



**Documentation**

## **KM2604 and KM2614**

**Four channel relay module**

**Version:** 2.1.0  
**Date:** 2017-12-01

**BECKHOFF**



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# 1 Foreword

## 1.1 Notes on the documentation

### Intended audience

This description is only intended for the use of trained specialists in control and automation engineering who are familiar with the applicable national standards.

It is essential that the documentation and the following notes and explanations are followed when installing and commissioning these components.

It is the duty of the technical personnel to use the documentation published at the respective time of each installation and commissioning.

The responsible staff must ensure that the application or use of the products described satisfy all the requirements for safety, including all the relevant laws, regulations, guidelines and standards.

### Disclaimer

The documentation has been prepared with care. The products described are, however, constantly under development.

We reserve the right to revise and change the documentation at any time and without prior announcement.

No claims for the modification of products that have already been supplied may be made on the basis of the data, diagrams and descriptions in this documentation.

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## 1.2 Safety instructions

### Safety regulations

Please note the following safety instructions and explanations!  
Product-specific safety instructions can be found on following pages or in the areas mounting, wiring, commissioning etc.

### Exclusion of liability






All the components are supplied in particular hardware and software configurations appropriate for the application. Modifications to hardware or software configurations other than those described in the documentation are not permitted, and nullify the liability of Beckhoff Automation GmbH & Co. KG.

### Personnel qualification

This description is only intended for trained specialists in control, automation and drive engineering who are familiar with the applicable national standards.

### Description of symbols

In this documentation the following symbols are used with an accompanying safety instruction or note. The safety instructions must be read carefully and followed without fail!

 <b>DANGER</b>	<p><b>Serious risk of injury!</b> Failure to follow the safety instructions associated with this symbol directly endangers the life and health of persons.</p>
 <b>WARNING</b>	<p><b>Risk of injury!</b> Failure to follow the safety instructions associated with this symbol endangers the life and health of persons.</p>
 <b>CAUTION</b>	<p><b>Personal injuries!</b> Failure to follow the safety instructions associated with this symbol can lead to injuries to persons.</p>
 <b>Attention</b>	<p><b>Damage to the environment or devices</b> Failure to follow the instructions associated with this symbol can lead to damage to the environment or equipment.</p>
 <b>Note</b>	<p><b>Tip or pointer</b> This symbol indicates information that contributes to better understanding.</p>

## 1.3 Documentation Issue Status

Version	Comment
2.1.0	• KM2614 added
2.0.0	• Migration
1.0.1	• Pin assignment for relay supply (24 V <sub>DC</sub> ) corrected
1.0.0	• First release
0.1.0	• First provisional documentation

### Firmware and hardware versions

Documentation Version	KM2604		KM2614	
	Firmware version	Hardware version	Firmware version	Hardware version
2.1.0	00	05	-	04
2.0.0	00	05	-	-
1.0.1	00	00	-	-
1.0.0	00	00	-	-
0.1.0	00	00	-	-

The hardware version is indicated in the serial number printed on the top of the terminal module.

### Syntax of the serial number

Structure of the serial number: WW YY FF HH

WW - week of production (calendar week)

YY - year of production

FF - firmware version (not applicable for digital modules)

HH - hardware version

Example with ser. no.: 35 05 00 01:

35 - week of production 35

05 - year of production 2005

00 - firmware version 00

01 - hardware version 01

## 2 Product overview

### 2.1 Terminal Modules - System Overview

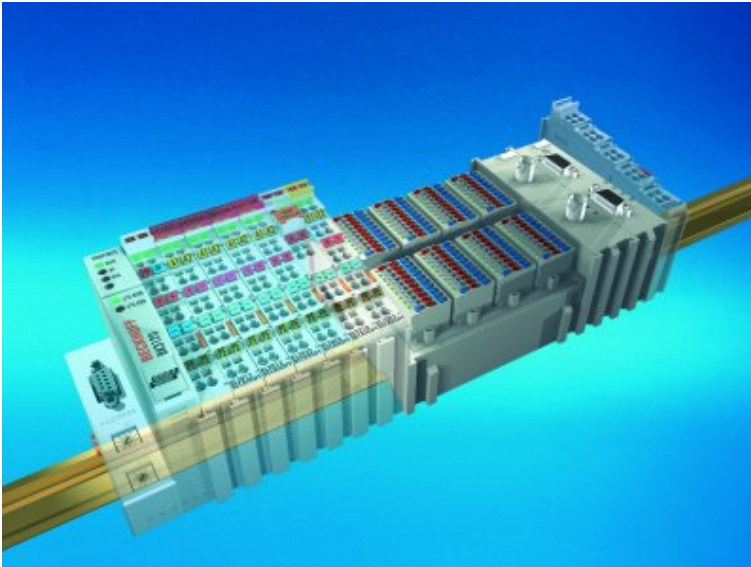


Fig. 1: Bus Terminal Block

Better sensor and actuator functionality makes machines and systems more and more powerful. The Bus Terminal reliably meets increased requirements for I/O signals through its modularity and compact design. The existing Beckhoff Bus Terminal system is complemented by the new version of the EMxxxx / KMxxxx Terminal Module with increased packing density. In many areas of application, cost benefits can be realized through lower overall installed size and application-specific signal mix.

The new Terminal Modules are fully system-compatible. Like the Bus Terminals, they are bus-neutral and can therefore be operated with any Beckhoff Bus Coupler and Bus Terminal Controller. Like the standard Bus Terminals, the EM / KM modules are integrated in the I/O system and connected with the internal terminal bus (E-bus / K-bus). Bus Terminals and terminal modules can be combined without restriction.

#### Plug connector

Like for the Bus Terminals, no tools are required for the wiring. Spring-loaded technology is used, however the connection layer is pluggable (fixed wiring).



Fig. 2: Pluggable connection (fixed wiring)



## Connection

Plug connectors are available for single and triple conductor connection methods.



Fig. 3: Terminal module with plug connector for single conductor connection method (ZS2001-0002)

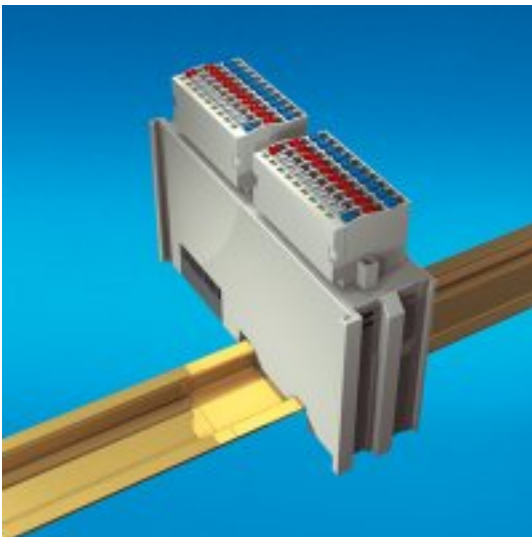


Fig. 4: Terminal module with plug connector for triple-conductor connection method (ZS2001-0004)

## Packing density

The Terminal Modules combine 16, 32 or 64 digital inputs or outputs on a very small area. This compact and slimline design enables very high packing densities, leading to smaller control cabinets and terminal boxes.

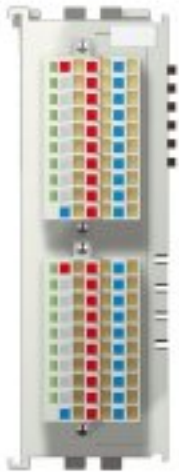


Fig. 5: Terminal module with 16 channels

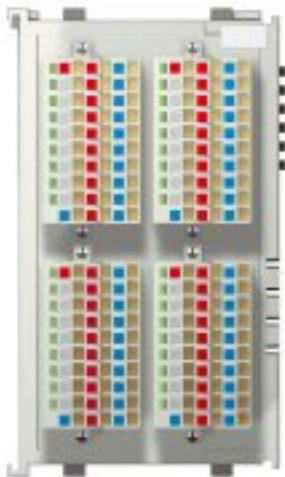


Fig. 6: Terminal module with 32 channels



Fig. 7: Terminal module with 64 channels

## 2.2 Introduction



Fig. 8: KM2604



Fig. 9: KM2614

### Four-channel relay module, 230 V<sub>AC</sub>, 16 A

The KM2604 and KM2614 terminal module combines 4 pluggable power relays (ZB2601 or ZB2602) in one fieldbus module. The high switching capacity of 16 A at 230 V<sub>AC</sub> enables direct mains connection of consumers with high current consumption. The relays are positioning at the top and can therefore be exchanged easily.

The KM2614 terminal module enables each relay to be manually switched to the ON status. A seal indicates the initial manual operation.

## 2.3 Technical Data

Technical Data	KM2604	KM2614
Number of relays	4 change-over contacts	
Manual operation	no	at the relays
Rated switching voltage	250 V <sub>AC</sub> , 30 V <sub>DC</sub>	
Starting current	max. 30 A	
Continuous current	max. 16 A	
Breaking current	max. 16 A	
Minimum permitted load	5 mA (at 10 V <sub>DC</sub> )	
Mechanical switching cycles	see <a href="#">relay data [► 13]</a>	
Electrical switching cycles	see <a href="#">relay data [► 13]</a>	
Power supply for the electronics	via the K-bus	
Current consumption from the K-bus	typically 15 mA	
Current consumption from the relay power supply (24 V <sub>DC</sub> )	typically 50 mA for each active relay	
Width of a bus terminal block	<a href="#">maximum [► 14]</a> 64 Bus Terminals/terminal modules or 80 cm	
Electrical isolation	1.5 V (K-bus/signal voltage) 2.5 kV (rated surge voltage for overvoltage category III)	
Configuration	No address or configuration settings	
Bit width in the output process image	4 outputs	
Dimensions with relay (W x H x D)	approx. 99 mm x 100 mm x 62 mm (width aligned: 96 mm), see <a href="#">dimensional drawing [► 14]</a>	
Weight (with 4 relays)	approx. 250 g	
Permissible ambient temperature range during operation	0°C ... + 55°C	
Permissible ambient temperature range during storage	-25°C ... + 85°C	
Permissible relative air humidity	95 %, no condensation	
<a href="#">Mounting [► 15]</a>	on 35 mm mounting rail according to EN60715	
Vibration / shock resistance	conforms to EN 60068-2-6 / EN 60068-2-27	
EMC immunity / emission	conforms to EN 61000-6-2 / EN 61000-6-4	
Protection class	IP20	
Installation position	variable	
Approval	CE	

## 2.4 Relay

Technical Data	ZB2601	ZB2602
Manual operation	no	yes
Number of contacts	1 change-over contacts	
Starting current	maximum 30 A	
Continuous current	maximum 16 A	
Breaking current (230 V <sub>AC</sub> , 30 V <sub>DC</sub> )	maximum 16 A	
Rated switching voltage	230 V <sub>AC</sub> , 30 V <sub>DC</sub>	
Max. switching voltage	400 V <sub>AC</sub>	
1 phase motor load, AC3 operation with 230 V <sub>AC</sub>	max. 550 W	
Min. switching load	10 V, 5 mA	
Rated coil voltage	24 V <sub>DC</sub>	
Rated coil current	typically 50 mA	
Mechanical switching cycles	minimum 5 x 10 <sup>6</sup>	
Electrical switching cycles	minimum 1 x 10 <sup>6</sup> (1 A <sub>AC</sub> /250 V <sub>AC</sub> )	
Weight	approx. 20 g	
Permissible ambient temperature range during operation	0°C ... + 55°C	
Permissible ambient temperature range during storage	-25°C ... + 85°C	
Permissible relative air humidity	95 %, no condensation	
Mounting	on relay base with reteiner bracket	on relay socket
Approval	CE	

### 3 Mounting and wiring

#### 3.1 Recommended mounting rails

Terminal Modules and EtherCAT Modules of KMxxxx and EMxxxx series, same as the terminals of the EL66xx and EL67xx series can be snapped onto the following recommended mounting rails:

- DIN Rail TH 35-7.5 with 1 mm material thickness (according to EN 60715)
- DIN Rail TH 35-15 with 1,5 mm material thickness



**Note**

**Pay attention to the material thickness of the DIN Rail**

Terminal Modules und EtherCAT Modules of KMxxxx and EMxxxx series, same as the terminals of the EL66xx and EL67xx series does not fit to the DIN Rail TH 35-15 with 2,2 to 2,5 mm material thickness (according to EN 60715)!

#### 3.2 Dimensions

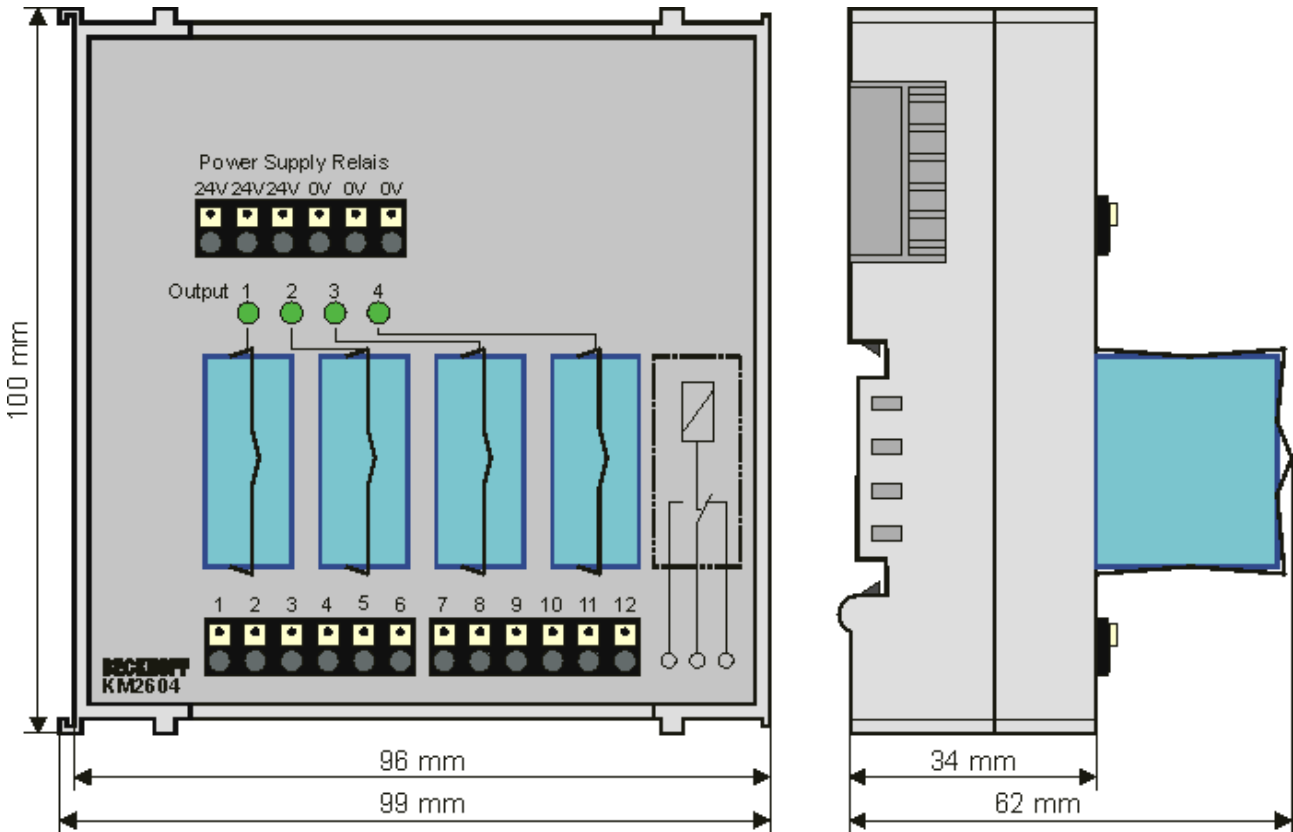


Fig. 10: Dimensions

**Width of a bus terminal block**



**Attention**

**Note the maximum number of Bus Terminals**


The maximum number of Bus Terminals or terminal modules that can be connected to a Bus Coupler is 64!


An overall width of 80 cm must not be exceeded!

Also ensure that the current consumption of the Bus Terminals/terminal modules from the K-bus does not overload the K-bus power supply of the Bus Coupler.

### 3.3 Mounting and demounting - terminals with traction lever unlocking

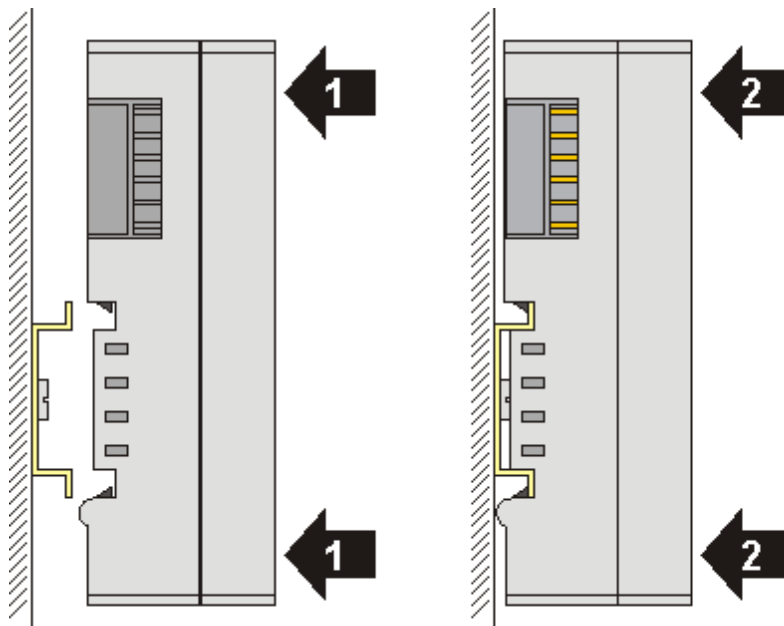
The terminal modules are fastened to the assembly surface with the aid of a 35 mm mounting rail (e.g. mounting rail TH 35-15).

 <b>Note</b>	<p><b>Fixing of mounting rails</b></p> <p>The locking mechanism of the terminals and couplers extends to the profile of the mounting rail. At the installation, the locking mechanism of the components must not come into conflict with the fixing bolts of the mounting rail. To mount the recommended mounting rails under the terminals and couplers, you should use flat mounting connections (e.g. countersunk screws or blind rivets).</p>
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 <b>WARNING</b>	<p><b>Risk of electric shock and damage of device!</b></p> <p>Bring the bus terminal system into a safe, powered down state before starting installation, disassembly or wiring of the Bus Terminals!</p>
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**Mounting**

- Fit the mounting rail to the planned assembly location.

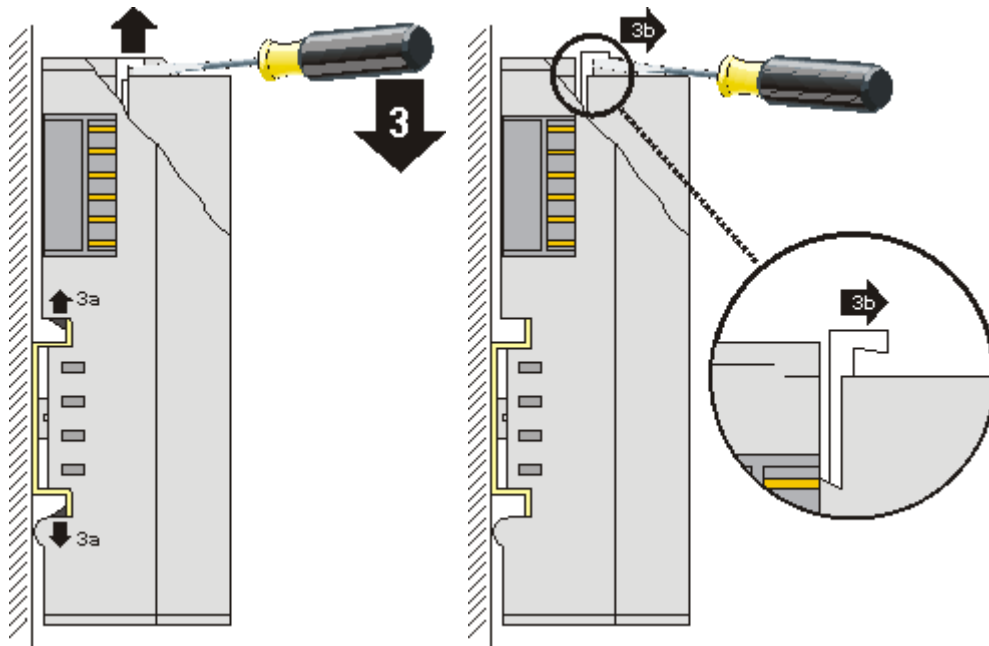


and press (1) the terminal module against the mounting rail until it latches in place on the mounting rail (2).

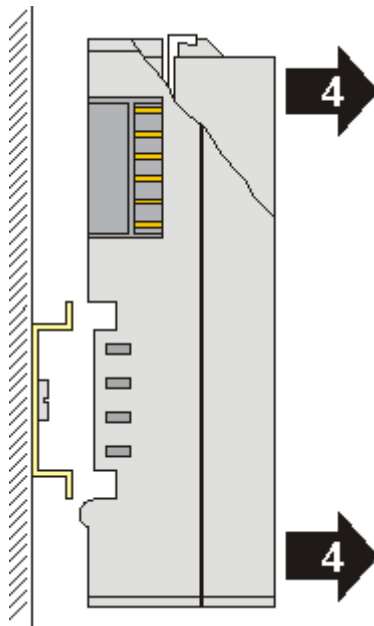
- Attach the cables.

**Demounting**

- Remove all the cables. Thanks to the KM/EM connector, it is not necessary to remove all the cables separately for this, but for each KM/EM connector simply undo 2 screws so that you can pull them off (fixed wiring)!
- Lever the unlatching hook on the left-hand side of the terminal module upwards with a screwdriver (3). As you do this
  - an internal mechanism pulls the two latching lugs (3a) from the top hat rail back into the terminal module,
  - the unlatching hook moves forwards (3b) and engages



- In the case 32 and 64 channel terminal modules (KMxxx4 and KMxxx8 or EMxxx4 and EMxxx8) you now lever the second unlatching hook on the right-hand side of the terminal module upwards in the same way.
- Pull (4) the terminal module away from the mounting surface.





### 3.4 Connection

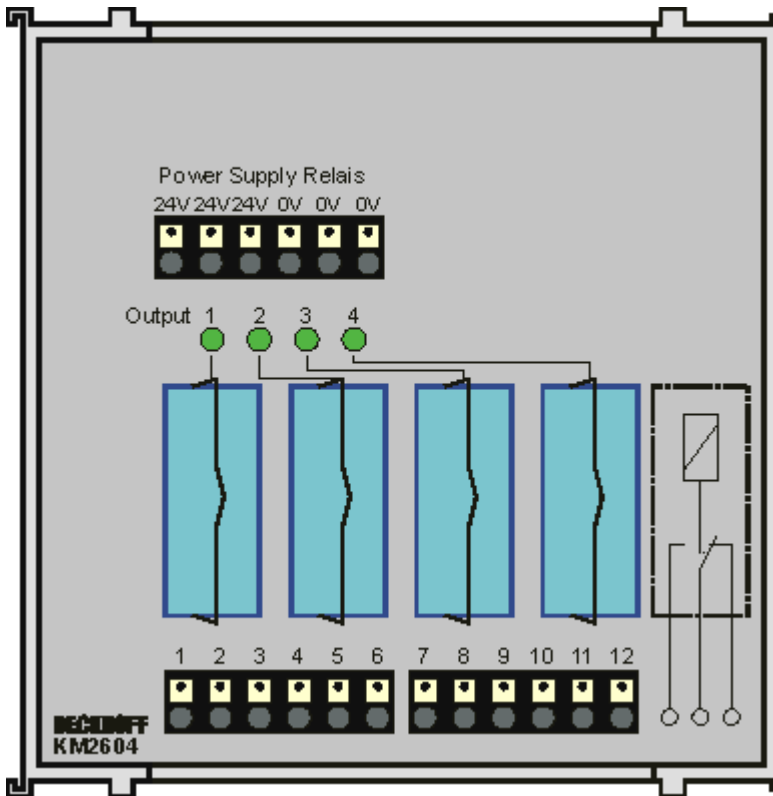


Fig. 11: Connection KM2604

#### Power supply for the relays

Terminal point	Comment
24 V	24 V <sub>DC</sub> supply for relays
24 V	
24 V	
0 V	0 V supply for relays
0 V	
0 V	

#### Connecting the relays

Terminal point no.	Output/relay	Relay connection
1	1	14
2		11
3		12
4	2	14
5		11
6		12
7	3	14
8		11
9		12
10	4	14
11		11
12		12

## 4 Appendix

### 4.1 Support and Service

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#### **Beckhoff's branch offices and representatives**

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<http://www.beckhoff.com>

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- spare parts service
- hotline service

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