

CANopen IO-X4 – Fact sheet

Overview

The CANopen IO-X4 is a very compact and cost effective CANopen IO module featuring a high-density of industrial proven IO's.

The module includes a CPU-core including the pre-programmed firmware for CANopen communication and peripherals for the industrial inputs and outputs. Extensive diagnostic routines are implemented to ensure a most reliable and safe operation.

All inputs and outputs as well as configuration parameters are accessible via the CANopen protocol.

The CANopen IO-X4 is a CANopen slave device according CANopen device profile **CiA 404 DS V1.2** and CANopen communication profile **CiA 301 DS V4.02**.

Two LED indicate the device state according to **CiA 303-3 DR V1.0**.



IO configuration:

- 8 channels analog input each configurable as $\pm 10V$; 0..10V or (0)4..20mA input type
Resolution 12bit (optional 14bit)
Accuracy < 0,5% (12-bit)

CANopen features:

- Communication profile CiA 301 DS V4.02
- Device profile CiA 404 DS V1.2
- State indicator profile CiA 303-3 DR V1.0
- Layer Setting Service (LSS)
CiA 305 DS V1.1
- 4 TPDO
- Dynamic PDO-Linking and -Mapping
- SDO-Server
- Life guarding, Node guarding, Heartbeat Producer
- Emergency Producer
- Minimum Boot-up capability (Slave)
- Minimum NMT boot-up master (Manufacturer extension)

Communication and device configuration:

- Galvanic decoupled CAN-bus driver supports up to 110 CAN-nodes on one bus
- Jumper for CAN-bus termination 120 Ω
- Hex-encoding switches for setting node-ID and baud rate
- CAN-bus baud rate: 10kBit/s to 1Mbit/s
- High-quality connectors included in scope of delivery:
 - Power-Supply:* 2-pin plug connector
 - CAN-bus:* 5-pin plug connector
 - I/O:* single 24-pin plug connector, lockable
- Non-volatile memory for storage of configuration data
- Internal monitoring and diagnostics of:
 - onboard temperature,*
 - power supply,*
 - memory and other controller internals*
- Emergency Messages sent out in case of failure

Power Supply, Environmental Conditions:

- Operating voltage: 24V $\pm 20\%$
- Current consumption: <70mA
- Operating temperature: -20°C to +70°C
- Storage temperature: -20°C to +90°C
- Dimensions (LxWxH in mm): 95x70x58
- Installation method: DIN-rail mounting
- Enclosure protection class: IP20
- Weight: ca. 130g

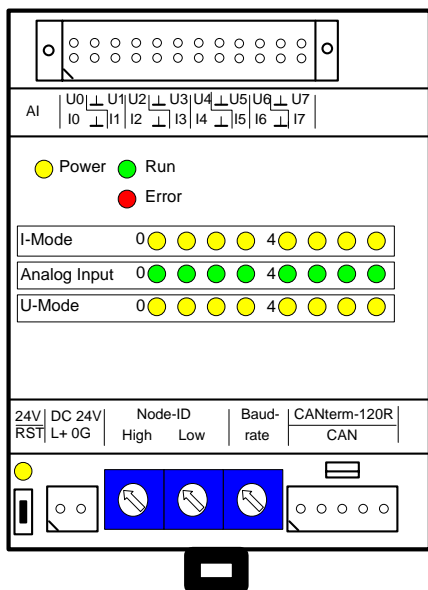
Delivery contents / order number

Assembled and tested module,
Manual and corresponding EDS-file.

Order number:

3001003 CANopen IO-X4,
standard version

Device pinout



Hex-encoding Switches:

Node ID:

Allows for configuration of node ID from 0x1 ... 0x7F (1..127 dec).
When node-ID is set to value 0xFF, the device is reset to factory settings after power-on or reset.
The node-ID is also configurable via LSS.

Baud rate:

Selectable via Hex-switch:
0 = 1 Mbit/s
1 = 800 kbit/s
2 = 500 kbit/s
3 = 250 kbit/s
4 = 125 kbit/s
5 = 100 kbit/s
6 = 50 kbit/s
7 = 20 kbit/s
8 = 10 kbit/s

The baud rate is also configurable via LSS.

PDO Mapping

In standard configuration (factory settings) the analog inputs AI0..7 are mapped to the following PDO's.

	ID	Length	BYTE 0	BYTE 1	BYTE 2	BYTE 3	BYTE 4	BYTE 5
1. TPDO	180H +Node ID	6	AI0 7130H/1		AI0 State 6150H/1	AI1 7130H/2		AI1 State 6150H/2
2. TPDO	280H +Node ID	6	AI2 7130H/3		AI2 State 6150H/3	AI3 7130H/4		AI3 State 6150H/4
3. TPDO	380H +Node ID	6	AI4 7130H/5		AI4 State 6150H/5	AI5 7130H/6		AI5 State 6150H/6
4. TPDO	480H +Node ID	6	AI6 7130H/7		AI6 State 6150H/7	AI7 7130H/8		AI7 State 6150H/8

The PDO-mapping and linking can be changed dynamically by use of a standard CANopen configuration tool. The configuration can be saved to non-volatile memory and thus is available after restart.

Connector pinout:

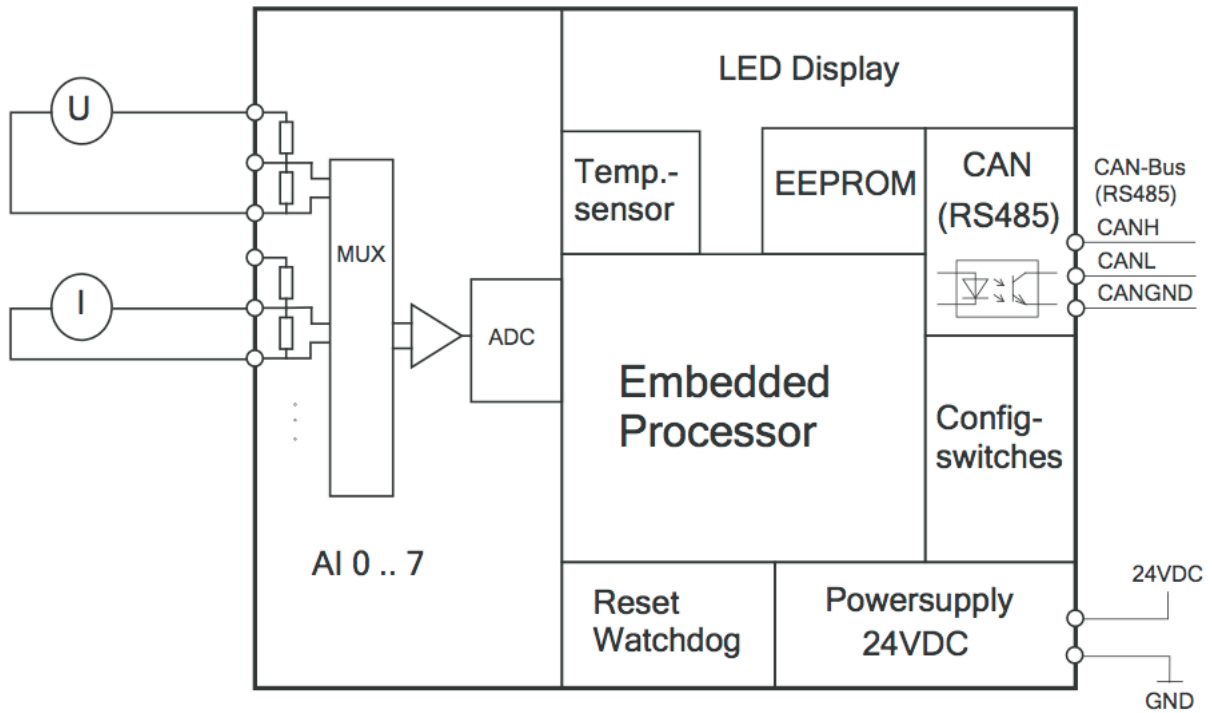
Pin	Name	Description
Power Connector		
1*	L+	+24VDC ±20%
2	0G	Ground 0
CAN Connector		
1*		CAN ground
2		CAN low
3		n.c.
4		CAN high
5		+24VDC (optional used)
IO Connector		
1*	I0	ch 0 current input
2	U0	ch 0 voltage input
3	GND	ch 0 Ground
5	I1	ch 1 current input
6	U1	ch 1 voltage input
4	GND	ch 1 Ground
7	I2	ch 2 current input
8	U2	ch 2 voltage input
9	GND	ch 2 Ground
11	I3	ch 3 current input
12	U3	ch 3 voltage input
10	GND	ch 3 Ground
13	I4	ch 4 current input
14	U4	ch 4 voltage input
15	GND	ch 4 Ground
17	I5	ch 5 current input
18	U5	ch 5 voltage input
16	GND	ch 5 Ground
19	I6	ch 6 current input
20	U6	ch 6 voltage input
21	GND	ch 6 Ground
23	I7	ch 7 current input
24	U7	ch 7 voltage input
22	GND	ch 7 Ground

* in picture pin 1 is marked with slash

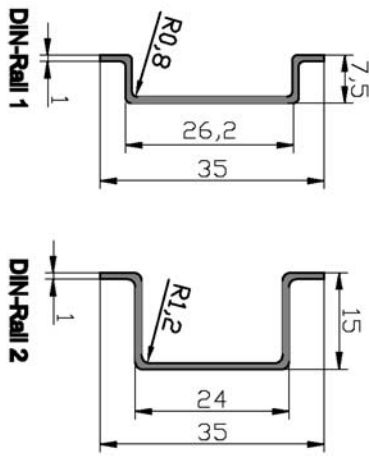
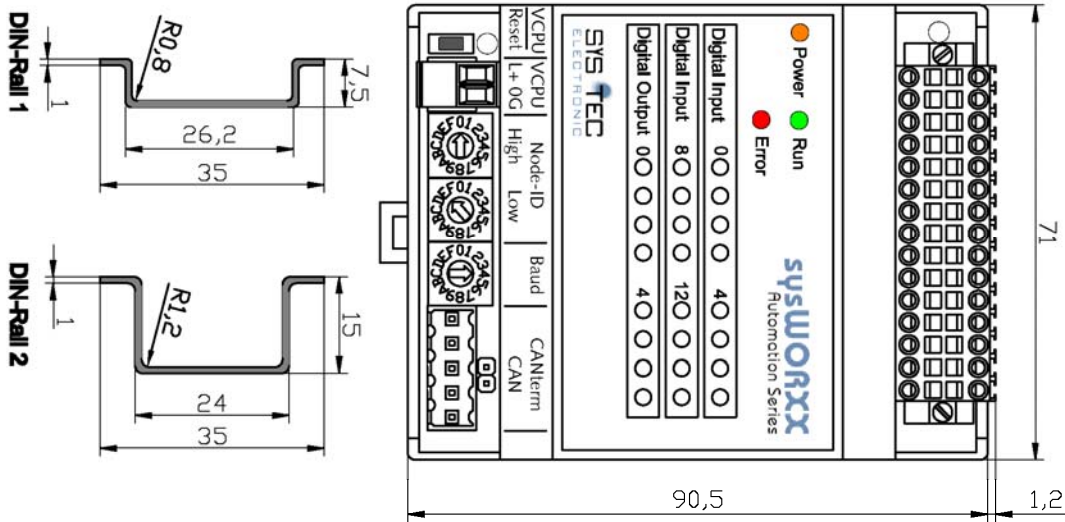
Object Dictionary

Index	Object	Name	Data type	Object is mappable	Object gets saved via 1010H	Object gets Restored via 1011H
1000H	Var	Device type	Unsigned32	-	-	-
1001H	Var	Error register	Unsigned8	-	-	-
1003H	Array	Pre-defined error field	Unsigned32	-	-	-
1005H	Var	COB-ID SYNC message	Unsigned32	-	x	x
1007H	Var	Synchronous window length	Unsigned32	-	x	x
1008H	Var	Manufacturer device name	String	-	-	-
1009H	Var	Manufacturer hardware version	String	-	-	-
100AH	Var	Manufacturer software version	String	-	-	-
100CH	Var	Guard Time	Unsigned16	-	x	x
100DH	Var	Life Time Factor	Unsigned8	-	x	x
1010H	Array	Store parameters	Unsigned32	-	-	-
1011H	Array	Restore default parameters	Unsigned32	-	-	-
1014H	Var	COB-ID EMCY	Unsigned32	-	x	x
1016H	Array	Consumer Heartbeat Time	Unsigned32	-	x	x
1017H	Var	Producer Heartbeat Time	Unsigned16	-	x	x
1018H	Record	Identity object	Identity	-	-	-
1029H	Array	Error behavior object	Unsigned8	-	x	x
1200H	Record	1st SDO Server Parameter	SDO Parameter	-	-	-
1800H	Record	TPDO1 Communication parameter	PDOComPar	-	x	x
1801H	Record	TPDO2 Communication parameter	PDOComPar	-	x	x
1802H	Record	TPDO3 Communication parameter	PDOComPar	-	x	x
1803H	Record	TPDO4 Communication parameter	PDOComPar	-	x	x
1A00H	Record	TPDO1 Mapping parameter	PDOMapPar	-	x	x
1A01H	Record	TPDO2 Mapping parameter	PDOMapPar	-	x	x
1A02H	Record	TPDO3 Mapping parameter	PDOMapPar	-	x	x
1A03H	Record	TPDO4 Mapping parameter	PDOMapPar	-	x	x
1F51H	Var	ProgramControl	Unsigned8	-	-	-
2000H	Var	NMT Boot Configuration	Unsigned8	-	-	-
2001H	Array	Device Features	Integer16	-	-	-
2002H	Var	Power Fail Configuration	Unsigned8	-	x	x
2500H	Record	for production only		-	-	-
6110H	Array	AI Sensor Typ	Unsigned16	-	x	x
6112H	Array	AI Operation mode	Unsigned8	-	x	x
6126H	Array	AI Scaling Factor	Real32	-	x	x
6127H	Array	AI Scaling Offset	Real32	-	x	x
6131H	Array	AI Physical Unit PV	Unsigned32	-	x	x
6132H	Array	AI Decimal Digits PV	Unsigned8	-	x	x
6150H	Array	AI Status	Unsigned8	x	-	-
7100H	Array	AI Input FV	Integer16	x	-	-
7130H	Array	AI Input PV	Integer16	x	-	-
7133H	Array	AI Interrupt delta input PV	Integer16	-	x	x

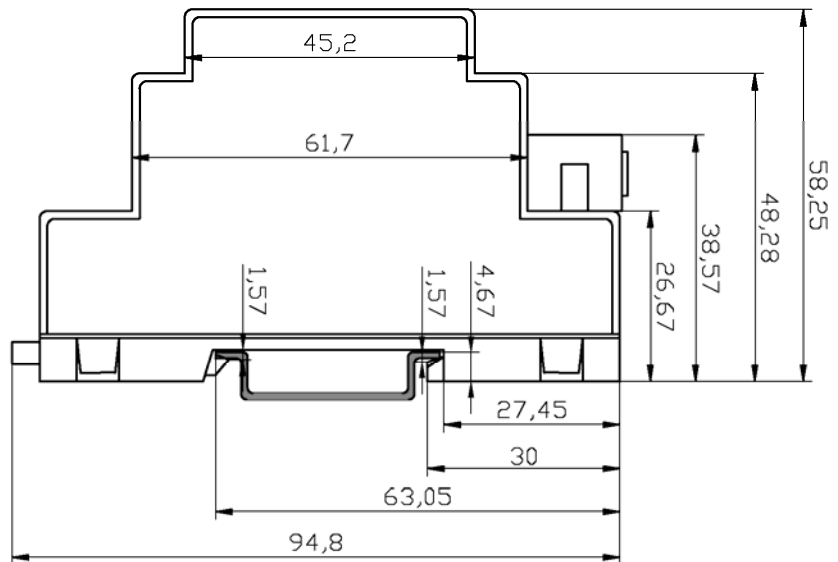
IO circuitry



Device dimensions



With DIN-Rail 1



With DIN-Rail 2

