



Harmony Analog

Converters for thermocouples,
Converters for Pt100 probes,
Voltage/current converters



Harmony

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References

Modicon TM3
I/O expansion modules for Modicon controllers
Analog I/O modules

Number and type of channels	Input range	Resolution	Aperture time (ms)	Reference	Weight (kg)
2 voltage inputs	-15...+10 VDC 0...20 mA r.t. 20 mA	16,000 or 10,000 4 sign	0.005 0.005	TM3AI2H TM3AI2HG	0.110 0.100
4 voltage inputs	-15...+10 VDC 0...20 mA r.t. 20 mA	12,000 or 10,000 4 sign	0.005 0.005	TM3AI4 TM3AI4G	0.100 0.090
4 voltage or temperature inputs	-15...+10 VDC 0...20 mA r.t. 20 mA	16,000 or 10,000 4 sign	0.005 0.005	TM3AI4T TM3AI4TG	0.110 0.100
4 differential temperature inputs	Thermopiles or RTD (Pt100, Ni1000, Pt1000, Pt100)	16,000 or 10,000 4 sign	0.005 0.005	TM3AI4T TM3AI4TG	0.110 0.100
8 self-supply	-15...+10 VDC	12,000 or 10,000 4 sign	0.005 0.005	TM3AI8 TM3AI8G	0.100 0.110

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TM3AI2H

Module TM3 - 2 analog inputs high resolution

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Related Software >

Product Datasheet User guide Catalogue CAD Document

Characteristics Documents and Downloads Technical FAQs Additional Information Dimensions Drawings >

Main

range of product Modicon TMI

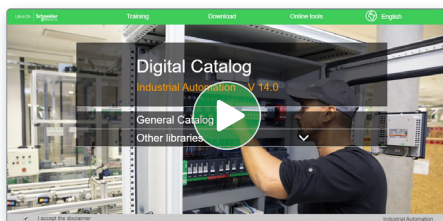
product or component type Analog input module

range compatibility Modicon M251

Each commercial reference presented in a catalog contains a hyperlink. Click on it to obtain the technical information of the product:

- Characteristics, Dimensions and drawings, Mounting and clearance, Connections and schemas, Performance curves
- Product image, Instruction sheet, User guide, Product certifications, End of life manual

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Harmony Analog

Converters for thermocouples
Converters for Pt100 probes
Voltage/current converters

Product types		Converters for J and K type thermocouples				Universal and Optimum converters for Pt100 probes					Universal voltage/current converters				
															
Input type		J (Fe-CuNi)		K (Ni-CrNi)		Pt100, 2, 3 and 4 fils					-				
Input signal	Temperature range	0...150 °C	0...300 °C	0... 600 °C	0...1200 °C	-40...40 °C	-100...100 °C	0...100 °C	0...250 °C	0...500 °C	-				
		32...302 °F	32...572 °F	32...1112 °F	32...2192 °F	-40...104 °F	-148...212 °F	32...212 °F	32...482 °F	32...932 °F	-				
	Voltage	-					-					0...10 V	0...10 V; ± 10 V	0...50 V 0...300 V 0...500 V ~ or ~ 50/60 Hz	-
	Current	-					-					4...20 mA	0...20 mA 4...20 mA	-	0...1.5 A 0...5 A 0...15 A ~ or ~ 50/60 Hz
Output signal	Voltage/Current	Switchable: 0...10 V /0...20 mA; 4...20 mA					Switchable: 0...10 V/0...20 mA, 4...20 mA for Universel range RMPT●0BD 0...10 V ou 4...20 mA for Optimum range RMPT●3BD					0...10 V or 4...20 mA	Switchable: 0...10 V ±10 V/0...20 mA 4...20 mA	Switchable: 0...10 V/4...20 mA 0...20 mA	0...10 V or 0...20 mA or 4...20 mA
Supply voltage	Rated	~ 24 V ± 20%, not isolated					~ 24 V ± 20 %, not isolated					~ 24 V ± 20 %, isolated			
Built-in protection	Outputs	Reverse polarity, overvoltage and short-circuit Output safety feature, if input not wired or wire broken					Reverse polarity, overvoltage and short-circuit Output safety feature, if input not wired or wire broken								
	Supply	Reverse polarity					Reverse polarity								
Signalling		Green LED (power on)					Green LED (power on)								
Conformity/Approvals	Conforming to standards	IEC 60947-1, IEC 60584-1					IEC 60751, DIN 43 760					IEC 60947-1			
	Approvals	UL, CSA, GL, CE					UL, CSA, GL, CE					UL, CSA, GL, CE			
Type		RMTJ40BD	RMTJ60BD	RMTK80BD	RMTK90BD	RMPT10BD, RMPT13BD	RMPT20BD, RMPT23BD	RMPT30BD, RMPT33BD	RMPT50BD, RMPT53BD	RMPT70BD, RMPT73BD	RMCA22BD	RMCA55BD	RMCA60BD	RMCA61BD	
Pages		6					6 and 7								

Harmony Analog

Converters for thermocouples

Converters for Pt100 probes

Voltage/current converters



RMTJ/K



RMPT•0



RMPT•3



RMC

The Harmony Analog range of converters is designed to convert signals emitted by sensors or electrical measurements into standard electrical signals which are compatible with automation platforms, controllers (thermal processes, speed, ...).

They also allow the connection distance between a sensor and the measurement acquisition device to be increased: for example between a thermocouple and a programmable controller.

Conforming to IEC standards, UL and CSA certified, these converters are suitable for universal use.

Measurement signals for thermocouples and Pt100 probes

The voltages induced by thermocouples vary between 10 and 80 $\mu\text{V}/^\circ\text{C}$, Pt100 probes (100 ohms at 0 $^\circ\text{C}$) produce about 0.5 $\text{mV}/^\circ\text{C}$, with measurement currents of 1 mA. Depending on the sensor, the signal to be measured ranges from a few μV (thermocouple) to 250 and 700 mV for a Pt100 probe.

It is therefore difficult to transmit these low level signals over long electric lines without encountering problems of interference, signal reduction or errors.

Connecting Harmony Analog converters close to the sensors resolves these problems :

- 4-20 mA current loops transmitted over a long distance are less sensitive to interference than low level voltage signals from sensors,
- signal reductions during transmission (resistance) of voltages do not occur,
- the cables used to connect the converters to process equipment (programmable controllers) are standard cables, which are more cost effective than extension cables or compensation cables suitable for low level signals for Pt100 probes or thermocouples.

Presentation

The Harmony Analog range

The Harmony Analog range has been developed both to take account of the most common applications and to ensure great simplicity of installation:

- pre-set input and output scales, requiring no adjustment
- outputs protected against reverse polarity, overvoltage and short-circuits
- \sim 24 V power supply
- sealable protective cover
- rail mounting and screw fixing onto mounting plate
- LED indicator on the front panel
- input and output selector switches on the front panel
- output with fallback value if no input signal is present (due to failure of a sensor, for example).

The Harmony Analog converter range is divided into four families:

- Converters for J and K type thermocouples: **RMTJ/K**
- Universal converters for Pt100 probes: **RMPT•0**
- Optimum converters for Pt100 probes: **RMPT•3**
- Universal voltage/current converters: **RMC**.

Harmony Analog

Converters for thermocouples

Converters for Pt100 probes

Voltage/current converters



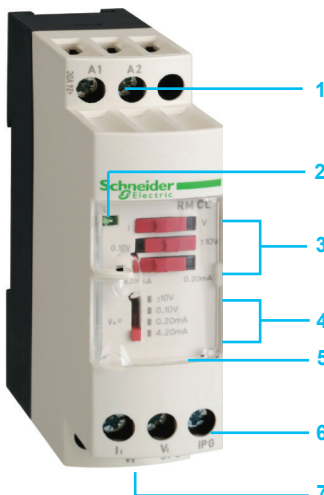
RMTJ40BD



RMPT70BD



RMCA61BD



RMCL55BD

Presentation

Converters for J and K type thermocouples

Thermocouples, which consist of two metals with different thermo-electric characteristics, produce a voltage that varies according to temperature. This voltage is transmitted to the Harmony Analog converter which converts it to a standard signal.

Converters for thermocouples have cold junction compensation to allow detection of measurement errors induced by the connection to the device itself.

Converters for J and K type thermocouples have:

- for inputs, a pre-set temperature range, depending on the model:
 - Type J: 0...150 °C, 0...300 °C,
 - Type K: 0...600 °C, 0...1200 °C.
- for outputs, a switchable signal:
 - 0...10 V, 0...20 mA, 4...20 mA.

Universal converters for Pt100 probes

Pt100 probes with platinum resistor are electrical conductors whose resistance varies according to the temperature.

This ohmic resistance is transmitted to the Harmony Analog converter which converts it to a standard signal.

Universal converters for Pt100 probes have :

- for inputs, a pre-set temperature range, depending on the model:
 - -100...100 °C,
 - -40...40 °C,
 - 0...100 °C,
 - 0...250 °C,
 - 0...500 °C.
- for outputs, a switchable signal:
 - 0...10 V, 0...20 mA, 4...20 mA.

The products in the family Universal converters for Pt100 probes allow wiring of Pt100 probes in 2, 3 and 4-wire mode.

Optimum converters for Pt100 probes

Derived from the above family, these converters have:

- for inputs, a pre-set temperature range identical to that of universal converters for Pt100 probes.
- for outputs: 0...10V signal dedicated to Zelio Logic relays (1) analogue inputs. They allow Pt100 probes to be wired in 2, 3 and 4-wire mode.

Universal voltage/current converters

This family of converters allows the adaptation of electrical values (voltage/current). Four products are available:

- a cost effective converter which will convert a 0...10 V signal to a 4...20mA signal or vice versa.
- a Universal voltage/current converter allowing the most common signals. They have:
 - for inputs, a voltage/current range:
 - 0...10 V, ± 10 V, 0...20 mA, 4...20 mA.
 - for outputs, a switchable voltage/current range:
 - 0...10 V, ± 10 V, 0...20 mA, 4...20 mA.
- two Universal voltage/current converters which allow conversion of electrical power signals, both a.c. and d.c. They have the following, depending on the model:
 - **for voltage inputs**, a range of 0 to 500 V (~ or ---)
 - for outputs, a switchable voltage/current range:
 - 0...10 V, 0...20 mA, 4...20 mA.
 - **for current inputs**, a range of 0 to 15 A (~ or ---)
 - for outputs, a voltage/current range:
 - 0...10 V, 0...20 mA, 4...20 mA.

Description

Harmony Analog converters have the following on their front panel, depending on the model:

- 1 Two terminals for --- 24 V supply connection
- 2 A 'Power ON' LED
- 3 Three input selector switches (depending on model)
- 4 An output selector switch (depending on model)
- 5 A sealable protective cover
- 6 A screw terminal block for inputs
- 7 A screw terminal block for outputs

(1) Converters dedicated to Zelio Logic smart relays. Consult catalog ref. [DIA3ED2111202EN](#)

Harmony Analog

Converters for thermocouples

Converters for Pt100 probes



RMTJ40BD



RMTK90BD



RMPT70BD



RMPT13BD

Converters for J and K type thermocouples

Supply voltage $\approx 24\text{ V} \pm 20\%$, non isolated

Type	Temperature range		Switchable output signal	Reference	Weight kg lb
	°C	°F			
Type J	0...150	32...302	0...10 V, 0...20 mA, 4...20 mA	RMTJ40BD	0.120 0.264
	0...300	32...572			
Type K	0...600	32...1112	0...10 V, 0...20 mA, 4...20 mA	RMTK80BD	0.120 0.264
	0...1200	32...2192			

Universal converters for Pt100 probes

Supply voltage $\approx 24\text{ V} \pm 20\%$, non isolated

Type	Temperature range		Switchable output signal	Reference	Weight kg lb
	°C	°F			
Pt100 2-wire, 3-wire and 4-wire	-40...40	-40...104	0...10 V, 0...20 mA, 4...20 mA	RMPT10BD	0.120 0.264
	-100...100	-148...212			
	0...100	32...212			
	0...250	32...482			
	0...500	32...932			

Optimum converters for Pt100 probes (1)

Supply voltage $\approx 24\text{ V} \pm 20\%$, non isolated

Type	Temperature range		Output signal	Reference	Weight kg lb
	°C	°F			
Pt100 2-wire, 3-wire and 4-wire	-40...40	-40...104	0...10 V or 4...20 mA	RMPT13BD	0.120 0.264
	-100...100	-148...212			
	0...100	32...212			
	0...250	32...482			
	0...500	32...932			

(1) Converters dedicated to Zelio Logic smart relays. Consult catalog ref. [DIA3ED2111202EN](#)



RMCA61BD



RMCL55BD



RMCN22BD

Universal voltage/current converters

Supply voltage $\approx 24\text{ V} \pm 20\%$, non isolated

Input signal	Output signal	Reference	Weight kg /lb
0...10 V or 4...20 mA	0...10 V or 4...20 mA	RMCN22BD	0.120 0.264

Supply voltage $\approx 24\text{ V} \pm 20\%$, isolated

Input signal	Output signal	Reference	Weight kg /lb
0...10 V, $\pm 10\text{ V}$, 0...20 mA, 4...20 mA	Switchable: 0...10 V, $\pm 10\text{ V}$, 0...20 mA, 4...20 mA	RMCL55BD	0.120 0.264
0...50 V, 0...300 V, 0...500 V \approx or $\sim 50/60\text{ Hz}$	Switchable: 0...10 V, 0...20 mA, 4...20 mA	RMCV60BD	0.150 0.330
0...1.5 A, 0...5 A, 0...15 A \approx or $\sim 50/60\text{ Hz}$	0...10 V or 0...20 mA or 4...20 mA	RMCA61BD	0.150 0.330

Connection accessories

Description	Type	Sold in lots of	Unit reference	Weight kg /lb
Screw terminal, Protective earth	Screw	50	NSYTRV42PE	0.025 0.055
Spring terminal, Protective earth	Spring	50	NSYTRR42PE	0.010 0.055

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N	
NSYTRR42PE	7
NSYTRV42PE	7
R	
RMCA61BD	2 7
RMCL55BD	2 7
RMCN22BD	2 7
RMCV60BD	2 7
RMPT10BD	2 6
RMPT13BD	2 6
RMPT20BD	2 6
RMPT23BD	2 6
RMPT30BD	2 6
RMPT33BD	2 6
RMPT50BD	2 6
RMPT53BD	2 6
RMPT70BD	2 6
RMPT73BD	2 6
RMTJ40BD	2 6
RMTJ60BD	2 6
RMTK80BD	2 6
RMTK90BD	2 6

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