



+24V

0V



Address



High



OK



Low

# Fieldbus Components

***ricos***  
***ricos***TP

Address



Fieldbus components  
Contents

# *ricos*

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# Fieldbus Components

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|                                             | CANopen            |                                                                                                                                                                                                                                                                   | <b>ricos</b> BC-CANopen<br><b>ricos</b> EC-CANopen                                                                                                                                                                                                                  | 500<br>505                                                         |
|                                             | DeviceNet          |                                                                                                                                                                                                                                                                   | <b>ricos</b> BC-CAN-DN<br><b>ricos</b> EC-CAN-DN                                                                                                                                                                                                                    | 500<br>505                                                         |
|                                             | Interbus           |                                                                                                                                                                                                                                                                   | <b>ricos</b> BC-S<br><b>ricos</b> EC-S                                                                                                                                                                                                                              | 499<br>504                                                         |
|                                             | Ethernet           |                                                                                                                                                                                                                                                                   | <b>ricos</b> BC-Ethernet                                                                                                                                                                                                                                            | 501                                                                |
| PLC                                         | Ethernet           |                                                                                                                                                                                                                                                                   | <b>ricos</b> BC-Ethernet PLC                                                                                                                                                                                                                                        | 502                                                                |
| I/O modules                                 | binary I/O         | 8 I/O for 24 V DC<br>8 I and 8 I/O for 24 V DC<br>16 I for 24 V DC<br>16 O for 24 V DC<br>8 O for 24 V / 2A DC<br>8 O for 24 V DC negative<br>4 O, relay outputs<br>4 I for 115 V AC<br>4 I for 230 V AC                                                          | <b>ricos</b> 8 I/O<br><b>ricos</b> 8I 8I/O<br><b>ricos</b> 16 I<br><b>ricos</b> 16 O<br><b>ricos</b> 8O 2A<br><b>ricos</b> 8O NEG<br><b>ricos</b> 4O RELAY<br><b>ricos</b> 4I AC 115V<br><b>ricos</b> 4I AC 230V                                                    | 507<br>510<br>507<br>510<br>511<br>511<br>512<br>508<br>508        |
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|                                             | Counter module     | 2 x 32 bit / 4 x 16 bit                                                                                                                                                                                                                                           | <b>ricos</b> COUNTER                                                                                                                                                                                                                                                | 515                                                                |
|                                             | Positioning module | 2 x incremental encoder                                                                                                                                                                                                                                           | <b>ricos</b> POSITION                                                                                                                                                                                                                                               | 515                                                                |
|                                             | Analog I/O         | 4 I for Pt 100/1000<br>4 I for thermocouples type J/K/T<br>4 I for 0 through 10 V<br>4 I for ±10 V<br>4 I/O for 0 through 10 V<br>4 I/O for ±10 V<br>4 I for 0 through 20 mA<br>4 I for 4 through 20 mA<br>4 I/O for 0 through 20 mA<br>4 I/O for 4 through 20 mA | <b>ricos</b> 4AI/PT100<br><b>ricos</b> 4AI/TC<br><b>ricos</b> 4AI/10V<br><b>ricos</b> 4AI/±10V<br><b>ricos</b> 4AI4AO/10V<br><b>ricos</b> 4AI4AO/±10V<br><b>ricos</b> 4AI/20MA<br><b>ricos</b> 4AI/4-20MA<br><b>ricos</b> 4AI4AO/20MA<br><b>ricos</b> 4AI4AO/4-20MA | 517<br>517<br>519<br>519<br>520<br>520<br>521<br>521<br>522<br>522 |

## Contents – Bus systems

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|                 |             | 8 I and 8 I/O for 24 V DC | <b>ricos</b> COM-DP 8I 8I/O | 524  |
|                 |             | 16 I for 24 V DC          | <b>ricos</b> COM-DP 16 I    | 524  |
|                 |             | 16 O for 24 V DC          | <b>ricos</b> COM-DP 16 O    | 524  |
|                 | CANopen     | 8 I/O for 24 V DC         | <b>ricos</b> COM-CO 8I/O    | 525  |
|                 |             | 8 I and 8 I/O for 24 V DC | <b>ricos</b> COM-CO 8I 8I/O | 525  |
|                 |             | 16 I for 24 V DC          | <b>ricos</b> COM-CO 16 I    | 525  |
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# Remote I/O

## Selection per function

# ricos

### CATALOG PAGE

| FUNCTION                    |                          |
|-----------------------------|--------------------------|
| FIELDBUS                    | Profibus DP              |
|                             | CANopen                  |
|                             | Interbus                 |
|                             | DeviceNet                |
|                             | Ethernet Modbus TCP/IP   |
| PLC (openly programmable)   | Ethernet TCP/IP          |
| DIGITAL INPUTS AND OUTPUTS  | 24 V DC input            |
|                             | 115 V AC input           |
|                             | 230 V AC input           |
|                             | 24 V DC 1 A output       |
|                             | 24 V DC 2 A output       |
|                             | 24 V DC 1 A neg. output  |
|                             | Relay output             |
| ANALOG INPUTS AND OUTPUTS   | Pt 100/1000              |
|                             | Thermocouple J/K/T       |
|                             | Voltage input 0...10 V   |
|                             | Voltage input +/- 10 V   |
|                             | Voltage output 0...10 V  |
|                             | Voltage output +/- 10 V  |
|                             | Current input 0...20 mA  |
|                             | Current input 4...20 mA  |
|                             | Current output 0...20 mA |
|                             | Current output 4...20 mA |
| FUNCTION INPUTS AND OUTPUTS | Counter input + 24 V     |
|                             | Incremental input + 24 V |
|                             | Interface RS 232/422     |

## Remote I/O

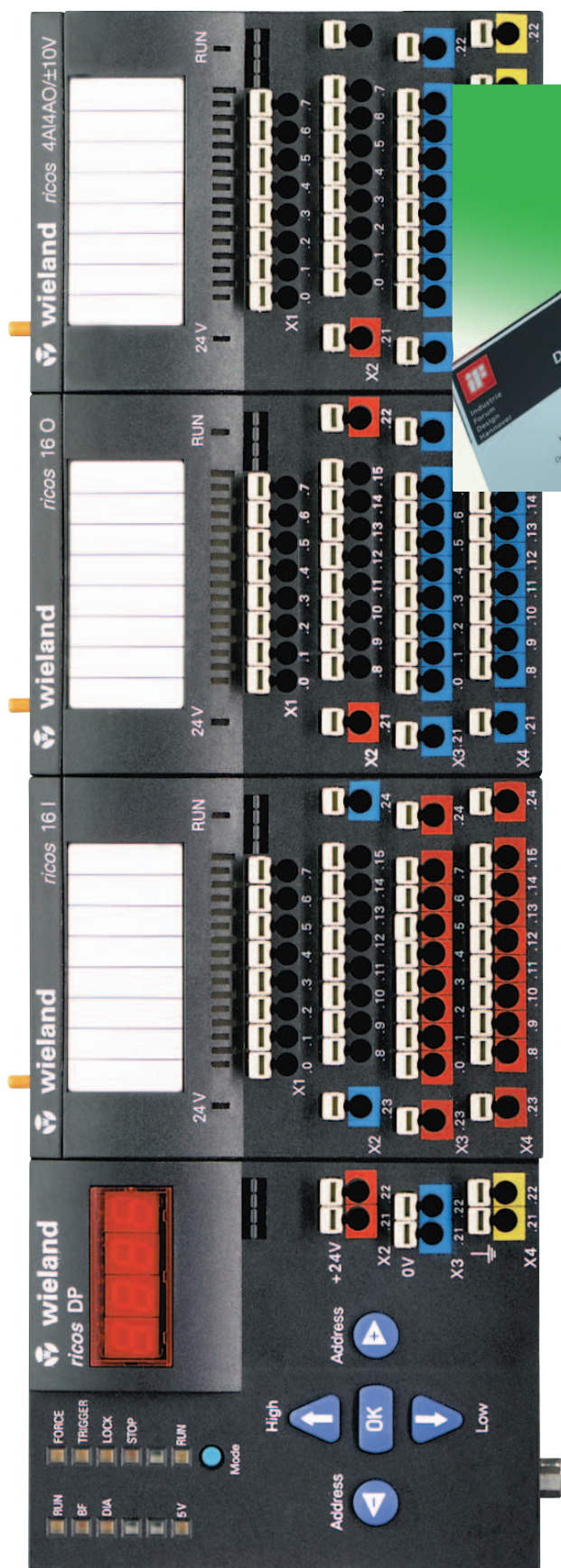
### Selection per function



# Remote I/O

## General information

# ricos



A field bus system introduces a high level of performance when compared to conventional wiring technology. The possibility for intelligent and convenient distribution of signals is a significant benefit of digital fieldbus technology.

Nowadays, there are a variety of functional and topological variants available on the market. This broad spectrum is due to the various requirements of the individual branches of industry as well as the interests of the manufacturer's company or international standards.

As a global company, Wieland fulfills these requirements and offers the user a universal fieldbus system with a winning design in **ricos**:

- ☐ Fieldbus couplers for all major fieldbus systems
- ☐ Openly configurable modules for digital and analog signals
- ☐ Modular assembly of fieldbus nodes
- ☐ Integrated diagnostic tools in the bus coupler enables commissioning functions such as Force, Trigger and Lock without the need for additional software
- ☐ Full range of functionality
- ☐ Spring clamp terminations for secure and rapid connection
- ☐ Economy bus coupler
- ☐ Function modules can be replaced without disconnecting the wiring
- ☐ High degree of EMC resistance due to integrated ground connection to the mounting rail
- ☐ Compact housing dimensions
- ☐ Universal marking

# Remote I/O

## Technical information on bus systems



PROFIBUS (process fieldbus) has a number of variations including PROFIBUS-DP which is established in DIN 19245, section 3 and integrated in the European fieldbus standard EN 50170. PROFIBUS has an optimum transmission rate for opening up the object-related system area as well as the sophisticated sensor/actuator area. It is tailor-made to the requirements for fast, efficient data exchange between the programmable controllers and the distributed devices such as digital or analog input/output modules and drives



for time-critical applications, where the service development of Layer 7 is omitted. This shift of PROFIBUS-DP to the field level makes it possible to save cable. PROFIBUS-DP uses proven characteristics of the PROFIBUS transmission technology and the bus access protocol (DIN 19245, section 1 and 2) reduced to specific functions so that the high demands for system reaction time in the distributed interface systems can be met.

It is also possible to operate PROFIBUS-FMS and PROFIBUS-DP on a single cable. Particularly interesting possibilities are produced by so-called combination devices which unite the characteristics of both variations.

PROFIBUS-DP stands out due to:

- ☐ Short reaction times
- ☐ High level of interference immunity
- ☐ Replacement of the cost-effective transfer of measured values in 0(4) to 20 mA technology.

The data transmission with the distributed devices (slaves) is primarily selected at cyclic intervals as in a normal master/slave process. The central controller (master) reads the input data from the slaves and writes the output data to the slaves. PROFIBUS-DP-V1 also supports the acyclic exchange of data. PROFIBUS-DP operates with a maximum transmission rate of 12 Mbit/s and enables the transfer of 1024 bits of input/output data, distributed to 32 devices in less than 2 ms.

Properties:

- ☐ Line structure (with passive bus interface)
- ☐ Maximum length for electrical structure is 9.6 km and 90 km for optical structure
- ☐ Networking covers entire area due to division of the system into a maximum of 5 bus segments (via repeaters) up to 1.5 Mbit/s
- ☐ Number of repeaters that can be used and thus the transmission range is dependent on the baud rate
- ☐ Max. 124 devices (over all bus segments), max. 32 devices per segment
- ☐ Bus access according to token passing procedure; normal operation only with a master and polling
- ☐ High transmission rate (real-time capability for PLCs is the main reason behind DP)
- ☐ Data transmission via twin-core cable or optical fibre (active bus interface)
- ☐ Electrical structure with shielded, twisted, twin-core cable and RS 485 interface
- ☐ Bit coding in NRU code (Non Return to Zero)
- ☐ Distributed devices and field devices can be connected and disconnected during operation
- ☐ Comprehensive diagnostics options
- ☐ Open system (DIN 19245, section 3; European standard EN 50170)

# CAN

In 1983, the auto industry formulated its requirement for a bus system for use in motor vehicles. An electrical two-wire bus should replace the extensive cable harnesses for the connection of electrical systems. This was also urgently needed as the traditional cable harnesses in vehicles already exceeded 2 km in length and a mass of over 100 kg. However, requirements arose which could not be met by the bus systems that were available at that time.

In 1985, the Controller Area Network (CAN) was presented as a solution. The CAN-Bus was developed in a collaboration between Robert Bosch and INTEL Semiconductor. Meanwhile, CAN created a broad area of applications for itself in automation engineering in addition to the motor vehicle sector. Nowadays, CAN can be found in mobile systems as an internal communication system for machines or plants, in production automation, in the lower field area of process automation, in building management systems as well as many other applications.

The user organisation CiA (CAN in Automation) has been in existence since 1992 and incorporates over 200 manufacturers and users of programmable controllers, sensors, actuators, software and services [Trum95]. The CAN-Bus was standardised in the international norm ISO 11898 and thus became an open system.

The reason for the broad appeal of CAN, apart from the performance characteristics, is the availability of extremely cost-effective switching circuits, limited by the high number of items guaranteed in the auto industry.

Properties:

- ☐ Line structure  
(with passive bus interface)
- ☐ Number of devices only limited by capacity of driver modules
- ☐ Expansion dependent on the transmission rate: 40 m at 1 Mbit/s; 1000 m at 50 kbit/s
- ☐ Twisted pair cable with terminating resistor, optical fibre
- ☐ Object-oriented messages, broadcast and multicast with acceptance test
- ☐ Multimaster network
- ☐ Bus access via arbitration in bits according to the CSMA/CA procedure; real-time capability for messages with higher priority
- ☐ Max. transmission rate of 1 Mbit/s
- ☐ Very high level of data security (HD = 6); error detection and signalling, automatic disconnection of faulty stations (Node Guarding)
- ☐ Various chips and microcontrollers support the protocol
- ☐ Open system  
(ISO 11898 and CiA DS 301)

These were in particular:

- ☐ High level of safety against electromagnetic interference
- ☐ Real-time capability for fast processes such as ignition and ABS
- ☐ High degree of reliability
- ☐ Economic price for applications involving mass production



## Remote I/O Technical information on bus systems



The INTERBUS was specially developed by Phoenix Contact for use in machine systems and rapid processes. This fieldbus system is therefore primarily used in production automation at system level and as an object-related fieldbus for the connection of sophisticated sensors and actuators. It can be used in standard PLC applications and industrial PCs with relatively little cost and effort.



The INTERBUS has been structured using point-to-point connection as an active, coupled ring. Each bus device uses a separate outgoing and incoming cable. The return circuit required in ring systems from the last device to the first device is thereby avoided. The outgoing and return lines are fed into one cable. INTERBUS is thus similar to a line bus as regards the installation as only one cable is drawn from one device to another. A complete bus system is implemented with various bus devices. These are designated as interface modules, bus couplers, remote bus devices and local bus devices.

An interface module (master) operates as a central unit for data communication in the remote bus. The interface module also links the INTERBUS system with the

higher-level controller. The remote bus can be implemented with a maximum number of 512 stations and a maximum distance of 400 m between 2 devices. The data transmission rate is 500 kbit/s. The RS 485 standard is used for data transmission on a twisted pair cable. Each remote bus device is provided with a separate auxiliary power supply and acts simultaneously as a repeater due to its active interface. Greater distances can thereby be achieved. There is also an electrical isolation of the routing INTERBUS segment. Remote bus devices are both input/output devices and interfaces to subordinate rings. There are also compound devices, so-called I/O bus couplers.

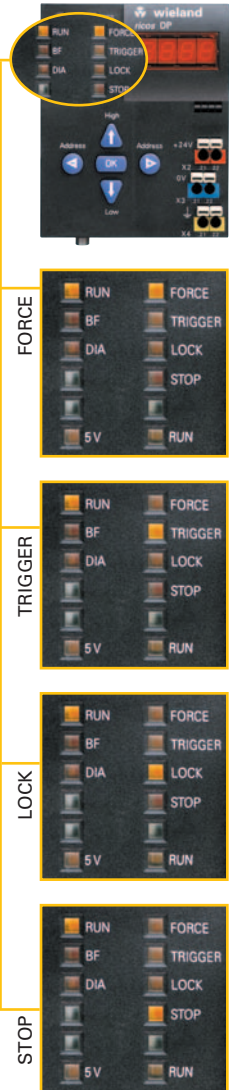
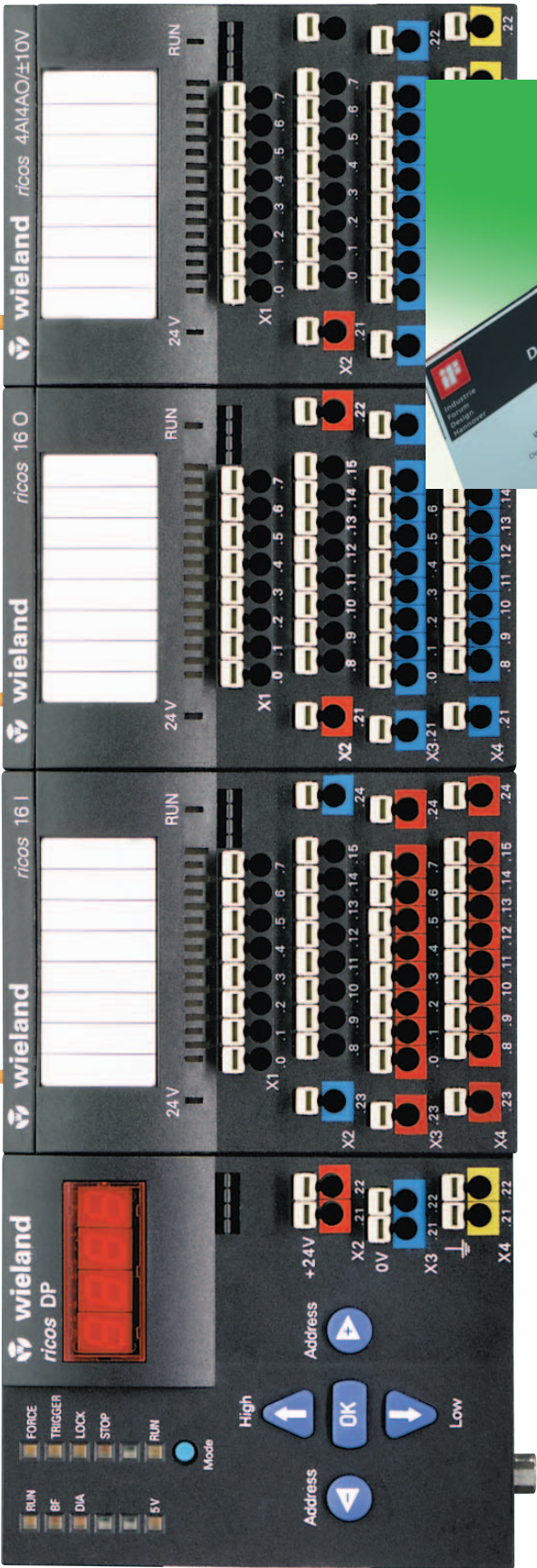
Since the addressing of the devices is not specified in the protocol for INTERBUS, the maximum number of bus devices is determined by the master firmware. Implemented firmware permits up to 512 remote bus devices. This produces the theoretically possible distance of 102 km for an INTERBUS system if copper cables are used. A maximum system expansion of 13 km is however currently guaranteed. Greater distances can be achieved when using other transmission media. Total expansions of 100 km are currently possible when glass fibre cable is used.

Properties:

- ☐ Ring structure with active coupling of the devices
- ☐ Remote bus with max. 512 devices, max. distance of 400 m, max. total expansion of 13 km with copper cable and 100 km with glass fibre
- ☐ Local bus with max. 8 devices, max. distance of 1.5 m, max. total expansion of 10 m
- ☐ Addressing of the devices according to their sequence in the ring
- ☐ Transmission rate: remote bus with 500 kbit/s, local bus with 300 kbit/s
- ☐ Remote bus uses interface based on RS 485 two-wire connection system
- ☐ Local bus uses CMOS level and has 4 core pairs for transmission
- ☐ Protection level up to IP 65 is possible
- ☐ High level of data security, several protection mechanisms (CRC etc.)
- ☐ Open system (DIN EN 19258; European standard 50254)

# Remote I/O

## Operating and display functions



Digital and analog I/O channels can be operated manually without the fieldbus (offline)  
→ in FORCE mode

The last 20 process images of the nodes can be recorded and displayed.  
→ in TRIGGER mode

Analog and digital I/O channels can be 'frozen' at a fixed switching state to simulate parts of the system.  
→ in LOCK mode

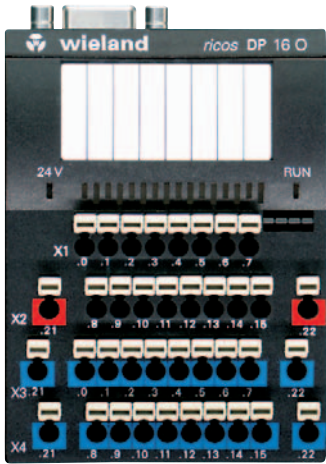
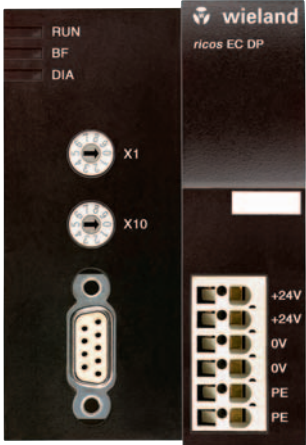
The outputs are switched off and the inputs are no longer available.  
→ in STOP mode

# *ricos*

# Remote I/O

## Bus couplers, economy bus couplers, compact modules

# ricos



Would you like to ...

- ☐ use more than one fieldbus?
- ☐ shorten your commissioning process?
- ☐ simulate signals offline – locally and without a programming device?
- ☐ set I/Os without a PLC?
- ☐ read out analogue values locally?

... then you should use the **ricos** coupler with operating and display functionality!

- ☐ Commissioning without a fieldbus interface
- ☐ Fault location on site
- ☐ Display of the signalling states of all inputs and outputs for digital and analog values

**ricos** bus couplers offer:

- ☐ Connection to the latest fieldbus systems such as PROFIBUS DP, Interbus, CANopen and CAN DeviceNet
- ☐ Modules for rapid DIN rail installation
- ☐ Wiring via spring-clamp terminals
- ☐ Supplied with open clamping body
- ☐ Modules are wired from the front
- ☐ Plug-in distribution board on the module
- ☐ Compact dimensions of the modules
- ☐ Up to 8 modules can be connected in series on a bus coupler, up to 128 I/O signals are therefore possible per bus node
- ☐ Electronics can be replaced without disconnecting the wiring

If you do not require the operation and display functionality of the **ricos** bus coupler ...

... then we recommend our **ricos** economy bus coupler.

**ricos** bus couplers and economy bus couplers are fully compatible in their functionality.

If your control requirements are more complex ...

... we can offer you our **ricos** compact modules

**ricos** compact modules:

- ☐ Use of 4 compact module types for digital signal detection in fieldbus systems:
  - PROFIBUS DP
  - Interbus
  - CANopen
  - DeviceNet
- ☐ All modules are slaves with bus coupler functionality
- ☐ Efficient and space-saving addition for small numbers of I/Os

### ricos housing data

|                               |                                                       |
|-------------------------------|-------------------------------------------------------|
| Material                      | Makrolon 2805, Lexan 161R, Polyamide 6.0 GF20         |
| Color                         | black                                                 |
| Flammability class            | according to DIN VDE 0304 T3 (IEC 707) and UL 94-V-2  |
| Creepage resistance           | according to DIN VDE 0303 T1/06.84 CTI = 600          |
| Permanent rigidity            | according to DIN VDE 0304 20,000 h/5,000 h 100/115 °C |
| Dielectric strength           | according to DIN VDE 0303 T2 (DIN 53481/>15 kV/mm)    |
| Protection class              | Class I according to IEC 536                          |
| Degree of protection          | IP20 according to EN 60529                            |
| Free fall                     | falling height 1 m (DIN IEC 68-2-32), in packaging    |
| Shock resistance              | according to IEC 68 part 2, see "free fall" test      |
| Relative humidity             | 10...95%, no condensation                             |
| Air pressure during operation | 860...1060 hPa                                        |
| Wire strip length             | 10 mm                                                 |
| Clamping body opening         | 2.4 x 1.5 mm according to IEC 999                     |
| Mounting rail                 | TS35                                                  |
| Weight                        | approx. 190 g                                         |

# Remote I/O Bus couplers

## ricos

Modular bus couplers with operating and display functionality for the following fieldbus systems:

- PROFIBUS DP
- Interbus



**ricos BC-DP**  
**PROFIBUS DP bus coupler**  
Approvals: US, Profibus certification



**ricos BC-S**  
**Interbus bus coupler**  
Approvals: US

Dimensions (mm): W x H x D  
74 x 92 x 51

| Description                                        | Type                                                                                  | Part No.      | Std. Pack | Type                                                                                  | Part No.      | Std. Pack |
|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------|-----------|---------------------------------------------------------------------------------------|---------------|-----------|
| Bus coupler with diagnostic functions              | BC-DP                                                                                 | 83.030.0000.1 | 1         | BC-S                                                                                  | 83.031.0000.1 | 1         |
| Display of operating modes:                        |                                                                                       |               |           |                                                                                       |               |           |
| FORCE mode: yellow LED                             |                                                                                       |               |           |                                                                                       |               |           |
| TRIGGER mode: yellow LED                           |                                                                                       |               |           |                                                                                       |               |           |
| LOCK mode: yellow LED                              |                                                                                       |               |           |                                                                                       |               |           |
| STOP mode: yellow LED                              |                                                                                       |               |           |                                                                                       |               |           |
| RUN mode: green LED                                |                                                                                       |               |           |                                                                                       |               |           |
| <b>System data</b>                                 |                                                                                       |               |           |                                                                                       |               |           |
| Maximum number of nodes                            | 126                                                                                   |               |           | 256                                                                                   |               |           |
| Transmission medium                                | Shielded copper cable 2 x 0.25 mm <sup>2</sup> /AWG 23                                |               |           | Shielded copper cable 5 x 0.25 mm <sup>2</sup> /AWG 23                                |               |           |
| Maximum system expansion                           | 100 m – 1200 m (dependent on baud rate/cable)                                         |               |           | 400 m (remote bus)                                                                    |               |           |
| Baud rate                                          | 9.6 kBaud...12 MBaud                                                                  |               |           | 500 kBaud                                                                             |               |           |
| Internal bus refresh rate                          | 2 ms                                                                                  |               |           | 2 ms                                                                                  |               |           |
| Bus connection                                     | 1 x D-SUB 9, female connector with shield                                             |               |           | 2 x D-SUB 9, female connector and plug with shield                                    |               |           |
| <b>Technical data</b>                              |                                                                                       |               |           |                                                                                       |               |           |
| Maximum number of I/O bytes                        | 64 E-Byte/64 A-Byte                                                                   |               |           | 20 E-Byte/20 A-Byte                                                                   |               |           |
| Number of I/O modules per node                     | 8                                                                                     |               |           | 8                                                                                     |               |           |
| Number of digital I/O points per node              | 128                                                                                   |               |           | 128                                                                                   |               |           |
| Number of analog I/O points per node               | 32                                                                                    |               |           | 32                                                                                    |               |           |
| Address setting                                    | 3...126 (via keyboard)                                                                |               |           | automatic dependent on system                                                         |               |           |
| Configuration                                      | PC oder PLC                                                                           |               |           | PC oder PLC                                                                           |               |           |
| Operating voltage                                  | 24 V DC, ±20 %, max. 5 % residual ripple                                              |               |           | 24 V DC, ±20 %, max. 5 % residual ripple                                              |               |           |
| Power consumption                                  | < 125 mA (at 24 V without I/O modules)                                                |               |           | < 125 mA (at 24 V without I/O modules)                                                |               |           |
|                                                    | < 500 mA (at 24 V with I/O modules)                                                   |               |           | < 500 mA (at 24 V with I/O modules)                                                   |               |           |
| Insulation voltage                                 | 350 V AC, 50 Hz (system/supply)                                                       |               |           | 350 V AC, 50 Hz (system/supply)                                                       |               |           |
| Creepage distances and clearances                  | DIN EN 61131-2; DIN EN 50178                                                          |               |           | DIN EN 61131-2; DIN EN 50178                                                          |               |           |
| Electrostatic discharge                            | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           |
| Electrostatic fields                               | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           |
| Interference immunity/emitted interference         | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           |
| Burst                                              | 2 kV according to DIN EN 61000-4-4                                                    |               |           | 2 kV according to DIN EN 61000-4-4                                                    |               |           |
| Connection technology                              | Spring clamp terminal                                                                 |               |           | Spring clamp terminal                                                                 |               |           |
| Wire range: fine-stranded/solid                    | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           |
| Ambient temperature                                | 0 °C...+55 °C                                                                         |               |           | 0 °C...+55 °C                                                                         |               |           |
| Storage temperature                                | –25 °C...+75 °C                                                                       |               |           | –25 °C...+75 °C                                                                       |               |           |
| Bus-specific status displays                       | RUN green LED RUN                                                                     |               |           | RUN green LED RUN                                                                     |               |           |
|                                                    | Bus fault red LED BF                                                                  |               |           | Remote bus disabled red LED RD                                                        |               |           |
|                                                    | Diagnostics red LED DIA                                                               |               |           | Remote bus connected green LED RC                                                     |               |           |
|                                                    | Operating voltage green LED 5 V                                                       |               |           | Bus access green LED BA                                                               |               |           |
|                                                    |                                                                                       |               |           | Operating voltage green LED 5 V                                                       |               |           |
| <b>Accessories</b>                                 |                                                                                       |               |           |                                                                                       |               |           |
| Vertical bus connector                             | 83.030.0010.0 (node)                                                                  | 1             |           | 83.031.0010.0 (incoming cable)                                                        | 1             |           |
| Vertical bus connector                             | 83.030.0011.0 (terminator)                                                            | 1             |           | 83.031.0011.0 (outgoing cable)                                                        | 1             |           |
| Horizontal bus connector                           | 83.030.0012.0 (switch)                                                                | 1             |           |                                                                                       |               |           |
| Manual, German                                     | 05.591.3389.0                                                                         | 1             |           | 05.591.3389.0                                                                         | 1             |           |
| Manual, English                                    | 05.562.1389.0                                                                         | 1             |           | 05.562.1389.0                                                                         | 1             |           |
| GSD file and Word document for labels              | 05.591.3255.0                                                                         | 1             |           | 05.591.3255.0                                                                         | 1             |           |
| 8 digit marking tag, blank                         | 04.242.1553.0                                                                         | 500           |           | 04.242.1553.0                                                                         | 500           |           |
| 8 digit marking tag, with inscription (on request) |                                                                                       |               |           |                                                                                       |               |           |
| End clamp for DIN rail                             | Z5.522.8553.0                                                                         | 100           |           | Z5.522.8553.0                                                                         | 100           |           |

# Remote I/O Bus couplers *ricos* OS

Modular bus couplers with operating and display functionality for the following fieldbus systems:

- DeviceNet
- CANopen



**ricos BC-DeviceNet**  
DeviceNet bus couplers  
Approvals: cULus



**ricos BC-CANopen**  
CANopen bus couplers  
Approvals: cULus

Dimensions (mm): W x H x D  
74 x 92 x 51

| Description                                        | Type                                                                                                                | Part No.                 | Std. Pack | Type                                                                                                        | Part No.                 | Std. Pack |
|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------|-----------|-------------------------------------------------------------------------------------------------------------|--------------------------|-----------|
| Bus coupler with diagnostic functions              | BC-DEVICENET                                                                                                        | 83.032.0000.1            | 1         | BC-CANOPEN                                                                                                  | 83.033.0000.1            | 1         |
| Display of operating modes:                        | incl.1 bus plug                                                                                                     |                          |           | incl.1 bus plug                                                                                             |                          |           |
| FORCE mode: yellow LED                             |                                                                                                                     |                          |           |                                                                                                             |                          |           |
| TRIGGER mode: yellow LED                           |                                                                                                                     |                          |           |                                                                                                             |                          |           |
| LOCK mode: yellow LED                              |                                                                                                                     |                          |           |                                                                                                             |                          |           |
| STOP mode: yellow LED                              |                                                                                                                     |                          |           |                                                                                                             |                          |           |
| RUN mode: green LED                                |                                                                                                                     |                          |           |                                                                                                             |                          |           |
| <b>System data</b>                                 |                                                                                                                     |                          |           |                                                                                                             |                          |           |
| Maximum number of nodes                            | 64 with Repeater                                                                                                    |                          |           | 126                                                                                                         |                          |           |
| Transmission medium                                | Shielded copper cable trunk line AWG 15, 18<br>Shielded copper cable drop line AWG 22, 24                           |                          |           | Shielded copper cable 4 x 0.25 mm <sup>2</sup> /AWG 23                                                      |                          |           |
| Maximum system expansion                           | 100 m – 500 m (dependent on baud rate/cable)                                                                        |                          |           | 100 m – 500 m (dependent on baud rate/cable)                                                                |                          |           |
| Baud rate                                          | 125/250/500 kBaud (setting via keyboard)                                                                            |                          |           | 10 kBaud...1 MBaud (setting via keyboard)                                                                   |                          |           |
| Internal bus refresh rate                          | 2 ms                                                                                                                |                          |           | 2 ms                                                                                                        |                          |           |
| Bus connection                                     | 5 pole connector, screw                                                                                             |                          |           | 5 pole connector, screw                                                                                     |                          |           |
| <b>Technical data</b>                              |                                                                                                                     |                          |           |                                                                                                             |                          |           |
| Maximum number of I/O bytes                        | 64 E-Byte/64 A-Byte                                                                                                 |                          |           | 9 R-PDO's; 9 T-PDO's                                                                                        |                          |           |
| Number of I/O modules per node                     | 8                                                                                                                   |                          |           | 8                                                                                                           |                          |           |
| Number of digital I/O points per node              | 128                                                                                                                 |                          |           | 96                                                                                                          |                          |           |
| Number of analog I/O points per node               | 32                                                                                                                  |                          |           | 24                                                                                                          |                          |           |
| Address setting (MAC ID)                           | 1...63 (via keyboard)                                                                                               |                          |           | 1...126 (via keyboard)                                                                                      |                          |           |
| Configuration                                      | PC or PLC                                                                                                           |                          |           | PC or PLC                                                                                                   |                          |           |
| Operating voltage                                  | 24 V DC, ± 20 %, max. 5 % residual ripple                                                                           |                          |           | 24 V DC, ± 20 %, max. 5 % residual ripple                                                                   |                          |           |
| Power consumption                                  | < 125 mA (at 24 V without I/O modules)<br>< 500 mA (at 24 V with I/O modules)                                       |                          |           | < 125 mA (at 24 V without I/O modules)<br>< 500 mA (at 24 V with I/O modules)                               |                          |           |
| Insulation voltage                                 | 350 V AC, 50 Hz ( system/supply)                                                                                    |                          |           | 350 V AC, 50 Hz (system/supply)                                                                             |                          |           |
| Creepage distances and clearances                  | DIN EN 61131-2; DIN EN 50178                                                                                        |                          |           | DIN EN 61131-2; DIN EN 50178                                                                                |                          |           |
| Electrostatic discharge                            | EN 61000-4-2; 8 kV air; 4 kV contact                                                                                |                          |           | EN 61000-4-2; 8 kV air; 4 kV contact                                                                        |                          |           |
| Electrostatic fields                               | ENV 50140; 10 V/m; 30...1000 MHz                                                                                    |                          |           | ENV 50140; 10 V/m; 30...1000 MHz                                                                            |                          |           |
| Interference immunity/emitted interference         | EN 61000-6-2/EN 55011; limit value A; group 1                                                                       |                          |           | EN 61000-6-2/EN 55011; limit value A; group 1                                                               |                          |           |
| Burst                                              | 2 kV according to DIN EN 61000-4-4                                                                                  |                          |           | 2 kV according to DIN EN 61000-4-4                                                                          |                          |           |
| Connection technology                              | Spring clamp terminal                                                                                               |                          |           | Spring clamp terminal                                                                                       |                          |           |
| Wire range: fine-stranded/solid                    | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup>                               |                          |           | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup>                       |                          |           |
| Ambient temperature                                | 0 °C...+ 55 °C                                                                                                      |                          |           | 0 °C...+ 55 °C                                                                                              |                          |           |
| Storage temperature                                | –25 °C...+ 75 °C                                                                                                    |                          |           | –25 °C...+ 75 °C                                                                                            |                          |           |
| Bus-specific status displays                       | RUN green LED<br>Status to master green/red LED<br>Ready for operation green/red LED<br>Operating voltage green LED | RUN<br>NET<br>MOD<br>5 V |           | RUN green LED<br>Network status green/red LED<br>Module status green/red LED<br>Operating voltage green LED | RUN<br>NET<br>MOD<br>5 V |           |
| <b>Accessories</b>                                 |                                                                                                                     |                          |           |                                                                                                             |                          |           |
| Bus connector                                      | 25.323.3501.0                                                                                                       | 50                       |           | 25.323.3501.0                                                                                               | 50                       |           |
| Manual, German                                     | 05.591.3389.0                                                                                                       | 1                        |           | 05.591.3389.0                                                                                               | 1                        |           |
| Manual, English                                    | 05.562.1389.0                                                                                                       | 1                        |           | 05.562.1389.0                                                                                               | 1                        |           |
| GSD file and Word document for labels              | 05.591.3255.0                                                                                                       | 1                        |           | 05.591.3255.0                                                                                               | 1                        |           |
| 8 digit marking tag, blank                         | 04.242.1553.0                                                                                                       | 500                      |           | 04.242.1553.0                                                                                               | 500                      |           |
| 8 digit marking tag, with inscription (on request) |                                                                                                                     |                          |           |                                                                                                             |                          |           |
| End clamp for DIN rail                             | Z5.522.8553.0                                                                                                       | 100                      |           | Z5.522.8553.0                                                                                               | 100                      |           |

# Remote I/O Bus couplers

# ricos

Modular bus coupler with operating and display functionality for the following fieldbus:

- Ethernet Modbus TCP/IP



Dimensions (mm): W x H x D  
74 x 92 x 51

**ricos BC-Ethernet**  
**Ethernet Modbus TCP/IP bus coupler**  
Approvals:  in preparation: CE

| Description                                        | Type                                                   | Part No.      | Std. Pack |  |
|----------------------------------------------------|--------------------------------------------------------|---------------|-----------|--|
| Bus coupler with diagnostic functions              | BC-Ethernet                                            | 83.034.0000.1 | 1         |  |
| Display of operating modes:                        |                                                        |               |           |  |
| FORCE mode: yellow LED                             |                                                        |               |           |  |
| TRIGGER: yellow LED                                |                                                        |               |           |  |
| LOCK mode: yellow LED                              |                                                        |               |           |  |
| STOP mode: yellow LED                              |                                                        |               |           |  |
| RUN mode: green LED                                |                                                        |               |           |  |
|                                                    |                                                        |               |           |  |
| <b>System data</b>                                 |                                                        |               |           |  |
| Maximum number of nodes                            | 254 per network                                        |               |           |  |
| Transmission medium                                | 100 Base-T4 or 100 Base-TX                             |               |           |  |
| Maximum system expansion                           | 100 m                                                  |               |           |  |
| Baud rate                                          | 10/100 Mbit/s                                          |               |           |  |
| Internal bus refresh rate                          | 2 ms                                                   |               |           |  |
| Bus connection                                     | RJ 45                                                  |               |           |  |
| <b>Technical data</b>                              |                                                        |               |           |  |
| Maximum number of I/O bytes                        | 64 E-Byte/64 A-Byte                                    |               |           |  |
| Number of I/O modules per node                     | 8                                                      |               |           |  |
| Number of digital I/O points per node              | 128                                                    |               |           |  |
| Number of analogue I/O points per node             | 32                                                     |               |           |  |
| Address setting                                    | setting via keyboard                                   |               |           |  |
| Configuration                                      | PC or PLC                                              |               |           |  |
| Operating voltage                                  | 24 V DC +20%, max. 5% residual ripple                  |               |           |  |
| Power consumption                                  | < 150 mA (< 3.5 W) (without I/O module)                |               |           |  |
|                                                    |                                                        |               |           |  |
| Insulation voltage                                 | 350 V AC / 50 Hz                                       |               |           |  |
| Creepage distances and clearances                  | DIN EN 61131-2; DIN EN 50178                           |               |           |  |
| Electrostatic discharge                            | EN 61000-4-2; 8 kV air; 4 kV contact                   |               |           |  |
| Electrostatic fields                               | ENV 50140; 10 V/m; 30 ... 1000 MHz                     |               |           |  |
| Interference immunity/emitted interference         | EN 61000-6-3 / EN 55011; limit value A; group 1        |               |           |  |
| Burst                                              | 2 kV according to DIN EN 61000-4-4                     |               |           |  |
| Connection technology                              | Spring clamp terminal                                  |               |           |  |
| Wire range: fine-stranded/solid                    | 0.14 – 1.5 mm <sup>2</sup> / 0.5 – 2.5 mm <sup>2</sup> |               |           |  |
| Ambient temperature                                | 0 °C ... +55 °C                                        |               |           |  |
| Storage temperature                                | -25 °C ... +70 °C                                      |               |           |  |
| Bus-specific status displays                       | RUN yellow LED RUN                                     |               |           |  |
|                                                    | Data exchange green LED TxD/RxD                        |               |           |  |
|                                                    | Connection to network green LED LINK                   |               |           |  |
|                                                    | Operating voltage yellow LED 5 V                       |               |           |  |
|                                                    | Initialization red LED INIT                            |               |           |  |
| <b>Accessories</b>                                 |                                                        |               |           |  |
| Vertical bus connector                             |                                                        |               |           |  |
| Vertical bus connector                             |                                                        |               |           |  |
| Horizontal bus connector (being prepared)          |                                                        |               |           |  |
| Manual, German                                     | 05.564.1589.0                                          | 1             |           |  |
| Manual, English                                    | 05.563.9289.0                                          | 1             |           |  |
| GSD file and Word document for labels              | 05.591.3255.0                                          | 1             |           |  |
| 8 digit marking tag, blank                         | 04.242.1553.0                                          | 500           |           |  |
| 8 digit marking tag, with inscription (on request) |                                                        |               |           |  |
| End clamp for DIN rail                             | Z5.522.8553.0                                          | 100           |           |  |

# Remote I/O PLC with Ethernet fieldbus

## ricos

Freely programmable PLC with Ethernet fieldbus:

- Programming according to EN 61131-3

Fieldbus:

- Ethernet Modbus TCP/IP



### ricos BC-Ethernet PLC PLC with Ethernet Modbus TCP/IP

Approvals: in preparation: CE

Dimensions (mm): W x H x D

74 x 92 x 51

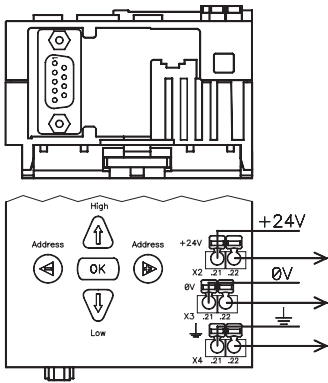
| Description                                        | Type                                            | Part No.      | Std. Pack | Other technical data                                  |                                |
|----------------------------------------------------|-------------------------------------------------|---------------|-----------|-------------------------------------------------------|--------------------------------|
| Bus coupler with diagnostic functions              | BC-Ethernet PLC                                 | 83.034.0010.1 | 1         |                                                       |                                |
| Display of operating modes:                        |                                                 |               |           | Download of operating system via Ethernet FT protocol |                                |
| FORCE mode: yellow LED                             |                                                 |               |           | Programming of CoDeSys via Ethernet TCP/IP            |                                |
| TRIGGER: yellow LED                                |                                                 |               |           | Development environment                               |                                |
| LOCK mode: yellow LED                              |                                                 |               |           |                                                       |                                |
| STOP mode: yellow LED                              |                                                 |               |           | Extendable                                            | max. 8 ricos I/O-Module        |
| RUN mode: green LED                                |                                                 |               |           |                                                       | all functions                  |
|                                                    |                                                 |               |           |                                                       |                                |
| <b>System data</b>                                 |                                                 |               |           | Program memory/                                       | 16 MB RAM available, minus     |
| Maximum number of nodes                            | 254 per network                                 |               |           | Data memory                                           | firmware requirement, only     |
| Transmission medium                                | CAT 5 twisted pair 10/100 base Tx               |               |           |                                                       | limited by size of user        |
| Maximum system expansion                           | 100 m                                           |               |           |                                                       | memory                         |
| Baud rate                                          | 10/100 MBaud (Ethernet coupler)                 |               |           |                                                       |                                |
| Internal bus refresh rate                          | 2 ms                                            |               |           | Flash / Memory                                        | 1 MB for CoDeSys,              |
| Bus connection                                     | RJ 45                                           |               |           |                                                       | PLC program                    |
| <b>Technical data</b>                              |                                                 |               |           |                                                       | Process image size,            |
| Maximum number of I/O bytes                        | 64 E-Byte/64 A-Byte                             |               |           |                                                       | Program size, POU size,        |
| Number of I/O modules per node                     | 8                                               |               |           |                                                       | number of variables,           |
| Number of digital I/O points per node              | 128                                             |               |           |                                                       | only limited by size of user   |
| Number of analogue I/O points per node             | 32                                              |               |           |                                                       | memory                         |
| Address setting                                    | Ethernet coupler                                |               |           |                                                       |                                |
| Configuration                                      | PC or PLC                                       |               |           | EEPROM                                                | 512 kBytes                     |
| Operating voltage                                  | 24 V DC +20%, max. 5% residual ripple           |               |           |                                                       |                                |
| Power consumption                                  | < 150 mA (< 3.5 W) (without I/O module)         |               |           | Controller                                            | NetARM40                       |
|                                                    |                                                 |               |           |                                                       |                                |
| Insulation voltage                                 | 350 V AC / 50 Hz                                |               |           | Execution time                                        | one PLC task                   |
| Creepage distances and clearances                  | DIN EN 61131-2; DIN EN 50178                    |               |           |                                                       |                                |
| Electrostatic discharge                            | EN 61000-4-2; 8 kV air; 4 kV contact            |               |           | Programming languages                                 | IEC 61131-3: IL, FBD, LD, SFC, |
| Electrostatic fields                               | ENV 50140; 10 V/m; 30 ... 1000 MHz              |               |           |                                                       | ST, CFC, AWL, FUL, KOP,        |
| Interference immunity/emitted interference         | EN 61000-6-3 / EN 55011; limit value A; group 1 |               |           |                                                       | C code can be incorporated,    |
| Burst                                              | 2 kV according to DIN EN 61000-4-4              |               |           |                                                       | powerful library management    |
| Connection technology                              | Spring clamp terminal                           |               |           |                                                       |                                |
| Wire range: fine-stranded/solid                    | 0.14 – 1.5 mm² / 0.5 – 2.5 mm²                  |               |           |                                                       |                                |
| Ambient temperature                                | 0 °C ... +55 °C                                 |               |           | Times and counters                                    | typically 10 ms                |
| Storage temperature                                | -25 °C ... +70 °C                               |               |           |                                                       |                                |
| Bus-specific status displays                       | RUN                                             | yellow LED    | RUN       | Times and counters                                    | 600 µs (NETARM) for            |
|                                                    | Data exchange                                   | green LED     | TxD/RxD   |                                                       | 1000 PLC commands              |
|                                                    | Data exchange                                   | green LED     | LINK      |                                                       |                                |
|                                                    | Operating voltage                               | yellow LED    | 5 V       | Times and counters                                    | openly programmable /          |
|                                                    | Initialization                                  | red LED       | INIT      |                                                       | unlimited number               |
| <b>Accessories</b>                                 |                                                 |               |           |                                                       |                                |
| Vertical bus connector                             |                                                 |               |           | Function modules                                      | Builder and Editor             |
| Vertical bus connector                             |                                                 |               |           |                                                       |                                |
| Horizontal bus connector (being prepared)          |                                                 |               |           | Real-time clock and date                              | not available                  |
| Manual, German                                     |                                                 | 05.564.1589.0 | 1         |                                                       |                                |
| Manual, English                                    |                                                 | 05.563.9289.0 | 1         |                                                       |                                |
| GSD file and Word document for labels              |                                                 | 05.591.3255.0 | 1         |                                                       |                                |
| 8 digit marking tag, blank                         |                                                 | 04.242.1553.0 | 500       |                                                       |                                |
| 8 digit marking tag, with inscription (on request) |                                                 |               |           |                                                       |                                |
| End clamp for DIN rail                             |                                                 | Z5.522.8553.0 | 100       |                                                       |                                |

# Remote I/O

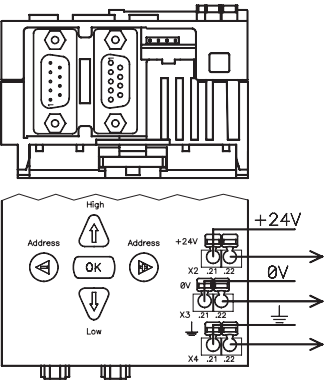
## Circuit diagrams for bus coupler PLC

### Circuit diagrams for field bus couplers

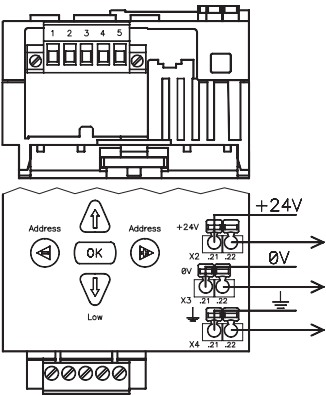
#### PROFIBUS DP



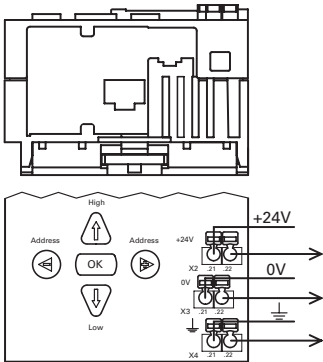
#### Interbus



#### DeviceNet and CANopen



#### Modular bus coupler Ethernet Modbus TCP/IP



# Remote I/O Bus couplers *ricos* OS

Modular economy bus couplers  
for the following fieldbus systems:

- PROFIBUS DP
- Interbus



**ricos EC-DP**  
**PROFIBUS DP bus coupler**  
Approvals: us, Profibus certification



**ricos EC-S**  
**Interbus bus coupler**  
Approvals: us

Dimensions (mm): W x H x D  
63 x 92 x 51

| Description                                        | Type                                                                                                                           | Part No.                   | Std. Pack | Type                                                                                                                                            | Part No.      | Std. Pack |
|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------|
| Economy bus coupler                                | EC-DP                                                                                                                          | 83.030.0001.1              | 1         | EC-S                                                                                                                                            | 83.031.0001.1 | 1         |
| Display of operating modes:                        | RUN – processor is running: yellow LED<br>BF – no bus connection (Bus Fail): red LED<br>DIA – diagnostics signal sent: red LED |                            |           | RUN – processor is running: yellow LED<br>RD – remotebus disabled: red LED<br>RC – remotebus connected: green LED<br>BA – bus access: green LED |               |           |
| <b>System data</b>                                 |                                                                                                                                |                            |           |                                                                                                                                                 |               |           |
| Maximum number of nodes                            | 99 (or 126 in connection with slaves with higher addressing options)                                                           |                            |           | 256                                                                                                                                             |               |           |
| Transmission medium                                | Shielded copper cable 2 x 0.25 mm <sup>2</sup> /AWG 23                                                                         |                            |           | Shielded copper cable 5 x 0.25 mm <sup>2</sup> /AWG 23                                                                                          |               |           |
| Maximum system expansion                           | 100 m – 1200 m (dependent on baud rate/cable)                                                                                  |                            |           | 400 m (remote bus)                                                                                                                              |               |           |
| Baud rate                                          | 9.6 kBaud...12 Mbaud                                                                                                           |                            |           | 500 kBaud                                                                                                                                       |               |           |
| Internal bus refresh rate                          | 2 ms                                                                                                                           |                            |           | 2 ms                                                                                                                                            |               |           |
| Bus connection                                     | 1 x D-SUB 9, female connector with shield                                                                                      |                            |           | 2 x D-SUB 9, female connector and plug with shield                                                                                              |               |           |
| <b>Technical data</b>                              |                                                                                                                                |                            |           |                                                                                                                                                 |               |           |
| Maximum number of I/O bytes                        | 64 E-Byte/64 A-Byte                                                                                                            |                            |           | 20 E-Byte/20 A-Byte                                                                                                                             |               |           |
| Number of I/O modules per node                     | 8                                                                                                                              |                            |           | 8                                                                                                                                               |               |           |
| Number of digital I/O points per node              | 128                                                                                                                            |                            |           | 128                                                                                                                                             |               |           |
| Number of analogue I/O points per node             | 32                                                                                                                             |                            |           | 32                                                                                                                                              |               |           |
| Address setting                                    | 3...99 (switch)                                                                                                                |                            |           | automatic dependent on system                                                                                                                   |               |           |
| Configuration                                      | PC or PLC                                                                                                                      |                            |           | PC or PLC                                                                                                                                       |               |           |
| Operating voltage                                  | 24 V DC, ±20 %, max. 5 % residual ripple                                                                                       |                            |           | 24 V DC, ±20 %, max. 5 % residual ripple                                                                                                        |               |           |
| Power consumption                                  | < 125 mA (at 24 V without I/O modules)                                                                                         |                            |           | < 125 mA (at 24 V without I/O modules)                                                                                                          |               |           |
|                                                    | < 500 mA (at 24 V with I/O modules)                                                                                            |                            |           | < 500 mA (at 24 V with I/O modules)                                                                                                             |               |           |
| Insulation voltage                                 | 350 V AC, 50 Hz (system/supply)                                                                                                |                            |           | 350 V AC, 50 Hz (system/supply)                                                                                                                 |               |           |
| Creepage distances and clearances                  | DIN EN 61131-2; DIN EN 50178                                                                                                   |                            |           | DIN EN 61131-2; DIN EN 50178                                                                                                                    |               |           |
| Electrostatic discharge                            | EN 61000-4-2; 8 kV air; 4 kV contact                                                                                           |                            |           | EN 61000-4-2; 8 kV air; 4 kV contact                                                                                                            |               |           |
| Electrostatic fields                               | ENV 50140; 10 V/m; 30...1000 MHz                                                                                               |                            |           | ENV 50140; 10 V/m; 30...1000 MHz                                                                                                                |               |           |
| Interference immunity/emitted interference         | EN 61000-6-2/EN 55011; limit value A; group 1                                                                                  |                            |           | EN 61000-6-2/EN 55011; limit value A; group 1                                                                                                   |               |           |
| Burst                                              | 2 kV according to DIN EN 61000-4-4                                                                                             |                            |           | 2 kV according to DIN EN 61000-4-4                                                                                                              |               |           |
| Connection technology                              | Spring clamp terminal                                                                                                          |                            |           | Spring clamp terminal                                                                                                                           |               |           |
| Wire range: fine-stranded/solid                    | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup>                                          |                            |           | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup>                                                           |               |           |
| Ambient temperature                                | 0 °C...+55 °C                                                                                                                  |                            |           | 0 °C...+55 °C                                                                                                                                   |               |           |
| Storage temperature                                | –25 °C...+75 °C                                                                                                                |                            |           | –25 °C...+75 °C                                                                                                                                 |               |           |
| <b>Accessories</b>                                 |                                                                                                                                |                            |           |                                                                                                                                                 |               |           |
| Vertical bus connector                             |                                                                                                                                | 83.030.0010.0 (node)       | 1         |                                                                                                                                                 |               |           |
| Vertical bus connector                             |                                                                                                                                | 83.030.0011.0 (terminator) | 1         |                                                                                                                                                 |               |           |
| Horizontal bus connector                           |                                                                                                                                | 83.030.0012.0 (switch)     | 1         |                                                                                                                                                 |               |           |
| Manual, German                                     |                                                                                                                                | 05.591.3389.0              | 1         | 05.591.3389.0                                                                                                                                   |               | 1         |
| Manual, English                                    |                                                                                                                                | 05.562.1389.0              | 1         | 05.562.1389.0                                                                                                                                   |               | 1         |
| GSD file and Word document for labels              |                                                                                                                                | 05.591.3255.0              | 1         | 05.591.3255.0                                                                                                                                   |               | 1         |
| 8 digit marking tag, blank                         |                                                                                                                                | 04.242.1553.0              | 500       | 04.242.1553.0                                                                                                                                   |               | 500       |
| 8 digit marking tag, with inscription (on request) |                                                                                                                                |                            |           |                                                                                                                                                 |               |           |
| End clamp for DIN rail                             |                                                                                                                                | Z5.522.8553.0              | 100       | Z5.522.8553.0                                                                                                                                   |               | 100       |

# Remote I/O Bus couplers

## ricos

Modular economy bus couplers  
for the following fieldbus system:

- DeviceNet
- CANopen



**ricos EC-DeviceNet**  
**DeviceNet bus coupler**  
Approvals: 



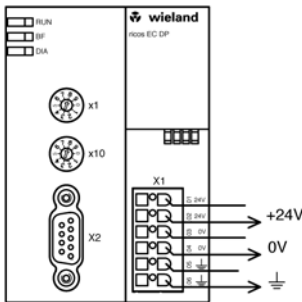
**ricos EC-CANopen**  
**CANopen bus coupler**  
Approvals: 

Dimensions (mm): W x H x D  
63 x 92 x 51

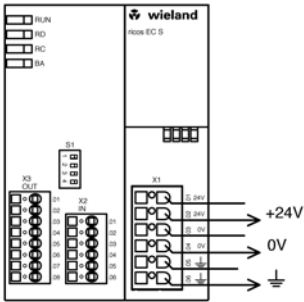
| Description                                        | Type                                                                                      | Part No.      | Std. Pack | Type                                                                                  | Part No.      | Std. Pack |
|----------------------------------------------------|-------------------------------------------------------------------------------------------|---------------|-----------|---------------------------------------------------------------------------------------|---------------|-----------|
| Bus coupler with diagnostic functions              | EC-DEVICENET                                                                              | 83.032.0001.1 | 1         | EC-CANOPEN                                                                            | 83.033.0001.1 | 1         |
|                                                    | incl.1 bus plug                                                                           |               |           | incl.1 bus plug                                                                       |               |           |
| Display of operating modes:                        | RUN – processor is running: yellow LED                                                    |               |           | RUN – processor is running: yellow LED                                                |               |           |
|                                                    | NET – status display to master: green/red LED                                             |               |           | NET – status display to master: green/red LED                                         |               |           |
|                                                    | MOD – Ready for operation: green/red LED                                                  |               |           | MOD – Ready for operation: green/red LED                                              |               |           |
|                                                    |                                                                                           |               |           |                                                                                       |               |           |
|                                                    |                                                                                           |               |           |                                                                                       |               |           |
| <b>System data</b>                                 |                                                                                           |               |           |                                                                                       |               |           |
| Maximum number of nodes                            | 64 with Repeater                                                                          |               |           | 126                                                                                   |               |           |
| Transmission medium                                | Shielded copper cable trunk line AWG 15, 18<br>Shielded copper cable drop line AWG 22, 24 |               |           | Shielded copper cable 3 x 0.25 mm <sup>2</sup> /AWG 23                                |               |           |
| Maximum system expansion                           | 100 m – 500 m (dependent on baud rate/cable)                                              |               |           | 100 m – 500 m (dependent on baud rate/cable)                                          |               |           |
| Baud rate                                          | 125/250/500 kBaud (DIP switch)                                                            |               |           | 10 kBaud...1 MBaud (DIP switch)                                                       |               |           |
| Internal bus refresh rate                          | 2 ms                                                                                      |               |           | 2 ms                                                                                  |               |           |
| Bus connection                                     | 5 pole connector, screw                                                                   |               |           | 5 pole connector, screw                                                               |               |           |
| <b>Technical data</b>                              |                                                                                           |               |           |                                                                                       |               |           |
| Maximum number of I/O bytes                        | 64 E-Byte/64 A-Byte                                                                       |               |           | 9 R-PDO's; 9 T-PDO's                                                                  |               |           |
| Number of I/O modules per node                     | 8                                                                                         |               |           | 6                                                                                     |               |           |
| Number of digital I/O points per node              | 128                                                                                       |               |           | 96                                                                                    |               |           |
| Number of analogue I/O points per node             | 32                                                                                        |               |           | 24                                                                                    |               |           |
| Address setting (MAC ID)                           | 1...63 (via DIP switch)                                                                   |               |           | 1...126 (via DIP switch)                                                              |               |           |
| Configuration                                      | PC or PLC                                                                                 |               |           | PC or SPS                                                                             |               |           |
| Operating voltage                                  | 24 V DC, ±20 %, max. 5 % residual ripple                                                  |               |           | 24 V DC, ±20 %, max. 5 % residual ripple                                              |               |           |
| Power consumption                                  | < 125 mA (at 24 V without I/O modules)<br>< 500 mA (at 24 V with I/O modules)             |               |           | < 125 mA (at 24 V without I/O modules)<br>< 500 mA (at 24 V with I/O modules)         |               |           |
| Insulation voltage                                 | 350 V AC, 50 Hz (system/supply)                                                           |               |           | 350 V AC, 50 Hz (system/supply)                                                       |               |           |
| Creepage distances and clearances                  | DIN EN 61131-2; DIN EN 50178                                                              |               |           | DIN EN 61131-2; DIN EN 50178                                                          |               |           |
| Electrostatic discharge                            | EN 61000-4-2; 8 kV air; 4 kV contact                                                      |               |           | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           |
| Electrostatic fields                               | ENV 50140; 10 V/m; 30...1000 MHz                                                          |               |           | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           |
| Interference immunity/emitted interference         | EN 61000-6-2/EN 55011; limit value A; group 1                                             |               |           | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           |
| Burst                                              | 2 kV according to DIN EN 61000-4-4                                                        |               |           | 2 kV according to DIN EN 61000-4-4                                                    |               |           |
| Connection technology                              | Spring clamp terminal                                                                     |               |           | Spring clamp terminal                                                                 |               |           |
| Wire range: fine-stranded/solid                    | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup>     |               |           | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           |
| Ambient temperature                                | 0 °C...+55 °C                                                                             |               |           | 0 °C...+55 °C                                                                         |               |           |
| Storage temperature                                | –25 °C...+75 °C                                                                           |               |           | –25 °C...+75 °C                                                                       |               |           |
|                                                    |                                                                                           |               |           |                                                                                       |               |           |
| <b>Accessories</b>                                 |                                                                                           |               |           |                                                                                       |               |           |
| Bus connector                                      | 25.323.3501.0                                                                             | 50            |           | 25.323.3501.0                                                                         | 50            |           |
| Manual, German                                     | 05.591.3389.0                                                                             | 1             |           | 05.591.3389.0                                                                         | 1             |           |
| Manual, English                                    | 05.562.1389.0                                                                             | 1             |           | 05.562.1389.0                                                                         | 1             |           |
| GSD file and Word document for labels              | 05.591.3255.0                                                                             | 1             |           | 05.591.3255.0                                                                         | 1             |           |
| 8 digit marking tag, blank                         | 04.242.1553.0                                                                             | 500           |           | 04.242.1553.0                                                                         |               |           |
| 8 digit marking tag, with inscription (on request) |                                                                                           |               |           |                                                                                       |               |           |
| End clamp for DIN rail                             | Z5.522.8553.0                                                                             | 100           |           | Z5.522.8553.0                                                                         | 100           |           |
|                                                    |                                                                                           |               |           |                                                                                       |               |           |
|                                                    |                                                                                           |               |           |                                                                                       |               |           |
|                                                    |                                                                                           |               |           |                                                                                       |               |           |
|                                                    |                                                                                           |               |           |                                                                                       |               |           |

Circuit diagrams for economy fieldbus couplers

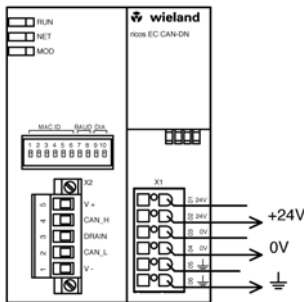
PROFIBUS DP



Interbus



DeviceNet and CANopen



# Remote I/O Binary I/O modules

# ricos

- Individual parameterization as input or output with 8 I/O
- For 2, 3 and 4 wire connection
- Electronics can be replaced without disconnection of the wiring



**ricos 8I/O**  
**8 inputs or 8 outputs 24 V DC**  
Approvals: 



**ricos 16I**  
**16 inputs 24 V DC**  
Approvals: 

Dimensions (mm): W x H x D  
69 x 92 x 51

| Description                                             | Type                                                                                  | Part No.      | Std. Pack | Type                                                                                  | Part No.      | Std. Pack |
|---------------------------------------------------------|---------------------------------------------------------------------------------------|---------------|-----------|---------------------------------------------------------------------------------------|---------------|-----------|
|                                                         | ricos 8I/O                                                                            | 83.035.3100.1 | 1         | ricos 16I                                                                             | 83.035.3000.1 | 1         |
| Display of operating modes:                             |                                                                                       |               |           |                                                                                       |               |           |
| 24 V – power supply connected: yellow LED               |                                                                                       |               |           |                                                                                       |               |           |
| RUN – internal data transmission is running: yellow LED |                                                                                       |               |           |                                                                                       |               |           |
| Channel LED – switching state: green LED                |                                                                                       |               |           |                                                                                       |               |           |
| Channel LED – channel cursor: yellow LED                |                                                                                       |               |           |                                                                                       |               |           |
|                                                         |                                                                                       |               |           |                                                                                       |               |           |
| <b>Module data</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Number of inputs                                        | maximal 8                                                                             |               |           | 16                                                                                    |               |           |
| Number of outputs                                       | maximal 8                                                                             |               |           | 0                                                                                     |               |           |
| Operating voltage                                       | 24 V DC, ±20 %, max. 5 % residual ripple                                              |               |           | 24 V DC, ±20 %, max. 5 % residual ripple                                              |               |           |
| Power consumption                                       | < 0.5 W                                                                               |               |           | < 0.5 W                                                                               |               |           |
| Configuration                                           | None required                                                                         |               |           | None required                                                                         |               |           |
| Memory space required by the control                    | 2 input bytes/2 output bytes                                                          |               |           | 2 input bytes                                                                         |               |           |
| <b>Input data</b>                                       |                                                                                       |               |           |                                                                                       |               |           |
| Switching level “0” (EN 61131-2)                        | –30 V...+5 V DC                                                                       |               |           | –30 V...+5 V DC                                                                       |               |           |
| Switching level “1” (EN 61131-2)                        | +15 V...+30 V DC                                                                      |               |           | +15 V...+30 V DC                                                                      |               |           |
| Input current/channel (at 24 V DC)                      | 6.1 mA                                                                                |               |           | 4.5 mA                                                                                |               |           |
| Status display                                          | green LED                                                                             |               |           | green LED                                                                             |               |           |
| <b>Output data</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Output voltage                                          | Operating voltage – 0.5 V DC                                                          |               |           |                                                                                       |               |           |
| Output current per channel                              | 1 A DC                                                                                |               |           |                                                                                       |               |           |
| Maximum total current per module                        | 8 A DC                                                                                |               |           |                                                                                       |               |           |
| Concurrence                                             | 100 %                                                                                 |               |           |                                                                                       |               |           |
| Load types                                              | resistive, inductive                                                                  |               |           |                                                                                       |               |           |
| Status display                                          | green LED                                                                             |               |           |                                                                                       |               |           |
| Output behavior                                         | Resistant to overload and short circuits                                              |               |           |                                                                                       |               |           |
| <b>General</b>                                          |                                                                                       |               |           |                                                                                       |               |           |
| Signal delay per I/O channel                            | < 100 µs                                                                              |               |           | < 100 µs                                                                              |               |           |
| Maximum voltage of power contact                        | 30 V DC                                                                               |               |           | 30 V DC                                                                               |               |           |
| Maximum current of power contact                        | 8 A DC                                                                                |               |           | 8 A DC                                                                                |               |           |
| Insulation voltage                                      | 350 V AC, 50 Hz (system/supply)                                                       |               |           | 350 V AC, 50 Hz (system/supply)                                                       |               |           |
| Creepage distances and clearances                       | DIN EN 61131-2; DIN EN 50178                                                          |               |           | DIN EN 61131-2; DIN EN 50178                                                          |               |           |
| Electrostatic discharge                                 | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           |
| Electrostatic fields                                    | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           |
| Interference immunity/emitted interference              | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           |
| Burst                                                   | according to EN 61000-4-4                                                             |               |           | according to EN 61000-4-4                                                             |               |           |
| Connection technology                                   | Spring clamp terminal                                                                 |               |           | Spring clamp terminal                                                                 |               |           |
| Wire range: fine-stranded/solid                         | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           |
| Ambient temperature                                     | 0 °C...+55 °C                                                                         |               |           | 0 °C...+55 °C                                                                         |               |           |
| Storage temperature                                     | –25 °C...+75 °C                                                                       |               |           | –25 °C...+75 °C                                                                       |               |           |
| <b>Accessories</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Snap-on distribution board 3 and 4 wire operation       |                                                                                       | 83.039.0000.0 | 1         |                                                                                       | 83.039.0000.0 | 1         |
| Adhesive labels, A4 sheet                               |                                                                                       | 05.591.3089.0 | 10        |                                                                                       | 05.591.3089.0 | 10        |
| 2 pole jumper for parallel connection of outputs        |                                                                                       | Z7.258.1225.0 | 10        |                                                                                       | Z7.258.1225.0 | 10        |
| 8 digit marking tag, blank                              |                                                                                       | 04.242.1553.0 | 500       |                                                                                       | 04.242.1553.0 | 500       |
| 8 digit marking tag, with inscription (on request)      |                                                                                       |               |           |                                                                                       |               |           |
| End clamp for DIN rail                                  |                                                                                       | Z5.522.8553.0 | 100       |                                                                                       | Z5.522.8553.0 | 100       |
|                                                         |                                                                                       |               |           |                                                                                       |               |           |
|                                                         |                                                                                       |               |           |                                                                                       |               |           |

# Remote I/O Binary I/O modules *ricos*

Alternating current input modules  
for 115 V and 230 V



**ricos 4I AC 115 V**  
**4 inputs 115 V AC**  
Approvals: cULus



**ricos 4I AC 230 V**  
**4 inputs 230 V AC**  
Approvals: cULus

Dimensions (mm): W x H x D  
69 x 92 x 51

| Description                                             | Type                                                                                  | Part No.      | Std. Pack | Type                                                                                  | Part No.      | Std. Pack |
|---------------------------------------------------------|---------------------------------------------------------------------------------------|---------------|-----------|---------------------------------------------------------------------------------------|---------------|-----------|
|                                                         | ricos 4I AC 115 V                                                                     | 83.035.5000.1 | 1         | ricos 4I AC 230 V                                                                     | 83.035.5005.1 | 1         |
| Display of operating modes:                             |                                                                                       |               |           |                                                                                       |               |           |
| 24 V – power supply connected: yellow LED               |                                                                                       |               |           |                                                                                       |               |           |
| RUN – internal data transmission is running: yellow LED |                                                                                       |               |           |                                                                                       |               |           |
| Channel LED – switching state: green LED                |                                                                                       |               |           |                                                                                       |               |           |
| Channel LED – channel cursor: yellow LED                |                                                                                       |               |           |                                                                                       |               |           |
|                                                         |                                                                                       |               |           |                                                                                       |               |           |
| <b>Module data</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Number of inputs                                        | 4                                                                                     |               |           | 4                                                                                     |               |           |
| Number of outputs                                       | 0                                                                                     |               |           | 0                                                                                     |               |           |
| Operating voltage                                       | 115 V AC, ± 10 %                                                                      |               |           | 230 V AC, ± 10 %                                                                      |               |           |
| Power consumption                                       | < 0.5 W                                                                               |               |           | < 0.5 W                                                                               |               |           |
| Configuration                                           | None required                                                                         |               |           | None required                                                                         |               |           |
| Memory space required by the control                    | 1 input byte                                                                          |               |           | 1 input byte                                                                          |               |           |
| <b>Input data</b>                                       |                                                                                       |               |           |                                                                                       |               |           |
| Switching level "0" (EN 61131-2)                        | 0 V...20 V AC                                                                         |               |           | 0 V...40 V AC                                                                         |               |           |
| Switching level "1" (EN 61131-2)                        | 79 V...130 V AC                                                                       |               |           | 164 V...250 V AC                                                                      |               |           |
| Input current/channel (at 24 V DC)                      | typically 5 mA                                                                        |               |           | typically 5 mA                                                                        |               |           |
| Status display                                          | green LED                                                                             |               |           | green LED                                                                             |               |           |
| <b>Output data</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Output voltage                                          |                                                                                       |               |           |                                                                                       |               |           |
| Output current per channel                              |                                                                                       |               |           |                                                                                       |               |           |
| Maximum total current per module                        |                                                                                       |               |           |                                                                                       |               |           |
| Concurrence                                             |                                                                                       |               |           |                                                                                       |               |           |
| Load types                                              |                                                                                       |               |           |                                                                                       |               |           |
| Status display                                          |                                                                                       |               |           |                                                                                       |               |           |
| Output behavior                                         |                                                                                       |               |           |                                                                                       |               |           |
| <b>General</b>                                          |                                                                                       |               |           |                                                                                       |               |           |
| Signal delay per I/O channel                            | max. 10 ms                                                                            |               |           | max. 10 ms                                                                            |               |           |
| Maximum voltage of power contact                        | 250 V AC                                                                              |               |           | 250 V AC                                                                              |               |           |
| Maximum current of power contact                        | 8 A AC                                                                                |               |           | 8 A AC                                                                                |               |           |
| Insulation voltage                                      | 350 V AC, 50 Hz (system/supply)                                                       |               |           | 350 V AC, 50 Hz (system/supply)                                                       |               |           |
| Creepage distances and clearances                       | DIN EN 61131-2; DIN EN 50178                                                          |               |           | DIN EN 61131-2; DIN EN 50178                                                          |               |           |
| Electrostatic discharge                                 | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           |
| Electrostatic fields                                    | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           |
| Interference immunity/emitted interference              | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           |
| Burst                                                   | according to EN 61000-4-4                                                             |               |           | according to EN 61000-4-4                                                             |               |           |
| Connection technology                                   | Spring clamp terminal                                                                 |               |           | Spring clamp terminal                                                                 |               |           |
| Wire range: fine-stranded/solid                         | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           |
| Ambient temperature                                     | 0 °C...+55 °C                                                                         |               |           | 0 °C...+55 °C                                                                         |               |           |
| Storage temperature                                     | –25 °C...+75 °C                                                                       |               |           | –25 °C...+75 °C                                                                       |               |           |
| <b>Accessories</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Snap-on distribution board 3 and 4 wire operation       |                                                                                       | 83.039.0000.0 | 1         |                                                                                       | 83.039.0000.0 | 1         |
| Adhesive labels, A4 sheet                               |                                                                                       | 05.591.3089.0 | 10        |                                                                                       | 05.591.3089.0 | 10        |
| 2 pole jumper for parallel connection of outputs        |                                                                                       | Z7.258.1225.0 | 10        |                                                                                       | Z7.258.1225.0 | 10        |
| 8 digit marking tag, blank                              |                                                                                       | 04.242.1553.0 | 500       |                                                                                       | 04.242.1553.0 | 500       |
| 8 digit marking tag, with inscription (on request)      |                                                                                       |               |           |                                                                                       |               |           |
| End clamp for DIN rail                                  |                                                                                       | Z5.522.8553.0 | 100       |                                                                                       | Z5.522.8553.0 | 100       |
|                                                         |                                                                                       |               |           |                                                                                       |               |           |
|                                                         |                                                                                       |               |           |                                                                                       |               |           |

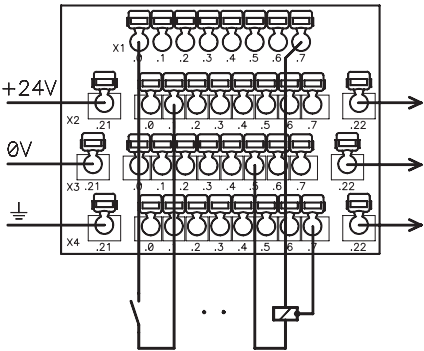
Remote I/O

Circuit diagrams

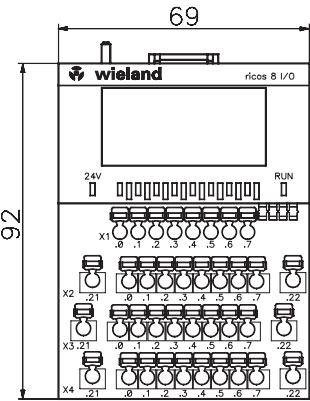
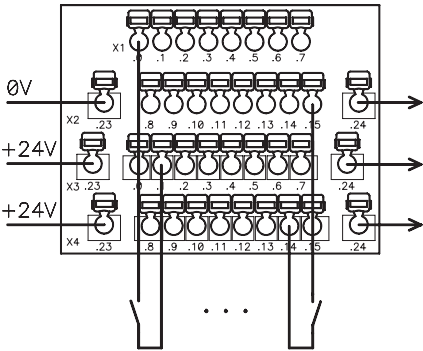
ricos

Circuit diagrams for binary input modules

ricos 8I/O

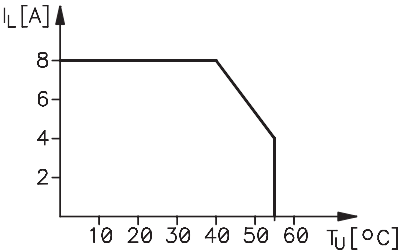


ricos 16I

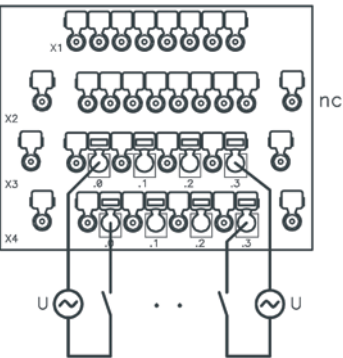


Derating

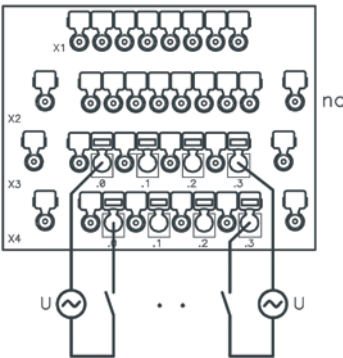
Total current



ricos 4I 115 V



ricos 4I 230 V



# Remote I/O Binary I/O modules

## ricos

- Parameterization as input or output with 8 I, 8 I/O
- For 2, 3 and 4 wire connection
- Electronics can be replaced without disconnection of the wiring



**ricos 16O**  
**16 outputs 24 V DC**  
Approvals: cULus



**ricos 8I/O**  
**8 inputs and 8 inputs/outputs 24 V DC**  
Approvals: cULus

Dimensions (mm): W x H x D  
69 x 92 x 51

| Description                                             | Type                                                                                  | Part No.      | Std. Pack | Type                                                                                  | Part No.      | Std. Pack |
|---------------------------------------------------------|---------------------------------------------------------------------------------------|---------------|-----------|---------------------------------------------------------------------------------------|---------------|-----------|
|                                                         | ricos 16O                                                                             | 83.035.3200.1 | 1         | ricos 8I/O                                                                            | 83.035.3300.1 | 1         |
| Display of operating modes:                             |                                                                                       |               |           |                                                                                       |               |           |
| 24 V – power supply connected: yellow LED               |                                                                                       |               |           |                                                                                       |               |           |
| RUN – internal data transmission is running: yellow LED |                                                                                       |               |           |                                                                                       |               |           |
| Channel LED – switching state: green LED                |                                                                                       |               |           |                                                                                       |               |           |
| Channel LED – channel cursor: yellow LED                |                                                                                       |               |           |                                                                                       |               |           |
|                                                         |                                                                                       |               |           |                                                                                       |               |           |
| <b>Module data</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Number of inputs                                        | 0                                                                                     |               |           | 8 + maximal 8                                                                         |               |           |
| Number of outputs                                       | 16                                                                                    |               |           | maximal 8                                                                             |               |           |
| Operating voltage                                       | 24 V DC, ±20 %, max. 5 % residual ripple                                              |               |           | 24 V DC, ±20 %, max. 5 % residual ripple                                              |               |           |
| Power consumption                                       | < 0.5 W                                                                               |               |           | < 0.5 W                                                                               |               |           |
| Configuration                                           | None required                                                                         |               |           | None required                                                                         |               |           |
| Memory space required by the control                    | 2 output byte                                                                         |               |           | 2 input bytes and 2 output byte                                                       |               |           |
| <b>Input data</b>                                       |                                                                                       |               |           |                                                                                       |               |           |
| Switching level "0" (EN 61131-2)                        |                                                                                       |               |           | –30 V...+5 V DC                                                                       |               |           |
| Switching level "1" (EN 61131-2)                        |                                                                                       |               |           | +15 V...+30 V DC                                                                      |               |           |
| Input current/channel (at 24 V DC)                      |                                                                                       |               |           | 4.5 mA/6.5 mA (Combi I/O)                                                             |               |           |
| Status display                                          |                                                                                       |               |           | green LED                                                                             |               |           |
| <b>Output data</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Output voltage                                          | Operating voltage – 0.5 V DC                                                          |               |           | Operating voltage –0.5 V DC                                                           |               |           |
| Output current per channel                              | 1 A DC                                                                                |               |           | 1 A DC                                                                                |               |           |
| Maximum total current per module                        | 8 A DC                                                                                |               |           | 8 A DC                                                                                |               |           |
| Concurrence                                             | 50 %                                                                                  |               |           | 100 %                                                                                 |               |           |
| Load types                                              | resistive inductive                                                                   |               |           | resistive inductive                                                                   |               |           |
| Status display                                          | green LED                                                                             |               |           | green LED                                                                             |               |           |
| Output behavior                                         | Resistant to overload and short circuits                                              |               |           | Resistant to overload and short circuits                                              |               |           |
| <b>General</b>                                          |                                                                                       |               |           |                                                                                       |               |           |
| Signal delay per I/O channel                            | < 100 µs                                                                              |               |           | < 100 µs                                                                              |               |           |
| Maximum voltage of power contact                        | 30 V DC                                                                               |               |           | 30 V DC                                                                               |               |           |
| Maximum current of power contact                        | 8 A DC                                                                                |               |           | 8 A DC                                                                                |               |           |
| Insulation voltage                                      | 350 V AC, 50 Hz (system/supply)                                                       |               |           | 350 V AC, 50 Hz (system/supply)                                                       |               |           |
| Creepage distances and clearances                       | DIN EN 61131-2; DIN EN 50178                                                          |               |           | DIN EN 61131-2; DIN EN 50178                                                          |               |           |
| Electrostatic discharge                                 | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           |
| Electrostatic fields                                    | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           |
| Interference immunity/emitted interference              | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           |
| Burst                                                   | according to EN 61000-4-4                                                             |               |           | according to EN 61000-4-4                                                             |               |           |
| Connection technology                                   | Spring clamp terminal                                                                 |               |           | Spring clamp terminal                                                                 |               |           |
| Wire range: fine-stranded/solid                         | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           |
| Ambient temperature                                     | 0 °C...+55 °C                                                                         |               |           | 0 °C...+55 °C                                                                         |               |           |
| Storage temperature                                     | –25 °C...+75 °C                                                                       |               |           | –25 °C...+75 °C                                                                       |               |           |
| <b>Accessories</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Snap-on distribution board 3 and 4 wire operation       |                                                                                       | 83.039.0000.0 | 1         |                                                                                       | 83.039.0000.0 | 1         |
| Adhesive labels, A4 sheet                               |                                                                                       | 05.591.3089.0 | 10        |                                                                                       | 05.591.3089.0 | 10        |
| 2 pole jumper for parallel connection of outputs        |                                                                                       | Z7.258.1225.0 | 10        |                                                                                       | Z7.258.1225.0 | 10        |
| 8 digit marking tag, blank                              |                                                                                       | 04.242.1553.0 | 500       |                                                                                       | 04.242.1553.0 | 500       |
| 8 digit marking tag, with inscription (on request)      |                                                                                       |               |           |                                                                                       |               |           |
| End clamp for DIN rail                                  |                                                                                       | Z5.522.8553.0 | 100       |                                                                                       | Z5.522.8553.0 | 100       |
|                                                         |                                                                                       |               |           |                                                                                       |               |           |
|                                                         |                                                                                       |               |           |                                                                                       |               |           |

# Remote I/O Binary I/O modules

## ricos

- For 2, 3 and 4 wire connection
- Electronics can be replaced without disconnection of the wiring



**ricos 80 DC 2A**  
**8 outputs 24 V DC 2 A**  
Approvals:



**ricos 80 NEG**  
**8 outputs 24 V DC neg. switching**  
Approvals:

Dimensions (mm): W x H x D  
69 x 92 x 51

| Description                                             | Type                                                                                  | Part No.      | Std. Pack | Type                                                                                  | Part No.      | Std. Pack |
|---------------------------------------------------------|---------------------------------------------------------------------------------------|---------------|-----------|---------------------------------------------------------------------------------------|---------------|-----------|
|                                                         | ricos 80 DC 2A                                                                        | 83.035.3220.1 | 1         | ricos 80 NEG                                                                          | 83.035.3210.1 | 1         |
| Display of operating modes:                             |                                                                                       |               |           |                                                                                       |               |           |
| 24 V – power supply connected: yellow LED               |                                                                                       |               |           |                                                                                       |               |           |
| RUN – internal data transmission is running: yellow LED |                                                                                       |               |           |                                                                                       |               |           |
| Channel LED – switching state: green LED                |                                                                                       |               |           |                                                                                       |               |           |
| Channel LED – channel cursor: yellow LED                |                                                                                       |               |           |                                                                                       |               |           |
|                                                         |                                                                                       |               |           |                                                                                       |               |           |
| <b>Module data</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Number of inputs                                        | 0                                                                                     |               |           | 0                                                                                     |               |           |
| Number of outputs                                       | 8                                                                                     |               |           | 8                                                                                     |               |           |
| Operating voltage                                       | 24 V DC, ±20 %, max. 5 % residual ripple                                              |               |           | 24 V DC, ±20 %, max. 5 % residual ripple                                              |               |           |
| Power consumption                                       | < 0.5 W                                                                               |               |           | < 0.5 W                                                                               |               |           |
| Configuration                                           | None required                                                                         |               |           | None required                                                                         |               |           |
| Memory space required by the control                    | 2 Output bytes (byte 2 is not occupied)                                               |               |           | 2 Output bytes (byte 2 is not occupied)                                               |               |           |
| <b>Input data</b>                                       |                                                                                       |               |           |                                                                                       |               |           |
| Switching level "0" (EN 61131-2)                        |                                                                                       |               |           |                                                                                       |               |           |
| Switching level "1" (EN 61131-2)                        |                                                                                       |               |           |                                                                                       |               |           |
| Input current/channel (at 24 V DC)                      |                                                                                       |               |           |                                                                                       |               |           |
| Status display                                          |                                                                                       |               |           |                                                                                       |               |           |
| <b>Output data</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Output voltage                                          | Operating voltage –0.5 V DC                                                           |               |           | Operating voltage –0.5 V DC                                                           |               |           |
| Output current per channel                              | 2 A DC                                                                                |               |           | 1 A DC                                                                                |               |           |
| Maximum total current per module                        | 8 A DC                                                                                |               |           | 8 A DC                                                                                |               |           |
| Concurrence                                             | 100 % (note max. total current)                                                       |               |           | 100 %                                                                                 |               |           |
| Load types                                              | resistive, inductive                                                                  |               |           | resistive, inductive                                                                  |               |           |
| Status display                                          | green LED                                                                             |               |           | green LED                                                                             |               |           |
| Output behavior                                         | Resistant to overload and short circuits                                              |               |           | Resistant to overload and short circuits                                              |               |           |
| <b>General</b>                                          |                                                                                       |               |           |                                                                                       |               |           |
| Signal delay per I/O channel                            | < 100 µs                                                                              |               |           | < 100 µs                                                                              |               |           |
| Maximum voltage of power contact                        | 30 V DC                                                                               |               |           | 30 V DC                                                                               |               |           |
| Maximum current of power contact                        | 8 A DC                                                                                |               |           | 8 A DC                                                                                |               |           |
| Insulation voltage                                      | 350 V AC, 50 Hz (system/supply)                                                       |               |           | 350 V AC, 50 Hz (system/supply)                                                       |               |           |
| Creepage distances and clearances                       | DIN EN 61131-2; DIN EN 50178                                                          |               |           | DIN EN 61131-2; DIN EN 50178                                                          |               |           |
| Electrostatic discharge                                 | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           |
| Electrostatic fields                                    | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           |
| Interference immunity/emitted interference              | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           |
| Burst                                                   | according to EN 61000-4-4                                                             |               |           | according to EN 61000-4-4                                                             |               |           |
| Connection technology                                   | Spring clamp terminal                                                                 |               |           | Spring clamp terminal                                                                 |               |           |
| Wire range: fine-stranded/solid                         | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           |
| Ambient temperature                                     | 0 °C...+55 °C                                                                         |               |           | 0 °C...+55 °C                                                                         |               |           |
| Storage temperature                                     | –25 °C...+75 °C                                                                       |               |           | –25 °C...+75 °C                                                                       |               |           |
| <b>Accessories</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Snap-on distribution board 3 and 4 wire operation       |                                                                                       | 83.039.0000.0 | 1         |                                                                                       | 83.039.0000.0 | 1         |
| Adhesive labels, A4 sheet                               |                                                                                       | 05.591.3089.0 | 10        |                                                                                       | 05.591.3089.0 | 10        |
| 2 pole jumper for parallel connection of outputs        |                                                                                       | Z7.258.1225.0 | 10        |                                                                                       | Z7.258.1225.0 | 10        |
| 8 digit marking tag, blank                              |                                                                                       | 04.242.1553.0 | 500       |                                                                                       | 04.242.1553.0 | 500       |
| 8 digit marking tag, with inscription (on request)      |                                                                                       |               |           |                                                                                       |               |           |
| End clamp for DIN rail                                  |                                                                                       | Z5.522.8553.0 | 100       |                                                                                       | Z5.522.8553.0 | 100       |
|                                                         |                                                                                       |               |           |                                                                                       |               |           |
|                                                         |                                                                                       |               |           |                                                                                       |               |           |

# Remote I/O Digital I/O modules

## ricos

- Can be configured as input or output for 2, 3 and 4 wire connection
- Electronics can be replaced without disconnection of the wiring



### ricos 40 RELAY

#### 4 relay outputs

Approvals: US

Dimensions (mm): W x H x D  
69 x 92 x 51

| Description                                             | Type                                                                                  | Part No.      | Std. Pack |
|---------------------------------------------------------|---------------------------------------------------------------------------------------|---------------|-----------|
|                                                         | ricos 40 RELAY                                                                        | 83.035.5200.1 | 1         |
| Display of operating modes:                             |                                                                                       |               |           |
| 24 V – power supply connected: yellow LED               |                                                                                       |               |           |
| RUN – internal data transmission is running: yellow LED |                                                                                       |               |           |
| Channel LED – switching state: green LED                |                                                                                       |               |           |
| Channel LED – channel cursor: yellow LED                |                                                                                       |               |           |
| <b>Module data</b>                                      |                                                                                       |               |           |
| Number of inputs                                        | 0                                                                                     |               |           |
| Number of outputs                                       | 4                                                                                     |               |           |
| Operating voltage                                       | 24 V DC, ± 20 %, max. 5 % residual ripple                                             |               |           |
| Power consumption                                       | < 1 W                                                                                 |               |           |
| Configuration                                           | None required                                                                         |               |           |
| Memory space required by the control                    | 1 output byte                                                                         |               |           |
| <b>Input data</b>                                       |                                                                                       |               |           |
| Switching level "0" (EN 61131-2)                        |                                                                                       |               |           |
| Switching level "1" (EN 61131-2)                        |                                                                                       |               |           |
| Input current/channel (at 24 V DC)                      |                                                                                       |               |           |
| Status display                                          |                                                                                       |               |           |
| <b>Output data</b>                                      |                                                                                       |               |           |
| Output voltage                                          | 250 V AC, 30 V DC                                                                     |               |           |
| Output current per channel                              | 2 A AC/DC                                                                             |               |           |
| Maximum total current per module                        | 8 A AC/DC                                                                             |               |           |
| Concurrence                                             | 100 %                                                                                 |               |           |
| Load types                                              | resistive/inductive                                                                   |               |           |
| Status display                                          | green LED                                                                             |               |           |
| Output behavior                                         |                                                                                       |               |           |
| <b>General</b>                                          |                                                                                       |               |           |
| Signal delay per I/O channel                            | < 10 ms                                                                               |               |           |
| Maximum voltage of power contact                        | 250 V AC/DC                                                                           |               |           |
| Maximum current of power contact                        | 8 A AC/DC                                                                             |               |           |
| Insulation voltage                                      | 350 V AC, 50 Hz (system/supply)                                                       |               |           |
| Creepage distances and clearances                       | DIN EN 61131-2; DIN EN 50178                                                          |               |           |
| Electrostatic discharge                                 | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           |
| Electrostatic fields                                    | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           |
| Interference immunity/emitted interference              | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           |
| Burst                                                   | according to EN 61000-4-4                                                             |               |           |
| Connection technology                                   | Spring clamp terminal                                                                 |               |           |
| Wire range: fine-stranded/solid                         | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           |
| Ambient temperature                                     | 0 °C...+55 °C                                                                         |               |           |
| Storage temperature                                     | –25 °C...+75 °C                                                                       |               |           |
| <b>Accessories</b>                                      |                                                                                       |               |           |
| Snap-on distribution board 3 and 4 wire operation       | 83.039.0000.0                                                                         | 1             |           |
| Adhesive labels, A4 sheet                               | 05.591.3089.0                                                                         | 10            |           |
| 2 pole jumper for parallel connection of outputs        | Z7.258.1225.0                                                                         | 10            |           |
| 8 digit marking tag, blank                              | 04.242.1553.0                                                                         | 500           |           |
| 8 digit marking tag, with inscription (on request)      |                                                                                       |               |           |
| End clamp for DIN rail                                  | Z5.522.8553.0                                                                         | 100           |           |

## Remote I/O

### RS 232 / RS 485 modules

- RS 232 and RS 485 interface
- 300...38400 Baud
- Electronics can be replaced without disconnection of the wiring



**ricos RS 232/485**  
**Interface Module RS 232 / RS 485**

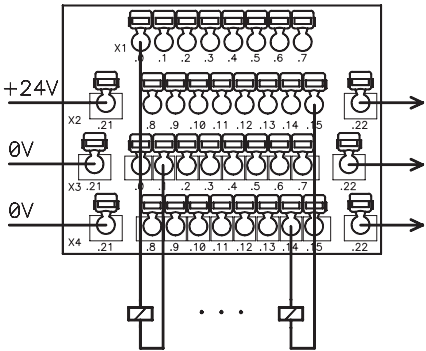
Approvals: c(UL)<sub>US</sub> in preparation: CE

Dimensions (mm): W x H x D  
69 x 92 x 51

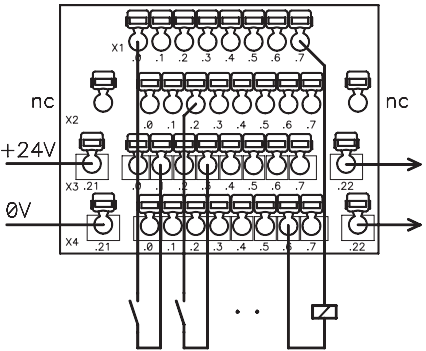
| Description                                       | Type                                                | Part No.      | Std. Pack |
|---------------------------------------------------|-----------------------------------------------------|---------------|-----------|
|                                                   | ricos RS 232/RS 485                                 | 83.035.5420.1 | 1         |
| Display of operating modes:                       |                                                     |               |           |
| Ready for operation RUN:      yellow LED          |                                                     |               |           |
| Power supply OK:                yellow LED        |                                                     |               |           |
| RTS, CTS:                        green LED        |                                                     |               |           |
| RxD, TxD:                        green LED        |                                                     |               |           |
|                                                   |                                                     |               |           |
| <b>Module data</b>                                |                                                     |               |           |
| Interfaces                                        | RS 232, RS 485                                      |               |           |
| Buffer memory                                     | 128 Byte in; 16 Byte out                            |               |           |
| Transmission length                               | 15 m (RS 232); 500 m twisted pair (RS 485)          |               |           |
| Transmission rate                                 | 300, 600, 1200, 2400, 4800, 9600, 19200, 38400 Baud |               |           |
| Bit transfer                                      | ISO 8482 / DIN 66259-4                              |               |           |
| Internal data width                               | 10 Byte                                             |               |           |
| <b>Input data</b>                                 |                                                     |               |           |
| Power supply                                      | 24 V DC, ±20% max. 5% residual ripple               |               |           |
| Power consumption                                 | max. 30 mA                                          |               |           |
| Over voltage protection                           | Supressor diode                                     |               |           |
| Supply (from bus coupler) 5V                      |                                                     |               |           |
| Power consumption                                 | approx. 23 mA / approx. 0.55 W                      |               |           |
| <b>Output data</b>                                |                                                     |               |           |
| Signal delay of input/output                      | < 1 µs / < 300 µs                                   |               |           |
| Maximum voltage of power contacts                 | 30 V DC                                             |               |           |
| Maximum current of power contacts                 | 8 A DC                                              |               |           |
| Insulation voltage                                | 350 V AC, 50 Hz (system/supply)                     |               |           |
| Creepage distances and clearances                 | DIN EN 61131-2; DIN EN 50178                        |               |           |
| Electrostatic discharge                           | EN 61000-4-2; 8 kV air; 4 kV contact                |               |           |
| Electrostatic fields                              | ENV 50140; 10 V/m; 30...1000 MHz                    |               |           |
| Interference immunity/emitted interference        | EN 61000-6-2 / EN 55011; limit value A; group 1     |               |           |
| Burst                                             | according to EN 61000-4-4                           |               |           |
| Connection technology                             | Spring clamp terminal                               |               |           |
| Wire range: fine-stranded/solid                   | 0.14 mm² – 1.5 mm² / 0.5 mm² – 2.5 mm²              |               |           |
| Ambient temperature                               | 0 °C...+55 °C                                       |               |           |
| Storage temperature                               | –25 °C...+70 °C                                     |               |           |
|                                                   |                                                     |               |           |
|                                                   |                                                     |               |           |
|                                                   |                                                     |               |           |
|                                                   |                                                     |               |           |
|                                                   |                                                     |               |           |
|                                                   |                                                     |               |           |
|                                                   |                                                     |               |           |
| <b>Accessories</b>                                |                                                     |               |           |
| Snap-on distribution board 3 and 4 wire operation |                                                     | 83.039.0000.0 | 1         |
| Adhesive labels, A4 sheet                         |                                                     | 05.591.3255.0 | 1         |
| 2 pole jumper for parallel connection of outputs  |                                                     | Z7.258.1225.0 | 10        |
| 8 digit marker tag, blank                         |                                                     | 04.242.1553.0 | 500       |
| 8 digit marker tag, with inscription (on request) |                                                     |               |           |
| End clamp for DIN rail                            |                                                     | Z5.522.8553.0 | 100       |
|                                                   |                                                     |               |           |

Circuit diagrams for binary output modules

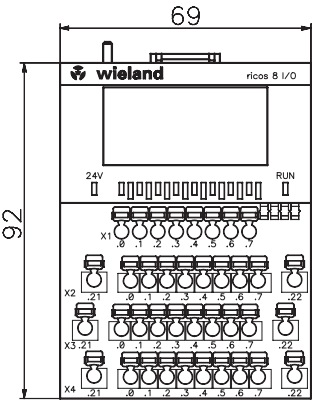
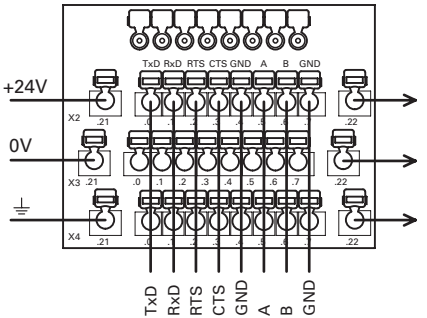
**ricos 160**



**ricos 8I 8I/O**

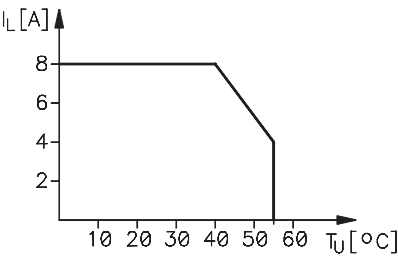


**ricos RS 232/RS 485**

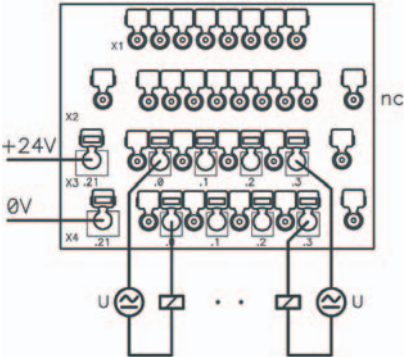


Derating

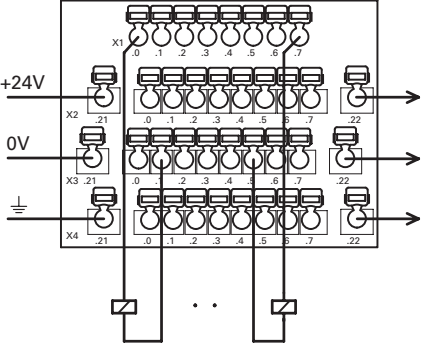
Total current



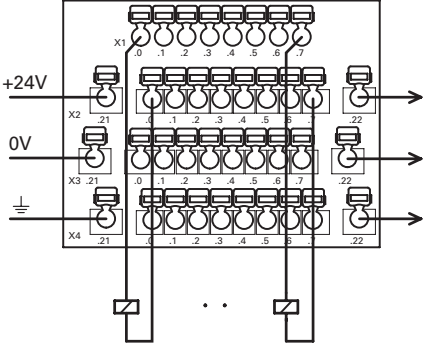
**ricos 40 RELAY**



**ricos 80 2A**



**ricos 80 NEG**



# Remote I/O Counter/positioning modules

## ricos

- 2 or 4 counters per module
- Up to 2 threshold values can be set
- Positioning modules for 2 axes
- Electronics can be replaced without disconnection of the wiring



**ricos COUNTER**  
**2/4 fold counter**  
Approvals:



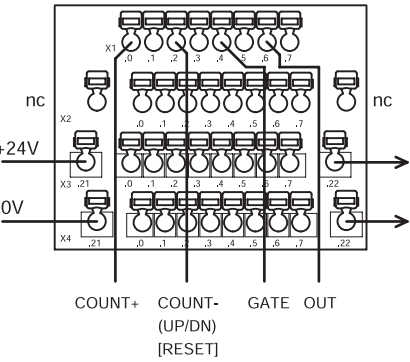
**ricos POSITION**  
**Positioning module with incremental encoder inputs**  
Approvals:

Dimensions (mm): W x H x D  
69 x 92 x 51

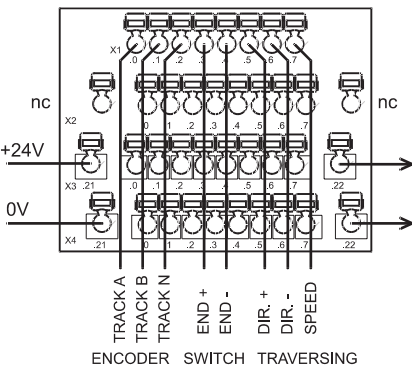
| Description                                             | Type                                                                                  | Part No.      | Std. Pack | Type                                                                                  | Part No.      | Std. Pack |
|---------------------------------------------------------|---------------------------------------------------------------------------------------|---------------|-----------|---------------------------------------------------------------------------------------|---------------|-----------|
|                                                         | ricos COUNTER                                                                         | 83.035.5400.1 | 1         | ricos POSITION                                                                        | 83.035.5410.1 | 1         |
| Display of operating modes:                             |                                                                                       |               |           |                                                                                       |               |           |
| 24 V – power supply connected: yellow LED               |                                                                                       |               |           |                                                                                       |               |           |
| RUN – internal data transmission is running: yellow LED |                                                                                       |               |           |                                                                                       |               |           |
| Channel LED – switching state: green LED                |                                                                                       |               |           |                                                                                       |               |           |
| Channel LED – channel cursor: yellow LED                |                                                                                       |               |           |                                                                                       |               |           |
|                                                         |                                                                                       |               |           |                                                                                       |               |           |
| <b>Module data</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Number of ...                                           | Counter: 4 x 16 Bit or 2 x 32 Bit                                                     |               |           | Controllable axes: 2                                                                  |               |           |
| Counting range                                          | 0 to 2 <sup>16</sup> or 0 to 2 <sup>32</sup>                                          |               |           | –2 <sup>31</sup> to 2 <sup>31</sup> –1                                                |               |           |
| Number of inputs and outputs                            | 12/4 or 6/4                                                                           |               |           | 10/6                                                                                  |               |           |
| Counting frequency                                      | 200 Hz, 2 kHz, 20 kHz, 200 kHz adjustable                                             |               |           | maximal 200 kHz                                                                       |               |           |
| Configuration                                           | via PC or PLC                                                                         |               |           | via PC or PLC                                                                         |               |           |
| Memory space required by the control                    | 3 to 5 words                                                                          |               |           | 5 words                                                                               |               |           |
| <b>Input data</b>                                       |                                                                                       |               |           |                                                                                       |               |           |
| Switching level "0" (EN 61131-2)                        | –30 V...+5 V DC                                                                       |               |           | –30 V...+5 V DC                                                                       |               |           |
| Switching level "1" (EN 61131-2)                        | +15 V...+30 V DC                                                                      |               |           | +15 V...+30 V DC                                                                      |               |           |
| Input current/channel (at 24 V DC)                      | 7.5 mA                                                                                |               |           | 7.5 mA                                                                                |               |           |
| Status display                                          | green LED                                                                             |               |           | green LED                                                                             |               |           |
| <b>Output data</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Output voltage                                          | Operating voltage –0.5 V DC                                                           |               |           | Operating voltage –0.5 V DC                                                           |               |           |
| Output current per channel                              | 1 A DC                                                                                |               |           | 1 A DC                                                                                |               |           |
| Maximum total current per module                        | 4 A DC                                                                                |               |           | 6 A DC                                                                                |               |           |
| Concurrence                                             | 100 %                                                                                 |               |           | 100 %                                                                                 |               |           |
| Load types                                              | resistive, inductive                                                                  |               |           | resistive, inductive                                                                  |               |           |
| Status display                                          | LED green                                                                             |               |           | green LED                                                                             |               |           |
| Output behavior                                         | Resistant to overload and short circuits                                              |               |           | Resistant to overload and short circuits                                              |               |           |
| Operating voltage/Power consumption                     | 24 V DC, ±20 %, max. 5 % residual ripple/< 3 W                                        |               |           | 24 V DC, ±20 %, max. 5 % Residual ripple/< 3 W                                        |               |           |
| <b>General</b>                                          |                                                                                       |               |           |                                                                                       |               |           |
| Operating voltage/power consumption                     | < 1 µs/< 300 µs                                                                       |               |           | < 100 µs                                                                              |               |           |
| Maximum voltage of power contact                        | 30 V DC                                                                               |               |           | 30 V DC                                                                               |               |           |
| Maximum current of power contact                        | 8 A DC                                                                                |               |           | 8 A DC                                                                                |               |           |
| Insulation voltage                                      | 350 V AC, 50 Hz (system/supply)                                                       |               |           | 350 V AC, 50 Hz (system/supply)                                                       |               |           |
| Creepage distances and clearances                       | DIN EN 61131-2; DIN EN 50178                                                          |               |           | DIN EN 61131-2; DIN EN 50178                                                          |               |           |
| Electrostatic discharge                                 | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           |
| Electrostatic fields                                    | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           |
| Interference immunity/emitted interference              | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           |
| Burst                                                   | according to EN 61000-4-4                                                             |               |           | according to EN 61000-4-4                                                             |               |           |
| Connection technology                                   | Spring clamp terminal                                                                 |               |           | Spring clamp terminal                                                                 |               |           |
| Wire range: fine-stranded/solid                         | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           |
| Ambient temperature                                     | 0 °C...+55 °C                                                                         |               |           | 0 °C...+55 °C                                                                         |               |           |
| Storage temperature                                     | –25 °C...+75 °C                                                                       |               |           | –25 °C...+75 °C                                                                       |               |           |
|                                                         |                                                                                       |               |           |                                                                                       |               |           |
| <b>Accessories</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Snap-on distribution board 3 and 4 wire operation       | 83.039.0000.0                                                                         | 1             |           | 83.039.0000.0                                                                         | 1             |           |
| Adhesive labels, A4 sheet                               | 05.591.3089.0                                                                         | 10            |           | 05.591.3089.0                                                                         | 10            |           |
| 2 pole jumper for parallel connection of outputs        | Z7.258.1225.0                                                                         | 10            |           | Z7.258.1225.0                                                                         | 10            |           |
| 8 digit marking tag, blank                              | 04.242.1553.0                                                                         | 500           |           | 04.242.1553.0                                                                         | 500           |           |
| 8 digit marking tag, with inscription (on request)      |                                                                                       |               |           |                                                                                       |               |           |
| End clamp for DIN rail                                  | Z5.522.8553.0                                                                         | 100           |           | Z5.522.8553.0                                                                         | 100           |           |

Circuit diagrams for counter and positioning modules

**ricos** COUNTER



**ricos** POSITION



## Remote I/O Pt/TC modules

- 4 sensor inputs per module self-setting on Pt100/Pt1000 sensors
- For thermocouples type J/K/T
- For 2, 3 and 4 wire connection
- Electronics can be replaced without disconnection of the wiring



**ricos 4Al Pt100**  
**4 inputs Pt100/1000**

Approvals: cULUS



**ricos 4AI TC**  
**4 inputs TC J/K/T**

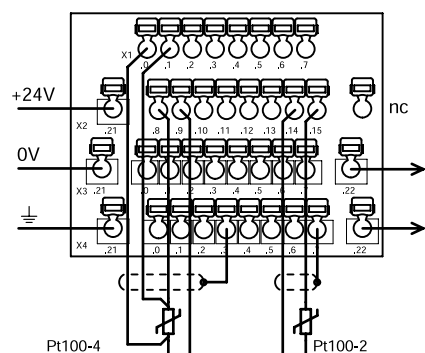
Approvals: c<sup>UL</sup><sub>US</sub>

Dimensions (mm): W x H x D  
69 x 92 x 51

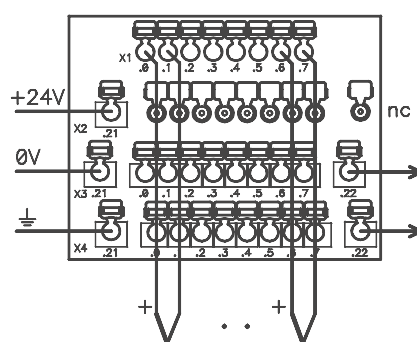
[illegible]

### Circuit diagrams for Pt100 and TC modules

**ricos 4AI Pt100**



**ricos 4AI TC**



# Remote I/O Analog I/O modules

## ricos

- For default signals 0...10 V /  $\pm 10$  V
- For 2, 3 and 4 wire connection
- Electronics can be replaced without disconnection of the wiring



**ricos 4AI/0...10 V**  
4 inputs 0 to 10 V  
Approvals:  $\text{cULus}$



**ricos 4AI/±10 V**  
4 inputs  $\pm 10$  V  
Approvals:  $\text{cULus}$

Dimensions (mm): W x H x D  
69 x 92 x 51

| Description                                             | Type                                                                                  | Part No.      | Std. Pack | Type                                                                                  | Part No.      | Std. Pack |
|---------------------------------------------------------|---------------------------------------------------------------------------------------|---------------|-----------|---------------------------------------------------------------------------------------|---------------|-----------|
| Display of operating modes:                             | ricos 4AI/0...10 V                                                                    | 83.035.4001.1 | 1         | ricos 4AI/±10 V                                                                       | 83.035.4000.1 | 1         |
| 24 V – power supply connected: yellow LED               |                                                                                       |               |           |                                                                                       |               |           |
| RUN – internal data transmission is running: yellow LED |                                                                                       |               |           |                                                                                       |               |           |
| Channel LED – switching state: green LED                |                                                                                       |               |           |                                                                                       |               |           |
| Channel LED – channel cursor: yellow LED                |                                                                                       |               |           |                                                                                       |               |           |
| <b>Module data</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Number of inputs                                        | 4                                                                                     |               |           | 4                                                                                     |               |           |
| Number of outputs                                       | 0                                                                                     |               |           | 0                                                                                     |               |           |
| Operating voltage                                       | 24 V DC, $\pm 20\%$ , max. 5 % residual ripple                                        |               |           | 24 V DC, $\pm 20\%$ , max. 5 % residual ripple                                        |               |           |
| Power consumption                                       | < 2.5 W                                                                               |               |           | < 2.5 W                                                                               |               |           |
| Configuration                                           | PC, PLC, diagnostics code 9 bus coupler                                               |               |           | PC, PLC, diagnostics code 9 bus coupler                                               |               |           |
| Memory space required by the control                    | 1 to 4 input words (dependent on configuration)                                       |               |           | 1 to 4 input words (dependent on configuration)                                       |               |           |
| <b>Technical data</b>                                   |                                                                                       |               |           |                                                                                       |               |           |
| Measuring range                                         | 0...+9.995 V                                                                          |               |           | –10...+9.995 V                                                                        |               |           |
| Resolution                                              | 12 Bit                                                                                |               |           | 12 Bit                                                                                |               |           |
| Scanning frequency                                      | < 2 ms                                                                                |               |           | < 2 ms                                                                                |               |           |
| Offset error                                            | typ. 0.5 LSB; max. 1 LSB                                                              |               |           | typ. 0.5 LSB; max. 1 LSB                                                              |               |           |
| Channel crosstalk                                       | –74 dB (f < 100 Hz)                                                                   |               |           | –74 dB (f < 100 Hz)                                                                   |               |           |
| Gain error                                              | typ. 0.08 % FSR; max. 0.2 % FSR                                                       |               |           | typ. 0.08 % FSR; max. 0.2 % FSR                                                       |               |           |
| Noise voltage                                           | typ. 0.5 LSB; max. 2 LSB                                                              |               |           | typ. 0.5 LSB; max. 2 LSB                                                              |               |           |
| Offset error via source impedance                       | +3 LSB/kOhm (Uinput. = 0 V)                                                           |               |           | +3 LSB/kOhm (Uinput. = 0 V)                                                           |               |           |
| Electrical isolation                                    | 75 V (AGND/Shield)                                                                    |               |           | 75 V (AGND/Shield)                                                                    |               |           |
| Common-mode range                                       | +12.8 V DC                                                                            |               |           | –12.8 V/+12.8 V DC                                                                    |               |           |
| Input resistance                                        | 1 MOhm                                                                                |               |           | 1 MOhm                                                                                |               |           |
| Input current                                           | typ. 15 $\mu$ A                                                                       |               |           | typ. 15 $\mu$ A                                                                       |               |           |
| Short circuit current/short circuit duration            | –                                                                                     |               |           | –                                                                                     |               |           |
| Ripple                                                  | –                                                                                     |               |           | –                                                                                     |               |           |
| Voltage range for two-way detection of wire breakage    | 9.9 V (floating source)                                                               |               |           | –10 V/9.9 V (floating source)                                                         |               |           |
| Common-mode rejection                                   | 87 dB (f = DC); 70 dB (f = 50 Hz); 60 dB (f = 1 kHz)                                  |               |           | 87 dB (f = DC); 70 dB (f = 50 Hz); 60 dB (f = 1 kHz)                                  |               |           |
| Common-mode input resistance                            | 500 kOhm (inputs short-circuited to AGND)                                             |               |           | 500 kOhm (inputs short-circuited to AGND)                                             |               |           |
| Capacitive common-mode input resistance                 | 4.4 nF (inputs short-circuited to AGND)                                               |               |           | 4.4 nF (inputs short-circuited to AGND)                                               |               |           |
| Dynamic common-mode input resistance                    | 1.1 kOhm (f > 100 kHz)                                                                |               |           | 1.1 kOhm (f > 100 kHz)                                                                |               |           |
| Insulation voltage                                      | 350 V AC, 50 Hz (system/supply)                                                       |               |           | 350 V AC, 50 Hz (system/supply)                                                       |               |           |
| Creepage distances and clearances                       | DIN EN 61131-2; DIN EN 50178                                                          |               |           | DIN EN 61131-2; DIN EN 50178                                                          |               |           |
| Electrostatic discharge                                 | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           |
| Electrostatic fields                                    | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           |
| Interference immunity/emitted interference              | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           |
| Burst                                                   | according to EN 61000-4-4                                                             |               |           | according to EN 61000-4-4                                                             |               |           |
| Connection technology                                   | Spring clamp terminal                                                                 |               |           | Spring clamp terminal                                                                 |               |           |
| Wire range: fine-stranded/solid                         | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           |
| Ambient temperature                                     | 0 °C...+55 °C                                                                         |               |           | 0 °C...+55 °C                                                                         |               |           |
| Storage temperature                                     | –25 °C...+75 °C                                                                       |               |           | –25 °C...+75 °C                                                                       |               |           |
| <b>Accessories</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Snap-on distribution board 3 and 4 wire operation       | 83.039.0000.0                                                                         | 1             |           | 83.039.0000.0                                                                         | 1             |           |
| Adhesive labels, A4 sheet                               | 05.591.3089.0                                                                         | 10            |           | 05.591.3089.0                                                                         | 10            |           |
| 2 pole jumper for parallel connection of outputs        | Z7.258.1225.0                                                                         | 10            |           | Z7.258.1225.0                                                                         | 10            |           |
| 8 digit marking tag, blank                              | 04.242.1553.0                                                                         | 500           |           | 04.242.1553.0                                                                         | 500           |           |
| 8 digit marking tag, with inscription (on request)      |                                                                                       |               |           |                                                                                       |               |           |
| End clamp for DIN rail                                  | Z5.522.8553.0                                                                         | 100           |           | Z5.522.8553.0                                                                         | 100           |           |

# Remote I/O Analog I/O modules **ricos**

- For default signals 0...10 V or  $\pm 10$  V
- For 2, 3 and 4 wire connection
- Electronics can be replaced without disconnection of the wiring



**ricos 4AI4AO/0...10 V**  
**4 inputs and 4 outputs 0 to 10 V**  
Approvals:



**ricos 4AI4AO/±10 V**  
**4 inputs and 4 outputs ±10 V**  
Approvals:

Dimensions (mm): W x H x D  
69 x 92 x 51

| Description                                             | Type                                                                                  | Part No.      | Std. Pack | Type                                                                                  | Part No.      | Std. Pack |
|---------------------------------------------------------|---------------------------------------------------------------------------------------|---------------|-----------|---------------------------------------------------------------------------------------|---------------|-----------|
| Display of operating modes:                             | ricos 4AI4AO/0...10 V                                                                 | 83.035.4101.1 | 1         | ricos 4AI4AO/±10 V                                                                    | 83.035.4100.1 | 1         |
| 24 V – power supply connected: yellow LED               |                                                                                       |               |           |                                                                                       |               |           |
| RUN – internal data transmission is running: yellow LED |                                                                                       |               |           |                                                                                       |               |           |
| Channel LED – switching state: green LED                |                                                                                       |               |           |                                                                                       |               |           |
| Channel LED – channel cursor: yellow LED                |                                                                                       |               |           |                                                                                       |               |           |
| <b>Module data</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Number of inputs                                        | 4                                                                                     |               |           | 4                                                                                     |               |           |
| Number of outputs                                       | 4                                                                                     |               |           | 4                                                                                     |               |           |
| Operating voltage                                       | 24 V DC, $\pm 20\%$ , max. 5 % residual ripple                                        |               |           | 24 V DC, $\pm 20\%$ , max. 5 % residual ripple                                        |               |           |
| Power consumption                                       | < 2.5 W                                                                               |               |           | < 2.5 W                                                                               |               |           |
| Configuration                                           | PC, PLC, diagnostics code 9 bus coupler                                               |               |           | PC, PLC, diagnostics code 9 bus coupler                                               |               |           |
| Memory space required by the control                    | 1 to 4 input/output words (dependent on configuration)                                |               |           | 1 to 4 input/output words (dependent on configuration)                                |               |           |
| <b>Technical data</b>                                   |                                                                                       |               |           |                                                                                       |               |           |
| Measuring range                                         | 0...+9.995 V                                                                          |               |           | -10...+9.995 V                                                                        |               |           |
| Resolution                                              | 12 Bit                                                                                |               |           | 12 Bit                                                                                |               |           |
| Scanning frequency                                      | < 2 ms                                                                                |               |           | < 2 ms                                                                                |               |           |
| Offset error                                            | typ. 0.5 LSB; max. 1 LSB                                                              |               |           | typ. 0.5 LSB; max. 1 LSB                                                              |               |           |
| Channel crosstalk                                       | -74 dB (f < 100 Hz)                                                                   |               |           | -74 dB (f < 100 Hz)                                                                   |               |           |
| Gain error                                              | input: max. 0.2 % FSR; output: max. 0.12 % FSR                                        |               |           | typ. 0.08 % FSR; max. 0.2 % FSR                                                       |               |           |
| Noise voltage                                           | typ. 0.5 LSB; max. 2 LSB                                                              |               |           | typ. 0.5 LSB; max. 2 LSB                                                              |               |           |
| Offset error                                            | input: +3 LSB/kOhm (Uinput. = 0 V); output: max. 10 mV                                |               |           | +3 LSB/kOhm (Uinput. = 0 V)                                                           |               |           |
| Electrical isolation                                    | 75 V (AGND/Shield)                                                                    |               |           | 75 V (AGND/Shield)                                                                    |               |           |
| Common-mode range                                       | +12.8 V DC                                                                            |               |           | -12.8 V/+12.8 V DC                                                                    |               |           |
| Input resistance                                        | 1 MOhm                                                                                |               |           | 1 MOhm                                                                                |               |           |
| Input current/Output current                            | typ. 15 $\mu$ A/10 mA                                                                 |               |           | typ. 15 $\mu$ A                                                                       |               |           |
| Short circuit current/short circuit duration            | 20 mA/100 % ED                                                                        |               |           | 20 mA/100 % ED                                                                        |               |           |
| Ripple                                                  | 5 mV                                                                                  |               |           | 5 mV                                                                                  |               |           |
| Voltage range for two-way detection of wire breakage    | 9.9 V (floating source)                                                               |               |           | -10 V/9.9 V (floating source)                                                         |               |           |
| Common-mode rejection                                   | 87 dB (f = DC); 70 dB (f = 50 Hz); 60 dB (f = 1 kHz)                                  |               |           | 87 dB (f = DC); 70 dB (f = 50 Hz); 60 dB (f = 1 kHz)                                  |               |           |
| Common-mode input resistance                            | 500 kOhm (inputs short-circuited to AGND)                                             |               |           | 500 kOhm (inputs short-circuited to AGND)                                             |               |           |
| Capacitive common-mode input resistance                 | 4.4 nF (inputs short-circuited to AGND)                                               |               |           | 4.4 nF (inputs short-circuited to AGND)                                               |               |           |
| Dynamic common-mode input resistance                    | 1.1 kOhm (f > 100 kHz)                                                                |               |           | 1.1 kOhm (f > 100 kHz)                                                                |               |           |
| Insulation voltage                                      | 350 V AC, 50 Hz (system/supply)                                                       |               |           | 350 V AC, 50 Hz (system/supply)                                                       |               |           |
| Creepage distances and clearances                       | DIN EN 61131-2; DIN EN 50178                                                          |               |           | DIN EN 61131-2; DIN EN 50178                                                          |               |           |
| Electrostatic discharge                                 | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           |
| Electrostatic fields                                    | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           |
| Interference immunity/emitted interference              | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           |
| Burst                                                   | according to EN 61000-4-4                                                             |               |           | according to EN 61000-4-4                                                             |               |           |
| Connection technology                                   | Spring clamp terminal                                                                 |               |           | Spring clamp terminal                                                                 |               |           |
| Wire range: fine-stranded/solid                         | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           |
| Ambient temperature                                     | 0 °C...+55 °C                                                                         |               |           | 0 °C...+55 °C                                                                         |               |           |
| Storage temperature                                     | -25 °C...+75 °C                                                                       |               |           | -25 °C...+75 °C                                                                       |               |           |
| <b>Accessories</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Snap-on distribution board 3 and 4 wire operation       | 83.039.0000.0                                                                         | 1             |           | 83.039.0000.0                                                                         | 1             |           |
| Adhesive labels, A4 sheet                               | 05.591.3089.0                                                                         | 10            |           | 05.591.3089.0                                                                         | 10            |           |
| 2 pole jumper for parallel connection of outputs        | Z7.258.1225.0                                                                         | 10            |           | Z7.258.1225.0                                                                         | 10            |           |
| 8 digit marking tag, blank                              | 04.242.1553.0                                                                         | 500           |           | 04.242.1553.0                                                                         | 500           |           |
| 8 digit marking tag, with inscription (on request)      |                                                                                       |               |           |                                                                                       |               |           |
| End clamp for DIN rail                                  | Z5.522.8553.0                                                                         | 100           |           | Z5.522.8553.0                                                                         | 100           |           |

# Remote I/O Analog I/O modules

## ricos

- For default signals 0...20 mA or 4...20 mA
- For 2, 3 and 4 wire connection
- Electronics can be replaced without disconnection of the wiring



**ricos 4AI/0–20 mA**  
**4 inputs 0 to 20 mA**  
Approvals:



**ricos 4AI/4–20 mA**  
**4 inputs 0 to 20 mA**  
Approvals:

Dimensions (mm): W x H x D  
69 x 92 x 51

| Description                                                                                                                                                                                                                 | Type                                                                                  | Part No.      | Std. Pack | Type                                                                                  | Part No.      | Std. Pack |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------|-----------|---------------------------------------------------------------------------------------|---------------|-----------|
| Display of operating modes:<br>24 V – power supply connected: yellow LED<br>RUN – internal data transmission is running: yellow LED<br>Channel LED – switching state: green LED<br>Channel LED – channel cursor: yellow LED | ricos 4AI/0–20 mA                                                                     | 83.035.4010.1 | 1         | ricos 4AI/4–20 mA                                                                     | 83.035.4011.1 | 1         |
| <b>Module data</b>                                                                                                                                                                                                          |                                                                                       |               |           |                                                                                       |               |           |
| Number of inputs                                                                                                                                                                                                            | 4                                                                                     |               |           | 4                                                                                     |               |           |
| Number of outputs                                                                                                                                                                                                           | 0                                                                                     |               |           | 0                                                                                     |               |           |
| Operating voltage                                                                                                                                                                                                           | 24 V DC, ±20 %, max. 5 % residual ripple                                              |               |           | 24 V DC, ±20 %, max. 5 % residual ripple                                              |               |           |
| Power consumption                                                                                                                                                                                                           | < 2.5 W                                                                               |               |           | < 2.5 W                                                                               |               |           |
| Configuration                                                                                                                                                                                                               | PC, PLC, diagnostics code 9 bus coupler                                               |               |           | PC, PLC, diagnostics code 9 bus coupler                                               |               |           |
| Memory space required by the control                                                                                                                                                                                        | 1 to 4 input words (dependent on configuration)                                       |               |           | 1 to 4 input words (dependent on configuration)                                       |               |           |
| <b>Technical data</b>                                                                                                                                                                                                       |                                                                                       |               |           |                                                                                       |               |           |
| Measuring range                                                                                                                                                                                                             | 0...+19.995 mA                                                                        |               |           | 4...+19.995 mA                                                                        |               |           |
| Resolution                                                                                                                                                                                                                  | 12 Bit                                                                                |               |           | 12 Bit                                                                                |               |           |
| Scanning frequency                                                                                                                                                                                                          | 2 ms                                                                                  |               |           | 2 ms                                                                                  |               |           |
| Offset error                                                                                                                                                                                                                | typ. 0.5 LSB; max. 1 LSB                                                              |               |           | typ. 0.5 LSB; max. 1 LSB                                                              |               |           |
| Channel crosstalk                                                                                                                                                                                                           | –74 dB (f < 100 Hz)                                                                   |               |           | –74 dB (f < 100 Hz)                                                                   |               |           |
| Gain error                                                                                                                                                                                                                  | max. 0.45 % FSR                                                                       |               |           | max. 0.45 % FSR                                                                       |               |           |
| Noise voltage                                                                                                                                                                                                               | typ. 0.5 LSB; max. 2 LSB                                                              |               |           | typ. 0.5 LSB; max. 2 LSB                                                              |               |           |
| Drift Rate                                                                                                                                                                                                                  | –                                                                                     |               |           | –                                                                                     |               |           |
| Electrical isolation                                                                                                                                                                                                        | 75 V (AGND/Shield)                                                                    |               |           | 75 V (AGND/Shield)                                                                    |               |           |
| Load                                                                                                                                                                                                                        | max. 100.1 Ohm                                                                        |               |           | max. 100.1 Ohm                                                                        |               |           |
| Continuous input current                                                                                                                                                                                                    | 40 mA at 100 % ED                                                                     |               |           | 40 mA at 100 % ED                                                                     |               |           |
| Continuous output voltage                                                                                                                                                                                                   | 4 V at 100 % ED                                                                       |               |           | 4 V at 100 % ED                                                                       |               |           |
| Short circuit current/short circuit duration                                                                                                                                                                                | –                                                                                     |               |           | –                                                                                     |               |           |
| Ripple                                                                                                                                                                                                                      | –                                                                                     |               |           | –                                                                                     |               |           |
| Dynamic common-mode input resistance                                                                                                                                                                                        | 1.1 kOhm (f > 100 kHz)                                                                |               |           | 1.1 kOhm (f > 100 kHz)                                                                |               |           |
| Insulation voltage                                                                                                                                                                                                          | 350 V AC, 50 Hz (system/supply)                                                       |               |           | 350 V AC, 50 Hz (system/supply)                                                       |               |           |
| Creepage distances and clearances                                                                                                                                                                                           | DIN EN 61131-2; DIN EN 50178                                                          |               |           | DIN EN 61131-2; DIN EN 50178                                                          |               |           |
| Electrostatic discharge                                                                                                                                                                                                     | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           |
| Electrostatic fields                                                                                                                                                                                                        | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           |
| Interference immunity/emitted interference                                                                                                                                                                                  | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           |
| Burst                                                                                                                                                                                                                       | according to EN 61000-4-4                                                             |               |           | according to EN 61000-4-4                                                             |               |           |
| Connection technology                                                                                                                                                                                                       | Spring clamp terminal                                                                 |               |           | Spring clamp terminal                                                                 |               |           |
| Wire range: fine-stranded/solid                                                                                                                                                                                             | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           |
| Ambient temperature                                                                                                                                                                                                         | 0 °C...+55 °C                                                                         |               |           | 0 °C...+55 °C                                                                         |               |           |
| Storage temperature                                                                                                                                                                                                         | –25 °C...+75 °C                                                                       |               |           | –25 °C...+75 °C                                                                       |               |           |
| <b>Accessories</b>                                                                                                                                                                                                          |                                                                                       |               |           |                                                                                       |               |           |
| Snap-on distribution board 3 and 4 wire operation                                                                                                                                                                           |                                                                                       | 83.039.0000.0 | 1         |                                                                                       | 83.039.0000.0 | 1         |
| Adhesive labels, A4 sheet                                                                                                                                                                                                   |                                                                                       | 05.591.3089.0 | 10        |                                                                                       | 05.591.3089.0 | 10        |
| 2 pole jumper for parallel connection of outputs                                                                                                                                                                            |                                                                                       | Z7.258.1225.0 | 10        |                                                                                       | Z7.258.1225.0 | 10        |
| 8 digit marking tag, blank                                                                                                                                                                                                  |                                                                                       | 04.242.1553.0 | 500       |                                                                                       | 04.242.1553.0 | 500       |
| 8 digit marking tag, with inscription (on request)                                                                                                                                                                          |                                                                                       |               |           |                                                                                       |               |           |
| End clamp for DIN rail                                                                                                                                                                                                      |                                                                                       | Z5.522.8553.0 | 100       |                                                                                       | Z5.522.8553.0 | 100       |
|                                                                                                                                                                                                                             |                                                                                       |               |           |                                                                                       |               |           |
|                                                                                                                                                                                                                             |                                                                                       |               |           |                                                                                       |               |           |
|                                                                                                                                                                                                                             |                                                                                       |               |           |                                                                                       |               |           |
|                                                                                                                                                                                                                             |                                                                                       |               |           |                                                                                       |               |           |

# Remote I/O Analog I/O modules

## ricos

- For default signal 0...20 mA / 4...20 mA
- For 2, 3 and 4 wire connection
- Electronics can be replaced without disconnecting wiring



**ricos 4AI4AO/0–20 mA**  
**4 inputs and 4 outputs 0 to 20 mA**  
Approvals: cULus



**ricos 4AI4AO/4–20 mA**  
**4 inputs and 4 outputs 0 to 20 mA**  
Approvals: cULus

Dimensions (mm): W x H x D  
69 x 92 x 51

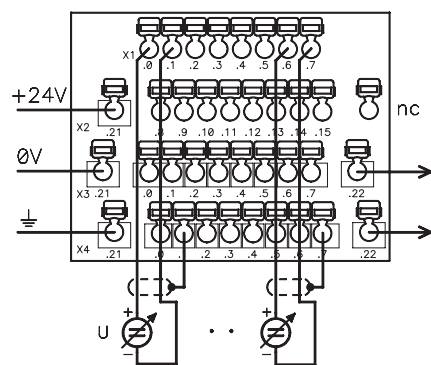
| Description                                             | Type                                                   | Part No.      | Std. Pack | Type                                                   | Part No.      | Std. Pack |
|---------------------------------------------------------|--------------------------------------------------------|---------------|-----------|--------------------------------------------------------|---------------|-----------|
|                                                         | ricos 4AI4AO/0–20 mA                                   | 83.035.4110.1 | 1         | ricos 4AI4AO/4–20 mA                                   | 83.035.4111.1 | 1         |
| Display of operating modes:                             |                                                        |               |           |                                                        |               |           |
| 24 V – power supply connected: yellow LED               |                                                        |               |           |                                                        |               |           |
| RUN – internal data transmission is running: yellow LED |                                                        |               |           |                                                        |               |           |
| Channel LED – switching state: green LED                |                                                        |               |           |                                                        |               |           |
| Channel LED – channel cursor: yellow LED                |                                                        |               |           |                                                        |               |           |
|                                                         |                                                        |               |           |                                                        |               |           |
| <b>Module data</b>                                      |                                                        |               |           |                                                        |               |           |
| Number of inputs                                        | 4                                                      |               |           | 4                                                      |               |           |
| Number of outputs                                       | 4                                                      |               |           | 4                                                      |               |           |
| Operating voltage                                       | 24 V DC, ±20 %, max. 5 % residual ripple               |               |           | 24 V DC, ±20 %, max. 5 % residual ripple               |               |           |
| Power consumption                                       | < 2.5 W                                                |               |           | < 2.5 W                                                |               |           |
| Configuration                                           | PC, PLC, diagnostics code 9 bus coupler                |               |           | PC, PLC, diagnostics code 9 bus coupler                |               |           |
| Memory space required by the control                    | 1 to 4 input/output words (dependent on configuration) |               |           | 1 to 4 input/output words (dependent on configuration) |               |           |
| <b>Technical data</b>                                   |                                                        |               |           |                                                        |               |           |
| Measuring range                                         | 0...+19.995 mA                                         |               |           | 4...+19.995 mA                                         |               |           |
| Resolution                                              | 12 Bit                                                 |               |           | 12 Bit                                                 |               |           |
| Scanning frequency                                      | 2 ms                                                   |               |           | 2 ms                                                   |               |           |
| Offset error                                            | input: max. 1 LSB; output: max. 4 µA                   |               |           | input: max. 1 LSB; output: max. 4 µA                   |               |           |
| Channel crosstalk                                       | –74 dB (f < 100 Hz)                                    |               |           | –74 dB (f < 100 Hz)                                    |               |           |
| Gain error                                              | input: max. 0.45 % FSR; output: max. 0.5 % FSR         |               |           | input: max. 0.45 % FSR; output: max. 0.5 % FSR         |               |           |
| Noise voltage                                           | typ. 0.5 LSB; max. 2 LSB                               |               |           | typ. 0.5 LSB; max. 2 LSB                               |               |           |
| Drift Rate                                              | 4 µA/ms                                                |               |           | 4 µA/ms                                                |               |           |
| Electrical isolation                                    | 75 V (AGND/Shield)                                     |               |           | 75 V (AGND/Shield)                                     |               |           |
| Load                                                    | input: max. 100.1 Ohm; output: 500 Ohm                 |               |           | input: max. 100.1 Ohm; output: 500 Ohm                 |               |           |
| Continuous input current                                | 40 mA at 100 % ED                                      |               |           | 40 mA at 100 % ED                                      |               |           |
| Continuous output voltage                               | 4 V at 100 % ED                                        |               |           | 4 V at 100 % ED                                        |               |           |
| Short circuit current/short circuit duration            | 20 mA; 100 % ED                                        |               |           | 20 mA; 100 % ED                                        |               |           |
| Ripple                                                  | 10 µA                                                  |               |           | 10 µA                                                  |               |           |
| Dynamic common-mode input resistance                    | 1.1 kOhm (f > 100 kHz)                                 |               |           | 1.1 kOhm (f > 100 kHz)                                 |               |           |
| Insulation voltage                                      | 350 V AC, 50 Hz (system/supply)                        |               |           | 350 V AC, 50 Hz (system/supply)                        |               |           |
| Creepage distances and clearances                       | DIN EN 61131-2; DIN EN 50178                           |               |           | DIN EN 61131-2; DIN EN 50178                           |               |           |
| Electrostatic discharge                                 | EN 61000-4-2; 8 kV air; 4 kV contact                   |               |           | EN 61000-4-2; 8 kV air; 4 kV contact                   |               |           |
| Electrostatic fields                                    | ENV 50140; 10 V/m; 30...1000 MHz                       |               |           | ENV 50140; 10 V/m; 30...1000 MHz                       |               |           |
| Interference immunity/emitted interference              | EN 61000-6-2/EN 55011; limit value A; group 1          |               |           | EN 61000-6-2/EN 55011; limit value A; group 1          |               |           |
| Burst                                                   | according to EN 61000-4-4                              |               |           | according to EN 61000-4-4                              |               |           |
| Connection technology                                   | Spring clamp terminal                                  |               |           | Spring clamp terminal                                  |               |           |
| Wire range: fine-stranded/solid                         | 0.14 mm² – 1.5 mm²/0.5 mm² – 2.5 mm²                   |               |           | 0.14 mm² – 1.5 mm²/0.5 mm² – 2.5 mm²                   |               |           |
| Ambient temperature                                     | 0 °C...+55 °C                                          |               |           | 0 °C...+55 °C                                          |               |           |
| Storage temperature                                     | –25 °C...+75 °C                                        |               |           | –25 °C...+75 °C                                        |               |           |
| <b>Accessories</b>                                      |                                                        |               |           |                                                        |               |           |
| Snap-on distribution board 3 and 4 wire operation       | 83.039.0000.0                                          | 1             |           | 83.039.0000.0                                          | 1             |           |
| Adhesive labels, A4 sheet                               | 05.591.3089.0                                          | 10            |           | 05.591.3089.0                                          | 10            |           |
| 2 pole jumper for parallel connection of outputs        | Z7.258.1225.0                                          | 10            |           | Z7.258.1225.0                                          | 10            |           |
| 8 digit marking tag, blank                              | 04.242.1553.0                                          | 500           |           | 04.242.1553.0                                          | 500           |           |
| 8 digit marking tag, with inscription (on request)      |                                                        |               |           |                                                        |               |           |
| End clamp for DIN rail                                  | Z5.522.8553.0                                          | 100           |           | Z5.522.8553.0                                          | 100           |           |
|                                                         |                                                        |               |           |                                                        |               |           |
|                                                         |                                                        |               |           |                                                        |               |           |
|                                                         |                                                        |               |           |                                                        |               |           |

# Remote I/O

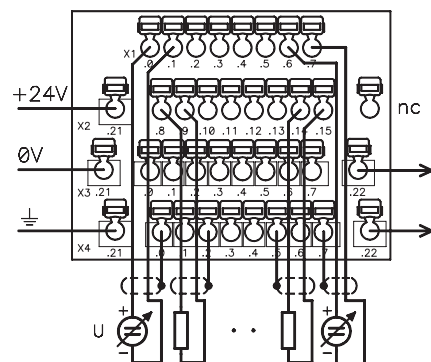
## Circuit diagrams

### Circuit diagrams for digital modules

**ricos 4AI/0...10 V**  
**ricos 4 AI/±10 V**  
**ricos 4AI/0...20 mA**  
**ricos 4AI/4...20 mA**



**ricos 4AI4AO/0...10 V**  
**ricos 4AI4AO/±10 V**  
**ricos 4AI4AO/0...20 mA**  
**ricos 4AI4AO/4...20 mA**



# Remote I/O

## Fieldbus couplers including binary inputs and outputs

# ricos

- Compact modules can be configured as input or output for 2, 3 and 4 wire connection
- Electronics can be replaced without disconnecting wiring



**ricos COM-DP**  
Compact modules for Profibus DP  
Approvals: us, Profibus certification



**ricos COM-S**  
Compact modules for Interbus  
Approvals: us

Dimensions (mm): W x H x D  
69 x 92 x 51

\*Approvals in preparation

| Description                                             | Type                                                                                  | Part No.      | Std. Pack | Type                                                                                  | Part No.      | Std. Pack |
|---------------------------------------------------------|---------------------------------------------------------------------------------------|---------------|-----------|---------------------------------------------------------------------------------------|---------------|-----------|
| 8 binary inputs and outputs                             | ricos COM-DP 8I/O                                                                     | 83.030.1100.1 | 1         | ricos COM-S 8I/O                                                                      | 83.031.1100.1 | 1         |
| 16 binary inputs                                        | ricos COM-DP 16I                                                                      | 83.030.1000.1 | 1         | ricos COM-S 16I                                                                       | 83.031.1000.1 | 1         |
| 16 binary outputs                                       | ricos COM-DP 16O                                                                      | 83.030.1200.1 | 1         | ricos COM-S 16O                                                                       | 83.031.1200.1 | 1         |
| 8 I and 8 I/O, binary (parameterizable)*                | ricos COM-DP 8I 8I/O                                                                  | 83.030.1300.1 | 1         | ricos COM-S 8I 8I/O                                                                   | 83.031.1300.1 | 1         |
| Display of operating modes:                             |                                                                                       |               |           |                                                                                       |               |           |
| 24 V – power supply connected: yellow LED               |                                                                                       |               |           |                                                                                       |               |           |
| RUN – internal data transmission is running: yellow LED |                                                                                       |               |           |                                                                                       |               |           |
| Channel LED – switching state: green LED                |                                                                                       |               |           |                                                                                       |               |           |
| Channel LED – switching state: yellow LED               |                                                                                       |               |           |                                                                                       |               |           |
|                                                         |                                                                                       |               |           |                                                                                       |               |           |
| <b>System data</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Maximum number of nodes                                 | 99                                                                                    |               |           | 256                                                                                   |               |           |
| Transmission medium                                     | Shielded copper cable 2 x 0.25 mm <sup>2</sup> /AWG 23                                |               |           | Shielded copper cable 5 x 0.25 mm <sup>2</sup> /AWG 23                                |               |           |
| Maximum system expansion                                | 100 m – 1200 m (dependent on baud rate/cable)                                         |               |           | 400 m (Remote bus)                                                                    |               |           |
| Baud rate                                               | 9.6 kBaud...12 MBaud                                                                  |               |           | 500 kBaud                                                                             |               |           |
| Internal bus refresh rate                               | 2 ms                                                                                  |               |           | 2 ms                                                                                  |               |           |
| Bus connection                                          | 1 x D-SUB 9, female connector with shield                                             |               |           | 6 and 8 pole screw terminal, pluggable                                                |               |           |
| <b>Input data</b>                                       |                                                                                       |               |           |                                                                                       |               |           |
| Switching level "0" (EN 61131-2)                        | –30 V...+5 V DC                                                                       |               |           | –30 V...+5 V DC                                                                       |               |           |
| Switching level "1" (EN 61131-2)                        | +15 V...+30 V DC                                                                      |               |           | +15 V...+30 V DC                                                                      |               |           |
| Input current/channel (at 24 V DC)                      | 4.5 mA, 6.5 mA (combined I/O)                                                         |               |           | 4.5 mA/6.5 mA (combi I/O)                                                             |               |           |
| Status display                                          | green LED                                                                             |               |           | green LED                                                                             |               |           |
| <b>Output data</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Output voltage                                          | Operating voltage –0.5 V DC                                                           |               |           | Operating voltage –0.5 V DC                                                           |               |           |
| Output current per channel                              | 1 A DC                                                                                |               |           | 1 A DC                                                                                |               |           |
| Maximum total current per module                        | 4 A DC                                                                                |               |           | 4 A DC                                                                                |               |           |
| Concurrence                                             | 100 % at max. 500 mA per channel                                                      |               |           | 100 % at max. 500 mA per channel                                                      |               |           |
| Load types                                              | resistive, inductive                                                                  |               |           | resistive, inductive                                                                  |               |           |
| Status display                                          | green LED                                                                             |               |           | green LED                                                                             |               |           |
| Output behavior                                         | Resistant to overload and short circuits                                              |               |           | Resistant to overload and short circuits                                              |               |           |
| <b>General</b>                                          |                                                                                       |               |           |                                                                                       |               |           |
| Signal delay per I/O channel                            | < 100 µs                                                                              |               |           | < 100 µs                                                                              |               |           |
| Maximum voltage of power contact                        | 30 V DC                                                                               |               |           | 30 V DC                                                                               |               |           |
| Maximum current of power contact                        | 8 A DC                                                                                |               |           | 8 A DC                                                                                |               |           |
| Insulation voltage                                      | 350 V AC, 50 Hz (system/supply)                                                       |               |           | 350 V AC, 50 Hz (system/supply)                                                       |               |           |
| Creepage distances and clearances                       | DIN EN 61131-2; DIN EN 50178                                                          |               |           | DIN EN 61131-2; DIN EN 50178                                                          |               |           |
| Electrostatic discharge                                 | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           |
| Electrostatic fields                                    | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           |
| Interference immunity/emitted interference              | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           |
| Burst                                                   | according to EN 61000-4-4                                                             |               |           | according to EN 61000-4-4                                                             |               |           |
| Connection technology                                   | Spring clamp terminal                                                                 |               |           | Spring clamp terminal                                                                 |               |           |
| Wire range: fine-stranded/solid                         | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           |
| Ambient temperature                                     | 0 °C...+55 °C                                                                         |               |           | 0 °C...+55 °C                                                                         |               |           |
| Storage temperature                                     | –25 °C...+75 °C                                                                       |               |           | –25 °C...+75 °C                                                                       |               |           |
| <b>Accessories</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Snap-on distribution board 3 and 4 wire operation       |                                                                                       | 83.039.0000.0 | 1         |                                                                                       | 83.039.0000.0 | 1         |
| Adhesive labels, A4 sheet                               |                                                                                       | 05.591.3089.0 | 10        |                                                                                       | 05.591.3089.0 | 10        |
| 2 pole jumper for parallel connection of outputs        |                                                                                       | Z7.258.1225.0 | 10        |                                                                                       | Z7.258.1225.0 | 10        |
| 8 digit marking tag, blank                              |                                                                                       | 04.242.1553.0 | 500       |                                                                                       | 04.242.1553.0 | 500       |
| 8 digit marking tag, with inscription (on request)      |                                                                                       |               |           |                                                                                       |               |           |
| End clamp for DIN rail                                  |                                                                                       | Z5.522.8553.0 | 100       |                                                                                       | Z5.522.8553.0 | 100       |
| GSD file and Word document for labels                   |                                                                                       | 05.591.3255.0 | 1         |                                                                                       | 05.591.3255.0 | 1         |

# Remote I/O

## Fieldbus couplers including binary inputs and outputs

*ricos*

- Compact module can be configured as input or output for 2, 3 and 4 wire connection
- Electronics can be replaced without disconnecting wiring

Dimensions (mm): W x H x D  
69 x 92 x 51

\*Approvals in preparation



**ricos COM-DN**  
**DeviceNet compact module**  
Approvals: 

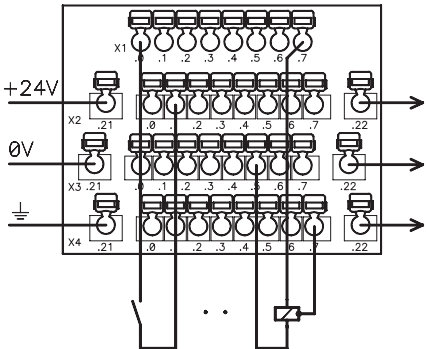


**ricos COM-CO**  
**CANopen compact module**  
Approvals: 

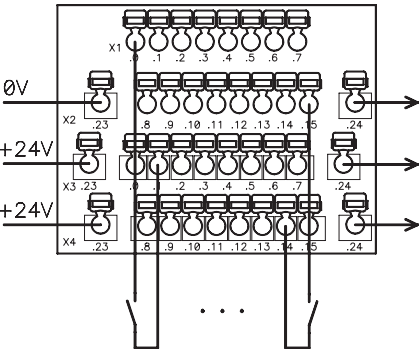
| Description                                             | Type                                                                                  | Part No.      | Std. Pack | Type                                                                                  | Part No.      | Std. Pack |
|---------------------------------------------------------|---------------------------------------------------------------------------------------|---------------|-----------|---------------------------------------------------------------------------------------|---------------|-----------|
| 8 binary inputs and outputs (parameterizable)           | ricos COM-DN 8I/O                                                                     | 83.032.1100.1 | 1         | ricos COM-CO 8I/O                                                                     | 83.033.1100.1 | 1         |
| 16 binary inputs                                        | ricos COM-DN 16I                                                                      | 83.032.1000.1 | 1         | ricos COM-CO 16I                                                                      | 83.033.1000.1 | 1         |
| 16 binary outputs                                       | ricos COM-DN 16O                                                                      | 83.032.1200.1 | 1         | ricos COM-CO 16O                                                                      | 83.033.1200.1 | 1         |
| 8 I and 8 I/O, binary (parameterizable)                 | ricos COM-DN 8I 8I/O                                                                  | 83.032.1300.1 | 1         | ricos COM-CO 8I 8I/O                                                                  | 83.033.1300.1 | 1         |
| Display of operating modes:                             |                                                                                       |               |           |                                                                                       |               |           |
| 24 V – power supply connected: yellow LED               |                                                                                       |               |           |                                                                                       |               |           |
| RUN – internal data transmission is running: yellow LED |                                                                                       |               |           |                                                                                       |               |           |
| Channel LED – switching state: green LED                |                                                                                       |               |           |                                                                                       |               |           |
| Channel LED – switching state: yellow LED               |                                                                                       |               |           |                                                                                       |               |           |
| <b>System data</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Maximum number of nodes                                 | 64 with repeater                                                                      |               |           | 64                                                                                    |               |           |
| Transmission medium                                     | Shielded copper cable trunk line AWG 15, 18                                           |               |           | Shielded copper cable 3 x 0.25 mm <sup>2</sup> /AWG 23                                |               |           |
|                                                         | Shielded copper cable drop line AWG 22, 24                                            |               |           |                                                                                       |               |           |
| Maximum system expansion                                | 100 m – 500 m (dependent on baud rate/cable)                                          |               |           | 100 m – 500 m (dependent on baud rate/cable)                                          |               |           |
| Baud rate                                               | 125/250/500 kBaud (setting via keyboard)                                              |               |           | 10 kBaud...1 MBaud (setting via keyboard)                                             |               |           |
| Internal bus refresh rate                               | 2 ms                                                                                  |               |           | 2 ms                                                                                  |               |           |
| Bus connection                                          | 5 pole connector, screw terminal                                                      |               |           | 5 pole connector, screw terminal                                                      |               |           |
| <b>Input data</b>                                       |                                                                                       |               |           |                                                                                       |               |           |
| Switching level "0" (EN 61131-2)                        | –30 V...+5 V DC                                                                       |               |           | –30 V...+5 V DC                                                                       |               |           |
| Switching level "1" (EN 61131-2)                        | +15 V...+30 V DC                                                                      |               |           | +15 V...+30 V DC                                                                      |               |           |
| Input current/channel (at 24 V DC)                      | 4.5 mA/6.5 mA (combined I/O)                                                          |               |           | 4.5 mA/6.5 mA (combined I/O)                                                          |               |           |
| Status display                                          | green LED                                                                             |               |           | green LED                                                                             |               |           |
| <b>Output data</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Output voltage                                          | Operating voltage –0.5 V DC                                                           |               |           | Operating voltage –0.5 V DC                                                           |               |           |
| Output current per channel                              | 1 A DC                                                                                |               |           | 1 A DC                                                                                |               |           |
| Maximum total current per module                        | 4 A DC                                                                                |               |           | 4 A DC                                                                                |               |           |
| Concurrence                                             | 100 % at max. 500 mA per channel                                                      |               |           | 100 % at max. 500 mA per channel                                                      |               |           |
| Load types                                              | resistive, inductive                                                                  |               |           | resistive, inductive                                                                  |               |           |
| Status display                                          | green LED                                                                             |               |           | green LED                                                                             |               |           |
| Output behavior                                         | Resistant to overload and short circuits                                              |               |           | Resistant to overload and short circuits                                              |               |           |
| <b>General</b>                                          |                                                                                       |               |           |                                                                                       |               |           |
| Signal delay per I/O channel                            | < 100 µs                                                                              |               |           | < 100 µs                                                                              |               |           |
| Maximum voltage of power contact                        | 30 V DC                                                                               |               |           | 30 V DC                                                                               |               |           |
| Maximum current of power contact                        | 8 A DC                                                                                |               |           | 8 A DC                                                                                |               |           |
| Insulation voltage                                      | 350 V AC, 50 Hz (system/supply)                                                       |               |           | 350 V AC, 50 Hz (system/supply)                                                       |               |           |
| Creepage distances and clearances                       | DIN EN 61131-2; DIN EN 50178                                                          |               |           | DIN EN 61131-2; DIN EN 50178                                                          |               |           |
| Electrostatic discharge                                 | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           | EN 61000-4-2; 8 kV air; 4 kV contact                                                  |               |           |
| Electrostatic fields                                    | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           | ENV 50140; 10 V/m; 30...1000 MHz                                                      |               |           |
| Interference immunity/emitted interference              | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           | EN 61000-6-2/EN 55011; limit value A; group 1                                         |               |           |
| Burst                                                   | according to EN 61000-4-4                                                             |               |           | according to EN 61000-4-4                                                             |               |           |
| Connection technology                                   | Spring clamp terminal                                                                 |               |           | Spring clamp terminal                                                                 |               |           |
| Wire range: fine-stranded/solid                         | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           | 0.14 mm <sup>2</sup> – 1.5 mm <sup>2</sup> /0.5 mm <sup>2</sup> – 2.5 mm <sup>2</sup> |               |           |
| Ambient temperature                                     | 0 °C...+55 °C                                                                         |               |           | 0 °C...+55 °C                                                                         |               |           |
| Storage temperature                                     | –25 °C...+75 °C                                                                       |               |           | –25 °C...+75 °C                                                                       |               |           |
| <b>Accessories</b>                                      |                                                                                       |               |           |                                                                                       |               |           |
| Snap-on distribution board 3 and 4 wire operation       | 83.039.0000.0                                                                         | 1             |           | 83.039.0000.0                                                                         | 1             |           |
| Adhesive labels, A4 sheet                               | 05.591.3089.0                                                                         | 10            |           | 05.591.3089.0                                                                         | 10            |           |
| 2 pole jumper for parallel connection of outputs        | Z7.258.1225.0                                                                         | 10            |           | Z7.258.1225.0                                                                         | 10            |           |
| 8 digit marking tag, blank                              | 04.242.1553.0                                                                         | 500           |           | 04.242.1553.0                                                                         | 500           |           |
| 8 digit marking tag, with inscription (on request)      |                                                                                       |               |           |                                                                                       |               |           |
| End clamp for DIN rail                                  | Z5.522.8553.0                                                                         | 100           |           | Z5.522.8553.0                                                                         | 100           |           |
| GSD file and Word template for labels                   | 05.591.3255.0                                                                         | 1             |           | 05.591.3255.0                                                                         | 1             |           |

Circuit diagrams for compact modules

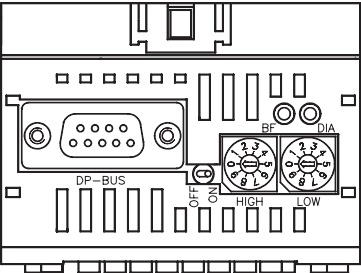
**ricos COM 8I/O**



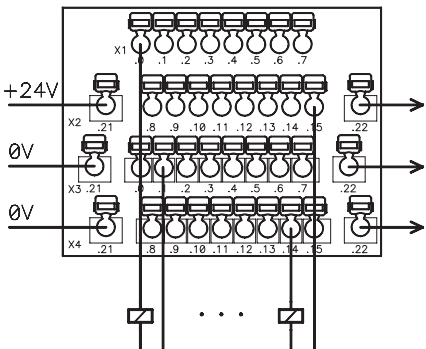
**ricos COM 16I**



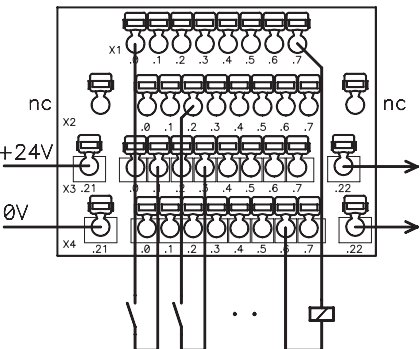
**ricos COM-DP**



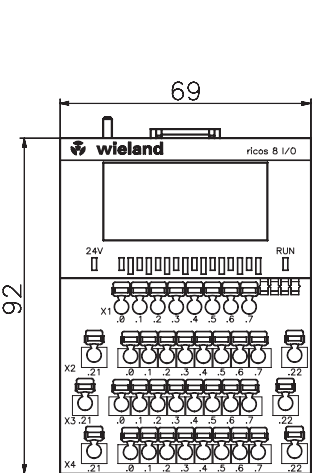
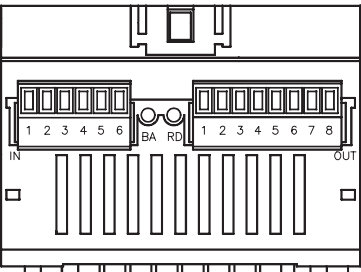
**ricos COM 16O**



**ricos COM 8I 8I/O**

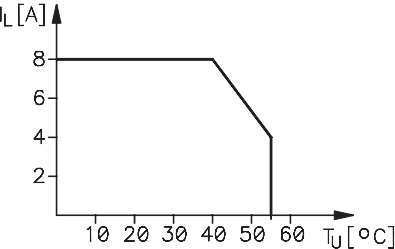


**ricos COM-S**



**Derating**

Total current



**ricos COM CAN DN**  
**ricos COM CANopen**

