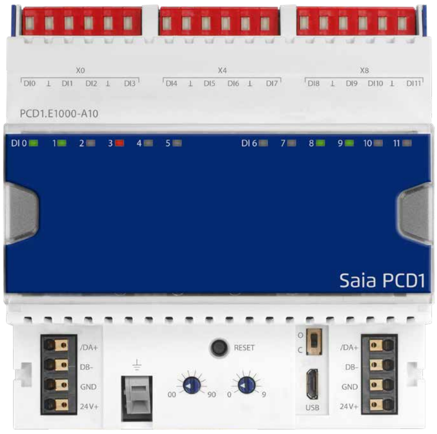
# PCD1.E1000-A10

## E-Line S-Serie RIO 12DI



The S-Serie E-Line RIO modules are controlled via the RS-485 serial communication protocols S-Bus and Modbus for decentralised automation using industrial quality components. The data point mix is specifically designed for building automation applications.

The compact design according to DIN 43880 enables the use in electrical distribution boxes even in the most confined spaces. Installation and maintenance are facilitated by the local manual override for each output. Remote maintenance is also possible using the access to the manual override by the web interface in the Saia PCD® controller. Programming is very efficient and fast using a complete FBox library with web templates for S-Bus. Individual programs may directly access the data points via Registers and Flags, a complete documentation is available from this data sheet.

## Features

- S-Bus protocol optimized for fast data exchange
- Modbus protocol for integration in multi-vendor installations*
- Local override operating level via web panel or buttons on the module
- Easy programming using the FBox library and web templates
- Industrial hardware in accordance with IEC EN 61131-2
- Pluggable terminal blocks
- Bridge connectors for power supply and communication
- Bus termination on board
- Configurable Bi-Colour LEDs and labelling for I/Os

* By default the module is working in S-Bus Data Mode with Autobaud detection.
To configure Modbus the Windows based Application "E-LineApp" is required.

## General technical data

### Power supply

| | |
|---|---|
| Supply voltage | 24 VDC, −15/+20% max. incl. 5% ripple<br>(in accordance with EN/IEC 61131-2) |
| Power consumption | 1.2 … 3 W |
| Power supply bridge | 24 VDC, 5 A max., up to 40 modules |

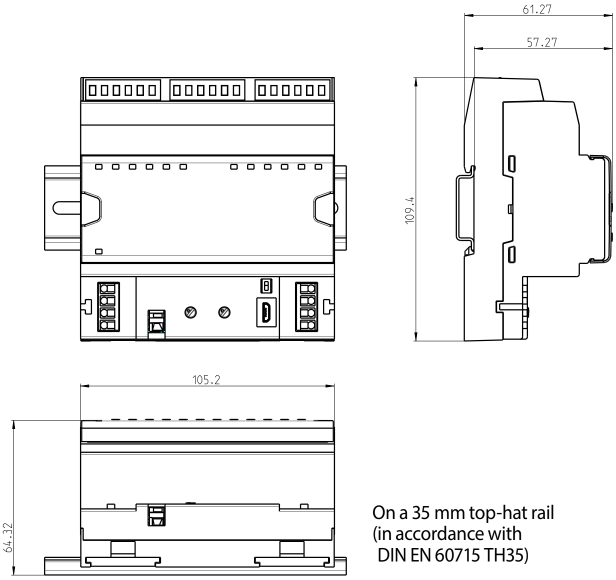
### Interfaces

| | |
|---|---|
| Communications interface | - RS-485 - Baud rate: 9,600, 19,200, 38,400, 57,600, 115,200 bps (Autobauding)<br>- Micro USB, Type B |
| Address switch | Two rotary switches 0 … 9<br>Address range 0 … 98 |
| Bus termination | Integrated switch<br>to activate and inactivate resistor termination |

### General data

| | |
|---|---|
| Ambient temperature | Operation: 0 … +55 °C<br>Storage: −40 … +70 °C |
| Protection class | IP 20 |
| Package | Single carton package with 1 Module incl. terminal blocks, 1 bridge connector |

## Dimensions and installation

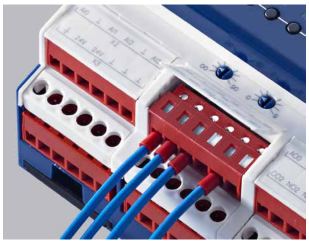


On a 35 mm top-hat rail
(in accordance with
DIN EN 60715 TH35)

Housing width 6 HP (105 mm)
Compatible with electrical control cabinet
(in accordance with DIN 43880, size 2 × 55 mm)

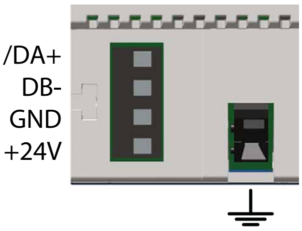
## Terminal technology

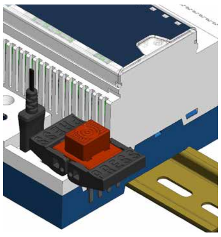
Push-in spring terminals enable wiring with rigid or flexible wires with a diameter up to 1.5 mm². A max. of 1 mm² is permitted with cable end sleeves.



## Connection concept

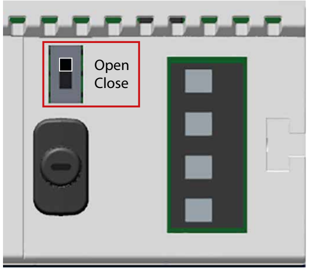
For easy installation the power supply and communication bus is available together at one connector. The push-in spring terminals enable wiring as well support the connector bridge.





## Bus termination

The module provides an active bus termination. It is switched off by factory default. To enable the termination, the switch need to be in the "Close" position.

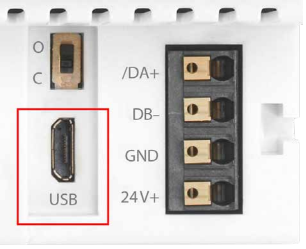


## Status LED

| | |
|---|---|
| OFF | No Power |
| Green | Communication OK |
| Green blink | Auto bauding in progress |
| Orange | No communication |
| Red | Error |
| Red/Green alternate | Booter mode<br>(e.g. during Firmware download) |
| Red blink | Internal fatal error |

## Service interface

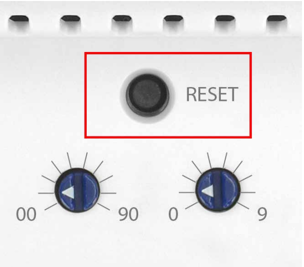
The USB interface provides access to the communication protocol configuration. Firmware updates can also be downloaded via Saia PG5® Firmware Download tool.



## Reset button

**Pushed over 20 seconds:** The button needs to be pushed for minimum 20 seconds and released during the first minute after power up. All user settings are reset to factory default values.

**Pushed at power up:** Power off the device and press the button. Power on and release the button before 5 seconds have passed. The device stays in boot mode for further actions like firmware download etc.

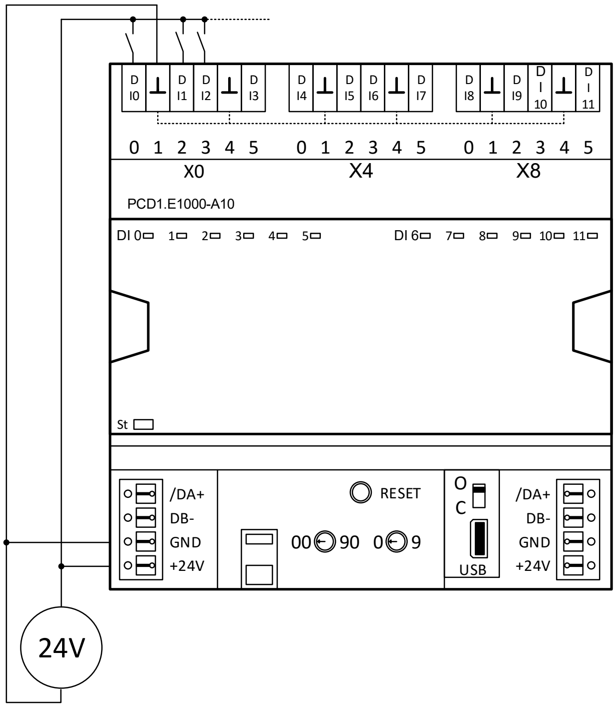


## Input/output configuration

### Digital inputs

| | |
|---|---|
| **Number** | 12 |
| **Input voltage** | 24 VDC, source operation (positive switching) |
| **Switching level** | Low: 0…5 V,<br>High: 15…24 V |
| **Input current** | Typically: 2 mA |
| **Input filter time (DC)** | Typically: 8 ms |

## Assignment overview



## LED Signalisation

### Status LED

| | |
|---|---|
| OFF | No Power |
| Green | Communication OK |
| Green blink | Auto bauding in progress |
| Orange | No communication |
| Red | Error |
| Red/Green alternate | Booter mode<br>(e.g. during Firmware download) |
| Red blink | Internal fatal error |

### Digital intput

The Input indication LED can be configured in colour and blink code separately for state Low and High.

**LED colour**

- Off
- Red
- Green*
- Orange (red + green)

**LED blink code**

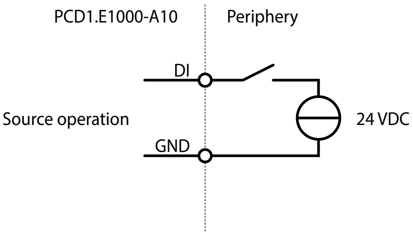
- No blink*
- Slow blinking (0.5 flashes per second)
- Fast blinking (2 flashes per second)

*Factory default

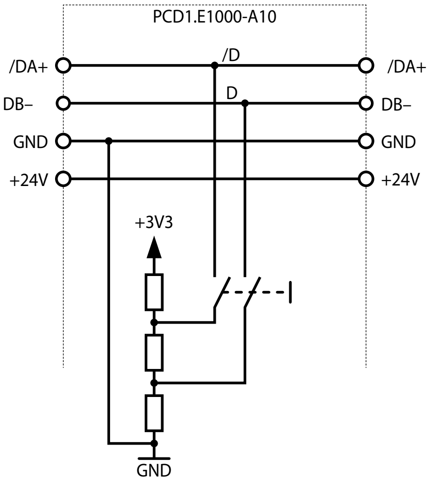
Remarks: In case of error on analogue I/O (overflow), the LED will blink at 1 Hz.

## Connection diagrams

### Digital inputs



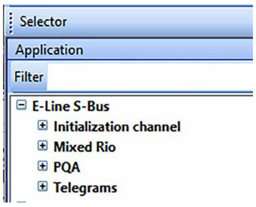
### Power supply and bus termination



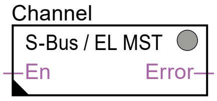
## Programming

The modules are addressed and programmed with Saia PG5® Fupla FBoxes. Web templates are available for the operation and visualisation of the manual override function.

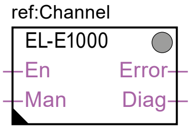
### Fupla



E-Line library



FBox S-Bus initialisation



FBox for devices

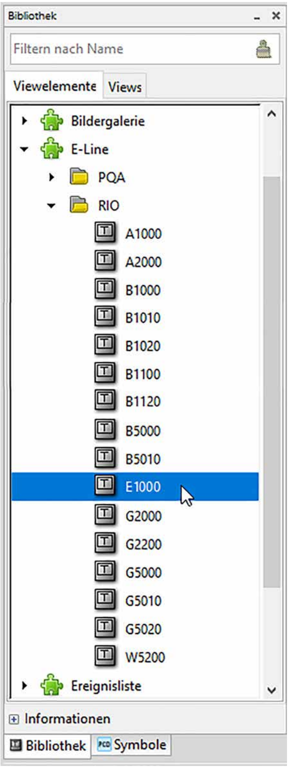
### Communication FBox

- Data exchange for I/O via optimised S-Bus
- Configurable save state for bus interruption or timeout
- Direct generation of the symbols
- Reading and writing of the status of the manual override status
- Direct compatibility with web macros

Further information, including which FBoxes are supported, Getting Started, etc., can be found on our support page www.sbc-support.com.

### Web templates

Web templates are available for the operation and visualisation of the manual override function.

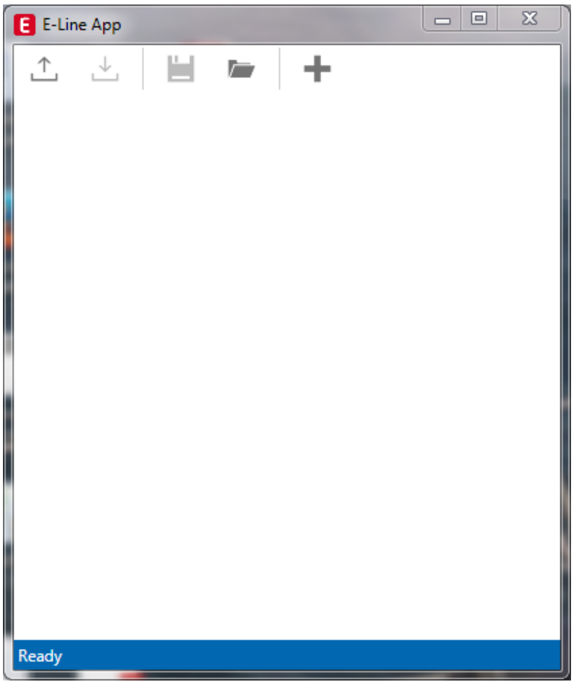


The inputs of the E-Line RIO modules can be addressed via the standard S-Bus. However the FBox from the E-Line library is used for the configuration of these modules.

It is therefore recommended to use the optimised S-Bus protocol and the corresponding FBoxes from the E-Line library. Mixed mode operation is not recommended.

## E-line App device setup

E-Line RIOs support the device setup by a windows application program connected via USB. The installer is available for download from the SBC support page: www.sbc-support.com ➔ E-Line RIO IO Modules.


E-Line App

Ready

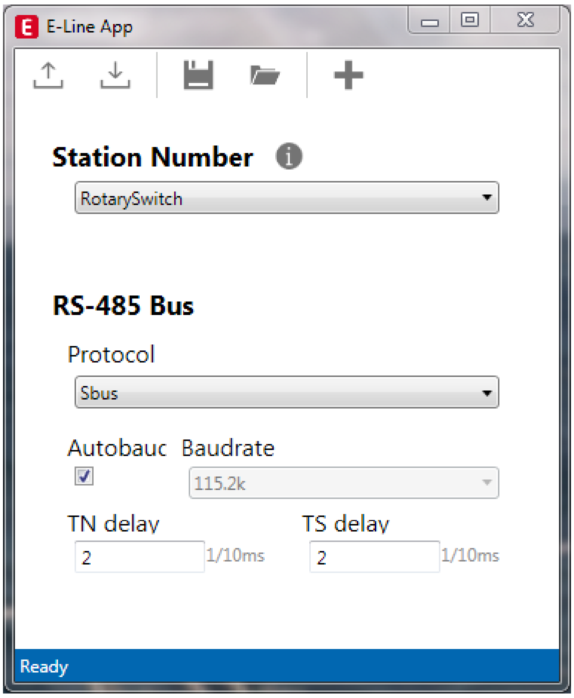
✚ Create a new device configuration

📂 Open an existing device configuration

💾 Save the current settings as device configuration

⭱ Upload configuration from the device

⭳ Download settings to the device


E-Line App

**Station Number** ⓘ

RotarySwitch ▾

**RS-485 Bus**

Protocol

Sbus ▾

Autobauc Baudrate

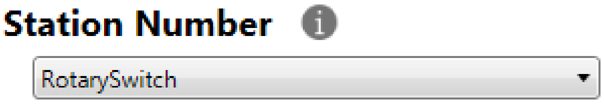
☑ 115.2k ▾

TN delay 2 1/10ms

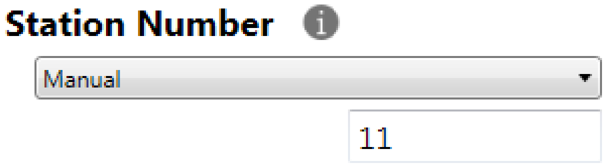
TS delay 2 1/10ms

Ready

The station number can be set by the rotary switches at the device in the range of 0 … 98. If the rotary switches are set to position 99 the station number can be defined by the device configuration in a range of 0 … 253.


**Station Number** ⓘ

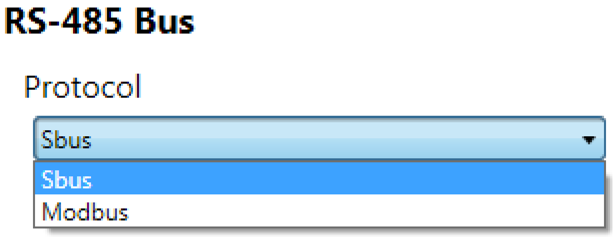
RotarySwitch ▾


**Station Number** ⓘ

Manual ▾

11

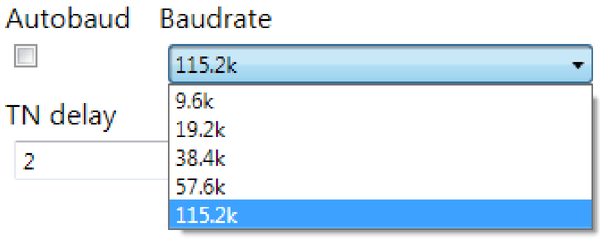
The serial communication protocol can be defined either as S-Bus or Modbus. By default the modules are delivered from factory with S-Bus.


**RS-485 Bus**

Protocol

Sbus ▾

### S-Bus settings


Autobaud ☐

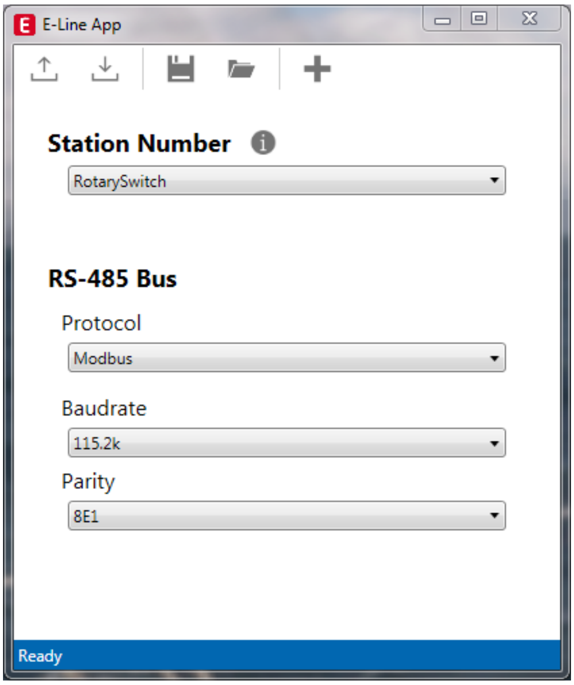
Baudrate 115.2k ▾

TN delay 2

The Baudrate can be defined as automatic detection (default) or set to a specific value. The drop down choice will be available when the check box “Automatic” is unchecked. TN delay and TS delay shall be left at their default values of 2.

# E-line App device setup

## Modbus settings



**Station Number**

RotarySwitch

**RS-485 Bus**

Protocol

Modbus

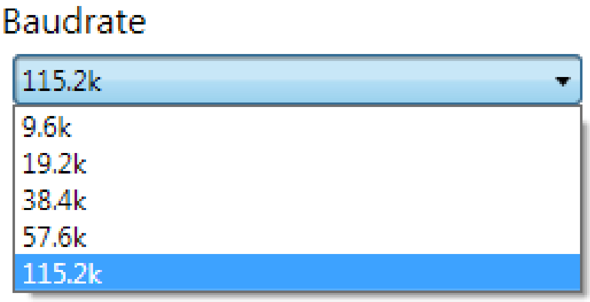
Baudrate

115.2k

Parity

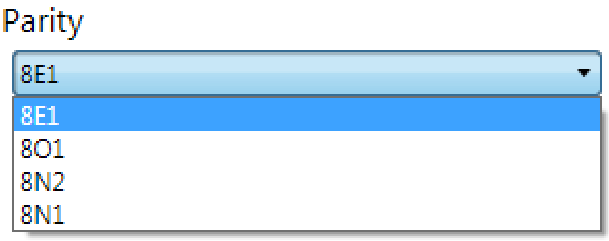
8E1

The Baudrate is set by default to 115k. It can be defined as choice of the list.


Baudrate

115.2k

For best interoperability the Parity Mode and number of Stop Bits can also be set.


Parity

8E1

## S-Bus communication

S-Bus communication is based on Saia PCD® S-Bus Data Mode. Only the set-up of a unique S-Bus address within the communication line is required to establish a communication between Saia PCD® controllers and E-Line RIO modules. The address can be set by the rotary switches at the front of the module. The baud rate will be learned from the network by factory default. In addition a Windows based application is available for manual parameter setup. Configuration parameters as well as manual override state and value are saved non-volatile. A delay of about one second between a manual state change and none volatile saving has to be taken into consideration.

### Device address

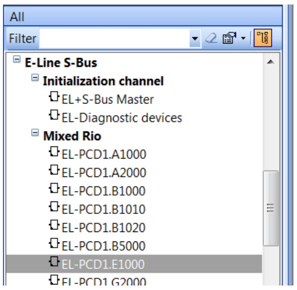
- 0 … 98 Address is taken from the rotary switches
- 99 Address is taken from the device configuration. The address is settable with the E-Line configuration software.

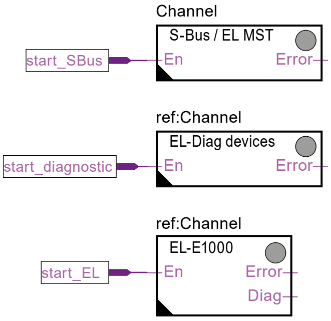
## Usage of the E-Line module specific FBoxes

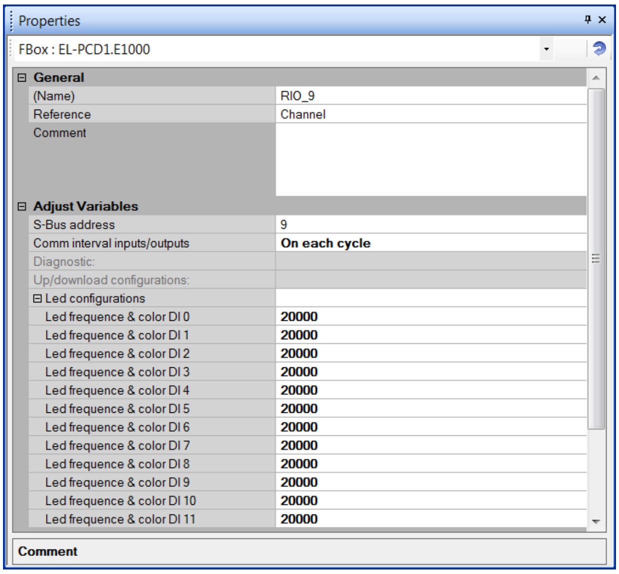
The usage of the E-Line module specific FBoxes from the E-Line S-Bus Fupla library allows an easy and efficient commissioning of the E-Line RIO.

The FBox allow to define and configure all possible functionalities of the E-Line RIO like the behaviour and colour of the LED's and so on.

In the background, the FBox does use the fast 'E-Line S-Bus' protocol for a high speed communication between the master and the RIO.






Properties

FBox : EL-PCD1.E1000

| | |
|---|---|
| ⊟ **General** | |
| (Name) | RIO_9 |
| Reference | Channel |
| Comment | |
| ⊟ **Adjust Variables** | |
| S-Bus address | 9 |
| Comm interval inputs/outputs | **On each cycle** |
| Diagnostic: | |
| Up/download configurations: | |
| ⊟ Led configurations | |
| Led frequence & color DI 0 | **20000** |
| Led frequence & color DI 1 | **20000** |
| Led frequence & color DI 2 | **20000** |
| Led frequence & color DI 3 | **20000** |
| Led frequence & color DI 4 | **20000** |
| Led frequence & color DI 5 | **20000** |
| Led frequence & color DI 6 | **20000** |
| Led frequence & color DI 7 | **20000** |
| Led frequence & color DI 8 | **20000** |
| Led frequence & color DI 9 | **20000** |
| Led frequence & color DI 10 | **20000** |
| Led frequence & color DI 11 | **20000** |

**Comment**

# S-Bus communication

## Direct access to the RIO media with standard S-Bus send and receive telegrams

The following chapter describes the media and parameter mapping to Registers and Flags for individual programming. For efficient PCD programming the E-Line RIO FBox family and templates are suitable for most applications. Only individual programming (e.g. Instruction List) require standard S-Bus communication.

### Digital inputs

| Input | Input Value | Read/Write |
|---|---|---|
| **Digital input 0** | Flag 0 | R |
| **Digital input 1** | Flag 1 | R |
| **Digital input 2** | Flag 2 | R |
| **Digital input 3** | Flag 3 | R |
| **Digital input 4** | Flag 4 | R |
| **Digital input 5** | Flag 5 | R |
| **Digital input 6** | Flag 6 | R |
| **Digital input 7** | Flag 7 | R |
| **Digital input 8** | Flag 8 | R |
| **Digital input 9** | Flag 9 | R |
| **Digital input 10** | Flag 10 | R |
| **Digital input 11** | Flag 11 | R |

### LED Configuration

| | | |
|---|---|---|
| **Digital input 0** | Register 330 | RW |
| **Digital input 1** | Register 331 | RW |
| **Digital input 2** | Register 332 | RW |
| **Digital input 3** | Register 333 | RW |
| **Digital input 4** | Register 334 | RW |
| **Digital input 5** | Register 335 | RW |
| **Digital input 6** | Register 336 | RW |
| **Digital input 7** | Register 337 | RW |
| **Digital input 8** | Register 338 | RW |
| **Digital input 9** | Register 339 | RW |
| **Digital input 10** | Register 340 | RW |
| **Digital input 11** | Register 341 | RW |

Register format:

| | | |
|---|---|---|
| Bit 0 … 7 | I/O state Low | LED colour |
| Bit 8 … 15 | I/O state Low | LED blink code |
| Bit 16 … 23 | I/O state High | LED colour |
| Bit 24 … 31 | I/O state High | LED blink code |

| | |
|---|---|
| LED colour | 0: Off |
| | 1: Red |
| | 2: Green |
| | 3: Orange (red + green) |
| LED blink code | 0: No blink |
| | 1: Slow blinking (0.5 flashes per second) |
| | 2: Fast blinking (2 flashes per second) |

Factory default: Low: off, High: LED colour 2 (green), no blink

The LEDs can be configured individually depending on the I/O state in colour and blink code.

## Device Information

| | | |
|---|---|---|
| Firmware version (Decimal xyyzz, 10802 ➔ 1.08.02) | Register 600 | R |
| Number of supported registers | Register 601 | R |
| Number of supported flags | Register 602 | R |
| Product type (ASCII String)*** | Register 605 … 608 | R |
| Hardware version (Hex) | Register 609 | R |
| Serial number (Hex) | Register 611 … 612 | R |
| Communication protocol (1:S-Bus Slave, 3:Modbus) | Register 620 | R |
| Communication baud rate | Register 621 | R |
| Communication auto baud enable (0:disabled, 1:enabled) | Register 622 | R |
| Communication TN delay * | Register 623 | R |
| Communication TS delay ** | Register 624 | R |
| Communication module address | Register 626 | R |

* Time in 0.1 ms (e.g. 2 means 200 us) before setting activation of RS-485 line driver send mode (only used for S-Bus slave protocol)
** Time in 0.1 ms (e.g. 2 means 200 us) before sending the first character after line driver activation (only used for S-Bus slave protocol)
*** The four registers contain the ASCII characters of the product type.
E.g. for PCD1.A2000-A20:
0605: 50434431H 0606: 2E413230H 0607: 30302D41H 0608: 32300000H

## Modbus communication

Modbus fulfils the requirements for standard communication protocols. It is based on Modbus RTU. The Windows based configuration software is required to enable and set up the Modbus communication parameters. The device address can be set up with the rotary switches at the front of the module. Configuration parameters as well as manual override state and value are saved non-volatile. A delay of about one second between a manual state change and non-volatile saving has to be taken into consideration.

**Device address**

- 0 … 98 Address is taken from the rotary switches
- 99 Address is taken from the device configuration. The address is settable with the E-Line configuration software.

**Start-up procedure**

- Reboot: All outputs are cleared (Off state)
- <1 sec. Output in manual operation are set according to the state before power down.
- Outputs in automatic mode

  Is no telegram received after reboot within the "safe state power-on timeout" the module enters as will into the safe state mode and sets the outputs according to their configured values.

  On reception of a valid command telegram the outputs are controlled by the communication. When no communication update followed within the "safe state com. timeout" the module enters into safe state and sets the outputs according to their configured values.

The following chapter describes the media and parameter mapping to Registers and Flags (=Coils).

Supported Modbus services:

- Function code 1 (read outputs)
- Function code 3 (read registers)
- Function code 15 (write multiple outputs)
- Function code 16 (write multiple registers)

# Modbus communication

## Read coils

| Request | | | | | | | |
|---|---|---|---|---|---|---|---|
| Address | Function | Start Address | | Number of coils to read | | CRC | |
| 0 … 254 | 1 | High-Byte | Low-Byte | High-Byte | Low-Byte | High-Byte | Low-Byte |

| Reply | | | | | | | |
|---|---|---|---|---|---|---|---|
| Address | Function | No. of Byte | Data | | | CRC | |
| 0 … 254 | 1 | 0 … 256 | Coil 0 … 7 | Coil 8 … 15 | ··· | High-Byte | Low-Byte |

## Write coils

| Request | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Address | Function | Start Address | | Number of Coils to write | | Coil data | | | CRC | |
| 0 … 254 | 15 | High-Byte | Low-Byte | High-Byte | Low-Byte | No. of Bytes | Coil 0 … 7 | ··· | High-Byte | Low-Byte |

| Reply | | | | | | | |
|---|---|---|---|---|---|---|---|
| Address | Function | Start Address | | Number of written Coils | | CRC | |
| 0 … 254 | 15 | High-Byte | Low-Byte | High-Byte | Low-Byte | High-Byte | Low-Byte |

## Read register

| Request | | | | | | | |
|---|---|---|---|---|---|---|---|
| Address | Function | Start Address | | No. of Register to read | | CRC | |
| 0 … 254 | 3 | High-Byte | Low-Byte | High-Byte | Low-Byte | High-Byte | Low-Byte |

| Reply | | | | | | | |
|---|---|---|---|---|---|---|---|
| Address | Function | No. of Byte | Register Start Addr + 0 | | Addr + n | CRC | |
| 0 … 254 | 3 | 0 … 256 | High-Byte | Low-Byte | ··· | High-Byte | Low-Byte |

## Write register

| Request | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Address | Function | Start Address | | No. of Registers | | No. of Bytes | Data Word: Start Addr + 0 | | Addr + n | CRC | |
| 0 … 254 | 16 | High-Byte | Low-Byte | High-Byte | Low-Byte | 2 … 256 | Low-Byte | High-Byte | ··· | High-Byte | Low-Byte |

| Reply | | | | | | | |
|---|---|---|---|---|---|---|---|
| Address | Function | Start Address | | No of written Registers | | CRC | |
| 0 … 254 | 16 | High-Byte | Low-Byte | High-Byte | Low-Byte | High-Byte | Low-Byte |

The CRC has to be calculated over all telegram bytes starting with address field up to the last data byte. The CRC has to be attached to the data. Please find an example at the appendix of this document. For more details, please refer the publicly available Modbus documentation www.modbus.org.

# Modbus communication

### Digital inputs

| Input | Input Value | Read/Write |
|---|---|---|
| Digital input 0 | Flag 0 | R |
| Digital input 1 | Flag 1 | R |
| Digital input 2 | Flag 2 | R |
| Digital input 3 | Flag 3 | R |
| Digital input 4 | Flag 4 | R |
| Digital input 5 | Flag 5 | R |
| Digital input 6 | Flag 6 | R |
| Digital input 7 | Flag 7 | R |
| Digital input 8 | Flag 8 | R |
| Digital input 9 | Flag 9 | R |
| Digital input 10 | Flag 10 | R |
| Digital input 11 | Flag 11 | R |

### LED Configuration

| | | |
|---|---|---|
| **LED Digital input 0** | Output L, Reg. 660<br>Output H, Reg. 661 | RW |
| **LED Digital input 1** | Output L, Reg. 662<br>Output H, Reg. 663 | RW |
| **LED Digital input 2** | Output L, Reg. 664<br>Output H, Reg. 665 | RW |
| **LED Digital input 3** | Output L, Reg. 666<br>Output H, Reg. 667 | RW |
| **LED Digital input 4** | Output L, Reg. 668<br>Output H, Reg. 669 | RW |
| **LED Digital input 5** | Output L, Reg. 670<br>Output H, Reg. 671 | RW |
| **LED Digital input 6** | Output L, Reg. 672<br>Output H, Reg. 673 | RW |
| **LED Digital input 7** | Output L, Reg. 674<br>Output H, Reg. 675 | RW |
| **LED Digital input 8** | Output L, Reg. 676<br>Output H, Reg. 677 | RW |
| **LED Digital input 9** | Output L, Reg. 678<br>Output H, Reg. 679 | RW |
| **LED Digital input 10** | Output L, Reg. 680<br>Output H, Reg. 681 | RW |
| **LED Digital input 11** | Output L, Reg. 682<br>Output H, Reg. 683 | RW |

Register format:

| | | |
|---|---|---|
| Output L, Bit 0 … 7 | I/O state Low | LED colour |
| Output L, Bit 8 … 15 | I/O state Low | LED blink code |
| Output H, Bit 0 … 7 | I/O state High | LED colour |
| Output H, Bit 8 … 15 | I/O state High | LED blink code |

| | |
|---|---|
| LED colour | 0: Off |
| | 1: Red |
| | 2: Green |
| | 3: Orange (red + green) |
| LED blink code | 0: No blink |
| | 1: Slow blinking (0.5 flashes per second) |
| | 2: Fast blinking (2 flashes per second) |

Factory default: Low: off, High: LED colour 2 (green), no blink

The LEDs can be configured individually depending on the I/O state in colour and blink code.

## Device Information

| | | |
|---|---|---|
| Firmware version (Decimal xyyzz, 10802 ➔ 1.08.02) | Register 1200 | R |
| Number of supported registers | Register 1202 | R |
| Number of supported flags | Register 1204 | R |
| Product type (ASCII String)* | Register 1210 … 1217 | R |
| Hardware version (Hex) | Register 1218 | R |
| Serial number (Hex) | Register 1222 … 1224 | R |
| Communication protocol (1: S-Bus Slave, 3: Modbus) | Register 1240 | R |
| Communication baud rate | Register 1242 | R |
| Communication auto baud enable (0:disabled, 1:enabled) | Register 1244 | R |
| Communication Mode<br>0: 8,E,1; 1: 8,O,1; 2: 8,N,2; 3: 8,N,1 | Register 1250 | R |
| Communication module address | Register 1252 | R |

* The eight registers contain the ASCII characters of the product type.
E.g. for PCD1.A2000-A20:
1210…1217: 5043H | 4431H | 2E41H | 3230H | 3030H | 2D41H | 3230H | 0000H

### CRC Generation Example

(Source: http://modbus.org/docs/PI_MBUS_300.pdf, the following content of this page is copied from the referenced document. In case of any questions, please check out the original source)

The function takes two arguments: unsigned char *puchMsg; A pointer to the message buffer containing binary data to be used for generating the CRC unsigned short usDataLen; The quantity of bytes in the message buffer. The function returns the CRC as a type unsigned short.

### CRC Generation Function

```
unsigned short CRC16(puchMsg, usDataLen) ;
unsigned char *puchMsg ;                           /* message to calculate CRC upon */
unsigned short usDataLen ;                         /* quantity of bytes in message */
{
       unsigned char uchCRCHi = 0xFF ;             /* high byte of CRC initialized */
       unsigned char uchCRCLo = 0xFF ;             /* low byte of CRC initialized */
       unsigned uIndex ;                           /* will index into CRC lookup table */
       while (usDataLen--)                         /* pass through message buffer */
       {
              uIndex = uchCRCHi ^ *puchMsgg++;     /* calculate the CRC */
              uchCRCHi = uchCRCLo ^ auchCRCHi[uIndex];
              uchCRCLo = auchCRCLo[uIndex];
       }
       return (uchCRCHi << 8 | uchCRCLo);
}
```

### High-Order Byte Table

```
/* Table of CRC values for high-order byte */
static unsigned char auchCRCHi[] = {
0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40 };
```

### Low-Order Byte Table

```
/* Table of CRC values for low-order byte */
static char auchCRCLo[] = {
0x00, 0xC0, 0xC1, 0x01, 0xC3, 0x03, 0x02, 0xC2, 0xC6, 0x06, 0x07, 0xC7, 0x05, 0xC5, 0xC4, 0x04,
0xCC, 0x0C, 0x0D, 0xCD, 0x0F, 0xCF, 0xCE, 0x0E, 0x0A, 0xCA, 0xCB, 0x0B, 0xC9, 0x09, 0x08, 0xC8,
0xD8, 0x18, 0x19, 0xD9, 0x1B, 0xDB, 0xDA, 0x1A, 0x1E, 0xDE, 0xDF, 0x1F, 0xDD, 0x1D, 0x1C, 0xDC,
0x14, 0xD4, 0xD5, 0x15, 0xD7, 0x17, 0x16, 0xD6, 0xD2, 0x12, 0x13, 0xD3, 0x11, 0xD1, 0xD0, 0x10,
0xF0, 0x30, 0x31, 0xF1, 0x33, 0xF3, 0xF2, 0x32, 0x36, 0xF6, 0xF7, 0x37, 0xF5, 0x35, 0x34, 0xF4,
0x3C, 0xFC, 0xFD, 0x3D, 0xFF, 0x3F, 0x3E, 0xFE, 0xFA, 0x3A, 0x3B, 0xFB, 0x39, 0xF9, 0xF8, 0x38,
0x28, 0xE8, 0xE9, 0x29, 0xEB, 0x2B, 0x2A, 0xEA, 0xEE, 0x2E, 0x2F, 0xEF, 0x2D, 0xED, 0xEC, 0x2C,
0xE4, 0x24, 0x25, 0xE5, 0x27, 0xE7, 0xE6, 0x26, 0x22, 0xE2, 0xE3, 0x23, 0xE1, 0x21, 0x20, 0xE0,
0xA0, 0x60, 0x61, 0xA1, 0x63, 0xA3, 0xA2, 0x62, 0x66, 0xA6, 0xA7, 0x67, 0xA5, 0x65, 0x64, 0xA4,
0x6C, 0xAC, 0xAD, 0x6D, 0xAF, 0x6F, 0x6E, 0xAE, 0xAA, 0x6A, 0x6B, 0xAB, 0x69, 0xA9, 0xA8, 0x68,
0x78, 0xB8, 0xB9, 0x79, 0xBB, 0x7B, 0x7A, 0xBA, 0xBE, 0x7E, 0x7F, 0xBF, 0x7D, 0xBD, 0xBC, 0x7C,
0xB4, 0x74, 0x75, 0xB5, 0x77, 0xB7, 0xB6, 0x76, 0x72, 0xB2, 0xB3, 0x73, 0xB1, 0x71, 0x70, 0xB0,
0x50, 0x90, 0x91, 0x51, 0x93, 0x53, 0x52, 0x92, 0x96, 0x56, 0x57, 0x97, 0x55, 0x95, 0x94, 0x54,
0x9C, 0x5C, 0x5D, 0x9D, 0x5F, 0x9F, 0x9E, 0x5E, 0x5A, 0x9A, 0x9B, 0x5B, 0x99, 0x59, 0x58, 0x98,
0x88, 0x48, 0x49, 0x89, 0x4B, 0x8B, 0x8A, 0x4A, 0x4E, 0x8E, 0x8F, 0x4F, 0x8D, 0x4D, 0x4C, 0x8C,
0x44, 0x84, 0x85, 0x45, 0x87, 0x47, 0x46, 0x86, 0x82, 0x42, 0x43, 0x83, 0x41, 0x81, 0x80, 0x40 };
```

## ATTENTION

**These devices must only be installed by a professional electrician, otherwise there is the risk of fire or the risk of an electric shock.**

## WARNING

**Product is not intended to be used in safety critical applications, using it in safety critical applications is unsafe.**

## WARNING - Safety

**The unit is not suitable for the explosion-proof areas and the areas of use excluded in EN 61010 Part 1.**

## WARNING - Safety

**Check compliance with nominal voltage before commissioning the device (see type label). Check that connection cables are free from damage and that, when wiring up the device, they are not connected to voltage.**

## NOTE

**In order to avoid moisture in the device due to condensate build-up, acclimatise the device at room temperature for about half an hour before connecting.**

## CLEANING

**The device can be cleaned in dead state with a dry cloth or cloth soaked in soap solution. Do not use caustic or solvent-containing substances for cleaning.**

## MAINTENANCE

**These devices are maintenance-free. If damaged during transportation or storage, no repairs should be undertaken by the user.**

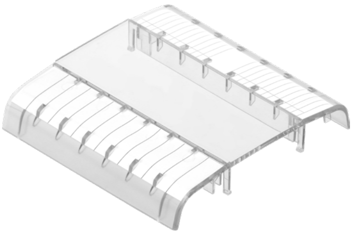
## GUARANTEE

**Opening the module invalidates the guarantee.**

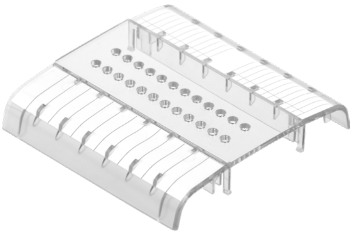
**WEEE Directive 2012/19/EC Waste Electrical and Electronic Equipment directive**
The product should not be disposed of with other household waste. Check for the nearest authorized collection centers or authorized recyclers. The correct disposal of end-of-life equipment will help prevent potential negative consequences for the environment and human health.

EAC Mark of Conformity for Machinery Exports to Russia, Kazakhstan or Belarus.

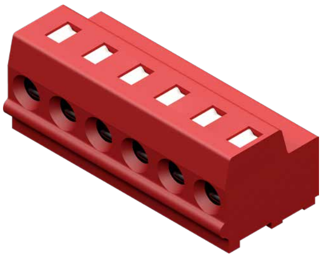
PCD1.E1000-A10



PCD1.K0206-005



PCD1.K0206-025



Terminal set
32304321-003-S

## Order details

| Type | Short description | Description | Weight |
|---|---|---|---|
| **PCD1.E1000-A10** | E-Line S-Serie RIO 12DI | E-Line S-Serie Digital input module<br>status LED for inputs<br>supply 24 VDC<br>12 Digital inputs 24 VDC (source operation)<br>1 interface RS-485 (S-Bus and Modbus)<br>1 USB service interface | 180 g |
| **PCD1.K0206-005** | E-Line labelling set 5 × 6 HP* | E-Line cover and labelling set consisting of 5 × covers (6 HP = 105 mm) and labelling sheet for mounting in the automation control cabinet | 365 g |
| **PCD1.K0206-025** | E-Line labelling set 5 × 6 HP* with holes | E-Line cover and labelling set with holes consisting of 5 × covers (6 HP = 105 mm) with holes for manual override operating level and labelling sheet for mounting in the automation control cabinet | 365 g |
| **32304321-003-S** | Terminal set | 6-pin terminal. Set of 6 terminal blocks | 40 g |

* Horizontal pitch: 1 HP corresponds to 17.5 mm

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