



I/O module, 24 V DC, for MFD-CP8/CP10, 12DI(4AI), 4DO-Trans

Part no. MFD-T16
Catalog No. 265255

EL-Nummer (Norway) 4519705

Delivery program

Supply voltage			24 V DC
Inputs			
Digital			12
of which can be used as analog			4
Outputs			
Transistor			4
Temperature range			
Temperature detector			-
For use with			MFD-CP8.. MFD-CP10..

Technical data

General

Standards			EN 61000-6-1/-2/-3/-4, IEC/EN 61000-4, IEC 60068-2-6, IEC 60068-2-27
Dimensions (W x H x D)		mm	89 x 90 x 25 (installed)
Weight		kg	0.114
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 (symmetrical power lines)
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			12
Inputs can be used as analog inputs			4 (I7, I8, 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 - I6, I9 - I10) < 8 (I7, I8, I11, I12)
On 1 signal	U _e	V DC	< 5.0 (I1 - I6, I9 - I10) < 8 (I7, I8, I11, I12)
Input current on 1 signal			
I1 to I6		mA	3.3 (at 24 V DC)
I7, I8		mA	2.2 (at 24 V DC)
I9, I10		mA	3.3 (at 24 V DC)
I11, I12		mA	2.2 (at 24 V DC)
Delay time from 0 to 1		ms	
Debounce ON		ms	20
Debounce OFF		ms	Normally 0.025 (I1 - I4), normally 0.25 (I5, I6, I9, I10), normally 0.15 (I7, I8, I11, I12)
Delay time from 1 to 0		ms	
Debounce ON		ms	20
Debounce OFF		ms	Normally 0.025 (I1 - I4), normally 0.25 (I5, I6, I9, I10), normally 0.15 (I7, I8, I11, I12)
Cable length (unscreened)		m	100
Frequency counter			
Quantity			4 (I1, I2, I3, I4)
Counter frequency		kHz	< 3
Pulse shape			Square
Pulse pause ratio			01:01
Incremental counter			
Quantity			2 (I1 + I2, I3 + I4)
Counter frequency		kHz	≤ 3
Pulse shape			Square
Signal offset			90°
Pulse pause ratio			01:01
Rapid counter inputs			
Number			4 (I1, I2, I3, I4)
Counter frequency		kHz	< 3
Pulse shape			Square
Pulse pause ratio			01:01
Cable length, screened		m	< 20
Analog inputs			
Number			1
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	Every CPU cycle
Input current	mA	< 1
Cable length screened	m	< 30

Analog inputs temperature resistance Pt100 or Ni1000 sensors

Potential isolation		
From power supply		No
From the digital inputs		No
From the outputs		Yes

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 $R_a \leq 10$ mΩ		A $0.7 \leq I_e \leq 2$ 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 40000 h
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 4500
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 %)	Operation	3500
$T_{0.95} = 15 \text{ ms}$, 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 %)	Operation	3500
With external suppressor circuit		
Utilization factor	g	1
Duty factor	% DF	100
Max. switching frequency, max. duty factor	Operation	Depending on the suppressor circuit

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

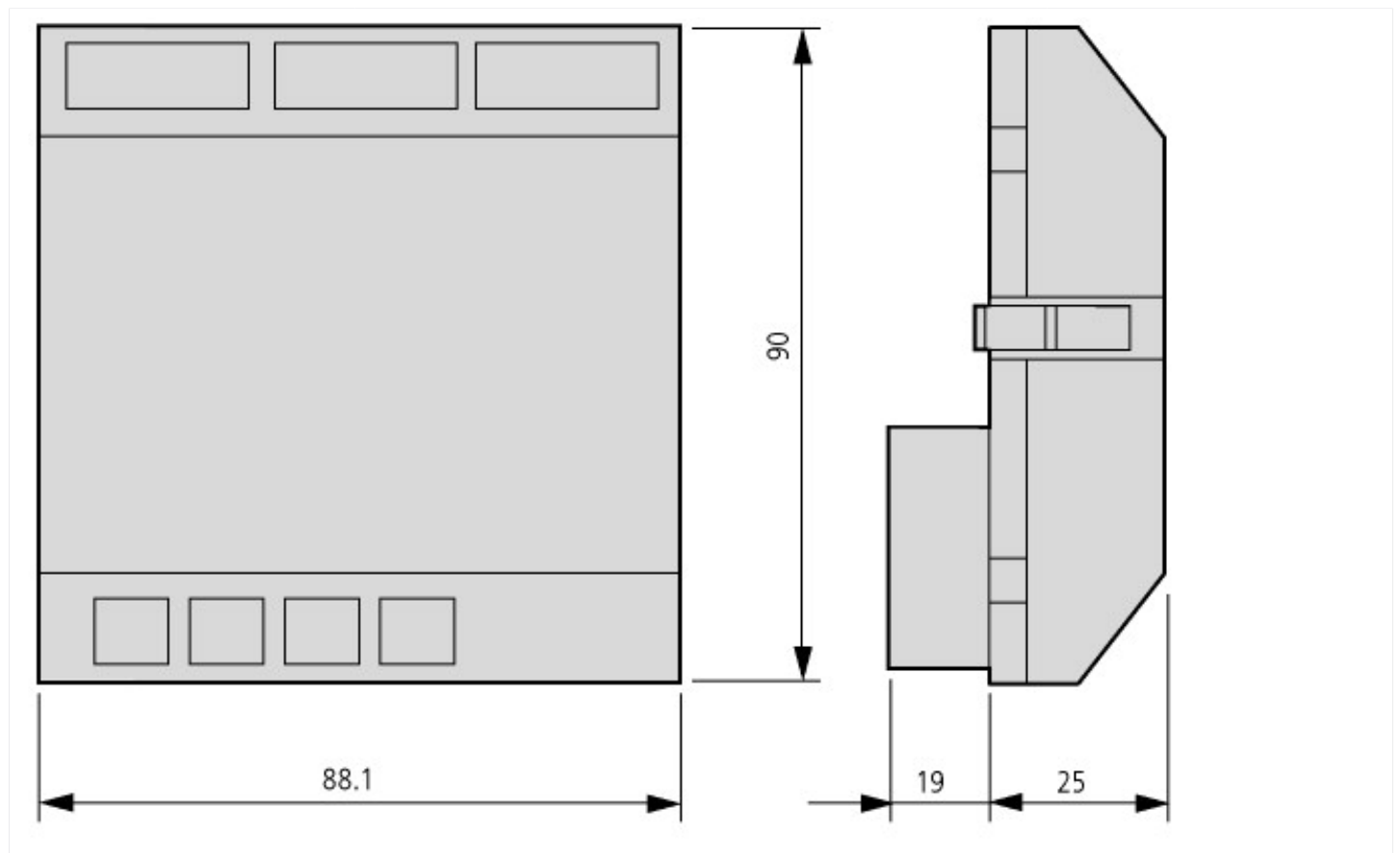
PLC's (EG000024) / PLC digital I/O-module (EC001419)		
Electric engineering, automation, process control engineering / Control / Programmable logic control (SPS) / SPS digital input/output module (ecl@ss10.0.1-27-24-22-04 [AKE527014])		
Supply voltage AC 50 Hz	V	0 - 0
Supply voltage AC 60 Hz	V	0 - 0
Supply voltage DC	V	20.4 - 28.8
Voltage type of supply voltage		DC
Number of digital inputs		12

Number of digital outputs		4
Digital inputs configurable		No
Digital outputs configurable		No
Input current at signal 1	mA	3.3
Permitted voltage at input	V	20.4 - 28.8
Type of voltage (input voltage)		DC
Type of digital output		Transistor
Output current	A	0.5
Permitted voltage at output	V	20.4 - 28.8
Type of output voltage		DC
Short-circuit protection, outputs available		Yes
Redundancy		No
Type of electric connection		Spring clamp connection
Time delay at signal exchange	ms	0.1 - 20
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	89
Height	mm	90
Depth	mm	25

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

IL05013014Z2018_02

Manuals

MN05002001Z_EN (English)

Additional product information (links)

Instruction leaflet "Multi-function display, easy control relays" IL05013014Z (AWA2528-2019)

Instruction leaflet "Multi-function display, easy control relays" IL05013014Z (AWA2528-2019) ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL05013014Z2018_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

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