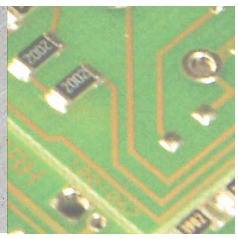
Honeywell

PCD3.W745

Universal temperature measurement module for up to 4 measuring inputs, 16 bits, TC Type J & K and 4 wire Pt/Ni 100/1000



Main characteristics

- Four input channels, each with 4 spring terminals, all inputs software configurable
- Electrical isolation between input channels and HPCD ground (the channels themselves are not separated against each other)
- Integrated cold junction for thermocouple
- External cold junction compensation can be measured via channel 0
- RTD measurement with 2, 3, or 4-wire connection
- The linearization and all compensation activities as well as the conversion into °C, °F and K is done in the module (Thermocouples types R, S, T, E, N on request)

PCD3.W745

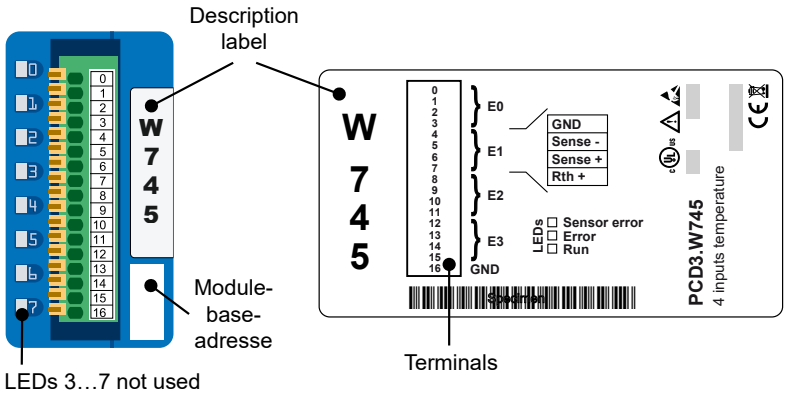
Powerful sensor diagnostics

- Overshoot and undershoot detection in measurement range
- Line breaks detection
- Short-circuit detection for resistance thermometers (RTD)
- 3 LEDs to indicate configuration, data acquisition, connection states, line breaks or short circuits

Hardware configuration

- PCD3.W745 modules are for use with the following units HPCD3.M6893, HPCD3.Txxx and HPCD3.Cxxx
- The functions of the module are defined by the firmware or by the programming environment for the respective CPU.

Indicators and connections



LED	Meaning	Description
0	Run	The Run LED blinks when the data acquisition is running
1	Error	The Error LED indicates that the module has no valid configuration.
2	Sensor Error	Indicates that at least one of the inputs detects: • no connection • line break • short circuit

Technical Data

All specifications at 25 °C ambient temperature, unless otherwise noted.

Sensor types	TC Type J	TC Type K	Pt100 Pt1000	Ni100 Ni1000
Input range for temperature sensors	−210 … 1200 °C [1] DIN IEC 584	−270 … 1372 °C [1] DIN IEC 584	−200 … 850 °C DIN IEC 751	−60 … 250 °C DIN IEC 43760
Measurement range	−75 mV … +75 mV		Pt/Ni100: 0 … 600 Ω Pt/Ni1000: 0 … 5000 Ω	
Resolution	0.1 °C		0,1 °C	
	2.5 µV		0.01 Ω (Range 600 Ω) 0.10 Ω (Range 5000 Ω)	
Measuring error in % of full scale value [2]	0.05 %		0.05 %	
Measuring error in °C	Alternative to the “measuring error in %” specification above:			
	−100 … +100 °C: <0.4 °C −150 … +500 °C: <0.7 °C −150 … +1000 °C: <1.0 °C		−100 … +100 °C: <0.3 °C −150 … +500 °C: <0.4 °C −200 … +850 °C: <0.5 °C	
Temperature coefficient of full scale value [2]	10 ppm/K		80 ppm/K	
Sampling time per channel	250 ms			
Measurement resolution	16 Bit			
50 Hz rejection 60 Hz rejection	>75 dB >60 dB			
Line break detection	✓	✓	✓	✓
Short circuit detection	×	×	✓	✓
Linearization	on Board			
Compensation of cold junction temperature	on Board		N/A	
Cold junction internal	yes [3]		N/A	
Cold junction external	yes		N/A	
Connection techniques for resistors (RTD's)	N/A		2-wire 3-wire 4-wire	
Galvanic isolation	500 VDC between CPU and analogue inputs			
Ambient temperature	Operation: 0 … +50 °C without forced ventilation Storage: −25 … +85 °C			
Power supply	No external power supply necessary			
Internal power consumption from +5 V bus	200 mA			
Wire gauge	max. 0.5 mm² (AWG 20)			
Wire Stripping	Remove 10 mm of isolation			
Internal reference junction (internal cold junction)				
The built-in Reference Junction is used when thermocouples are directly connected to the module				
	Built-in Temperature sensor			
Operating temperature range	0 … 55 °C			
Resolution	0.1 °C			
Measuring error at 25 °C	0.8 °C			
Drift over operating Temperature Range (0 … 55 °C)	0.05 °C / °C			
Stabilization time	5 min.			

[1] For thermocouples, the full measurement range is offered. The specifications of resolution and accuracy are given for temperatures higher than −150 °C. For lower temperatures than −150 °C, the characteristics of thermocouples become worse. If thermocouples are used in this very low temperature range, the tolerance should be calculated using the tolerance specifications for the ±75 mV range and the thermocouple characteristic.

[2] Measuring error in % and temperature coefficient specifications made for the measurement ranges ±75 mV, 600 Ω, 5000 Ω.

[3] Technical data of the internal cold junction are specified in the following section.

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

It is strongly recommended to check the total power consumption of all modules in a system structure with CPU and in all HPCD3.C100 expansions to ensure that the maximum allowable power consumption is not exceeded.

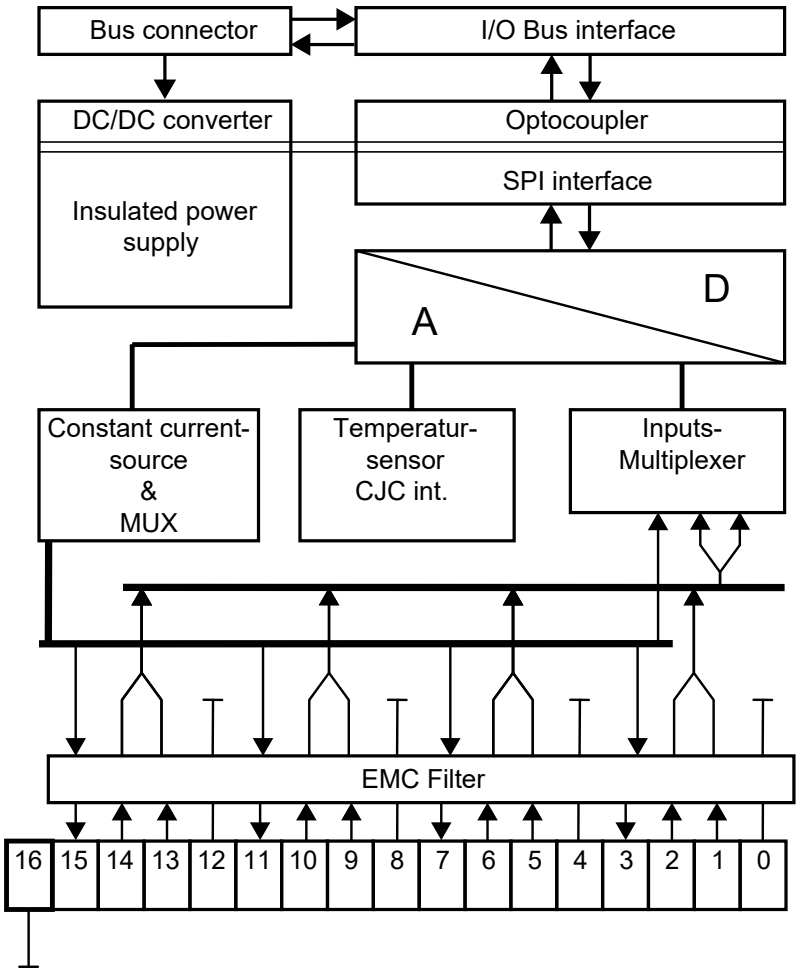
The module racks like CPU and expansion housin provide the following internal power

Module rack	+5 V	V +
HPCD3.M6893	600 mA	100 mA
HPCD3.C200	1000 mA	100 mA
HPCD3.T66x	600 mA	100 mA
HPCD3.T668	650 mA	100 mA

When using expansion units, it is recommended to place the PCD3.W745 modules in the base unit (CPU). This prevents undesirable effects such as a possible voltage drop across the connection cable from the expansion unit to the base unit.

This module includes components that are sensitive to electrostatic discharges.

Block diagram



Module configuration

Sensor types / input ranges

The module has four input channels, which are individually configurable:

Thermocouples (TC)

Type J / K according to IEC584

Resistive Temperature detectors (RTD)

Pt100 / Pt 1000 according to IEC751
Ni100 / Ni1000 according to DIN 43760

Sensor types / input ranges

All specifications at 25 °C ambient temperature, unless otherwise noted.

	Sensortyp	Range	Output value	Units
TC	Typ K (NiCr-Ni)	−270 … +1372 °C −454 … +2501 °F +3 … +1645 K	−2700 … +13720 −4540 … +25010 +30 … +16450	1/10 °C 1/10 °F 1/10 K
	Typ J (Fe-CuNi)	−210 … +1200 °C −346 … +2192 °F +63 … +1473 K	−2100 … +12000 −3460 … +21920 +630 … +14730	
RTD	Pt100	−200 … +850 °C −328 … +1562 °F +73 … +1123 K	−2000 … +8500 −3280 … +15620 +730 … +11230	1/10 °C 1/10 °F 1/10 K
	Pt1000	−200 … +850 °C −328 … +1562 °F +73 … +1123 K	−2000 … +8500 −3280 … +15620 +730 … +11230	
	Ni100	−60 … +250 °C −76 … +482 °F +213 … +523 K	−600 … +2500 −760 … +4820 +2130 … +5230	
	Ni1000	−60 … +250 °C −76 … +482 °F +213 … +523 K	−600 … +2500 −760 … +4820 +2130 … +5230	
mV	±75 mV	−75 … +75 mV	−30000 … +30000	2.5 µV*
Ohm	600 Ω	0 … 600 Ω	0 … 60000	10 mΩ
	5000 Ω	0 … 5000 Ω	0 … 50000	100 mΩ

* mV-range: Output value • 2,5 = voltage in µV

Measurement unit

The measurement unit for temperature sensors can be configured per module:

°C Temperature output in 1/10 °C
°F Temperature output in 1/10 °F
K Temperature output in 1/10 K

For voltage and Ohm input ranges, this configuration takes no effect.

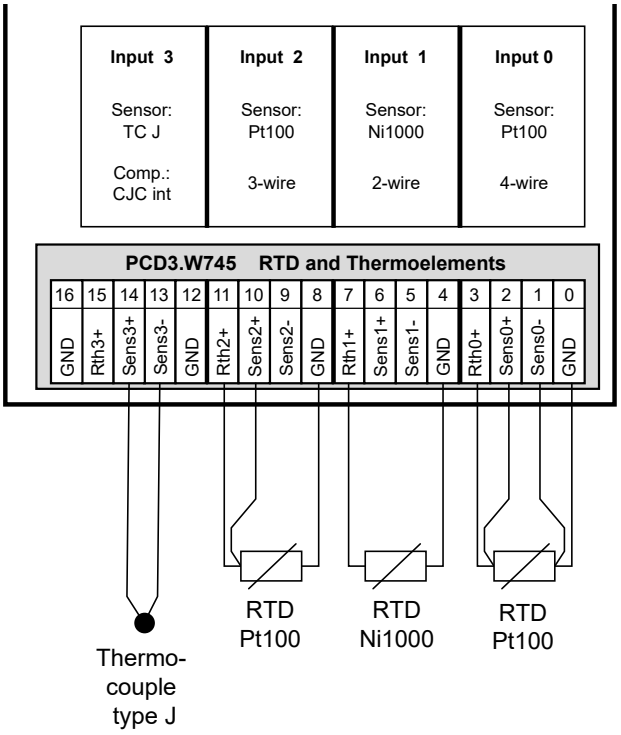
Connection & compensation techniques

	Connection & compensation technique
RTD Ohm	2 – Wire connection
	3 – Wire connection
	4 – Wire connection
TC	Internal reference junction (CJC int.)
	External reference junction (CJC ext.)**
mV	Voltage measurement using sense inputs

** In this operating mode, input 0 is used to measure the temperature of the external reference junction

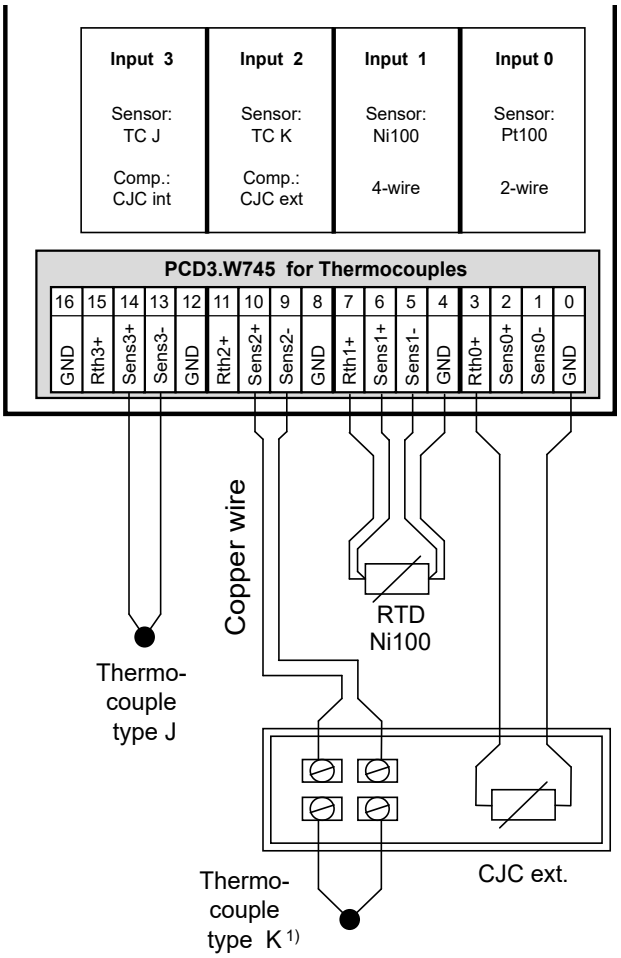
Configuration and connection examples

General example for RTD and thermocouple connection



Designation	Description
RthX+	Constant current output for RTD measurement
SensX+	Positive line of the differential voltage input (Sense +)
SensX−	Negative line of the differential voltage input (Sense –)
GND	Sensor ground, galvanic separated from CPU ground

Use of an external isothermal block (CJCext)

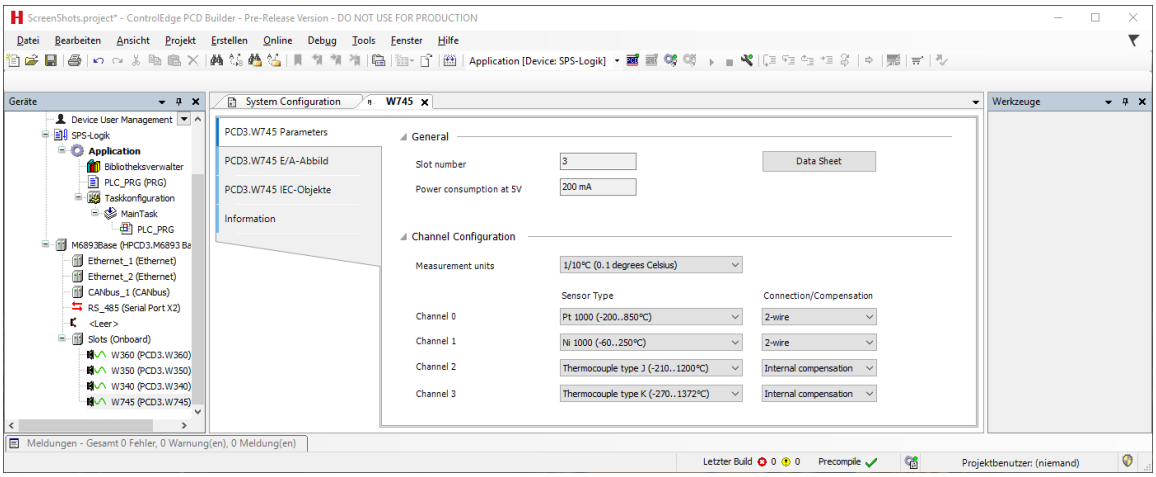


1) Input 2: Thermocouple type K combined with external cold junction CJC ext. (RTD Pt 100, 2 - wire) at input 0 for cold junction compensation.

Configuration

HPS ControlEdge PCD Builder

HPCD-System	Evaluation
HPCD3.M6893	The evaluation is performed by the firmware. It reads the values according to the configuration (Device Configurator)



PCD3.W745

Ordering information

Type	Short description	Description	Weight
PCD3.W745	Temperature measurement module, 4 inputs	Universal temperature measurement module for up to 4 measuring inputs, resolution 16 bits, TC Type J & K and 4 wires Pt/Ni 100/1000 (with soldered I/O spring terminal block)	100 g

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 0used 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.
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 during, 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.

Sales and Service

For application assistance, current specifications, pricing, or name of the nearest Authorized Distributor, contact one of the offices below.

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While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications are subject to change without notice.

For more information

Learn more about ControlEdge PCD, visit our website www.honeywellprocess.com/ControlEdgePCD or contact your Honeywell account manager.

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Document No.: 51-52-03-97
Rev.2.0
December 2020