DATASHEET - MFD-TAP13-NI-A

I/O module with temperature measuring, range A, 6DI(2AI), 4DO-Trans, 1AO

Powering Business Worldwide™

Part no.	**MFD-TAP13-NI-A**
Catalog No.	**106047**
EL-Nummer (Norway)	**4560801**

Delivery program

Description			Configurable temperature range
Supply voltage			24 V DC
Inputs			
Digital			6
of which can be used as analog			2
Outputs			
Transistor			4
Analog			1
Temperature range			
Temperature detector			-40…+90 °C 0…+250 °C
For use with			MFD-CP8… from device version 08 MFD-CP10..

Technical data

General

Standards			EN 61000-6-1/-2/-3/-4, IEC 60068-2-6, IEC 60068-2-27
Dimensions (W x H x D)		mm	89 x 90 x 25 (installed)
Weight		kg	0.14
Mounting			Fitted into the power supply unit.

Terminal capacities

Solid		mm^2	0.2/4 (AWG 24 - 12)
Flexible with ferrule		mm^2	0.2/2.5 (AWG 24 - 12)
Standard screwdriver		mm	3.5 x 0.6

Climatic environmental conditions

Operating ambient temperature		°C	-25 to 55, cold as per IEC 60068-2-1, heat as per IEC 60068-2-2
Condensation			Take appropriate measures to prevent condensation
Storage		°C	- 40 - 70
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	5 - 95
Air pressure (operation)		hPa	795 - 1080

Ambient conditions, mechanical

Pollution degree			2
Protection type (IEC/EN 60529, EN50178, VBG 4)			IP20
Vibrations (IEC/EN 60068-2-6)		Hz	
Constant amplitude 0.15 mm		Hz	10 - 57
Constant acceleration 2 g		Hz	57 - 150
Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15 g/11 ms		Impacts	18
Drop to IEC/EN 60068-2-31	Drop height	mm	50
Free fall, packaged (IEC/EN 60068-2-32)		m	1
Mounting position			Vertical or horizontal

Electromagnetic compatibility (EMC)

Electrostatic discharge (IEC/EN 61000-4-2, Level 3, ESD)		kV	
Air discharge		kV	8
Contact discharge		kV	6
Electromagnetic fields (RFI) to IEC EN 61000-4-3		V/m	10
Radio interference suppression			EN 55011 Class B, EN 55022 Class B

Burst Impulse (IEC/EN 61000-4-4, Level 3)			
Supply cable		kV	2
Signal lines		kV	2
Power pulses (surge) (IEC/EN 61000-4-5)		kV	2 (supply cables, symmetrical)
power pulses (surge) (IEC/EN 61000-4-5, level 2)		kV	0.5 (supply cables, symmetrical)
Immunity to line-conducted interference to (IEC/EN 61000-4-6)		V	10

Insulation resistance

Clearance in air and creepage distances			EN 50178, UL 508, CSA C22.2, No. 142
Insulation resistance			EN 50178

Power supply

Heat dissipation		W	2

Digital inputs 24 V DC

Number			6
Inputs can be used as analog inputs			2 (I11, I12)
Potential isolation			
From power supply			No
Between digital inputs			No
From the outputs			Yes
to PC interface, memory card, easyNet, easyLink			Yes
Rated operational voltage	U_e	V DC	24
On 0 signal	U_e	V DC	< 5.0 (I1 - I4) < 8.0 (I11, I12)
On 1 signal	U_e	V DC	>15.0 (I1 - I4) > 8.0 (I11, I12)
Input current on 1 signal			
I11, I12		mA	2.2 (at 24 V DC)
Delay time from 0 to 1		ms	
Debounce ON		ms	20
Debounce OFF		ms	Normally 0.1 (I1 - I4), Normally 0.25 (I11 - I12)
Delay time from 1 to 0		ms	
Debounce ON		ms	20
Debounce OFF		ms	Normally 0.1 (I1 - I4), normally 0.2 (I11, I12)
Cable length (unscreened)		m	100
Frequency counter			
Quantity			4 (I1, I2, I3, I4)
Counter frequency		kHz	< 3
Pulse shape			Square
Incremental counter			
Quantity			2 (I1 + I2, I3 + I4)
Counter frequency		kHz	≦ 3
Pulse shape			Square
Signal offset			90°
Rapid counter inputs			
Number			4 (I1, I2, I3, I4)
Counter frequency		kHz	< 3
Pulse shape			Square
Cable length, screened		m	< 20

Analog inputs

Potential isolation			
From power supply			No
From the digital inputs			No
From the outputs			Yes
From the PC interface, memory card NET network, EASY-Link			Yes
Input type			DC voltage
Signal range		V DC	0 - 10
Resolution, analog		V	0.01
Resolution, digital		V	0.01
Resolution		Bit	10 (value 0 - 1023)

Input impedance		kΩ	11.2
Accuracy of actual value			
two MFD devices		%	± 3
Within a single device		%	± 2
Conversion time, analog/digital		ms	Each CPU cycle
Input current		mA	< 1
Cable length screened		m	< 30

Analog inputs temperature resistance Pt100 or Ni1000 sensors

Number			2 x Pt 100 or 2 x Ni1000 (according to part no.)
Input type resistance sensor			Platinum sensor Pt100 according to DIN EN 60751, IEC 751: MFD-TP12-PT… Nickel sensor Ni1000 according to DIN 43760: MFD-TP12-NI…
Temperature range		°C, (°F)	Pt100, area A, selectable:-40 — +90, (-40 — +194); 0 — +250 (+32 — +482); 0 — +400, (+32 — +752) Ni1000, area A, selectable: -40 — +90, (-40 — +194); 0 — +250 (+32 — +482) Pt100, area B: -0 — +850, (+32 — +1562); -200 — +200 (-328 — +392)
Potential isolation			
From power supply			No
From the digital inputs			No
From the outputs			Yes
to PC interface, memory card, easyNet, easyLink			Yes
Resolution digital, scaling per sensor			With operands "IA" and "MD", selectable under scaling: 12 (0- 4095) Bit With operand "MD", selectable under scaling: 1, 0.1 °C (1, 0.1 °F)
Measurement value resolution analog/digital		Bit	Depending upon the scaling
Measuring current		mA	< 1.6
Damage limit (in the case of a wiring error)			Apply external voltage
Measuring principle			Two or three wire per sensor, selectable by connection of sensor
Accuracy (without electromagnetic compatibility interference)		%	Two MFD devices between each other: Typically 1; max. 1.6 (Pt), 1.2 (Ni) Pt100 sensor (offset error, linearity error, repetition accuracy, temperature error of device included): ± 0.8 of measuring range Ni1000 sensor (offset error, linearity error, repetition accuracy, temperature error of device included): ± 0.8 of measuring range
Conversion time, analog/digital		ms	without sampling time setting, selectable per sensor: 200 with sampling time (adjustable), selectable per sensor: 200 - 65535
additional measurement aids			Filtering (software), smoothing of analog input signal (PT1 behavior), only with set sampling time, selectable per sensor: yes Filter for the suppression of certain frequencies and their multiples: 50, 60, 250, 500 Hz
Diagnostics			Card diagnostic: yes Wire break diagnostic per sensor: yes Wire break diagnostic per sensor: yes below lower measurement range: yes Upper sensor measuring range exceeded: yes
Cable length screened		m	< 10

Relay outputs

Potential isolation			
From power supply			Yes

Transistor outputs

Number			4
Rated operational voltage	U_e	V DC	24
Admissible range	U_e	V DC	20.4 - 28.8
Supply current			
On 0 signal	Normally/max.	mA	18/32
On 1 signal	Normally/max.	mA	24 /44
Protection against polarity reversal			yes (Caution: A short circuit will result if 0 V or earth is applied to the outputs in the event that the supply voltage is connected to the wrong poles.)
Potential isolation			
Potential isolation of the power supply, inputs			Yes
From the inputs			Yes
to PC interface, memory card, easyNet, easyLink			Yes
Rated operational current at signal „1" DC per channel	I_e	A	max. 0.5
Lamp load without R_v per channel		W	5 (Q1 - Q4)
Residual current on 0 signal per channel		mA	< 0.1
Max. output voltage			

On 0 signal with external load < 10 MΩ		V	2.5
On 1 signal with I_e = 0.5 A		V	U = U_e -1 V
Short-circuit protection			Thermal (Q1 - Q4), (evaluation with diagnostics input I16)
Short-circuit tripping current for R_a ≦ 10 mΩ		A	0.7 ≦ I_e ≦ 2 per output
Total short-circuit current		A	8
Peak short-circuit current		A	16
Thermal cutout			Yes
Max. operating frequency with constant resistive load		Operations/h	10000
Parallel connection of outputs			
With resistive load, inductive load with external suppressor circuit, combination within a group			Group 1: Q1 to Q4
Number of outputs	max.		4
Total max. current		A	2 (Caution! Outputs must be switched simultaneously and for the same period.)
Inductive load to EN 60947-5-1			
Without external suppressor circuit			
$T_{0.95}$ = 1 ms, R = 48 Ω, L = 16 mH			
Utilization factor		g	0.25
Duty factor		% DF	100
Max. switching frequency f = 0.5 Hz (max. DF = 50 %)		Operations/h	1500
DC-13, $T_{0.95}$ = 72 ms, R = 48 Ω, L = 1.15 H			
Utilization factor		g	0.25
Duty factor		% DF	100
Max. switching frequency f = 0.5 Hz (max. DF = 50 %)		Operations/h	1500
$T_{0.95}$ = 15 ms, R = 48 Ω, L = 0.24 H			
Utilization factor		g	0.25
Duty factor		% DF	100
Max. switching frequency f = 0.5 Hz (max. DF = 50 %)		Operations/h	1500
With external suppressor circuit			
Utilization factor		g	1
Duty factor		% DF	100
Max. switching frequency, max. duty factor		Operations/h	Depending on the suppressor circuit

Analog outputs

Number			1
Potential isolation			
From power supply			No
From the digital inputs			No
From the digital outputs			Yes
From the PC interface, memory card NET network, EASY-Link			Yes
Output type			DC voltage
Signal range		V DC	0 - 10
Max. output current		A	0.01
Load resistance			1 kΩ
Overload and short-circuit protection			Yes
Resolution, analog		V DC	0.01
Resolution, digital		Bit	12 (value 0 - 4095) at QA01, MD
Recovery time		µs	100
Accuracy			
-25 °C - 55 °C		%	2
25°C		%	1
Conversion time			Each CPU cycle

Point-to-point connection

Potential isolation			
From power supply			Yes

Design verification as per IEC/EN 61439

Technical data for design verification			
Rated operational current for specified heat dissipation	I_n	A	0
Heat dissipation per pole, current-dependent	P_{vid}	W	0
Equipment heat dissipation, current-dependent	P_{vid}	W	0
Static heat dissipation, non-current-dependent	P_{vs}	W	2
Heat dissipation capacity	P_{diss}	W	0
Operating ambient temperature min.		°C	-25
Operating ambient temperature max.		°C	55
IEC/EN 61439 design verification			
10.2 Strength of materials and parts			
10.2.2 Corrosion resistance			Meets the product standard's requirements.
10.2.3.1 Verification of thermal stability of enclosures			Meets the product standard's requirements.
10.2.3.2 Verification of resistance of insulating materials to normal heat			Meets the product standard's requirements.
10.2.3.3 Verification of resistance of insulating materials to abnormal heat and fire due to internal electric effects			Meets the product standard's requirements.
10.2.4 Resistance to ultra-violet (UV) radiation			Meets the product standard's requirements.
10.2.5 Lifting			Does not apply, since the entire switchgear needs to be evaluated.
10.2.6 Mechanical impact			Does not apply, since the entire switchgear needs to be evaluated.
10.2.7 Inscriptions			Meets the product standard's requirements.
10.3 Degree of protection of ASSEMBLIES			Meets the product standard's requirements.
10.4 Clearances and creepage distances			Meets the product standard's requirements.
10.5 Protection against electric shock			Does not apply, since the entire switchgear needs to be evaluated.
10.6 Incorporation of switching devices and components			Does not apply, since the entire switchgear needs to be evaluated.
10.7 Internal electrical circuits and connections			Is the panel builder's responsibility.
10.8 Connections for external conductors			Is the panel builder's responsibility.
10.9 Insulation properties			
10.9.2 Power-frequency electric strength			Is the panel builder's responsibility.
10.9.3 Impulse withstand voltage			Is the panel builder's responsibility.
10.9.4 Testing of enclosures made of insulating material			Is the panel builder's responsibility.
10.10 Temperature rise			The panel builder is responsible for the temperature rise calculation. Eaton will provide heat dissipation data for the devices.
10.11 Short-circuit rating			Is the panel builder's responsibility.
10.12 Electromagnetic compatibility			Is the panel builder's responsibility.
10.13 Mechanical function			The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.

Technical data ETIM 7.0

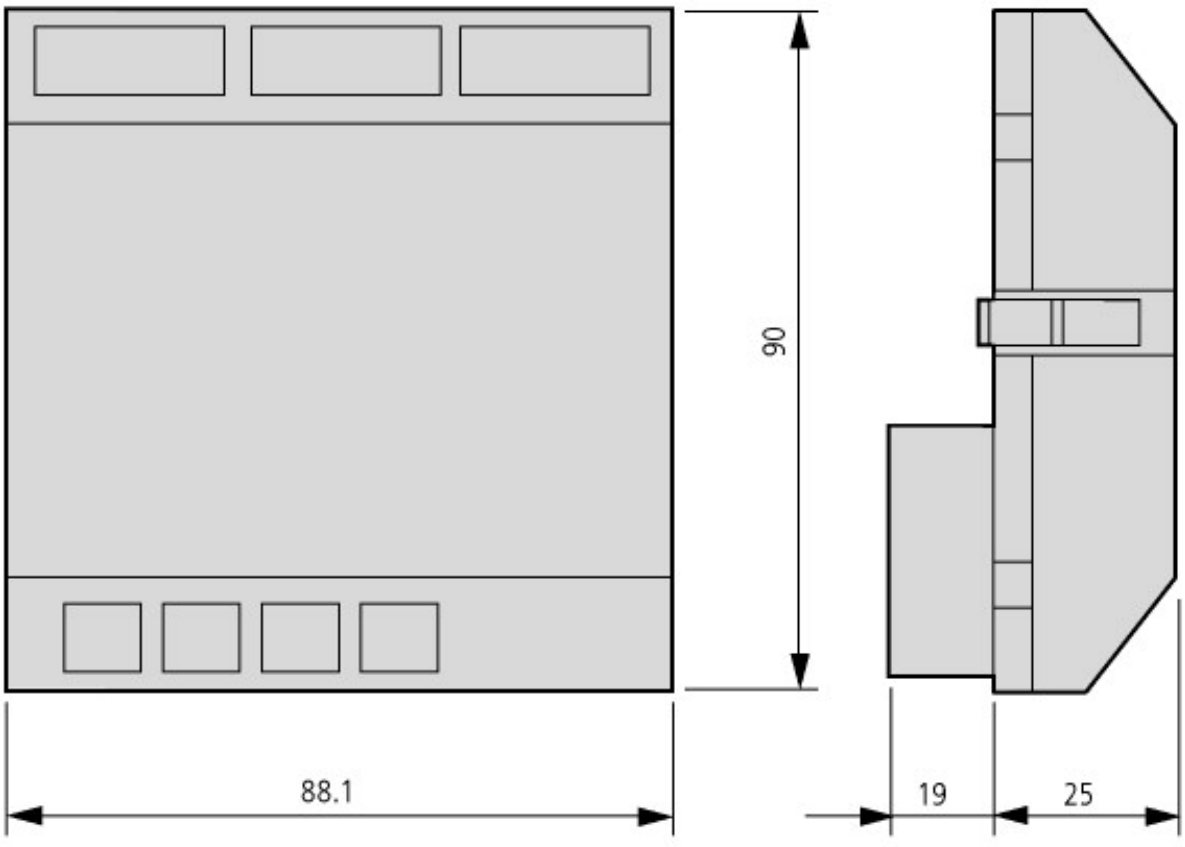
PLC's (EG000024) / PLC analogue I/O-module (EC001420)			
Electric engineering, automation, process control engineering / Control / Programmable logic control (SPS) / SPS analog input/output module (ecl@ss10.0.1-27-24-22-01 [AKE524014])			
Number of analogue inputs			2
Number of analogue outputs			1
Analogue inputs configurable			Yes
Analogue outputs configurable			No
Input, current			No
Input, voltage			Yes
Input, resistor			No
Input, resistance thermometer			Yes
Input, thermocouple			No
Input signal, configurable			Yes
Resolution of the analogue inputs		Bit	12
Output, current			No
Output, voltage			Yes
Output signal configurable			No
Resolution of the analogue outputs		Bit	12
Type of electric connection			Spring clamp connection

Suitable for safety functions		No
Category according to EN 954-1		
SIL according to IEC 61508		None
Performance level acc. EN ISO 13849-1		None
Appendant operation agent (Ex ia)		No
Appendant operation agent (Ex ib)		No
Explosion safety category for gas		None
Explosion safety category for dust		None
Width	mm	90
Height	mm	25
Depth	mm	89

Approvals

Product Standards		IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking
UL File No.		E135462
UL Category Control No.		NRAQ
CSA File No.		012528
CSA Class No.		2252-01 + 2258-02
North America Certification		UL listed, CSA certified
Degree of Protection		IEC: IP20, UL/CSA Type: -

Dimensions



Assets (links)

Declaration of CE Conformity
00002594

Instruction Leaflets
IL05013020Z2018_02

Manuals
MN05002001Z_EN (English)

Additional product information (links)

Instruction leaflet "MFD-Titan temperature module" IL05013020Z (AWA2528-2339)

Instruction leaflet "MFD-Titan temperature module" IL05013020Z (AWA2528-2339)	ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL05013020Z2018_02.pdf
Manual "MFD-Titan multi-function display" MN05002001Z (AWB2528-1480)	
Handbuch „Multifunktions-Display MFD-Titan“ MN05002001Z (AWB2528-1480) - Deutsch	ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN05002001Z_DE.pdf
Manual "MFD-Titan multi-function display" MN05002001Z (AWB2528-1480) - English	ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN05002001Z_EN.pdf
f1=1454&f2=1179;Labeleditor	http://applications.eaton.eu/sdlc?LX=11&amp