sbc ✚
SAIA BURGESS CONTROLS

PCD1.G1100-C15

E-Line light and blind module

The module has a housing width of 35 mm (2 HP*) that is compatible with electrical control cabinets, is controlled via RS-485 and enables light and blind control. It has two analogue and two relay outputs and four digital inputs. The user can optionally use the relay for the direct switching of two light groups or to control window shading or blinds. The blinds or shading can be positioned and defects localised via the integrated load current measurement. The user can implement the digital inputs to connect electrical sensors. All inputs/outputs are available to the PLC program at all times via the communications interface.

Features

▶ 4 digital inputs

▶ 2 relays incl. current detection

▶ 2 analogue outputs

▶ Electrical isolation between supply, bus and I/Os

▶ Pluggable terminal blocks protected by flaps

▶ Status LEDs on the front

▶ RS-485, USB and NFC interfaces

▶ Freely programmable with Saia PG5®

General technical data

Power supply

Supply voltage	Nominal 24 VAC (50 Hz) or DC 24 VDC, -15/+20 % incl. 5 % ripple 24 VAC, -15 %/+10 % (in accordance with EN/IEC 61131-2)
Electrically isolated	500 VDC between power supply and RS-485 as well as between power supply and inputs/outputs
Power consumption max.	2 W

Interfaces

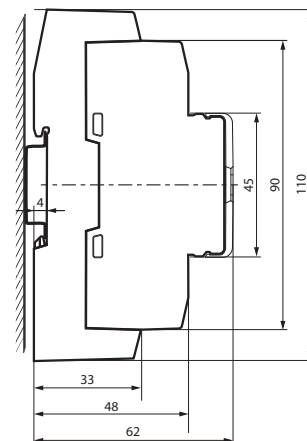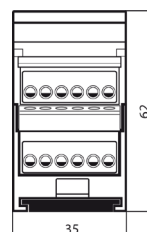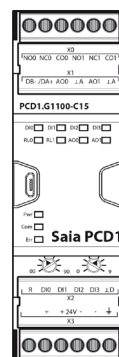|	
Communications interface	RS-485 with galvanic isolation Baud rate: 9,600, 19,200, 38,400, 57,600, 115,200 bps (autobauding)
Address switch for S-Bus address	Two rotary switches 0…9 Address range 0…253
Service interface	Micro USB NFC (Near Field Communication)

General data

Ambient temperature	Operation: 0 … +55 °C Storage: −40 … +70 °C

Dimensions and installation

on DIN rails 35 mm
(in accordance with DIN EN 60715 TH35)

Housing width 2 HP* (35 mm)
Compatible with electrical control cabinets
(in accordance with DIN 43880, size 2 × 55 mm)

* Horizontal pitch: 1 HP corresponds to 17.5 mm

Input/output configuration

Digital inputs

|	
Number	4
Input voltage	24 VAC / VDC source operation (positive switching) or sink operation
Switching level	Low: 0…5 V, High: 15…24 V
Input current	Typically 2 mA (AC/DC)
Input delay	20 ms (AC), 2 / 8 / 50 ms (DC)

Relay outputs

Number	2 (changeovers)
Switching voltage max.	250 VAC / 30 VDC
Switching current max.	8 A (AC1, DC1)
Max. inrush current	15 A
Contact protection	None
Local operation	None
Load current measurement	≥ 200 mA, resolution 100 mA

Analogue outputs

|		
Number	2	
Resolution	12 bit	
Signal range	0…10 V	
Protection	Short-circuit protection	
Resolution	2.44 mV	
Max. load at output	3.3 kΩ (3.3 mA @ 10 V)	
Accuracy (at TAmbient = 25°C)	0.3 % of the value ± 10 mV	
Residual ripple	< 15 mVpp	
Temperature error (0°C…+55°C)	± 0.2 %	
Output delay	Channel update	1 ms (all channels are updated during this time)
	Time constant of hardware output filter	voltage measurement τ = 2.5 ms
Local override operation	None	

Assignment overview
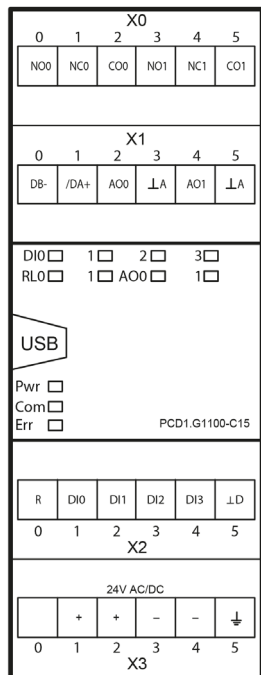
Connection diagrams

Digital input
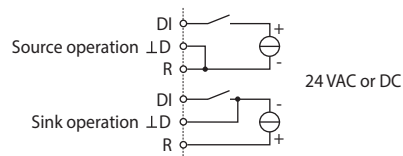
Relay
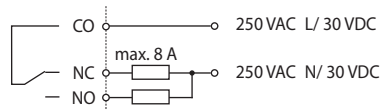
Analogue output
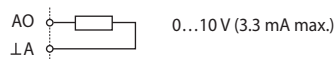
GND	⊥	ground
DGND	⊥D	digital galvanic isolated ground
AGND	⊥A	analogue galvanic isolated ground
SGND	⊥S	signal ground
	a, b, ..	alphanumeric index by different grounds

Terminal technology

Rigid or flexible wires with a diameter of up to 1.5 mm² can be used. A max. of 1 mm² is permitted with wire ferrules.
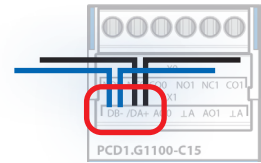
Connection concept

The device is supplied by a 24 VDC or AC voltage supply.
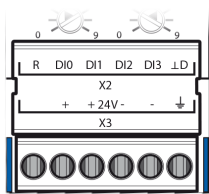
Bus wiring

DB- and /DA+ terminals must be used for exchanging data between the modules. The bus is through-wired to a terminal to ensure the exchange between modules to avoid an interruption in the bus connection.

> Flexible RS-485 cables with a cross section of no more than 0.75 mm² are permissible for bus wiring. A cable cross section of 1.5 mm² per terminal applies overall. External bus terminating resistors must be used.

5 Programming

The modules are programmed with Saia PG5® via a master controller or directly via Micro USB.

Program

Non-volatile memory (Flash memory)

Program blocks

COB	COB 0
XOB	XOB 10, 12, 13 and 16
PB / FB	100 with maximum hierarchy of 8

Data types

ROM Text / DB	50

Memory

Program memory	64 kByte

Media

Volatile memory (RAM) without battery backup

Data types

Register	2000
Flag	2000
Timer / Counter	200

Memory

| Memory (RAM) for 50 Text / DB	5 kByte
Memory (EEPROM) for up to 500 parameters (media) backup	2 kByte
Cyclic synchronisation with PCD controller	Real-time clock (RTC)

Supported libraries

The modules are planned with Saia PG5® using FBoxes or IL. The Saia PG5® Fupla Editor provides a selection of FBoxes which significantly simplify engineering.

PG5 standard FBox libraries:
- Binary
- Blinker
- Block Control (without SB)
- Buffers
- Com.Text (not interpreted)
- Converter
- Counter
- DALI E-Line Driver (new)
- Data Block
- Data Buffer
- EIB Driver (partly)
- EnOcean (partly)
- Flip-Flop
- Floating Point (IEEE only)
- HVC (partly)
- Indirect
- Integer
- Ladder
- Move In / Out
- MP-Bus
- Regulation (partly)
- Special, sys info (partly)
- Timer

In addition to these libraries, an "E-Suite" library is available for specific applications that can be created with the Saia PCD1 E-Line modules. An example for the electrical plant: shade control, light dimming,…
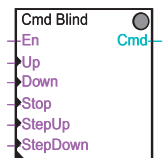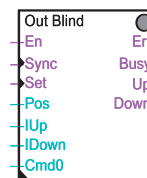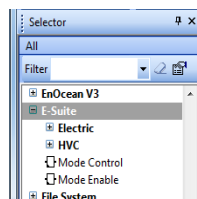
> More details on which FBoxes are supported, Getting Started, etc. are available on our support page www.saia-support.com

NOTE

Extra low voltages (ELV) or secure low voltages (SELV) are voltages up to 50 Volts.

NOTE

Low voltages are voltages between 50 … 250 Volts.

INSTALLATION DIRECTION FOR SWITCHING LOWER VOLTAGES

For reasons of safety it is not allowed that extra low voltages and low voltages are connected to two adjacent relay contacts. Neither may different phases may be connected to two adjacent relay contacts. But a relay contact between them can be left empty.

If a Saia PCD® system module is connected to low voltage, then all components which are electrically connected to this system must be approved for low voltage.

When using low voltage, all connections to the relay contacts, which are connected to the same circuit, must be protected by a common fuse.
The individual load circuits, on the other hand, may be protected individually by a fuse.

Switching Inductive Loads

Due to the physical properties of the inductance, noiseless shutdown of the inductance is not possible. These interferences must be minimised as much as possible. Regardless of whether the Saia PCD® is immune to these interferences, other devices may still be impaired.

It should also be noted that, as part of EU standard harmonisation, the EMC standards have been valid since 1996 (EMC Directive 89/336/EC). For this reason, two principles can be observed:

- THE SUPPRESSION OF INDUCTIVE LOADS IS ABSOLUTELY NECESSARY!
- INTERFERENCE SHOULD BE ELIMINATED AT THE INTERFERENCE SOURCE IF POSSIBLE!

The relay contacts on the existing module are wired. It is nevertheless recommended to install a suppressor on the load.

(Often available as standard components for standardised gates and valves).

When switching DC voltage, it is highly recommended to install a freewheeling diode over the load. This is also the case even if theoretically a resistive load is switched. There is always an inductive share in practice (connection cable, resistor coil, etc.). Please note that the shutdown time is extended here.

(Ta approx. L/RL * √ (RL * IL/0.7).

The transistor output modules are recommended for DC voltage.

Specifications of the relay manufacturer about the dimensioning of the RC elements

Contact protection circuits:

The purpose of the contact protection circuits is the suppression of the switching arcs ("switching sparks") and thus achieving a longer service life of the contact pieces. Each protection circuit may exhibit advantages and disadvantages. For arc quenching using RC elements, see the figure opposite.

When shutting down load circuits with inductive components (e.g. relay coils and magnet windings), an overvoltage (self-induction voltage) can arise which may be many times higher than the operating voltage and jeopardise the isolation on the load circuit due to the current interruption at the switching contacts. The initial sparks that arise from this lead to rapid wear on the relay contacts. For this reason, the contact protection circuit is particularly important for inductive load circuits. The values for the RC combination can also be determined from the diagram opposite, however the overvoltage (e.g. to be measured with an oscilloscope) arising from the current interruption for the voltage U is to be applied. The current must be calculated based on this voltage and the known resistance at which this was measured.

Only anti-interference capacitors in accordance with VDE 0565 T1 class X2 may be used in suppressors. These capacitors have a high switching capability and are designed for particularly high switching overvoltages. Direct operation on the mains voltage is also possible.

The resistors used must withstand high voltages (pulse strength). Voltage flashovers can arise on the production-related coil cut particularly for low-resistance values. Fixed carbon resistors are therefore used for suppressors in particular. Enamelled wire resistors, however, or cement resistors with a large coil pitch are also suitable.

Specifications of the relay manufacturer about the dimensioning of the RC elements

Dimensioning aid:

The value for C results directly from the current to be switched. The value for the resistance R is calculated by drawing a line through the corresponding points of the I and U curve and the resistance is read at the point of intersection with the R curve.
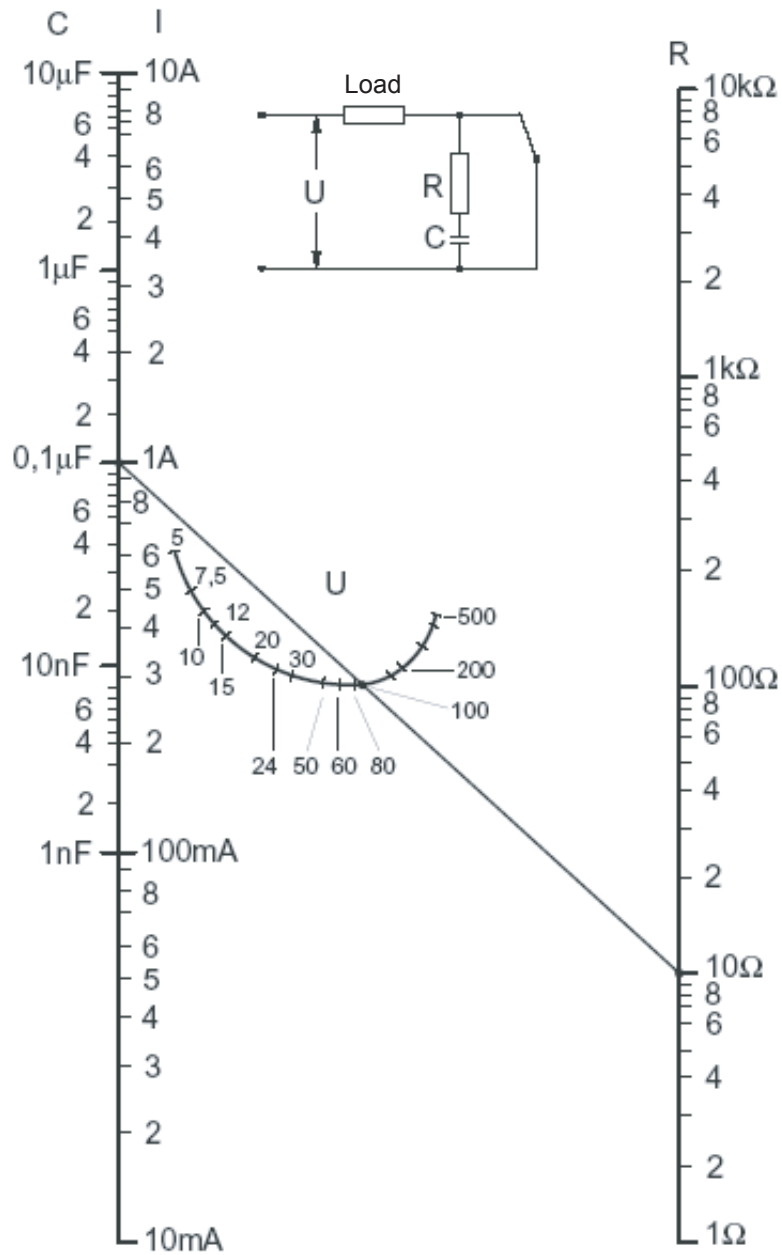
Example:

U = 100V   I = 1A

C is therefore 0.1 µF

R = 10 Ω (point of intersection with R-scale)

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, 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.G1100-C15

Terminal set
32304321-003-S

Order details

Type	Short description	Description	Weight
PCD1.G1100-C15	E-Line light and blind module	Programmable E-Line input/output module for light and sunblind control Supply 24 VAC/VDC 4 digital inputs 24 VAC / VDC 2 changeover relays 230 VAC / 30 VDC, 8 A, max. inrush current 15 A, incl. electrically isolated current measurement of the burden 2 analogue outputs 12 bit, 0…10 V (3 mA max.) 2 interfaces: RS-485 (S-Bus), µUSB for PG5	140 g
32304321-003-S	Terminal set	6-pin terminal. Set of 6 terminal blocks	40 g

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