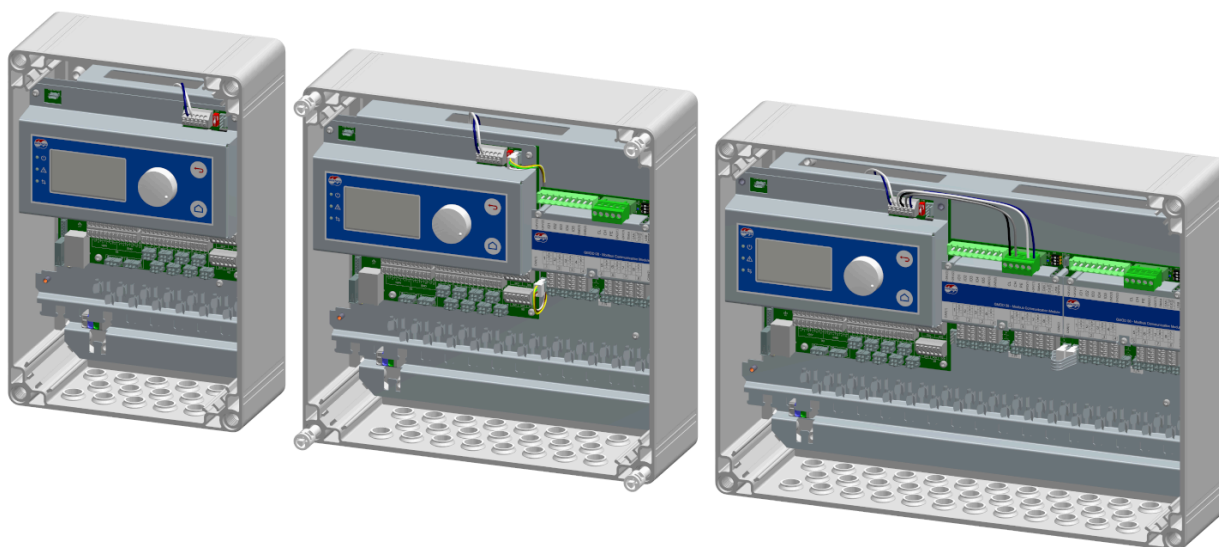


## GMMnext EC/xx.1

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|          |         |                 |
|----------|---------|-----------------|
| ERP No.: | 5207185 | GMMnext EC/08.1 |
|          | 5207186 | GMMnext EC/16.1 |
|          | 5207187 | GMMnext EC/24.1 |

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## Contents

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# 1 GMMnext EC/xx.1

## 1.1 Functional description

The GMMnext EC/xx.1 serves to control EC fans. The speed of the connected fans is adjusted depending on the control deviation between the actual value and the setpoint.

In order to ensure controlled operation, the controller must have a power supply and must be enabled via the digital input (DI1 by default). If it is not enabled the process will not be controlled.

The unit has an internal PID controller, whose parameters (amplification factor, integral and differential time) can be configured either via the menu or via a field bus interface like e.g. Modbus RTU (RS485) or Modbus TCP (ETH1).

The setpoint can be specified via the internal menu, an external analogue value or an internal or external communication interface. The actual value is determined via a pressure sensor (4-20mA), a temperature sensor (PT1000) or a 0-10V signal.

Depending on the model, up to 8, 16 or 24 EC fans can be controlled by the controller via separate bus segments. These fans must be set up for the condenser or dry cooler, depending on the design of the heat exchanger. These settings are necessary on initial commissioning and may need to be repeated when a fan is replaced. This commissioning process determines the performance and noise emissions.

The GMM automatically detects whether commissioning is necessary when it is switched on. If this is the case, it will jump to the commissioning menu and the user will be guided through the commissioning process.

The GMMnext EC/xx.1 has the following inputs and outputs:

- 5 analogue inputs (AI1 to AI5), each one variably configurable
- 2 analogue outputs (AO1 to AO2)
- 5 digital inputs (DI1 to DI5)
- 5 digital relay outputs (DO1+ DO2 changeover contacts, DO3 to DO5 closers).

The profiles and functions of the input and outputs can be set via the IO-configuration menu in conjunction with settings for the functions itselfs. The digital inputs are designed for positive voltages of a nominal +24V.

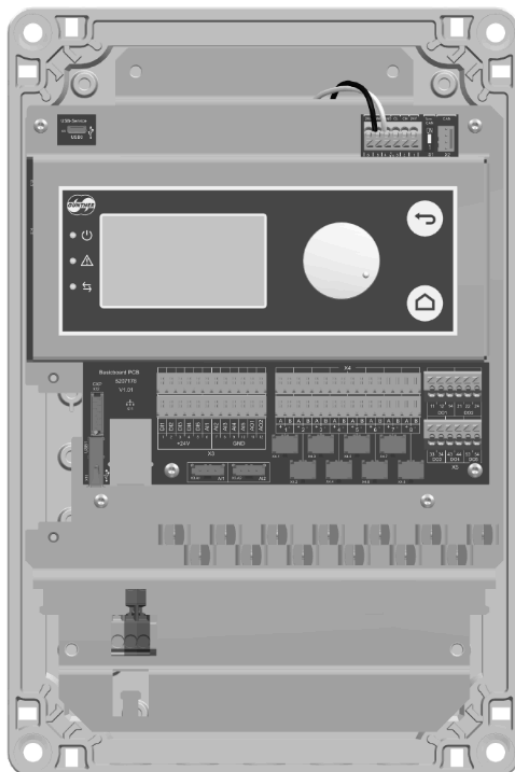
### NOTICE

Please note that connecting the wrong voltage (e.g. 230V) may seriously damage the controller.

## 1.2 Variants

GMMnext EC/08.1

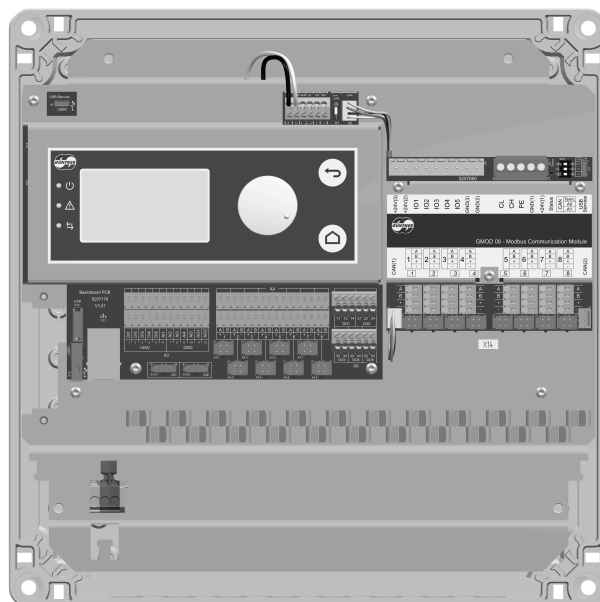
Connection of up to 8 fans



## GMMnext EC/16.1

Connection of up to 16 fans

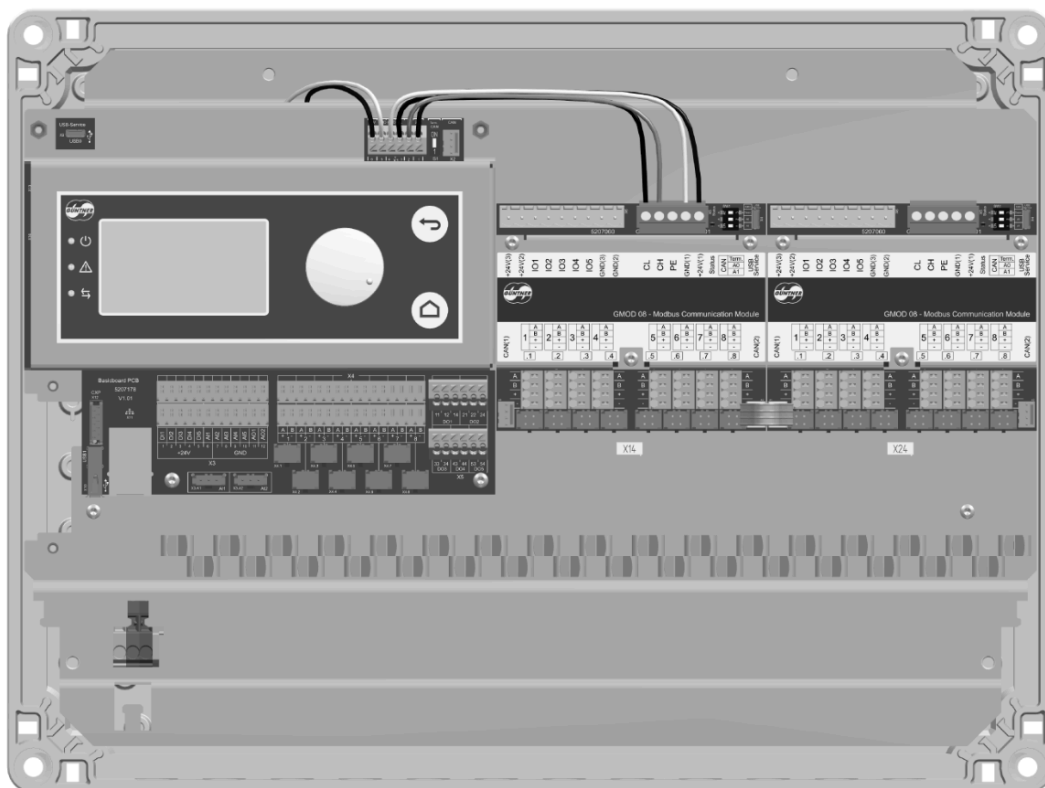
Type with additional 1 x GMOD 08 GMMnext EC.1



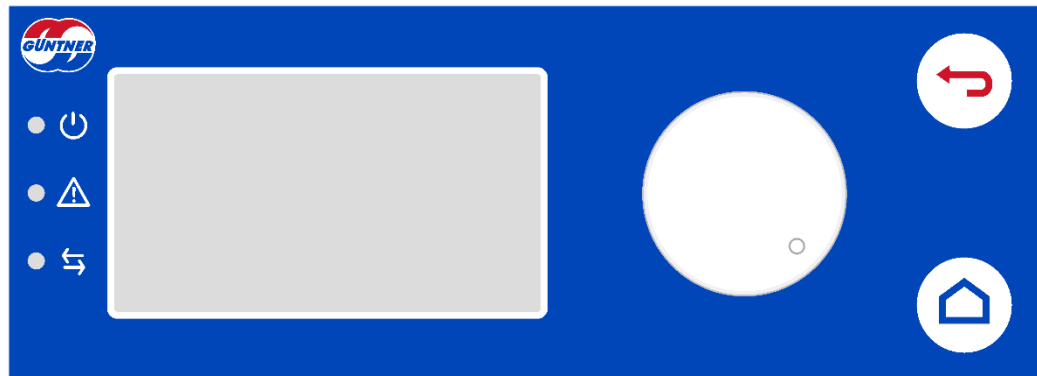
# GMMnext EC/24.1

Connection of up to 24 fans

Type with additional 2 x GMOD 08 GMMnext EC.1



## 1.3 Operating unit



Controls GMMnext EC\_xx.1

| Status LED                                                                          | Description                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <b>General operating state <sup>*1)</sup></b><br>LED status:<br>Off → No supply voltage<br>Green → Ready, no error<br>Orange → Warning<br>Red → Serious error in the control device, user must take action                                                  |
|  | <b>Alarm status <sup>*1)</sup></b><br>LED status:<br>Off → No active control activity<br>Green → System operating normally<br>Orange → Warning, maintenance request, critical operating state (e.g. overload)<br>Red → Control error, user must take action |
|  | <b>Internal/external communication <sup>*1)</sup></b><br>LED status:<br>Off → No active int. / ext. communication<br>Green → Active communication status<br>Orange → Warning (faults, overload...)<br>Red → Error, communication disrupted                  |

Status display GMMnext EC\_xx.1

<sup>\*1)</sup> More detailed information regarding the meaning of LED statuses and flashing LEDs can be found in the user manual.

## 1.4 Configuration table

### NOTICE

The following table shows a “standard configuration” of the control device following commissioning. Details of all possible configurations can be found in the section [Function table, page 9](#).

|    | I/O | Sig-<br>nal/Profile              | Function                                                    |
|----|-----|----------------------------------|-------------------------------------------------------------|
| X3 | DI1 | 24V                              | Enable                                                      |
|    | DI2 |                                  | No function                                                 |
|    | DI3 |                                  | No function                                                 |
|    | DI4 |                                  | No function                                                 |
|    | DI5 |                                  | No function                                                 |
|    | AI1 | 0...10V                          | 4...20 mA pressure sensor (scaling 0-25 bar) <sup>*1)</sup> |
|    | AI2 | 2...10V                          | 0...10V / no function                                       |
|    | AI3 | 0...20mA                         | PT1000 outlet temperature (-30...100°C) <sup>*2)</sup>      |
|    | AI4 | 4...20mA                         | PT1000 outlet temperature (-30...100°C) <sup>*2)</sup>      |
|    | AI5 | Resis-<br>tance ther-<br>mometer | 0...10V control value slave (0...100%) <sup>*3)</sup>       |
|    | AO1 | 0...10V                          | Control value of fan group 1                                |
|    | AO2 | 2...10V                          | No function                                                 |
| X5 | DO1 | Float-<br>ing relay              | Alarm message Prio 1 (contact 11/12 closed)                 |
|    | DO2 |                                  | Warning message Prio 2 (contact 21/22 closed)               |
|    | DO3 |                                  | Operating state                                             |
|    | DO4 |                                  | Threshold function                                          |
|    | DO5 |                                  | No function                                                 |

Configuration table GMMnext EC/xx.1

<sup>\*1)</sup>: Condition: Heat exchanger = condenser and operating mode = automatic internal

<sup>\*2)</sup>: Condition: Heat exchanger = dry cooler and operating mode = automatic internal

<sup>\*3)</sup>: Condition: Operating mode = slave external analogue

## 1.5 Function table

The following table shows the possible functions of the GMMnext. Depending on the wiring of the controller, these functions can be selected individually in the service menu/the I/O configuration or rather in the sensor configuration and in the respective functions. Some functions (e.g. digital inputs) can be assigned several times to different functions. A multitude of different sensors can be configured, which can then be assigned to the respective analog inputs. For the analog inputs, by selecting a profile, the measurement can be switched between current, voltage and resistance.

| I/O type       | Function                                                                                                                          | Possible I/Os | Recommendation * 1) |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------|---------------|---------------------|
| DO (relay)     | Alarms prio 1                                                                                                                     | DO1 + DO2     | DO1                 |
| DO (relay)     | Alarms prio 2                                                                                                                     | DO1 + DO2     | DO2                 |
| DO (relay)     | Operating state                                                                                                                   | DO1 to DO5    | DO3                 |
| DO (relay)     | Threshold function                                                                                                                | DO1 to DO5    | DO4                 |
| DI (24 V)      | Enable fans                                                                                                                       | DI1 to DI5    | DI1                 |
| DI (24 V)      | Switch over to setpoint 2                                                                                                         | DI1 to DI5    | DI3                 |
| DI (24 V)      | Heating mode                                                                                                                      | DI1 to DI5    | DI3                 |
| DI (24 V)      | Switch on manual mode                                                                                                             | DI1 to DI5    | DI4                 |
| DI (24 V)      | Switch on night setback                                                                                                           | DI1 to DI5    | DI2                 |
| DI (24 V)      | Switch on inverse operation                                                                                                       | DI1 to DI5    | DI5                 |
| DI (24 V)      | External fault message                                                                                                            | DI1 to DI5    | DI5                 |
| AI (0...20 mA) | Currently no function                                                                                                             | AI1 to AI5    |                     |
| AI (4...20 mA) | Pressure sensor, e.g. actual value for the control cycle (scaling should be configured separately, e.g. 0...25 bar or 0...40 bar) | AI1 to AI5    | AI1                 |
| AI (4...20 mA) | Active temperature sensor, actual value for the control cycle (scaling should be configured separately, e.g. -30...70°C)          | AI1 to AI5    | AI3                 |
| AI (4...20 mA) | Active temperature sensor, external temperature (scaling should be configured separately, e.g. -50...50°C)                        | AI1 to AI5    | AI2                 |
| AI (4...20 mA) | Control value 0...100 % for the fans in slave external analogue operating mode                                                    | AI1 to AI5    | AI4                 |
| AI (4...20 mA) | External setpoint (scaling should be configured separately)                                                                       | AI1 to AI5    |                     |
| AI (4...20 mA) | Setpoint displacement (scaling should be configured separately)                                                                   | AI1 to AI5    |                     |
| AI (0...10 V)  | Pressure sensor, e.g. actual value for the control cycle (scaling should be configured separately, e.g. 0...25 bar or 0...40 bar) | AI1 to AI5    |                     |

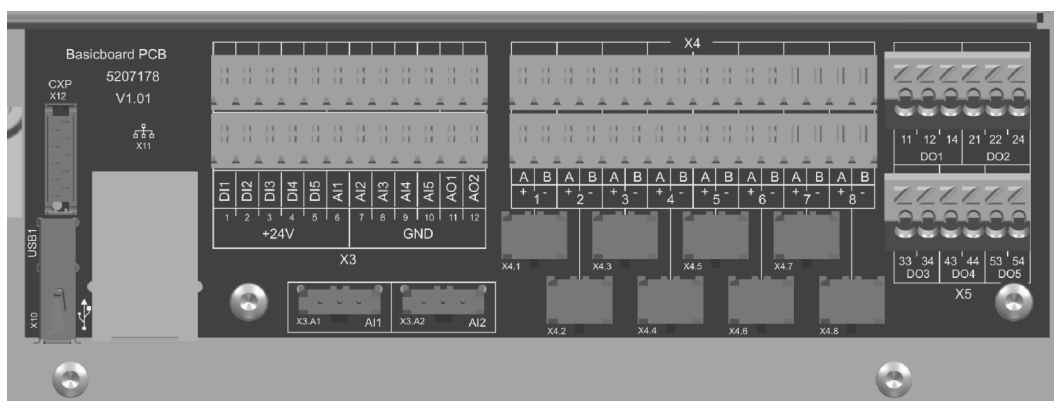
Function table GMMnext EC\_xx.1

| I/O type      | Function                                                                                                                                               | Possible I/Os | Recommendation * 1) |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------------|
| AI (0...10 V) | Active temperature sensor, e.g. actual value for the control cycle or external temperature (scaling should be configured separately, e.g. -30....70°C) | AI1 to AI5    |                     |
| AI (0...10 V) | Active temperature sensor, external temperature (scaling should be configured separately, e.g. -50....50°C)                                            | AI1 to AI5    |                     |
| AI (0...10 V) | Control value 0...100 % for the fans in slave external analogue operating mode                                                                         | AI1 to AI5    | AI4                 |
| AI (0...10 V) | External setpoint (scaling should be configured separately)                                                                                            | AI1 to AI5    |                     |
| AI (0...10 V) | Setpoint displacement (scaling should be configured separately)                                                                                        | AI1 to AI5    |                     |
| AI (PT1000)   | Recording the outlet temperature                                                                                                                       | AI1 to AI5    | AI3                 |
| AI (PT1000)   | Recording the inlet temperature                                                                                                                        | AI1 to AI5    | AI2                 |
| AI (PT1000)   | External temperature                                                                                                                                   | AI1 to AI5    |                     |
| AO (0...10 V) | Control value 0...100 % of the PID controller (control cycle 1...5)                                                                                    | AO1/AO2       |                     |
| AO (0...10 V) | Control value of the fan group 1                                                                                                                       | AO1/AO2       | AO1                 |
| AO (0...10 V) | Control signal for the subcooler fan                                                                                                                   | AO1/AO2       | AO2                 |

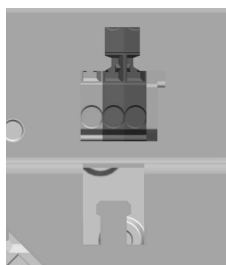
Function table GMMnext EC\_xx.1

\* 1) The recommendation is a suggestion for a consistent system configuration.

## 1.6 Connections



Connections X3, X4, X5, X10, X11, X12



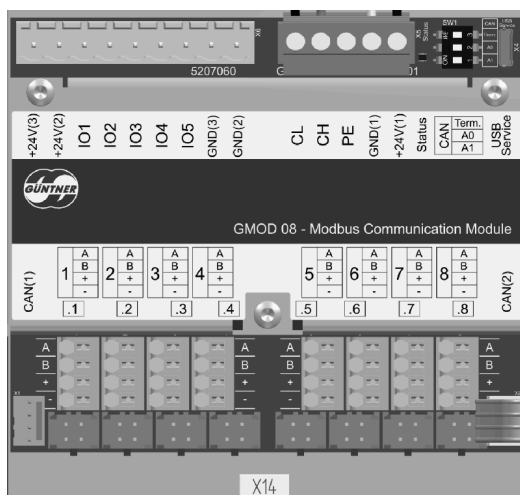
Connection X0



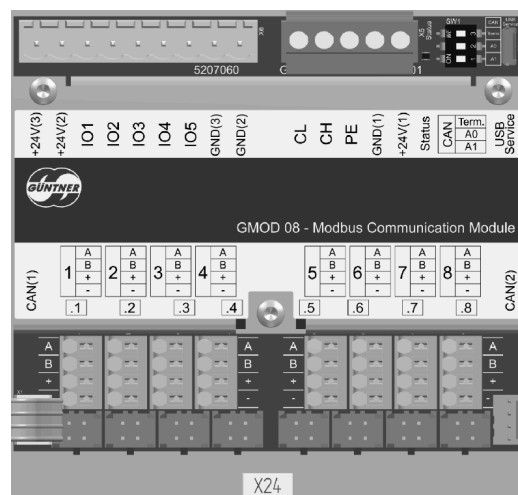
Connection X9



Connections X1, S1, X2



Connections X14 (On the first GMOD 08 GMMnext EC.1)



Connections X24 (On the second GMOD 08 GMMnext EC.1)

|    | Name         | Description                                                                                                                                                       |
|----|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X0 | Mains supply | Mains connection:<br>Phase L1: grey<br>Neutral conductor N: blue<br>Protective conductor PE: green and yellow                                                     |
| X1 | 24V          | 24 volt supply from the internal power supply unit                                                                                                                |
|    | GND          | GND supply from the internal power supply unit                                                                                                                    |
|    | GND          | Ground potential for CAN bus                                                                                                                                      |
|    | CL           | CAN low                                                                                                                                                           |
|    | CH           | CAN high                                                                                                                                                          |
|    | +24V         | 24 volts for supplying a CAN module                                                                                                                               |
| X2 | CAN          | CAN bus connecting plug                                                                                                                                           |
| X3 | 1 ... 6      | +24V - Positive supply voltage for digital inputs (when floating switching contacts are used) and connected sensors                                               |
|    | 7 ... 12     | GND - Reference potential for analogue inputs (voltage, current, resistance, PT1000 temperature sensors), digital inputs (voltage) and analogue outputs (voltage) |
|    | DI1          | Digital inputs +24V, X3-7..12 as reference potential                                                                                                              |
|    | DI2          |                                                                                                                                                                   |
|    | DI3          |                                                                                                                                                                   |
|    | DI4          |                                                                                                                                                                   |
|    | DI5          |                                                                                                                                                                   |
|    | AI1          | Analogue inputs, depending on the configuration 0-10V, 2-10V, 0..20mA, 4..20mA or PT1000                                                                          |
|    | AI2          |                                                                                                                                                                   |
|    | AI3          |                                                                                                                                                                   |
|    | AI4          |                                                                                                                                                                   |
|    | AI5          |                                                                                                                                                                   |
|    | AI1          | Additional parallel plug-in contact for the analogue input AI1 (+24V, AI1, GND)                                                                                   |
|    | AI2          | Additional parallel plug-in contact for the analogue input AI2 (+24V, AI2, GND)                                                                                   |
|    | AO1          | Analogue outputs, depending on the configuration 0-10V                                                                                                            |
|    | AO2          |                                                                                                                                                                   |

|                    | Name | Detail                       | Description                      |
|--------------------|------|------------------------------|----------------------------------|
| X4                 | 1A   | Signal A / Data +            | Modbus (RS485) connection fan 1  |
|                    | 1B   | Signal B / Data -            |                                  |
|                    | 1+   | +24 VDC<br>(max. 100mA)      |                                  |
|                    | 1-   | Common/GND<br>ref. potential |                                  |
|                    | to   | /                            |                                  |
|                    | 8A   | Signal A / Data +            | Modbus (RS485) connection fan 8  |
|                    | 8B   | Signal B / Data -            |                                  |
|                    | 8+   | +24 VDC<br>(max. 100mA)      |                                  |
|                    | 8-   | Common/GND<br>ref. potential |                                  |
| X14 <sup>*1)</sup> | 1A   | Signal A / Data +            | Modbus (RS485) connection fan 9  |
|                    | 1B   | Signal B / Data -            |                                  |
|                    | 1+   | +24 VDC<br>(max. 100mA)      |                                  |
|                    | 1-   | Common/GND<br>ref. potential |                                  |
|                    | to   | /                            |                                  |
|                    | 8A   | Signal A / Data +            | Modbus (RS485) connection fan 16 |
|                    | 8B   | Signal B / Data -            |                                  |
|                    | 8+   | +24 VDC<br>(max. 100mA)      |                                  |
|                    | 8-   | Common/GND<br>ref. potential |                                  |
| X24 <sup>*2)</sup> | 1A   | Signal A / Data +            | Modbus (RS485) connection fan 17 |
|                    | 1B   | Signal B / Data -            |                                  |
|                    | 1+   | +24 VDC<br>(max. 100mA)      |                                  |
|                    | 1-   | Common/GND<br>ref. potential |                                  |
|                    | to   | /                            |                                  |
|                    | 8A   | Signal A / Data +            | Modbus (RS485) connection fan 24 |
|                    | 8B   | Signal B / Data -            |                                  |
|                    | 8+   | +24 VDC<br>(max. 100mA)      |                                  |
|                    | 8-   | Common/GND<br>ref. potential |                                  |

|     | Name        | Detail                                                                                                                                                                                                                                                                                                                                                                                                         | Description |
|-----|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| X5  | DO1         | 11 (COM)                                                                                                                                                                                                                                                                                                                                                                                                       | Relay 1     |
|     |             | 12 (NC)                                                                                                                                                                                                                                                                                                                                                                                                        |             |
|     |             | 14 (NO)                                                                                                                                                                                                                                                                                                                                                                                                        |             |
|     | DO2         | 21 (COM)                                                                                                                                                                                                                                                                                                                                                                                                       | Relay 2     |
|     |             | 22 (NC)                                                                                                                                                                                                                                                                                                                                                                                                        |             |
|     |             | 24 (NO)                                                                                                                                                                                                                                                                                                                                                                                                        |             |
|     | DO3         | 33 (COM)                                                                                                                                                                                                                                                                                                                                                                                                       | Relay 3     |
|     |             | 34 (NO)                                                                                                                                                                                                                                                                                                                                                                                                        |             |
|     | DO4         | 43 (COM)                                                                                                                                                                                                                                                                                                                                                                                                       | Relay 4     |
|     |             | 44 (NO)                                                                                                                                                                                                                                                                                                                                                                                                        |             |
| DO5 | 53 (COM)    | Relay 5                                                                                                                                                                                                                                                                                                                                                                                                        |             |
|     | 54 (NO)     |                                                                                                                                                                                                                                                                                                                                                                                                                |             |
| X9  | USB service | Service interface (micro USB socket, USB2.0 high speed). This interface is intended exclusively for service applications.                                                                                                                                                                                                                                                                                      |             |
| X10 | USB1        | USB expansion interface (USB type A, socket, USB2.0 high speed). This interface can be used for: <ul style="list-style-type: none"><li>• Connection of a USB storage medium to:<ul style="list-style-type: none"><li>◦ Make software updates</li><li>◦ Save and load parameter sets (configuration data)</li></ul></li><li>• Connect external peripheral devices such as network adapters (WLAN/LAN)</li></ul> |             |
| X11 | Ethernet    | Ethernet interface <sup>*3)</sup>                                                                                                                                                                                                                                                                                                                                                                              |             |
| X12 | CXP         | Expansion port for additional external communication interfaces                                                                                                                                                                                                                                                                                                                                                |             |

<sup>\*1)</sup> Only with GMMnext EC/16.1 and GMMnext EC/24.1 on assembly group GMOD 08 GMMnext EC.1

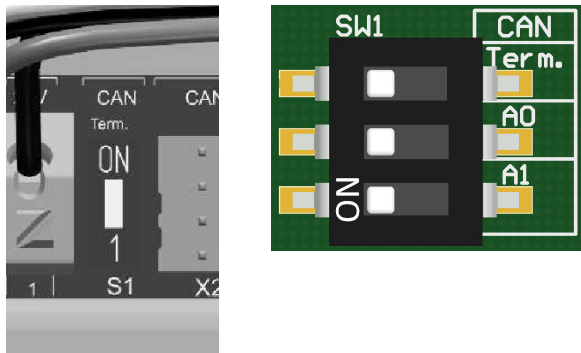
<sup>\*2)</sup> Only with GMMnext EC/24.1 on assembly group GMOD 08 GMMnext EC.1

<sup>\*3)</sup> Various functions can be provided via the Ethernet interface (e.g. Ethernet-based field buses). For details please refer to the operating manual.

## 1.7 DIP switch

The termination of the CAN bus can be switched on and off via the DIP switch S1 on the base board.

Via the DIP switch SW 1 on the GMOD 08 GMMnext EC.1 (where applicable), the termination of the CAN bus and the CAN bus address (node ID) of the module can be set.



| Term | Meaning                       |
|------|-------------------------------|
| OFF  | CAN bus termination off       |
| ON   | CAN bus termination activated |

### NOTICE

Termination must be switched on for the first and last CAN bus subscriber. Termination must be switched off for all other subscribers.

| A1  | A0  | Meaning                                                                    | Node ID [decimal] |
|-----|-----|----------------------------------------------------------------------------|-------------------|
| OFF | OFF | This setting should be chosen if fans 1-8 are connected to this GMOD 08.   | 49                |
| OFF | ON  | This setting should be chosen if fans 9-16 are connected to this GMOD 08.  | 50                |
| ON  | OFF | This setting should be chosen if fans 17-24 are connected to this GMOD 08. | 51                |
| ON  | ON  | not used                                                                   | -                 |

## 1.8 Electrical properties of

| Description                                         | Min               | Type | Max  | Unit                  |
|-----------------------------------------------------|-------------------|------|------|-----------------------|
| <b>Power supply</b>                                 |                   |      |      |                       |
| Input voltage range (AC)                            | 85                |      | 264  | VAC                   |
| Input voltage (DC)<br>(alternative)                 | 120               |      | 373  | VDC                   |
| Input voltage frequency                             | 47                |      | 63   | Hz                    |
| Current consumption of GMMnext EC/08.1<br>(115 VAC) |                   |      | 510  | mA                    |
| Current consumption of GMMnext EC/08.1<br>(230 VAC) |                   |      | 305  | mA                    |
| Current consumption of GMMnext EC/16.1<br>(115 VAC) |                   |      | 910  | mA                    |
| Current consumption of GMMnext EC/16.1<br>(230 VAC) |                   |      | 540  | mA                    |
| Current consumption of GMMnext EC/24.1<br>(115 VAC) |                   |      | 1360 | mA                    |
| Current consumption of GMMnext EC/24.1<br>(230 VAC) |                   |      | 830  | mA                    |
| <b>Digital inputs</b>                               |                   |      |      |                       |
| Potential separation                                | No                |      |      |                       |
| High level (digital mode) *2)                       | 15                | 24   | 28   | V                     |
| Low level (digital mode) *2)                        | -1                | 0    | 5    | V                     |
| Frequency (digital mode) *2)                        |                   |      | 20   | kHz                   |
| Input resistor:                                     | 35                |      |      | kΩ                    |
| <b>Relay outputs</b>                                |                   |      |      |                       |
| Potential separation                                | Yes               |      |      |                       |
| Voltage DC                                          |                   | 24   | 30   | V                     |
| Voltage AC                                          |                   |      | 250  | V                     |
| Current resistive load (30 VDC)                     |                   |      | 1.0  | A                     |
| Current inductive load (30 VDC)                     |                   |      | 0.45 | A                     |
| Current resistive load (250VAC)                     |                   |      | 1.5  | A                     |
| Current inductive load (250VAC)                     |                   |      | 0.6  | A                     |
| Switch cycles, mechanical                           | 1*10 <sup>5</sup> |      |      | Switch-<br>ing cycles |
| Switching cycles, electrical                        | 1*10 <sup>5</sup> |      |      | Switch-<br>ing cycles |

\*1) The maximum current consumption includes supplying 2 connected pressure transmitters and 1 connected temperature sensor.



\*2) Digital inputs can be operated in analogue or digital mode. The switching levels in analogue mode are configured via software parameters.

| Description                                                        | Min | Type | Max  | Unit             |
|--------------------------------------------------------------------|-----|------|------|------------------|
| <b>Analogue input general</b>                                      |     |      |      |                  |
| Potential separation                                               | No  |      |      |                  |
| Dielectric strength                                                | -5  |      | 30   | V                |
| Resolution                                                         |     |      | 12   | Bit              |
| <b>Analogue input voltage mode 0...10V</b>                         |     |      |      |                  |
| Measuring range                                                    | 0   |      | 12   | V                |
| Error                                                              |     | 0.25 | 0.5  | % <sup>*3)</sup> |
| Input resistor:                                                    | 100 |      |      | kΩ               |
| <b>Analogue input current mode 0..25mA</b>                         |     |      |      |                  |
| Measuring range                                                    | 0   |      | 25   | mA               |
| Error                                                              |     | 0.25 | 0.5  | % <sup>*3)</sup> |
| Input resistor in the measuring range (without protective circuit) |     | 110  | 150  | Ω                |
| <b>Analogue input PT1000 mode</b>                                  |     |      |      |                  |
| Measurement range (resistance)                                     | 800 |      | 1500 | Ω                |
| Error (resistance)                                                 |     | 1.5  | 2.0  | Ω                |
| Measuring range (temperature)                                      | -50 |      | 130  | °C               |
| Error (temperature)                                                |     | 0.4  | 0.6  | K                |
| Measured current                                                   |     | 1    | 1.4  | mA               |

\*3) error relating to measuring range end value

| Description                              | Min | Type | Max | Unit             |
|------------------------------------------|-----|------|-----|------------------|
| <b>Voltage output 0..10V</b>             |     |      |     |                  |
| Potential separation                     | No  |      |     |                  |
| Voltage range                            | 0   |      | 10  | V                |
| Load resistance                          |     | ≥5   |     | kΩ               |
| Resolution                               |     |      | 12  | Bit              |
| Error ( $I_{out} \leq 1\text{mA}$ )      |     |      | 1   | % <sup>*4)</sup> |
| Short circuit protection                 | Yes |      |     |                  |
| Short circuit current ( $I_{out\_max}$ ) |     |      | 5   | mA               |
| <b>Ethernet interface 1 / 2</b>          |     |      |     |                  |
| Dielectric strength                      |     |      | 2   | kV               |
| Transmission rate                        | 10  |      | 100 | MBit             |
| Autonegotiation                          | Yes |      |     |                  |
| Auto MDI-X                               | Yes |      |     |                  |

Electrical properties



| Description                                   | Min | Type | Max | Unit   |
|-----------------------------------------------|-----|------|-----|--------|
| Galvanic separation                           | Yes |      |     |        |
| USB service interface                         |     |      |     |        |
| OTG capability                                | Yes |      |     |        |
| Voltage supply U <sub>out</sub> (host mode)   | 4.5 | 5    |     | V      |
| Voltage supply I <sub>out</sub> (host mode)   |     |      | 500 | mA     |
| Transmission rate                             | 1.5 |      | 480 | Mbit/s |
| USB1 interface                                |     |      |     |        |
| OTG capability                                | No  |      |     |        |
| Voltage supply U <sub>out</sub> (host mode)   | 4.5 | 5    |     | V      |
| Voltage supply I <sub>out</sub> (host mode)   |     |      | 500 | mA     |
| Transmission rate                             | 1.5 |      | 480 | Mbit/s |
| CXP interface                                 |     |      |     |        |
| Plug and play recognition of expansion module | Yes |      |     |        |

#### Electrical properties

\*4) error relating to range end value

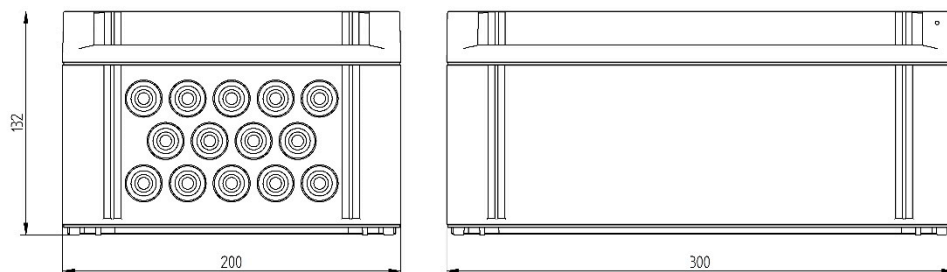
## 1.9 Installation / Operating conditions

- The controller is suitable for installation outdoors.
- All measurement and signalling lines must be connected via shielded cables.
- The shielding of measuring, signal and bus lines must be earthed at one end only.
- Suitable shielding and routing measures must be taken to ensure that mains cables and motor cables do not give rise to any interference in signal and control lines.
- Recommended RS 485 cables: Belden 9841, Lapp Unitronic LD 2170203 / 2170204 / 2170803, Helukabel 81910
- Recommended Ethernet cables: min. CAT.5e (CAT.5 from 2003), recommended: CAT.6, CAT.7; cable structure: S/FTP (overall shield mesh, pair shield foil), F/FTP (overall shield foil, pair shield foil), SF/FTP (overall shield mesh+foil, pair shield foil)
- Temperature in operation:  $-20^{\circ}\text{C} \sim +55^{\circ}\text{C}$
- Temperature for storage and transport:  $-20^{\circ}\text{C} \sim +70^{\circ}\text{C}$ , dry
- Protection class: IP 54
- The GMMnext EC\_xx.1 controller complies with the following EMV standards:  
EN 61000-6-2 (Interference immunity for industrial environments)  
EN 61000-6-3 (Noise emission for residential use)  
IEC 61000-4-4/-5/-6/-11

## 1.10 Dimensions / weight

You will find the housing dimensions below.

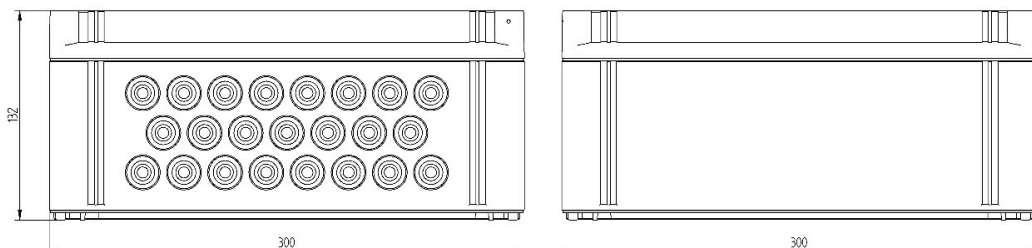
All dimensions are given in millimetres.



Dimension drawing of GMMnext EC/08.1

**Weight:**

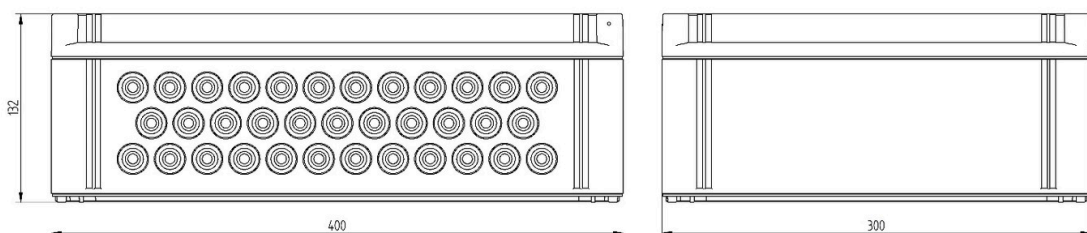
approx. 2700 g



Dimension drawing of GMMnext EC/16.1

**Weight:**

approx. 3600 g



Dimension drawing of GMMnext EC/24.1

**Weight:**

approx. 4700 g

## 1.11 Options

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The GMMnext EC/xx.1 can also be expanded with an interface module.

This module can be installed in a slot provided for this purpose.

For technical details, please see the relevant data sheets or interface specifications.

These can be downloaded from the “Controls” area of the Güntner homepage ([www.guentner.eu](http://www.guentner.eu)).

**RS485 module:**

GCM RS485 GMMnext EC.1

ERP no. 5207189