

ConveyLinx-IO

Specification



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Rev 1.2

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1 I/O Wiring

M8 connectors as Inputs

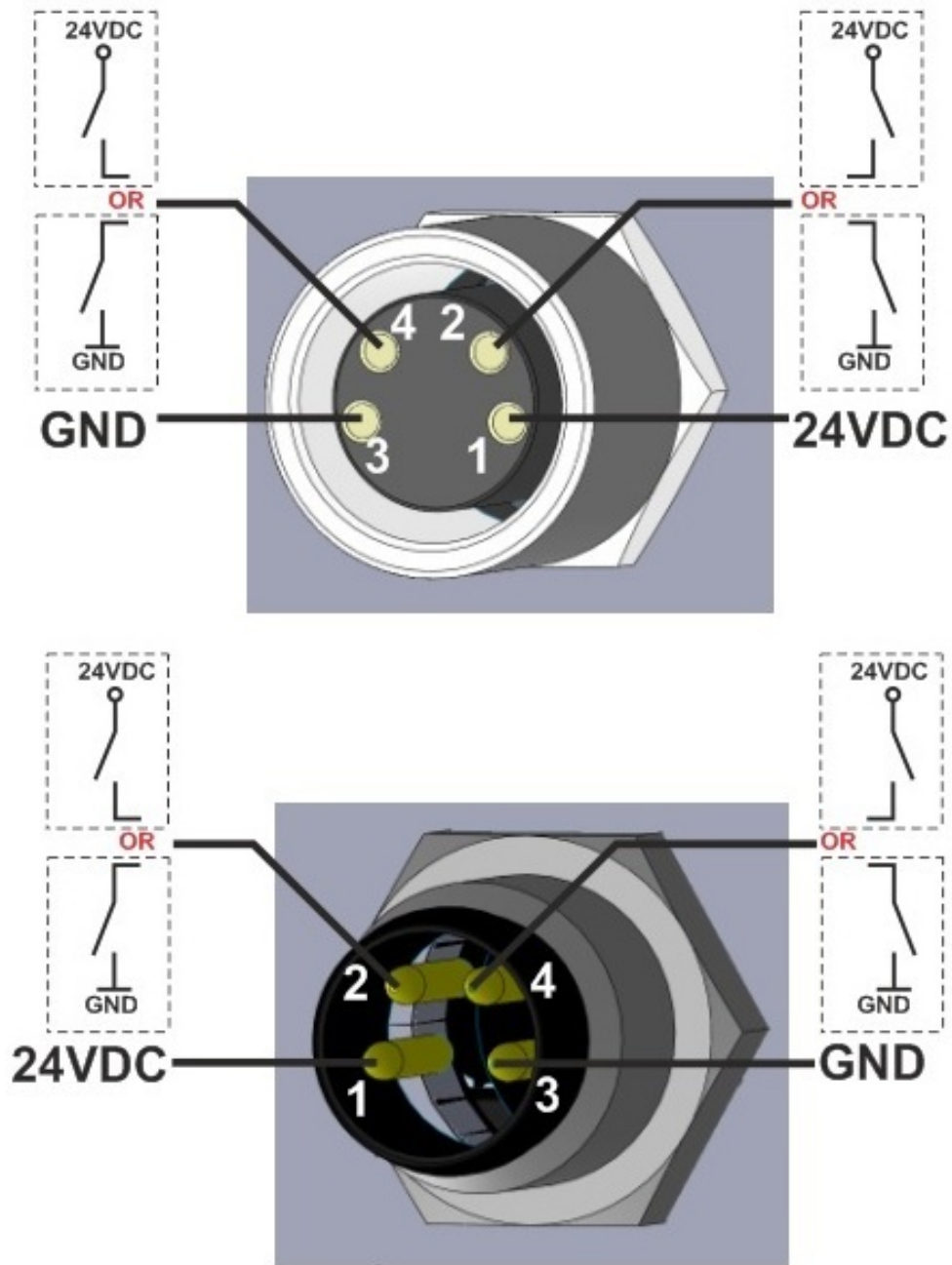


Figure 1: ConveyLinx-IO typical Inputs wiring

M8 connectors as Outputs

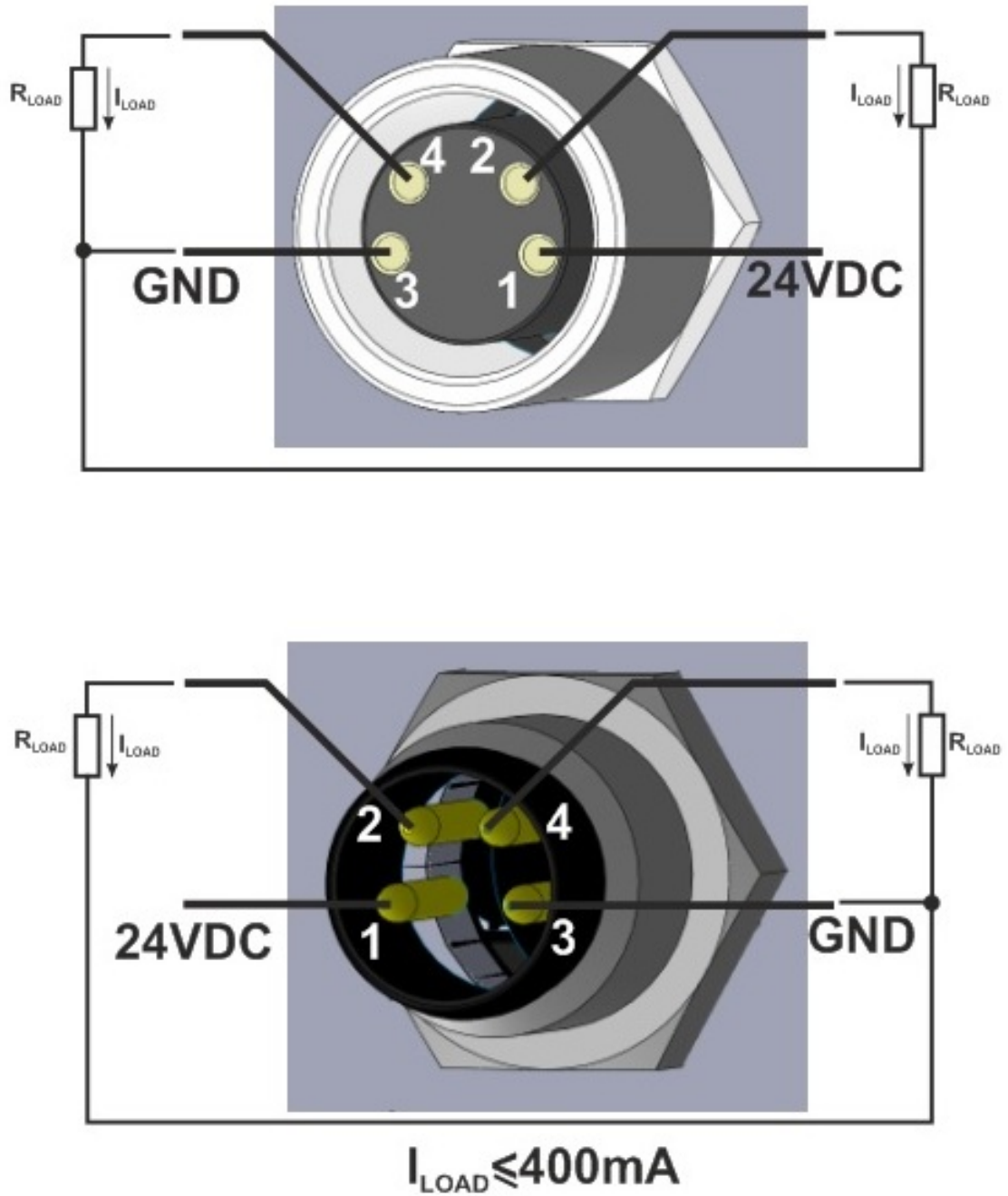


Figure 2: ConveyLinx-IO typical Outputs wiring

M8 connectors as Inputs or Outputs

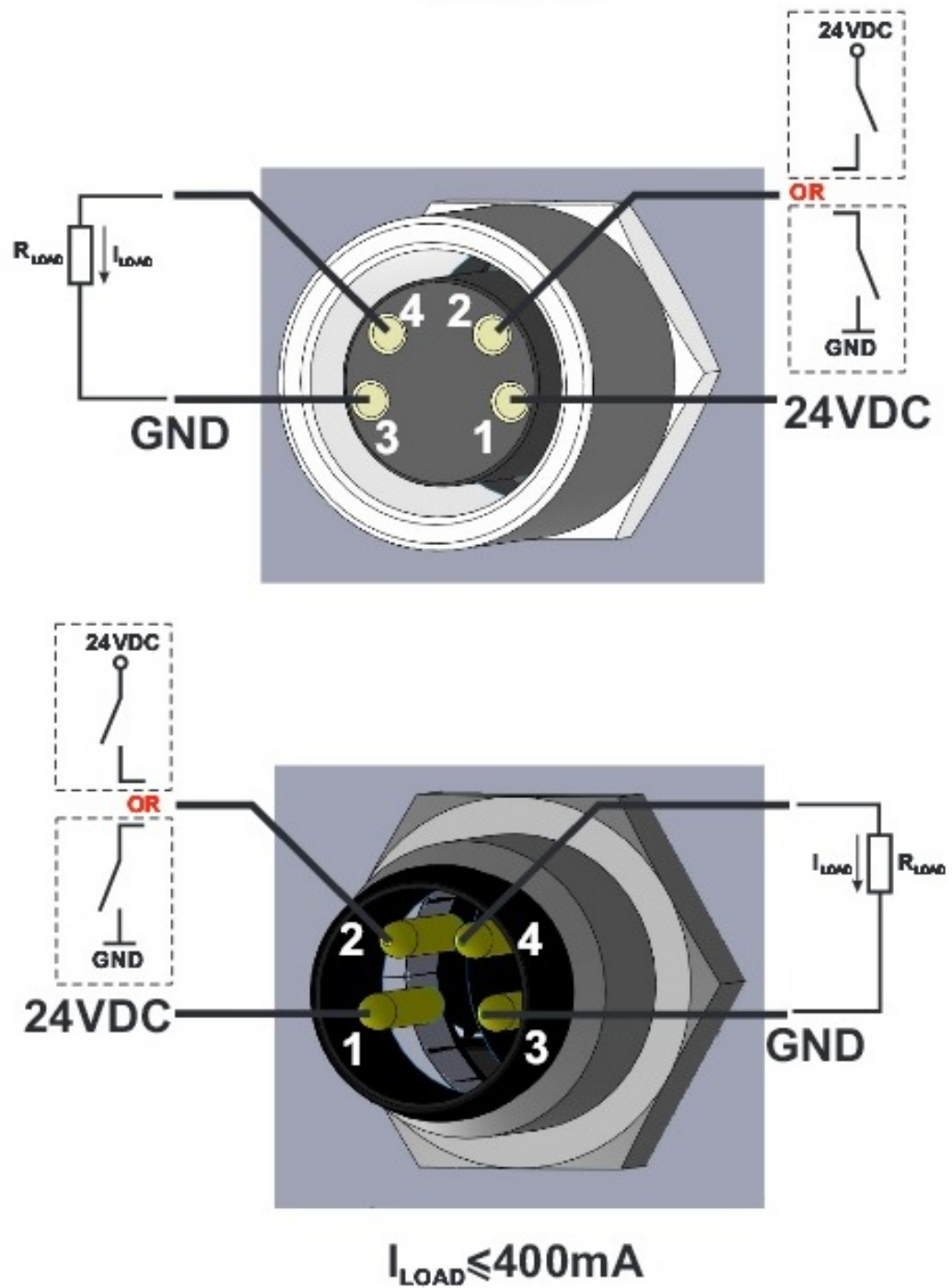


Figure 3: ConveyLinx-IO typical Inputs/Outputs wiring

2 Using the ConveyLinx-IO data

2.1 ConveyLinx-IO pinout

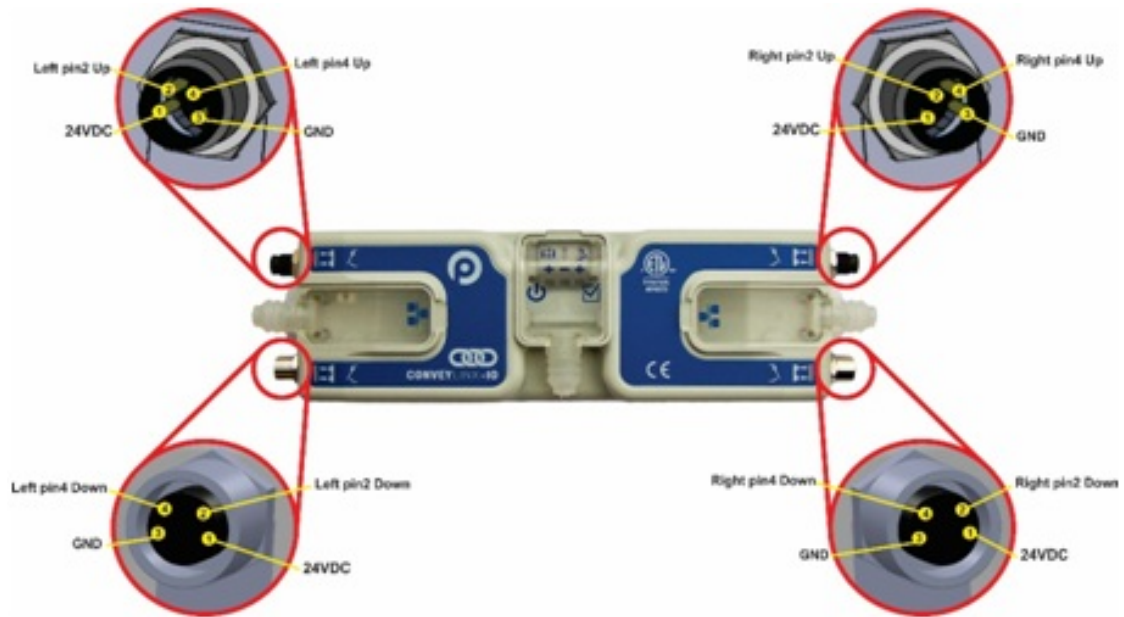
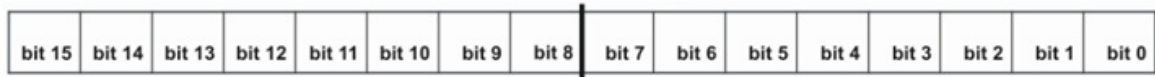


Figure 4: ConveyLinx-IO pinout

2.2 ConveyLinx-IO Real-time data

Regardless of which protocol is used to communicate with the ConveyLinx-IO, the exchanged data is the same.

The data sent from the ConveyLinx-IO to the PLC



Read Inputs

- bit 0 : Input State from Up Left pin2
- bit 1 : Input State from Down Left pin2
- bit 2 : Input State from Up Right pin2
- bit 3 : Input State from Down Right pin2
- bit 4 : Input State from Up Left pin4

- bit 5 : Input State from Down Left pin4
- bit 6 : Input State from Up Right pin4
- bit 7 : Input State from Down Right pin4

- bit 8 : Over Current or Short Circuit Error for Up Left pin2 (if pins function is Output)
- bit 9 : Over Current or Short Circuit Error for Down Left pin2 (if pins function is Output)
- bit 10 : Over Current or Short Circuit Error for Up Right pin2 (if pins function is Output)
- bit 11 : Over Current or Short Circuit Error for Down Right pin2 (if pins function is Output)
- bit 12 : Over Current or Short Circuit Error for Up Left pin4 (if pins function is Output)
- bit 13 : Over Current or Short Circuit Error for Down Left pin4 (if pins function is Output)
- bit 14 : Over Current or Short Circuit Error for Up Right pin4 (if pins function is Output)
- bit 15 : Over Current or Short Circuit Error for Down Right pin4 (if pins function is Output)

If "Over Current or Short Circuit" Error bits[8-11] are 1, that means: There is a short circuit/overcurrent on the left side Input (Sensor) power.

If "Over Current or Short Circuit" Error bits[12-15] are 1, that means: There is a short circuit/overcurrent on the right side Input (Sensor) power.

The data received by the ConveyLinx-IO from the PLC



Set Outputs

- bit 0 : Drive Up Left pin2
- bit 1 : Drive Down Left pin2
- bit 2 : Drive Up Right pin2
- bit 3 : Drive Down Right pin2

- bit 4 : Drive Up Left pin4
- bit 5 : Drive Down Left pin4
- bit 6 : Drive Up Right pin4
- bit 7 : Drive Down Right pin4
- bit 8 to bit 15 - reserved

2.3 ConveyLinx-IO configuration data

The ConveyLinx-IO has five configuration data fields. They can be accessed, when the device is used in PROFINET, ModbusTCP or EthernetIP systems. In this subsection we show the general configuration data. How to use the ConveyLinx-IO with each individual protocol is described in the following subsections.

Input/Output configuration field Each IO pin can be configured as an input or an output. Each IO pin has a corresponding bit in the "Input/Output" field.

- If the corresponding bit has the value of '0', then the Pin will act as an Input.
- If the bit has the value of '1', then the Pin will act as an Output.



Input or Output

- bit 0 : Input or Output Up Left pin2
- bit 1 : Input or Output Down Left pin2
- bit 2 : Input or Output Up Right pin2
- bit 3 : Input or Output Down Right pin2
- bit 4 : Input or Output Up Left pin4
- bit 5 : Input or Output Down Left pin4
- bit 6 : Input or Output Up Right pin4
- bit 7 : Input or Output Down Right pin4
- bit 8 to bit 15 - reserved

Inputs polarity configuration field The polarity of each pin, when used as an Input can be changed by writing to this configuration field. This field is only take into account IF the corresponding pins are configured as inputs.

- If the corresponding bit has the value of '0', then the Pin will have the default input polarity.
- If the bit has the value of '1', then the Pin will have an inversed input polarity.

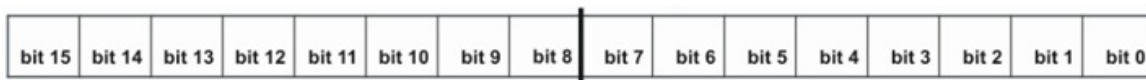


Input polarity

- bit 0 : Inverse input Up Left pin2
- bit 1 : Inverse input Down Left pin2
- bit 2 : Inverse input Up Right pin2
- bit 3 : Inverse input Down Right pin2
- bit 4 : Inverse input Up Left pin4
- bit 5 : Inverse input Down Left pin4
- bit 6 : Inverse input Up Right pin4
- bit 7 : Inverse input Down Right pin4
- bit 8 to bit 15 - reserved

Outputs polarity configuration field The polarity of each pin, when used as an Output can be changed by writing to this configuration field. This field is only take into account IF the corresponding pins are configured as outputs.

- If the corresponding bit has the value of '0', then the Pin will have the default output polarity.
- If the bit has the value of '1', then the Pin will have an inversed output polarity.

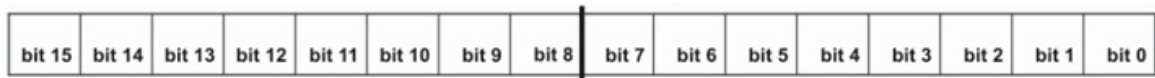


Output polarity

- bit 0 : Inverse output Up Left pin2
- bit 1 : Inverse output Down Left pin2
- bit 2 : Inverse output Up Right pin2
- bit 3 : Inverse output Down Right pin2
- bit 4 : Inverse output Up Left pin4
- bit 5 : Inverse output Down Left pin4
- bit 6 : Inverse output Up Right pin4
- bit 7 : Inverse output Down Right pin4
- bit 8 to bit 15 - reserved

State on disconnect configuration field When a disconnect from the PLC occurs the pins used as outputs can be configured how to respond.

- If the corresponding bit has the value of '0', then the Pin will be set to OFF.
- If the bit has the value of '1', then the Pin will retain the last state sent by the PLC.

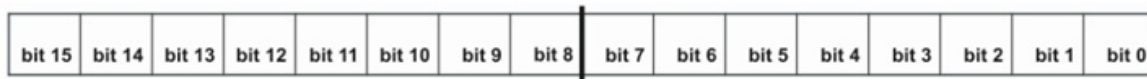


State on disconnect

- bit 0 : State on disconnect Up Left pin2
- bit 1 : State on disconnect Down Left pin2
- bit 2 : State on disconnect Up Right pin2
- bit 3 : State on disconnect Down Right pin2
- bit 4 : State on disconnect Up Left pin4
- bit 5 : State on disconnect Down Left pin4
- bit 6 : State on disconnect Up Right pin4
- bit 7 : State on disconnect Down Right pin4
- bit 8 to bit 15 - reserved

Push/Pull configuration field The pins can be used as Push/Pull input. This field is only taken into account, if the corresponding pins are configured as inputs.

- If the corresponding bit has the value of '0', then the Pin will not be used as Push/Pull.
- If the bit has the value of '1', then the Pin will be used as Push/Pull.



Push/Pull

- bit 0 : Push/Pull Up Left pin2
- bit 1 : Push/Pull Down Left pin2
- bit 2 : Push/Pull Up Right pin2
- bit 3 : Push/Pull Down Right pin2
- bit 4 : Push/Pull Up Left pin4
- bit 5 : Push/Pull Down Left pin4
- bit 6 : Push/Pull Up Right pin4
- bit 7 : Push/Pull Down Right pin4
- bit 8 to bit 15 - reserved

2.4 Using ConveyLinx-IO with Siemens PLC

ConveyLinx-IO supports PROFINET I/O and can be used as a remote I/O to the PLC. As noted above it exchanges 2 bytes with the PLC, so it uses very little of the PLC I/O memory. ConveyLinx-IO supports Topological discovery and Media redundancy. The configuration fields can be found in the "Properties" of the device under "Module parameters" tab, similar to the ConveyLinx-Ai configuration parameters. The configuration fields have been segmented into check-variables. The DAP for the ConveyLinx-IO can be found in both ConveyLinx-Ai directories(with standard and PLC-based configuration) after the GSDML for the ConveyLinx-IO has been installed. The ConveyLinx-IO DAPs from both directories are identical.

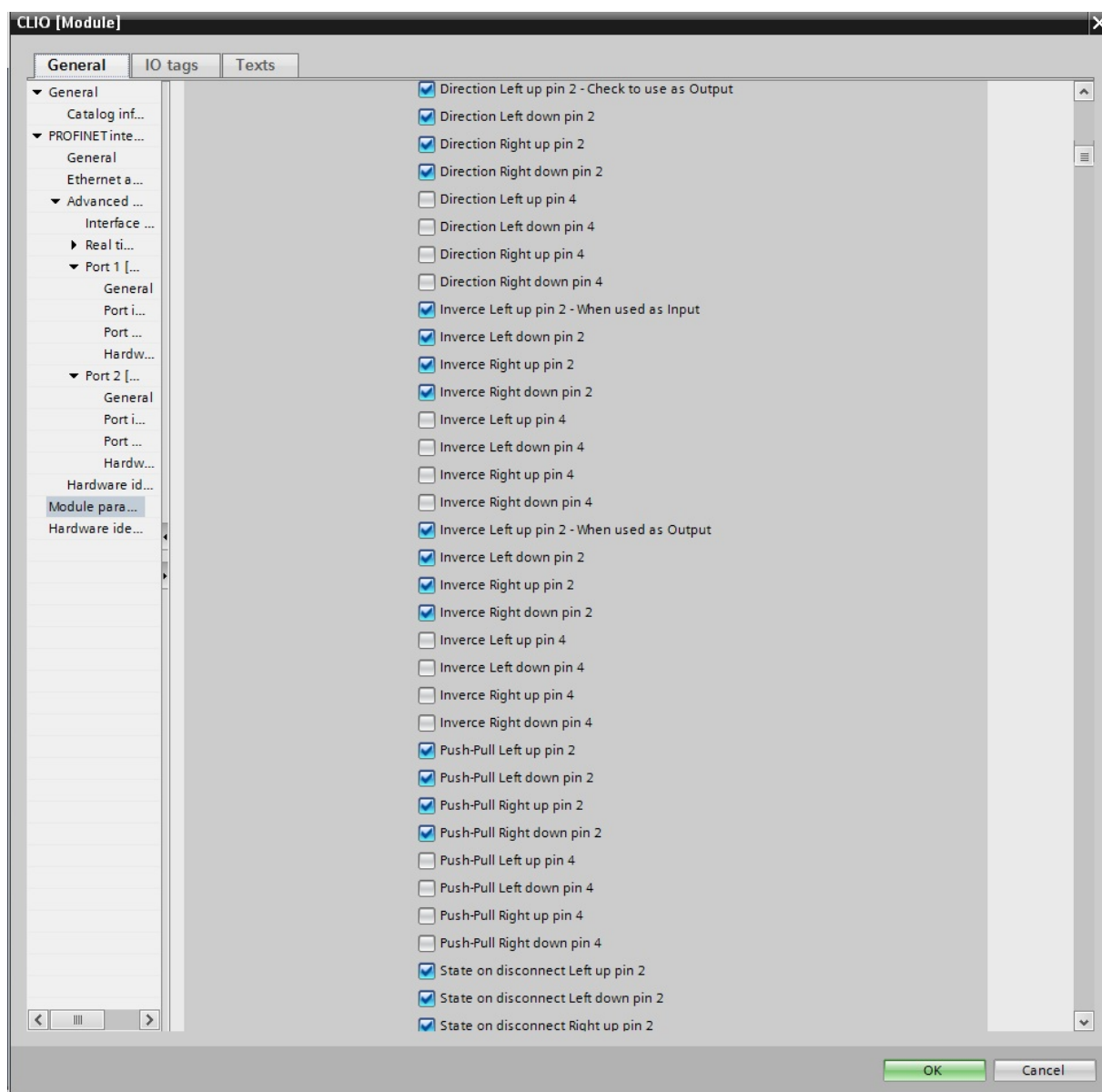


Figure 5 :ConveyLinx-IO parameters in TIA Portal

2.5 Using ConveyLinx-IO with ModbusTCP

ConveyLinx-IO supports ModbusTCP and can be used as a remote I/O to the PLC. When using ModbusTCP the PLC can connect to the following (Base 1) addresses for configuration and the Real-Time data :

- Address 35 : From this address the PLC can read the inputs of the ConveyLinx-IO .
- Address 37 : To this address the PLC can write the outputs of the ConveyLinx-IO .
- Address 497 : To this address the PLC can write the direction(input or output) of the ConveyLinx-IO pins.
- Address 34 : To this address the PLC can write the polarity("to inverse") of the ConveyLinx-IO pins when used as inputs.
- Address 38 : To this address the PLC can write the polarity("to inverse") of the ConveyLinx-IO pins when used as outputs.
- Address 255 : To this address the PLC can write the state on disconnect(OFF or to keep) of the ConveyLinx-IO pins when it disconnects from the PLC.
- Address 496 : To this address the PLC can write the ConveyLinx-IO pins to be used as Push/Pull, when they are inputs.

2.6 Using ConveyLinx-IO with EthernetIP

ConveyLinx-IO supports EtherNet/IP and can be used as a remote I/O to the PLC. Using ConveyLinx-IO EDS file device can be added to the PLC project. ConveyLinx-IO exchanges 2 bytes with the PLC for both Input and Output instances. Configuration data can be set through the Configuration instance. In RSLogix5000, for example this instance can be written in the menu Controller Tags, where the data for Input, Output and Configuration instances are accessible. Configuration data should be set before downloading the project to the PLC.

The size of Configuration data is 10 bytes, 2 bytes for each configuration field. Configuration fields are arranged as noted above:

- Input/Output
- Inputs polarity
- Outputs polarity
- State on disconnect
- Push/Pull

Name	Value	Force Mask	Style	Data Type
- IO1:C	{...}	{...}		_055C:IO_CDCE...
- IO1:C.Data	{...}	{...}	Decimal	SINT[10]
- IO1:C.Data[0]	16#0F		Hex	SINT
- IO1:C.Data[0].0	1		Decimal	BOOL
- IO1:C.Data[0].1	1		Decimal	BOOL
- IO1:C.Data[0].2	1		Decimal	BOOL
- IO1:C.Data[0].3	1		Decimal	BOOL
- IO1:C.Data[0].4	0		Decimal	BOOL
- IO1:C.Data[0].5	0		Decimal	BOOL
- IO1:C.Data[0].6	0		Decimal	BOOL
- IO1:C.Data[0].7	0		Decimal	BOOL
+ IO1:C.Data[1]	0		Decimal	SINT
+ IO1:C.Data[2]	16#00		Hex	SINT
+ IO1:C.Data[3]	16#00		Hex	SINT
+ IO1:C.Data[4]	16#00		Hex	SINT
+ IO1:C.Data[5]	16#00		Hex	SINT
+ IO1:C.Data[6]	16#00		Hex	SINT
+ IO1:C.Data[7]	16#00		Hex	SINT
+ IO1:C.Data[8]	16#00		Hex	SINT
+ IO1:C.Data[9]	16#00		Hex	SINT
+ IO1:I	{...}	{...}		_055C:IO_F0B37...
+ IO1:O	{...}	{...}		_055C:IO_F5E3C...

Figure 6 :ConveyLinx-IO parameters in RSLogix5000

In the example Input/Output field is set with the value 0x000F, which enables pin2 as an output on all ports.

3 Mounting dimensions

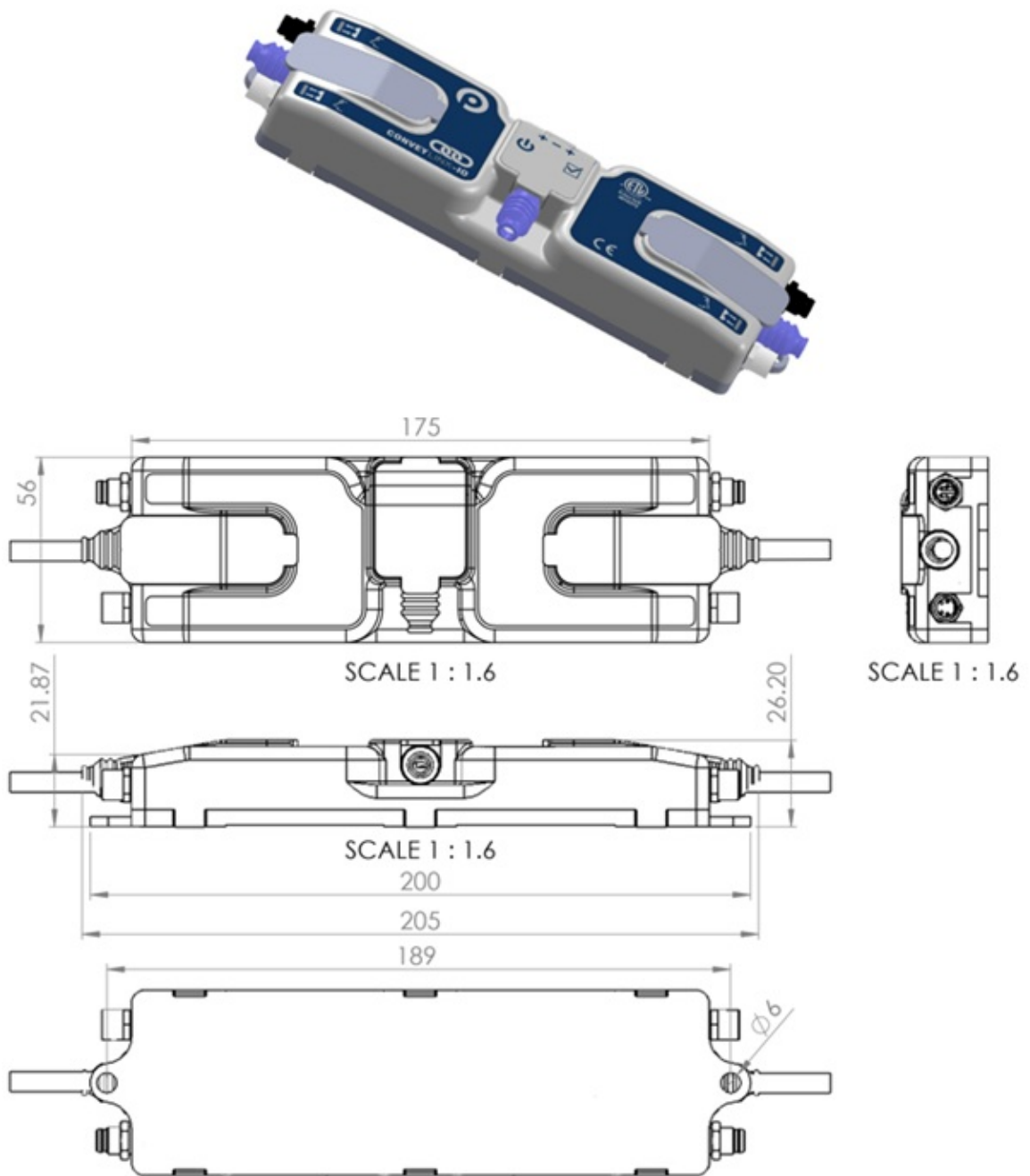


Figure 7: Basic dimensions of the ConveyLinx-IO

4 Specifications

4.1 Overall module electrical specification

Specification	Values
Power supply voltage	18 to 30 VDC
Standby current consumption	<120mA
Minimum Operating Voltage	21V
Maximum Operating Voltage	30V

4.2 Digital inputs

Specification	Values
Quantity	8
Input Delay ON	4 ms
Input Delay OFF	4 ms

4.3 Digital outputs

Specification	Values
Quantity	8
Output Delay ON	4 ms
Output Delay OFF	4 ms
OFF State Leakage Current	1.0 mA
Minimum ON State Current	1.0 mA
Maximum Current per Point	0.4 A
Maximum Current for Total Output Bus	3.2 A
Surge Current	0.5A for 10 ms, repeatable every 2s

4.4 Environmental

Operating outside of these parameters may result in permanent module failure or unexpected device behavior.

Specification	Values
Ambient Operating temperature	0°C to 70°C (32°F to 158°F)
Humidity	5% to 95% non-condensing
Enclosure IP rating	IP54

4.5 Ethernet specification

- 3 port integrated switch (2 external ports and 1 port for the on-board processor)
- Automatic speed setup (10Base-T / 100Base-TX)
- Automatic duplex configuration (Full / Half)
- Automatic straight/crossover cable detection (Auto MDI/MDI-X)
- PAUSE frame support

- Back pressure flow control support
- Maximum segment length: 100m / 328ft

4.6 Supported network protocols

- Modbus/TCP
- EtherNet/IP
- Profinet I/O