



## Controller GMA200-MT

# For sophisticated gas detection systems





## Controller GMA200-MT

For sophisticated gas detection systems and a wide variety of requirements

As a DIN rail module, the GMA200-MT is perfectly suited for installation in control cabinets or wall-mounted housings. It is available in the versions GMA200-MT6 (for 16 transmitters, of which a maximum of 6 are analog) and GMA200-MT16 (also 16 transmitters, of which a maximum of 16 are analog).

Together with the connected transmitters, it forms a stationary gas detection system for continuous measurement of gas concentrations. Its scope of performance makes it the perfect choice for monitoring combustible gases and vapors below the lower explosion limit, warning of toxic gases in the ambient air and keeping an eye on oxygen concentration (deficiency, excess or inert).

Of course, it fulfills the requirements of the suitability test according to ATEX Directive 2014/34/EU (in case switching or protective measures for explosion protection are provided via the gas detection system), the requirements for gas detection systems without special approvals and additionally the requirements for functional safety (SIL).

The GMA200-MT6 and GMA200-MT16 have been tested by TÜV Rheinland Industrie Service GmbH regarding compliance with the requirements of product standards EN 50402, IEC 61508 and IEC 62061 for SIL2 and PL d according to EN ISO 13849-1. They can be used in a single-channel HFT=0 structure up to SIL2 / PL d and in a redundant HFT=1 architecture up to SIL3 / PL e. A corresponding certificate no.: 968/FSP 1324.01/17 is available.

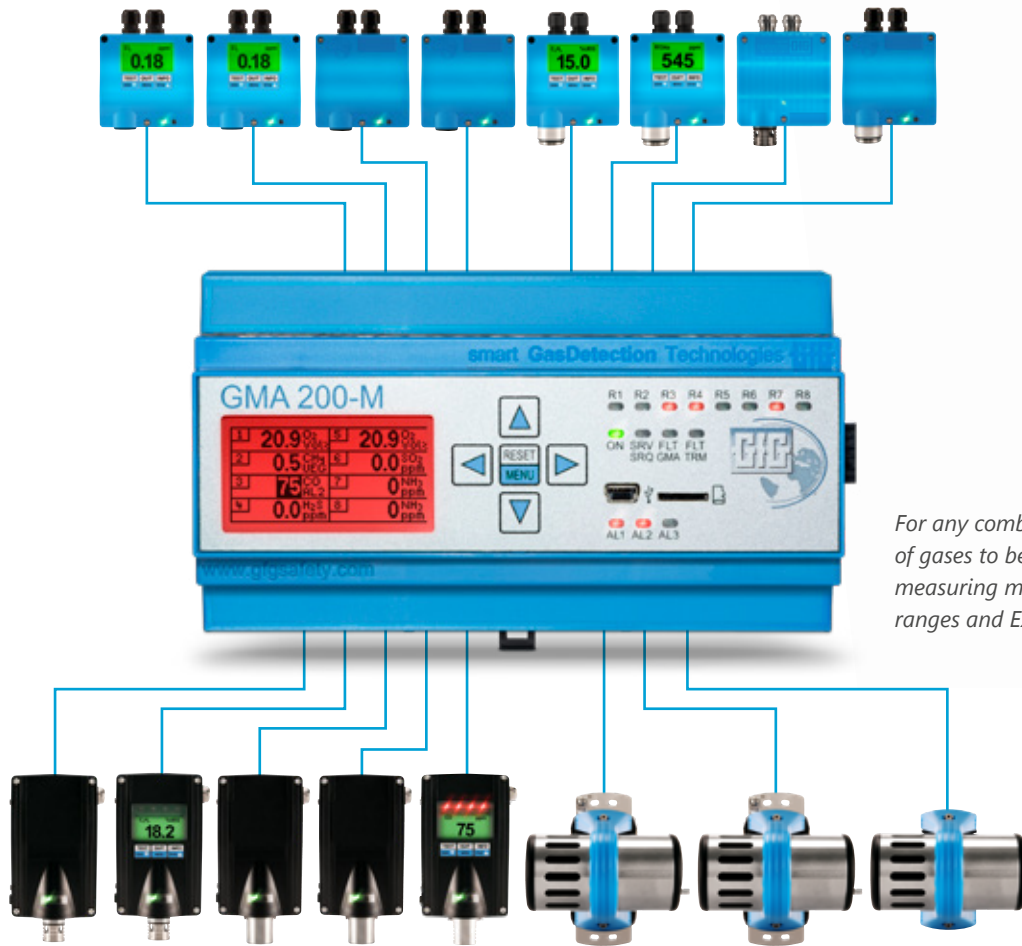
### A versatile concept

The design and construction of the GMA200-MT controller allows versatile usage in industrial and commercial applications. It features simple installation and a structured, easy-to-understand and user-friendly menu. The compact design allows cost- and space-saving installation in existing control cabinets.

By means of the GMA200Config software, measuring points can be configured quickly and easily. This applies to new installations as well as to changes to already installed controllers. The configuration software can be used to program measuring point designations, transmitter type, gas type and measuring range as well as the three individual or preset alarm limit values for each measuring point.



*GMA200-MT - for connecting up to 16 digital or analog transmitters.*



For any combination of gases to be monitored, measuring methods, measuring ranges and Ex zones.

### Integrated relays

Increasing demands on safety concepts, e.g. redundantly designed protective measures, result in gas detection systems becoming more and more complex. The GMA200-MT controller therefore features 8 internal relays.

Six freely programmable alarm relays are available for implementing safety functions, protective measures and alarm functions. A wide range of options can be realized by means of the GMA200Config software:

- » the assignment of single or multiple measuring points to relays
- » individual alarms per measuring point and alarm limit value
- » configuration of collective or group alarms
- » fault messages
- » voting functions
- » selection of open-circuit current principle / closed-circuit current principle

Two additional relays are available, one as a safety-related fault signal and the other one as a maintenance relay.

### Power supply and availability

In addition to the conventional power supply, the GMA200-MT controller can alternatively be used with a redundant, safety-related power supply. Thereby, even the highest requirements for functional safety are met and the required continuous availability of gas detection systems is ensured.

### Terminal assignments

With the GMA200-MT6, the power supply for a maximum of 6 analog transmitters is provided by the GMA. When using the GMA200-MT16, all analog transmitters are supplied with voltage via an external power supply unit.

69	68	67	66	65	64	63	62	61	59	58	57	56	44	43	42	41												
D	DD	D	DD	D	DD	D	DD	D	REL1	REL2	REL3	REL4	REL5	REL6	REL7	REL8												
40	AB	48	IR	B	48	I	R	B	48	CO	TA	S	SRV	A	2	A	0	D	OH	A	2	S	SRV	A	2	A	0	D

Terminal assignment diagram GMA200-MT6 and -MT16 top

POWER				TRANSMITTER SIGNAL				TRANSMITTER SIGNAL			
11	12	13	14	21	22	23	24	31	32	33	34
GND	24V	GND	24V	In1	In2	In3	In4	In5	In6	In7	In8
Rel.1	Rel.2	Rel.1	Rel.2	GND	GND	GND	GND	GND	GND	GND	GND
0-1	0-1	0-1	0-1	4-0	4-0	4-0	4-0	4-0	4-0	4-0	4-0
0-2	0-2	0-2	0-2								

Terminal assignment diagram GMA200-MT6 bottom (internal power supply of the analog transmitters)

POWER				TRANSMITTER SIGNAL				TRANSMITTER SIGNAL			
11	12	13	14	21	22	23	24	31	32	33	34
GND	24V	GND	24V	In1	In2	In3	In4	In5	In6	In7	In8
Rel.1	Rel.2	Rel.1	Rel.2	GND	GND	GND	GND	GND	GND	GND	GND
0-1	0-1	0-1	0-1	4-0	4-0	4-0	4-0	4-0	4-0	4-0	4-0
0-2	0-2	0-2	0-2								

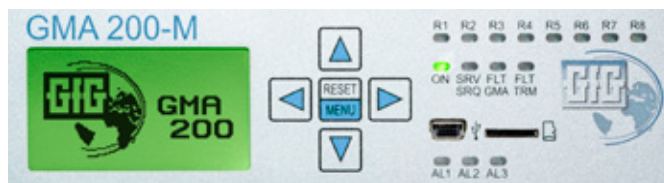
Terminal assignment diagram GMA200-MT16 bottom (external power supply of the analog transmitters)

## System functions

### LED status indicators

The current status of the controller is displayed clearly and easy to grasp by colored LEDs:

- » R1-R8            Status of the internal relays (switched/not switched)
- » ON              Operating state
- » SRV/SRQ       service/service-request
- » FLT/GMA       Controller fault
- » FLT/TRM       Fault of a transmitter
- » Alarm 1-3      Alarms 1 to 3



User interface of the GMA200-MT with display, control keys, status LEDs and connectors.

### Display

Part of the intuitive user interface of the GMA200-MT is the clear, green backlit LC display. In normal operation, it continuously displays the current measured values of all connected transmitters.

When an alarm occurs, the backlight changes to red and the display changes to the alarm display. In addition to the clearly visible ALARM message, the number of measuring points that have triggered an alarm, their location and the current measured

### Data logger

For measured value storage, the GMA200-MT controller can be equipped with a microSD memory card. Measured values, average values, alarm events and faults are permanently stored at individually configurable intervals and can be read out for evaluation.

### User interface

The controller is operated using 5 push buttons. They are mainly used for acknowledging alarms and menu-guided operation of the GMA200-MT. In the control menu, information on the status of the controller, the transmitters and the relays can be called up.

### USB port

The USB interface of the GMA200-MT is used for connection with the configuration software.

values with gas type and alarm level are displayed. This is also indicated via the alarm LEDs. Other LEDs indicate which relays have been switched due to the alarms.

The GMA offers an even better overview in combination with the GMA200-VS visualization software, which allows all information to be additionally displayed on touchscreen TFTs up to 21".





Configuration of the GMA200-MT „offline“ via PC.

## GMA200Config

### Access to all options

The configuration software offers a wide range of setting options, from selecting the language for the display, to scheduling relay contacts.

For configuration, the GMA200-MT is connected to a computer via USB cable with mini USB plug. If it is not yet connected to a power supply, this can also be provided via the USB interface for configuration purposes.

### Password protected

Access to the program is password protected and allows different authorization levels. These range from simple queries, such as an overview of all measuring points that use a linearization table, to the authorization to change safety-relevant parameters.

GfG offers appropriate training and continuing education for the various authorization levels.

The screenshot shows the 'Transmitter assistant' window with the following data table:

Transmitter type	Type of gas	Measuring range	Interface selection	Sensor type selection	Alarm 1	Alarm 2	Alarm 3
CC28	bG (Flammable gases and fumes)	0...100.0 %LEL	analog (4-20mA)	MK208-1	20.0 %LEL	40.0 %LEL	60.0 %LEL
CC28	C2H2 (Acetylene)	0...100.0 %LEL	analog (4-20mA)	MK208-1	20.0 %LEL	40.0 %LEL	60.0 %LEL
CC28	C2H4 (Ethylene)	0...100.0 %LEL	analog (4-20mA)	MK208-1	20.0 %LEL	40.0 %LEL	60.0 %LEL
CC28	C2H6 (Ethane)	0...100.0 %LEL	analog (4-20mA)	MK208-1	20.0 %LEL	40.0 %LEL	60.0 %LEL
CC28	C2H6O (Ethanol)	0...100.0 %LEL	analog (4-20mA)	MK208-1	20.0 %LEL	40.0 %LEL	60.0 %LEL
CC28	C2H6O (Dimethyl ether)	0...100.0 %LEL	analog (4-20mA)	MK208-1	20.0 %LEL	40.0 %LEL	60.0 %LEL
CC28	C3H4 (Propyne)	0...100.0 %LEL	analog (4-20mA)	MK208-1	20.0 %LEL	40.0 %LEL	60.0 %LEL
CC28	C3H6O (Acetone)	0...100.0 %LEL	analog (4-20mA)	MK208-1	20.0 %LEL	40.0 %LEL	60.0 %LEL
CC28	C3H8 (Propane)	0...100.0 %LEL	analog (4-20mA)	MK217-1	20.0 %LEL	40.0 %LEL	60.0 %LEL
CC28	C3H8 (Propane)	0...50.0 %LEL	analog (4-20mA)	MK219-1	10.0 %LEL	20.0 %LEL	40.0 %LEL
CC28	C3H8O (Propanol)	0...100.0 %LEL	analog (4-20mA)	MK208-1	20.0 %LEL	40.0 %LEL	60.0 %LEL
CC28	C4H10 (n-Butane)	0...100.0 %LEL	analog (4-20mA)	MK208-1	20.0 %LEL	40.0 %LEL	60.0 %LEL
CC28	C4H10 (i-Butane)	0...100.0 %LEL	analog (4-20mA)	MK208-1	20.0 %LEL	40.0 %LEL	60.0 %LEL
CC28	C4H10O (Diethyl ether)	0...100.0 %LEL	analog (4-20mA)	MK208-1	20.0 %LEL	40.0 %LEL	60.0 %LEL

Transmitter assistant of the GMA200-MT



## Extension by external relays

The more complex gas detection systems become or the more widespread plants are, the more important it becomes to have enough relays and short cable runs between the relays and the devices to be switched. In addition to the 8 internal relays of the GMA200-MT, the controller is able to address up to 64 additional, freely configurable relays with a potential-free changeover contact, each by means of 4 external relay modules.

### External relay module in two versions

GfG offers respective extensions for your gas detection system with the GMA200-RT series. Both, the GMA200-RT and the version with display and push buttons, GMA200-RTD, are designed for DIN rail mounting (TS35) and are connected to the GMA200-MT via a digital RS-485 bus.

This allows the relay modules to be installed quickly and easily together with the controller in a control cabinet as well as decentralized at a distance of up to 1200 meters from the GMA200-MT. Thus, costs and effort for laying necessary lines can be minimized.

The GMA200-RTW wall-mount housing is available to match. It offers protection against damage, dirt and dust and is optionally available with or without an integrated 230 volt power supply.

*Wall-mounting housing GMA200-RTW for relay modules.*



*Relay module GMA200-RTD with display and push buttons.*

**Indication of alarms and switched relays**

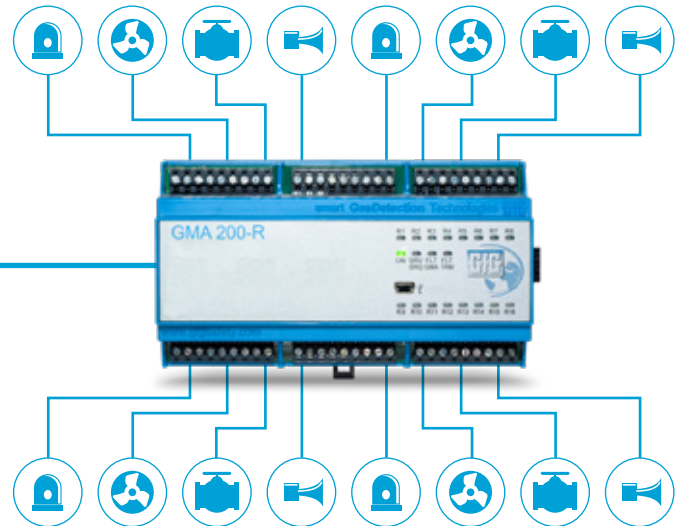
Both versions feature 19 status LEDs for indicating the operating status, service requests and relay states. In addition, the GMA200-RTD's integrated 2.2-inch display shows exactly the same information about transmitters, measured values and alarms as shown on the controller, and can therefore be used as a remote display.

The display of the GMA200-RTD is also backlit in green during normal operation and changes to red in the event of an alarm. The device is operated via five push buttons to the right of the display.



User interface of the GMA200-RTD with display, push buttons, status LEDs and USB port.

Example of wiring a GMA200-MT with relay module GMA200-RT and different safety measures.




-  Visual alarm devices
-  Audible alarm devices
-  Ventilation control
-  Asset control

**Connection and configuration**

Power is supplied via a 24 V DC power supply unit. It is also possible to have a redundant power supply using two power supply units.

The connection to the controller is made via the GMA bus connector on the side or alternatively via the TRM bus. The bus cabling is continued via the second connector.

There is also a mini-USB port in the case's front. It lets you connect a computer for convenient configuration of the relay modules. The GMA200Config software is required for this.

69	68	67	66	65	64	63	62	61	59	58	57	56	55	54	53	52	51	49	48	47	46	45	44	43	42	41
REL1			REL2			REL3			REL4			REL5			REL6			REL7			REL8			REL9		
CONTACTS: max. 3A/250VAC or 3A/30VDC																					CONTACTS: max. 3A/250VAC or 3A/30VDC			CONTACTS: max. 3A/250VAC or 3A/30VDC		
POWER			REL15			REL14			REL13			REL12			REL11											
11	12	13	14	15	17	18	19	21	22	23	24	25	26	27	28	29	31	32	33	34	35	36	37	38	39	

In addition to the 16 freely configurable relays, both versions of the relay module also offer the option of connecting an acknowledgement button for acknowledging alarms.

**Functional Safety**

The relay modules GMA200-RT and GMA200-RTD meet the requirements of functional safety according to DIN EN 50402. In single-channel use (1oo1), the SIL capability is 1 or 2, in redundant use it is 2 or 3. In each case, the higher value applies to a contact load of max. 2 A.



GMA200-MT with two relay modules GMA200-RT and GMA200-RTD mounted in a control cabinet.

# Technical Data: GMA200-MT

<b>Gases:</b>	Combustible and toxic gases/vapors as well as oxygen in combination with all GfG transmitters.		
<b>Connection options:</b> GMA200-MT6: GMA200-MT16:	16 transmitters (of which max. 6 are analog) 16 transmitters (of which max. 16 are analog)		
<b>Inputs:</b>	16 analog inputs 4-20 mA or 0.2-1 mA max. 50 Ohm input resistance 2 digital inputs: acknowledgement of alarms; freely configurable 2x RS-485 bus e.g. for connection of external relay modules or digital transmitters in bus wiring 1x RS-485 bus for digital transmission of measurement and output data to a higher-level control center or, withmaster functionality of a GMA200-MT, for connection of relay modules		
<b>Outputs:</b>	6 relays (normally open contacts) freely configurable for individual alarms per measuring point and alarm limit value, configuration of collective or group alarms, fault messages and voting functions 1 relay each for maintenance and fault (closed-circuit current principle) 2 analog outputs: 4-20 mA / 600 Ohm max. load, freely configurable		
<b>External relay modules:</b>	Up to 64 additional, freely configurable relays (through additional relay modules with 16 relays each) Configurable for individual alarms for each measuring point and alarm limit value, configuration of collective or group alarms, fault messages and voting functions		
<b>Alarms:</b>	3 independent limit value alarms for each measuring point (Alarm 1, Alarm 2 and Alarm 3) freely adjustable within the measuring range		
<b>Alarm functions:</b>	» exceeding, falling short » acknowledgeable (only the additional horn) » not acknowledgeable	» latching / non-latching » alarm with switch-on delay (up to max. 3 minutes) » alarm with switch-off delay (up to max. 60 minutes)	
<b>Data storage:</b>	Measured values can be stored on SD card for permanent data recording of measured values, alarms and faults Storage intervals adjustable (5 s - 60 min), Recording of instantaneous and average values, minimum/maximum concentration selectable for each measuring channel		
<b>Environmental conditions:</b> Temperature operation: Temperature storage: Humidity:	-20 to +50 °C -30 to +60 °C 0 to 99 % r.h.		
<b>Power supply:</b>	2 x 24 V DC, 20-30 V (1 x redundant power supply)		
<b>Power consumption:</b> GMA200-MT6:  GMA200-MT16: Relay module GMA200-RT:	5 W without transmitter 30 W including connected transmitter 5 W without transmitter 6 W		
<b>Displays and controls:</b> Display: Interface: LEDs: Horn:	Backlit LC display / 2.2" with 132 x 65 pixels 5 push buttons (RESET/MENU, Up, Down, Right, Left) 15 status LEDs (green, yellow, red) Integrated, for local alarming		
<b>Housing:</b> Dimensions: Mounting: Material: Weight: Protection class:	162 x 97 x 62 mm (B x H x T) on TS35 DIN rail Plastic 370 g IP20		
<b>Approvals/Certifications:</b> ATEX approval according to Directive 2014/34/EU: Electromagnetic compatibility: Electrical Safety: Functional Safety:  Metrological suitability:	BVS 19 ATEX G 001 X	Ⓜ II (2) G	CE 0158  EN 50270:2015 (Interference emission: Type class I, Interference immunity: Type class II) EN 61010-1:2010 (pollution degree 2, overvoltage category III for relay contacts) EN 50402:2017; IEC 61508-1 to -7:2010 (SIL2/SC3) EN 50271:2018; EN 62061:2016; ISO 13849-1:2015 EN 60079-29-1:2016 (EX); EN 50104:2019 (OX); EN 45544-1/-2/-3:2015 (TOX)



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