Wir leben Elektronik!
We live electronics!

Sontheim

# IO Modules

## Overview of our CAN and EtherCAT modules

# Sontheim Overview

We are your close partner with our innovative portfolio of standardized and customer-specific products and comprehensive support capabilities.

Make your decision a one-stop issue. Every part of our systems is developed, engineered and manufactured in our in-house production and development facilities.

We are working closely together with universities and educational institutions of the region and realise important R&D projects.

We are reinvesting into new technologies, doing pioneers' work in the hardware and software development.

Our driven team of motivated and qualified specialists creates specifically tailored solutions for you.

We are happy to support you in every step of your project – especially our project teams and product manager.




CERTIFICATE

sontheim Industrie Elektronik GmbH

ISO 9001:2008

DEKRA Certification GmbH hereby certifies that the company

Sontheim Industrie Elektronik GmbH

Scope of certification:
Development, manufacturing and distribution of industrial electronics

Certified location:
D-87437 Kempten / Allgäu, Georg-Krug-Straße 2

has established and maintains a quality management system according to the above mentioned standard. The conformity was adduced with audit report no. A15011231.

This certificate is valid from 2015-03-30 to 2018-02-26

Certificate registration no. 51100793/5

DEKRA Certification GmbH
Stuttgart, 2015-03-30

DEKRA

We are certified according to international standards like ISO 9001:2008. In addition to that we are an active member in different industry-related organisations. Our products comply to various standards - you will benefit from normised high quality standards.

# Overview of Services

Engineering

We support you from the development phase to integration and support. From the idea, through documentation and production and up to test setups, training courses and seminars you get everything from one source.

Fieldbus

We can use our extensive fieldbus expertise in various branches of the automation and automotive industry. Our focus is particularly on CAN, EtherCAT, Profibus and the protocols used in the automotive sector.

Automotive

With our tools and systems in the automotive sector we offer tstandard-based solutions in the field of diagnostics, measurement and testing. Our modular systems are future-proof and highly performant.

Automation

Whether you need IO modules, Industrial PCs, PLCs, interfaces or the matching software, with Sontheim you get standardized and customized products in highest quality based on current fieldbus technologies.

Hardware-Development

With us you get everything from one source. We develop modular hardware systems - standard or customized - its your choice.

Software-Development

Our software development provides beside diagnostic and analysis tools, protocol stacks, programming interfaces and software for control, operation and configuration of machines.



Diagnostics

MDT - the innovative and comfortable diagnostic tool chain based on ODX for the flexible creation of individual and complex diagnostic and service applications leaves no wish unfulfilled.

**Product Development**

As an expert in different fieldbus applications, we can provide you with custom-tailored solutions. We are passionate about all aspects of electronics including hardware, software, firmware and the design of complete systems that meet your specific needs. You benefit from our comprehensive know-how as a system provider and the perfect combination of functional hardware, suitable firmware and modular software.

**Electronics Manufacturing Services (EMS)**

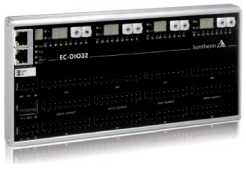
On our two modern production lines, we manufacture electronic components and systems according to your needs and to the highest standards in quality while maintaining your schedule and optimizing for costs. We stand out for our flexibility; we are capable of producing batches from prototype to series and up to nearly 240,000 units per year.

# Remote-IO Modules

Have a look at our remote IO-modules for CAN and EtherCAT

## Did you know...

EC-DI032 is an IO-module that gives you the possibility to configure all the inputs and outputs. Your advantage is high flexibility even at changing environments. Moreover, safety and diagnostic functions make the module highly suitable for industrial applications.




Many of our IO-modules exist in standardised versions but also have numerous adapted designs. So please don't hesitate to contact us with your specific requirements. We have a broad knowledge in the area of fieldbuses and signal processing that might contain the solution to your individual ideas.

# DIO32


## Key Features

- Compact aluminum housing with IP20 and an integrated top hat rail mount
- Safety functions for a high process safety
- Easy access to all interfaces
- Own intelligence for complex CAN-networks
- Clamps pluggable and lockable
- Signal delay less than 400 µ-seconds
- Galvanically isolated CAN-interface acc. to ISO 11898
- Galvanically isolated inputs and outputs

DIO32 is a digital 24V (opt. 12V) input and output module with 16 channels each. It is optimally suited for the use in CAN-networks. The device possesses the shortest conversion times and a high process reliability. That makes it the best choice for continuous operation in complex machine networks.



### Overview of interfaces
– 16 digital inputs
– 16 digital outputs

### Housing
The compact housing is made of aluminum. It contains a top hat rail mount and a front cover with all interfaces for better overview in the control cabinet. The technician will note the convenience while working at the bus cabling.

### Clamps and cabling
The Remote-IO series uses 3-wire cabling for direct connection to sensors and actors, supplying them with power. In order to reduce the danger of false-wire harnessing the 3-wire clamps are coloured. If you wish to see the status of each channel, we can deliver the modules with LED-clamps.

### LEDs and switches
All inputs and outputs can be monitored with the help of LEDs at the clamps. In addition to that, you can configure the baud rate and module address with HEX-switches at the front cover - easy and comfortable.

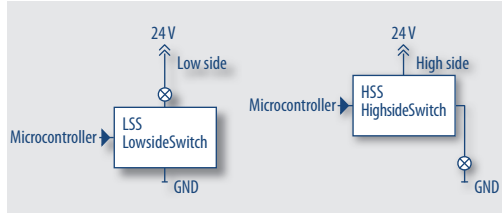
### Signal processing
Besides its inputs and outputs the DIO32 offers a powerful micro-controller that handles data acquisition of sensors, control of actors and the processing of any CAN-data.

An important safety function is the DIO32's guarding capability which is fully integrated into the IO for network surveillance. Furthermore, there is a relay contact (changeover) as an additional safety measure. If there is an absence of guarding by the master registered, the module immediately goes into STOP-mode.

### CAN-Interface
The integrated CAN-interface is designed in accordance to DS301 and 401 for a flexible use in different places and tasks in the CAN-bus network. All Sontheim CAN-interfaces comply to ISO11898.

### Power supply
The DIO32 needs a power supply with 24V. Due to the polarity reversal protection the user is in no danger of damaging the module by reversed power connection. Short surge peaks are also eliminated by an EMI wiring for the control section.

### Highside and Lowside switch
All digital outputs can be fitted with a Highside or Lowside switch. Being Highside, the outputs toggle the supply voltage to load. Being Lowside, they toggle to ground.



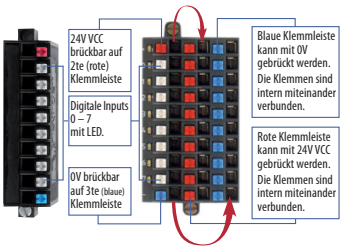
## DIO 32 — Technical data

| Hardware | |
|---|---|
| Dimensions (l × w × h) | 121 mm × 120 mm × 48 mm |
| Weight | 600g |
| Protection class | IP 20, EMV-requirements acc. to CE |
| Storage temperature | -30 °C to 70 °C |
| Operating temperature | 0 °C to 60 °C |
| Humidity | 90 % non-condensing |
| VCC | 24 VDC ±20 % |
| Pre-Operational Mode | 95 mA |
| Operational Mode | 110 mA |
| All inputs/outputs active, incl. LED's | 500 mA |
| Operating status | 1 × LED green for power supply (5V)<br>1 × LED green for operation mode (Run)<br>1 × LED red for error status (Err)<br>16 × LED green for activated inputs<br>16 × LED green for activated outputs (at the clamp) |
| Microcontroller | Motorola Freescale, 16 Bit |
| CAN | Galvanically isolated acc. to ISO11783<br>SubD9 plug male and female, bridged<br>Pinning acc. to DIN 41652 |
| CAN-Protocol | DS 301 and 401 |
| Number of modules / bus | 127 |
| Settings | Module address via 2 HEX-switches<br>Baud rate via HEX-switch |
| Clamps and cabling | Connection with Weidmueller clamps<br>clamp capacity 0,25 – 1,5 mm², 1-wire „e"<br>Fine-wired „f" 0,25 – 1,5 mm², „f" with conductor sleeve without plastic flange 0,25 – 1,5 mm² |

| Digital inputs | |
|---|---|
| Number of digital inputs | 16 |
| Switching level „1" | +15,0V to +28,8V DC |
| Switching level „0" | 0,0V to +8,0V DC |
| Potential isolation | Optocoupler |
| Input current | 11 mA |
| Sample rate | 2,5 kHz |
| Signal delay | < 400 µs |

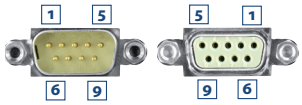
| Digital outputs | |
|---|---|
| Number of digital outputs | 16 |
| Current | 24 VDC ±20 % |
| Type of switch | FET-Highside-Power-Switch |
| Potential isolation | Optocoupler |
| Supply outputs | 1 A (Short-circuit proof) |
| Overall power consumption | 8 A |
| Overall power consumption at supply per block | 16 A |
| Sample rate | 1 kHz |
| Free-wheeling diode | Yes |
| Signal delay | < 100 µs |
| Relay contact (if module is active) | 1 × UM / 1A |

## Clamp block — Pin — Pin assignment




| Pin | Pin assignment |
|---|---|
| + | nc |
| 1 | Input 0 / Output 0 |
| 2 | Input 1 / Output 1 |
| 3 | Input 2 / Output 2 |
| 4 | Input 3 / Output 3 |
| 5 | Input 4 / Output 4 |
| 6 | Input 5 / Output 5 |
| 7 | Input 6 / Output 6 |
| 8 | Input 7 / Output 7 |
| – | GND 0V |

## CAN-Interface — Pin — Pin assignment




| Pin | Pin assignment |
|---|---|
| 2 | CAN L (low) |
| 3 | CAN GND (ground) |
| 7 | CAN H (high) |

## HEX-switches module address — Range — Address

| Range | Address |
|---|---|
| Minimum 01 HEX | 1 |
| Maximum 7F HEX | 127 |

## HEX-switches baud rate — Range — baud rate (kBit)

| Range | baud rate (kBit) |
|---|---|
| 0 | 10 |
| 1 | 20 |
| 2 | 50 |
| 3 | 125 |
| 4 | 250 |
| 5 | 500 |
| 6 | 800 |
| 7 | 1000 |



## Order information

| Art.-No | Description |
|---|---|
| V966160000 | DIO 32_RM35 24V IO High-Side |
| V966160300 | DIO 32_RM35 12V IO High-Side |
| V966160400 | DIO 32_RM35 12V IO Low-Side |
| V980109000 | Weidmüller BL IO-30-pol. with LED (not included in delivery) |
| V980109100 | Weidmüller BL IO-30pol. without LED (not included in delivery) |
| V980109200 | Weidmüller BL IO-10pol.with LED (not included in delivery) |
| V980109300 | Weidmüller BL IO-10pol.without LED (not included in delivery) |

# Overview

## Digital Remote IO Modules — Technical data




| Housing | DI32 | DO32 | DIO32 | DI40 |
|---|---|---|---|---|
| Dimensions (l × w × h) | 121 mm × 120 mm × 48 mm | | | |
| Weight | 600g | | | |
| Protection class | IP 20, EMV-requirements according to CE | | | |
| Storage temperature | -30 °C to 70 °C | | | |
| Operating temperature | 0 °C to 60 °C | | | |
| Humidity | 90 % non-condensing | | | |
| VCC | 24 VDC ±20 % | | | |
| Pre-Operational Mode | 85 mA | 100 mA | 95 mA | 85 mA |
| Operational Mode | 85 mA | 100 mA | 110 mA | 85 mA |
| All inputs/outputs active, incl. LED's | 540 mA | 440 mA | 500 mA | 540 mA |
| Operating status | 1 × LED green for power supply (5V)<br>1 × LED green for operation mode (Run)<br>1 × LED red for error status (Err)<br>32 × LED green for activated inputs | 1 × LED green for power supply (5V)<br>1 × LED green for operation mode (Run)<br>1 × LED red for error status (Err)<br>32 × LED green for activated outputs (at the clamp) | 1 × LED green for power supply (5V)<br>1 × LED green for operation mode (Run)<br>1 × LED red for error status (Err)<br>16 × LED green for activated inputs<br>16 × LED green for activated outputs (at the clamp) | 1 × LED green for power supply (5V)<br>1 × LED green for operation mode (Run)<br>1 × LED red for error status (Err)<br>40 × LED green for activated inputs |
| Microcontroller | Motorola Freescale, 16 Bit | | | |
| CAN | Galvanically isolated acc. to ISO11783<br>SubD9 plug male and female, bridged<br>Pinning acc. to DIN 41652 | | | |
| CAN-Protocol | DS 301 and 401 | | | |
| Number of modules / bus | 127 | | | |
| Settings | Module address via 2 HEX-switches<br>Baud rate via HEX-switch | | | |
| Clamps and cabling | Connection with Weidmueller clamps<br>clamp capacity 0,25 – 1,5 $mm^2$, 1-wire „e"<br>Fine-wired „f" 0,25 – 1,5 $mm^2$, „f" with concuctor sleeve without plastic flange 0,25 – 1,5 $mm^2$ | | | |
| Wires | 2-wire and 3-wire connection, dismantling 10 mm | | | |

| Digital Inputs | | | | |
|---|---|---|---|---|
| Number of digital inputs | 32 | - | 16 | 40 |
| Switching level „1" | +15,0V to +28,8V DC | - | +15,0V to +28,8V DC | |
| Switching level „0" | 0,0V to +8,0V DC | - | 0,0V to +8,0V DC | |
| Potential isolation | Optocoupler | - | Optocoupler | |
| Supply inputs | 11 mA | - | 11 mA | |
| Sample rate | 2,5 kHz | - | 2,5 kHz | |
| Signal delay | < 400 µs | - | < 400 µs | |

| Digital Outputs | | | | |
|---|---|---|---|---|
| Number of digital outputs | - | 32 | 16 | - |
| Current | - | 24 VDC ±20 % | | - |
| Type of switch | - | FET-Highside-Power-Switch | | - |
| Potential isolation | - | Optocoupler | | - |
| Supply outputs | - | 1 A (short-circuit proof) | | - |
| Overall power consumption | - | 8 A | | - |
| Overall power consumption at supply per block | - | 32 A | 16 A | - |
| Sample rate | - | 1 kH | | - |
| Free-wheeling diode | - | Yes | | - |
| Signal delay | - | < 100 µs | | - |
| Relay contact (if module is active) | - | 1 × UM / 1A | | - |

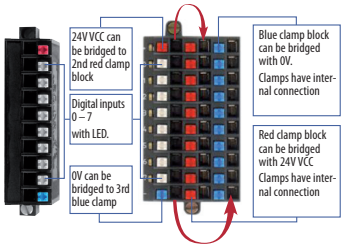
## Technical Data

| DIO40 | DIO72 |
|---|---|
| 121 mm × 120 mm × 48 mm | 241mm x 120mm x 48mm |
| 600g | 800g |
| IP 20, EMV-requirements according to CE | |
| -30 °C to 70 °C | |
| 0 °C to 60 °C | |
| 90 % non-condensing | |
| 24 VDC ±20 % | |
| 95 mA | 120 mA |
| 110 mA | 130 mA |
| 500 mA | 830 mA |
| 1 × LED green for power supply (5V) | 1 × LED green for power supply (5V) |
| 1 × LED green for operation mode (Run) | 1 × LED green for operation mode (Run) |
| 1 × LED red for error status (Err) | 1 × LED red for error status (Err) |
| 32 × LED green for activated inputs | 32 × LED green for activated inputs |
| 8 × LED green for activated outputs (at the clamp) | 40 × LED green for activated outputs (at the clamp) |
| Motorola Freescale, 16 Bit | |
| Galvanically isolated acc. to ISO11783 | |
| SubD9 plug male and female, bridged | |
| Pinning acc. to DIN 41652 | |
| DS 301 and 401 | |
| 127 | |
| Module address via 2 HEX-switches | |
| Baud rate via HEX-switch | |
| Weidmueller clamps, clamp capacity 0,25 – 1,5 mm², 1-wire „e“ | |
| Fine-wired „f“ 0,25 – 1,5 mm², „f“ with conductor sleeve without plastic flange 0,25 – 1,5 mm² | |
| 2-wire and 3-wire connection, dismantling 10 mm | |

| | |
|---|---|
| 32 | |
| +15,0V to +28,8V DC | |
| 0,0V to +8,0V DC | |
| Optocoupler | |
| 11 mA | |
| 2,5 kHz | |
| < 400 µs | |

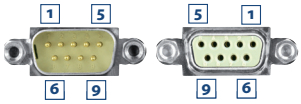
| | |
|---|---|
| 8 | 40 |
| 24 VDC ±20 % | |
| FET-Highside-Power-Switch | |
| Optocoupler | |
| 1 A (short-circuit proof) | |
| 8 A | |
| 8 A | 40 A |
| 1 kH | |
| Yes | |
| < 100 µs | |
| 1 × UM / 1A | |

## Clamp block




| Pin | Pin assignment |
|---|---|
| + | nc |
| 1 | Input 0 / Output 0 |
| 2 | Input 1 / Output 1 |
| 3 | Input 2 / Output 2 |
| 4 | Input 3 / Output 3 |
| 5 | Input 4 / Output 4 |
| 6 | Input 5 / Output 5 |
| 7 | Input 6 / Output 6 |
| 8 | Input 7 / Output 7 |
| – | GND 0V |

## CAN-Interface




| Pin | Pin assignment |
|---|---|
| 2 | CAN L (low) |
| 3 | CAN GND (ground) |
| 7 | CAN H (high) |

## HEX-switches module address

| Range | Address |
|---|---|
| Minimum 01 HEX | 1 |
| Maximum 7F HEX | 127 |

## HEX-switches baud rate

| Range | baud rate (kBit) |
|---|---|
| 0 | 10 |
| 1 | 20 |
| 2 | 50 |
| 3 | 125 |
| 4 | 250 |
| 5 | 500 |
| 6 | 800 |
| 7 | 1000 |

## Ordering information

| Art.-No. | Description |
|---|---|
| V966117000 | DI32 RM35 24V IO |
| V966117400 | DI32_RM35 12V IO |
| V966127000 | DO 32_RM35 24V IO High-Side |
| V966127300 | DO 32_RM35 12V IO High-Side |
| V966127400 | DO 32_RM35 12V IO Low-Side |
| V966160000 | DIO 32_RM35 24V IO High-Side |
| V966160300 | DIO 32_RM35 12V IO High-Side |
| V966160400 | DIO 32_RM35 12V IO Low-Side |
| V966181000 | DI40_RM35 |
| V966180000 | DIO40_RM35, 32dig.In. & 8xdig.Out 24V IO |
| V966170000 | DIO 72_RM35 24V IO High-Side |
| V966170300 | DIO 72_RM35 12V IO High-Side |
| V966170400 | DIO 72_RM35 12V IO Low-Side |
| V980109000 | Weidmüller BL IO-30-pol. mit LED (not included in delivery) |
| V980109100 | Weidmüller BL IO-30pol. ohne LED (not included in delivery) |
| V980109200 | Weidmüller BL IO-10pol. mit LED (not included in delivery) |
| V980109300 | Weidmüller BL IO-10pol. ohne LED (not included in delivery) |

# Multi-IO


## Key Features

- Compact aluminum housing with IP20 and an integrated top hat rail mount
- Safety functions for a high process safety
- Easy access to all interfaces
- Own intelligence for complex CAN-networks
- Clamps pluggable and lockable
- Signal delay less than 200 µ-seconds
- Galvanically isolated CAN-interface acc. to ISO 11898
- Galvanically isolated inputs and outputs

The CANopen module Multi-IO is a powerful device for handling digital and analogue signals. It incorporates 56 channels of different communication channels. The device possesses the shortest conversion times and a high process reliability. That makes it the best choice for continuous operation in complex machine networks.



### Overview of interfaces
– 16 digital inputs
– 16 digital outputs
– 8 analogue inputs
– 8 analogue outputs
– 4 24-Bit encoder interfaces
– 1 CAN-interface

### Housing
The compact housing is made of aluminum. It contains a top hat rail mount and a front cover with all interfaces for better overview in the control cabinet. The technician will note the convenience while working at the bus cabling.

### Clamps and cabling
The Remote-IO series uses 3-wire cabling for direct connection to sensors and actors, supplying them with power. In order to reduce the danger of false-wire harnessing the 3-wire clamps are coloured. If you wish to see the status of each channel, we can deliver the modules with LED-clamps. Please bear in mind that those are suited for digital channels only.

### LEDs and switches
All inputs and outputs can be monitored with the help of LEDs at the clamps. In addition to that, you can configure the baud rate and module address with HEX-switches at the front cover - easy and comfortable.

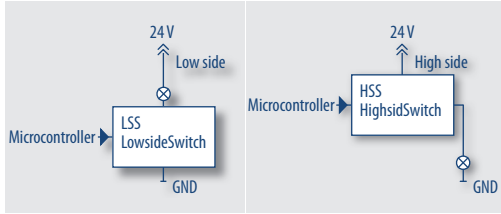
### Signal processing
Besides its inputs and outputs the Multi-IO offers a powerful micro-controller that handles data acquisition of sensors, control of actors and the processing of any CAN-data.
An important safety function is the Multi-IO's guarding capability which is fully integrated into the IO for network surveillance. Furthermore, there is a relay contact (changeover) as an additional safety measure. If there is an absence of guarding by the master registered, the module immediately goes into STOP-mode.

### CAN-Interface
The integrated CAN-interface is designed in accordance to DS301 and 401 for a flexible use in different places and tasks in the CAN-bus network. All Sontheim CAN-interfaces comply to ISO11898.

### Processor
The CPU module can be extended. It is a IEC61131 programmable device, enabling you to adapt it to your level of process complexity.

### Power supply
The Multi-IO needs a power supply with 24V. Due to the polarity reversal protection the user is in no danger of damaging the module by reversed power connection. Short surge peaks are also eliminated by an EMI wiring for the control section.

### Highside and Lowside switch
All digital outputs can be fitted with a Highside or Lowside switch. Being Highside, the outputs toggle the supply voltage to load. Being Lowside, they toggle to ground..



## Multi-IO — Technical data

### Hardware

| | |
|---|---|
| Dimensions (l × w × h) | 241 mm × 120 mm × 48 mm |
| Weight | approx.: 800g |
| Storage temperature | -10 °C to 70 °C |
| Operating temperature | 0 °C to 60 °C |
| Humidity | 90 % non-condensing |
| VCC | 24VDC ± 10 % |
| Power consumption | approx.: 500 mA |
| Clamp block | Wires ø 0,25 to 1,5 mm² |
| Operating status | 1 × LED green for power supply (5V)<br>1 × LED green for operation mode (Run)<br>1 × LED red for error status (Err) |
| Protection class | IP 20 |
| Microcontroller | Motorola MC9S12DP256B |
| CAN-interface | 1 × CAN-acc. to DIN ISO 11898, galv. isolated |
| CAN-Protocol | DS 301 and 401 |

### Digital inputs

| | |
|---|---|
| Number of inputs | 16 |
| Type of switch | Positive switching inputs |
| Potential isolation | Optocoupler |
| Status (at clamp) | LED (green) for activated input |
| Switching level „1“ | +15.0V ... +28.8V |
| Switching level „0“ | 0V ... +8,0V |
| Input current | 8 mA |
| Signal delay | < 200 µs |

### Digital outputs

| | |
|---|---|
| Number of outputs | 16 |
| Type of switch | FET - Highside - Switch |
| Potential isolation | Optocoupler |
| Output current | Power supply approx. 0,3V |
| Status (at clamp) | LED (green) for activated output |
| Iout Max | 1A |
| fg | 1 kHz |
| Short circuit proof | Yes |
| Free-wheeling diode | Yes |
| Signal delay | < 100µs |

### Analoge inputs

| | |
|---|---|
| Number of inputs | 8, galvanically isolated as a group |
| Resolution | 12 Bit |
| Potential isolation | Optocoupler |
| Input current | –10V...+10VDC |
| Sample rate | Up to 12 operating inputs: 1 KHz<br>more than 12 operating inputs: 500 Hz |

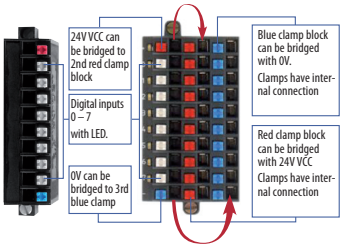
### Analogue outputs

| | |
|---|---|
| Number of outputs | 8, galvanically isolated as a group |
| Resolution | 12 Bit |
| Potential isolation | Optocoupler |
| Output current | –10V...+10VDC |
| Iout Max | 20 mA |
| Filter circuit | Integrated |

### Encoder-inputs

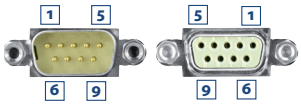
| | |
|---|---|
| Number of inputs | 4 |
| Level | RS485 (A and B) |
| Max. input frequency | 300 kHz |
| Input current | 5 V (encoder supply) |
| Iout Max | 80 mA (encoder supply) |
| Galvanic isolation | Optocoupler |

### Clamp block — Pin — Pin assignment



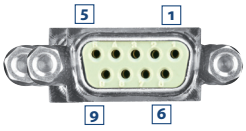

| Pin | Pin assignment |
|---|---|
| + | nc |
| 1 | Input 0 / Output 0 |
| 2 | Input 1 / Output 1 |
| 3 | Input 2 / Output 2 |
| 4 | Input 3 / Output 3 |
| 5 | Input 4 / Output 4 |
| 6 | Input 5 / Output 5 |
| 7 | Input 6 / Output 6 |
| 8 | Input 7 / Output 7 |
| – | GND 0V |

### CAN-Interface — Pin — Pin assignment




| Pin | Pin assignment |
|---|---|
| 2 | CAN L (low) |
| 3 | CAN GND (ground) |
| 7 | CAN H (high) |

### Encoder input — Pin — Pin assignment




| Pin | Pin assignment |
|---|---|
| 1 | B |
| 2 | A |
| 3 | 0 |
| 4 | 0 V |
| 5 | Erde |
| 6 | 5 V |
| 7 | /A |
| 8 | /0 |
| 9 | /B |

### HEX-switches module address — Range — Address

| Range | Address |
|---|---|
| Minimum 01 HEX | 1 |
| Maximum 7F HEX | 127 |

### HEX-switches baud rate — Range — baud rate (kBit)

| Range | baud rate (kBit) |
|---|---|
| 0 | 50 |
| 1 | 125 |
| 2 | 250 |
| 3 | 500 |
| 4 | 1000 |

# Overview

## Digital and analogue remote IO Versions — Technical data



| Hardware | Multi-IO | Multi-IO AI 16 | AI16 |
|---|---|---|---|
| Dimensions (l × w × h) | 241 mm × 120 mm × 48 mm | | |
| Weight | approx.: 800g | | |
| Storage temperature | -10 °C to 70 °C | | |
| Operating temperature | 0 °C to 60 °C | | |
| Humidity | 90 % non-condensing | | |
| VCC | 24VDC ± 10 % | | |
| Power consumption | approx.: 500 mA | | |
| Clamp block | Wires ø 0,25 to 1,5 mm² | | |
| Operating status | 1 × LED green for power supply (5V)<br>1 × LED green for operation mode (Run)<br>1 × LED red for error status (Err) | | |
| Protection class | IP 20 | | |
| Micro-controller | Motorola MC9S12DP256B | | |
| CAN-interface | 1 × CAN-interface according to DIN ISO 11898, galv. isolated | | |
| CAN-Protocol | DS 301 and 401 | | |
| **Digitale inputs** | | | |
| Number of inputs | 16 | | - |
| Type of switch | Positive switching inputs | | - |
| Potential isolation | Optocoupler | | - |
| Status (at clamp) | LED (green) for activated input | | - |
| Switching level „1“ | +15.0V ... +28.8V | | - |
| Switching level „0“ | 0V ... +8,0V | | - |
| Input current | 8 mA | | - |
| Signal delay | < 200 µs | | - |
| **Digitale outputs** | | | |
| Number of outputs | 16 | | - |
| Type of switch | FET - Highside - Switch | | - |
| Potential isolation | Optocoupler | | - |
| Output current | Power supply – approx. 0,3V | | - |
| Status (at clamp) | LED (green) for activated output | | - |
| Iout Max | 1A | | - |
| $f_g$ | 1 kHz | | - |
| Short circuit proof | Yes | | - |
| Free-wheeling diode | Yes | | - |
| Signal delay | < 100µs | | - |
| **Analoge inputs** | | | |
| Number of inputs | 8, galv. isolated as a group | 16, galv. isolated as a group | |
| Resolution | 12 Bit | | |
| Potential isolation | Optocoupler | | |
| Input current | –10V...+10VDC | | |
| Sample rate | Up to 12 operating inputs: 1 KHz<br>more than 12 operating inputs: 500 Hz | | |

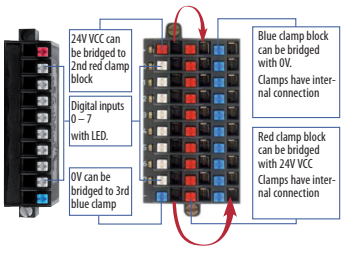
## Digital and analogue remote IO versions — Technical data



| Analoge outputs | Multi-IO | Multi-IO AI16 | AI16 |
|---|---|---|---|
| Number of outputs | 8, galvanically isolated as a group | - | - |
| Resolution | 12 Bit | - | - |
| Potential isolation | Optocoupler | - | - |
| Output current | –10V...+10VDC | - | - |
| Iout Max | 20 mA | - | - |
| Filter circuit | Integrated | - | - |

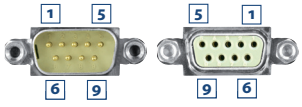
| Encoder-inputs | | |
|---|---|---|
| Number of inputs | 4 | - |
| Level | RS485 (A and B) | - |
| Max. input frequency | 300 kHz | - |
| Input current | 5 V (encoder supply) | - |
| Iout Max | 80 mA (encoder supply) | - |
| Galvanic isolation | Optocoupler | - |

### Clamp block — Pin — Pin assignment




| Pin | Pin assignment |
|---|---|
| + | nc |
| 1 | Input 0 / Output 0 |
| 2 | Input 1 / Output 1 |
| 3 | Input 2 / Output 2 |
| 4 | Input 3 / Output 3 |
| 5 | Input 4 / Output 4 |
| 6 | Input 5 / Output 5 |
| 7 | Input 6 / Output 6 |
| 8 | Input 7 / Output 7 |
| – | GND 0V |

### CAN-Interface — Pin — Pin assignment




| Pin | Pin assignment |
|---|---|
| 2 | CAN L (low) |
| 3 | CAN GND (ground) |
| 7 | CAN H (high) |

### HEX-switches module address — Range — Address

| Range | Address |
|---|---|
| Minimum 01 HEX | 1 |
| Maximum 7F HEX | 127 |

### HEX-switches baud rate — Range — baud rate (kBit)

| Range | baud rate (kBit) |
|---|---|
| 0 | 10 |
| 1 | 20 |
| 2 | 50 |
| 3 | 125 |
| 4 | 250 |

### Ordering information

| Art.-No. | Description |
|---|---|
| V966105000 | Multi-IO_RM35 24V IO High-Side |
| V966105300 | Multi-IO_RM35 12V IO High-Side |
| V966105400 | Multi-IO_RM35 12V IO Low-Side |
| V966105600 | Multi-IO_RM35 AI16 24V IO High-Side |
| V966105700 | Multi-IO_RM35 AI16 12V IO High-Side |
| V966105800 | Multi-IO_RM35 AI16 12V IO Low-Side |
| V966105500 | AI16 |
| V980109000 | Weidmüller BL IO-30-pol. mit LED (not included in delivery) |
| V980109100 | Weidmüller BL IO-30pol. ohne LED (not included in delivery) |
| V980109200 | Weidmüller BL IO-10pol. mit LED (not included in delivery) |

# eControl-IO


## Key Features

- CANopen according to CiA Draft Standard-DS301 and DS401
- Fast inputs and outputs, short signal delay
- CAN baud rate up to 1Mbit
- Compact aluminum housing with integrated DIN rail mounting
- Numerous expansion possibilities

## Possible use cases

- Central control unit with CAN master functionality
- Distributed IOs via CAN

The key to slim fieldbus networks and efficient process automation is flexibility. The user must be able to cope with rapidly changing process requirements with existing resources. The eControl IO-module was developed specifically for the use in machine networks and with its numerous expansion modules it provides many applications in industrial environments and is the ideal supplement for all PLCs of the eControl family.



### Overview of interfaces

– 16 digital inputs
– 16 digital outputs
– 8 analogue inputs
– Many expansion modules

### Master module and CAN-interface

The master module is the basis of the eControl IO-module and is required in each constellation. The entire IO system is controlled by an integrated microcontroller, while already 16 digital outputs, 16 digital inputs, 2 analog outputs and 2 analog inputs are integrated. The module has an LED status indicator to show the status of the module and the switching states of the digital IO's. As an interfaces for data exchange, it has two RJ45 ports for the CAN bus which allows an easy and fast connection. Via DIP switch the module ID and baud rate of the CAN bus can be set conveniently.

### High flexibility through individual expansion options

An expansion interface enables the connection of up to 6 IO modules. The modules and the order can be freely selected. The addressing of the expansion modules is performed automatically and the master module detects the plugged in module and the addressing automatically.

As extension options we provide currently a motor module, analog module, digital module or temperature module.

### Rugged interfaces

The used Phoenix clamps ensure a simple and extremely robust connection that makes the module in combination with the robust aluminum housing very durable and reliable.

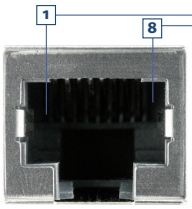
### eControl as a master with CODESYS V3

The PLCs of the eControl family are equipped with numerous communication interfaces, such as CAN, Ethernet, USB and serial interfaces. The PLCs have powerful CPUs which are optimized for the CODESYS target and web visualization. The robust and compact design in combination with CODESYS V.3 as a development environment open up a variety of applications in industrial environments.

## Mastermodul

| | |
|---|---|
| Power supply | 24V ±10% - over 3-wire Phoenix-Clamps |
| Supply IO | 24V ±10% - over 3-wire Phoenix-Clamps |
| Storage temperature | -20 to 70°C |
| Operating temperatur | 0° to 60°C (optional with extended temperature) |
| Dimensions | 180mm x 120mm |
| CAN | 2x CAN over RJ45 (2x Plugs) |
| Temperature sensor | integrated |
| Internal Bus | Serial Interface |
| Clamps | Phoenix-Clamp RM3,5 |
| 16 digital inputs | Typical 0-24V, max. 28,8V<br>- Input current at rated voltage < 1-5mA |
| 16 digital outputs | - Typical 0-24V, max. 28,8V<br>- 0,5A max. voltage per output<br>- Protection against thermaltic overload |
| 2 analogue inputs | - 2 contacts as reference GND<br>- 2 contacts for the analogue inputs<br>- input voltage range: 0V … +10V<br>- input voltage at +10V: < 1mA<br>- Resulution: 10Bit |
| 2 analogue outputs | - 2 contacts as reference GND<br>- 2 contacts for the analogue outputs<br>- output voltage range: 0V … +10V<br>- max output voltage 10mA<br>- Resolution: 10Bit |

## RJ45 (CAN)




| Pin | Pin assignment |
|---|---|
| 1 | |
| 2 | CAN H (high) |
| 3 | CAN L (low) |
| 4 | CAN GND (ground) |
| 5 | |
| 6 | |
| 7 | CAN GND (ground) |
| 8 | |

## DIP-switch (Master module)

**Module address**

| | |
|---|---|
| Minimum 01 HEX | 1 |
| Maximum 7F HEX | 127 |

**Baud rate**

| | |
|---|---|
| 0 | 50 |
| 1 | 125 |
| 3 | 250 |
| 4 | 500 |
| 5 | 1000 |

## IO - Overview

| IO - Overview | 8DI/8DO | 2H-bridge | PT100/PT1000 | 2AI/2AO | Relay module |
|---|---|---|---|---|---|
| DI 24 V | 8 | - | - | - | - |
| DO 24V | 8 | - | - | - | - |
| AI 0-10V | - | - | - | 2 | - |
| AO 0-10V | - | - | - | 2 | - |
| PT 100/1000 | - | - | 2 / 4 | - | - |
| Engine bridge 10A | - | 2 | - | - | - |
| Potential-free contacts 6A | - | - | - | - | 4 |
| CAN - adress settings | automatically | automatically | automatically | automatically | automatically |
| CAN baud rate | over master module | over master module | over master module | over master module | over master module |
| Spannungsversorgung | 24V | 24V | 24V | 24V | 24 V |



## Ordering information

| Art.-No. | Description |
|---|---|
| V965201110 | Master module 16DI/16DO/2AI/2AO 10 Bit |
| V965201210 | Module 2. 8DI/8DO |
| V965201310 | Module 3. 2H Bidge 10A |
| V965201410 | Module 4.1. 2PT100/PT1000 |
| V965201420 | Module 4.2. 4PT100/PT1000 |
| V965201510 | Module 5. 2AI/2AO 10 Bit |
| V965201610 | Module 6. Relay module |

# IAO 08


The analogue output module IAO08 is a powerful device for forwarding analogue signals. The device possesses the shortest conversion times and a high process reliability. That makes it the best choice for continuous operation in complex machine networks.

## Key Features

- Compact aluminum housing with IP20 and an integrated top hat rail mount
- Safety functions for a high process safety
- Easy access to all interfaces
- Own intelligence for complex CAN-networks
- Signal delay less than 400 µ-seconds
- Galvanically isolated CAN-interface acc. to ISO 11898
- Galvanically isolated inputs and outputs

### Overview of interfaces
– 8 analogue outputs



### Housing
The compact housing is made of aluminum. It contains a top hat rail mount and a front cover with all interfaces for better overview in the control cabinet. The technician will note the convenience while working at the bus cabling.

### Switches
You can configure the baud rate and module address with HEX-switches at the front cover - easy and comfortable.

### Signal processing
Besides its inputs and outputs the IAO08 offers a powerful micro-controller that handles data acquisition of sensors, control of actors and the processing of any CAN-data.
An important safety function is the IAO08's guarding capability which is fully integrated into the IO for network surveillance. Furthermore, there is a relay contact (changeover) as an additional safety measure. If there is an absence of guarding by the master registered, the module immediately goes into STOP-mode.

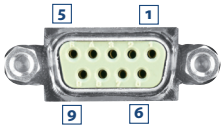
### CAN-Interface
The integrated CAN-interface is designed in accordance to DS301 and 401 for a flexible use in different places and tasks in the CAN-bus network. All Sontheim CAN-interfaces comply to ISO11898.

## IAO 08 — Technical data

| Hardware | |
|---|---|
| Dimensions (l × w × h) | 241 mm × 120 mm × 48 mm |
| Weight | approx.: 800g |
| Storage temperature | -10 °C to 70 °C |
| Operating temperature | 0 °C to 60 °C |
| Humidity | 90 % non-condensing |
| VCC | 24VDC ± 10 % |
| Power consumption | approx.: 500 mA |
| Clamp block | Wires ø 0,25 to 1,5 mm² |
| Operating status | 1 × LED green for power supply (5V)<br>1 × LED green for operation mode (Run)<br>1 × LED red for error status (Err)<br>32 × LED green for activated input |
| Protection class | IP 20 |
| Microcontroller | Motorola Freescale, 16 Bit |
| CAN-interface | 1 × CAN-interface acc. to DIN ISO 11898, galv. isolated |

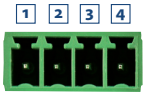
| Analogue outputs | |
|---|---|
| Number of outputs | 8 |
| Resolution | 12 Bit |
| Potential isolation | Optocoupler |
| Output current | –10V...+10VDC |
| Iout Max | 20 mA |
| Filter circuit | Integrated |

### Analogue outputs — Pin assignment




| Pin | Pin assignment |
|---|---|
| 1 | – |
| 2 | – |
| 3 | – |
| 4 | ANAOUT |
| 5 | ANAOUT |
| 6 | ANAGND |
| 7 | ANAGND |
| 8 | – |
| 9 | – |
| 10 | ERDE |

### CAN-interface — Pin assignment




| Pin | Pin assignment |
|---|---|
| 1 | CAN H (high) |
| 2 | CAN L (low) |
| 3 | GND |
| 4 | Erde |

### HEX-switches Baud rate — Range — baud rate (kBit)

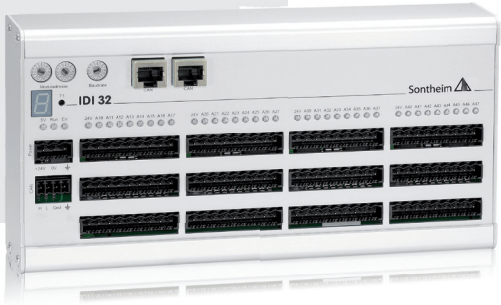
| Range | baud rate (kBit) |
|---|---|
| 0 | 50 |
| 1 | 125 |
| 2 | 250 |
| 3 | 500 |
| 4 | 1000 |



### Ordering information

| Art.-No. | Description |
|---|---|
| V966301000 | IAO 08 - 8 x AnaOut |

# IDI32




## Key Features

- Compact aluminum housing with IP20 and an integrated top hat rail mount
- Safety functions for a high process safety
- Easy access to all interfaces
- Own intelligence for complex CAN-networks
- Signal delay less than 400 µ-seconds
- Galvanically isolated CAN-interface acc. to ISO 11898
- Galvanically isolated inputs and outputs

IDI32 is a digital 32-channel 24V input module for the use in CAN networks. The device possesses the shortest conversion times and a high process reliability. That makes it the best choice for continuous operation in complex machine networks.

### Overview of interfaces

– 32 Digital inputs

### Clamps and cabling

A very important feature of the IDI32 in its different versions is the really sturdy way in which the connection of actors and sensors is handled. 24V, data and GND have separate connectors (3-wire-connection). We use Phoenix clamps for simple and rugged connections. Every IO-block of the device is galvanically isolated and has its own power supply. Thus, all IDxx modules can be used in safety-relevant environments. An example for a typical application is the CAN-handling of emergency-stop circuits like guard doors.

### CAN-interface

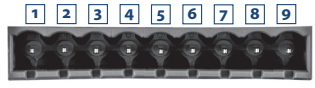
Two RJ45 connectors at the front cover facilitate the connection with other CAN-participants over ethernet patch cable. The IDI32 can also be used in a decentralised CAN network.

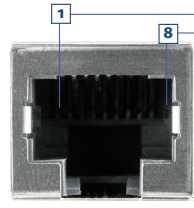
### LEDs and switches

All inputs and outputs can be monitored with the help of LEDs at the clamps. In addition to that, you can configure the baud rate and module address with HEX-switches at the front cover - easy and comfortable.

### Signal processing

Besides its inputs and outputs the IDI32 offers a powerful micro-controller that handles data acquisition of sensors and the processing of any CAN-data.

| 9-pole Phoenix clamp | Pin | Pin assignment |
|---|---|---|
|  | Top connector 24V | |
|  | 1 | 24 V |
| | 2 | Input 1 / ouput 1 |
| | 3 | Input 2 / ouput 2 |
| | 4 | Input 3 / ouput 3 |
| | 5 | Input 4 / ouput 4 |
| | 6 | Input 5 / ouput 5 |
| | 7 | Input 6 / ouput 6 |
| | 8 | Input 7 / ouput 7 |
| | 9 | Input 8 / ouput 8 |
|  | Bottom connector 0V | |

| RJ45 | Pin | Pin assignment |
|---|---|---|
|  | 1 | - |
| | 2 | - |
| | 3 | - |
| | 4 | CAN-L (low) |
| | 5 | CAN-H (high) |
| | 6 | - |
| | 7 | CAN GND (ground) |
| | 8 | – |

| HEX-switches baud rate | Range | baud rate (kBit) |
|---|---|---|
|  | 0 | 10 |
| | 1 | 20 |
| | 2 | 50 |
| | 3 | 125 |
| | 4 | 250 |
| | 5 | 500 |
| | 6 | 800 |
| | 7 | 1000 |

| HEX-switches module address | Range | Address |
|---|---|---|
|  | Minimum 01 HEX | 1 |
| | Maximum 7F HEX | 127 |



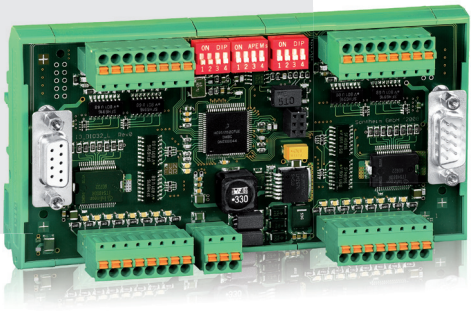
| Hardware | IDI32 | IDO32 | IDIO32 |
|---|---|---|---|
| Dimensions (l × w × h) | 241 mm × 120 mm × 48 mm | | |
| Weight | 850 g | | |
| Protection class | IP 20, EMI according to CE | | |
| Storage temperature | -30 °C to 70 °C | | |
| Operating temperature | 0 °C to 60 °C | | |
| Humidity | 90 % non-condensing | | |
| Power supply | 24 VDC ±20 % | | |
| Pre-Operational mode | 60 mA | 60 mA | 60 mA |
| Operational mode | 80 mA | 70 mA | 70 mA |
| All inputs/outputs active + LEDs | 400 mA | 470 mA | 470 mA |
| Operating status | 1 × LED green for power supply (5V)<br>1 × LED green for operation mode (Run)<br>1 × LED red for error status (Err)<br>32 × LED green for activated input | 1 × LED green for power supply (5V)<br>1 × LED green for operation mode (Run)<br>1 × LED red for error status (Err)<br>32 × LED green for activated output | 1 × LED green for power supply (5V)<br>1 × LED green for operation mode (Run)<br>1 × LED red for error status (Err)<br>16 × LED green for activated input<br>16 × LED green for activated output |
| Microcontroller | Motorola Freescale, 16 Bit | | |
| CAN | Interface according to ISO 11898, galvanically isolated<br>Connection via RJ45 connectors (bridged) | | |
| CAN-Protocol | DS 301 and 401 | | |
| Number of modules / bus | 127 | | |
| Settings | Module address via 2 HEX-switches<br>Baud rate via HEX-switch | | |
| Clamps and cabling | Connection with Weidmueller clamps<br>clamp capacity 0,25 – 1,5 mm², 1-wire „e“<br>Fine-wired „f“ 0,25 – 1,5 mm², „f“ with conductor sleeve without plastic flange 0,25 – 1,5 mm² | | |
| Wires | 2-wire and 3-wire connection, dismantling 10 mm | | |
| **Digital inputs** | | | |
| Number of digital inputs | 32 | - | 16 |
| Switching level „1“ | +15,0 V to +28,8 V DC | - | +15,0 V to +28,8 V DC |
| Switching level „0“ | 0,0 V to +8,0V DC | - | 0,0 V to +8,0V DC |
| Potential isolation | Optocoupler | - | Optocoupler |
| Input current | 11 mA | - | 11 mA |
| Sample rate | 2,5 kHz | - | 2,5 kHz |
| Signal delay | < 400 µs | - | < 400 µs |
| **Digital outputs** | | | |
| Number of outputs | - | 32 | 16 |
| Power supply | - | 24 VDC ±20 % | |
| Type of switch | - | FET-Highside-Power-Switch | |
| Potential isolation | - | Optocoupler | |
| Output current | - | 1 A (short-circuit proof) | |
| Overall power consumption | - | 8 A | |
| Overall power consumption with own supply for each block | - | 16 A | |
| Switching frequency | - | 1 kHz | |
| Free-wheeling diode | - | Yes | |
| Signal delay | - | < 100 µs | |



## Ordering information

| Art.-No. | Description |
|---|---|
| V966116000 | IDI 32 |
| V966126000 | IDO 32 |
| V966128000 | IDIO 32 |

# DIO32-L



## Key Features

- CANopen according to CiA Draft Standard DS 301 and DS 401
- Short signal delay
- short-circuit proof outputs
- CAN baud rate up to 1Mbit
- Compact dimensions
- comfortable top hat rail mounting

DIO32-L is a very low priced 24V CANopen IO module with 16 digital inputs and outputs each. The device possesses the shortest conversion times and a high process reliability. That makes it the best choice for continuous operation in complex machine networks.



### Overview of interfaces
– 16 digital inputs
– 16 digital outputs

### Housing
The compact housing is made for being in a control cabinet. It contains a top hat rail mount and a front cover with all interfaces for better overview in the control cabinet. The technician will note the convenience while working at the bus cabling.

### LEDs and switches
All inputs and outputs can be monitored with the help of LEDs at the clamps. In addition to that, you can configure the baud rate and module address with HEX-switches at the front cover - easy and comfortable.

### Inputs and outputs
DIO32-L is highly reliable most fail-proof due to optically isolated short-circuit protected inputs and outputs. It offers a wide input voltage range of 12 to 30VDC for the use in many different applications.

### Signal processing
Besides its inputs and outputs the DIO32-L offers a powerful micro-controller that handles data acquisition of sensors, control of actors and the processing of any CAN-data.
An important safety function is the DIO's guarding capability which is fully integrated into the IO for network surveillance. If there is an absence of guarding by the master registered, the module immediately goes into STOP-mode.

### CAN-Interface
The integrated CAN-interface is designed in accordance to DS301 and 401 for a flexible use in different places and tasks in the CAN-bus network. All Sontheim CAN-interfaces comply to ISO11898.

## DIO 32-L — Technical Data

| Housing | |
|---|---|
| Dimensions (l × w × h) | 147 mm × 77 mm × 37 mm |
| Weight | 185 g with clamps, 155 g without clamps |
| Mounting | Top hat rail |
| Temperature range | Operating 0 °C to 60 °C<br>extended temperature range available upon enquiry<br>Storage –30 °C to 70 °C |
| Humidity | 90 %, non-condensing |
| Conformity to EMI guidelines | EN 61000-6-4 and EN 61000-6-2 (industrial applications) |
| Power Supply | 12V DC to 30V DC |
| Power consumption | 30 mA |
| Overall consumption with active IOs | 350 mA |
| Operating status | 1 × LED green for operating mode (Run)<br>1 × LED red for error status (Err)<br>32× LED green for activated inputs / outputs |
| CAN | Interface acc. to ISO 11898, assignment acc. to DIN 41652<br>Connection via SubD9 plug male and female (bridged) |
| CAN-Protocol | DS 301 and 401 |
| Number of modules / bus | 127 |
| Setting | Module address via 2 DIP-switches<br>Baud rate via HEX-switch |
| Cabling | Rigid cables 0,20 – 2,5 mm², <br>Flexible cables 0,20 – 2,5 mm², |
| Clamps | Spring clamp |
| Wires | 2-wire connection with twin conductor sleeve, dismantling 10 mm |

| Digital Inputs | |
|---|---|
| Number of inputs | 16 |
| Switching level „1“ | +8,0V to +30,0V DC |
| Switching level „0“ | 0,0V to +4,0V DC |
| Potential isolation | Optocoupler |
| Input current | 3,0 / 6,5 mA |
| Sample rate | 2,5 kHz |
| Signal delay | < 100 µs |

| Digital outputs | |
|---|---|
| Number of outputs | 16 |
| Power supply | VB – 0,85 VV DC |
| Type of switch | FET-Highside-Power-Switch |
| Potential isolation | Optocoupler |
| Output current per channel | 600 mA |
| Max. output current | 8 A |
| Protective circuit | Short-circuit and overload protection |
| Switching frequency | 1 kHz |
| Free-wheeling diode | Yes |
| Signal delay | < 100 µs |

### Dip- switches module address


| Range | Address |
|---|---|
| Minimum 01 HEX | 1 |
| Maximum 7F HEX | 127 |

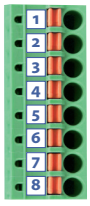
### Dip- switches baud rate


| Range | baud rate |
|---|---|
| 0 | 50 |
| 1 | 125 |
| 3 | 250 |
| 4 | 500 |
| 5 | 1000 |

### CAN-interface


| Pin | Pin assignment |
|---|---|
| 2 | CAN L (low) |
| 3 | CAN GND (ground) |
| 7 | CAN H (high) |

### Clamp block




| Pin | Name | Pin assignment |
|---|---|---|
| 1 | E 1.0 | Digtal Input / Output 1.0 |
| 2 | E 1.1 | Digtal Input / Output 1.1 |
| 3 | E 1.2 | Digtal Input / Output 1.2 |
| 4 | E 1.3 | Digtal Input / Output 1.3 |
| 5 | E 1.4 | Digtal Input / Output 1.4 |
| 6 | E 1.5 | Digtal Input / Output 1.5 |
| 7 | E 1.6 | Digtal Input / Output 1.6 |
| 8 | E 1.7 | Digtal Input / Output 1.7 |



### Ordering information

| Art.-No. | Description |
|---|---|
| V965100000 | DIO32-L |

# Overview

## Light-IO versions — Technicak data



| Hardware | DIO32-L | 32DIO 8AI-L | AIO16-L |
|---|---|---|---|
| Dimensions (l × w × h) | 147 mm × 77 mm × 37 mm | 166 mm × 72 mm × 37 mm | 147 mm × 77 mm × 37 mm |
| Weight | 155 g without clamps | 102 g without clamps | |
| Mounting | Top hat rail | | |
| Temperature range | Operating 0 °C to 60 °C<br>extended temperature range available upon enquiry<br>Storage –20 °C to 70 °C | Operating 0 °C to 50 °C<br>extended temperature range available upon enquiry<br>Storage –20 °C to 70 °C | Operating 0 °C to 50 °C<br>extended temperature range available upon enquiry<br>Storage –20 °C to 70 °C |
| Humidity | 90 %, non-condensing | | |
| Conformity to EMI guidelines | EN 61000-6-4 and EN 61000-6-2 (industrial applications) | | |
| Power Supply | 12V DC bis 30V DC | 12V +/-20% und 24V +/-20% | |
| Power consumption | 30 mA<br>350 mA (all IOs + LEDs active) | 90 mA<br>220 mA (all IOs + LEDs active) | |
| Operating status | 1 × LED green for operating mode (Run)<br>1 × LED red for error status (Err)<br>32× LED green for activated inputs / outputs | 1 × LED green for operating mode (Run)<br>1 × LED red for error status (Err)<br>1 × LED green for power supply<br>32× LED green for activated inputs / outputs | 1 × LED green for operating mode (Run)<br>1 × LED red for error status (Err)<br>1 × LED green for power supply |
| CAN | Interface acc. to ISO 11898, assignment acc. to DIN 41652<br>Connection via SubD9 plug male and female (bridged) | | |
| CAN-Protocol | DS 301 and 401 | | |
| Number of modules / bus | 127 | | |
| Setting | Module address via 2 DIP-switches<br>Baud rate via HEX-switch | | |
| Cabling | Clamp range 0.25 – 1.5 mm², single-wire „e“ | | |
| Clamps | Spring clamp | | |
| Wires | 2-wire connection with twin conductor sleeve, dismantling 10 mm | Single-wire connection, dismantling 10 mm | |

| Digital inputs | | | |
|---|---|---|---|
| Number of inputs | 16 | 0 - 32, configurable in blocks of 8 each | - |
| Switching level „1“ | +8,0V to +30,0V DC | +11.0V to +28.8V DC | - |
| Switching level „0“ | 0,0V to +4,0V DC | 0.0V to +5.0V DC | - |
| Potential isolation | Capacitive coupler | | - |
| Input current | 3,0 / 6,5 mA | 4 mA | - |
| Sample rate | 2,5 kHz | 1 kHz | - |
| Signal delay | < 100 µs | | - |

| Digital outputs | | | |
|---|---|---|---|
| Number of outputs | 16 | 0-32, configurable in blocks of 8 each | - |
| Minimum output power supply | VB - 0,85 V DC | VB - 0,16V DC | - |
| Type of switch | FET - Highside - Switch | | - |
| Potential isolation | Capacitive coupler | | - |
| Output current per channel | 600 mA | 500 mA | - |
| Max. output current | 8 A | 16 A | - |
| Protective circuit | Short-circuit and overload protection | Short-circuit and overload protection | - |
| Switching frequency | Yes | | - |
| Free-wheeling diode | Yes | | - |
| Signal delay | < 100µs | | - |

## Light-IO versions — Technical data



| Analogue inputs | DIO32-L | 32DIO 8AI-L | AIO16-L |
|---|---|---|---|
| Number of inputs | - | 8 | |
| Resolution | - | 12 Bit | |
| Input current | - | 0-10V DC | |
| Potential isolation | - | Capacitive coupler | |
| Sample rate | - | 1 kHz | 1 kHz |

| Analogue outputs | | | |
|---|---|---|---|
| Number of outputs | - | - | 8 |
| Resolution | - | - | 12 Bit |
| Output current | - | - | 0-10V DC |
| Potential isolation | - | - | Capacitive coupler |
| Sample rate | - | - | 250 mA per output |

### Module address DIO32-L — Range — Address


| | |
|---|---|
| Minimum 01 HEX | 1 |
| Maximum 7F HEX | 127 |

### Module address embedded IOs — Range — Address


| | |
|---|---|
| Minimum 01 HEX | 1 |
| Maximum 7F HEX | 127 |



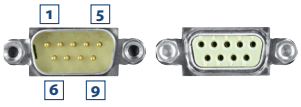
### Baud rate DIO32-L — Range — baud rate


| | |
|---|---|
| 0 | 50 |
| 1 | 125 |
| 3 | 250 |
| 4 | 500 |
| 5 | 1000 |

### Baud rate embedded IOs — Range — B a u d

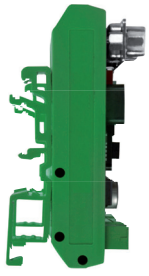

| | |
|---|---|
| 0 | 50 |
| 1 | 125 |
| 3 | 250 |
| 4 | 500 |
| 5 | 1000 |

### CAN-interface — Pin — Pin assignment

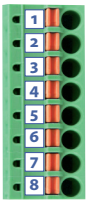



| | |
|---|---|
| 2 | CAN L (low) |
| 3 | CAN GND (ground) |
| 7 | CAN H (high) |

### Top hat rail mounting



### Clamp block — Pin — Name — Pin assignment




| | | |
|---|---|---|
| 1 | E 1.0 | Digtal Input / Output 1.0 |
| 2 | E 1.1 | Digtal Input / Output 1.1 |
| 3 | E 1.2 | Digtal Input / Output 1.2 |
| 4 | E 1.3 | Digtal Input / Output 1.3 |
| 5 | E 1.4 | Digtal Input / Output 1.4 |
| 6 | E 1.5 | Digtal Input / Output 1.5 |
| 7 | E 1.6 | Digtal Input / Output 1.6 |
| 8 | E 1.7 | Digtal Input / Output 1.7 |

### Ordering informationen

| Art.-No. | Description |
|---|---|
| V965100000 | DIO32-L |
| V930250300 | DIO32 8AI-L |
| V930250400 | AIO16-L |

# Relay module

**Key Features**

- Control of up to 8 high voltage relays for e.g. heating cartridges
- Safety functions
- Compact dimensions
- Top hat rail mounting
- Attractive price-performance ratio

The relay module is a module for controlling up to 8 high voltage relais with 400V for e.g. heating cartridges. Its housing is designed for saving costs while being mounted in a control cabinet. The device possesses the shortest conversion times and a high process reliability. That makes it the best choice for continuous operation in complex machine networks.



### Housing

The compact housing is made for being in a control cabinet. It contains a top hat rail mount and a front cover with all interfaces for better overview in the control cabinet. The technician will note the convenience while working at the bus cabling.

### Power supply

Phase L1 is only looped in. L2 and L3 are used for controlling the consumers. There is a current measurement integrated that enables a monitoring of each relay. It is build in 2 blocks with 4 relais each.

### Relais

A key feature of the relay module is its high process reliability. Its RP1 is a semiconductor relay for embedded board assembly with 3 regulated control currents for handling its consumers. Major advantages are both a high surge current and interference resistivity while switching AC loads.

### LEDs and Switches

Several status LEDs allow to visualise different operating modes and warning messages from its safety functions like heartbeat telegrams. Configuration of the module address and baud rate can be done via HEX switches and braze jumpers. The relay module is turned to 250 Kbit as a standard.

### Signal processing

There is a powerful ARM7 micro-controller on the module for controlling the relais and the CAN protocol. Additionally, heartbeat is integrated into the device.

### CAN-Interface

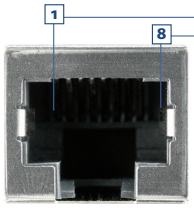
The integrated CAN-interface is designed in accordance to DS301 and 401 for a flexible use in different places and tasks in the CAN-bus network. All Sontheim CAN-interfaces comply to ISO11898.

## Relay module — Technical data

| Hardware | |
|---|---|
| Dimensions (l × w × h) | 285 mm × 77 mm × 37 mm |
| Weight | 185 g with clamps<br>155 g without clamps |
| Assembly | Top hat rail |
| Temperature range | Operating 0 °C to 60 °C<br>extended range available upon enquiry<br>Storage –30 °C to 70 °C |
| Humidity | 90 %, non-condensing |
| Conformity to EMI guidelines | EN 61000-6-4 and EN 61000-6-2 (industrial applications) |
| Power supply | 12V DC to 30V DC |
| Operating status | 1 × LED green for operating mode (Run)<br>1 × LED red for error status (Err)<br>1 × LED green for power supply |
| Microcontroller | ARM 7-based |
| CAN | Interface according to ISO 11898<br>Connection via RJ45 connector |
| Settings | Module address with 2 HEX-switches<br>Baud rate via braze jumpers |

| Relay data | |
|---|---|
| Load voltage | 2 – 530 VAC |
| Peak off-state voltage | 1000 V |
| Input load circuit | 4 kVAC |
| Rated frequency range | 45 – 65 Hz |
| Power factor | > 0,5 |
| Zero potential for power on | < 10 V |
| Certificates | UL, cUL, VDE |
| CE | yes |

## RJ45 — Pin — Pin assignment



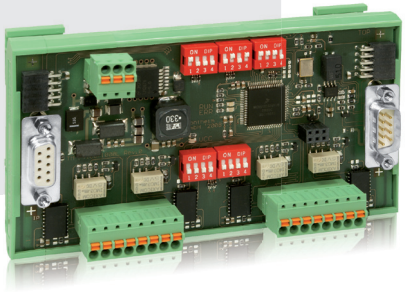

| Pin | Pin assignment |
|---|---|
| 1 | - |
| 2 | - |
| 3 | - |
| 4 | CAN-L (low) |
| 5 | CAN-H (high) |
| 6 | - |
| 7 | CAN GND (ground) |
| 8 | – |



## Ordering information

| Art.-No. | Description |
|---|---|
| V966305100 | RM-Relaismodul |

# TM-PT100/ 1000-L



## Key Features

- CANopen acc. to CiA Draft Standard DS 301 and DS 401
- CAN baud rate up to 1Mbit
- Compact dimensions
- Easy top hat rail mounting
- Free choice of cabling (4-wire / 2-wire) and sensors (PT100 / PT1000)
- Up to 8 sensors per module

Temperatures can easily be measured with the TM-PT100/1000-L with up to 8 sensors. It contains possibilities for 4-wire- and 2-wire-technology and thus provides a great amount of industrial-suitedness.



### Housing

The compact housing is made for being in a control cabinet. It contains a top hat rail mount and a front cover with all interfaces for better overview in the control cabinet. The technician will note the convenience while working at the bus cabling.

### LEDs and switches

All inputs and outputs can be monitored with the help of LEDs. In addition to that, you can configure the baud rate of up to 1 MBit and module address with DIP-switches at the front cover. An additional DIP-switch is meant for switching between 4-wire and 2-wire.

### Measuring

The data is collected with 4 (4-wire) or 8 (2-wire) sensors. You can choose between PT100 and PT1000 sensors and set the measurement speed to slow-mode with 100 ms or quick mode with 10ms per channel and cycle.

### Signal processing

A STAR 12 micro-controller handles the sensors and the CAN-protocol. TM-PT is also suited for control tasks via PWM/IO-interface.

### CAN-Interface

The integrated CAN-interface is designed in accordance to DS301 and 401 for a flexible use in different places and tasks in the CAN-bus network. All Sontheim CAN-interfaces comply to ISO11898.

## TM-PT100/1000-L — Technical data

| Hardware | |
|---|---|
| Dimensions (l × w × h) | 137 mm × 77 mm × 37 mm |
| Weight | 140 g without clamps |
| Assembly | Top hat rail |
| Temperature range | Operating 0 °C to 60 °C<br>extended temperature range available upon enquiry<br>Storage –30 °C to 70 °C |
| Humidity | 90 %, non-condensing |
| Conformity to EMI guidelines | EN 61000-6-4 and EN 61000-6-2<br>(industrial applications) |
| Power supply | 12V DC to 30V DC |
| Power consumption | 30mA |
| Overall consumption with active IOs, LEDs | 350mA |
| Operating status | 1 × LED green for operating mode (Run)<br>1 × LED red for error status (Err)<br>1 × LED green for power supply |
| CAN | Interface acc. to ISO 11898, assignment acc. to DIN 41652<br>Connection via SubD9 plug male and female (bridged) |
| CAN-Protocol | DS 301 and 401 |
| Number of modules / bus | 127 |
| Settings | Module address via 2 DIP-switches<br>Baud rate via DIP-switch<br>Sensor via DIP-Switch<br>Wire technology via DIP-Switch |
| Cabling | Rigid cables 0,20 – 1,50 mm²<br>Flexible cables 0,20 – 1,50 mm² |
| Clamps | Spring clamps and gold contacts |
| Connection, wire technology | 4-wire or 2-wire |

### Dip-switches module address


| Range | Address |
|---|---|
| Minimum 01 HEX | 1 |
| Maximum 7F HEX | 127 |

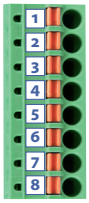
### Dip-switches baud rate


| Range | baud rate (kBit) |
|---|---|
| 0 | 50 |
| 1 | 125 |
| 3 | 250 |
| 4 | 500 |
| 5 | 1000 |

### CAN-interface


| Pin | Pin assignment |
|---|---|
| 2 | CAN L (low) |
| 3 | CAN GND (ground) |
| 7 | CAN H (high) |

### Clamp block




| Pin | Name | Pin assignment |
|---|---|---|
| 1 | E 1.0 | Sensor 1 |
| 2 | E 1.1 | Sensor 2 |
| 3 | E 1.2 | Sensor 3 |
| 4 | E 1.3 | Sensor 4 |
| 5 | E 1.4 | Sensor 5 |
| 6 | E 1.5 | Sensor 6 |
| 7 | E 1.6 | Sensor 7 |
| 8 | E 1.7 | Sensor 8 |



### Ordering information

| Art.-No. | Description |
|---|---|
| V965101000 | TM-PT100/1000L |

# CCCN-HC12 CANopen Controller

## Key Features

- Comprehensive CAN controller
- Galvanic isolated interface according to ISO 11898
- Software complies to CiA Draft Standards DS 301 Version 4.0 and DS 401 Version 2.0
- Traceability for watchdog and reset information

## Use-cases

- Specialised IO-modules
- CANopen-interface for HMIs
- Interface for sensor and measurement setups
- Specialised interface for measurement and PLC tasks

With its strong Philips micro-controller and the fully implemented CAN-interface the CCCN-HC12 CANopen controller is a small but powerful controller for CANopen devices. Key advantages of the embedded controller board are a support of several CiA standards and an attractive price-performance ratio. It can serve as a top-up module for upgrading other devices or handle any sensor interface task.



### Signal processing

The micro-controller is a 16 Bit Philips PCA 82C251 for handling actors, sensors and the CAN-protocol.

### Inputs and outputs

The small board contains 24 output and 16 input lanes. You will benefit from a low energy consumption and an attractive pricing while there are still possibilities for using it even in tough environments with high temperatures of –20 °C to 85 °C. Alternatively, there is also a version with 32 outputs and 8 inputs available.

### CAN-Interface

The integrated CAN-interface is designed in accordance to DS301 and 401 for a flexible use in different places and tasks in the CAN-bus network. All Sontheim CAN-interfaces comply to ISO11898.

### Standards

Take advantage of the implemented DS301 and DS401 with the following features:

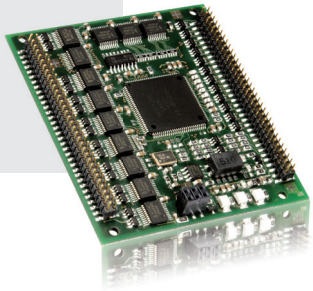
– 1 receive-PDO
– 1 transmit-PDO
– Standard SDO-interface
– Node guarding
– Emergency messages
– Minimum boot-up
– Asynchronous transmit of PDOs
– Transmitting of PDOs upon enquiry (only for inputs)

| CCCN-HC12 | Technical data |
|---|---|
| **Hardware** | |
| Dimensions (l × w) | 49 mm × 82 mm |
| Weight | approx. 50 g |
| Power supply | 5V |
| Assembly | Top hat rail |
| Temperature range | -20 °C to +85 °C |
| Humidity | 20% to 90% non-condensing |
| CAN-interface | 1 × CAN-interface acc. to DIN ISO 11898, galvanically isolated |
| CAN-Protocol | DS301 and 401 |
| **Interfaces** | |
| Input lines | 16 |
| Output lines | 24, TTL-compatible |

## Ordering information

| Art.-No. | Description |
|---|---|
| V930255000 | CCCN-HC12 CANOpen-controller |
| V930257000 | CCCN03 CANOpen-controller (8 In / 32 Out) |

# COK CANopen-node



## Key Features

- CANopen Modul acc. to CiA DS 301 and 401
- Quick inputs and outputs, minimum signal delay
- Additional analogue inputs with 10 Bit resolution
- CAN baud rate up to 1 MBit
- Very compact dimensions

## Use-cases

- Specialised IO-modules
- CANopen-interface for HMIs
- Interface for sensor and measurement setups
- Specialised interface for measurement and PLC tasks

Despite its small dimensions the COK provides 120 digital and analogue inputs and outputs as well as a CAN-interface. The numerous channels and a simple gripping of signals make the board a perfect piggy-back solution for IO-tasks in CAN-bus networks.

### Overview of interfaces

There are overall 80 digital inputs, 32 digital outputs and 8 additional analogue inputs available. The controller's CAN-interface allows a decentralised deployment in any CAN-environment.

### Signal processing

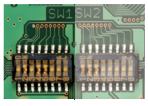
The micro-controller is a 16 Bit Freescale ColdFire for handling actors, sensors and the CAN-protocol.

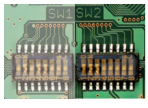
### CAN-Interface

The integrated CAN-interface is designed in accordance to DS301 and 401 for a flexible use in different places and tasks in the CAN-bus network. All Sontheim CAN-interfaces comply to ISO11898.



| COK CANopen node | Technical data |
|---|---|
| **Housing** | |
| CAN-interface | Acc. to ISO11898 without galvanic isolation, Connection via sockets |
| Number of modules / bus | 127 |
| Settings | Module address via DIP-Switch SW1, baud rate via DIP-Switch SW2 |
| Connection | 2x 66-pole socket, grid dimension 2mm |
| Digital inputs | up to 80 (16 configurable as DO) |
| Switching level „1" | +2,75 to +5,25 V DC |
| Switching level „0" | 0,0 to +0,8V DC |
| Input current | < 0,25 mA |
| Switching frequency (Fg) | 2,5 kHz |
| Signal delay | < 100 µs |
| Digital outputs | 32 standard |
| Output current | < 15 mA |
| Switching frequency | 1 kHz |
| Signal delay | < 100 µs |
| Analogue inputs | 8 |
| Measurement range | 0,0 to 10,0 V DC |
| Input current | < 2,75 mA |
| Switching frequency (Fg) | 1 kHz |
| Signal delay | < 100 |
| Power supply | 5 VDC +/- 5% |
| Power consumption | 100 mA |
| Dimensions | 80 x 70 x 3mm (without sockets) |
| Operating temperature | 0 to 60°C |
| Storage temperature | -10 to 70°C |

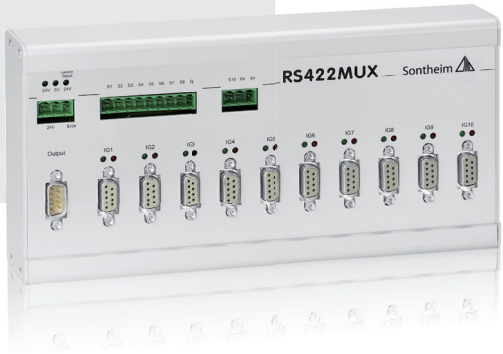
| Dip-switches module address | Range | Address |
|---|---|---|
|  | Minimum 01 HEX | 1 |
| | Maximum 7F HEX | 127 |

| Dip-switches baud rate | Range | baud rate (kBit) |
|---|---|---|
|  | 0010b | 50 |
| | 0011b | 125 |
| | 0100b | 250 |
| | 0101b | 500 |
| | 0111b | 1000 |

## Ordering information

| Art.-No. | Description |
|---|---|
| V930252010 | COK (CANopen controller) |

# CAN-RS422 Multiplexer




## Key Features

- 10 input channels for encoders
- 24V DC power supply with 3-pole Phoenix clamp
- Top hat rail assembly

CAN-RS422 Multiplexer is a 24V selection unit of up to 10 incremental encoders. It is made for realising switching states of 10 encoders to a single output.

### Housing

The compact aluminum housing contains a top hat rail mount and a front cover with all interfaces for better overview in the control cabinet. The technician will note the convenience while working at the bus cabling.

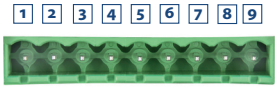
### LEDs and switches

Besides several LEDs for the operating states there are 2 LEDs each for the status of any input. Signals are being grapped with a 9-pole and a 3-pole Phoenix clamp.

### Overview of interfaces

All inputs and outputs use RS422. SubD9 plugs are used for grabbing any signals.

| CAN-RS422 | Technical data |
|---|---|
| **Hardware** | |
| Dimensions | 241 mm × 120 mm × 48 mm |
| Housing | Aluminum case, IP20 |
| Power supply | 24 VDC via 3-pole Phoenix clamp |
| Assembly | TS35 Top hat rail |
| Temperature range | Operating: 0 °C to 70 °C |
| Humidity | 10% to 90% non-condensing |
| RS232-interface | Connection via SubD9 plug |
| Number of digital inputs | 10 |
| Number of digital outputs | 1 |
| Maximum baud rate | 500 kHz |
| **Switch data** | |
| Power supply | 5V |
| Input level | +/- 5V |
| VIH | 2V |
| VIL | 0,8V |
| IOH | −440µA |
| IOL | 8mA |

| 9-pole Phoenix clamp | Pin | Pin assignment |
|---|---|---|
|  | 1 | Select 1 |
| | 2 | Select 2 |
| | 3 | Select 3 |
| | 4 | Select 4 |
| | 5 | Select 5 |
| | 6 | Select 6 |
| | 7 | Select 7 |
| | 8 | Select 8 |
| | 9 | Select 9 |

| 3-pole Phoenix clamp | Pin | Pin assignment |
|---|---|---|
|  | 1 | Select 10 |
| | 2 | 0 V |
| | 3 | 0 V |

| Input/ output | Pin | Pin assignment |
|---|---|---|
|  | 1 | A |
| | 2 | B |
| | 5 | 0 V |
| | 6 | /A |
| | 7 | /B |
| | 9 | 24 V |

## Ordering information

| Art.-No. | Description |
|---|---|
| V930890000 | CAN-RS422 Multiplexer |

# CAN-RS232 Interface-Converter


## Key Features

- Up to 4 RS232 interfaces with SubD9
- Baud rate and module address can be set via HEX-switch
- Module is built in accordance to CANopen specification
- Status LED for module status, CAN and every RS232 channel with Rx and Tx display

If you have all serial interfaces being occupied, you can rely on the CAN-RS232 interface converter. It is a 24V extension module for any desktop or industrial PC that provides another 4 RS232 channels according to CANopen with SubD9 plugs.

### Housing

The compact housing is made for being in a control cabinet. It contains a top hat rail mount and a front cover with all interfaces for better overview in the control cabinet. The technician will note the convenience while working at the bus cabling.

### Signal processing

Besides its inputs and outputs the Multi-IO offers a powerful micro-controller that handles data acquisition of sensors, control of actors and the processing of any CAN-data.

### CAN-Interface

The integrated CAN-interface is designed in accordance to DS301 and 401 for a flexible use in different places and tasks in the CAN-bus network. All Sontheim CAN-interfaces comply to ISO11898.

| RS232 | Pin | Pin assignment |
|---|---|---|
|  | 1 | – |
| | 2 | RxD |
| | 3 | TxD |
| | 4 | – |
| | 5 | GND |
| | 6 | – |
| | 7 | – |
| | 8 | – |
| | 9 | – |



| CAN-interface | Pin | Pin assignment |
|---|---|---|
|  | 1 | CAN H (high) |
| | 2 | CAN L (low) |
| | 3 | Ground |



| HEX-switches baud rate | Range | baud rate (kBit) |
|---|---|---|
|  | 0 | 10 |
| | 1 | 20 |
| | 2 | 50 |
| | 3 | 125 |
| | 4 | 250 |
| | 5 | 500 |
| | 6 | 1000 |

| CAN-RS232 | Technical Data |
|---|---|
| **Hardware** | |
| Dimensions | 187 mm × 120 mm × 60 mm |
| Housing | Aluminum case, IP20 |
| Power supply | 24 VDC via 3-pole Phoenix clamp |
| Assembly | TS35 Top hat rail |
| Temperature range | Operating: 0 °C to 70 °C |
| Humidity | 10% to 90% non-condensing |
| Microcontroller | Motorola Freescale, 16 Bit |
| CAN | Interface acc. to ISO 11898 galvanically isolated, pin assignment acc. to DIN 41652 |
| COM | SubD9 male |
| RS232 | SubD9 female |

## Ordering information

| Art.-No. | Description |
|---|---|
| V930882000 | CAN-RS232 Interface Converter |

# IGI16


## Key Features

- 16 incremental encoders with up to 32 Bit resolution
- Baud rate and module address can be set via HEX-switch
- Module is built in accordance to CANopen specification

IGI16 is designed for capturing positioning data according to CiA specification for CAN networks. The device possesses the shortest conversion times and a high process reliability. That makes it the best choice for continuous operation in complex machine networks.



### Housing

The compact aluminum housing contains a top hat rail mount and a front cover with all interfaces for better overview in the control cabinet. The technician will note the convenience while working at the bus cabling.

### Incremental encoder

Overall, the IGI has 16 incremental encoder interfaces. 5 of them are directly connected to counters. The sixth can be switched to D3 to D13. Inc A and B possess a resolution of 32 Bit. All others work with a standard 16 Bit resolution. Each encoder uses an impulse quadruplication for 20,000 impulses at 5,000 steps per turn.

### LEDs and switches

All inputs can be monitored with the help of LEDs at the clamps. In addition to that, you can configure the baud rate with a HEX-switch at the front cover - easy and comfortable.

### Signal processing

Besides its inputs the IGI16 offers a powerful microcontroller that handles the data acquisition of sensors and the processing of any CAN-data.

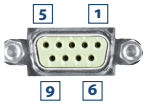
### CAN-Interface

The integrated CAN-interface is designed in accordance to DS301 and 401 for a flexible use in different places and tasks in the CAN-bus network. All Sontheim CAN-interfaces comply to ISO11898.

## IGI16 Technical data

| Hardware | |
|---|---|
| Dimensions | 241 mm × 120 mm × 48 mm |
| Weight | 800g |
| Protection class | IP 20, EMI requirements acc. to CE |
| Operating conditions (humidity 90%, non-condensing) | Operating 0 °C to 60 °C<br>Storage –30 °C to 70 °C |
| Power supply | 24 VDC ±20% |
| Settings | Baud rate via HEX-switch |
| Connection | SubD9 female |
| Microcontroller | Motorola Freescale, 16 Bit |
| CAN | Interface acc. to ISO 11898 galvanically isolated<br>Connection via 4-pole Phoenix clamp or RJ45 plug |

| Inputs | |
|---|---|
| Number of inputs | 16 × for incremental encoders |
| Counter size | Inc A: 32 Bit<br>Inc B: 32 Bit<br>Inc C: 16 Bit<br>Inc D1: 16 Bit<br>Inc D2: 16 Bit<br>Inc D3 to D13: 16 Bit multiplexed |
| Error mode | ErrorFrame every 60 ms at watchdog event |
| Operating status | LEDs (red) for short-circuit at Inc-side<br>LEDs (green) for multiplex input<br>RUN-LED (green) for reception of identifier<br>ERROR-LED (red) for watchdog error<br>24V-LED (green) for power supply |

| Incremental encoder | Pin | Pin assignment |
|---|---|---|
|  | 1 | GND |
| | 2 | /B |
| | 3 | GND |
| | 4 | /A |
| | 5 | 24 V |
| | 6 | 24 V |
| | 7 | GND |
| | 8 | B |
| | 9 | A |

| CAN-interface | Pin | Pin assignment |
|---|---|---|
|  | 1 | CAN H (high) |
| | 2 | CAN L (low) |
| | 3 | GND |
| | 4 | Erde |

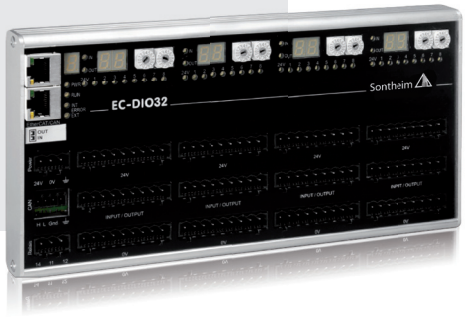
| HEX-switches baud rate | Range | baud rate (kBit) |
|---|---|---|
|  | 0 | 10 |
| | 1 | 20 |
| | 2 | 50 |
| | 3 | 125 |
| | 4 | 250 |
| | 5 | 500 |
| | 6 | 1000 |



### Ordering information

| Art.-No. | Description |
|---|---|
| V966302000 | IGI - Incremental Encoder Interface |

# EC-DIO32




## Key Features

- Configurable inputs and outputs
- Can be used in CAN and EtherCAT networks
- Power supply of each IO block
- Compact aluminum housing with IP20 and top hat rail
- Safety functions for process reliability
- Easy access to all interfaces
- Signal delay of less than 400 µ-seconds
- Analogue and digital diagnostics

With its 32 configurable channels the EC-DIO32 you can deploy it in numerous and changing applications. You are also free to use either CAN or EtherCAT - the module will recognise the different fieldbusses automatically. The device possesses the shortest conversion times and a high process reliability. That makes it the best choice for continuous operation in complex machine networks.



### Housing
The compact aluminum housing contains a top hat rail mount and a front cover with all interfaces for better overview in the control cabinet. The technician will note the convenience while working at the bus cabling.

### Cabling
All sensors and actors can be connected directly to the module. There are connectors for 8 data lines, power supply and 0V for each of the 4 blocks on the module, making the cabling very sturdy and resistant to shock and vibration. Every IO-block is galvanically isolated and obtains an own power supply. Thus, you can even use the EC-DIO32 for safety-relevant applications like emergency-stop circuits for guard-doors.

### Fieldbus-interfaces
Our latest IO-module provides 2 RJ45 connectors for EtherCAT and CAN as an easy possibility for connecting other devices via ethernet patch cable. With its multi-fieldbus detection and the two connectors the module can be used in different places and tasks in the CAN-bus network.

### Signal processing
Due to the configuration of each block as a digital input, digital output or analogue input there are many areas of deployment. You can choose by your individual number and type of IOs about the configuration of the module, saving costs and cabling. It is even possible to address every block on its own.

### Microcontroller
Besides its inputs and outputs the EC-DIO32 offers a powerful micro-controller that handles data acquisition of sensors, control of actors and the processing of any CAN and EtherCAT-data. An important safety function is the guarding capability which is fully integrated into the IO for network surveillance. Furthermore, there is a relay contact (changeover) as an additional safety measure. If there is an absence of guarding by the master registered, the module immediately goes into STOP-mode.

### Diagnostic features
Analogue measurement of ower supply at the blocks and single channels as well as a digital monitoring of outputs are implemented in the device.

## EC-DIO32 Technische Daten

| Hardware | |
|---|---|
| Dimensions (l × w × h) | 241 mm × 120 mm × 48 mm |
| Weight | 850g |
| IP-class | IP 20, EMI according to CE |
| Storage temperature | -30 °C to 70 °C |
| Operating temperature | 0 °C to 60 °C |
| Humidity | 90 % non-condensing |
| Number of digital inputs | Blocks (8 channels) can be configured (max. 32) |
| Number of digital outputs | Blocks (8 channels) can be configured (max. 32) |
| Power supply | 24 VDC ±20 % |
| Pre-Operational Mode | 95 mA |
| Operational Mode | 110 mA |
| Overall power consumption incl. IOs, LEDs | 500 mA |
| Operating status | 1 × LED green for power supply (5V)<br>1 × LED green for operation mode (Run)<br>1 × LED red for error status (Err)<br>32 × LED green for active IO |
| Microcontroller | Motorola Freescale, 16 Bit |
| Clamps and cabling | 2-wire, 3-wire connection |

| Digital inputs | |
|---|---|
| Switching level „1“ | +15,0V to +28,8V DC |
| Switching level „0“ | 0,0V to +8,0V DC |
| Potential isolation | Optocoupler |
| Input current | 11 mA |
| Sample rate (Fg) | 2,5 kHz |
| Signal delay | < 400 µs |

| Digital outputs | |
|---|---|
| Power supply | 24 VDC ±20 % |
| Typ of switch | FET-Highside-Power-Switch |
| Potential isolation | Optocoupler |
| Output current | 1 A (short-circuit proof) |
| Overall power supply of module | 8 A |
| Overall power supply with supply for each block | 16 A |
| Free-wheeling diode | Yes |
| Signal delay | < 100 µs |
| Relay contact (when module active) | 1 × UM / 1A |
| Switching level „1“ | +15.0V to +28.8V DC |

| RJ45 (Ethernet-connector) Pin | Pin assignment |
|---|---|
| 1 | LAN/EtherCAT_TX+ |
| 2 | LAN/EtherCAT_TX– |
| 3 | LAN/EtherCAT_RX+ |
| 4 | CAN L (low) (optional) |
| 5 | CAN H (high) (optional) |
| 6 | LAN/EtherCAT_RX– |
| 7 | CAN GND (ground) (optional) |
| 8 | – |

| RJ45 Pin | Pin assignment |
|---|---|
| 1 | – |
| 2 | – |
| 3 | – |
| 4 | CAN L (low) |
| 5 | CAN H (high) |
| 6 | – |
| 7 | CAN GND (ground) |
| 8 | – |

| HEX-Switches module address(1.Block) Range | Address |
|---|---|
| Minimum 01 HEX | 1 |
| Maximum 7F HEX | 127 |

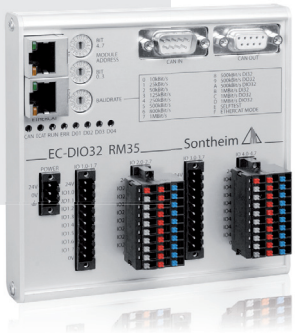
| HEX-Switches baud rate (2. Block) Range | baud rate (kBit) |
|---|---|
| 0 | 10 |
| 1 | 25 |
| 2 | 50 |
| 3 | 125 |
| 4 | 250 |
| 5 | 500 |
| 6 | 800 |
| 7 | 1000 |



### Ordering information

| Art.-No. | Description |
|---|---|
| V966210000 | EC-DIO32 |

# EC-DIO32 RM35




## Key Features

- Configurable inputs and outputs
- Can be used in CAN and EtherCAT networks
- Galvanically isolated in- and outputs
- Compact aluminum housing with IP20 and top hat rail
- Safety functions for process reliability
- Own intelligence for complex EtherCAT networks
- Easy access to all interfaces
- Signal delay of less than 100 µ-seconds
- Analogue and digital diagnostics

With its 32 configurable channels the EC-DIO32 RM35 you can deploy it in numerous and changing applications. You are also free to use either CAN or EtherCAT. The device possesses the shortest conversion times and a high process reliability. That makes it the best choice for continuous operation in complex machine networks.



### Flexibility
The key to slim fieldbus networks as well as to efficient process automation in flexibility. The user has to be able to meet changing process requirements with existing products. The EC-DIO32 RM35 has been designed for these particular cases, where either the fieldbus system, the number or the kind of actors and sensors changes.

### Freely configurable inputs and outputs
EC-DIO32 RM35 is a digital 24V remote IO-module, housing a 200 MHz NXP LPC with 32 Bit and 32 freely configurable inputs and outputs. It is separated into 4 blocks of 8 interfaces each that can be configured and addressed via 2 Hex-switches. Every block is galvanically isolated and has an own power supply. This enables the module to handle different voltages and allows the use in safety-relevant applications, e.g. guard doors.

### Switches and LEDs for a maximum of usability
LEDs and switches for each block show the status of the module channels. The network can therefore be created and monitored very easily.

### Rugged interfaces
3-point connection technology facilitates the direct connection of all sensors and actors with the module. The EC-DIO32 RM35 contains Weidmüller clamps for easy and rugged conctact, making it robust and process proof in multiple applications.

### EtherCAT and CAN-interfaces
You can configure the module for a CANopen or EtherCAT network via a hex switch. As interfaces for data exchange, it has two RJ45 ports and for CAN a Sub-D9 interface, allowing an easy connection with other modules.

### Diagnose-Features
The device offers various possibilities for revertively monitoring power levels and switching habits. These features facilitate the detection of defect outputs. By monitoring the levels of input signals the module can also verify input faults. All the data is made available while running the EC-DIO32 RM35.

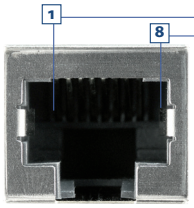
## EC-DIO32 RM35 Technical data

| Hardware | |
|---|---|
| Dimensions (l × w × h) | 121 mm × 120 mm × 35 mm |
| Weight | 400 g |
| IP-class | IP 20, EMI according to CE |
| Storage temperature | -20 °C to 70 °C |
| Operating temperature | -10 °C to 60 °C |
| Humidity | 90 % non-condensing |
| Number of digital inputs | Blocks (8 channels) can be configured (max. 32) |
| Number of digital outputs | Blocks (8 channels) can be configured (max. 32) |
| Power supply | 24 VDC ±20 % |
| Operating status | 8 LEDs Status<br>1x Mode CAN (CAN) green<br>1x Mode EtherCAT (EtherCAT) green<br>1x Run (RUN) green<br>1x Fehler (ERROR) red<br>4x Block cnfiguration<br><br>Fieldbus EtherCAT (LEDs on the RJ45 plug)<br>1x Transmit (green)<br>1x EtherCAT Status (orange) |
| Microcontroller | NXP LPC, 32 Bit und 200 MHz |
| Clamps and cabling | 2-wire, 3-wire connection |

| Digital inputs | |
|---|---|
| Switching level „1“ | +15,0V to +28,8V DC (EN 61131-2, type 1) |
| Switching level „0“ | 0,0V to+5,0V DC (EN 61131-2, type 1) |
| Input current | max. 5 mA |
| Sample rate (Fg) | 5 kHz |
| Signal delay | < 100 µs |

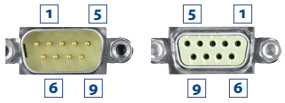
| Digitale outputs | |
|---|---|
| Power supply | 24 VDC ±20 % |
| Typ of switch | Highside-Power-Switch |
| Output current | 1 A (short-circuit proof) |
| Free-wheeling diode | Yes |
| Signal delay | < 100 µs |
| Switching level „1“ | +15.0V – +28.8V DC |

## RJ45




| Pin | Pin assignment |
|---|---|
| 1 | LAN/EtherCAT_TX+ |
| 2 | LAN/EtherCAT_TX– |
| 3 | LAN/EtherCAT_RX+ |
| 4 | – |
| 5 | – |
| 6 | LAN/EtherCAT_RX– |
| 7 | – |
| 8 | – |

## CAN-inteface




| Pin | Pin assignment |
|---|---|
| 1 | – |
| 2 | CAN L (low) |
| 3 | CAN GND (ground) |
| 4 | – |
| 5 | – |
| 6 | – |
| 7 | CAN H (high) |
| 8 | – |

## HEX-Switches baud rate (1.Block)

| Range | Address |
|---|---|
| Minimum 01 HEX | 1 |
| Maximum 7F HEX | 127 |

## HEX-Switches baud rate (2. Block)

| Range | baud rate (kBit) |
|---|---|
| 0 | 10 |
| 1 | 25 |
| 2 | 50 |
| 3 | 125 |
| 4 | 250 |
| 5 | 500 |
| 6 | 800 |
| 7 | 1000 |



## Ordering information

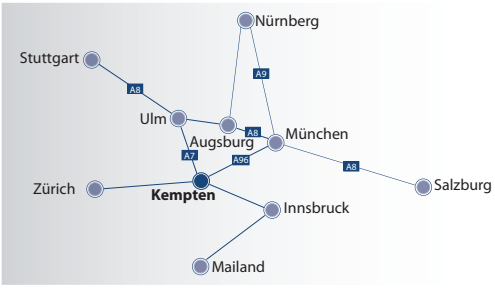
| Art.-No. | Description |
|---|---|
| V966213250 | EC-DIO32 RM35 |

# Legal information

**Contact:**


DE

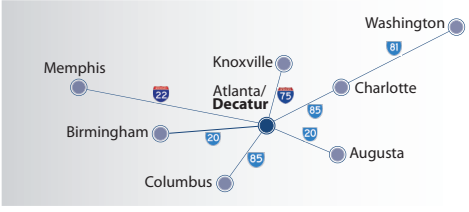
**Sontheim Industrie Elektronik GmbH**
Georg-Krug-Strasse 2 · 87437 Kempten - Germany
**Phone** +49-831-575900-0
**Fax** +49-831-575900-73
**Mail** info@s-i-e.de
**Internet** www.sontheim-industrie-elektronik.de



US

**Sontheim Industrial Electronics Inc.**
One West Court Square, Suite 750
Decatur, GA 30030 · USA
**Phone** +1(404) 494-7839
**Fax** +1(404) 494-7701
**Mail** info@s-i-e.de
**Internet** www.sontheim-industrie-elektronik.de

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We are looking forward to your enquiry. For a personal advice and detailled information please refer to our specialists:

DE **Sontheim Industrie Elektronik GmbH**
Georg-Krug-Str. 2, 87437 Kempten
Tel: +49 831 57 59 00 -0 - Fax: -73
info@s-i-e.de

US **Sontheim Industrial Electronics Inc.**
One West Court Square, Suite 750
Decatur, GA 30030
Phone: +1 (404) 494 -7839 - Fax: -7701

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www.sontheim-industrie-elektronik.de