

# EC-COM Communication Modules

## Interface modules for the EC1000



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### **General Information on this Manual**

This equipment manual contains product-specific information valid at the time of publication.

This equipment manual is only complete in conjunction with the product-related hardware and software user manuals required for the individual application.

→ [Content](#)

→ [Completeness](#)

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# 1. General Information

## Documentation

This equipment manual is intended for qualified personnel and contains information regarding mounting, installation, commissioning and maintenance. The information contained in this manual is subject to change without prior notice.

## 1.1. About This Manual





This equipment manual is an integral part of the product. Make sure the equipment manual is always available near the product's point-of-employment. The manual contains information about the following topics:

- Areas of application;
- Safety;
- Mechanical construction;
- Electrical construction;
- Connections;
- Commissioning;
- Care and maintenance;
- Decommissioning;
- Disposal.

## 1.2. Hazard Categories and Terminology

The indications described below are used in connection with safety instructions you will need to observe for your own personal safety and the avoidance of damage to property.

The indications have the following meaning:

	<p><b>Immediate danger.</b> Failure to observe the information indicated by this warning will result in death, serious injury or extensive property damage.</p>
	<p><b>Potential danger.</b> Failure to observe the information indicated by this warning may result in death, serious injury or extensive property damage.</p>
	<p><b>Danger.</b> Failure to observe the information indicated by this warning may result in injury or property damage.</p>
	<p><b>No hazard.</b> Information indicated in this manner provides additional notes concerning the product.</p>

## 1.3. Conformity Declaration

Both the standard version of the controller module and the extension modules mentioned below comply with and make allowance for the following directives and standards:

- **EMP Directive 2004/108/EC**
- **DIN EN 61131-2:2009-1** Programmable controllers  
Part 2: Equipment requirements and tests
- **DIN EN 61000-6-2:2011-06** Electromagnetic compatibility (EMP)  
Part 6-2: Generic standard – immunity for industrial environments
- **DIN EN 61000-6-4:2011-9** Electromagnetic compatibility (EMP)  
Part 6-4: Generic standard – electrostatic discharge for industrial environments



## 1.4. Qualified Personnel

Only qualified personnel may install, operate and maintain the controller module.

Within the context of this documentation and the safety information it contains, qualified personnel constitutes trained specialists who have the authority to mount, install, commission, ground and identify equipment, systems and power circuits in accordance with the standards of safety technology, and who are familiar with the safety concepts of automation technology.

## 1.5. Due Diligence

The operator, or the processor (OEM) must ensure that ...

- the controller module is only used for the purpose for which it was intended;
- the controller module is only operated in impeccable full working order;
- the user manual is always available in full and in a legible condition;
- only specialists with sufficient qualification and authorisation mount, install, commission and maintain the controller module;
- these specialists are regularly instructed in all relevant questions of occupational health and safety and environmental protection and that they also know the contents of the user manual and especially of the safety notes therein;
- the device markings, identifications, safety and warning notes attached to the controller module are not removed and are always kept in a legible state;
- the national and international regulations for controlling machines and systems which apply at the relevant usage site are observed;
- the relevant information about the controller module and its application and operation is always available to the users

### 1.5.1. Working on the controller module

Before carrying out work on the controller module you must always:

- first ensure that the controller and the system are in a secure state;
- only then switch off the controller and the system and
- only now disconnect the controller module from the system.

## 1.6. Use as Prescribed

This is a modular automation system based on the CANbus, intended for industrial control applications within the medium to high performance range.

The automation system is designed for use within Overvoltage Category I (IEC 364-4-443) for the controlling and regulating of machinery and industrial processes in low-voltage installations in which the rated supply voltage does not exceed 1,000 VAC (50/60 Hz) or 1,500 VDC.

Qualified project planning and design, proper transport, storage, installation, use and careful maintenance are essential to the flawless and safe operation of the automation system.

The automation system may only be used within the scope of the data and applications specified in the present documentation and associated user manuals.

The automation system is to be used only as follows:

- as prescribed
- in technically flawless condition
- without arbitrary or unauthorized changes and
- exclusively by qualified users

The regulations of the German professional and trade associations, the German technical supervisory board (TÜV), the VDE (Association of German electricians) or other corresponding national bodies are to be observed.

### Safety-oriented (fail-safe) systems

Particular measures are required in connection with the use of SPC in safety-oriented systems.

If an SPC is to be used in a safety-oriented system, the user ought to seek the full advice of the SPC manufacturer in addition to observing any standards or guidelines on safety installations which may be available.



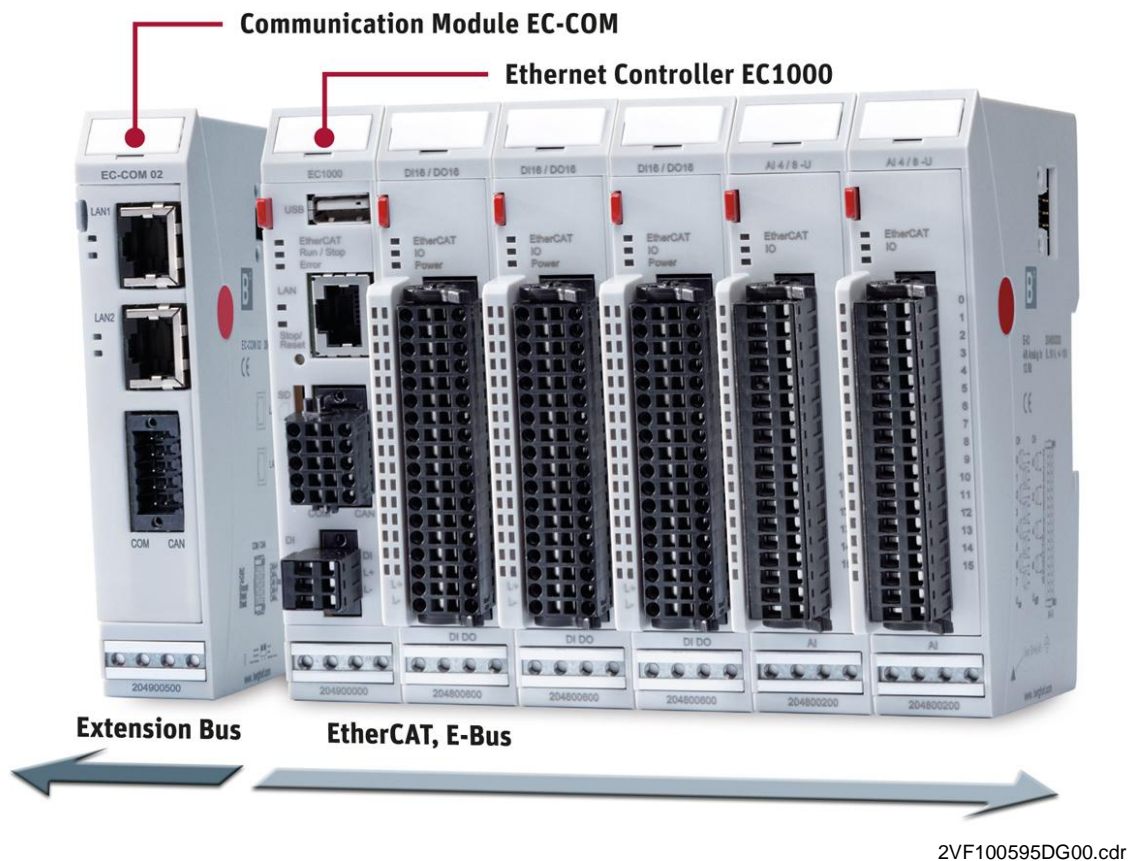
**As with any electronic control system, the failure of particular components may result in uncontrolled and/or unpredictable operation.**

All types of failure and the associated fuse systems are to be taken into account at system level. The advice of the SPC manufacturer should be sought if necessary.

## 2. Product description

### 2.1. Overview

The CANtrol EC control system with its EC1000 SPS controller is modular, flexible and compactly designed. [→ Brief description](#)  
 With a module width of just 25 mm the EC1000 controller features a whole range of interfaces. The comprehensive basic configuration includes EtherCAT, Ethernet, USB, CAN bus and RS232. If additional interfaces are required communication modules for direct connection to the EC1000 are available under the system designation EC-COM. The additional EC-COM interfaces offer the same best performance as those on the EC1000. They are directly linked to the CPU and thus represent a modular extension to the EC1000 controller.



#### Mounting

The EC-COM communication module is connected to the left face of an EC1000 controller with the integrated plug connector. The module is meant for mounting in a switching cabinet and DIN rail installation. The power supply is provided by the EC1000, with provision for a maximum of one communication module on the EC1000.

**Ethernet switch ports**

The Ethernet interface of the EC 1000 is already provided with a switch. The corresponding switch ports are transferred to one (EC-COM 01) or both (EC-COM 02) RJ45 plugs of the EC-COM module. The EC-COM saves on the need for an additional switch. An Ethernet interface with 10/100 Mbit/s is available. A highly flexible connection to a visualisation software, superordinate control units or the IT infrastructure is enabled by the TCP/IP and UDP/IP protocols.

**CAN interface**

With the EC-COM the EC1000 controller gets a second, opto-decoupled CAN interface which is compliant with the CAN high-speed standard (ISO11898) and can be used as CANopen master.

**Serial interface**

The serial interface of the EC-COM can be operated either as RS232 or as RS485, making a changeover switch possible. For RS485 operation a terminator may additionally be connected.

**Performance features – an overview**

- 1 or 2 Ethernet switch ports for 10/100 Base-T interface
- 1 CAN interface
- 1 serial interface RS232 or RS485 optional (DIP switch)
- Lateral slot for connection to EC1000

→ [Scope of supply and accessories](#)

**Scope of Supply**

The scope of supply of the controller module consists of:

- EC-COM

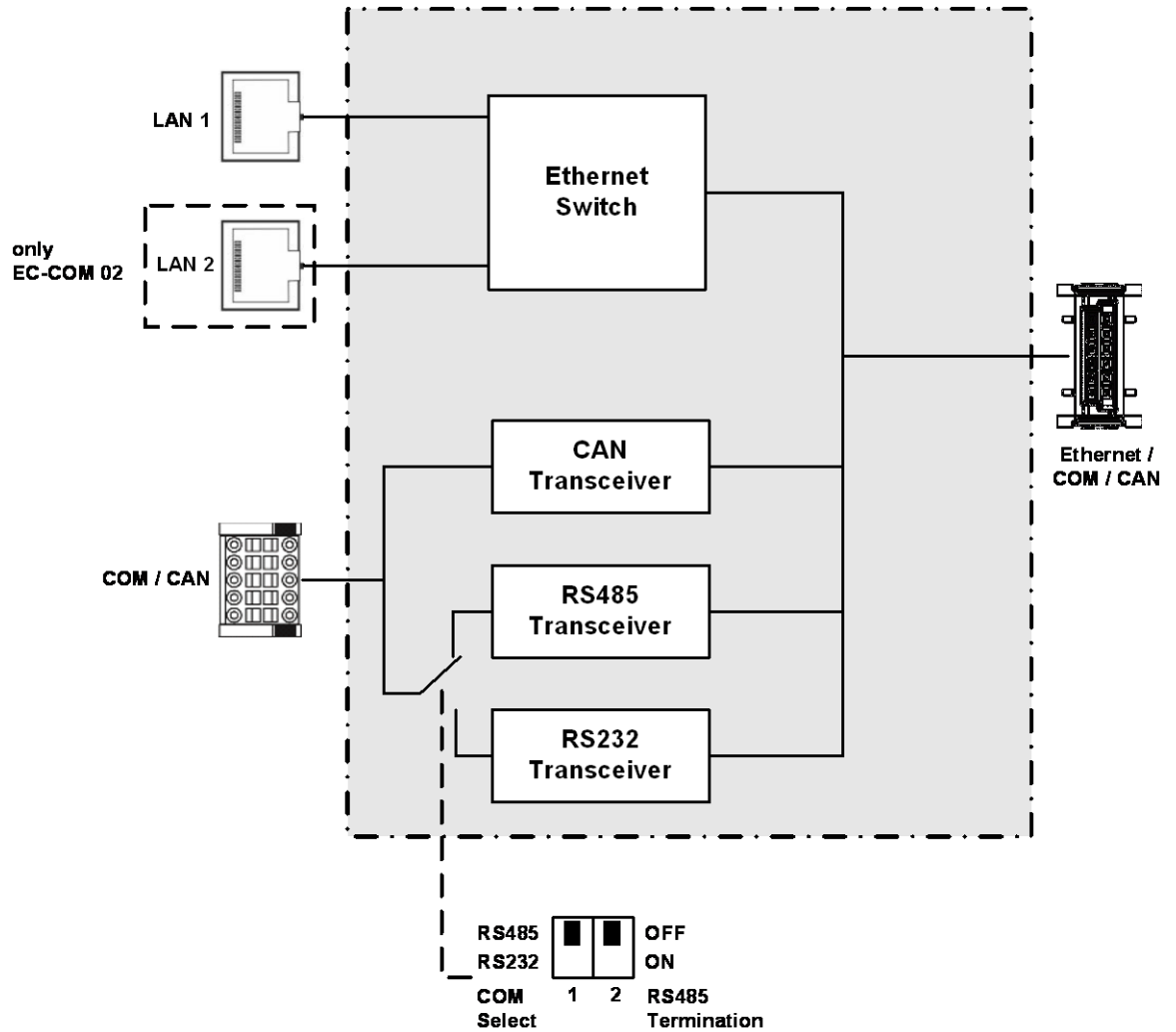
**Accessories**

- Plug-in connector 10-pin; order no.: 204802100
- Shield connection terminals:
  - 2 x 8 mm; order no.: 204802400
  - 1 x 14 mm; order no.: 204802500

## 2.2. Technical data

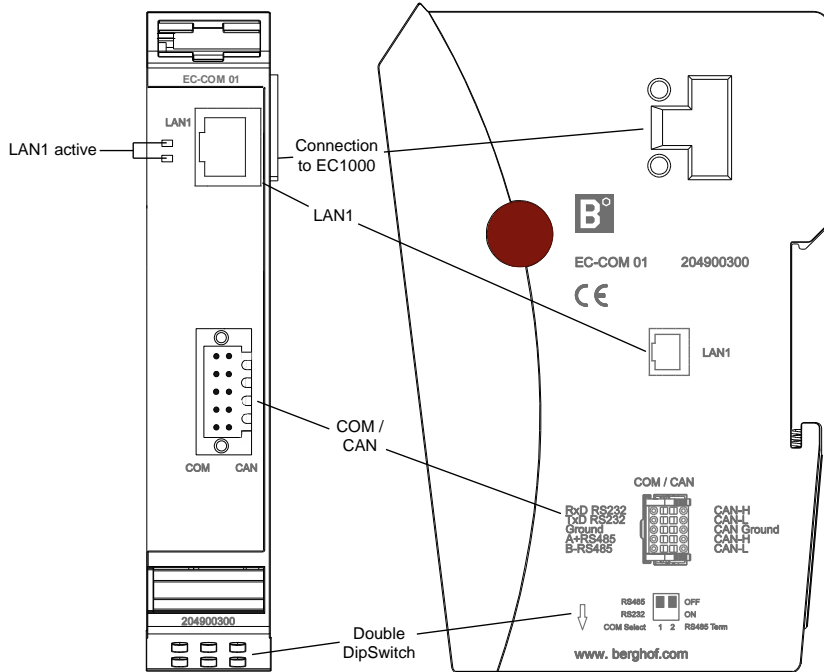
EC-COM module data		
Designation	EC-COM 01	EC-COM 02
Article no.	204900300	204900500
<b>Ethernet interfaces</b>		
Number / type of interfaces	1 x 10/100 Mbit per RJ45 (switch port of the EC1000)	2 x 10/100 Mbit per RJ45 (2 switch ports of the EC1000)
<b>Serial interface</b>		
Number / type of interfaces	1 x serial interface (opto-decoupled) RS232 / RS485 switchable (RS485 with switchable terminator)	
<b>CAN bus interface</b>		
Number / type of interfaces	1 x CAN bus interface, opto-decoupled	
<b>Dimensions and weights</b>		
Dimensions (WxHxD [mm])	25x120x90 (CANtrol EC system housing)	
Weight	100 g	
<b>Operating conditions</b>		
Ambient temperature	0 °C to 55 °C (with installation instructions complied with)	
Relative humidity	Max. 85 %, non-condensing	
<b>Transport, storage</b>		
Ambient temperature	-20 °C to +70 °C	
Relative humidity	Max. 85 %, non-condensing	
<b>Shock resistance</b>		
Vibration	Sinusoidal (EN 60068-2-6) test: Fc 10 ... 150 Hz, 1 G (operation mode)	
Shock resistance	15 G (approx. 150 m/s <sup>2</sup> ), 10 ms duration, half sinal (EN 60068-2-27) test: Ea	
<b>EMC, protection type</b>		
Emitted interference	EN 61000-6-4, industrial	
Insensitivity to interference	EN 61000-6-2, industrial	
Protection class	III	
Protection type	IP20	
<b>Energy supply</b>		
Energy supply	Via EC1000 CPU	
Power consumption	Typically 0.2 A	

## 2.3. Block diagram



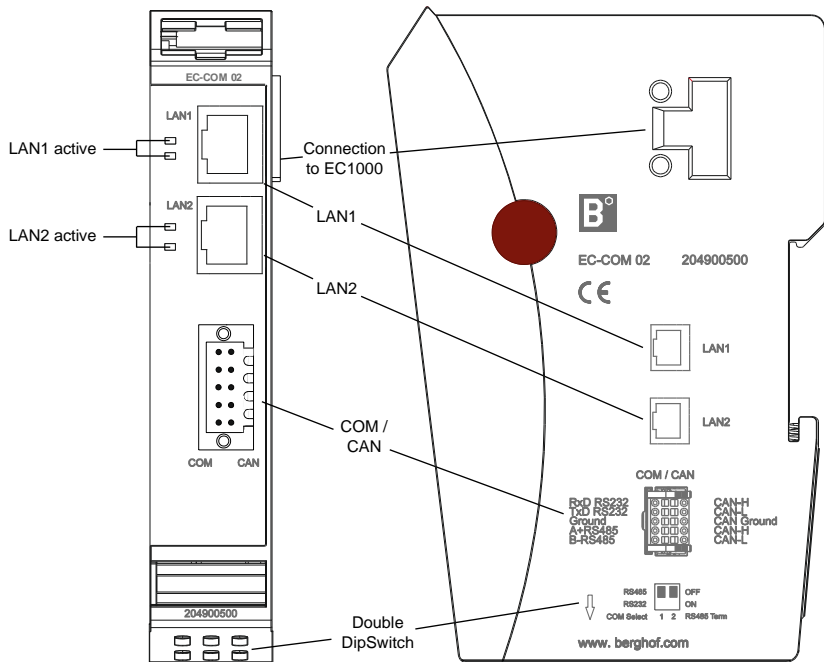
2VF100591DG00.VSD

## 2.4. Module view and pin assignment EC-COM 01



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## 2.5. Module view and pin assignment EC-COM 02



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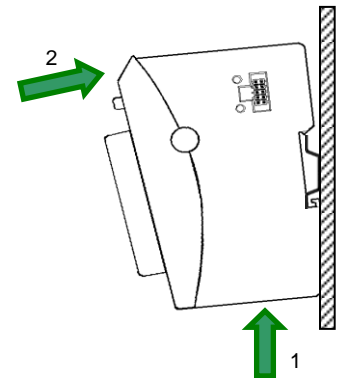
## 2.6. Mounting and connecting

### 2.6.1. Mounting

The modules are intended for mounting rail installation (DIN EN 50022, 35 x 7.5 mm).

→ To snap on a single module

- Push up the module against the mounting rail from below, allowing the metal spring to snap in between mounting rail and mounting area as illustrated.
- Push the module above against the mounting wall until it snaps in.



Rail mounting of module

#### To interconnect with EC1000 controller

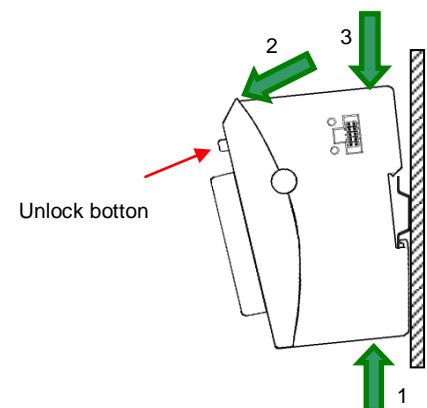
After snapping on the EC-COM module to the rail, snap on the EC1000 module about 1cm away towards the right of the EC-COM module. Push the second module along the rail towards the first module until you hear the locking device snap in.

#### To disconnect two modules

Push down the unlock button (see figure below) of the EC1000 module that you wish to disconnect from the EC-COM module to the left of it. Push both modules away from one another until they are about 1 cm apart.

→ To take down a single module

- Push the module up and against the metal spring located on the underside of the rail guide.
- Tip the module away from the rail as shown in the illustration.
- Pull the module down and out of the mounting rail.



Uninstalling a module



## 2.6.2. Connecting

### Power supply

The module is supplied by the EC1000 controller.

## 2.6.3. Earth

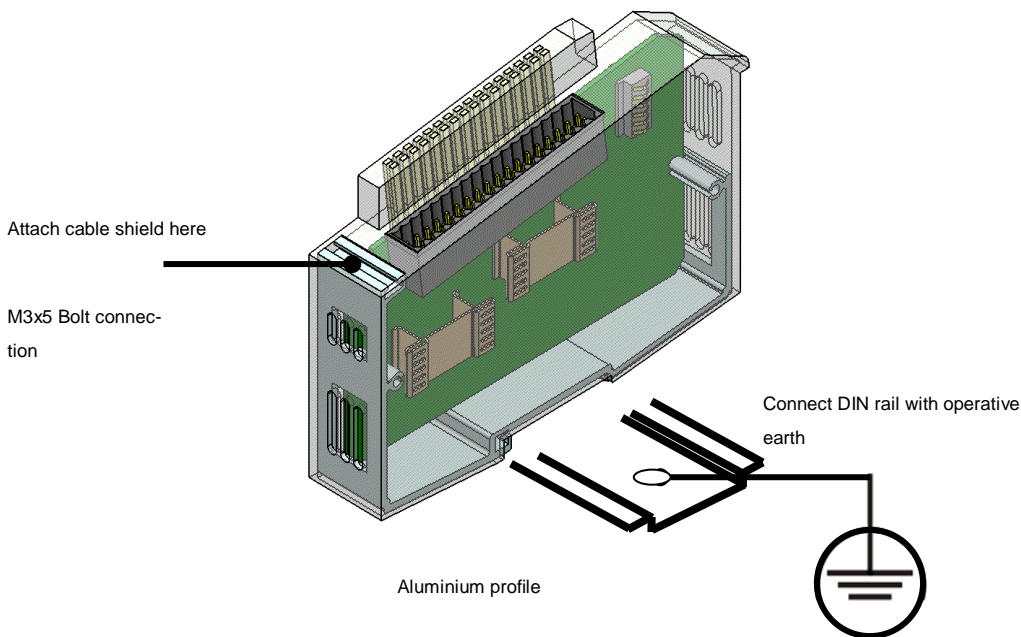
The module is to be earthed by attaching the metal housing to operative earth.

Since the operative earth connectors dissipate HF currents, it is of utmost importance for the module's noise immunity. HF interference is dissipated from the electronics board to the metal housing. The metal housing therefore needs to be suitably connected to an operative earth connector.

You will normally have to ensure that

- the connection between module housing and DIN rail conducts well,
- the connection between DIN rail and switching cabinet conducts well,
- the switching cabinet is safely connected to earth.

In special cases you may attach the earth wire straight to the module.



**Earth wires should be short and have a large surface (copper mesh).**  
 Further details has site [http://en.wikipedia.org/wiki/Ground \(electricity\)](http://en.wikipedia.org/wiki/Ground_(electricity)).


## 2.7. Pin assignment

### 2.7.1. 10/100 Base-T network connection (Ethernet)

→ [Connection to the network](#)

The 10/100 Base-T on board Ethernet adapter with RJ-45 connection enables connection to the network. The “LNK” and “RCV” status LED give information about successful connection to the network in compliance with IEEE 802.3, clause 25.

#### LAN plug-in connector assignment

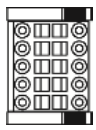
LAN		
 <p>RJ45</p>	1	TX+
	2	TX-
	3	RX+
	4	75 Ohm
	5	75 Ohm
	6	RX-
	7	75 Ohm
	8	75 Ohm
“LNK” LED	<b>green</b>	ON: ready to operate
“RCV” LED	<b>yellow</b>	FLASHING: Data Receive

### 2.7.2. CAN bus and one serial interface

The CAN bus and **one** serial interface are located on the plug-in connector.

The CAN interface is opto-decoupled. It conforms to the ISO 11898 standard and can be operated up to the maximum baud rate of 1 Mbit/s. The lowest CAN baud rate which can be set is 50 kbit/s.

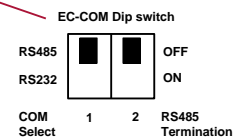
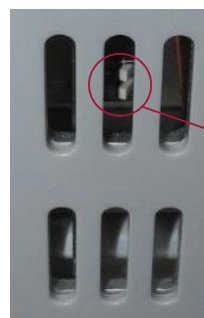
#### COM/CAN plug assignment

COM/CAN		
<b>COM</b>		<b>CAN-Bus</b>
<b>RS232 RxD</b>		<b>CAN-H</b>
<b>RS232 TxD</b>		<b>CAN-L</b>
<b>Ground</b>		<b>CAN Ground</b>
<b>A- RS485</b>		<b>CAN-H</b>
<b>A+ RS485</b>		<b>CAN-L</b>



**A 120 Ω terminal resistor can be connected between the CAN\_L and CAN\_H connections.**  
 This is necessary if the appropriate CAN interface is located at the beginning or end of the relevant CAN bus topology.

The serial interface is set up by a selection switch (Dip switch), which is built in between the lateral cooling openings. The serial interface of the EC-COM can be operated either as RS232 or as RS485. A terminating resistor can additionally be cut in for RS485 operation. The serial interface is addressed in the software under the name of COM2.



→ Dip switch serial interface

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## 3. Annex

### 3.1. Environmental Protection

#### 3.1.1. Emission

When used correctly, our modules do not produce any harmful emissions.

#### 3.1.2. Disposal

At the end of their service life, modules may be returned to the manufacturer against payment of an all-inclusive charge to cover costs. The manufacturer will then arrange for the modules to be recycled.

### 3.2. Maintenance/Upkeep



**Do not insert, apply, detach or touch connections while in operation – risk of destruction or malfunction.**

Disconnect all incoming power supplies before working on our modules; this also applies to connected peripheral equipment such as externally powered sensors, programming devices, etc. All ventilation openings must always be kept free of any obstruction.

- The modules are maintenance-free when used correctly.
- Clean only with a dry, non-fluffing cloth.
- Do not use detergents!

### 3.3. Repairs/Service



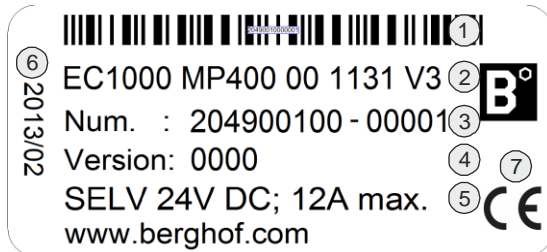
Repair work may only be carried out by the manufacturer or its authorised service engineers.

#### 3.3.1. Warranty

Sold under statutory warranty conditions. Warranty lapses in the event of unauthorised attempts to repair the equipment and/or product, or in the event of any other form of intervention.

### 3.4. Nameplate

#### Nameplate descriptions (example)



2VF100080DG02.cdr

- ① **Barcode**  
same as identification number.
- ② **Module type**  
plain-text name of module.
- ③ **Identification no.**  
is the unique labeling of the module, consists of two elements.  
**Part no.** (the first nine digits)  
The designation of this number suffices for ordering a module.  
The delivery takes place in each current hard- and software version.  
**Serial no.** (five digits behind the hyphen)
- ④ **Version**  
defines the design-level of the module as supplied ex-works.
- ⑤ **Supply voltage**
- ⑥ **Production date**  
year / calendar week of the production.
- ⑦ **CE mark**



**The 'Version' (supply version) panel specifies the design-level of the module as supplied ex-works.**

When replacing a module, users, with the CNW (CANtrol Node Wizard) tool, can read off the current software version of the newly supplied module, and then reload their 'own' software version for a particular project if necessary. With the latter in mind, before the download you should always keep a record of the existing software levels in your project documentation (software version, node IDs, baud rate, etc.).

## 3.5. Addresses and Bibliography

### 3.5.1. Addresses

CAN in Automation; international manufacturers and users organisation for CAN users in the field of automation: → [CiA](#)

CAN in Automation e.V. (CiA)  
Am Weichselgarten 26  
D-91058 Erlangen / Germany  
headquarters@can-cia.de  
www.can-cia.de

EtherCAT Technology Group → [ETG](#)  
ETG Headquarters  
Ostendstraße 196  
D-90482 Nuremberg / Germany  
info@ethercat.org  
www.ethercat.org

Beuth Verlag GmbH, 10772 Berlin → [DIN-EN Standards](#)  
or  
VDE-Verlag GmbH, 10625 Berlin

VDE Verlag GmbH, 10625 Berlin → [IEC Standards](#)  
or  
Internet search: [www.iec.ch](http://www.iec.ch)

### 3.5.2. Standards/Bibliography

Standard	Label
<b>IEC61131-1 / EN61131-1</b>	Programmable controllers Part 1: General information
<b>IEC61131-2 / EN61131-2</b>	Programmable controllers Part 2: Equipment requirements and tests
<b>IEC61131-3 / EN61131-3</b>	Programmable controllers Part 3: Programming languages
<b>IEC61131-4 / EN61131BI1</b>	Programmable logic controllers Supplementary Sheet 1: User guidelines
<b>IEC61000-6-4 / EN61000-6-4</b>	German EMC Standard: Emitted interference
<b>IEC61000-6-2 / EN61000-6-2</b>	German EMC Standard: Noise immunity
<b>ISO/DIS 11898</b>	Draft International Standard: Road vehicles - Interchange of digital information - Controller Area Network (CAN) for high-speed communication
<b>DIN EN ISO 13849-1</b>	Safety of machinery: Safety-related parts of control systems (Part 1)
<b>Bibliography</b>	A variety of specialist publications on the CANbus is available from specialist bookshops, or can be obtained through the CiA users' organisation.

Notice: Our Technical Support team will be glad to provide other literature references on request.