following connections are available and can be supplied separately if required:

– Supply voltage US1 (terminal blocks US1/GND)
– Supply voltage US2 (terminal blocks US2/GND)
– Sensor supply - here connection for the sensor power supply (terminal blocks UI/GNDI to connector X30, internally to connector X31, terminal blocks UI/GNDI bridged)

Connections are also available for:

– Sensor supply - here connection for the sensor (sensor power supply, terminal blocks UI/GNDI to connector X31, internally to connector X30, terminal blocks UI/GNDI bridged)
– Sensor signals DI1/DI2
– Floating alarm contact 1 (terminal blocks R1/R2)
– Floating alarm contact 2 (terminal blocks R3/R4)

If redundant power supply monitoring is active (default setting), an error is indicated if only one voltage is applied. A bridge between US1 and US2 prevents this error message. It is also possible to deactivate monitoring via the management interfaces.

2.3.1.1 Example: Supplying the device from one voltage source

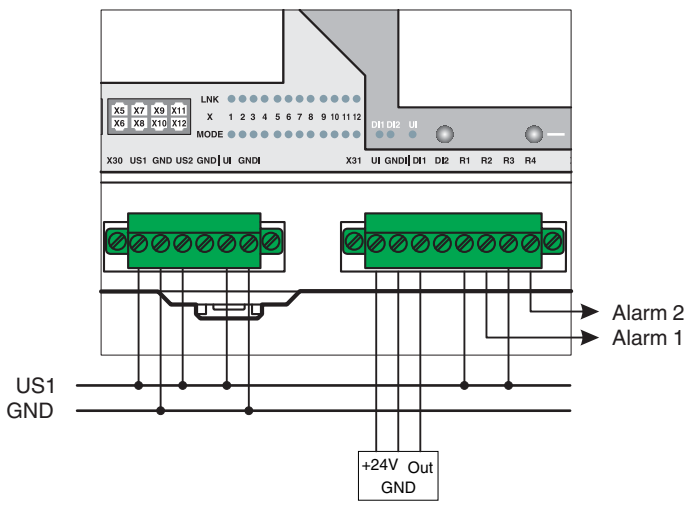

Figure 2-6 Supplying the system using one voltage source