

General Description

The CANit-20 is a low cost CANopen Unit with 16 digital inputs and 16 digital outputs suitable for DC 24 V. The I/O's are positive switching and opto-isolated from the bus and the system supply. All outputs are short-circuit protected.

The I/O-Module CANit-20 is based on the high performance Single Chip CANopen Controller CO4011B, which offers the complex implementation of the CANopen standards DS301 and DS401. All usual baud rates up to 1 MBit are supported.

Features

- CANopen remote I/O Module according to CiA Draft Standards DS301 Version 4.0 and DS401 Version 2.0
- Separated power supplies for system/bus and Inputs/Outputs (DC 24 V)
- 16 digital Input Channels optoisolated from bus and system supply, DC 24 V, Positive Switching, Input Filter 70us
- 16 digital Output Channels optoisolated from bus and system supply, DC 24 V / 0,6A Positive Switching, Short Circuit Protected
- Output overload monitoring
- Internal noise filtering for all inputs with individual setting for each channel
- CAN-Baudrate up to 1Mbit
- CAN bus ISO11898 transceiver 82C251
- 2 Transmit- and 1 Receive PDOs
- Dynamic PDO mapping
- Variable PDO identifier
- All CANopen specific PDO transmission types supported: synchronous, asynchronous, event driven, cyclic, acyclic and remote frame dependent.
- Event timer and inhibit timer features for all transmit PDOs.
- Storing and restoring of object dictionary to non-volatile memory
- Nodeguarding, Lifeguarding, Heartbeat
- Emergency messages
- Minimum boot up
- Available as single board, built in a plastics housing with open frontside or in a closed aluminium housing. Both housings are suitable for mounting on a carrier rail.
- Operating temperature -40 to +85 °C

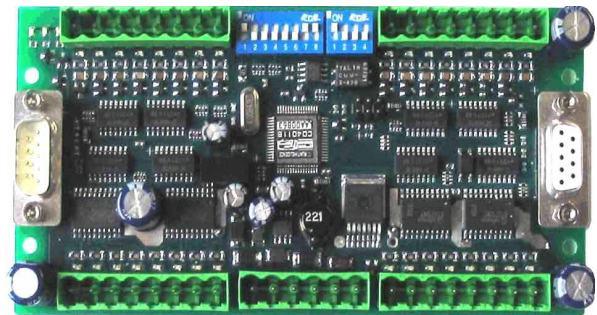


Photo CANit-20ZV

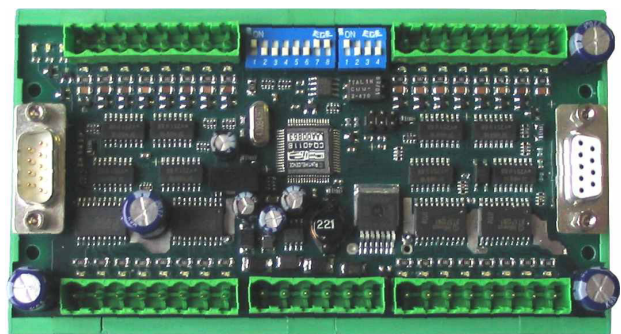


Photo CANit-20P with Plastics-Housing



Photo CANit-20M with Alu-Housing

Ordering Information

| Part | Description |
|------------|---|
| CANit-20ZV | PCB without housing, screw holes CAN plug direction vertical |
| CANit-20ZH | PCB without housing, screw holes, CAN plug direction horizontal |
| CANit-20P | With plastics housing green, mounting on carrier rail possible, CAN plug direction vertical |
| CANit-20M | With aluminium housing black / RAL5021, mounting on carrier rail possible, CAN plug direction horizontal |

Technical Data

The CANopen Unit CANit-20 has separated power supplies for the system/bus and the digital I/Os.

| System Power Supply | Min. | Norm. | Max. |
|--|---|--------------|-------------|
| Nominal system / bus supply voltage DC | 9 V | 24 V | 34 V |
| Current consumption system / bus | --- | 70 mA | 85 mA |
| Nominal I/O supply voltage DC | 11,8 V | 24 V | 36 V |
| CAN bus norm | ISO11898 | | |
| Transceiver PCA82C251T | Manufacturer Philips | | |
| CiA Draft Standards | DS301 Version 4.0 and DS401 Version 2.0 | | |
| Conformance designation | CE | | |

| Digital Inputs | |
|------------------------------------|----------|
| Number of inputs | 16 |
| Switching | Positive |
| Signal Level LOW | 0...3 V |
| Signal Level HIGH | 9...34 V |
| Input delay (CAN reaction time) | 2 ms |
| Input filter | 70 us |
| Input current DC 24V | 5 mA |
| Isolation from bus / system supply | 60 V |

| Digital Outputs | |
|------------------------------------|--|
| Number of outputs | 16 |
| Switching | Positive |
| Short circuit protected | Yes |
| Isolation from bus / system supply | 60 V |
| Output supply voltage | DC 24 V (11,8 - 36 V) |
| Output delay (CAN reaction time) | 2 ms |
| Type of load | resistive, inductive, lamps |
| Continuous output current | 0,6 A |
| Continuous output current > 55°C | 0,45 A |
| Peak output current | 1,5 A max.1 sec. |
| Output Overload monitoring | Common emergency message for all outputs |

| Connectors and Measurement | |
|-----------------------------------|---|
| Connectors | PCB multi connectors with screw-cage clamp princip, plug direction vertical, grid 5,08 mm |
| Cross section [mm ²] | 0,08 to 2,5 mm ² |
| Cross section [AWG] | 14 to 28 AWG |
| Strip length | 6 mm |
| Measurement CANit-10 board | 100 x 72 x 27 mm |
| Measurement CANit-10 housings | see pictures measurement housings |
| Operating temperature | -40 .. 85° |

Pin Assignment PL1 and PL2 (CAN)

| Pin No. | Name | Function |
|---------|-------|--|
| 1 | --- | PL1 connected to PL2 |
| 2 | CANL | CAN-Bus Low |
| 3 | G1 | Ground System supply |
| 4 | --- | PL1 connected to PL2 |
| 5 | SHL | Optional jumpered shield |
| 6 | G1 | Ground System supply |
| 7 | CANH | CAN-Bus High |
| 8 | --- | PL1 connected to PL2 |
| 9 | CANV+ | Optional power supply for system DC 24V (Standard Power Supply PL5 PIN4) |

Pin Assignment PL4 (Outputs Byte 0)

| Pin No. | Name | Function |
|---------|-------|-----------------------|
| 1 | OUT07 | Digital Output DC 24V |
| 2 | OUT06 | Digital Output DC 24V |
| 3 | OUT05 | Digital Output DC 24V |
| 4 | OUT04 | Digital Output DC 24V |
| 5 | OUT03 | Digital Output DC 24V |
| 6 | OUT02 | Digital Output DC 24V |
| 7 | OUT01 | Digital Output DC 24V |
| 8 | OUT00 | Digital Output DC 24V |

Pin Assignment PL3 (Inputs Byte 0)

| Pin No. | Name | Function |
|---------|------|----------------------|
| 1 | IN00 | Digital Input DC 24V |
| 2 | IN01 | Digital Input DC 24V |
| 3 | IN02 | Digital Input DC 24V |
| 4 | IN03 | Digital Input DC 24V |
| 5 | IN04 | Digital Input DC 24V |
| 6 | IN05 | Digital Input DC 24V |
| 7 | IN06 | Digital Input DC 24V |
| 8 | IN07 | Digital Input DC 24V |

Pin Assignment PL7 (Outputs Byte 1)

| Pin No. | Name | Function |
|---------|-------|-----------------------|
| 1 | OUT17 | Digital Output DC 24V |
| 2 | OUT16 | Digital Output DC 24V |
| 3 | OUT15 | Digital Output DC 24V |
| 4 | OUT14 | Digital Output DC 24V |
| 5 | OUT13 | Digital Output DC 24V |
| 6 | OUT12 | Digital Output DC 24V |
| 7 | OUT11 | Digital Output DC 24V |
| 8 | OUT10 | Digital Output DC 24V |

Pin Assignment PL6 (Inputs Byte 1)

| Pin No. | Name | Function |
|---------|------|----------------------|
| 1 | IN10 | Digital Input DC 24V |
| 2 | IN11 | Digital Input DC 24V |
| 3 | IN12 | Digital Input DC 24V |
| 4 | IN13 | Digital Input DC 24V |
| 5 | IN14 | Digital Input DC 24V |
| 6 | IN15 | Digital Input DC 24V |
| 7 | IN16 | Digital Input DC 24V |
| 8 | IN17 | Digital Input DC 24V |

Pin Assignment PL5 (Power Supplies)

| Pin No. | Name | Function |
|---------|------|--|
| 1 | G2 | Power-Ground for Inputs and Outputs |
| 2 | P2 | Power DC 24V for Outputs |
| 3 | G1 | Ground System Supply |
| 4 | P1 | Power DC 24V for System The system can also be supplied with the CAN-Connectors PL1/PL2 PIN9. |
| 5 | NC | not connected |
| 6 | PE | Shield |

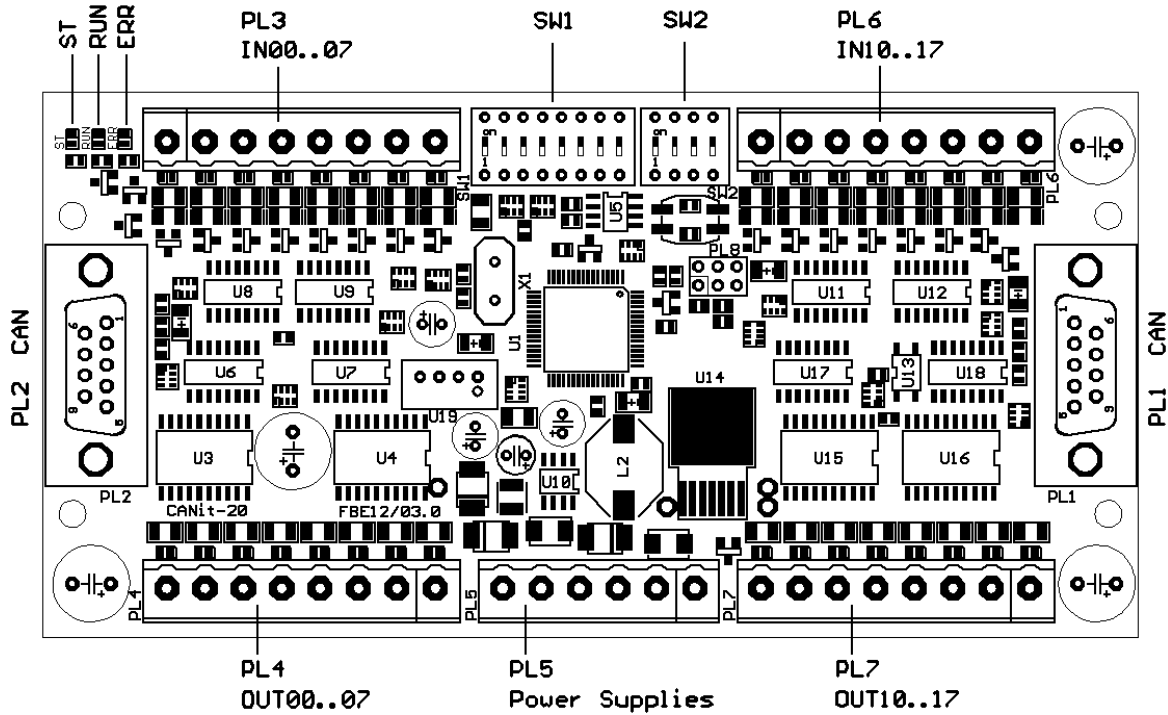
CANopen Unit CANit-20

I/O-Module with 16/16 digital In-/Outputs DC 24V Positive Switching

frenzel + berg



Placeplan



Configuration Dip Switches SW1 and SW2

The configuration of the CANit-20 will be set with dip switches SW1 and SW2.

| DIP Switch SW1 (Node identifier selection) | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|------------------------------|
| Switch Number | | | | | | | | Function |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| ID6 | ID5 | ID4 | ID3 | ID2 | ID1 | ID0 | | |
| ON | | | | | | | | CAN-Termination resistor ON |
| OFF | | | | | | | | CAN-Termination resistor OFF |
| | X | X | X | X | X | X | X | Node ID selection |
| | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Programmable Node ID |
| | OFF | OFF | OFF | OFF | OFF | OFF | ON | Node ID = 1 |
| | OFF | OFF | OFF | OFF | OFF | ON | OFF | Node ID = 2 |
| | .. | .. | .. | .. | .. | .. | .. | |
| | ON | ON | ON | ON | ON | ON | OFF | Node ID = 126 |
| | ON | ON | ON | ON | ON | ON | ON | Node ID = 127 |

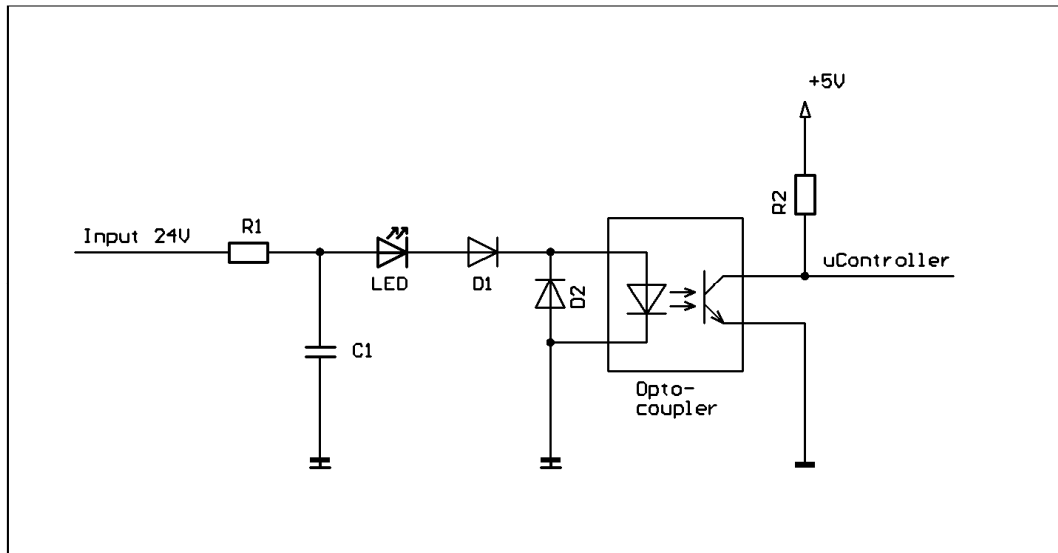
| DIP Switch SW2 (Baud rate selection) | | | | |
|--|-----|-----|----------|---------------------|
| Switch Number | | | | Function |
| 1 | 2 | 3 | 4 | |
| BD2 | BD1 | BD0 | reserved | |
| X | X | X | | Baud rate selection |
| OFF | OFF | OFF | | 1 Mbit / sec |
| OFF | OFF | ON | | 800 kbit / sec |
| OFF | ON | OFF | | 500 kbit / sec |
| OFF | ON | ON | | 250 kbit / sec |
| ON | OFF | OFF | | 125 kbit / sec |
| ON | OFF | ON | | 50 kbit / sec |
| ON | ON | OFF | | 20 kbit / sec |
| ON | ON | ON | | 10 kbit / sec |

With jumpers J1 and J2 (placed on the bottom side of the CANit-20) the CAN-connectors PL1 and PL2 (PIN5) can be connected to shield.

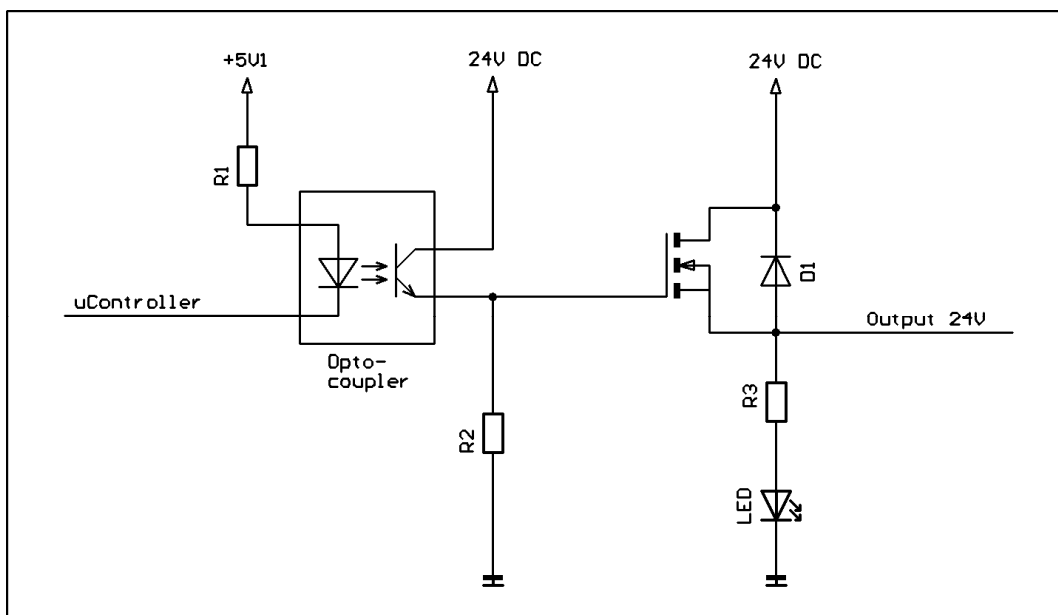
CAN Signal LED's

- ST-LED (yellow)**
 The Chip-Status-LED shows the status of the CO4011B CANopen-Chip. This yellow LED is always blinking.
 10% duty cycle indicates no error
 50% duty cycle indicates uncritical error or warning (no NMT state change, outputs not in error condition)
 90% duty cycle indicates critical error (NMT state change or outputs in error condition)
- RUN-LED (green)**
 The CANopen-RUN-LED shows NMT state according to DRP303-3
- ERROR-LED (red)**
 The CANopen-Error-LED shows the error state according to DRP303-3

Circuit Diagram Digital Inputs



Circuit Diagram Digital Outputs



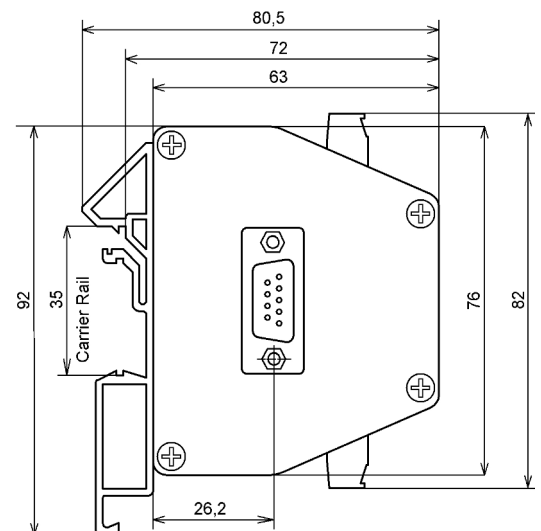
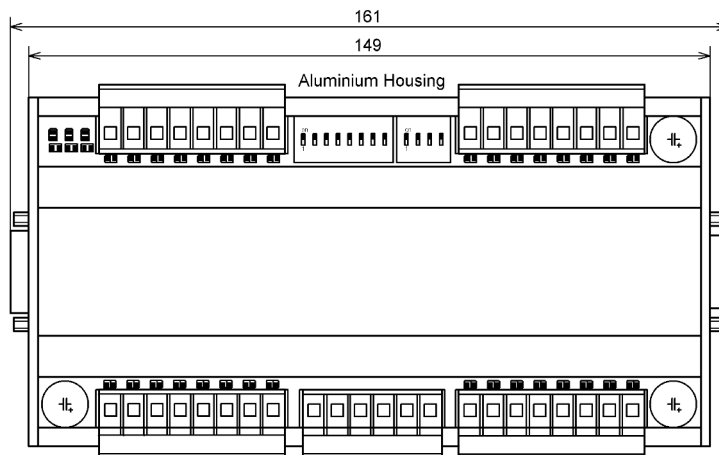
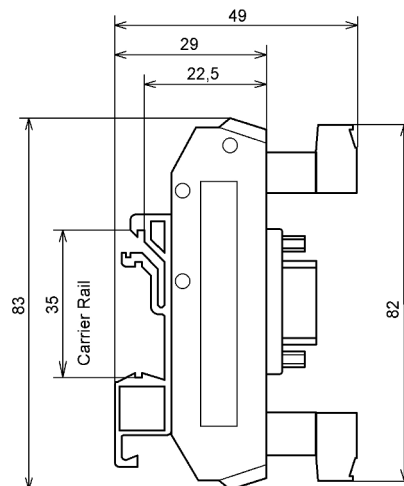
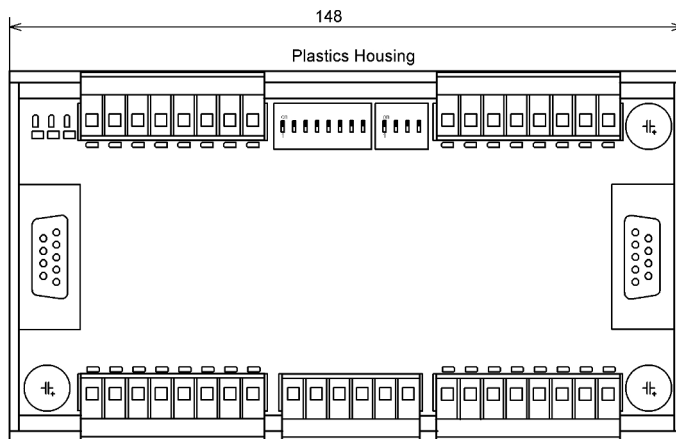
CANopen Unit CANit-20

I/O-Module with 16/16 digital In-/Outputs DC 24V Positive Switching

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Measurement Housings



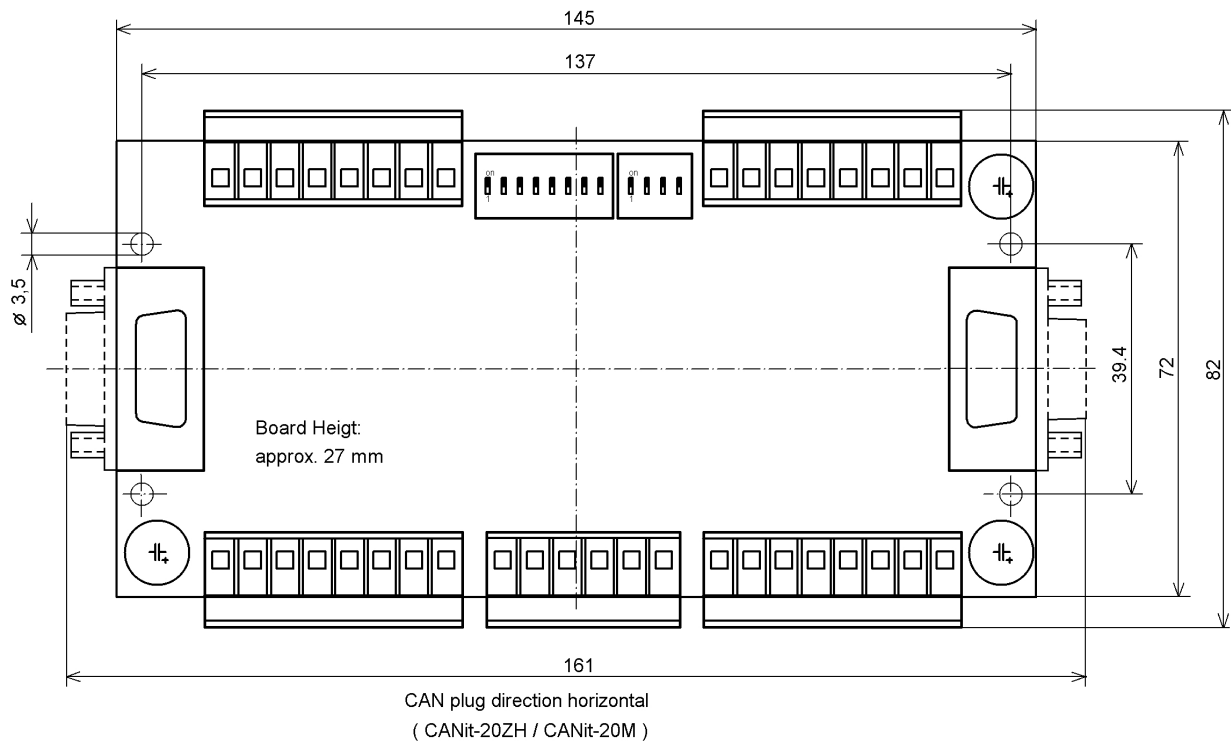
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I/O-Module with 16/16 digital In-/Outputs DC 24V Positive Switching

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Board Measurement



Object Dictionary

The CANit-20 Single Chip CANopen Controller CO4011B implements a complex object dictionary for CANopen I/O devices. (For detailed information about CANopen objects see additional brochure "Introduction to CANopen")

CANit-20 Objects

For the Object tables all values are shown in hexadecimal way.

For access type the following settings are valid:

ro read only

wo write only

rw read and write access enabled

rww read and write access enabled by SDO, write only by PDO

| Index | Sub-Index | Name | Data type | Acc. | Map-pable | Default Value / Note | Object Category |
|-------|-----------|--|----------------|------|-----------|-------------------------------|-----------------|
| 0005 | - | Dummy 8 | Unsigned 8 | wo | yes | 0 h | Global |
| 0006 | - | Dummy 16 | Unsigned 16 | wo | yes | 0 h | Global |
| 0007 | - | Dummy 32 | Unsigned 32 | wo | yes | 0 h | Global |
| 1000 | - | Device Type | Unsigned 32 | ro | no | 0003 0191 h | Global |
| 1001 | - | Error Register | Unsigned 8 | ro | yes | - | Global |
| 1002 | - | Manufacturer Status Register | Unsigned 32 | ro | yes | - | Global |
| 1005 | - | COB-ID Sync Identifier Sync Object | Unsigned 32 | ro | no | 80 h | Global |
| 1008 | - | Device Name | Visible String | ro | no | "CO4011B" | Global |
| 1009 | - | Hardware Version | Visible String | ro | no | - | Global |
| 100A | - | Software Version | Visible String | ro | no | active Version | Global |
| 100B | - | Node Id (Not Accessible - Read by DIP-Switch 1) | Unsigned 8 | - | no | DIP-Switch 1 Nr 2-8 = ID6-ID0 | Global |
| 100C | - | Guard Time | Unsigned 16 | rw | no | 0 h | Global |
| 100D | - | Life Time Factor | Unsigned 8 | rw | no | 0 h | Global |
| 100E | - | COB-ID Guard (Not Accessible - Read by DIP-Switch 1 + 700 h) | Unsigned 32 | - | no | 700 h + Node-ID | Global |
| 1010 | | Store Parameters (only in preoperational device state) | Array | - | - | - | Global |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 4 h | Global |
| | 1 | Store All Parameters | Unsigned 32 | rw | no | - | Global |
| | 2 | Store Communication Parameters | Unsigned 32 | rw | no | Not supported | Global |
| | 3 | Store Application Parameters | Unsigned 32 | rw | no | Not supported | Global |
| | 4 | Store Application Information Parameters | Unsigned 32 | rw | no | - | Global |
| 1011 | | Reload Default Parameter (only in preoperational device state) | Array | - | - | - | Global |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 1 h | Global |
| | 1 | Restore All Parameters | Unsigned 32 | rw | no | - | Global |
| 1014 | - | COB ID Emergency | Unsigned 32 | rw | no | 80 h + Node-ID | Global |
| 1015 | - | Inhibit Time Emergency | Unsigned 16 | rw | no | 0 h (disabled) | Global |
| 1017 | - | Producer Heartbeat Time | Unsigned 16 | rw | no | 0 h | Global |

| Index | Sub-Index | Name | Data type | Acc. | Map-pable | Default Value / Note | Object Category |
|-------|-----------|-----------------|-----------|------|-----------|----------------------|-----------------|
| 1018 | | Identity Object | Record | - | - | - | Global |

| | | | | | | | |
|------|---|--|----------------|----|----|--|--------|
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 04 h | Global |
| | 1 | Vendor ID | Unsigned 32 | ro | no | 0000 0058 h | Global |
| | 2 | Product Code | Unsigned 32 | ro | no | 0140 1102 h | Global |
| | 3 | Revision Number | Unsigned 32 | ro | no | active Rev. Code | Global |
| | 4 | Serial Number | Unsigned 32 | ro | no | 0 h | Global |
| 1029 | | Error Behavior Object | Array | - | - | - | Global |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 2 h | Global |
| | 1 | Communication error | Unsigned 8 | rw | no | 0 h | Global |
| | 2 | Application error | Unsigned 8 | rw | no | 0 h | Global |
| 1400 | | Receive PDO1 - Communication Parameters | Record | - | - | - | PDO |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 2 h | PDO |
| | 1 | COB-ID | Unsigned 32 | rw | no | 200 h + Node-ID | PDO |
| | 2 | Transmission Type | Unsigned 8 | rw | no | FF h | PDO |
| 1600 | | Receive PDO1 - Mapping Parameters | Record | - | - | - | PDO |
| | 0 | Nr of Subobjects | Unsigned 8 | rw | no | 2 h | PDO |
| | 1 | Mapped Object | Unsigned 32 | rw | no | 6200 01 08 h Dig. Output 0UT00-OUT07 | PDO |
| | 2 | Mapped Object | Unsigned 32 | rw | no | 6200 02 08 h Dig. Output 0UT10-OUT17 | PDO |
| 1800 | | Transmit PDO1 - Communication Parameters | Record | - | - | - | PDO |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 5 h | PDO |
| | 1 | COB-ID | Unsigned 32 | rw | no | 180 h + Node-ID | PDO |
| | 2 | Transmission Type | Unsigned 8 | rw | no | FF h | PDO |
| | 3 | Inhibit Time | Unsigned 16 | rw | no | 0 h | PDO |
| | 4 | Compatibility Entry | Unsigned 8 | rw | no | - | PDO |
| 1801 | | Transmit PDO2 - Communication Parameters | Record | - | - | - | PDO |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 5 h | PDO |
| | 1 | COB-ID | Unsigned 32 | rw | no | 8000 02 80 h + Node-ID | PDO |
| | 2 | Transmission Type | Unsigned 8 | rw | no | FF h | PDO |
| | 3 | Inhibit Time | Unsigned 16 | rw | no | 0 h | PDO |
| | 4 | Compatibility Entry | Unsigned 8 | rw | no | - | PDO |
| 1A00 | | Transmit PDO1 – Mapping Parameters | Record | - | - | - | PDO |
| | 0 | Nr of Subobjects | Unsigned 8 | rw | no | 2 h | PDO |
| | 1 | Mapped Object | Unsigned 32 | rw | no | 6000 01 08 h Dig. Input IN00 – IN07 | PDO |
| | 2 | Mapped Object | Unsigned 32 | rw | no | 6000 02 08 h Dig. Input IN10 – IN17 | PDO |
| 1A01 | | Transmit PDO2 – Mapping Parameters | Record | - | - | - | PDO |
| | 0 | Nr of Subobjects | Unsigned 8 | rw | no | 0 h | PDO |
| 2000 | - | Device Manufacturer | Visible String | ro | no | “FRENZEL+BERG” | Global |

| Index | Sub-Index | Name | Data type | Acc. | Map- pable | Default Value / Note | Object Category |
|-------|-----------|--|----------------|------|---------------|-------------------------------------|--------------------|
| 2002 | | Application Info | Record | - | - | - | Global |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 5 h | Global |
| | 1 | Application Vendor Name | Visible String | rw | no | "FRENZEL+BERG" | Global |
| | 2 | Application Name | Visible String | rw | no | "CO4011B" | Global |
| | 3 | Application Add-Info | Visible String | rw | no | "FRENZEL+BERG" | Global |
| | 4 | Application Version1 | Unsigned 32 | rw | no | active Version | Global |
| | 5 | Application Version2 | Unsigned 32 | rw | no | active Rev. Code | Global |
| 2100 | - | New Node Id (Used to set a Node-Nr. independent from the Node-Id Input Bits on Switch 1) | Unsigned 8 | rw | no | 0 h | Global |
| 2101 | - | System Configuration | Unsigned 32 | ro | no | Setting of Config. Input Pins | Global |
| 2102 | - | Remapping Enabled Info | Unsigned 8 | ro | no | 1 h (enabled) | Global |
| 2103 | - | Enable Guarding Warning | Unsigned 8 | rw | no | 0 h (disabled) | Global |
| 2110 | - | Enable Boot Up Message | Unsigned 8 | rw | no | 1 (enabled) | Global |
| 2180 | - | CAN Restart Time | Unsigned 16 | rw | no | 1000 h (restart after one second) | Global |
| 2FF8 | - | Wake Up NMT State after Power Down with Stop Node | Unsigned 8 | rw | no | 2 h | Power Down |
| 2FF9 | - | Power Down with Stop Node | Unsigned 32 | rw | no | 0 h | Power Down |
| 2FFA | - | Wake Up Confirm Time | Unsigned 16 | rw | no | 1000 h | Power Down |
| 2FFB | - | Power Down Delay Time | Unsigned 16 | rw | no | 500 h | Power Down |
| 2FFC | - | Power Down Wake Up Counter | Unsigned 32 | rw | yes | 0 h | Power Down |
| 2FFD | - | Reset Power Down Input Pin Enable | Unsigned 32 | rw | no | 0 h | Power Down |
| 2FFE | - | Power Down Enable | Unsigned 32 | rw | no | 0 h | Power Down |
| 2FFF | - | Switch to Power Down Mode | Unsigned 32 | wo | no | 0 h | Power Down |
| 5001 | | Write 0/1 to Dig. Input (OR) | Array | - | - | - | Dig. Input |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 2 h | Dig. Input |
| | 1 | Logical OR Mask for Input Byte 0 | Unsigned 8 | rww | yes | 0 h | Dig. Input |
| | 2 | Logical OR Mask for Input Byte 1 | Unsigned 8 | rww | yes | 0 h | Dig. Input |
| 5002 | | Write 0/1 to Dig. Input (AND) | Array | - | - | - | Dig. Input |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 2 h | Dig. Input |
| | 1 | Logical AND Mask for Input Byte 0 | Unsigned 8 | rww | yes | FF h | Dig. Input |
| | 2 | Logical AND Mask for Input Byte 1 | Unsigned 8 | rww | yes | FF h | Dig. Input |
| 5003 | | Filter Time Digital Inputs | Array | - | - | - | Dig. Input |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 10 h | Dig. Input |
| | 1..8 | Filter Time IN00..IN08 | Unsigned 8 | rw | no | 5 h (5 milliseconds) | Dig. Input |
| | 9..10 | Filter Time IN10..IN18 | Unsigned 8 | rw | no | 5 h (5 milliseconds) | Dig. Input |
| 5200 | - | Reset Output Object on Error | Unsigned 8 | rw | no | 1 h | Dig. Output |

| Index | Sub-Index | Name | Data type | Acc. | Map- pable | Default Value / Note | Object Category |
|-------|-----------|--|-------------|------|---------------|-----------------------------|--------------------|
| 6000 | | Digital Input 8 Bit | Array | - | - | - | Dig. Input |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 2 h | Dig. Input |
| | 1 | Digital Input Byte 0 | Unsigned 8 | ro | yes | - | Dig. Input |
| | 2 | Digital Input Byte 1 | Unsigned 8 | ro | yes | - | Dig. Input |
| 6002 | | Polarity Input 8 Bit | Array | - | - | - | Dig. Input |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 2 h | Dig. Input |
| | 1 | Polarity Input Byte 0 | Unsigned 8 | rw | no | 0 h | Dig. Input |
| | 2 | Polarity Input Byte 1 | Unsigned 8 | rw | no | 0 h | Dig. Input |
| 6003 | | Filter Enable Input 8 Bit | Array | - | - | - | Dig. Input |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 2 h | Dig. Input |
| | 1 | Filter Enable 8 Bit Byte 0 | Unsigned 8 | rw | no | 0 h | Dig. Input |
| | 2 | Filter Enable 8 Bit Byte 1 | Unsigned 8 | rw | no | 0 h | Dig. Input |
| 6005 | | Global Interrupt Enable | Unsigned 8 | rw | no | FF h | Dig. Input |
| 6006 | | Interrupt Mask any Change | Array | - | - | - | Dig. Input |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 2 h | Dig. Input |
| | 1 | Interrupt Mask Any Change Byte 0 | Unsigned 8 | rw | no | FF h (interrupt enabled) | Dig. Input |
| | 2 | Interrupt Mask Any Change Byte 1 | Unsigned 8 | rw | no | FF h (interrupt enabled) | Dig. Input |
| 6007 | | Interrupt Mask Rising Edge | Array | - | - | - | Dig. Input |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 2 h | Dig. Input |
| | 1 | Interrupt Mask Rising Edge Byte 0 | Unsigned 8 | rw | no | 0 h (interrupt disabled) | Dig. Input |
| | 2 | Interrupt Mask Rising Edge Byte 1 | Unsigned 8 | rw | no | 0 h (interrupt disabled) | Dig. Input |
| 6008 | | Interrupt Mask Falling Edge | Array | - | - | - | Dig. Input |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 2 h | Dig. Input |
| | 1 | Interrupt Mask Falling Edge Byte 0 | Unsigned 8 | rw | no | 0 h (interrupt disabled) | Dig. Input |
| | 2 | Interrupt Mask Falling Edge Byte 1 | Unsigned 8 | rw | no | 0 h (interrupt disabled) | Dig. Input |
| 6100 | | Read Digital Input 16 Bit | Array | - | - | - | Dig. Input |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 1 h | Dig. Input |
| | 1 | Read Digital Input 16 Bit UnsignedInteger 0 | Unsigned 16 | yes | no | - | Dig. Input |
| 6120 | | Read Digital Input 32 Bit | Array | - | - | - | Dig. Input |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 1 h | Dig. Input |
| | 1 | Read Digital Input 32 Bit Long 0 | Unsigned 16 | yes | no | - | Dig. Input |
| 6200 | | Write Digital Output 8 Bit | Array | - | - | - | Dig. Output |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 2 h | Dig. Output |
| | 1 | Dig. Output Byte 0 | Unsigned 8 | rw | yes | 0 h | Dig. Output |
| | 2 | Dig. Output Byte 1 | Unsigned 8 | rw | yes | 0 h | Dig. Output |
| 6202 | | Change Polarity Output 8 bit | Array | - | - | - | Dig. Output |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 2 h | Dig. Output |
| | 1 | Polarity Output Byte 0 | Unsigned 8 | rw | no | 0 h | Dig. Output |
| | 2 | Polarity Output Byte 1 | Unsigned 8 | rw | no | 0 h | Dig. Output |
| 6206 | | Error Mode Output 8 bit | Array | - | - | - | Dig. Output |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 2 h | Dig. Output |
| | 1 | Error Mode Output 8 Bit Byte 0 | Unsigned 8 | rw | no | FF h | Dig. Output |
| | 2 | Error Mode Output 8 Bit Byte 1 | Unsigned 8 | rw | no | FF h | Dig. Output |

| | | | | | | | |
|------|---|---------------------------------|-------------|-----|-----|------------------------------|-------------|
| 6207 | | Error State Output | Array | - | - | - | Dig. Output |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 2 h | Dig. Output |
| | 1 | Error Value Output 8 Bit Byte 0 | Unsigned 8 | rw | no | 0 h (Inactive, high level) | Dig. Output |
| | 2 | Error Value Output 8 Bit Byte 1 | Unsigned 8 | rw | no | 0 h (Inactive, high level) | Dig. Output |
| 6300 | | Write Digital Output 16 bit | Array | - | - | - | Dig. Output |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 1 h | Dig. Output |
| | 1 | Dig. Output Word 1 | Unsigned 16 | rww | yes | - | Dig. Output |
| 6320 | | Write Digital Output 32 bit | Array | -- | - | - | Dig. Output |
| | 0 | Nr of Subobjects | Unsigned 8 | ro | no | 1 h | Dig. Output |
| | 1 | Dig. Output Long 1 | Unsigned 32 | rww | yes | - | Dig. Output |

Notes: DS301 Global Objects

The data type entries Index 0005 to 0007 are implemented for compatibility reasons. They may be mapped to PDOs in order to define the appropriate space in the PDO.

Notes: DS301 PDO Parameter Objects

Description of PDO Parameter objects:

These Objects enable dynamic PDO mapping, variable identifier distribution for PDOs and setting of the transmission mode, inhibit and event times.

For the CO4011B setting of all parameters may be done in the device state "operational" as well as in "preoperational" state.

Notes: DS401 Digital Input Objects

The objects 5001 and 5002 are implemented for debug purposes, because the CANopen object 6000 does not allow write access to an input line. With objects 5001 and 5002 a debug environment may simulate setting or resetting of input lines. The CO4011B first scans the physical input lines and then processes the scanned values with the debug parameters.

Index 5001 and 5002 make direct bit manipulation of single bits possible.

Index 5001 enables bit setting by using a bit wise logical OR conjunction with index 6000 while index 5002 performs a logical AND conjunction with index 6000 and therefore enables resetting of single bits.

Objects 5001 and 5002 are always working in continuous execution mode. This means that logical operations with object 6000 are performed in each internal input scan cycle

With object 5003 an individual filter constant (value in msec) may be assigned to each input line. This gives great flexibility to prevent inputs from distortion. The default value for filter constant is 5msec. The filter constants enable object is at index 6003.

Emergency Messages

The CO4011B supports several emergency messages. For all emergencies the same structure is used:

| Byte | | | | | | | | |
|----------|------|---|---|---|---|---|---|-------------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| EMY-Code | 1001 | 0 | | | | | | CO4011-Code |

EMY-Code: Emergency-Error-Code according to DS301

1001: Content of Object 1001

CO4011-Code: Emergency-Error-Code for CO4011 as unsigned 32 value

| CO4011-Code (hex) | May change | | Description |
|-------------------|------------|-----|--------------------------------|
| | NMT | I/O | |
| 8000 0000 | X | X | CAN bus is bus off |
| 4000 0000 | | | CAN bus in error warning state |
| 2000 0000 | | | Node guarding warning |
| 3000 0000 | X | X | Life guarding error |
| 0000 0001 | X | X | Output Overload detected |
| 0000 0100 | | | Wake up from Power down |

Emergency 2000 0000 (Node guarding warning) must be enabled with object 2103.

If more than one error is active at the same time, the bitmap of the CO4011-Codes for all active errors are combined with a logical or conjunction.

Some of the emergencies may cause a NMT state change and/or may force the output pins to the error state. This behaviour depends on the setting of object 1029.

The ID for emergency transmission is fixed to: 0x80 + \$NodeID.

Data Mapping to Dictionary

| | | | | | | | | |
|----------------------------------|--|---|---|---|---|---|---|---|
| Operation mode 3 | | | | | | | | |
| 16 dig. Inputs / 16 dig. Outputs | | | | | | | | |
| EDS-file: CO4011B3.EDS | | | | | | | | |
| Data Mapping to Dictionary | | | | | | | | |
| Index. | Mapped I/O Signal bit/value | | | | | | | |
| SubIndex | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 6000.01 | IN07 to IN00 | | | | | | | |
| 6000.02 | IN17 to IN10 | | | | | | | |
| 6200.01 | OUT07 to OUT00 | | | | | | | |
| 6200.02 | OUT17 to OUT10 | | | | | | | |
| 6400.xx | Not available | | | | | | | |
| 6401.xx | Not available | | | | | | | |
| Default PDO Mapping | | | | | | | | |
| PDO | Mapped Data | | | | | | | |
| RPDO1 | 6200.01 dig. output OUT00 to 07 6200.02 dig. output OUT10 to 17 | | | | | | | |
| TPDO1 | 6000.01 dig. input IN00 to IN07 6000.02 dig. input IN10 to IN17 | | | | | | | |

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