

PCD3.W325

Analog input module, 7 channel, 12 bit, – 10 ...+ 10 V,
electrically isolated from the CPU



High-speed input modules for general use with 7 channels,
each with 12 bit resolution and – 10 ...+ 10 V.
Electrically isolated from the CPU.

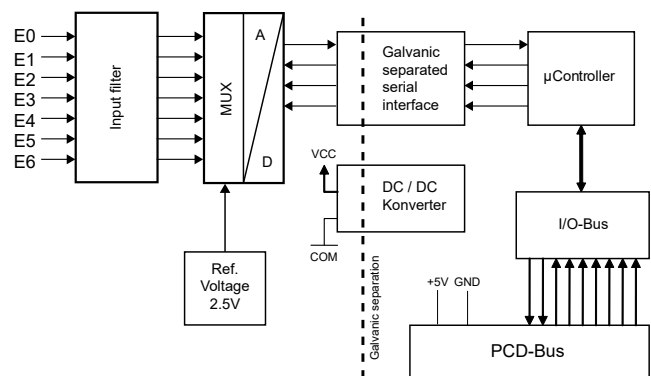
Technical specifications

Number of inputs (channels)	7
Signal range	– 10 ...+ 10 V
Resolution (representation)	12 bit (0 ... 4095)
Resolution (value of least significant bit(LSB))	5 mV
Galvanic separation	500 V, electrical isolation of outputs to CPU, channels themselves not separated
Measuring principle	non-differential, single-ended
Input resistance	13.7 kΩ / 0.1 %
Accuracy at 25 °C	± 0.15 %
Repeating accuracy (under same conditions)	± 0.05 %
Temperature error (0 ... +55 °C)	± 0.25 %
Conversion time A/D	≤ 2 ms
Overvoltage protection	± 40 VDC (permanent)
EMV protection	yes
Time constant of input filter	typisch 2.4 ms
Internal current consumption (from +5 V bus)	< 60 mA
Internal current consumption (from V+ bus)	0 mA
External current consumption	0 mA
Terminals	Pluggable 10-pole spring terminal block for Ø up to 2.5 mm ² , plug type E (4 405 4998 0)

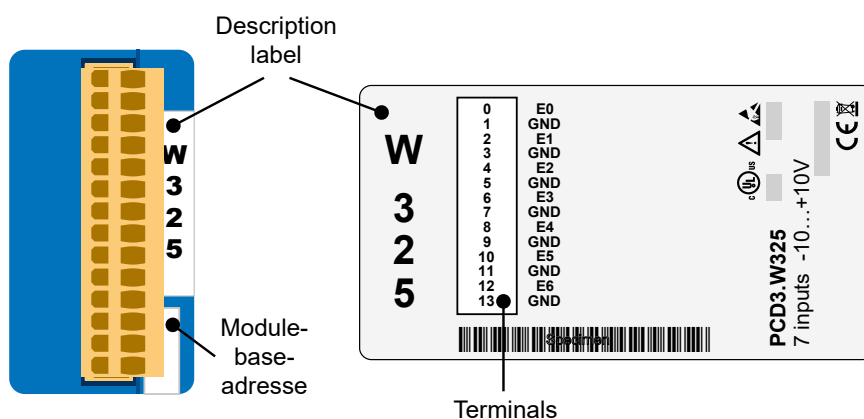


PCD3.W325

Block schematic



Indicators and connections

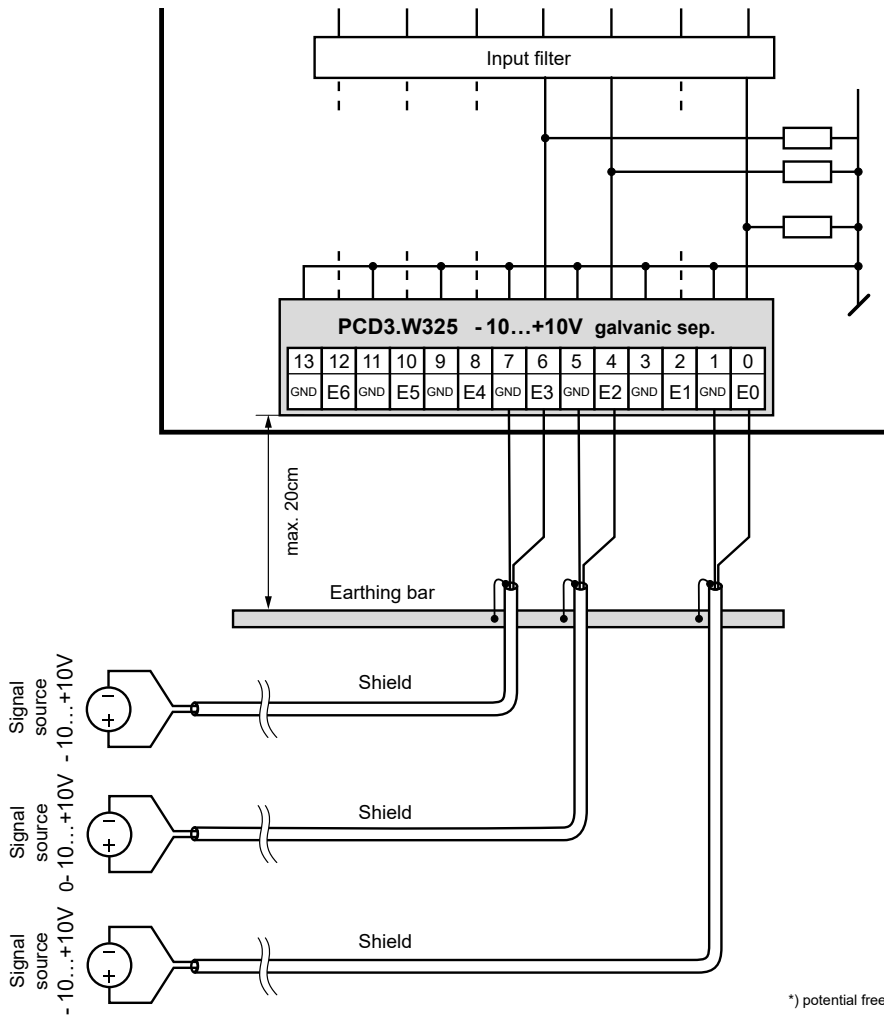


The GND connections are connected together in the module and are galvanically isolated from the CPU. These GNDs must not be connected to the CPU, process GNDs or ground !

Connection concept for voltage inputs

The voltage input signals are connected directly to the 14-pole terminal block (E0 ... E6 and GND). To minimize the amount of interference coupled into the module via the transmission lines, connection should be made according to the principle explained below.

Connection for -10...+10 V



The GND connections are connected together in the module and are galvanically isolated from the CPU. These GNDs must not be connected to the CPU, process GNDs or ground !



If shielded cables are used, the shielding should be connected to an earthing rail.



Input signals with incorrect polarity significantly distort the measurements on the other channels.

Configuration

Saia PG5® Controls Suite

PCD-System	Evaluation
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Classic

The evaluation is performed by the firmware. It reads the values according to the configuration (Device Configurator or Network Configurator).

Slot 2 : PCD3.W325, 7 Analogue Inputs, -10..+10V, Isolated

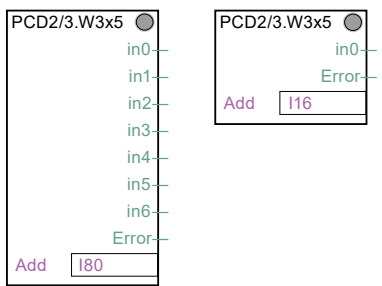
- General**
 - BaseAddress: 32
 - Filter: Off
 - Under-/OverflowAvoidance: Off
 - Connector Type: Type E, Spring Terminals 14-pole
- Power Consumption**
 - Power Consumption 5V [mA]: 60
- Media Mapping Analogue Inputs**
 - Media Mapping For Inputs Enabled: No
 - Media Type For Inputs: Register
 - Number Of Media For Inputs: 7
- Media Mapping Status/Diagnostic**
 - Media Type For Status/Diagnostic: Register
 - Number Of Media For Status/Diagnostic: 2
- Analogue Input 0**
 - Input 0 Range: -10..10V in mV resolution
 - Minimum Value Input 0: -10000
 - Maximum Value Input 0: 10000
- Analogue Input 1**
 - Input 1 Range: -10..10V in mV resolution
 - Minimum Value Input 1: -10000
 - Maximum Value Input 1: 10000
- Analogue Input 2**
 - Input 2 Range: **12 Bit resolution**
 - Minimum Value Input 2: 0
 - Maximum Value Input 2: 4095
- Analogue Input 3**
 - Input 3 Range: **12 Bit resolution**
 - Minimum Value Input 3: 0
 - Maximum Value Input 3: 4095
- Analogue Input 4**
 - Input 4 Range: **User defined range**
 - Minimum Value Input 4: 0
 - Maximum Value Input 4: **1000**
- Analogue Input 5**
 - Input 5 Range: **User defined range**
 - Minimum Value Input 5: **0**
 - Maximum Value Input 5: **20000**
- Analogue Input 6**
 - Input 6 Range: **User defined range**
 - Minimum Value Input 6: **-20000**
 - Maximum Value Input 6: **20000**

Maximum Value Input 6
Maximal value for the conversion of the analogue input 6.

Alternatively

An FBox "PCD2/3.W3x5" exists for evaluation.

FBox for PCD3.W325 (Inputs 0...7 selectable)



Saia QronoX ECS Engineering and Commissioning Suite

PCD-System	Evaluation
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IEC-Controller

The evaluation is performed by the firmware. It reads the values according to the configuration (Device Configurator)

Information

PCD3.W325 Parameters

- General: Slot number: 2, Power consumption at 5V: 60mA
- Analogue Input Configuration:

Analogue Input	Input Range	Minimum value	Maximum value
Analogue Input 0	±10.00V with 4.095 resolution	-10000	10000
Analogue Input 1	±10.00V with 4.095 resolution	-10000	10000
Analogue Input 2	0..4095	0	4095
Analogue Input 3	0..4095	0	4095
Analogue Input 4	User defined range	0	1000
Analogue Input 5	User defined range	-20000	20000
Analogue Input 6	User defined range	-20000	20000

Parameter

PCD3.W325 Parameters

- General: Slot number: 2, Power consumption at 5V: 60mA

Mapping

PCD3.W325 I/O Mapping

Variable	Mapping	Channel	Address	Type	Unit	Description
W325_AnalogueInput0	Analogue Input 0	W325_0	307	INT16		
W325_AnalogueInput1	Analogue Input 1	W325_1	307	INT16		
W325_AnalogueInput2	Analogue Input 2	W325_2	307	INT16		
W325_AnalogueInput3	Analogue Input 3	W325_3	307	INT16		
W325_AnalogueInput4	Analogue Input 4	W325_4	307	INT16		
W325_AnalogueInput5	Analogue Input 5	W325_5	307	INT16		
W325_AnalogueInput6	Analogue Input 6	W325_6	307	INT16		
W325_StatusInput0	Status Input 0	W325_7	307	INT16		
W325_StatusInput1	Status Input 1	W325_8	307	INT16		
W325_StatusInput2	Status Input 2	W325_9	307	INT16		
W325_StatusInput3	Status Input 3	W325_10	307	INT16		
W325_StatusInput4	Status Input 4	W325_11	307	INT16		
W325_StatusInput5	Status Input 5	W325_12	307	INT16		
W325_StatusInput6	Status Input 6	W325_13	307	INT16		

Configuration of the modules

The module has a resolution of 12 bits. This corresponds to 4096 possible measured values.

With a measuring range of $-10 \dots 10$ volts, this results in a resolution of 4.8828 millivolts/bit.

The module can output much more precise values than the 12-bit resolution allows by using suitable algorithms (moving averages, etc.). With PG5 and QronoX, a measuring range of $-10 \dots 10$ volts with a resolution of 1 mV is achieved as standard.

In the configurator you can choose whether you want to use the measurement results in mV or in bits.

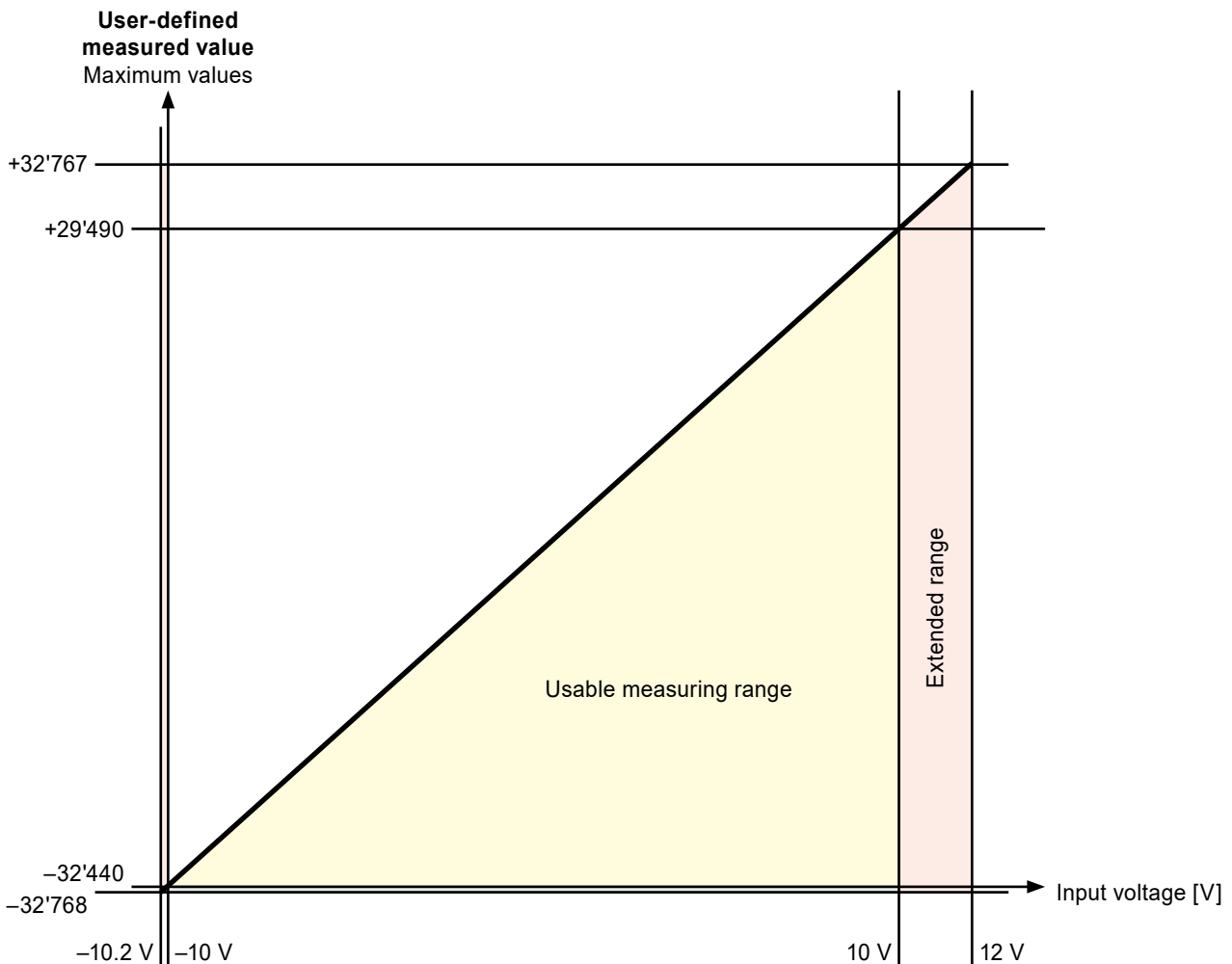
A user-defined range can also be displayed for special applications. The user can make specifications:

- ▶ Lower value: Displayed value with an input signal of -10 volts.
- ▶ Upper value: Displayed value at an input signal of 10 volts.

Any integer value ($-32'768$ up to $+32'767$) can be entered for both values, but the lower value must be smaller than the upper value. However, to avoid error messages when outputting in the extended range (-1% up to $+110\%$), the following values should be used:

- ▶ Lower value: greater than $-32'440$
- ▶ Upper value: less than $+29'490$

All values in between are converted directly proportional to these two basic values and indicated as measured value.



Graph with the maximum possible user-defined measured values

Measurement filter: In the function boxes of PG5, you can select whether the measurement filter for the entire module should be switched on or off (with QronoX, the measurement filter is always activated).

Extended output value format: The module can measure from -1% to $+110\%$. In PG5, the output of the measured values can also be limited to $0\ldots 100\%$ (with QronoX, the output of the measured values cannot be limited).

- ▶ If the measured value is below -10 volts, 0 (or the user-defined "lower value") is displayed and the underrange flag is set.
- ▶ If the measured value is above 10 volts, 10000 , 4095 bits (or the user-defined "upper value") is displayed and the overrange flag is set.

The modules can also be used on old PCD controllers with Step@7 compatible operating systems (Saia® PCD series xx7) (See table).

Input signals [V]	12 bit resolution	$-10\ldots 10V$ in 1 mV resolution	xx7	Simatic
-10	0	0	0	0
-2	1637	4000	1638	11074
0	2047	5000	2047	13842
10	4095	10000	4095	27684

Media mapping - symbol name and description

Error register

To use the module diagnosis in the programme, the error output can be used. The meaning of the bits is as follows:

Error register	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Bit	No response from the W3x5 module.	Initialisation failed	Calibration error	Internal error	Not used	Not used	Overrange	Underrange	Not used	Not used	Overrange	Underrange	Not used	Not used	Overrange	Underrange	Not used	Not used	Overrange	Underrange	Not used	Not used	Overrange	Underrange	Not used	Not used	Overrange	Underrange	Not used	Not used	Overrange	Underrange
Nibble	7				6				5				4				3				2				1				0			
	Module Diagnosis				Channel 6 Diagnostic				Channel 5 Diagnostic				Channel 4 Diagnostic				Channel 3 Diagnostic				Channel 2 Diagnostic				Channel 1 Diagnostic				Channel 0 Diagnostic			



Galvanic separation of inputs to CPU, channels themselves not separated.



I/O modules and I/O terminal blocks may only be plugged in and removed when the CPU and the external +24 V are disconnected from the power supply.



Further information

This can be found in the Manual "27-600_I/O-modules for PCD1 / PCD2 series and for PCD3".

**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 EN61010 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.
Do not use a damaged device!

**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.

Observe this instructions (data sheet) and keep them in a safe place.
Pass on the instructions (data sheet) to any future user.



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.



PCD3.W325



4 405 4998 0

Ordering information

Type	Short description	Description	Weight
PCD3.W325	7 analogue inputs –10 ... +10 V, 12 bit, electrical isolation	Analog input module with electrical isolation, 7 channels (the channels are not isolated from each other), resolution 12 bit, range –10 ... +10 V, connection with pluggable spring terminals, connector type E (4 405 4998 0) supplied	100 g

Ordering information equipment

Type	Short description	Description	Weight
4 405 4998 0	Plug-in, type E	Plug-in I/O spring terminal block, 14-pole up to 1.5 mm ² , labelled 0 ... 13	13 g

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