Bieler+Lang
Gas Detection Systems

Operating and Installation Manual

GMC 8032 / GMC 8034



Gas Detection Controller

From firmware version 2.04

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1.1. Document Revision

Revision	Date	Description of Changes	Approval
1.0	06 / 2025	Initial Release	QM, PM, VT, SV
2.0	10 / 2026	New Document Framework Supplementary information in accordance with the requirements of EN 60079-29-1, EN 60079-29-0 and EN 50271	QM, PM, VT, SV

Abbreviations:
QM = Quality Management
VT = Sales Department
PM = Product Management
SV = Service

1.2. Imprint

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Document Status

This Operating and Installation Manual applies to the GMC 8032 and GMC 8034 gas detection controller.

The information contained in this document reflects the technical status at the time of publication.

Technical modifications as part of continuous product development are reserved.

Binding Nature of Information

This Operating and Installation Manual is part of the product and must be observed to ensure safe and Intended Use.

Deviations from the procedures described may result in malfunctions of the Gas Detection System and may lead to hazardous situations.

Current Version of the Documentation

The operator must ensure that the current version of this Operating and Installation Manual is used.

The current version is available from the manufacturer.

In Case of Uncertainty

If there are any uncertainties or missing information, the manufacturer or an authorised distribution partner must be contacted.

2. General Information

This Operating and Installation Manual applies to the following products:

- GMC 8032 — Gas detection control unit with up to two measuring channels.

- GMC 8034 — Gas detection control unit with up to four measuring channels.

2.1. Manufacture Information

The control unit continuously evaluates signals from connected gas detectors with analogue 4–20 mA outputs. The GMC 8032 supports up to two measuring channels; the GMC 8034 supports up to four.

The control unit supplies power to the connected gas detectors, displays the measured values and evaluates them according to the configured measuring ranges and alarm thresholds.

Alarm, fault and service conditions are indicated on the display and by dedicated LEDs. Relay outputs are provided for connection to external warning devices and control systems.

Configuration is performed using the menu-guided user interface and the rotary encoder on the front of the control unit.

The control unit is designed for mounting on a TS35 DIN rail inside a control cabinet or suitable enclosure. It must be installed outside hazardous areas.

2.2. Product Designation and Rating Label Description

2.2.1. Rating Labels

GMC 8032 rating label:



GMC 8034 rating label:



2.2.2. Meaning of the Rating Label Markings

Marking / symbol	Meaning
Typ: GMC8032 / GMC8034	Product designation. GMC 8032 supports up to two measuring channels GMC 8034 supports up to four.
TN 12.600823.x / TN 12.600808.x	Part number: 12.600823.x for GMC 8032 Part number: 12.600808.x for GMC 8034. The suffix ".x" identifies the revision.
24 V and direct current symbol	Rated supply voltage: 24 V DC. The solid line above a dashed line denotes direct current.
12 W	GMC 8032 rated power consumption with 2 detectors
20 W	GMC 8034 rated power consumption with 4 detectors
–20 °C < Ta < +55 °C	Permitted ambient temperature range as marked on the label. "Ta" denotes the ambient temperature at the control unit.
Bieler+Lang GmbH, D-77855 Achern	Manufacturer identification and location. "D" identifies Germany; 77855 is the postal code for Achern.
CE	Indicates conformity with the applicable EU legislation requiring CE marking. Refer to the EU Declaration of Conformity for details.
0044	Identification number of the notified body involved in the production control phase of the ATEX conformity assessment procedure: TÜV NORD CERT GmbH.
Lightning bolt in a triangle	Warning: electricity. Observe the electrical safety instructions before installation, maintenance or other work on the control unit.
Exclamation mark in a triangle	General warning. Consult this manual for the relevant hazards and precautions.
EN 60079-29-1 / 60079-29-0	References to standards for gas detection equipment: performance requirements for detectors for flammable gases (EN 60079-29-1), and general requirements and test methods for gas detection equipment (EN 60079-29-0). Refer to the conformity and certification documentation for the applicable editions and scope.
Ex symbol in a hexagon	Specific explosion protection marking under the ATEX Directive 2014/34/EU. Read this symbol together with "II (2) G".
II	Equipment group II: applications other than mines susceptible to firedamp.
(2)	The category in parentheses refers to the category 2 equipment whose safe functioning with respect to explosion risks is supported by the control unit. It does not authorise installation of the control unit in a hazardous area.
G	Relates to explosive atmospheres caused by gases, vapours or mists.
FTZU 25 ATEX 0100	ATEX certificate reference. Refer to the corresponding certificate for the certified scope and applicable requirements.
Crossed-out wheeled bin	Separate collection of waste electrical and electronic equipment is required. Do not dispose of the control unit with unsorted municipal waste.
Black bar below the wheeled bin	Indicates that the product was placed on the market after 13 August 2005.
Electrical data reference	Further electrical specifications and installation requirements are provided in the data sheet and this Operating and Installation Manual.
Data Matrix code	Encodes device identification data, including serial number, product type and revision, for internal material flow control and traceability.
SN: xxxxxx / 20xx	Serial number and year of manufacture. "xxxxxx" represents the individual serial number; "20xx" represents the year of manufacture.

2.2.3. Specific Conditions of Use

The following conditions must be observed when installing and operating the control unit:

- Install the control unit indoors and outside hazardous areas.
- Do not install or operate the control unit in oxygen-enriched atmospheres. Oxygen enrichment increases the risk of ignition and the severity of combustion. Electrical sparks and hot components may become ignition sources. This restriction concerns the atmosphere surrounding the control unit; observe the separate suitability requirements for detectors installed at the measuring locations.
- Mount the control unit on a TS35 DIN rail inside a control cabinet or suitable enclosure.
- If a plastic enclosure is used, its flammability classification must be UL 94 V-1 or better.
- Protect the control unit against water splashes, oil, dust and mechanical damage.
- Ensure sufficient clearance from external heat sources. Keep the ventilation slots unobstructed to allow natural convection.
- Install the control unit in a location with low vibration and stable temperatures.
- Operate the control unit within the environmental and electrical limits specified in the technical data.
- Ensure that the control unit remains accessible for maintenance.

Contamination, moisture ingress or blocked ventilation slots may impair operation and cause faults. Protect the control unit from rain, snow, fog, fumes, dust and other particulates by selecting a suitable installation location and surrounding enclosure.

2.2.4. Front Markings

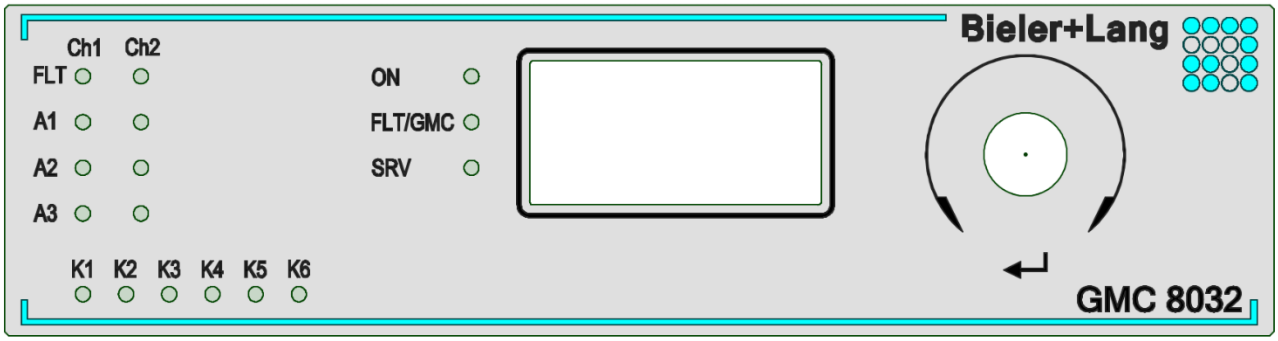


Figure 1: Front Marking GMC 8032

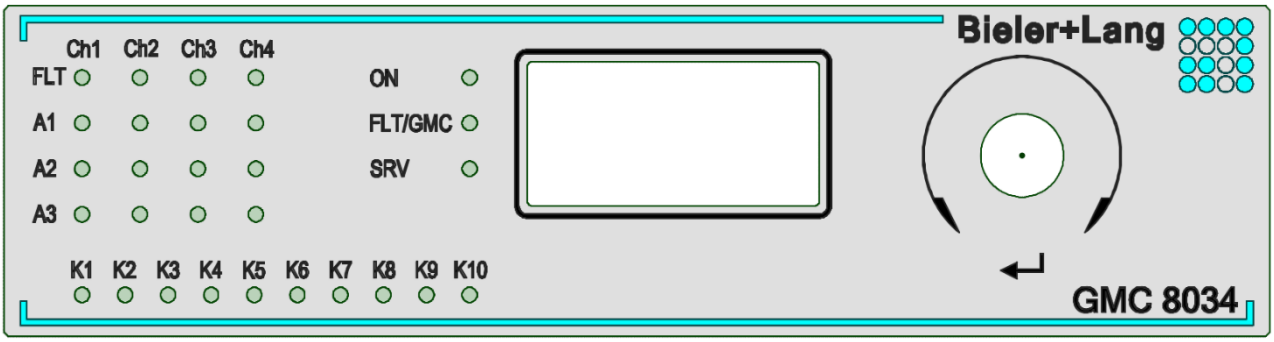


Figure 2: Front Marking GMC 8034

The front panel provides channel-specific alarm and fault indicators, general status indicators, relay status indicators, a display and a rotary encoder with push-button function. The following table explains the front markings of both versions.

Marking / symbol	Meaning
Bieler+Lang logo	Manufacturer identification.
GMC 8032 / GMC 8034	Product designation.
Ch1–Ch2 / Ch1–Ch4	Measuring channel identification: two channels on GMC 8032 and four channels on GMC 8034.
FLT	Channel fault indicator for the corresponding measuring channel.
A1	Alarm level 1 indicator for the corresponding measuring channel.
A2	Alarm level 2 indicator for the corresponding measuring channel.
A3	Alarm level 3 indicator for the corresponding measuring channel.
ON	Operating status indicator. Indicates that the control unit is ready for operation and the supply voltage is within the permissible limits.
FLT/GMC	General fault indicator. Indicates an internal fault or a fault condition associated with a measuring channel.
SRV	Service indicator. Indicates a service condition, for example during configuration or maintenance of a measuring channel.
K1–K6 / K1–K10	Status indicators for the programmable output relays: six on GMC 8032 and ten on GMC 8034. An illuminated indicator signifies that the corresponding relay is energised.
Curved arrows around the rotary encoder	Turn the rotary encoder to navigate through menus or change input values.
Enter symbol below the rotary encoder	Press the rotary encoder to select a menu item or confirm an input.

2.3. Intended Use and Foreseeable Misuse

2.3.1. Intended Use

The control unit is intended for use as part of a fixed gas detection system. It continuously evaluates the analogue 4–20 mA signals from connected gas detectors, displays measured values and indicates alarm, fault and service conditions. Relay outputs are provided for connection to external warning devices and control systems.

The GMC 8032 supports up to two measuring channels; the GMC 8034 supports up to four. The gases and measuring ranges that can be monitored depend on the connected gas detectors and the configuration of the control unit.

Use only gas detectors whose signal characteristics and electrical requirements are compatible with the control unit. Configure each measuring channel to match the connected detector, including the gas designation, measuring range and alarm thresholds. The relay assignments and switching functions must suit the intended protective measures.

The control unit is intended for indoor installation on a TS35 DIN rail inside a control cabinet or suitable enclosure, outside hazardous areas. Operate it within the specified technical limits and observe the conditions in Section 2.2.3.

Installation, commissioning, configuration and maintenance must be carried out by qualified personnel. Intended use includes observing this manual and the instructions for the connected gas detectors and other system components.

2.3.2. Foreseeable Misuse

The following uses are not permitted:

- Installing the control unit outdoors or in a hazardous area.
- Operating the control unit outside its specified environmental or electrical limits.
- Connecting incompatible gas detectors or using a measuring channel configuration that does not match the connected detector.
- Using unsuitable alarm thresholds, relay assignments or switching functions for the required protective measures.
- Relying on a measuring channel for gas monitoring while it is disabled or in a service condition that interrupts monitoring.
- Bypassing or disabling required alarm or fault signalling without providing suitable alternative protective measures.
- Continuing operation with a damaged housing or damaged cables.
- Opening or modifying the control unit without authorisation from the manufacturer.
- Allowing installation, commissioning, configuration or maintenance to be carried out by unqualified personnel.

Such misuse may impair gas monitoring or prevent the required alarm and protective functions from operating correctly. Electrical hazards may also result.

3. Basic Safety Instructions

3.1. General Safety Instructions

The control unit has been designed and manufactured in accordance with the state of the art and recognised safety engineering principles. Nevertheless, improper use may result in hazards to persons, property and the environment.

- Read and follow this Operating and Installation Manual before installation, commissioning and operation.
- The control unit shall only be installed, commissioned, configured and maintained by qualified personnel.
- Observe applicable national regulations, standards and directives relating to gas detection systems and electrical safety.
- Use the control unit only in accordance with its intended use (see Section 2.3).
- Install the control unit outside hazardous areas and observe the conditions in Section 2.2.3.
- Before electrical work, disconnect the control unit and all externally supplied circuits connected to it from their power sources. Secure them against reconnection and verify that they are de-energised. Relay terminals may carry hazardous voltages even when the 24 V DC supply is switched off.
- Do not open or modify the control unit without authorisation from the manufacturer.
- Use only original spare parts and approved accessories.
- Inspect and maintain the gas detection system at regular intervals. Check the alarm, fault and relay functions. Calibrate and adjust connected gas detectors in accordance with their instructions.
- Before interrupting gas monitoring for configuration, maintenance or other work, provide suitable alternative protective measures. Verify correct operation before returning the system to service.
- Do not operate the control unit if its housing or connected cables are visibly damaged.
- Follow the instructions for the connected gas detectors and other system components.

3.2. Symbols and Signal Words

Signal Word	Meaning
DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
NOTICE	Indicates possible property damage or functional impairment.

3.3. Residual Risks

Even when the control unit is used as intended, residual risks remain. These risks must be considered when designing, operating and maintaining the gas detection system.

Loss or interruption of gas monitoring

A power failure, a fault in the control unit, a cable fault or a detector fault may interrupt gas monitoring. Monitoring may also be interrupted during configuration or maintenance.

Fault and service indications do not replace gas monitoring. Ensure that these conditions are recognised and suitable protective measures are taken. Provide alternative protection whenever monitoring is unavailable.

Incorrect measurement or alarm evaluation

The control unit evaluates the signals supplied by the connected gas detectors. It cannot independently verify the actual gas concentration.

Detector drift, unsuitable detector selection or incorrect channel settings may lead to incorrect measured values or inadequate alarm response. Use suitable detectors, verify the configuration and perform regular system checks. Calibrate and adjust the detectors according to their instructions.

Delayed detection and protective action

Gas may reach a detector only after a delay, depending on detector location, air movement and gas distribution. Detector response times configured alarm delays and the response times of connected equipment may further delay protective action.

Consider these delays when selecting detector locations, alarm thresholds and system settings.

Failure of external warning or protective functions

An indicated alarm does not confirm that a connected warning device or protective system has operated correctly. Relay faults, wiring faults or faults in connected equipment may prevent the required action.

Check the complete signal chain, including the connected warning devices and protective functions, during commissioning and at the specified inspection intervals.

Electrical hazards

Relay terminals may carry hazardous voltages from external circuits, even when the control unit's 24 V DC supply is switched off.

Before electrical work, disconnect all relevant power sources, secure them against reconnection and verify that the circuits are de-energised.

The gas detection system does not replace a comprehensive assessment of the installation's hazards or the other protective measures required for safe operation.

3.4. Personal Protective Equipment (PPE)

The required personal protective equipment (PPE) depends on the work to be performed, the installation environment and the applicable site safety requirements.

During installation, commissioning and maintenance, use the PPE specified by the risk assessment for the task. Depending on the identified hazards, this may include:

- Protective clothing suitable for the work and installation environment.
- Safety footwear.
- Protective gloves suitable for the task.

- Safety goggles where there is a risk of eye injury.
- Suitable respiratory protection where required for work in areas with hazardous gases, for example when servicing connected gas detectors.

The control unit must be installed outside hazardous areas. Work on connected gas detectors may require additional protective measures at their installation locations.

The selection of suitable PPE is the responsibility of the operator based on the risk assessment.

3.5. Environmental and Health Protection

The control unit shall be operated and disposed of in an environmentally responsible manner.

- Dispose of the control unit in accordance with applicable regulations for waste electrical and electronic equipment (WEEE).
- Do not dispose of the control unit or other electronic system components with unsorted municipal waste.
- Dispose of packaging materials through the appropriate recycling or waste collection systems.
- When working on connected gas detectors or installations containing hazardous gases, take suitable measures to protect personnel and prevent the release of hazardous substances.
- Observe the handling and disposal instructions for connected gas detectors and other system components.

Improper disposal may lead to environmental damage and health hazards.

4. Product Overview

4.1. Design and Function

4.1.1. General Device Design

The control unit is a DIN rail-mounted device for use in a fixed gas detection system. It is designed for installation on a TS35 DIN rail inside a control cabinet or suitable enclosure, outside hazardous areas.

The GMC 8032 provides up to two measuring channels and six programmable output relays. The GMC 8034 provides up to four measuring channels and ten programmable output relays. Both versions also provide dedicated service and fault relay outputs.

The front panel contains a display, channel-specific alarm and fault indicators, general status indicators and relay status indicators. A rotary encoder with push-button function is used for menu navigation and configuration.

The control unit operates from an external 24 V DC power supply. Electrical connections are made via the connection terminals.

4.1.2. Measuring Channels and Detector Interfaces

Each measuring channel receives a linear analogue 4–20 mA signal from a connected gas detector. The control unit provides a 24 V DC supply connection for each detector. Detector power supply and signal inputs are protected by internal fuses.

The measuring principle, detectable gases and measuring performance depend on the connected detector. The control unit does not measure gas concentrations directly.

Each channel is configured to match the signal characteristics and measuring range of its detector. Only detectors with compatible signal characteristics and electrical requirements may be connected.

4.1.3. Signal Processing and Alarm Evaluation

The control unit converts each detector’s input signal into a measured value according to the configured measuring range. It compares this value with the alarm thresholds configured for the corresponding channel.

Three alarm levels, A1, A2 and A3, are available for each measuring channel. Alarm indications and assigned relay outputs respond according to the configured thresholds, delays and switching functions.

The control unit also evaluates input signals for fault and service conditions. These may include detector faults, signal values outside the permissible range and detector maintenance signals, depending on the channel configuration.

Internal self-tests monitor the control unit’s hardware and software. Detected system faults are indicated and recorded in the event memory.

4.1.4. Status Indication

The display shows measured values, operating information and menus. LEDs provide an overview of channel conditions, the general device status and the state of the programmable output relays.

Each measuring channel has a fault indicator, FLT, and three alarm indicators, A1, A2 and A3. The general indicators ON, FLT/GMC and SRV indicate operating, fault and service conditions. Indicators K1–K6 on the GMC 8032 and K1–K10 on the GMC 8034 show whether the corresponding programmable relays are energised.

The front markings are explained in Section 2.2.4. Detailed information on indication colours, flashing states and the required responses is provided in the operation and troubleshooting sections.

4.1.5. Role in the Gas Detection System

The control unit links the connected gas detectors to external warning devices and control systems. The detectors measure gas concentrations at their installation locations; the control unit evaluates their signals and provides local indications and relay outputs.

The programmable relays can be assigned to alarm functions according to the system configuration. Dedicated service and fault relays provide signals for these conditions to external equipment.

An external reset input allows a connected push-button to initiate the permitted reset functions, such as acknowledging resettable alarms or silencing an acoustic warning, according to the configuration.

Effective gas monitoring depends on the complete system, including detector selection and location, power supply, channel configuration, wiring and connected warning or protective equipment. The complete signal chain must be checked during commissioning and at the specified inspection intervals.

System response and recovery times

The response time of the complete gas detection system is approximately the sum of the response times of all relevant system components. Likewise, the system recovery time is approximately the sum of their recovery times.

Include the connected detectors, the control unit, any sampling system and connected warning or protective equipment, as applicable. Take any configured alarm delays into account when determining the overall response time.

4.1.6. Safety-related and non-safety-related functions

Safety-related functions

The safety-related functions of the control unit comprise:

- Acquisition and evaluation of the detector signals, including conversion into measured gas concentration values.
- Evaluation of alarm thresholds and activation of the corresponding alarm indications and assigned relay outputs.
- Alarm latching and reset according to the configured relay functions, including reset via the external reset input.
- Detection and indication of detector input faults and internal device faults, including signalling via the fault relay.

- Indication of service and special conditions, including conditions in which gas monitoring or alarm evaluation is unavailable.

Channel configuration, alarm settings, relay assignments and relay functions determine the behaviour of these functions. Channel disabling, alarm inhibition and relay testing affect the availability or operation of the protective functions. Observe the restrictions and precautions in Sections 8.5 to 8.8.

Non-safety-related functions

Supporting information and administrative functions comprise viewing and clearing the event log, viewing and setting the date and time, selecting the display language, adjusting display contrast, and displaying device identification, operating hours and internal temperature. These functions do not provide an independent gas alarm or protective output.

Access to a supporting function through Menu 2 nevertheless interrupts gas monitoring as described in Section 8.7. The LED test checks the indicators only and does not verify the complete protective function.

4.2. Main Components

4.2.1. Overall View

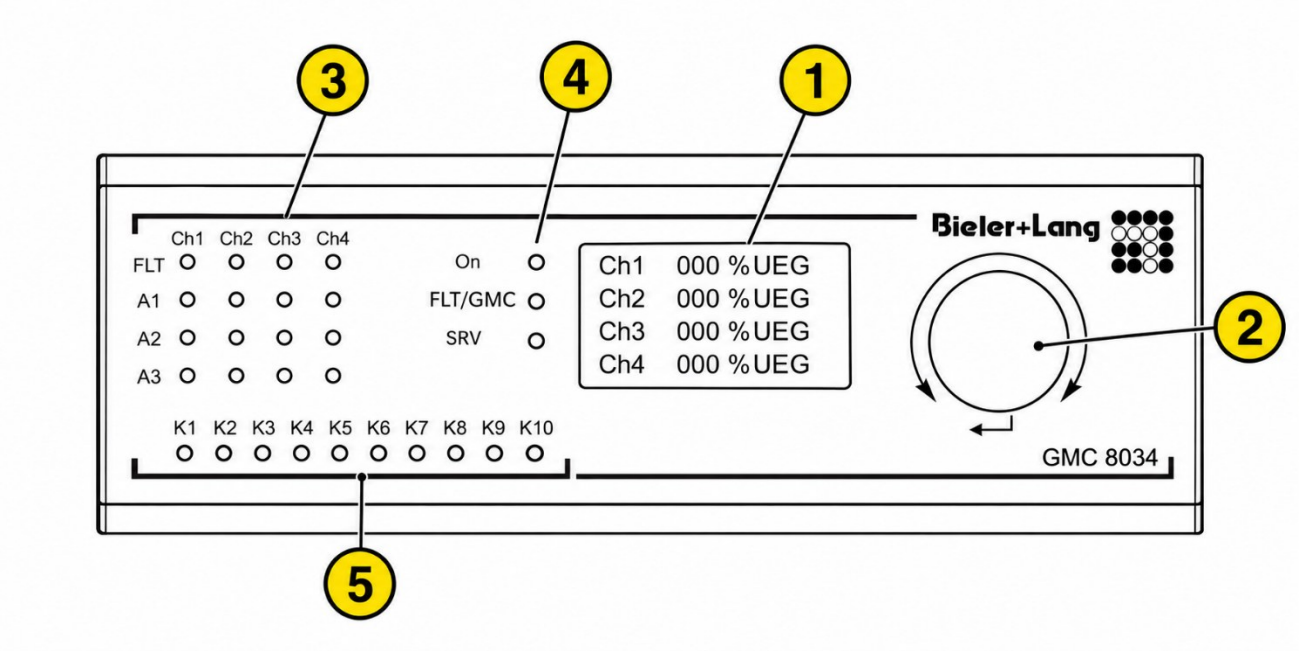


Figure 3: The GMC 8034 is shown. The GMC 8032 has the same types of front-panel components but provides two measuring channels and six programmable relay status indicators.

4.2.2. Component description

Nr.	Component	Description
1	Display	Shows measured values, operating status information and menus.
2	Rotary Encoder with Push-Botton	Turn to navigate through menus or change input values. Press to select a menu item or confirm an input.
3	Channel Alarm and Fault Indicators	Each measuring channel has one fault indicator (FLT) and three alarm indicators (A1, A2 and A3). GMC 8032: Ch1–Ch2. GMC 8034: Ch1–Ch4.
4	General Status Indicators	ON indicates operational readiness, FLT/GMC indicates a general fault condition, and SRV indicates a service condition.
5	Programmable Relay Status Indicators	Indicate whether the corresponding programmable output relays are energised. GMC 8032: K1–K6. GMC 8034: K1–K10.

4.3. Technical Data

The following technical data apply to the GMC 8032 and GMC 8034. Differences between the two versions are indicated in the respective columns. The measuring principle, detectable gases and detector performance depend on the connected gas detectors.

Parameter	GMC 8032	GMC 8034
Electrical Data		
Rated supply voltage	24 V DC	24 V DC
Permissible supply voltage range	21.5 – 28.8 V DC	21.5–28.8 V DC
Low supply voltage fault threshold	< 21.5 V DC; FLT/GMC fault indication; event recorded in the event log	< 21.5 V DC; FLT/GMC fault indication; event recorded in the event log
Power supply requirements	SELV or PELV power supply overvoltage category II	SELV or PELV power supply overvoltage category II
Current consumption without detectors	Max. 200 mA	Max. 200 mA
Power consumption without detectors	Max. 4.8 W	Max. 4.8 W
Calculated current consumption at 24 V DC[1]	520 mA with two detectors	840 mA with four detectors
Calculated power consumption at 24 V DC[1]	12.48 W with two detectors	20.16 W with four detectors
Control unit fuse	1 × T 500 mA	1 × T 500 mA
Measuring Channels and Detector Connections		
Number of measuring channels	2	4
Detector signal input	Linear analogue 4–20 mA	Linear analogue 4–20 mA
Input shunt resistance	81 Ω to GND	81 Ω to GND
Detector supply voltage	Same voltage specification as the control unit supply	Same voltage specification as the control unit supply
Maximum detectors supply current[2]	160 mA per channel	160 mA per channel
Detector supply fuses	2 × T 160 mA	4 × T 160 mA
Signal input fuses	2 × T 50 mA	4 × T 50 mA
Maximum detector cable length	Up to 1000 m, depending on configuration, detector and cable cross-section; observe the detector data sheet	Up to 1000 m, depending on configuration, detector and cable cross-section; observe the detector data sheet
Alarm Functions and Outputs		
Alarm levels per channel	3: A1, A2 and A3	3: A1, A2 and A3
Programmable output relays	6 potential-free relay contacts: K1–K6	10 potential-free relay contacts: K1–K10
Dedicated service and fault outputs	1 service relay (SRV) and 1 fault relay (ST), with potential-free contacts	1 service relay (SRV) and 1 fault relay (ST), with potential-free contacts
Programmable relay operation	Configurable to open or close on alarm; individual or group alarms	Configurable to open or close on alarm; individual or group alarms
Alarm switching functions	Configurable latching, automatic reset, acknowledgement and delay functions, subject to application restrictions	Configurable latching, automatic reset, acknowledgement and delay functions, subject to application restrictions
Service and fault relay operation	Fail-safe: contacts open when de-energised	Fail-safe: contacts open when de-energised
Maximum AC switching load	230 V AC, 3 A, cos ϕ = 0.7	230 V AC, 3 A, cos ϕ = 0.7

Maximum DC switching load	30 V DC, 3 A	30 V DC, 3 A
Minimum switching load	5 V DC, 10 mA	5 V DC, 10 mA
Maximum switching frequency	100 switching operations per year per relay contact	100 switching operations per year per relay contact
Relay overvoltage category	III	III
External reset input	Normally open contact switching the internal 24 V DC control voltage; do not apply external voltage	Normally open contact switching the internal 24 V DC control voltage; do not apply external voltage
Display and Operation		
Display	Four-line LCD with four-colour backlight	Four-line LCD with four-colour backlight
Display units	ppb, ppm, % vol and % LEL	ppb, ppm, % vol and % LEL
Channel indicators	FLT and A1–A3 for each measuring channel	FLT and A1–A3 for each measuring channel
General status indicators	ON, FLT/GMC and SRV	ON, FLT/GMC and SRV
Relay status indicators	K1–K6	K1–K10
Operating element	Rotary encoder with push-button function	Rotary encoder with push-button function
Measured value display update interval	< 1.4 s	< 1.4 s
Safety-relevant output update interval (alarm, fault and service relays)	< 1.2 s	< 1.2 s
Input transmission error detection delay	< 3 s	< 3 s
Configurable Start-up time [1)]	0 – 900 sec.	0 – 900 sec.
Event memory capacity	500	500
Real-time clock backup battery	CR2032 coin cell	CR2032 coin cell
	Configuration parameters are retained in non-volatile memory independently of the supply voltage and internal battery. The internal battery backs up the real-time clock only.	
Mechanical Data and Installation		
Dimensions (W × H × D)	160 × 90 × 75 mm	160 × 90 × 75 mm
Weight	Approx. 350 g	Approx. 350 g
Enclosure material	Light grey polycarbonate (PC), UL 94 V-0	Light grey polycarbonate (PC), UL 94 V-0
Degree of protection	IP20	IP20
Mounting	TS35 DIN rail according to EN 60715, inside a control cabinet or suitable enclosure	TS35 DIN rail according to EN 60715, inside a control cabinet or suitable enclosure
Mounting orientation	Horizontal	Horizontal
Terminal conductor cross-section: solid or stranded	0.25–2.5 mm^2	0.25–2.5 mm^2
Terminal conductor cross-section: stranded with ferrule	0.25–1.5 mm^2	0.25–1.5 mm^2
Wire stripping length	6–7 mm	6–7 mm
Cooling	Natural convection; ventilation slots must remain unobstructed	Natural convection; ventilation slots must remain unobstructed
Surrounding plastic enclosure	Minimum flammability classification UL 94 V-1	Minimum flammability classification UL 94 V-1
Recommended service life	20 years	20 years
Environmental Conditions		
Operating ambient temperature	−20 to +55 °C	−20 to +55 °C
Storage temperature	−25 to +60 °C	−25 to +60 °C

Recommended storage temperature	0 to +30 °C	0 to +30 °C
Operating relative humidity	0–99 % RH, non-condensing	0–99 % RH, non-condensing
Storage relative humidity	0–99 % RH, non-condensing	0–99 % RH, non-condensing
Recommended storage relative humidity	40–60 % RH	40–60 % RH
Maximum installation altitude	2000 m above sea level	2000 m above sea level
Installation environment	Indoors, outside hazardous areas; protected against direct sunlight, water splashes, oil, dust and mechanical damage	Indoors, outside hazardous areas; protected against direct sunlight, water splashes, oil, dust and mechanical damage
Pollution degree	2	2
Approvals and Standards		
ATEX marking	II (2) G	II (2) G
ATEX certificate reference	FTZU 25 ATEX 0100	FTZU 25 ATEX 0100
CE marking / notified body number	CE 0044	CE 0044
Gas detection performance — IEC	IEC 60079-29-1:2016 + AMD1:2020	IEC 60079-29-1:2016 + AMD1:2020
Gas detection performance — EN	EN 60079-29-1:2016 + A1:2022 + A11:2022	EN 60079-29-1:2016 + A1:2022 + A11:2022
Gas detection equipment — general requirements	IEC 60079-29-0:2025	IEC 60079-29-0:2025
Software and digital techniques	EN 50271:2018	EN 50271:2018
Electromagnetic compatibility	EN 50270:2015; emission type class I, immunity type class II	EN 50270:2015; emission type class I, immunity type class II
Electrical safety — IEC	IEC 61010-1:2010 + AMD1:2016	IEC 61010-1:2010 + AMD1:2016
Electrical safety — EN	EN 61010-1:2010 + A1:2019	EN 61010-1:2010 + A1:2019

[1)] The configurable start-up time allows connected gas detectors to warm up and stabilise. Set this time according to the requirements of the connected detectors. This may be necessary, for example, for oxygen detectors using solid-state electrolyte sensors.

4.4. Functional safety data

The following data apply to the control unit and the assessed safety function of opening a relay contact in response to a valid gas alarm condition.

Parameter	Value
Probability of failure on demand, PFD	3.85×10^{-4}
Dangerous undetected failure rate, λDU	$8.414 \times 10^{-8}\ h^{-1}$
Dangerous detected failure rate, λDD	$6.8694 \times 10^{-7}\ h^{-1}$
Proof-test interval, T1	1 year (8,760 h)
Assumed mean time to restoration, MTTR	24 h

Source: Technis Report T1155, Issue 1.0, dated 24 September 2025, Section 1.2.4 and Appendix 1. Applicability to both control-unit variants is confirmed by the manufacturer. These values concern the control unit; connected detectors and other system components must be considered separately

Conditions underlying the functional safety data

The stated figures are based on the following conditions:

- Low-demand operation with a single, non-redundant control unit.
- The assessed safety function is opening a relay contact in response to a valid gas alarm condition. Configure and wire the relevant output for fail-safe operation.
- A proof-test interval of one year (8,760 h) and an assumed mean time to restoration of 24 h.
- Diagnosed faults are recognised through the fault-relay output and acted upon.
- Constant random hardware failure rates are assumed. Early-life failures are assumed to be addressed by burn-in and wear-out failures by preventive replacement.
- The equipment configuration and operating conditions remain consistent with the assessment. Modifications or functions outside the assessed scope are not covered by these figures.
- The stated control-unit figures exclude the contributions of connected detectors and other system components.

Proof test

Perform the proof test at intervals not exceeding one year, following the functional test procedure in Section 7.4 and the system-check requirements in Section 9.1.

Include:

- Each configured measuring channel and its safety-relevant alarm thresholds.
- The actual switching of each safety-relevant relay contact and the response of connected warning and protective equipment.
- Fault and service signalling, including the corresponding relay outputs.
- Configured latching, alarm clearing and reset functions, including the external reset input where fitted.

Relay status LEDs alone do not verify contact operation. Signal simulation alone does not verify the response of connected detectors to gas.

Record the configuration tested, test methods, results and corrective actions. After testing, remove all temporary inhibitions and bypasses, restore the required channels and verify normal monitoring before release for operation.

4.5. Scope of Delivery

The scope of delivery comprises:

- One GMC 8032 or GMC 8034 control unit, according to the order.
- One printed Operating and Installation Manual.
- One EU Declaration of Conformity.
- One EU-Type Examination Certificate.

On receipt, check that the delivery is complete and corresponds to the order. Inspect the control unit for visible transport damage. If any items are missing or damaged, contact the supplier before installation.

5. Transport, Storage and Handling

5.1. Packaging and Protective Measures

The control unit is supplied in protective packaging. Keep the original packaging for subsequent transport or storage.

If the original packaging is no longer available, use equivalent packaging that:

- Prevents the control unit from moving inside the package.
- Provides cushioning against shocks and vibration.
- Protects the control unit against moisture and contamination.
- Prevents pressure on the display, rotary encoder and connection terminals.

NOTICE Damage due to inadequate packaging or transport protection.

Shocks, moisture or mechanical pressure may damage the control unit and impair its function.

- Use the original packaging or equivalent protective packaging.
- Keep the package dry.
- Do not place heavy objects on the package.

5.2. Transport Instructions

Transport the control unit in its original packaging or equivalent protective packaging as described in Section 5.1.

- Protect the package against impacts, excessive vibration and crushing.
- Keep the package dry and protect it against rain and other liquids.
- Secure the package against movement and falling during transport.
- Observe any handling instructions marked on the packaging.

After transport, inspect the packaging and the control unit for visible damage. Do not install or operate a damaged control unit. Report any transport damage to the supplier.

5.3. Storage Conditions

Store the control unit in its original packaging or equivalent protective packaging in a clean, dry location. Protect it against direct sunlight, contamination and mechanical damage.

Parameter	Permissible range	Recommended range
Storage temperature	–25 to +60 °C	0 to +30 °C
Relative humidity	0–99 % RH, non-condensing	40–60 % RH

NOTICE Damage due to condensation or unsuitable storage conditions.

Condensation and storage outside the specified limits may damage electronic components and impair the function of the control unit.

- Observe the specified storage temperature and humidity limits.
- After transfer from a cold to a warm environment, allow the control unit to reach ambient temperature.
- Do not connect the power supply while condensation is present.

Storage pressure and duration

- Store the control unit under normal atmospheric conditions. Do not expose it to vacuum or pressurised storage conditions.
- No fixed maximum storage period is specified, provided the stated storage conditions are maintained.
- Before commissioning, have the internal battery replaced by a specialist authorised by Bieler + Lang if five years or more have elapsed since its installation, or if its age is unknown.
- After storage, inspect the control unit and carry out the commissioning checks described in Chapter 7 before release for operation.
- Observe the storage conditions and shelf-life limits specified by the manufacturers of replacement parts and accessories.

Before installation, inspect the control unit for visible damage.

5.4. Handling

Handle the control unit carefully during unpacking, inspection and installation.

- - Hold the control unit by its housing.
- - Do not lift or carry it by the rotary encoder or connection terminals.
- - Avoid pressure on the display and mechanical strain on the rotary encoder and terminals.
- - Place the control unit on a clean, dry and stable surface.
- - Keep the housing closed.
- - Before installation, inspect the housing, display, rotary encoder and connection terminals for visible damage. Do not install a damaged control unit.

6. Installation

6.1. Preparations Before Installation

Installation shall only be carried out by qualified personnel. Before starting work, read the installation instructions and observe the safety requirements in Chapter 3.

Check the following:

- The control unit corresponds to the ordered version and has no visible damage.
- The installation location is indoors and outside hazardous areas.
- The ambient conditions comply with the technical data in Section 4.3.
- A suitable control cabinet or enclosure with a TS35 DIN rail is available.
- Sufficient space is provided for ventilation, wiring, operation and maintenance.
- The connected gas detectors are compatible with the control unit.
- The power supply is suitable for the control unit and the total load of the connected detectors.
- Wiring diagrams, detector instructions and the required system configuration are available.
- Suitable cables, tools and any required personal protective equipment are available.

If installation work affects an existing gas detection system, arrange suitable alternative protective measures before interrupting gas monitoring.

⚠ WARNING **Electric shock from live connection terminals.**

Contact with live parts may result in death or serious injury. Relay terminals may carry externally supplied hazardous voltages even when the control unit's 24 V DC supply is switched off.

- Disconnect the control unit and all relevant external circuits from their power sources.
- Secure the power sources against reconnection.
- Verify that the circuits are de-energised before starting work.

6.2. Mechanical Installation

Install the control unit on a TS35 DIN rail according to EN 60715 inside a control cabinet or suitable enclosure. The installation location must be indoors and outside hazardous areas.

Observe the following requirements:

- Mount the control unit in a horizontal orientation.
- Protect it against water splashes, oil, dust and mechanical damage.
- If a surrounding plastic enclosure is used, its flammability classification must be UL 94 V-1 or better.
- Select a location with low vibration and stable temperatures.
- Protect the control unit against direct sunlight and maintain sufficient clearance from external heat sources.
- Provide sufficient space for wiring and access to the connection terminals.
- Ensure that the display and rotary encoder remain accessible for operation.
- Provide access for inspection and maintenance.

The control unit is cooled by natural convection. Keep the ventilation slots unobstructed and ensure that the temperature inside the surrounding enclosure remains within the specified operating limits.

Mounting procedure

1. Check that the DIN rail is securely installed and that sufficient mounting space is available.
2. Position the control unit on the DIN rail in the specified orientation.
3. Engage the DIN rail mounting mechanism and check that the control unit is securely attached.
4. Check that the ventilation slots are unobstructed and that the terminals and operating elements remain accessible.

Do not apply mounting force to the display, rotary encoder or connection terminals.

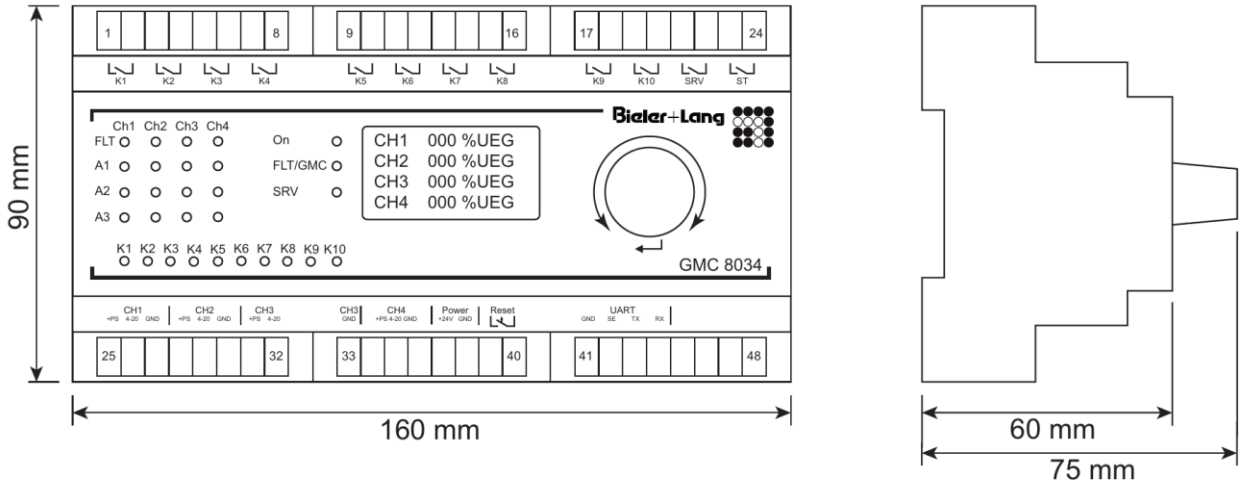


Figure 4: Dimensions of the control unit (GMC 8034 shown). All dimensions are in millimetres.

6.3. Electrical Installation

6.3.1. General Requirements

Electrical installation shall only be carried out by qualified personnel. Observe the applicable national electrical installation regulations and the technical data in Section 4.3.

WARNING **Electric shock from live terminals or externally supplied circuits.**

Contact with live parts may result in death or serious injury. Relay terminals may carry hazardous voltages even when the control unit's 24 V DC supply is switched off.

- Disconnect the control unit and all relevant external circuits from their power sources.
- Secure the power sources against reconnection.
- Verify that the circuits are de-energised before starting work.

Observe the following requirements:

- Supply the control unit from a suitable SELV or PELV power supply.
- Provide an easily accessible disconnecting device for the gas detection system. Ensure that externally supplied circuits can also be safely isolated.
- Size the power supply for the control unit and the total load of the connected gas detectors.
- Route cables carrying hazardous voltages separately from detector, supply and reset cables carrying protective extra-low voltage.
- Do not mix mains voltage and protective extra-low voltage across the relay contacts of the control unit.
- Observe the specified relay contact ratings and provide suitable protection for the connected circuits.
- Follow the installation instructions for the connected gas detectors, warning devices and other system components.
- Use the terminal assignments and wiring diagrams in Section 6.4.
- Leave unused terminals unconnected. Do not use the UART terminals unless an approved interface module and its installation instructions are available.

Do not connect the power supply until installation has been completed and checked as described in Section 6.5.

6.3.2. Cables, Cable Routing and Shielding

Select cables suitable for the installation environment, the connected equipment and the applicable electrical requirements.

The following cable types and conductor cross-sections are recommended:

Connection	Recommended cable type	Conductor cross-section
24 V DC power supply	LIYY or equivalent	0.5–1.5 mm^2
Gas detectors	LIYCY or equivalent, with braided shield	0.5–1.5 mm^2
External reset push-button	LIYCY or equivalent, with braided shield	0.5–1.5 mm^2
Relay outputs	NYM or equivalent cable suitable for the switched voltage and load	0.5–1.5 mm^2

Select the detector cable cross-section according to the cable length and detector current consumption. Ensure that the voltage at each detector remains within its specified supply limits under load.

Detector cable lengths of up to 1000 m may be possible, depending on the connected detector, cable cross-section and system configuration. Observe the requirements in the detector data sheet.

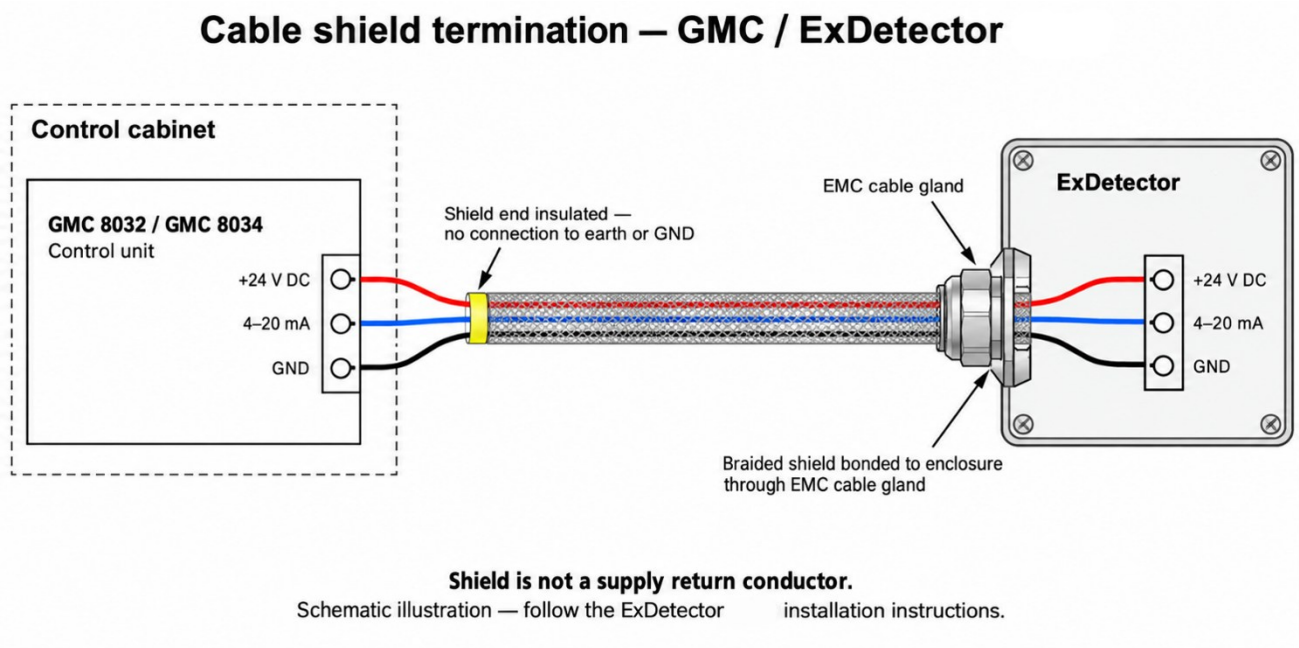
Cable routing

- Route cables carrying hazardous voltages separately from cables carrying protective extra-low voltage.
- Keep detector signal cables away from sources of electromagnetic interference, such as motor cables and frequency converters.
- Support and secure the cables so that no mechanical strain is applied to the connection terminals.
- Protect cables against abrasion, sharp edges and other mechanical damage.
- Provide sufficient access to the terminals for inspection and maintenance.

Shielding

Connect the detector cable shield according to the installation instructions for the connected detector.

- **ExDetector 1000:** Connect the braided cable shield to the transmitter enclosure through the designated EMC cable gland. Leave the shield unconnected at the control cabinet end and insulate it to prevent unintended contact with earth, GND or adjacent terminals.
- **Other detectors in non-ATEX applications:** Where specified by the detector manufacturer, terminate the braided cable shield at a suitable earthed shield clamp in the control cabinet.
- Do not use the cable shield as a supply return conductor or protective conductor.



6.3.3. Connection the Terminals

The control unit has integral spring-clamp terminals. Select the appropriate terminals using the terminal assignment in Section 6.4.

Conductor type	Permissible cross-section
Solid or stranded conductor	0.25–2.5 mm^2
Stranded conductor with ferrule	0.25–1.5 mm^2

Connect the conductors only when the control unit and all relevant external circuits are de-energised.

1. Strip the conductor insulation to a length of 6–7 mm.
2. Insert a small flat-blade screwdriver into the rectangular terminal actuation opening.
3. Apply gentle downward pressure to open the clamp.
4. Insert the stripped conductor fully into the round conductor entry opening.
5. Release the pressure and remove the screwdriver to close the clamp.
6. Gently pull the conductor to check that it is securely retained.
7. Check that no bare conductor protrudes from the terminal and that no loose strands can contact adjacent terminals.

Support and secure the cables so that no tensile or bending forces act on the terminals.

NOTICE **Damage to the connection terminals due to excessive force.**

An unsuitable tool or excessive force may damage the terminal mechanism.

- Use a flat-blade screwdriver suitable for the actuation opening.
- Operate the clamp gently.
- Do not force the conductor into a closed clamp.

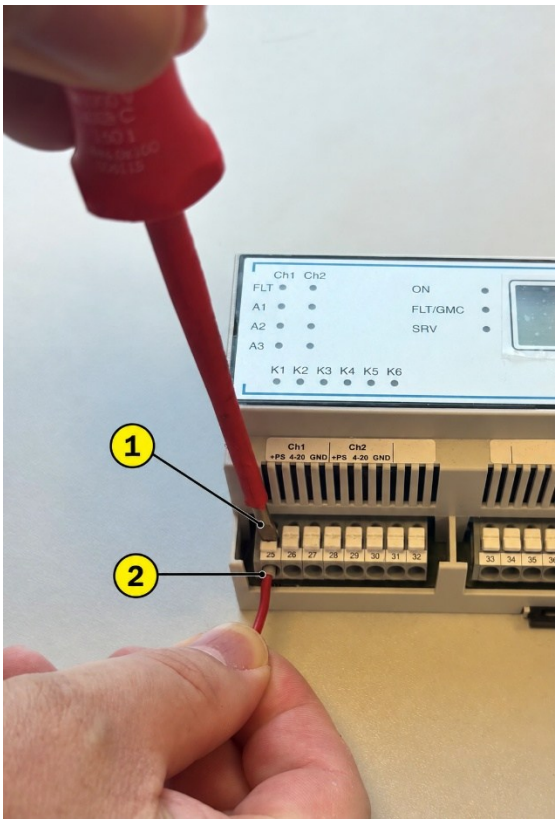


Figure 5: Connecting a conductor to the spring-clamp terminal.

1 **Terminal actuation opening:**
Insert the screwdriver here to open the clamp.

2 **Conductor entry opening:**
Insert the stripped conductor here while holding the clamp open.

6.3.4. Power Supply Connection

Supply the control unit from an external 24 V DC SELV or PELV power supply. The permissible supply voltage range at the control unit terminals is 21.5–28.8 V DC.

Select the power supply according to the current consumption of the control unit and all connected gas detectors. Allow for detector start-up currents and voltage drops in the supply cables.

Terminal	Designation	Connection
37	Power +24 V DC	Positive supply conductor

38	Power GND	Supply return conductor (0 V)

Refer to the connection overview in Section 6.4.1 and the terminal assignment in Section 6.4.2.

Connect the power supply only when the circuit is de-energised.

1. Check that the power supply meets the specified voltage and load requirements.
2. Connect the positive supply conductor to terminal 37.
3. Connect the supply return conductor to terminal 38.
4. Check the polarity and ensure that both conductors are securely retained.
5. Keep the power supply switched off until installation has been completed and checked as described in Section 6.5.

The connected gas detectors are supplied through the control unit. Include their total current consumption when sizing the power supply and its supply cables. Observe the detector supply limits in Section 4.3.

Provide an easily accessible disconnecting device for the gas detection system.

NOTICE **Damage due to incorrect supply voltage orpolarity.**

An unsuitable supply or incorrect wiring may damage the control unit and connected detectors.

- Observe the permissible supply voltage range.
- Check the polarity before switching on.
- Do not connect mains voltage to terminals 37 or 38.

6.3.5. Gas Detector Connections

Connect only gas detectors with a compatible linear analogue 4–20 mA output and suitable supply requirements. Follow the installation instructions for each connected detector.

Each measuring channel provides a detector supply connection, a signal input and a supply return connection.

Channel	Detector supply (+PS)	Signal input (4–20 mA)	Supply return (GND)	Availability
Ch1	25	26	27	GMC 8032 and GMC 8034
Ch2	28	29	30	GMC 8032 and GMC 8034
Ch3	31	32	33	GMC 8034 only
Ch4	34	35	36	GMC 8034 only

Refer to the connection overview in Section 6.4.1 and the terminal assignment in Section 6.4.2.

Channel protection

Each detector supply connection is individually protected by a **160 mA time-delay fuse (T 160 mA)**. Each 4–20 mA signal input is individually protected by a **50 mA time-delay fuse (T 50 mA)**.

Observe the detector supply limits and total permissible load specified in Section 4.3. Fuse ratings do not independently define the permissible continuous load.

Connection procedure

Connect the detectors only when the control unit and all relevant circuits are de-energised.

1. Identify the measuring channel assigned to each detector.
2. Connect the detector's positive supply conductor to the corresponding +PS terminal.
3. Connect the detector's 4–20 mA signal conductor to the corresponding signal input terminal.
4. Connect the detector's supply return conductor to the corresponding GND terminal.
5. Terminate the cable shield as described in Section 6.3.2 and in the detector's installation instructions.
6. Check the terminal assignment, polarity and secure retention of all conductors.

Before commissioning, ensure that each measuring channel is configured to match its connected detector, including the gas designation, measuring range, signal characteristics and alarm thresholds.

NOTICE **Damage or malfunction due to incorrect detector wiring.**

Incorrect wiring may damage the control unit or detector and prevent correct signal evaluation.

- Check the detector terminal assignment before connection.
- Do not connect the detector supply to the 4–20 mA signal input.
- Observe the detector's supply voltage and current requirements.

6.3.6. Relay Output Connections

The control unit provides potential-free relay contacts for connection to external warning devices and control systems.

Relay outputs	GMC 8032	GMC 8034
Programmable output relays	K1–K6	K1–K10
Service relay	SRV	SRV
Device / detector fault relay	ST	ST

Refer to the connection overview in Section 6.4.1 and the terminal assignment in Section 6.4.2.

Programmable relay outputs

The programmable relays can be assigned to individual or group alarms. Their switching behaviour depends on the configuration of the control unit.

Check the relay assignment and switching function against the required system response before connecting external equipment. A relay status indicator shows whether the relay is energised; it does not confirm that the connected equipment has operated.

Service and fault relay outputs

The service relay (SRV) and fault relay (ST) operate on the fail-safe principle. Their contacts open when the corresponding relay is de-energised, including when the control unit loses its power supply.

Connect these outputs so that service and fault conditions can be recognised by the connected system.

Contact ratings

Parameter	Rating
Maximum AC switching load	230 V AC, 3 A, cos ϕ = 0.7
Maximum DC switching load	30 V DC, 3 A
Minimum switching load	5 V DC, 10 mA
Maximum switching frequency	100 switching operations per year per relay contact

Observe the starting current and switching characteristics of the connected load. Use a suitable interface relay or contactor where the load exceeds the output contact ratings. Provide circuit protection and, where required, suitable suppression for inductive loads.

WARNING **Electric shock from externally supplied relay circuits.**

Relay terminals may carry hazardous voltages even when the control unit's 24 V DC supply is switched off. Contact with live parts may result in death or serious injury.

- Isolate all relevant external circuits before working on the relay connections.
- Secure them against reconnection and verify that they are de-energised.
- Do not mix mains voltage and protective extra-low voltage across the relay contacts of the control unit.

Connection procedure

1. Identify the relay assigned to each warning device or control function.
2. Connect the external circuit to the corresponding relay terminals.
3. Check that the wiring matches the configured switching function.
4. Check that all conductors are securely retained and that voltage separation is maintained.
5. Keep the external circuits de-energised until installation is complete.

During commissioning, test the complete signal chain from the alarm or fault condition to the response of the connected equipment.

6.3.7. External Reset Connection

The external reset input allows a remotely installed push-button to initiate the permitted reset functions, such as acknowledging resettable alarms or silencing an acoustic warning. The available functions depend on the configuration of the control unit.

Connect a potential-free, normally open momentary push-button between terminals 39 and 40.

Terminal	Designation	Connection
39	Reset	External push-button contact
40	Reset	External push-button contact

The push-button switches the control unit's internal 24 V DC control voltage. **Do not apply an external voltage to this input.**

Refer to the connection overview in Section 6.4.1 and the terminal assignment in Section 6.4.2.

Connection procedure

Connect the push-button only when the control unit is de-energised.

1. Connect the two push-button conductors to terminals 39 and 40.
2. Check that the contact is open when the push-button is released and closes only while it is pressed.
3. Check that both conductors are securely retained.
4. Verify the configured reset functions during commissioning.

If the external reset function is not used, leave terminals 39 and 40 unconnected.

NOTICE **Damage due to external voltage at the reset input.**

Applying an external voltage may damage the control unit.

- Connect only a potential-free, normally open push-button contact.
- Do not connect an external power supply to terminals 39 or 40.

Resetting an alarm does not eliminate the cause of the alarm. Follow the applicable response procedures before acknowledging or resetting alarm indications.

6.4. Wiring Diagrams and Terminal Assignment

6.4.1. Connection Overview

The following diagrams show the connection arrangement of the control unit. The terminal numbering applies to both versions; variant-specific connections are identified below.

Connection group	Terminals	GMC 8032	GMC 8034
Programmable relay outputs K1–K6	1–12	Available	Available
Programmable relay outputs K7–K10	13–20	Not available	Available
Service relay SRV	21–22	Available	Available
Device / detector fault relay ST	23–24	Available	Available
Detector channels Ch1–Ch2	25–30	Available	Available
Detector channels Ch3–Ch4	31–36	Not available	Available
Power supply	37–38	Available	Available
External reset	39–40	Available	Available
UART interface	41–44	Not available for use	Not available for use
Unassigned terminals	45–48	Not used	Not used

Leave unavailable and unassigned terminals unconnected.

The diagrams show the electrical connections schematically. Follow the connection instructions in Section 6.3 and the detailed terminal assignment in Section 6.4.2. For detector cable shielding, observe Section 6.3.2 and the installation instructions for the connected detector.

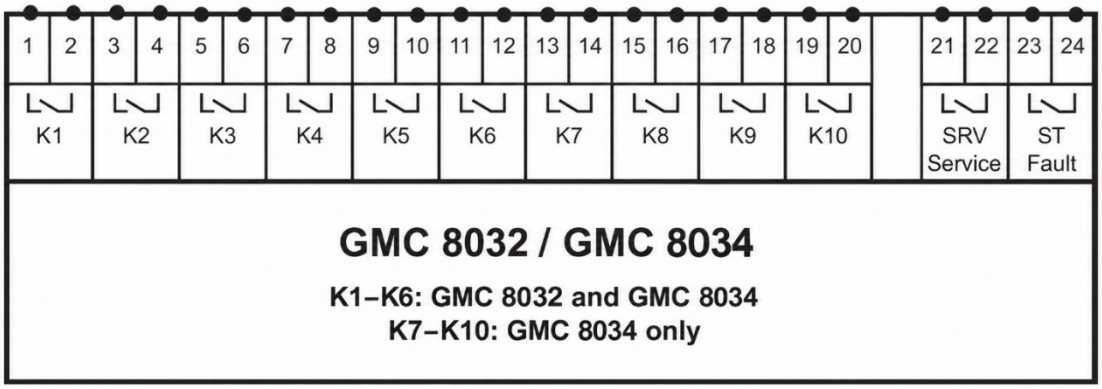


Figure 6: Connection overview — programmable relay outputs, service relay and fault relay

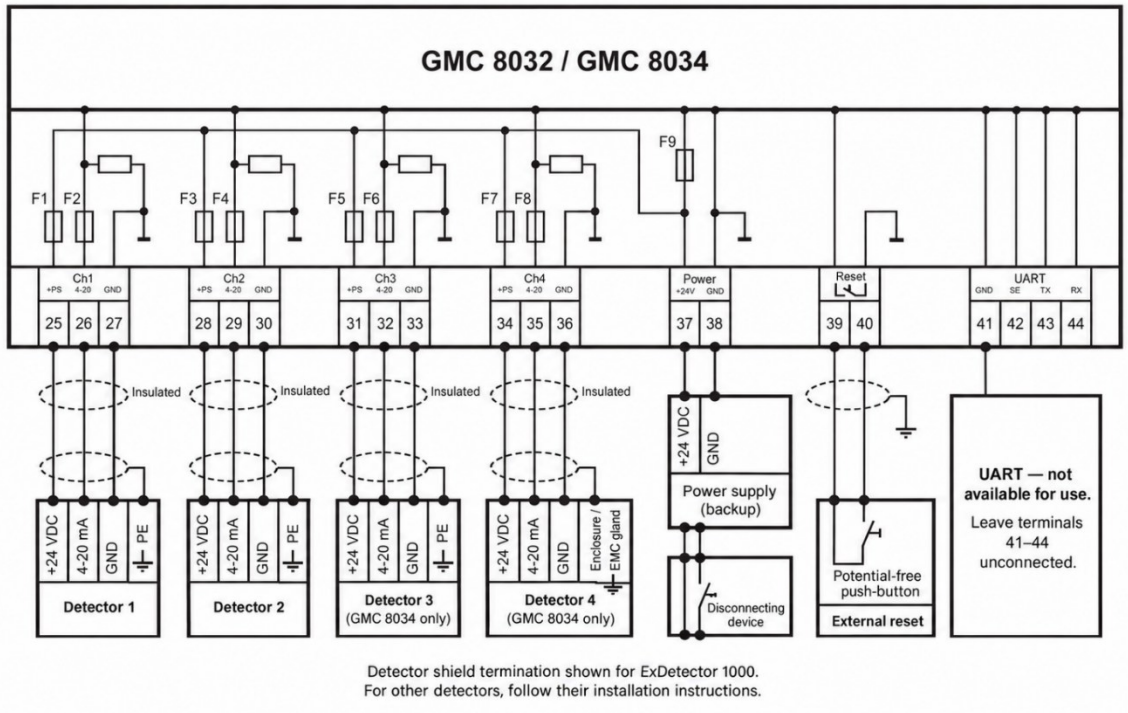


Figure 7: Connection overview — gas detector inputs, power supply and external reset

6.4.2. Terminal Assignment and Wiring Diagrams

The following tables identify the connection terminals of the control unit. Use them together with the wiring diagrams in Section 6.4.1 and the connection instructions in Section 6.3.

Terminal numbering is identical for both versions. Relay outputs K7–K10 and detector channels Ch3–Ch4 are available on the GMC 8034 only.

Relay Output Terminals

Terminals	Designation	Function	Availability
1–2	K1	Programmable relay output 1	Both versions
3–4	K2	Programmable relay output 2	Both versions
5–6	K3	Programmable relay output 3	Both versions
7–8	K4	Programmable relay output 4	Both versions
9–10	K5	Programmable relay output 5	Both versions
11–12	K6	Programmable relay output 6	Both versions
13–14	K7	Programmable relay output 7	GMC 8034 only
15–16	K8	Programmable relay output 8	GMC 8034 only
17–18	K9	Programmable relay output 9	GMC 8034 only
19–20	K10	Programmable relay output 10	GMC 8034 only
21–22	SRV	Service relay output	Both versions
23–24	ST	Device / detector fault relay output	Both versions

All relay outputs provide potential-free contacts. The functions of K1–K10 depend on the configuration. The SRV and ST contacts open when the corresponding relay is de-energised. Observe the contact ratings and voltage separation requirements in Section 6.3.6.

Detector Connection Terminals

Terminal	Designation	Function	Availability
25	Ch1 +PS	Detector supply, positive	Both versions
26	Ch1 4–20	4–20 mA signal input	Both versions
27	Ch1 GND	Detector supply return	Both versions
28	Ch2 +PS	Detector supply, positive	Both versions
29	Ch2 4–20	4–20 mA signal input	Both versions
30	Ch2 GND	Detector supply return	Both versions
31	Ch3 +PS	Detector supply, positive	GMC 8034 only
32	Ch3 4–20	4–20 mA signal input	GMC 8034 only
33	Ch3 GND	Detector supply return	GMC 8034 only
34	Ch4 +PS	Detector supply, positive	GMC 8034 only
35	Ch4 4–20	4–20 mA signal input	GMC 8034 only
36	Ch4 GND	Detector supply return	GMC 8034 only

Each detector supply is protected by a T 160 mA fuse. Each signal input is protected by a T 50 mA fuse. Follow Section 6.3.5 for detector connections and Section 6.3.2 for cable shielding.

Power Supply, Reset and Interface Terminals

Terminal	Designation	Function / instruction
37	Power +24 V DC	Positive supply input; permissible voltage 21.5–28.8 V DC
38	Power GND	Supply return input (0 V)
39	Reset	External normally open push-button contact
40	Reset	External normally open push-button contact
41	UART GND	Interface terminal; not available for use
42	UART SE	Interface terminal; not available for use
43	UART TX	Interface terminal; not available for use
44	UART RX	Interface terminal; not available for use
45–48	—	Unassigned; leave unconnected

Connect the external reset push-button between terminals 39 and 40. Do not apply external voltage to these terminals.

Leave terminals 41–48 unconnected. On the GMC 8032, also leave terminals 13–20 and 31–36 unconnected.

Check all connections against the terminal assignment before applying power. The cable shield is not a GND conductor; terminate it according to Section 6.3.2.

6.5. Completion of Installation

Before applying power, check that the mechanical and electrical installation is complete and complies with this manual.

Mechanical checks

- The control unit is securely attached to the DIN rail in the specified orientation.
- The surrounding enclosure provides the required protection.
- Ventilation slots are unobstructed.
- The display, rotary encoder and connection terminals remain accessible.
- The control unit and connected cables have no visible damage.

Electrical checks

- All conductors are connected according to Sections 6.4.1 and 6.4.2.
- The power supply meets the specified voltage and load requirements.
- Supply polarity is correct.
- Detector connections and channel assignments are correct.
- Cable shields are terminated according to Section 6.3.2 and the detector instructions.
- Relay wiring corresponds to the intended alarm, service and fault functions.
- Relay contact ratings and the separation of hazardous voltages from protective extra-low voltage are observed.
- If fitted, the external reset push-button is connected between terminals 39 and 40 without an external voltage source.
- Unavailable and unassigned terminals are unconnected.
- All conductors are securely retained, with no exposed strands or unintended connections.
- Cables are supported so that no mechanical strain acts on the terminals.
- The required disconnecting devices are accessible.

Remove tools, loose wire ends and other installation debris. Secure covers and protective barriers required for safe operation.

Record the results of the installation checks and correct any defects before applying power.

WARNING **Loss of gas monitoring due to incomplete or incorrect commissioning.**

Completion of installation does not confirm that the gas detection system is ready for operation. Incorrect configuration or untested warning and protective functions may allow hazardous gas conditions to remain undetected or without the required response.

- Carry out commissioning as described in Chapter 7.
- Test the complete system, including the connected detectors, warning devices and protective functions.
- Maintain alternative protective measures until correct operation has been verified.

Release the gas detection system for operation only after commissioning has been successfully completed

7. Commissioning

7.1. Checks Before Commissioning

Commissioning must be carried out by qualified personnel familiar with the control unit, the connected gas detectors and the required alarm and protective functions.

⚠ WARNING **Loss of gas monitoring during commissioning.**

During commissioning, gas monitoring and the connected warning and protective functions may be unavailable or not yet correctly configured. Hazardous gas conditions may remain undetected or without the required response.

- Maintain alternative protective measures until the complete gas detection system has been tested and released for operation.
- Inform affected personnel before starting commissioning.
- Prevent unintended activation of connected equipment during testing.

Before applying power, complete the following checks.

Installation

- The installation checks in Section 6.5 have been completed, and any defects have been corrected.
- The control unit is installed outside hazardous areas.
- The installation and environmental conditions comply with the specified requirements.

Connected detectors

- Each detector is suitable for the intended gas and measuring range.
- The detectors are installed and connected according to their respective instructions.
- The detector assignment to each measuring channel is documented.
- Any detector-specific preparations required before applying power have been completed.

Configuration and system functions

- The required settings are available for each measuring channel, including gas designation, measuring range, unit and alarm thresholds.
- The required alarm behaviour, relay assignments and reset functions are defined.
- The connected warning devices and protective functions are identified, and their intended response is documented.

Test preparation

- The instructions for the connected detectors and other system components are available.
- Suitable test equipment and any test gases required by the detector instructions are available.
- The functional test can be carried out safely, including activation of the connected warning devices and protective functions.

Do not proceed with initial power-up until these checks have been completed and any defects have been corrected.

7.2. Initial Power-Up

Apply power only after completing the checks in Section 7.1. Maintain the alternative protective measures throughout commissioning.

1. Switch on the external power supply.
2. Observe the power-on self-tests described below.
3. Wait until the start-up phase is complete.
4. Check the displayed measuring channels and their status.

Power-on self-tests

The power-on self-test is performed automatically at every power-up or restart and cannot be skipped.

During this sequence, the display cycles through different background colours and activates all pixels for a visual check. The watchdog function is also tested, and the firmware version is displayed.

Observe the display sequence and check for missing pixels or irregularities in the background illumination.



Figure 8: Watchdog test during the power-on sequence.

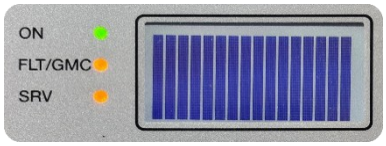


Figure 9: Display pixel test and LED test.



Figure 10: Device information and firmware version displayed during the LED test.

After the power-on sequence, the control unit enters the start-up phase described below.

Start-up phase

During start-up, the display background is green. The display shows “warm-up / please wait!” and the remaining start-up time in seconds. The FLT/GMC indicator is illuminated to indicate a special condition. Gas monitoring is not available during this phase.



Figure 11: Start-up countdown with illuminated FLT/GMC indicator (11 seconds remaining).

The configured start-up time delays the start of measuring operation to suppress false alarms while the connected detectors start up. It can be set from 0 to 900 seconds in increments of 10 seconds.

The start-up time must suit the connected detectors. Observe their specified warm-up times and commissioning instructions. Completion of the control unit’s start-up phase does not confirm that all connected detectors are ready for operation.

Checks after Start-up

After the start-up phase, the display shows the measured values of the configured measuring channels. The ON indicator is illuminated. An asterisk moves between the channel lines as a visible activity indicator (heartbeat).

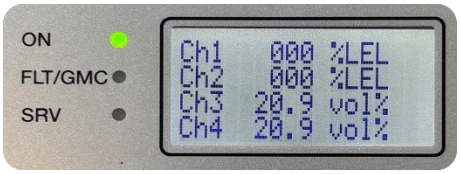


Figure 12: Measuring display with two connected detectors. The moving asterisk indicates activity.

- Check that the intended measuring channels are displayed.
- Check the displayed values and status indications for each connected detector.
- Investigate any unexpected alarm, fault or service indication before proceeding.
- Confirm that the connected detectors have completed their required warm-up periods.

If the display does not activate, the start-up phase does not complete or an unexpected condition persists, identify and correct the cause before continuing.

Proceed with configuration and parameterisation as described in Section 7.3. Do not release the gas detection system for operation until commissioning has been completed successfully.

7.3. Configuration / Parameterisation

Configure the control unit to match the connected detectors and the required alarm and protective functions. Check all settings before carrying out the functional test.

⚠ WARNING **Loss of gas monitoring during configuration.**

The control unit does not monitor gas concentrations while the configuration menus in Menu 2 or Menu 3 are active. Incorrect settings may also prevent alarms or protective functions from operating as required.

- Configuration must only be carried out by qualified personnel.
- Maintain alternative protective measures throughout configuration.
- Check all safety-relevant settings before leaving the configuration menus.
- Verify the configured functions during the functional test in Section 7.4.

Basic settings

Check and configure:

- The number of measuring channels used.
- The number of programmable output relays used.
- The number of channel types required.
- The start-up time, taking account of the connected detectors.

Measuring channel settings

For each measuring channel, check and configure:

- The assigned channel type and channel name.
- The application category, measuring range and unit.
- The alarm thresholds, hysteresis and alarm delays.
- The zero-point suppression and signal levels for fault detection.

Relay settings

Check and configure:

- The assignment of alarm conditions to the output relays.
- Energised or de-energised operation.
- Latching or non-latching alarm behaviour.
- Whether an alarm can be reset while the alarm condition persists.
- Automatic silencing, where required for audible warning devices.

Record the final settings for each measuring channel and relay. Exit the configuration menus and check that the control unit returns to measuring operation.

Verify the complete gas detection system as described in Section 7.4.

7.4. Functional Test

After completing configuration, test the complete gas detection system. Verify the response of the control unit, connected detectors, warning devices and protective functions.

⚠ WARNING **Hazard due to activation of connected equipment during testing.**

Functional testing may activate audible and visual warnings or initiate automatic protective actions. Connected equipment may start, stop or change operating state.

- Inform affected personnel before testing.
- Coordinate the test with the persons responsible for connected equipment.
- Ensure that each switching action can be performed safely.
- Maintain alternative protective measures while any safety function is temporarily inhibited.
- Restore all inhibited functions before release for operation.

Test preparation

- Confirm that the control unit and connected detectors have completed their start-up and warm-up periods.
- Check that the final configuration corresponds to the intended application.
- Prepare suitable test equipment and test gases according to the detector instructions.
- Define the expected indications and switching actions for each test.

Measuring channels and alarm functions

Test each configured measuring channel separately.

1. Apply suitable test gas to the connected detector according to its instructions.
2. Check that the measured value appears on the correct channel and agrees with the expected response.
3. Verify each configured alarm level using suitable test gas or an appropriate test method.
4. Check the corresponding display indications, alarm LEDs and assigned relay outputs.
5. Verify that the connected warning devices and protective functions respond as intended.
6. Remove the test gas and allow the detector to return to its normal condition.
7. Check alarm clearing and reset behaviour against the configured settings.

Verify alarm delays and hysteresis where configured. Test the external reset push-button, if fitted.

Signal simulation may be used to check individual control unit functions. It does not replace testing the response of the connected detectors to gas.

Fault and service functions

- Simulate detector fault signals using a suitable method permitted by the detector instructions.
- Verify the corresponding channel fault indication and the response of the FLT/GMC indicator and fault relay.
- Verify the service indication and service relay response when entering and leaving a configuration or service condition.
- Check the response of connected equipment to fault and service conditions against the intended system design.
- Where loss of the control unit power supply forms part of the protective function, verify the resulting relay states and the response of connected equipment.

Do not create test faults by short-circuiting terminals or applying signals outside the specified electrical limits.

Completion of testing

- Remove all test equipment and restore any connections changed for testing.
- Restore all temporarily inhibited warning devices and protective functions.
- Confirm that the control unit has returned to measuring operation.
- Check that no unexplained alarm, fault or service condition remains.
- Record the test results and any corrective measures.

If any test fails, correct the cause and repeat the affected tests. Repeat other tests where the corrective measures may have changed their results.

Proceed with documentation and release for operation as described in Section 7.5 only after all required tests have been completed successfully.

7.5. Documentation and Release for Operation

Document commissioning of the complete gas detection system. The commissioning record must include:

- Identification of the control unit and connected detectors, including their measuring locations.
- Date of commissioning and identification of the personnel carrying out the work.
- Firmware version of the control unit.
- Final channel settings, alarm parameters and relay configuration.

- Test methods, test equipment and test gases used.
- Results of the measuring channel, alarm, fault and service tests.
- Results of tests involving connected warning devices and protective functions.
- Any defects identified that corrective measures taken and repeat test results.
- Confirmation that all temporarily inhibited functions have been restored.

Keep the commissioning record and configuration data available for operation, maintenance and subsequent changes.

Release for operation

Release the gas detection system for operation only when:

- Installation and commissioning have been completed successfully.
- All required functional tests have passed.
- No unresolved defects affecting safe operation remain.
- All detectors have completed their required warm-up periods.
- The control unit is in measuring operation without unexplained alarm, fault or service indications.
- All required warning devices and protective functions are enabled.
- The personnel responsible for operation have received the operating instructions and have been informed about alarm responses and fault procedures.

Record the date of release and the identification of the person responsible for authorising operation.

Withdraw alternative protective measures only after the gas detection system has been released for operation and responsibility for monitoring has been handed over to the operating personnel.

After changes to the configuration, wiring or connected equipment, check the affected functions and repeat the relevant functional tests before returning the system to operation. Update the commissioning record and configuration data accordingly.

8. Operation

8.1. Display and Status Indicators

The front panel provides a display, general status indicators, channel-specific fault and alarm indicators, and relay status indicators.

The GMC 8032 provides indicators for two measuring channels and six programmable output relays. The GMC 8034 provides indicators for four measuring channels and ten programmable output relays.

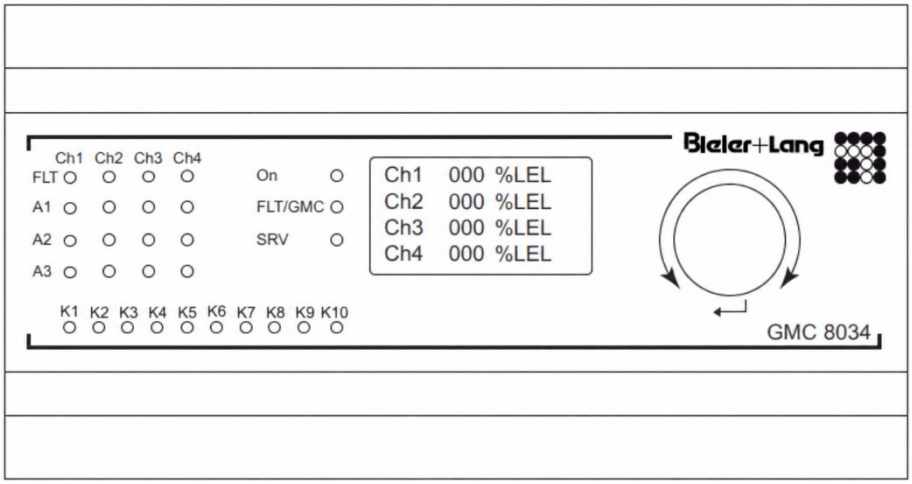


Figure 13: Display and indicator arrangement on the GMC 8034. The GMC 8032 provides two measuring channels and six programmable output relays.

General and channel-specific indicators

Indicator	Colour / state	Meaning
ON	Green, continuously illuminated	The control unit is ready for operation, and the supply voltage is within the permissible limits.
FLT/GMC	Yellow, continuously illuminated	General fault or special condition, including start-up, an internal fault, a channel fault or a channel switched off for maintenance.
SRV	Yellow, continuously illuminated	Service condition, for example when Menu 2 or Menu 3 is active, a detector signals maintenance or a channel is switched off for maintenance.
FLT, corresponding channel	Yellow, continuously illuminated	The channel is unavailable for normal monitoring, for example due to a detector or connection fault, an input signal outside the permissible limits, maintenance or channel deactivation.

A1, A2 or A3, corresponding channel	Red, flashing	The corresponding alarm condition has been detected, but the configured alarm delay has not yet elapsed.
A1, A2 or A3, corresponding channel	Red, continuously illuminated	The corresponding alarm level has been triggered. Alarm clearing and reset depend on the configuration.
K1–K6 / K1–K10	Green, illuminated	The corresponding programmable output relay is energised.
K1–K6 / K1–K10	Not illuminated	The corresponding programmable output relay is de-energised.

An illuminated relay indicator does not necessarily indicate an alarm. Its meaning depends on the assigned function and whether the relay is configured for energised or de-energised operation.

Display background colours

Background colour	Meaning
Green	Start-up phase. Gas monitoring is not yet available.
White	Measuring display with no alarm level triggered.
Yellow	Alarm level A1 has been triggered on at least one measuring channel.
Red	Alarm level A2 or A3 has been triggered on at least one measuring channel.

During the power-on self-tests, the background colours are activated as part of the display test. See Section 7.2.

Read the display background together with the channel and general status indicators. A white background alone does not confirm that all measuring channels are available for monitoring.

The display shows measured values, units, status information and menus. During measuring operation, a moving asterisk indicates that the measured value display is being updated.

8.2. Measuring Operation

After completion of the start-up phase, the control unit enters measuring operation. It continuously reads the signals from the configured measuring channels, displays the measured values and evaluates them according to the stored settings.

The GMC 8032 displays up to two measuring channels; the GMC 8034 displays up to four.

Measured value display

Each configured measuring channel is displayed with its channel identification, current measured value and unit of measurement.

An asterisk moves between the channel lines to indicate that the measured value display is being updated.

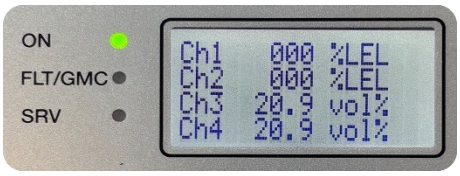


Figure 14: Measuring operation on the GMC 8032 with two configured measuring channels.

If a channel name has been assigned, it is displayed alternately with the measured value when an alarm occurs. The channel name can identify the detector location.

Normal monitoring condition

During measuring operation without an alarm, fault or service condition:

- - The ON indicator is illuminated green.
- - The display background is white.
- - The channel alarm and fault indicators are off.
- - The FLT/GMC and SRV indicators are off.

The programmable relay indicators show the energised state of the corresponding relays. Their states depend on the configured relay functions.

Alarm indications and reset functions are described in Section 8.3. Special conditions, including channels switched off and signals outside the measuring range, are described in Section 8.4.

8.3. Alarm Indication and Reset

The control unit evaluates each measuring channel against the configured alarm thresholds. Up to three alarm levels, A1, A2 and A3, are available for each channel.

Alarm thresholds, delays, hysteresis and relay functions depend on the configuration.

Alarm indication

Condition	Channel indicator	Display background
A1 alarm delay active	A1 flashes red	Depends on any other active alarms
A1 triggered	A1 continuously illuminated red	Yellow, unless A2 or A3 is also triggered
A2 alarm delay active	A2 flashes red	Depends on any other active alarms
A2 triggered	A2 continuously illuminated red	Red
A3 alarm delay active	A3 flashes red	Depends on any other active alarms
A3 triggered	A3 continuously illuminated red	Red



Figure 15: Alarm level A1 triggered on measuring channel 1.

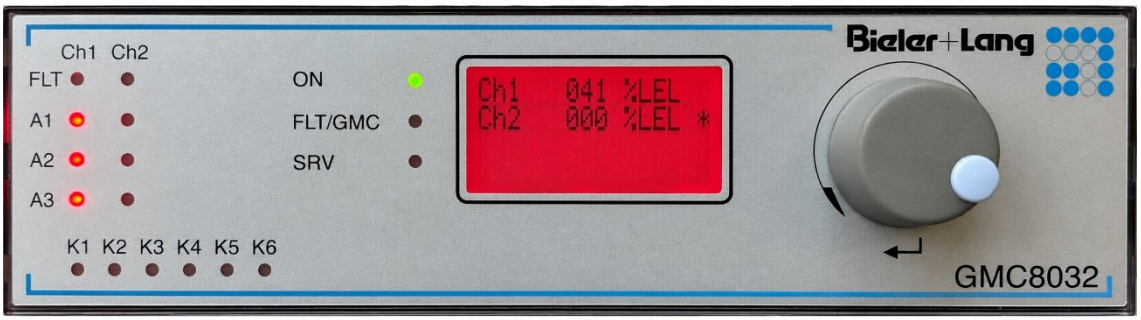


Figure 16: Alarm levels A1, A2 and A3 triggered on measuring channel 1, with red display background.

When an alarm is triggered, the assigned output relays respond according to their configured functions. If a channel name is assigned, it is displayed alternately with the measured value.

WARNING **Hazardous gas conditions may persist after an alarm reset.**

Resetting an alarm or silencing an audible warning does not confirm that the monitored area is safe.

- Follow the site-specific alarm response procedures.
- Identify and eliminate the cause of the alarm.
- Verify safe conditions before resuming affected activities.

Alarm clearing and reset

Non-latching alarms clear automatically when the configured alarm clearing condition, including hysteresis, is met.

Latching alarms remain stored until they are reset and the configured reset conditions are met.

Depending on the relay configuration, an output may permit reset while the alarm condition is still present. Audible warning outputs may also be configured for automatic silencing after two minutes. Silencing an audible warning does not remove the gas alarm condition.

To reset alarms using the front panel:

1. Press the rotary encoder to open Menu 1.
2. Select “Reset alarms”.
3. Select “Reset” and press the rotary encoder.
4. Check the remaining alarm indications and the status of the connected warning devices.

If an external reset push-button is fitted, it can also be used to initiate the reset function.

If an alarm cannot be reset, check whether the alarm condition persists or the configured reset conditions have not yet been met. Do not change alarm settings solely to clear an alarm.

8.4. Special Conditions

Special conditions indicate that monitoring is restricted or unavailable for an affected channel or for the complete control unit. Read the display together with the channel indicators, the FLT/GMC indicator and the SRV indicator.



Loss of gas monitoring during a special condition.

Fault clearing

Fault indications are non-latching. When the fault condition is no longer present, the active fault indication clears automatically. The fault relay (ST) automatically returns to its normal state, provided no other fault remains active. Manual reset is not required. Clearing an active fault does not delete its recorded event from the event log.

An affected measuring channel or the complete control unit may be unable to detect hazardous gas conditions or initiate the required protective response.

- Identify which measuring channels and functions are affected.
- Maintain alternative protective measures wherever monitoring is unavailable.
- Investigate unexpected indications and correct their cause.
- Verify correct operation before restoring normal monitoring.

Start-up

During the start-up phase, the display background is green, and the FLT/GMC indicator is illuminated. Gas monitoring is not available. The power-on sequence and start-up indications are described in Section 7.2.

Configuration mode

Selecting Menu 2 with the correct password places the control unit in a special condition. Gas monitoring is not available while Menu 2 or Menu 3 is active.

The SRV indicator is illuminated, and the service relay signals the condition. After completing the work, exit the configuration menus and check that the control unit returns to measuring operation.

Measuring channel switched off

A channel temporarily switched off displays “Off” instead of a measured value. The affected channel is excluded from gas monitoring.



Figure 17: Measuring channel 4 switched off.

Check the corresponding fault and service indications. Restore the channel after completing the work and verify its correct operation.

Values below zero

Values below the zero point may be displayed as negative measured values. Within the configured limits, a negative value alone does not indicate a channel fault.

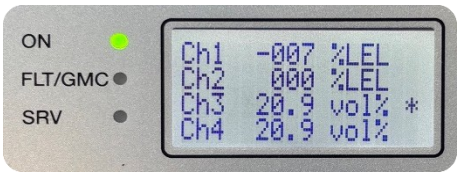


Figure 18: Negative measured value within the configured limits; no channel fault indicated.

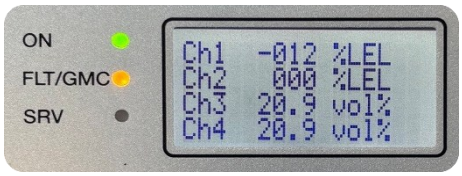


Figure 19: Measured value below the configured lower limit; FLT/GMC indicator illuminated.

If the measured value falls below the configured lower limit, a channel fault is indicated. The measured value remains visible, and the channel FLT indicator and the FLT/GMC indicator illuminate.

Investigate persistent or unexpected negative values according to the detector instructions. Do not adjust the detector solely to remove an unexplained indication.

Measuring range exceeded

When a measured value exceeds the measuring range within the configured signal limits, the displayed value flashes.

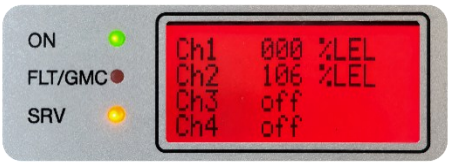


Figure 20: Measuring range exceeded on channel 4. The measured value flashes.

For a channel configured with the “Ex100” channel type, the peak value is stored and displayed. The stored indication can be reset only after the input signal has returned to the measuring range.

Treat an overrange indication as a potentially hazardous gas condition. Follow the site-specific alarm response procedures and the detector instructions before resetting the indication.

Channel fault

An input signal outside the configured fault limits causes a channel fault. Possible causes include a disconnected detector, a cable fault, a detector fault or a defective detector supply or signal-input fuse.

The corresponding channel FLT indicator and the FLT/GMC indicator illuminate, and the fault relay signals the condition. A high-fault condition is displayed as flashing “---”.



Figure 21: High-fault indication on channel 4. The "---" indication flashes.

Identify and correct the cause before returning the affected channel to monitoring. Troubleshooting information is provided in Chapter 10.

Alarm outputs at underscale and overscale

Within the configured input-current limits, alarm evaluation continues according to the linearly calculated measured value, including values below zero or above the measuring-range end value.

If the input current falls below the configured lower fault limit, a fault is signalled; the low-input fault does not activate the alarm relays.

If the input current exceeds the configured upper fault limit, a fault is signalled. Alarm relay outputs already activated by the preceding alarm condition retain their alarm state.

Internal fault

The control unit performs cyclic internal diagnostics. A detected internal fault may cause a fault indication or a restart.

If an internal fault persists or the control unit repeatedly restarts, maintain alternative protective measures and follow the troubleshooting instructions in Chapter 10.

8.5. Menu Navigation and Access Levels

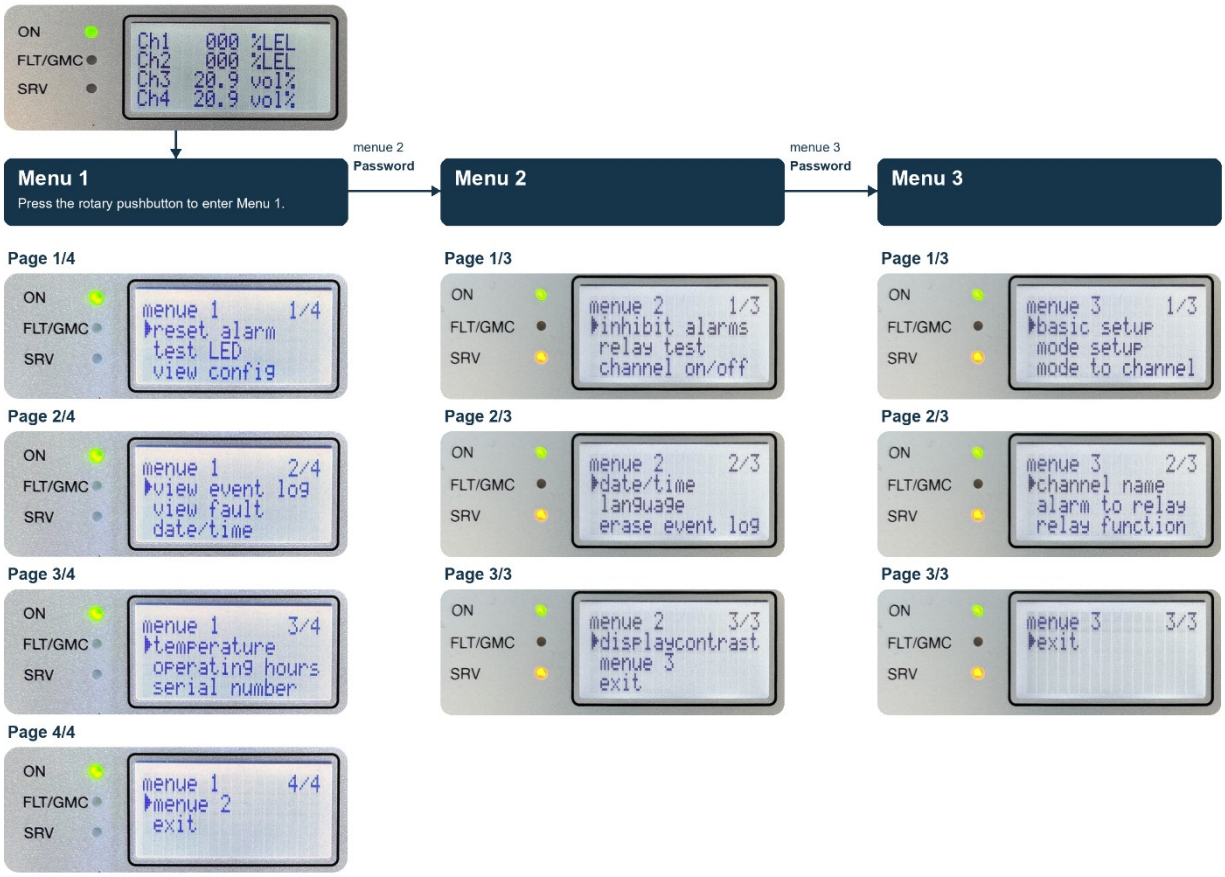
Operate the menus using the rotary encoder on the front panel.

Using the rotary encoder

Action	Function
Turn clockwise or anticlockwise	Move the cursor between menu items or change an input value.
Press	Select the highlighted menu item or confirm an input.
Select "Exit"	Leave the current function or return to the previous menu level.

The cursor ">" identifies the selected menu item. Page numbers indicate the current page and the total number of pages in the selected menu or information display.

Menu navigation and access levels



Reading the page indicator

1/4 = page 1 of 4 in the current menu. The indicator shows the page, not the access level.

Menu entries are grouped as shown on the photographed display pages.

Menu	Access	Purpose	Gas monitoring
Menu 1	No password required	Alarm reset, LED test, configuration display, event history and device information	Remains active
Menu 2	Password required	Service functions, relay testing and operating settings	Not available
Menu 3	Additional password required	Basic configuration, measuring channel parameters and relay functions	Not available

Opening Menu 1

1. Press the rotary encoder during measuring operation.
2. Turn the rotary encoder to select the required function.
3. Press the rotary encoder to open the function.

If no user input is made in Menu 1 for 20 seconds, the display returns to the measured values.

Accessing Menu 2 and Menu 3

WARNING **Loss of gas monitoring when accessing service and configuration menus.**

Entering Menu 2 interrupts gas monitoring. Monitoring also remains unavailable in Menu 3.

- Inform the personnel responsible for operation before entering these menus.
- Maintain alternative protective measures while monitoring is unavailable.
- After completing the work, exit to measuring operation and verify the system status.

To access Menu 2:

1. Select “Menu 2” in Menu 1.
2. Enter the password using the rotary encoder.
3. Confirm the entry with “y”.

The control unit enters a special condition. The SRV indicator illuminates and the service relay signals the condition.

To access Menu 3, select “Menu 3” in Menu 2 and enter the additional password.

Detailed functions and settings are described in Sections 8.7 and 8.8.

Returning to measuring operation

1. Select “Exit” to leave the current function.
2. From Menu 3, return to Menu 2.
3. Exit Menu 2 to return to Menu 1.
4. Exit Menu 1 to display the measured values.
5. Check that no unexpected fault or service indication remains.

Do not assume that returning to a measured value display alone confirms that all monitoring functions are active. Check that required channels are enabled and any temporary alarm inhibition has been removed.

8.6. Menu 1 – Information and Operating Functions

Menu 1 provides access to alarm reset, the LED test, configuration information, the event memory and device information. Gas monitoring remains active while Menu 1 is being used.

Press the rotary encoder during measuring operation to open Menu 1. Turn to select a function and press to open it.

Reset alarm

Use “reset alarms” to reset alarms according to the configured reset conditions.

1. Select “reset alarms”.
2. Select “reset” and press the rotary encoder.
3. Check the remaining alarm indications.

Resetting an alarm does not confirm that the monitored area is safe. Observe the alarm response and reset instructions in Section 8.3.

Test LED

Use “Test LED” to check the front-panel LED indicators.

1. Select “Test LED”.
2. Select “LED on” and check that all LED indicators illuminate.
3. Select “LED off” to complete the test.
4. Select “Exit” to leave the function.

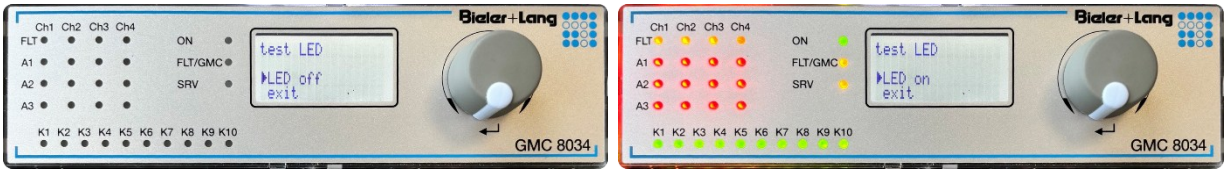


Figure 22: Menu 1 LED test controls.

The LED test checks the indicators. It does not replace the functional test of the relay outputs, connected warning devices or protective functions.

View config

Select “view config” to view the stored configuration for each configured measuring channel.

The information includes:

- Assigned channel type.
- Alarm thresholds A1, A2 and A3.
- Output relay assigned to each alarm threshold.

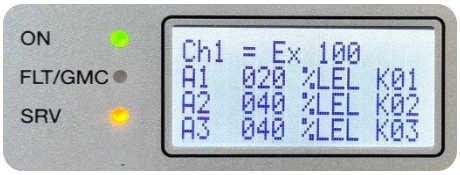


Figure 23: Configuration display for a measuring channel.

These settings cannot be changed using this function. Configuration and parameterisation are described in Section 8.8.

View event log

Select “view event log” to view recorded alarms, faults and user interventions.

Each event entry includes:

- Event number and total number of stored events.
- Event category.
- Description of the event.
- Date and time of occurrence.



Figure 24: Event entry with description and date/time stamp.

The event memory stores the most recent 500 events. When the memory is full, each new event overwrites the oldest entry.

Turn the rotary encoder to browse the entries. Press it to leave the event display.

View fault

Select “view fault” to view the results of the internal diagnostics.

The display identifies the diagnostic check and shows its result:

- “ok”: The check was completed without a detected fault.
- “nok”: The check detected a fault.

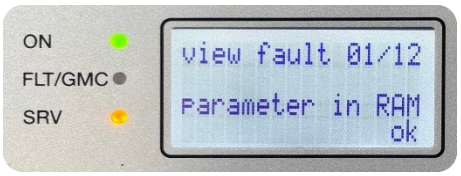


Figure 25: Internal diagnostic result displayed in Menu 1.

The displayed results refer to the most recent diagnostic checks. If a fault is indicated, follow the troubleshooting instructions in Chapter 10.

Date/time

Select “Date/time” to view the current device date and time.

The display identifies Central European Time as “CET” and Central European Summer Time as “CEST”.



Figure 26: Date and time display

Check that the date and time are correct so that event records can be interpreted reliably. Corrections are made in Menu 2 as described in Section 8.7.

Temperature

Select “Temperature” to view the internal temperature of the control unit.

The displayed value is the temperature inside the device, rather than the ambient temperature at the installation location.

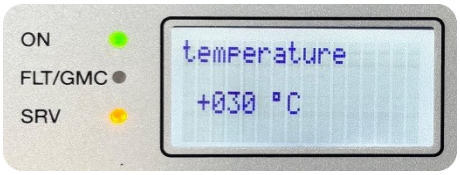


Figure 27: Temperature display

Operating hours

Select “Operating hours” to view the accumulated operating time.

The specified expected service life is 20 years, equivalent to 175,200 operating hours. When this operating time is exceeded, the control unit records a corresponding event.

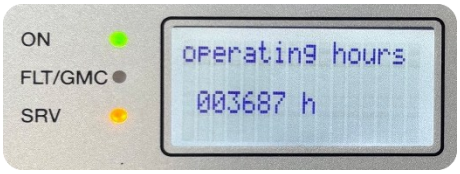


Figure 28: Operating hours display

Serial number

Select the serial-number function to view the serial number and year of manufacture.

Use this information to identify the control unit in maintenance records and service enquiries.

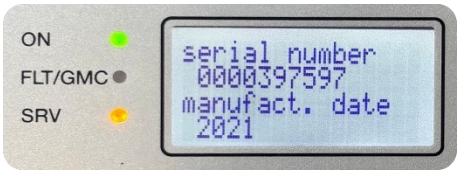


Figure 29: Serial number and year of manufacture

Menu 2

Select “Menu 2” to access the password entry for the service and settings menu.



Figure 30: Password entry for access to Menu 2.

Entering Menu 2 interrupts gas monitoring. Observe the precautions in Section 8.5 before entering the password.

Exit

Select “Exit” to return to the measured value display.

8.7. Menu 2 – Service and Settings

Menu 2 provides service functions and operating settings. Access is password-protected. These functions must only be used by authorised specialist personnel.

WARNING **Loss of gas monitoring during service and settings changes.**

Gas monitoring is not available while Menu 2 is active. Service functions may also switch connected equipment or exclude individual channels from monitoring.

- Inform the personnel responsible for operation before starting.
- Maintain alternative protective measures while monitoring is unavailable.
- Ensure that connected equipment can be switched safely before testing relays.
- Restore all required channels and functions before returning the system to operation.

Accessing Menu 2

1. Open Menu 1.
2. Select “Menu 2”.
3. Enter the password “1111” using the rotary encoder.
4. Confirm with “y”. Select “n” to correct the entry.

To cancel password entry, wait 20 seconds without making an input. The control unit returns to Menu 1.

After successful entry, the control unit leaves measuring operation. The SRV indicator illuminates and the service relay signals the special condition.

Inhibit alarms

Select “inhibit alarms” to display the measured values with alarm evaluation inhibited.



Figure 31: Selection of “inhibit alarms” in Menu 2.

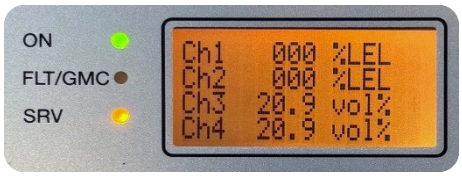


Figure 32: Measured value display with alarm evaluation inhibited.

This is a special condition. Displayed values and the moving asterisk do not confirm that alarm evaluation is active. The display background is orange, and the SRV indicator remains illuminated.

Relay test

Use “relay test” to switch individual output relays for testing.

1. Coordinate the test with the personnel responsible for connected equipment.
2. Select “relay test”.

3. Select the required relay and change its switching state.
4. Check the relay indication and the response of the connected equipment.
5. Repeat for the other relays requiring testing.



Figure 33: Selection of "relay test" in Menu 2.

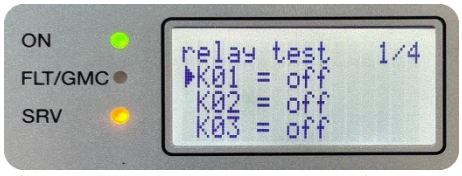


Figure 34: Relay test controls showing the switching states.

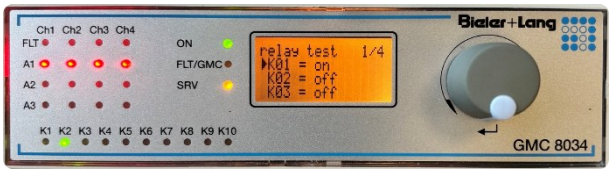


Figure 35: K1 switched on: A1 indicators illuminate for all four channels in this example.

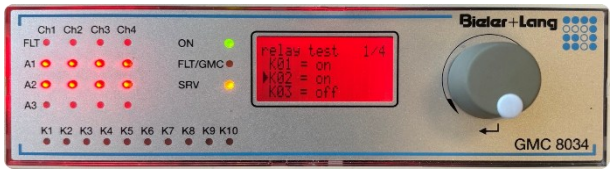


Figure 36: K1 and K2 switched on: A1 and A2 indicators illuminate for all four channels in this example.

The display shows the relay identification and its switching state. The channel LED matrix indicates the configured alarm assignments of the relays switched on during the test.

In the example shown, K1 is assigned to A1 of all four channels. Switching K1 on illuminates their A1 indicators, and the display background is orange. Switching K2 on as well illuminates their A2 indicators, and the display background changes to red. These assignments are specific to the example configuration.

After testing, leave the function, return to measuring operation and verify that the relay outputs respond correctly to their configured functions.

Channel on/off

Use "Channel on/off" to take individual measuring channels temporarily out of service for testing, maintenance or repair.

1. Select "Channel on/off".
2. Select the required channel.
3. Set the channel to "off" or "on", as required.
4. Check the selected channel and setting before leaving the function.



Figure 37: Selection of "channel on/off" in Menu 2.

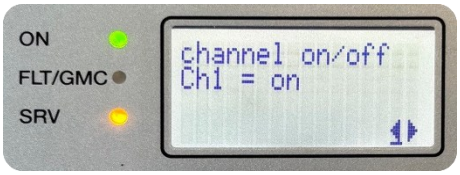


Figure 38: Channel 1 enabled.



Figure 39: Channel 1 disabled.

Turn the rotary encoder to select "▶", then press it to advance to the next channel. Select "◀" and press the rotary encoder to change the selected channel setting.

A channel set to "off" remains excluded from monitoring after leaving Menu 2. Its measured value is replaced by "off", and the service condition is indicated.

After completing the work, set the channel to "on" and verify correct operation before withdrawing alternative protective measures.

Date/time

Use "date/time" to correct the device clock.

1. Select "date/time".
2. Select "n" at the confirmation prompt to change the displayed settings.
3. Set the date, time and applicable winter/summertime settings.
4. Confirm the completed settings with "y".

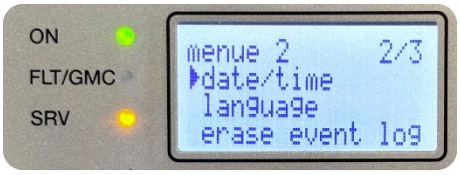


Figure 40: "date/time" selected in Menu 2.



Figure 41: Date and time settings.

The winter/summertime setting uses "W" for wintertime and "S" for summertime. The automatic summer-time option enables adjustment to Central European Summer Time.

Correct date and time settings are required for reliable event timestamps.

Language

Use "Language" to select the display language:

- "DE": German.
- "EN": English.

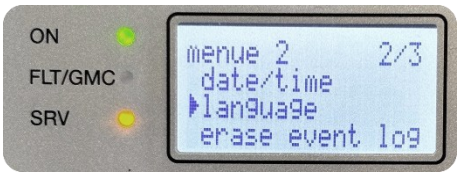


Figure 42: "language" selected in Menu 2.

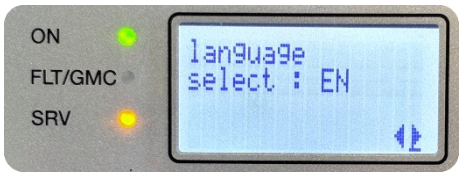


Figure 43: Language selection with English ("EN") selected.

In this function, "◀" changes the language setting and "▶" exits the function.

Erase event log

Use "erase event log" to clear the event memory. The display shows the number of stored events and requests confirmation.

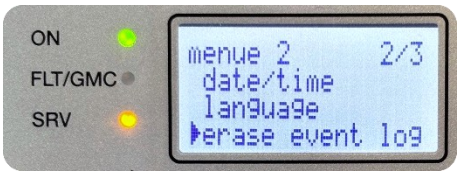


Figure 44: "erase event log" selected in Menu 2.

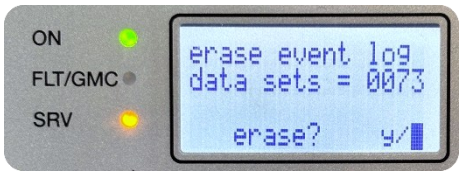


Figure 45: Confirmation prompt for erasing the event log.

Preserve any event information required for fault investigation or maintenance records before deleting it.

- Select "y" to confirm deletion.
- Select "n" to leave the function without deleting the events.

Display contrast

Use "displaycontrast" to adjust the contrast between the display characters and the background.

The display also shows the currently installed firmware version ("GASWARN V2.04" in the example shown).



Figure 46: "displaycontrast" selected in Menu 2.



Figure 47: Display contrast adjustment.

Select "◀" and press the rotary encoder to change the contrast. Select "▶" and press the rotary encoder to return to Menu 2.

Menu 3

Select “menue 3” to access the additional password entry for configuration and parameterisation. The functions are described in Section 8.8.



Figure 48: “menue 3” selected in Menu 2.



Figure 49: Password entry for access to Menu 3.

Gas monitoring remains unavailable when moving from Menu 2 to Menu 3.

The factory-set password for Menu 3 is “2222”. If a customer-specific password has been assigned, use that password.

Exit and return to operation



Figure 50: “exit” selected in Menu 2.

1. In Menu 2, select “exit” and press the rotary encoder to return to Menu 1.
2. In Menu 1, select “exit” and press the rotary encoder to display the measured values.
3. Confirm that all required measuring channels are enabled.
4. Check that no unintended alarm inhibition or relay test condition remains.
5. Verify that no unexplained fault or service indication is present.

After changes affecting alarm or protective functions, repeat the relevant functional tests described in Section 7.4.

8.8. Menu 3 – Configuration / Parameterisation

Menu 3 defines the basic configuration, channel types, channel assignments and programmable relay functions.

Configuration and parameterisation must only be carried out by specialist personnel authorised by Bieler + Lang.

WARNING **Loss of protective functions due to incorrect configuration.**

Incorrect measuring ranges, alarm parameters or relay settings may prevent the gas detection system from detecting hazardous conditions or initiating the required response. Gas monitoring remains unavailable while Menu 3 is active.

- Maintain alternative protective measures throughout configuration.
- Match the settings to the connected detectors and the intended application.
- Check the settings of every affected channel and relay.
- Verify the affected functions before returning the system to operation.

8.8.1. Accessing Menu 3

1. Open Menu 2 as described in Section 8.7.
2. Select “Menu 3”.
3. Enter the configured password using the rotary encoder.
4. Confirm with “y”. Select “n” to correct the entry.

The factory-set password is “2222”. If a customer-specific password has been assigned, use that password.

The control unit remains in the service condition. Gas monitoring is not available.

8.8.2. Basic Setup

Select “basic setup” in Menu 3 and press the rotary encoder to open the basic configuration settings.

Setting	GMC 8032	GMC 8034
Number of measuring channels	Up to 2	Up to 4
Number of programmable output relays (relay max)	Up to 6	Up to 10
Number of channel mode (channel mode max)	Up to 2	Up to 4
Warm-up time	0–900 seconds, in increments of 10 seconds	0–900 seconds, in increments of 10 seconds
Adress add-on modul		
Menu 3 password		

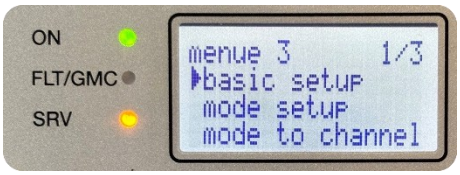


Figure 51: "basic setup" selected in Menu 3.

Number of measuring channels

Use "channel max" to set the number of measuring channels used:
1–2 for the GMC 8032 or 1–4 for the GMC 8034.



Figure 52: Setting the number of measuring channels ("channel max").

1. Select "◀" and press the rotary encoder. The cursor moves to the channel count.
2. Turn the rotary encoder to set the required number of measuring channels.
3. Press the rotary encoder to confirm the value. The cursor returns to "▶".
4. Select "▶" and press the rotary encoder to advance to the next basic setup page ("relay max", page 2/6).

Number of programmable output relays

Use "relay max" on page 2/6 to set the number of programmable output relays for the intended system configuration. The example shows three programmable output relays.



Figure 53: Setting the number of programmable output relays ("relay max").

1. Select "◀" and press the rotary encoder. The cursor moves to the relay count.
2. Turn the rotary encoder to set the required number of programmable output relays.
3. Press the rotary encoder to confirm the value. The cursor returns to "▶".
4. Select "▶" and press the rotary encoder to advance to "channel mode max" on page 3/6.

Number of channel mode

Use "channel mode max" on page 3/6 to set the number of channel modes. Each channel mode defines a set of measuring and alarm parameters and can be assigned to several measuring channels. The example shows two channel modes.

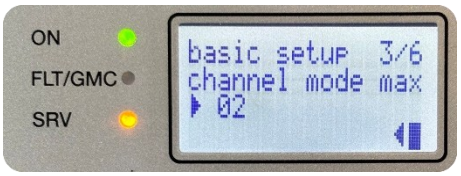


Figure 54: Setting the number of channel modes ("channel mode max").

1. Select "◀" and press the rotary encoder. The cursor moves to the number of channel modes.
2. Turn the rotary encoder to set the required number.
3. Press the rotary encoder to confirm the value. The cursor returns to "▶".
4. Select "▶" and press the rotary encoder to advance to "warm-up time" on page 4/6.

Warm-up time

Use "warm-up time" on page 4/6 to set the start-up period to suit the connected detectors. Observe the detector warm-up requirements described in Section 7.2. Gas monitoring is not available during this period. The example shows a setting of 20 seconds.

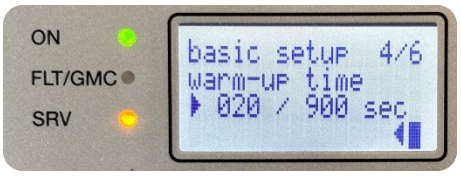


Figure 55: Setting the warm-up time ("warm-up time").

1. Select "◀" and press the rotary encoder. The cursor moves to the warm-up time.
2. Turn the rotary encoder to set the required time.
3. Press the rotary encoder to confirm the value. The cursor returns to "▶".
4. Select "▶" and press the rotary encoder to advance to "adr add-on modul" on page 5/6.

Add-on module address

Use "adr add-on modul" on page 5/6 to set the address for a compatible add-on module. Configure this setting in accordance with the documentation supplied with the module. If no add-on module is installed, leave this setting unchanged.

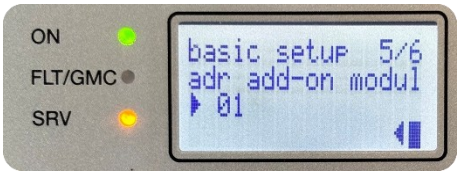


Figure 56: Add-on module address setting.

Select "▶" and press the rotary encoder to advance to "password new" on page 6/6.

Menu 3 password

Use “password new” on page 6/6 to change the Menu 3 password. Both fields initially show the current password, for example “2222 / 2222”.



Figure 57: Setting a new password for Menu 3 (“password new”).

To change the password, replace both entries with the same new password, for example “3333 / 3333”. Entering the new password twice ensures that the change is deliberate. If the entries do not match, the previous password remains valid.

1. Select “◀” and press the rotary encoder to edit the password.
2. Turn the rotary encoder to set each digit and press it to confirm.
3. Enter the same new password in the second field.
4. Select “▶” and press the rotary encoder to return to Menu 3, page 1/3.

Keep the password in a secure location accessible to authorised personnel. A lost password cannot be reset. Restoring access requires the device firmware to be reflashed.

8.8.3. Channel Mode Setup

Select “mode setup” in Menu 3 and press the rotary encoder. Select the channel mode to be configured, for example “mode 01”, and press the rotary encoder to open its settings.



Figure 58: “mode 01” selected in “mode setup”.



Figure 59: Channel type setting for channel mode 01.

Application category

Select a mode suitable for the connected detector and its measuring task.

1. Select “◀” and press the rotary encoder. The cursor moves to the channel type.
2. Turn the rotary encoder to select the required channel type, for example “Ex 100”.
3. Press the rotary encoder to confirm the selection. The cursor returns to “▶”.

Category	Application
Ex	Flammable gas monitoring for explosion protection
Oxy	Oxygen monitoring
Tox	Monitoring low gas concentrations
Refri	Refrigerant monitoring

The selected mode determines the measuring range and available units. Where unit selection is permitted, select the unit corresponding to the detector.
For oxygen monitoring, select the appropriate alarm direction: decreasing concentration or increasing concentration.
A channel mode may be assigned to several measuring channels. Changes to that mode affect all channels using it.

Channel mode	Measuring range	Resolution	Unit	Alarm direction	Preset A1	Preset A2	Preset A3
Ex 20	20	1	%LEL	Rising	4	8	8
Ex 50	50	1	%LEL	Rising	10	20	20
Ex 100[1]	100	1	%LEL	Rising	20	40	40
Oxy 25.0 ↓	25.0	0.1	vol%	Falling	18.0	17.0	16.0
Oxy 25.0 ↑	25.0	0.1	vol%	Rising	22.0	23.0	24.0
Tox 1.00	1.00	0.01	ppm / vol%	Rising	0.2	0.4	0.4
Tox 2.00	2.00	0.01	ppm / vol%	Rising	0.4	0.8	0.8
Tox 5.00	5.00	0.01	ppm / vol%	Rising	1	2	2
Tox 10.0	10.0	0.1	ppm / vol%	Rising	2	4	4
Tox 20.0	20.0	0.1	ppm / vol%	Rising	4	8	8
Tox 25.0	25.0	0.1	ppm / vol%	Rising	5	10	10
Tox 50.0	50.0	0.1	ppm / vol%	Rising	10	20	20
Tox 100	100	1	ppm / vol%	Rising	20	40	40
Tox 200	200	1	ppm	Rising	40	80	80
Tox 250	250	1	ppm	Rising	50	100	100
Tox 300	300	1	ppm	Rising	60	120	120
Tox 500	500	1	ppm	Rising	100	200	200
Tox 1000	1000	10	ppm / ppb	Rising	200	400	400
Tox 2000	2000	10	ppm	Rising	400	800	800
Tox 5000	5000	10	ppm	Rising	1000	2000	2000
Refri 100	100	1	%LEL	Rising	10	25	25
Refri 1000	1000	10	ppm	Rising	200	400	400
Refri 2000	2000	10	ppm	Rising	400	800	800
Refri 5000	5000	10	ppm	Rising	1000	2000	2000

[1] Factory-set channel mode.

The "◀" control in the bottom-right corner indicates that the displayed setting can be edited. If this control is absent, the setting is fixed. Select "▶" and press the rotary encoder to advance to the next parameter.

Unit

The "unit" screen shows the measuring unit for the selected channel type. For "Ex 100", the unit is fixed at "%LEL"; therefore, only "▶" is available. Where editing is permitted, select the unit corresponding to the connected detector.



Figure 60: Fixed measuring unit "%LEL" for channel type "Ex 100".

Measuring range

The "measuring range" screen shows the full-scale value for the selected channel type. For "Ex 100", the measuring range is fixed at 100 %LEL. The absence of the "◀" control in the bottom-right corner indicates that this setting cannot be edited.

Select "▶" and press the rotary encoder to advance to the next parameter.

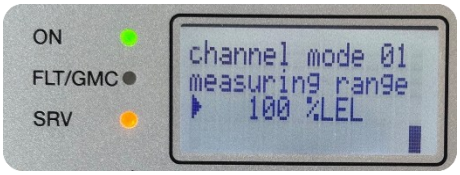


Figure 61: Fixed measuring range of 100 %LEL for channel type "Ex 100".

Alarm thresholds

Set the three alarm thresholds A1, A2 and A3 to match the required alarm strategy.

The general adjustment range is 10–100 % of the measuring range. For "Ex 50" and "Ex 100", the thresholds are restricted to 10–40 % LEL.

Check the alarm direction, thresholds and intended response for the application. Preset values do not replace application-specific alarm planning.



Figure 62: Setting alarm threshold A1 ("alarm 1 on").

The "alarm 1 on" screen defines the activation threshold for alarm A1. The example shows 20 %LEL.

1. Select "◀" and press the rotary encoder to edit the threshold.
2. Turn the rotary encoder to set the required value.
3. Press the rotary encoder to confirm the value.
4. Select "▶" and press the rotary encoder to advance to "alarm 2 on".

The same procedure applies to "alarm 1 on", "alarm 2 on" and "alarm 3 on".



Figure 63: Setting alarm threshold A2 ("alarm 2 on").



Figure 64: Setting alarm threshold A3 ("alarm 3 on").

Hysteresis

The "hysteresis" setting is expressed as a percentage of full scale ("FS"). The example shows 1 % FS.

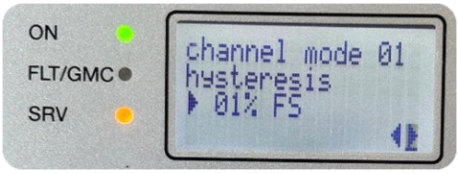


Figure 65: Alarm hysteresis setting ("hysteresis"), shown at 1 % of full scale.

1. Select "◀" and press the rotary encoder to edit the hysteresis.
2. Turn the rotary encoder to set the required value.
3. Press the rotary encoder to confirm the value.
4. Select "▶" and press the rotary encoder to advance to the next parameter.

Alarm delay

The "switch-on delay" setting defines the delay before alarm activation. Where permitted, the delay can be set up to 60 seconds. For explosion protection applications, set the delay to zero.

For "Ex 100", the delay is fixed at 0 seconds and cannot be edited. The "◀" control is therefore absent from the bottom-right corner.



Figure 66: Alarm delay fixed at 0 seconds for channel type "Ex 100".

Select "▶" and press the rotary encoder to advance to the next parameter.

Zero-point suppression

The “zero dead band” setting defines the range around zero within which measured values are displayed as zero. The negative and positive limits are expressed as percentages of full scale (“FS”).

The default settings are 0 % FS for both limits. Available settings depend on the selected channel type. For “Ex 100”, the maximum suppression range extends from −10 % FS to +5 % FS.

To disable zero-point suppression, set both limits to 0 % FS. To enable suppression, configure the required negative and/or positive limit using the editing controls described above. The setting applies to all channels assigned to this channel mode.

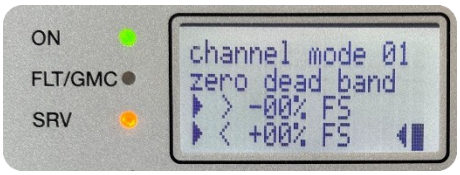


Figure 67: Zero-point suppression set to 0 % FS for both limits.

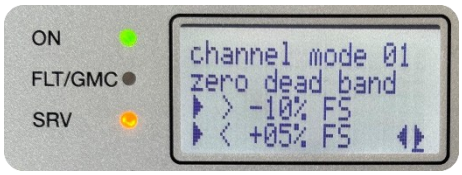


Figure 68: Maximum zero-point suppression settings for channel type “Ex 100”.

Do not use zero-point suppression to conceal unexplained detector deviations.

Select “▶” and press the rotary encoder to advance to the next parameter.

Input signal transfer function and indication limits

The input-current characteristic is linear. An input of 4 mA corresponds to zero; an input of 20 mA corresponds to the configured measuring-range end value.

Measured value = (input current − 4 mA) / 16 mA × measuring-range end value

Linear indication continues above 20 mA up to and including the configured upper input-current limit:

Upper input-current limit	Upper indication limit
21.0 mA	106.25 % of the measuring-range end value
22.0 mA	112.5 % of the measuring-range end value

Above the selected upper limit, the display shows flashing “---” and a channel fault is indicated. The configured zero-point suppression applies as described below.

Detector maintenance signal

The control unit recognises a square-wave signal alternating between 2.5 mA and 5.5 mA at a frequency of 1 Hz as a detector maintenance signal. This signal indicates a service condition rather than a gas concentration.

Fault signal limits

Use “limits 4-20mA” to set the lower and upper input-signal fault limits to match the output characteristics of the connected detector. An input signal at or below the selected lower limit, or above the selected upper limit, is treated as a fault.

Channel category	Available lower fault limits
Ex / Tox	≤ 2.4 mA or ≤ 3.6 mA
Oxy / Refri	≤ 3.2 mA or ≤ 3.6 mA

The available upper fault limits are > 21.0 mA or > 22.0 mA.

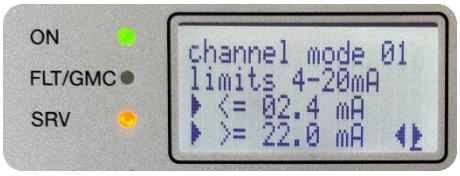


Figure 69: Example fault limits: ≤ 2.4 mA and ≥ 22.0 mA.

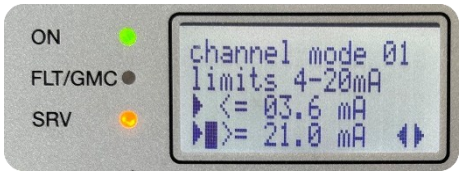


Figure 70: Example fault limits: ≤ 3.6 mA and ≥ 21.0 mA.

Check that the selected limits distinguish valid measuring signals from detector fault signals. Verify fault detection during the functional test.

8.8.4. Assigning Channel Modes

Use “mode to channel” to assign the channel modes configured in Section 8.8.3 to the individual measuring channels. The display shows the channel number, assigned mode and channel type designation.

Select “mode to channel” in Menu 3 and press the rotary encoder.

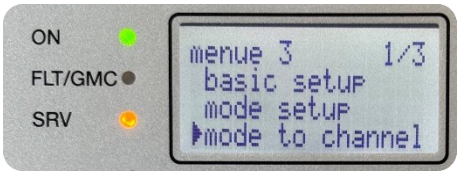


Figure 71: “mode to channel” selected in Menu 3.

1. Select “◀” and press the rotary encoder to edit the mode assignment for the displayed channel.
2. Turn the rotary encoder to select the required channel mode.
3. Press the rotary encoder to confirm the assignment.
4. Check the displayed mode number and channel type designation.
5. Select “▶” and press the rotary encoder to advance to the next measuring channel.
6. Repeat for each configured measuring channel.

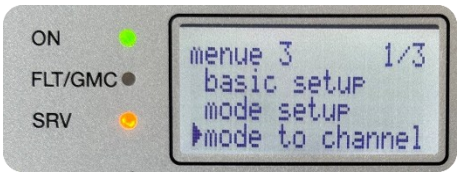


Figure 72: Channel 1 assigned to mode 01 (“Ex 100”).

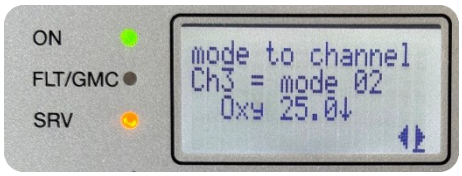


Figure 73: Channel 3 assigned to mode 02 (“Oxy 25.0 ↓”).

These are example assignments. A channel mode may be assigned to more than one measuring channel. Verify that each assignment matches the connected detector, measuring range, unit and alarm requirements.

8.8.5. Channel Names

Select “channel name” in Menu 3 and press the rotary encoder to assign a name of up to 10 characters to each measuring channel.

Use a name that clearly identifies the measuring location. During an alarm, the name is displayed alternately with the measured value.



Figure 74: “channel name” selected in Menu 3.

1. Select “◀” and press the rotary encoder. The cursor moves to the first character position.
2. Turn the rotary encoder to select the required character.
3. Press the rotary encoder to confirm the character and advance to the next position.
4. Repeat for the remaining character positions.
5. After confirming the last character position, the cursor returns to “▶”.
6. Select “▶” and press the rotary encoder to advance to the next measuring channel.
7. Repeat for each channel requiring a name.

If no channel name is required, enter “#”.



Figure 75: Channel 1 with “#” entered to indicate that no channel name is required.



Figure 76: Example name “BOILER 3” assigned to channel 2.

8.8.6. Relay Assignment

Select “alarm to relay” in Menu 3 and press the rotary encoder to assign each channel alarm level, A1, A2 and A3, to a programmable output relay.

Each alarm level must have a relay assignment. A missing assignment causes an error indication.



Figure 77: alarm to relay” selected in Menu 3.

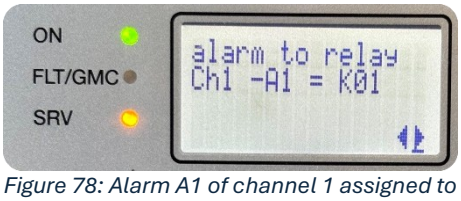


Figure 78: Alarm A1 of channel 1 assigned to relay K01.

Multiple alarm conditions may be assigned to the same relay to provide a collective alarm. In the photographed example, the assignments are:

Measuring channel	Alarm A1	Alarm A2	Alarm A3
Ch1	K01	K02	K03
Ch2	K01	K02	K03
Ch3	K01	K02	K03
Ch4	K01	K02	K03

Relay K01 provides the collective alarm for A1, K02 for A2 and K03 for A3 across all four channels. This is an example configuration; assignments must match the intended application.

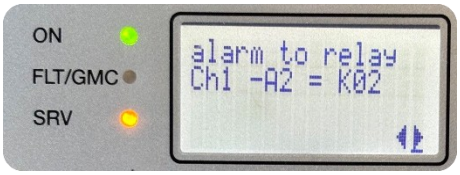


Figure 79: Alarm A2 of channel 1 assigned to relay K02.

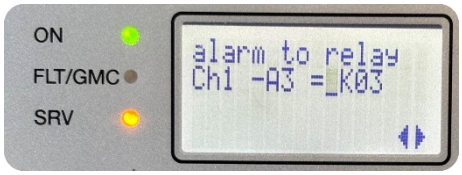


Figure 80: Alarm A3 of channel 1 assigned to relay K03.

Where only two separate alarm outputs are required, A2 and A3 of a channel may also be assigned to the same relay.

Check every assignment against the wiring and the required warning and protective functions.

8.8.7. Relay Functions

Select “relay function” in Menu 3 and press the rotary encoder to configure the switching behaviour of each programmable output relay. The display shows the relay number, selected function number and associated function codes.



Figure 81: “relay function” selected in Menu 3.

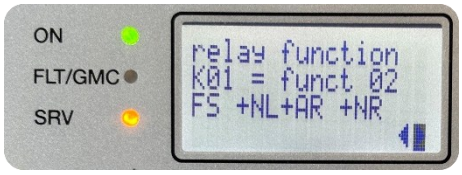


Figure 82: Relay K01 configured with function 02.

Switching principle

The switching principle determines the contact position when the relay output is in its normal state or its alarm state.

Relay output state	FS — Fail-safe	NFS — Non-fail-safe
Normal state	Relay energised; contact closed; front-panel LED on	Relay de-energised; contact open; front-panel LED off
Alarm state	Relay de-energised; contact open; front-panel LED off	Relay energised; contact closed; front-panel LED on

The relay output state depends on the assigned alarms, alarm storage and reset behaviour. A reset output does not necessarily indicate that the alarm condition has cleared. A latched output can remain in its alarm state after the alarm condition has cleared.

When the device is switched off or its power supply is lost, all relay contacts are open, regardless of the selected function.

With FS operation, the relay contact opens when the output enters its alarm state. Loss of device power or a wire break also interrupts this circuit. A suitable connected monitoring system can detect the interruption.

Alarm storage

NL — Non-latching:
The relay output returns automatically to its normal state when the alarm clearing condition, including hysteresis, is met. Depending on the selected function, it can also be reset while the alarm persists.

L — Latching:
The relay output remains in its alarm state after the alarm clearing condition is met. Manual reset is required.

Reset behaviour

- NR — Not resettable while the alarm persists:
The output cannot be reset while the alarm condition remains present.

- R — Resettable while the alarm persists:
The output can be reset while the alarm condition remains present.

Automatic and manual reset

- AR — Auto Reset:
The relay output resets automatically when the alarm clearing condition is met. Manual acknowledgement is not required.

- MR — Manual Reset required:
The relay output remains latched after the alarm clearing condition is met. Manual reset is required.

- AR2 — Automatic reset after two minutes:
The relay output resets automatically after two minutes, even if the alarm condition persists. Manual reset while the alarm persists is also possible.

Resetting a relay output does not mean that the underlying alarm condition has cleared.

Selecting a relay function

1. Select "◀" and press the rotary encoder to edit the function for the displayed relay.
2. Turn the rotary encoder to select the required function number.
3. Press the rotary encoder to confirm the selection.
4. Check the displayed function codes.

5. Select "▶" and press the rotary encoder to advance to the next relay.
6. Repeat for each configured programmable output relay.

Configuration examples

The photographs show the following example settings:

Relay	Selected function	Displayed function codes
K01	02	FS + NL + AR + NR
K02	04	FS + L + MR + NR
K03	05	NFS + NL + AR + R

These settings are examples and must be checked against the required alarm and protective functions for the application.

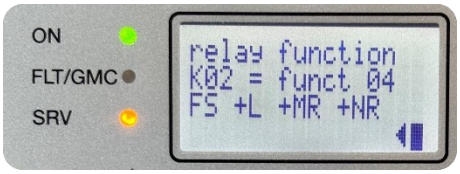


Figure 83: Relay K02 configured with function 04.

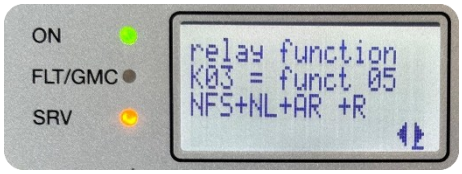


Figure 84: Relay K03 configured with function 05.

Available relay functions

The following relay functions are available:

Function	Switching principle	Alarm storage	Reset mode	Reset while alarm persists
01	NFS	NL	AR	NR
02	FS	NL	AR	NR
03	NFS	L	MR	NR
04	FS	L	MR	NR
05	NFS	NL	AR	R
06	FS	NL	AR	R
07	NFS	NL	AR2	R
08	FS	NL	AR2	R

Functions 07 and 08 provide automatic reset after two minutes. This is indicated by the code "AR2" on the display.

Application requirements

For each measuring channel and each configured alarm direction, configure the alarm having the highest relevance for safety as latching. Ensure that the associated relay output uses a latching function (L) requiring manual reset (MR) and cannot be reset while the alarm persists (NR). Select function 03 or 04 according to the required switching principle.

Use resettable or automatically silenced outputs for audible warnings only where another required alarm indication remains active. Do not use resetting or automatic silencing to cancel a required protective function.

Select latching and reset behaviour to suit the intended application and its applicable requirements. Check the interaction between relay assignment, alarm storage and resetting for every affected output.

Verify the configured relay functions during the functional test before returning the system to operation.

8.8.8. Completing Configuration

1. Check the final settings of all affected channel modes, channels and relays, including alarm thresholds, relay assignments and relay functions.
2. Record the final configuration and the changes made.
3. Select “exit” in Menu 3 and press the rotary encoder to return to Menu 2.
4. Exit Menu 2 and Menu 1 to return to measuring operation.
5. Check that all required channels are enabled, alarm inhibition is inactive, and any fault or service indication has been investigated and resolved.
6. Carry out the relevant functional tests described in Section 7.4. Verify the affected alarm indications, relay outputs and connected equipment, including latching and reset behaviour where applicable.

Release the system for operation only after the affected functions have been verified successfully.

8.8.9. Parameter Overview

The following table summarises the user-configurable parameters, available settings and standard factory configuration.

The standard factory configuration uses one channel mode set to Ex 100, assigned to all measuring channels. Where detectors are supplied with the control unit, the configuration may be adapted to those detectors and the customer’s requirements. Refer to the configuration record supplied with the device.

Changes to a channel mode affect all measuring channels assigned to that mode.

Menu / parameter	Description	Setting range / available options	Standard factory setting
Menu 2 Channel on/off	Enables or disables an individual measuring channel.	on / off	All configured channels on
Menu 2 Date/time	Sets the device clock and winter/summer-time settings.	Valid calendar dates from 2025 to 2060; time 00:00–23:59; automatic or manual winter/summer-time selection	Date and time set during the end-of-line test; automatic winter/summer-time switching enabled
Menu 2 Language	Selects the display language.	DE / EN	DE; EN on customer request
Menu 2 Displaycontrast	Adjusts display contrast.	0–60	10
Menu 3 Channel max	Sets the number of measuring channels used.	GMC 8032: 1–2; GMC 8034: 1–4	GMC 8032: 2; GMC 8034: 4
Menu 3 Relay max	Sets the number of programmable output relays used.	GMC 8032: 3–6; GMC 8034: 3–10	3

Menu 3 Channel mode max	Sets the number of available channel modes.	1 to the number of channels configured under “channel max”	1
Menu 3 Warm-up time	Delays measuring operation to allow connected detectors to stabilise.	0–900 s, in 10 s increments	0 s
Menu 3 Adr add-on modul	Sets the address for a compatible add-on module.	1–99; observe the module documentation	1
Menu 3 Password new	Changes the Menu 3 access password.	0000–9999	2222
Mode setup Channel-type	Selects the channel type and associated measurement characteristics.	See the channel-mode table in Section 8.8.3, including available alarm directions	Mode 01: Ex 100
Mode setup Unit	Selects the measuring unit where editable.	Depends on the channel type; see Section 8.8.3	%LEL for the standard Ex 100 configuration
Mode setup Measuring range	Defines the full-scale value.	Depends on the channel type; see Section 8.8.3. Fixed at 100 %LEL for Ex 100	100 %LEL
Mode setup Alarm 1/2/3 on	Sets the activation thresholds for A1, A2 and A3.	Generally 10–100 % of the measuring range; Ex 50 and Ex 100: 10–40 %LEL. See Section 8.8.3	Ex 100: A1 = 20 %LEL; A2 = 40 %LEL; A3 = 40 %LEL
Mode setup Hysteresis	Defines the difference between alarm activation and clearing thresholds.	1–5 %FS, in 1 %FS increments	1 %FS
Mode setup Switch-on delay	Sets the delay before alarm activation.	0–60 s, in 1 s increments, where editable. Fixed at 0 s for Ex 100. Use 0 s for explosion protection	0 s
Mode setup Zero dead band	Defines the interval around zero within which measured values are displayed as zero.	Ex and Tox: negative limit −10 to 0 %FS; positive limit 0 to +5 %FS, in 1 %FS increments. No zero-point suppression for Oxy or Refri	Both limits 0 %FS; suppression disabled
Mode setup Limits 4-20mA	Sets the lower and upper input-current fault thresholds.	Lower limit: Ex/Tox, 2.4 or 3.6 mA; Oxy/Refri, 3.2 or 3.6 mA. Upper limit: 21.0 or 22.0 mA	Standard Ex 100 configuration: lower 2.4 mA; upper 22.0 mA

Mode to channel	Assigns a channel mode to each measuring channel.	Channel modes available under “channel mode max”	All channels assigned to Mode 01, Ex 100
Channel name	Assigns a name to identify the measuring location.	Up to 10 characters: a–z, A–Z, 0–9, spaces and “#”. Enter “#” for no name	“#” followed by spaces; no channel name
Alarm to relay	Assigns each channel alarm level to a programmable output relay.	Relays available under “relay max”; several alarms may be assigned to the same relay	All channels: A1 → K1; A2 → K2; A3 → K3
Relay function	Selects switching principle, latching and reset behaviour.	Functions 01–08; see Section 8.8.7	K1: 02; K2: 04; K3: 05. Remaining programmable relays preset to 01 and unused while “relay max” is 3

Application requirements

Factory settings do not replace application-specific configuration. Check the settings against the connected detectors and required warning and protective functions before commissioning.

Set the warm-up time to suit the connected detectors. Configure the alarm having the highest relevance for safety in each alarm direction as latching, as described in Section 8.8.7.

The add-on module address does not indicate that a communication module is installed or available.

Operating and test functions

“Reset alarm”, “test LEDs”, “inhibit alarms”, “relay test” and “erase event log” are operating or test functions rather than persistent configuration parameters. Their operation and restrictions are described in Sections 8.6 and 8.7.

9. Maintenance

In Germany, inspections and checks must be carried out by personnel meeting the qualification requirements for the respective task specified in T023, Section 11. This may include specialists authorised by Bieler + Lang who meet these requirements.

Outside Germany, observe the applicable national requirements for personnel qualifications. Bieler + Lang recommends using a specialist authorised by Bieler + Lang for maintenance and testing.

Before starting work that interrupts gas monitoring or affects warning or protective functions, provide suitable alternative protective measures. Restore the required monitoring and protective functions as soon as possible.

9.1. Maintenance Schedule

Application-specific requirements

Gas detection systems are used for different purposes, including explosion protection, toxic gas monitoring and oxygen monitoring. The required maintenance tasks, test methods and intervals depend on the application, installed equipment, operating conditions and applicable national requirements.

The operator must establish and document a maintenance schedule for the complete installation. Include the control unit, gas detectors, sampling systems where fitted, and connected warning and protective equipment. Observe the instructions for each component.

Read the procedures described in IEC 60079-29-2 for flammable-gas and oxygen applications, IEC 62990-2 for toxic-gas applications, or other applicable codes of practice. Refer to these documents when planning and carrying out inspection, testing, calibration and maintenance of the complete gas detection system.

Check the measurement performance of the complete gas detection system during commissioning and at regular intervals thereafter. Calibrate the connected detectors according to their instructions and verify the corresponding indication at the control unit. The calibration interval shall not exceed one year unless an extension is supported by additional validated justification. Observe shorter intervals required by the application, detector instructions or applicable codes of practice.

Example: fixed gas detection systems for explosion protection in Germany

For this application, observe DGUV Information 213-057, BG RCI leaflet T023, Gaswarneinrichtungen und -geräte für den Explosionsschutz – Einsatz und Betrieb, particularly Section 7.3.

The following table summarises the recommended maximum intervals in T023, edition October 2023. Establish the actual intervals using the risk assessment, operating experience and manufacturer’s instructions.

Type of check	Recommended maximum interval	Main scope	Personnel qualification according to T023
Visual inspection	1 month	Check for visible damage, obstructed gas inlets and defects in sampling systems. Check readiness for measurement and investigate alarm or special operating states.	Instructed person (*unterwiesene Person*)

Functional check	4 months[1]	Include the visual inspection. Apply zero gas and test gas to assess indication accuracy and response time. Adjust if necessary. Check sampling equipment, flow and leak tightness where applicable.	Qualified specialist personnel (*qualifiziertes Fachpersonal*)
System check	1 year	Include the functional check. Verify all safety functions, including switching actions and connected protective measures. Compare safety-related settings with the specified configuration. Check signalling and recording equipment.	Competent person for gas detection systems (*befähigte Person – Gaswarneinrichtung*)
Review of records	3 years	Check completeness of maintenance records, implementation of corrective actions, and completeness and currency of installation documents and operating instructions.	Competent person for gas detection systems (*befähigte Person – Gaswarneinrichtung*)

[1] Extension of the functional-check interval to a maximum of one year is permitted under the specific conditions for automatic function monitoring described in T023, Section 7.3.5. Do not assume that control-unit diagnostics alone fulfil these conditions.

The qualification descriptions above refer to T023, Section 11.

A functional check includes a visual inspection due at the same time. A system check includes the functional check and visual inspection due at the same time. Under T023, the functional check alone does not require the switching functions to be triggered; these must be verified during the system check.

Battery replacement

Have the control unit's battery replaced every five years by a specialist authorised by Bieler + Lang. This maintenance interval applies in addition to the inspection and testing intervals above.

Establishing the intervals

Where sufficient operating experience under comparable conditions is unavailable, follow the initial checking procedure in T023, Section 7.3.3:

1. Carry out the first two functional checks at intervals of four weeks after commissioning.
2. If no adjustment is required, continue functional checks at intervals of two months.
3. If these checks also show that no adjustment is required, the interval may be increased to the recommended maximum.
4. If adjustment is necessary during the first eight weeks, use shorter intervals based on the observed performance.

Reassess the intervals following changes in operating or environmental conditions. Any departure from the recommended intervals must be justified and documented through the risk assessment. Observe applicable statutory inspection requirements.

Additional checks

After repairs, carry out a functional check or system check appropriate to the work performed before returning the installation to service.

For catalytic, semiconductor or electrochemical sensors exposed to concentrations exceeding the measuring range, T023 specifies a functional check shortly afterwards and a repeat check approximately one week later.

Input-signal simulation at the control unit does not verify gas access to the sensor or the detector's response to gas. Relay tests alone do not verify the complete safety function. Include the connected warning and protective equipment in the system check.

Documentation and return to service

Document the checks, results, assessment, defects and corrective actions. Include identification of the equipment, the date and the person performing the work. For gas tests, also record the test-gas composition, readings before and after adjustment, where applicable, and assessment of response times.

Unless longer retention periods apply, retain visual-inspection and functional-check records until the review of records. Retain system-check records and records of the review of records for ten years.

After maintenance, restore all required channels and alarm functions. Remove temporary alarm inhibition and bypasses in accordance with the agreed procedure. Release the installation for operation only after the required functions have been verified successfully.

10. Troubleshooting

Treat every gas alarm as potentially genuine. Follow the site emergency procedure before investigating a suspected malfunction.

Faults, disabled channels and service conditions may reduce or interrupt gas monitoring. Provide suitable alternative protective measures whenever the required monitoring or protective functions are unavailable.

Electrical checks and corrective work must be carried out by appropriately qualified personnel. Observe the safety instructions before accessing wiring or terminals.

10.1. Troubleshooting Table

Use “view fault” and “view event log” in Menu 1 to obtain additional information. Record the displayed messages and affected channels before changing settings.

Fault symptom or indication	Possible cause	Corrective action
Display blank; ON LED off	Power supply absent; interrupted supply connection; device fault	Check the external power supply and supply wiring against the specified requirements. If the correct supply is present and the device remains off, contact Bieler + Lang service.
FLT/GMC LED illuminated	Channel fault or internal device fault	Read “view fault” and identify the affected channel or diagnostic message. Follow the applicable action below.
Channel fault indicated; input below the configured lower current limit	Detector supply interrupted; open circuit; detector fault; incorrect wiring; unsuitable current-limit setting	Check the detector status, supply, wiring and actual input current. Compare the current with the detector documentation and configured limits. Do not change the limits merely to suppress the fault.
Channel fault indicated; input above the configured upper current limit	Detector output outside the permitted range; detector fault; wiring fault; unsuitable current-limit setting	Check the detector indication and actual input current. Investigate possible gas exposure and follow the detector instructions. Check wiring and configuration.
Channel displays “off”	Channel has been disabled	Establish why the channel was disabled. Restore it only when the detector and associated equipment are ready for operation. Verify the channel before returning it to service.
SRV LED remains illuminated	Configuration menu active; channel disabled; connected detector transmitting a maintenance signal; alarm inhibition active	Identify the service condition. Complete the work, restore required channels and alarm functions, and return to measuring operation. Check that the service indication clears.

Alarm indication present	Gas concentration has reached an alarm threshold; stored alarm; unsuitable configuration; detector malfunction	Follow the site alarm procedure. Establish the actual gas condition using suitable measures. Then check the detector, alarm settings and reset behaviour. Do not assume that the alarm is false.
Alarm or relay output cannot be reset	Alarm condition still present and the selected function is NR; alarm clearing condition not yet met	Check the measured value, hysteresis and selected relay function. Remove the cause of the alarm. Do not alter the relay function solely to permit resetting.
Relay output remains in its alarm state after the gas concentration returns to normal	Latching function selected; another assigned alarm remains active	Check all alarms assigned to the relay. For a latching output, perform a manual reset after the alarm clearing conditions have been met.
Relay output returns to its normal state while an alarm remains present	Manual reset of an R output; automatic reset of an AR2 output	Compare the selected function with the intended application. Functions 07 and 08 provide automatic reset after two minutes. Verify that the required warning and protective functions remain effective.
Relay contact or front-panel LED behaves differently from the expected alarm state	FS/NFS setting misunderstood; output reset; stored alarm; several alarms assigned to the relay	Check the relay assignment and function codes. Compare the output state with Section 8.8.7. The relay LED indicates the energised state, not necessarily the presence of an alarm.
Expected relay does not respond to an alarm	Incorrect relay assignment or function; alarm inhibition active; configuration error; relay fault	Check alarm inhibition, alarm-to-relay assignments and relay functions. Perform a controlled functional test. If the output still fails, contact Bieler + Lang service.
Relay operates, but connected warning or protective equipment does not respond	External supply interrupted; wiring fault; incorrect connection; connected equipment defective	Check the complete external circuit and connected equipment. Verify the required action by a controlled functional test before returning the installation to service.
Negative measured value displayed	Detector zero drift; negative input deviation; unsuitable configuration	Check the detector and input signal. Follow the detector instructions for zero checking and adjustment. If a fault is also indicated, investigate the configured lower signal limit. Do not use the zero dead band to conceal a fault.
Measured value implausible or inconsistent with the detector indication	Incorrect channel mode, measuring range or unit; unsuitable detector output configuration; wiring or detector fault	Compare the detector output specification with the assigned channel mode and range. Check the input current and wiring. Verify the complete measurement chain.

“Alarm to relay” diagnostic indicated	Alarm output without the required relay assignment	Check the relay assignments for the configured alarms. Correct the configuration and verify the affected alarm and output functions.
Internal temperature fault indicated	Excessive ambient temperature; inadequate ventilation; nearby heat source; internal fault	Check installation conditions, ventilation and heat sources. Restore the specified operating conditions. If the fault persists, contact Bieler + Lang service.
Internal memory, firmware, supply-monitoring, relay-control or self-test fault indicated; repeated restarts	Internal device fault	Record the diagnostic message and event-log entries. Provide alternative protection and contact Bieler + Lang service. Do not rely on repeated restarting as a corrective action.

11. Decommissioning and Disposal

11.1. Decommissioning

WARNING **Loss of gas monitoring**

Decommissioning the control unit disables monitoring of the connected channels and may affect warning and protective functions. Hazardous gas concentrations or explosive atmospheres may remain undetected.

- Before decommissioning, assess the consequences for the complete installation.
- Provide suitable alternative gas monitoring or other protective measures where required.
- Coordinate the work with the person responsible for the installation.

WARNING Hazard electrical voltage.

Externally supplied circuits connected to the relay terminals may remain live after the control unit's power supply has been disconnected.

- Isolate the control unit and all connected circuits that may carry hazardous voltage.
- Secure the isolated circuits against unintentional reconnection.
- Verify absence of voltage before touching terminals or disconnecting wiring.

Decommissioning must be carried out by qualified personnel. Electrical work must be carried out by personnel qualified for the task.

Proceed as follows:

1. Obtain authorisation from the person responsible for the installation. Establish the protective measures required while gas monitoring is unavailable.
2. Record the configuration and identify the connected detectors, relay circuits and associated warning and protective equipment.
3. Isolate the control unit's power supply and any separate supplies to connected circuits as required for safe disconnection.
4. Secure the isolated circuits against unintentional reconnection and verify absence of voltage.
5. Label and disconnect the electrical connections. Secure remaining cable ends and terminals against accidental contact, short circuits and unintended operation.
6. Release the control unit from the TS35 mounting rail and remove it from the installation.
7. Protect any components and wiring remaining in the installation against contamination, moisture and damage.

All relay contacts are open when the control unit is without power. Consider the resulting state of connected equipment before disconnecting the supply.

If the control unit is permanently removed, update the installation documentation. Ensure that the protective measures required by the risk assessment remain effective.

11.2. Disposal and Recycling



Do not dispose of the control unit or its battery with unsorted municipal waste.

Within the European Union, collect and dispose of electrical and electronic equipment separately in accordance with Directive 2012/19/EU on waste electrical and electronic equipment (WEEE) and the applicable national legislation. Outside the European Union, observe the local disposal requirements.

Return and disposal

Contact Bieler + Lang or the responsible national distribution partner to arrange the applicable return and disposal procedure before shipping the device.

Alternatively, use a suitably authorised waste-treatment company for electrical and electronic equipment. Confirm that the company is authorised to accept and treat the device.

Internal battery

The control unit contains an internal battery. Inform the organisation receiving the device that a battery is fitted.

Have the battery removed by a specialist authorised by Bieler + Lang or by the authorised waste-treatment facility. Removed batteries must be collected separately and disposed of through an appropriate battery collection or treatment route. Do not damage or short-circuit the battery.

For questions about return, battery handling or disposal, contact Bieler + Lang or the responsible national distribution partner.

12. Appendix

12.1. Spare Parts

Use only spare parts supplied or approved by Bieler + Lang. Replacement parts must match the specified electrical ratings and physical dimensions.

Spare part	Specification	Application	Bieler + Lang part number
Internal battery	CR 2032 Li-Manganese 3 V, 230 mAh	Internal battery replace every five years	12.071303.0
Main fuse	T 500 mA, time-lag TR5 package	Main fuse of the control unit	12.070475.0
Detector supply fuse	T 160 mA, time-lag TR5 package	Individual protection of each detector supply connection	12.071385.0
4–20 mA loop fuse	T 50 mA, time-lag TR5 package	Individual protection of each 4–20 mA input loop	12.071298.0

Fuse replacement

Fuse replacement must be carried out by personnel qualified for the task. Before accessing internal components, isolate the control unit and any externally supplied circuits that may carry hazardous voltage. Secure against unintentional reconnection and verify absence of voltage.

Identify and rectify the cause of a blown fuse before replacement. Never bridge a fuse or use a fuse with a higher current rating or different operating characteristic.

After replacement, verify the affected measuring channel and its associated alarm and output functions before returning the system to operation. If the replacement fuse blows again, contact Bieler + Lang service.

For spare-part orders, provide the device type, serial number and required part number.

12.2. Glossary

Term / abbreviation	Meaning
4–20 mA signal	Analogue current signal used to transmit the measured value from a gas detector to the control unit. Its interpretation depends on the configured measuring range and detector characteristics.
A1 / A2 / A3	The three configurable alarm levels available for each measuring channel.
Adjustment	Modification of a detector's settings to correct its indication. Adjustment differs from calibration, which checks the indication without necessarily changing it.
Alarm clearing condition	Condition that permits an alarm to clear, taking account of the alarm threshold and hysteresis. A latched relay output additionally requires manual reset.
Alarm inhibition	Temporary suppression of alarm functions using "inhibit alarms". Alternative protective measures may be required while inhibition is active.
Alarm threshold	Configured measured value at which an alarm is triggered, subject to the selected alarm direction and any permitted delay.
AR — Auto Reset	Relay reset mode in which the output returns automatically to its normal state when the alarm clearing condition is met. Manual acknowledgement is not required.
AR2 — Automatic reset after two minutes	Relay reset mode used by functions 07 and 08. The output resets automatically after two minutes, even if the alarm condition persists.
Calibration	Comparison of a detector's indication with the expected value when a gas of known composition and concentration is applied.
Channel / Ch	Measuring input and associated signal evaluation for one connected gas detector.
Channel mode	Set of measurement and alarm parameters that can be assigned to a measuring channel.
Channel type	Measurement characteristic selected within a channel mode using "channel-type", for example Ex 100.
Control unit	The GMC 8032 or GMC 8034. It evaluates detector signals, displays measured values and provides alarm, fault and service outputs. It does not measure gas directly.
Event log	Stored record of operating events, including alarms, faults and configuration-related events, with date and time information.
External reset	Reset command initiated by a potential-free push-button connected to the control unit's reset input. Its effect depends on the configured reset behaviour.
Fault / FLT	Condition indicating a malfunction or an input signal outside the configured permissible limits.
FLT/GMC	General fault indicator for the control unit or an associated measuring channel.

FS — Fail-safe	Relay switching principle: the contact is closed with the relay energised in the normal output state. In the alarm output state, the relay de-energises and the contact opens.
Full scale / %FS	Full scale is the configured measuring-range end value. %FS expresses a value as a percentage of that end value. In this context, FS does not mean Fail-safe.
Functional check	For the T023 maintenance schedule: a check including visual inspection, application of zero and test gas, assessment of indication and response time, and checks of sampling equipment where fitted.
Gas detector	Device that senses gas at the measuring location and supplies a corresponding signal to the control unit.
GND	Signal or supply reference connection. GND is not a protective-earth connection.
Group alarm	Relay output assigned to more than one alarm source, for example A1 from several measuring channels.
Hazardous area	Area in which an explosive atmosphere may occur and specific precautions are required. The control unit must be installed outside hazardous areas.
Hysteresis	Difference between the alarm activation and clearing thresholds. It prevents repeated switching when the measured value fluctuates near the alarm threshold.
K1–K10	Identifiers of programmable output relays. GMC 8032 provides K1–K6; GMC 8034 provides K1–K10.
L — Latching	Relay behaviour in which the output remains in its alarm state after the alarm clearing condition is met. Manual reset is required.
LEL — Lower Explosive Limit	Lower concentration limit of a flammable gas or vapour in air at which flame propagation can occur under specified conditions.
%LEL	Gas concentration expressed as a percentage of the lower explosive limit. 100 %LEL corresponds to the LEL of the specified gas; it does not mean 100 % gas by volume.
Measuring range	Configured concentration range used to interpret and display the connected detector's signal.
MR — Manual Reset required	Relay reset mode requiring deliberate manual reset after the alarm clearing condition is met.
NFS — Non-fail-safe	Relay switching principle: the contact is open with the relay de-energised in the normal output state. In the alarm output state, the relay energises and the contact closes.
NL — Non-latching	Relay behaviour in which the output returns automatically to its normal state when the alarm clearing condition is met. Earlier reset may be possible depending on the selected function.
NR — Not resettable while the alarm persists	Relay reset behaviour that prevents resetting while the alarm condition remains present.

Potential-free contact	Electrically isolated switching contact that does not itself supply voltage to the connected external circuit.
ppm / ppb	Parts per million / parts per billion. For gas volume fractions, 1 % vol equals 10,000 ppm; 1 ppm equals 1,000 ppb.
+PS	Positive supply connection for a connected gas detector.
R — Resettable while the alarm persists	Relay reset behaviour that permits resetting while the alarm condition remains present.
Relay assignment	Configuration linking an alarm source to a programmable output relay.
Relay function	Selected combination of switching principle, alarm storage and reset behaviour for a programmable relay.
Relay output state	Normal or alarm state of the output logic. The resulting physical contact position depends on whether FS or NFS is selected.
Reset	Command or automatic action returning a relay output to its normal state when permitted by its configuration. Resetting does not remove the underlying gas hazard.
Response time	Time taken by a detector or system to respond to a change in gas concentration under specified conditions.
Rotary encoder	Front-panel control turned to select items or change values and pressed to confirm selections.
Service condition / SRV	Operating condition associated with configuration, maintenance or another service-related state. Required gas monitoring may be affected.
Signal chain	Complete path from gas detection through signal evaluation to warning indications and the action of connected protective equipment.
ST	Designation of the dedicated device/detector fault relay output.
Switch-on delay	Configured delay between fulfilment of an alarm condition and activation of the alarm.
System check	For the T023 maintenance schedule: a check including the functional check, all safety functions and switching actions, safety-related configuration, and signalling and recording equipment.
T — Time-lag fuse	Fuse characteristic identifying a delayed response to overcurrent. Used together with the specified current, voltage, breaking capacity and package.
T023	BG RCI leaflet, also published as DGUV Information 213-057, addressing the use and operation of gas detection equipment for explosion protection.
Test gas	Gas or gas mixture of known composition and concentration used to check a gas detector’s performance.
TR5	Physical package designation of the internal fuses. It does not specify their current rating or operating characteristic.

Visual inspection	Check for visible damage, obstructed gas inlets, sampling-system defects and readiness for measurement.
% vol	Gas concentration expressed as a percentage by volume.
Warm-up time	Start-up period provided to allow connected detectors to warm up and stabilise before their signals are used for gas monitoring.
WEEE	Waste electrical and electronic equipment. Such equipment requires separate collection and appropriate treatment.
Zero dead band	Configured interval around zero within which measured values are displayed as zero. It must not be used to conceal detector drift or faults.
Zero gas	Gas used to establish or check the detector's zero indication, selected according to the detector manufacturer's instructions.

12.3. Configuration Record

Device identification and basic settings

Record the actual configuration after changes. Complete all applicable fields; mark unused entries N/A. Do not enter passwords.

Identification	Entry
Installation / customer	
Location / cabinet	
Device type (GMC 8032 or GMC 8034)	
Serial number	
Firmware version	
Prepared by / company	
Previous record / revision	

Basic settings - enter actual values

Parameter	Setting range / options	Actual value
channel max	1-2 (8032) / 1-4 (8034)	
relay max	3-6 (8032) / 3-10 (8034)	
channel mode max	1 to configured channel count	
warm-up time	0-900 s; 10 s increments	
adr add-on modul	1-99; N/A if no module fitted	
language	DE / EN	
displaycontrast	0-60	
winter/summer time	Automatic / manual W / manual S	

Add-on module type / document reference (if fitted): _____

☐ Menu 3 password changed (optional record; do not enter the password)

Store passwords separately in accordance with the site access-control procedure.

Before release, verify correct date and time and select the winter/summer-time mode required for the installation.

Record ID: _____ Date: _____

Channel mode settings

Complete one column for each configured mode. Settings apply to every channel assigned to that mode. Record units and alarm direction explicitly.

Parameter	Mode 01	Mode 02	Mode 03	Mode 04
Channel type				
Measuring unit				
Full-scale value				
Alarm direction (rising / falling)				
A1 threshold (in stated unit)				
A2 threshold (in stated unit)				
A3 threshold (in stated unit)				
Hysteresis (%FS)				
Switch-on delay (s)				
Zero dead band, negative (%FS)				
Zero dead band, positive (%FS)				
Lower input fault limit (mA)				
Upper input fault limit (mA)				

Setting limits and application notes

Channel types, units, ranges and alarm directions: see Section 8.8.3.

Hysteresis: 1-5 %FS, in 1 %FS increments. Delay: 0-60 s, in 1 s increments where editable; Ex 100 fixed at 0 s. Use 0 s for explosion protection.

Zero dead band: Ex/Tox negative -10 to 0 %FS, positive 0 to +5 %FS; 1 %FS increments. Both 0 disables suppression. Oxy/Refri: N/A (no suppression).

Lower fault limit: Ex/Tox 2.4 or 3.6 mA; Oxy/Refri 3.2 or 3.6 mA. Upper fault limit: 21.0 or 22.0 mA.

Identify the alarm with the highest safety relevance for each configured direction and verify the required latching output on page 3.

Record ID: _____ Date: _____

Channel assignments and relay configuration

Record actual detector and channel assignments. GMC 8032: Ch1-Ch2 and K1-K6 only. Mark other channels and relays N/A.

Measuring channels

Channel	on/off	Mode no.	Channel name (max. 10 characters)
Ch1			
Ch2			
Ch3			
Ch4			

Channel	Detector type / serial number / target gas / measuring location
Ch1	
Ch2	
Ch3	
Ch4	

Alarm-to-relay assignments

Channel	A1 → relay(s)	A2 → relay(s)	A3 → relay(s)
Ch1			
Ch2			
Ch3			
Ch4			

Relay functions - enter function number 01-08

K01	K02	K03	K04	K05

K06	K07	K08	K09	K10

01 NFS/NL/AR/NR; 02 FS/NL/AR/NR; 03 NFS/L/MR/NR; 04 FS/L/MR/NR;

05 NFS/NL/AR/R; 06 FS/NL/AR/R; 07 NFS/NL/AR2/R; 08 FS/NL/AR2/R. See 8.8.7.

Record ID: _____ Date: _____

Change history verification and release

Complete after configuration and testing. This record documents settings; it does not replace the functional test procedure or its detailed results.

Changes and reasons

Parameter / channel / relay	Previous setting	New setting / reason for change

Additional change record / attachment reference: _____

Verification before release - confirm each completed check

☐ Settings and channel modes match the connected detectors and application.

☐ Highest safety-relevance alarm in each direction has the required latching output.

☐ Relevant tests in Section 7.4 passed, including connected protective equipment.

☐ All required channels are enabled; test settings and temporary bypasses removed.

☐ Alarm inhibition is inactive and normal measuring operation is restored.

☐ No unresolved fault or unexplained service indication remains.

☐ Date, time and winter/summer-time settings checked.

Verification and release	Entry
Functional test record reference	
Test date	
Configuration performed by	
Date	
Verified / authorised for operation by	
Release date	
Signature / approval reference	

Record ID: _____ Date: _____

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