

Official Product Identity Mapping

TM4-N2SB

Official Autonics exact-model identity: TM4-N2SB

Four-channel modular PID temperature controller, basic module

NPN or 22 V DC pulse output configuration with RS485 communication

24 V DC power input and no display

Selected TM manual pages define order code, ratings and dimensions.

Official model page:

<https://www.autonics.com/de/model/TM4-N2SB>

- Make a required space around the unit for radiation of heat.
For accurate temperature measurement, warm up the unit over 20 min after turning on the power.
- Mounting multiple devices in any way other than the specified mounting method may cause heat to build up inside, which will shorten their service life. If there is a possibility of the ambient temperature rising to a temperature above the specified temperature range, take steps, such as installing fans, to cool the device. Be sure that the cooling method is not cooling just the terminal block. If only the terminal block is cooled, measurement errors may occur.
- Make sure that power supply voltage reaches to the rated voltage within 2 sec after supplying power.
- Do not wire to terminals which are not used.
- Install DIN rail vertically from the ground.
- This unit may be used in the following environments.
 - Indoors (in the environment condition rated in "Specifications")
 - Altitude Max. 2,000 m
 - Pollution degree 2
 - Installation category II

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

T	M	①	-	②	③	④	⑤
① Channel		② Alarm output		③ Structure		④ Control output	
2: 2 channels		2: Alarm output 1/2 (2 channels)		B: Basic module		R: Relay	
4: 4 channels		4: Alarm output 1/2/3/4 (2 channels)		E: Expansion module		C: Selectable current or SSR drive output	
		N: None (4 channels)		• Since the expansion module is not supplied with power/comm. terminal. Use it with the basic module.			
		⑤ Power supply					
		2: 24 VDC					

Product Components

- Product (+ bracket)
- Side connector ×1
- Instruction manual
- Power/Comm. connector ×1 (only for basic module)

Sold Separately

- Current transformer (CT)
- Communication Converter: SCM-US / SCM-381 / SCM-US481 / SCM-WF48

Manuals and Software

For the detailed information and instructions, please refer to the manuals, and be sure to follow cautions written in the technical descriptions. Visit Autonics website to download manuals and software.

■ DAQMaster

It is the comprehensive device management program for Autonics' products, providing parameter setting, monitoring and data management.

Errors

■ Indicator

Name	Status	Color	Description	Troubleshooting
PWR	ON	Red	□ channel error: Input < Input range, Input > Input range,	When the error factor is resolved, it automatically returns to normal operation.
CH	Flash (Cycle: 0.5 sec)	Red	Input sensor is open or not connected	
PWR	Flash (Cycle: 1 sec)	Red	Channel Input Error (One or more input channels are unconnected)	

■ Communication output, DAQMaster

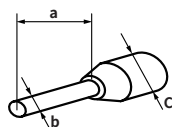
Communication output (decimal)	DAQMaster	Description	Troubleshooting
'31000'	Display 'OPEN'	Input sensor is open or not connected	When the error factor is resolved, it automatically returns to normal operation.
'30000'	Display 'HHHH' ⁽⁰¹⁾	Input > Input range	
'-30000'	Display 'LLLL' ⁽⁰¹⁾	Input < Input range	
'31500'	Display '31500'	Sensor internal communication error	Check the power supply (24VDC=), ⁽⁰²⁾

- 01) When HHHH / LLLL error occurs, the control output may occur by recognizing the maximum or minimum input depending on the control type. Please be careful.
02) This error may occur when connecting only the loader port.

Crimp Terminal Specifications

- Unit: mm, Use the crimp terminal of follow shape.

■ Wire ferrule



Terminal number	a	b	c
1 to 12	10	≤ 1.7	≤ 3.7
13 to 22	10	≤ 2.1	≤ 4.2

Specifications

Series	TM2	TM4
No. of channels	2 channels	4 channels
Power supply	24 VDC=	
Permissible voltage range	90 to 110% of rated voltage	
Power consumption	≤ 5 W (for Max. load)	
Sampling period	50 ms (2 channels synchronous sampling)	100 ms (4 channels synchronous sampling)
Input specification	Refer to 'Input Type and Using Range'.	
Option input	CT input	• 0.0-50.0 A (primary current measurement range) • CT ratio: 1/1,000 • Measurement accuracy: ±5% F.S. ±1 digit
	Digital input	• Contact ON: ≤ 1 kΩ, OFF: ≥ 100 kΩ • Non contact residual voltage: ≤ 1.5 VDC= leakage current: ≤ 0.1 mA • Outflow current: ≈ 0.5 mA per input
Control output	Relay	250 VAC ~ 3 A 1a, 30 VDC ~ 3 A 1a
	SSR	12 VDC ~ ±3 V, ≤ 30 mA
Alarm output	Current	DC 4-20 mA or DC 0-20 mA (Load resistance: ≤ 500 Ω)
RS485 Comm.	Modbus ASCII / RTU	
Display type	None- parameter setting and monitoring is available at external devices	
Control type	Heating, Cooling, Heating & Cooling	ON/OFF, P, PI, PD, PID Control
Hysteresis	1 to 100 (0.1 to 100) °C/°F	
Proportional band (P)	0.1 to 999.9 °C/°F	
Integral time (I)	0 to 9999 sec	
Derivative time (D)	0 to 9999 sec	
Control cycle (T)	0.1 to 120.0 sec	
Manual reset	0.0 to 100.0 %	
Relay life cycle	Mechanical	≥ 10,000,000 operations
	Electrical	≥ 100,000 operations (250 VAC ~ 3 A load resistance)
Dielectric strength	Between the charging part and the case: 3,000 VAC ~ 50/60 Hz for 1 min	
Vibration	0.75 mm amplitude at frequency of 5 to 55 Hz in each X, Y, Z direction for 2 hours	
Insulation resistance	100 MΩ (500 VDC= megger)	
Noise immunity	±0.5 kV/square shaped noise (pulse width 1 μs) by noise simulator	
Ambient temperature	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)	
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)	
Channel insulation	Dielectric strength 1,000 VAC ~	
Insulation type	Double insulation or reinforced insulation (mark: □, dielectric strength between the measuring input part and the power part: 1 kV)	
Certification	CE, UKCA, RoHS, REACH, ENEC, TUV	
Unit weight (packaged)	• Basic module: ≈ 152 g (≈ 217 g)	
	• Expansion module: ≈ 143 g (≈ 208 g)	
	• Basic module: ≈ 174 g (≈ 239 g)	
	• Expansion module: ≈ 166 g (≈ 231 g)	

Input Type and Using Range

The setting range of some parameters is limited when using the decimal point display.

Input type	Decimal point	Display method	Using range (°C)	Using range (°F)
Thermo-couple	K (CA)	1	-200 to 1,350	-328 to 2,462
		0.1	-200.0 to 1,350.0	-328.0 to 2,462.0
	J (IC)	1	-200 to 800	-328 to 1,472
		0.1	-200.0 to 800.0	-328.0 to 1,472.0
	E (CR)	1	-200 to 800	-328 to 1,472
		0.1	-200.0 to 800.0	-328.0 to 1,472.0
	T (CC)	1	-200 to 400	-328 to 752
		0.1	-200.0 to 400.0	-328.0 to 752.0
	B (PR)	1	0 to 1,800	32 to 3,272
		0.1	0 to 1,800	32 to 3,272
	R (PR)	1	0 to 1,750	32 to 3,182
		0.1	0 to 1,750	32 to 3,182
RTD	S (PR)	1	0 to 1,750	32 to 3,182
		0.1	0 to 1,750	32 to 3,182
	N (NN)	1	-200 to 1,300	-328 to 2,372
		0.1	-200.0 to 1,300.0	-328.0 to 2,372.0
	C (TT) ⁽⁰¹⁾	1	0 to 2,300	32 to 4,172
		0.1	0 to 2,300	32 to 4,172
	G (TT) ⁽⁰¹⁾	1	0 to 2,300	32 to 4,172
		0.1	0 to 2,300	32 to 4,172
	L (IC)	1	-200 to 900	-328 to 1,652
		0.1	-200.0 to 900.0	-328.0 to 1,652.0
	U (CC)	1	-200 to 400	-328 to 752
		0.1	-200.0 to 400.0	-328.0 to 752.0
RTD	Platinel II	1	0 to 1,400	32 to 2,552
		0.1	0 to 1,400	32 to 2,552
	JPt100 Ω	1	-200 to 600	-328 to 1,112
		0.1	-200.0 to 600.0	-328.0 to 1,112.0
	DPt100 Ω	1	-200 to 600	-328 to 1,112
		0.1	-200.0 to 600.0	-328.0 to 1,112.0
	DPt50 Ω	1	-200 to 600	-328 to 1,112
		0.1	-200.0 to 600.0	-328.0 to 1,112.0
	Cu50 Ω	1	-200 to 200	-328 to 392
		0.1	-200.0 to 200.0	-328.0 to 392.0
	Cu100 Ω	1	-200 to 200	-328 to 392
		0.1	-200.0 to 200.0	-328.0 to 392.0

01) C (TT): Same as existing W5 (TT) type sensor

02) G (TT): Same as existing W (TT) type sensor

■ Measurement accuracy

Input type	Using temperature	Measurement accuracy
Thermo-couple	At room temperature (23 ± 5 °C)	(PV ± 0.5% or ± 1 °C higher one) ± 1-digit • Thermocouple K, J, T, N, E below -100 °C and L, U, PLII, RTD DPt50 Ω, Cu50 Ω: PV ± 2 °C ± 1-digit • Thermocouple C, G and R, S below 200 °C: PV ± 3 °C ± 1-digit • Thermocouple B below 400 °C: there is no accuracy standards
	Out of room temperature range	(PV ± 0.5% or ± 2 °C higher one) ± 1-digit • RTD: (PV ± 0.5% or ± 3 °C higher one) ± 1-digit • Thermocouple R, S, B, C, G, L, U: (PV ± 0.5% or ± 5 °C higher one) ± 1-digit • Thermocouple below -100 °C: ± 5 °C

Communication Interface

■ RS485

Protocol	Modbus ASCII / RTU
Application standard	EIA RS485 compliance with
Maximum connection	31 units (address: 01 to 31)
Synchronization type	Asynchronous
Connection type	Two-wire half duplex
Comm. effective range	≤ 800 m
Comm. speed	2,400 / 4,800 / 9,600 (default) / 19,200 / 38,400 / 57,600 / 115,200 bps (parameter)
Response time	5 to 99 ms (default: 20 ms)
Start bit	1 bit (fixed)
Data bit	8 bit (fixed)
Parity bit	None (default) , Odd, Even
Stop bit	1 bit, 2 bit (default)
EEPROM life cycle	≈1,000,000 operations (Erase / Write)

- When changing the setting value related to communication interface, reboot the device for normal operation.
- It is not allowed to set overlapping communication address at the same communication line.
- It is recommended to use Autonics communication converter. Please use twisted pair wire, which is suitable for RS485 communication.

■ Address

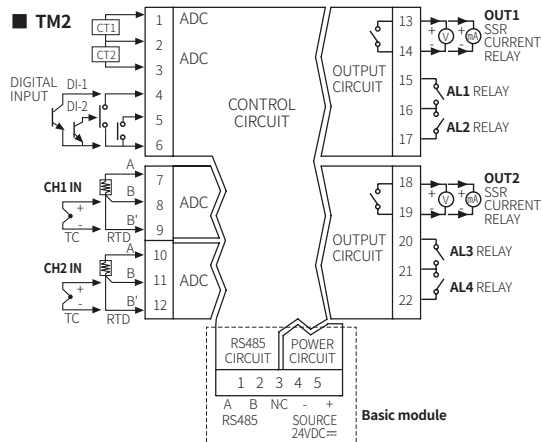
Set the communication address with the communication address setting switch (SW1, default: 1) and communication address group switch (SW2, default: +0).

- When setting as 0, it does not operate communication.

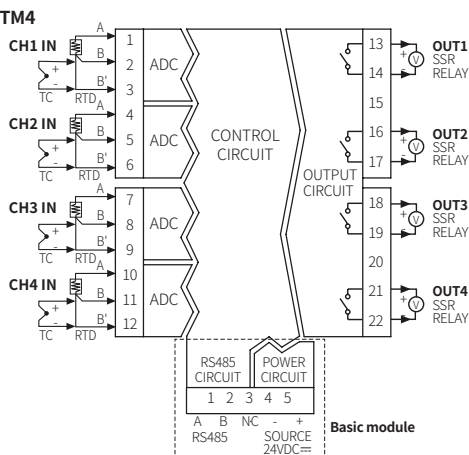
SW1	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
SW2	0	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
+0	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
+16																

Connections

■ TM2

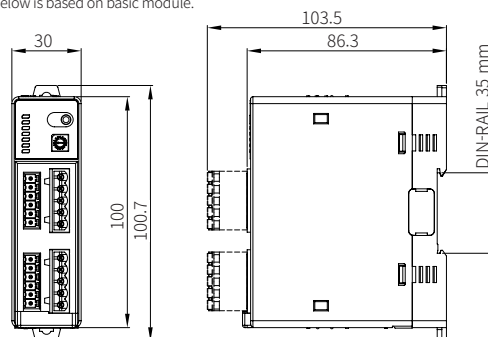


■ TM4



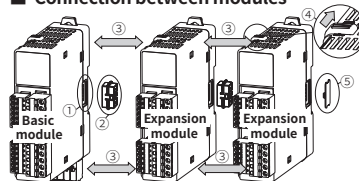
Dimensions

- Unit: mm, For the detailed drawings, follow the Autonics website.
- Below is based on basic module.



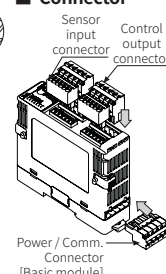
Installation Method

■ Connection between modules

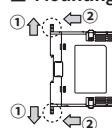


- Remove END cover (1) of each module (except END cover of the first and last module).
 - Insert side connector (2) and connect them tightly to (3) direction (max. 30 units).
 - Press lock switch (4) to lock direction.
- Supply adequate power for power input specifications and overall capacity.
(Max. power when connecting 31 modules: 31 units × 5 W = 155 W)

■ Connector



■ Mounting with bolts

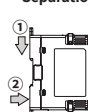


■ Mounting on DIN rail

- Installation



- Separation



■ Precautions

- Install the module vertically.
- Use end plates (sold separately, not available from Autonics) to fix firmly.



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PRODUCT: TM4-N2SB / Four-Channel Modular PID Temperature Controller, Basic Module

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