Operation Manual

GMA200-RT

Relay module for mounting rail assembly

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1.   Introduction

1.1 For your safety

This instruction manual states the intended use of the product according to §3 of the German Product Safety Act (ProdSG) and helps to prevent hazards.

It must be read and observed by all persons who operate, service, maintain and inspect this product. This product can serve its intended purpose only if it is operated, serviced, maintained and inspected according to the instructions given by GfG Gesellschaft für Gerätebau mbH.

Otherwise, the warranty provided by GfG Gesellschaft für Gerätebau mbH becomes void. Settings in service mode should only be carried out by experts.

1.2 Application and purpose

GMA200-RT and GMA200-RTD are relay modules in the mounting rail housing which can be used as an extension of the relay outputs to the gas detection controller (e.g. GMA200-MT6). The relay modules GMA200-RT are connected directly to the gas detection controller via a plug-in connection or a bus cable.

1.3   Special conditions for safe application

Important information:

The gas detection controllers GMA200-MT/-MW are not described in this user manual.
(see UM 222-000.20).

The configuration software GMA200Config is not described in this user manual.
(see UM 222-000.30).

2.   Relay modules GMA200-RT/-RTD

2.1   General description

The fundamental configuration and design of the gas detection controllers GMA200-MT/-MW in combination with the relay modules GMA200-RT/-RTD ensure flexible, simple and clearly structured operation in industrial and commercial applications for measuring combustible and toxic gases/vapours and oxygen concentrations.

In addition to the internal relays of the gas detection controller of the GMA200-MT/-MW, the relay modules GMA200-RT/-RTD can be used for extension purposes. The relay modules GMA200-RT/-RTD are connected directly to the gas detection controller via a plug-in connection or a bus cable.
The relays are managed via the microprocessor of the gas detection controller GMA200-MT/-MW and activated in the event of an alarm or a fault.

The relay module GMA200-RTD is equipped with an integrated graphical display.

2.2   Device design

The relay module GMA200-RT/-RTD enables the addition of a further 16 freely configurable relays. A total of 4 relay modules with 64 additional relays can be managed via the controller GMA200-MT/-MW. The relay modules GMA200-RT are connected to the controller GMA200-MT/-MW via the digital interface RS485, which also enables the spatial separation of the relay modules (max. 1,000 m).

The optionally available display at the relay module GMA200-RTD enables, amongst other things, the local display of measured values (see section 2.2.2) which are transferred by a gas detection controller GMA200-MT/-MW via the digital interface.

GMA Bus connector

LCD display only with GMA200-RTD

Type plate with date of production (SN:YYMMxxxx)

Terminal labelling

Unlocking mechanism for mounting rail attachment

Control buttons (only with GMA200-RTD)

Status display of the relays

Status display of operating status

GMA Bus connector

USB port

Status display of the relays

Terminals
(Terminal blocks are pluggable; this involves unlocking and removing the terminal cover in the middle)

2.2.1 LED status displays

During operation, LED status displays at the relay module GMA200-RT/-RTD indicate the following statuses according to the event:

- Operating status (ON) → green
- Service (SRV) → yellow
- Fault (FLT) → yellow
- Relay 1..16 (R1..R16) → red
  (Relay activated in the case of an alarm or fault)

2.2.2 Graphical display at the relay module GMA200-RTD

The gas detection controller GMA200-MT/-MW retrieves and displays the current measured values per measuring point on the display. The display for the measuring points can be optionally set via the menu navigation (also see section 4.1), e.g.:

Display in normal mode

Display of 8 measuring points

Display of 4 measuring points

Display as single measuring point

for displaying measuring point 9–16

for displaying measuring point 5-8 \ 13-16

for displaying measuring point 6 \ 4

Display for alarms

First display for alarms

Alarm for 2 measuring points

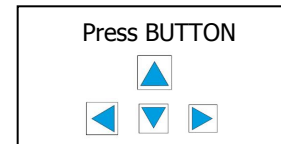each for the gradual display with 4 measuring points up to the display of the single measuring point

The display is backlit; the light intensity can be increased via any control button.
In the event of a gas alarm or faults, the display lighting is automatically activated with a red background.

2.2.3 General information about the measured value display

Operation of the graphical display is locked:

- If the keyboard at the gas detection controller GMA200-MT/-MW is/has been operated at the same moment or within the last minute.

- When activating the main menu or using the service menu of the gas detection controller GMA200-MT/-MW, the connection to the relay module is interrupted and shown on the display.

After the display is shown and one of the arrow buttons has been clicked, the display changes to the measured value display and the display can be operated.

```
No data from
the GMA200-M
available
```

```
Press BUTTON
   ▲
◄  ▼  ►
```

2.3 Relay configuration

The configuration of the relays is not described in this user manual. The function under which conditions the relays are switched and whether they are used according to the closed-circuit/open-circuit principle is configured in the gas detection controller GMA200-MT/-MW using the GMA200Config software.

3. Assembly and installation instructions

3.1 Site of installation

The GMA200-RT and GMA200-RTD are designed for assembly on a mounting rail in a control cabinet or a wall-mounted housing and should not be installed in potentially explosive atmospheres. They should be installed in areas with as little vibration as possible.

3.2 Electrical connections

The connection of the voltage supply and the application of the relay contacts take place according to the terminal assignment diagram which is also located at the GMA200 housing near the terminal covers.
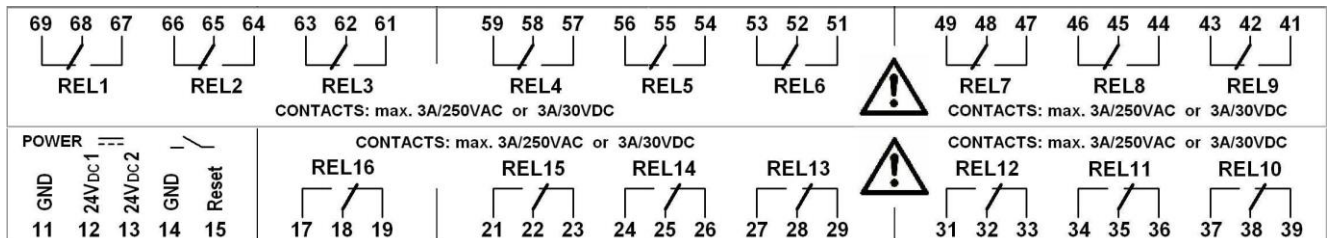
This symbol shown on the terminal assignment diagram means:
General warning, see user manual

3.2.1 Safety information

Electrical installation must always be carried out to DIN VDE 0100 or a similar country-specific standard. Cables with hazardous live voltages, e.g. 230 V AC, and cables with non-hazardous live voltages, e.g. 24 V DC, must be laid separately. The applied cables must be suitable for the connected transmitters or devices.

If maintenance work is carried out at the GMA200-RT/-RTD during operation, please note that hazardous live voltages may be present at the relay terminals Y17-69. Never come into contact with these terminals.

3.2.2   Floating relay contacts

⚠️ Additional external warning equipment, e.g. control lamps, acoustic signal transmitters, etc., can be connected to the terminals Y17-69 (contacts of the relays 1-16). The contacts of the adjacent relays 1&2, 2&3, 4&5, 5&6, 7&8, 8&9, 10&11, 11&12, 13&14 and 14&15 should only be operated with the same voltage category.

Hazardous live voltages (e.g. 230 V AC) and protective extra-low voltages (e.g. 24 V DC) should not be connected together at these adjacent relays.

3.2.3   24 V DC voltage supply

The GMA200-RT/-RTD is usually supplied with voltage via an external 24 V DC power supply unit or a 24 V DC power supply network. This voltage is connected to the terminals Y12 (24V$_{DC}$1) and Y11 (GND). A second 24 V DC power supply unit or a second 24 V DC power supply network can be optionally connected to the terminals Y13 (24V$_{DC}$2) and Y14 (GND). The used power supply unit should comply with EN60950-1 or feature reinforced or double insulation between the mains supply circuit and output voltage circuit similar to devices of protection class II (protective insulation ▫). If the GMA200-RT/-RTD is operated in a 24 V DC power supply network, it must be safety extra-low voltage (SELV) or protective extra-low voltage (PELV). Otherwise, the same requirements as for the previously described power supply units apply to the 24 V DC power supply network.

3.2.4   Connection at the gas detection controller via digital interface (RS485)

As the relay module GMA200-RT/-RTD is used as an extension of the gas detection controller (e.g. GMA200-MT6), a respective communication connection must be established between both devices.
In the simplest case, the relay module can be connected directly to the GMA bus connector of the gas detection controller. If this is not possible due to the spatial limitations, a cable with pluggable terminals (GMA200-BC, see section Accessories and Spare Parts) can be used for the bus connection.
If the relay module GMA200-RT/-RTD should be connected at the TRM-Bus1 or TRM-Bus2 of the gas detection controller, it must take place via a cable and pluggable terminal (GMA200-BC, see above).

3.2.5   Using the alarm acknowledgement input

A freely configurable input for connecting an external acknowledgement button is available at terminal Y15. The function of this input can be configured in the gas detection controller (e.g. GMA200-MT6). This input must be connected to GND to acknowledge alarms.

External button acknowledgement
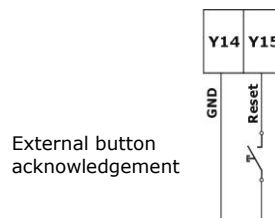
3.3 Commissioning

Commissioning can commence after assembling the GMA200-RT/-RTD and establishing a bus connection to the gas detection controller (e.g. a GMA200-MT6) and once the supply voltage has been connected.

The gas warning system must be inspected and commissioned by an expert after installation. Inspections must be carried out in accordance with the manufacturer's instructions and executed by a fully trained and qualified expert. The expert must record the result in writing (see data sheet T023/2009, section 8.1 and DIN EN 60079-29-2, section 8.9). GfG service technicians as well as experts authorised by us are at your disposal.

4.   Operating instructions

4.1 Operating mode

Normal operating mode of the relay module is achieved approx. 10 seconds after connection to the voltage supply. Device readiness is indicated by a short optical signal.

The LED "FLT" is activated depending on the operating status of the gas detection controller GMA200-MT/-MW, the transmitter type and its warm-up phase*. Subsequently, a brief, yet complete test of all LEDs takes place. In normal operating mode, all LEDs are inactive and the operation display ON lights up green.

If a display is available, allocation to the respective measuring point "SRT" is displayed during the warm-up phase*. All configured measuring points (max. 8 measuring points, see section 2.2.2, Changes of the Display, see section 5) are subsequently shown in the display.

*(typically between 1 and 2 minutes)

4.2 Faults

Faults at the relay module are displayed via the LED "FLT".

> Possible causes:
> - Defective electronics
> - Operating voltage has not been achieved
> - Communication error to the gas detection controller GMA200-MT/-MW
> - One or more defective relays at the relay module
> - Program error (error in the parameters, check sums, etc.)

Please contact our Service in the case of faults.

5.   Keyboard and menus

The main menu is used on the display via the clearly structured keyboard at the relay module.

5.1 Operation and menu navigation

Menu navigation occurs via the control keyboard at the relay module:

RESET MENU
Function when pressed:
Main menu activation:

Function when pressed: Access detailed information in the main menu (see section 5.2), change the measured value display to single measuring point display, toggle from the alarm display function to display, select cursor position for entering the password in the service menu.

Function when pressed: Toggle to menu items in the main menu, with single measuring point display to single view of other measuring points, toggle to total display (1-8, 9-16), select numerical values for entering the password in the service menu.

Function when pressed: Exit the detailed information in the main menu, exit the main menu, toggle the display to display of all measuring points, toggle the display function to alarm display function, select cursor position for entering the password in the service menu.

Function when pressed: Toggle to menu items in the main menu, with single measuring point display to single view of other measuring points, activate the auto-scroll function (10 sec. or 10 min., automatic change-over of the display), select numerical values for entering the password in the service menu.

5.2   Main menu

Press and hold down the RESET MENU button to access the main menu.
The main menu is divided into:

- Status relay module
- Info relay module
- Info relays
- Tests - test LCD. Test LED/ horn, test ext. Al. reset
- Service menu (password protected, see section 5.2)

User navigation in the main menu occurs via the keyboard at the relay module GMA200-RT (see section 5.1).

5.3 Service menu

Access to the service menu is password protected and set to "0000" as standard upon delivery.
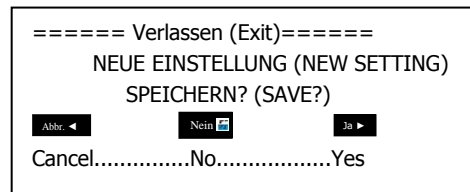
Access to the service menu is locked if the relay module is connected to the GMA200Config software. The connection must be disconnected first.
The configuration cannot be changed if the service menu is active at the same time.

The service menu is divided into:

- System settings
  Password, Language, BUS settings, Display contrast, Horn volume
- Test relay 1..16

The following appears on the display if changes
have been carried out and when exiting the menu item:

```
====== Verlassen (Exit)======
      NEUE EINSTELLUNG (NEW SETTING)
        SPEICHERN? (SAVE?)
 Abbr. ◄        Nein        Ja ►
 Cancel...............No..................Yes
```

Note: Safety-relevant changes should only be carried out by authorised and expert staff.

6. Annex

6.1 Cleaning and care

External soiling of the device housing can be removed using a cloth dampened with water when the device is de-energised. Do not use solvents or cleaning agents!

6.2 Maintenance and service

Maintenance and service include regular visual inspections, functional testing and system checks, as well as repairs to the gas warning system. (see DIN EN 60079-29-2 section 11 and, in Germany, the data sheets BGI RCI T023 and T021, section 9).

6.2.1 Visual inspection

Visual inspections should be carried out on a regular basis with a maximum interval of one month and include the following tasks:

- Check the operation display and the status messages,
  e.g. operation display "On", alarm and fault displays "Off"
- Check for mechanical damage and external soiling

6.2.2 Functional testing

Functional testing can be carried out at specific intervals, which depend on the gas hazard being monitored. With gas warning systems for explosion protection, 4 months and otherwise 6 months should not be exceeded. It includes the following tasks:

- Visual inspection according to section 3.7.1
- Triggering the test functions for display elements as well as optical and acoustic signal transducers, without triggering switching functions
- Inspection of saved messages, faults and maintenance requirements

6.2.3 System check

The system check must also be carried out at regular intervals. The time between intervals should not exceed 1 year. It includes the following tasks:
- Functional testing according to section 3.7.2
- Inspection of all safety functions, including triggering of switching functions.
- Monitoring of parameterisation via target / actual comparison
- Inspection of signalling and registration modules

6.2.4 Repair

This includes all repair and replacement tasks. These tasks should only be carried out by the manufacturer and persons who have been authorised to do so by the manufacturer – i.e. GfG Gesellschaft für Gerätebau mbH. Only use original spare parts and original modules inspected and released by the manufacturer.

6.3 Troubleshooting

	Fault / message	Cause	Remedy
1.			
2.			
3.			
4.			
5.			

6.4 Spare parts and accessories

	Description	Order No.
1.	36 W power supply unit for mounting rail assembly (input: 85-264 V AC output: 24 V DC/1.5 A)	1000271
2.	60W power supply unit for mounting rail assembly (input: 88-264 V AC output: 24 V DC/2.5A)	1000272
3.	GMA200-BC terminals for GMA Bus connector	2200200
4.	Spare slow-blow fuse T 500 mA (F1 for GMA200) PU=10 pieces	2200301
5.	Flat ribbon cable for GMA200-MT/-RT (L=22 cm)	2200309
6.	Terminal cover for GMA200-MT/-RT (9-hole)	2200310

6.5 Information on the environmentally sound disposal of used parts

According to section 11 of the General Terms and Conditions of the company GfG, the purchaser of the device agrees to dispose of the device or device components in an environmentally sound manner in line with sections 11 and 12 of the German Electrical and Electronic Equipment Act (ElektroG). If desired, GfG in Dortmund, Germany, can also carry out correct disposal.

6.6 Technical data

| Type designation:	GMA200-RT	GMA200-RTD
Display & control elements	19 status LEDs for operating and relay statuses	19 status LEDs for operating and relay statuses, 2.2" graphical display and 5 buttons
Ambient conditions For storage: For operation: Site of installation:	-25..+60 °C | 0..99 % RH (recommended 0...+30 °C) -20..+50 °C | 0..99 % RH in a control cabinet or in a wall housing up to a height of 2,000 m above sea level	
Power supply Operating voltage: Power consumption: Fuses:	24 V DC (20-30 V DC permissible) max. 6 W F1= slow-blow T 500 mA	
RS485 connection GMA Bus:	RS485; half-duplex; galvanically isolated; max. 230400 Baud (for GMA200-M, control centre, PC, PLC or Gateway)	
Relay outputs Contacts: Contact rating: Insulation distances:	16 relays each with a changeover contact 3 A / 250 V AC or 3 A / 30 V DC Basic insulation between the relays: 1&2, 2&3, 4&5, 5&6, 7&8, 8&9, 10&11, 11&12, 13&14, 14&15 Double insulation between the relays: 3&4, 6&7, 9&10, 12&13, 15&16	
Alarm acknowledgement inputs Reset:	0-3 V DC (alarm acknowledgement occurs at contact with GND; U_{MAX}=30 V DC)	
USB connection	Mini USB port for device configuration via PC	
Housing Attachment: Protection class: Material: Weight: Dimensions:	on mounting rail TS35 according to DIN 60715 IP20 Plastic approx. 410 g 162 x 97 x 62 mm (W x H x D)	
Connection cables Terminal blocks: Cable:	0.8..2.5 mm^2 cross section 2-4-wire 0.5-1.5 mm^2 LiYY, NYM (for GMA200 supply) 2-wire 1 x 2 x 0.22 mm^2 BUS-LD (for GMA Bus with a length >10 m)	

Approvals/Tests
Electromagnetic compatibility:
Electrical safety:
	EN 50270:2006 Emitted interference: Type class I
	                          Interference resistance: Type class II
	EN 61010:2010 Degree of soiling 2
	                          Overvoltage category III for relay contacts	

6.7 EC declaration of conformity

EU Declaration of Conformity   **GfG Gesellschaft für Gerätebau mbH**

GMA200-RT

GMA200-RTD

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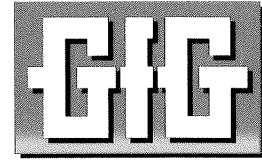
Edited: 03.12.2014   Amended: 31.07.2017

GfG Gesellschaft für Gerätebau mbH develops produces and sells gas sensors and gas warning devices which are subject to a **quality management system** as per DIN EN ISO 9001.
Subject to supervision by means of a **quality system**, surveilled by the notified body, DEKRA EXAM GmbH (0158), is the production of electrical apparatus of instrumentation Group I and II, categories M1, M2, 1G and 2G for gas sensors, gas detectors, gas warning systems in types of protection flameproof enclosures, increased safety, encapsulation and intrinsic safety, as well as their measuring function.

The Relay module **GMA200-RT** complies with council directive **2014/30/EU** for electromagnetic compatibility, with directive **2014/35/EU** for electrical safety and with directive **2011/65/EU** (RoHS) on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

The directive 2014/30/EU is complied considering the following standard:
- Electromagnetic compatibility - Electrical apparatus for the detection and measurement
of combustible gases, toxic gases or oxygen   EN 50270: 2006
Radio shielding   Type class 1
Interference resistance   Type class 2
The EMC test laboratory EM TEST GmbH at Kamen has tested and certified the electromagnetic compatibility.

The directive 2014/35/EU is complied considering the following standard:
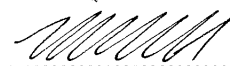- Safety requirements for electrical equipment for measurement, control and laboratory
use. General requirements.   EN 61010-1: 2010
The company du.tronic Consulting & Engineering at Ratingen has tested and certified the electrical safety.

The directive 2011/65/EU is complied considering the following standard:
- Technical documentation for the assessment of electrical and electronic products with respect
to the restriction of hazardous substances   EN 50581: 2012

Dortmund, 14 September 2017

i.V.
....
B. Siebrecht
QMB

EG-Kon-52.1/Siebrecht

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