



Compact PLC, 24 V DC, 12DI(of 4AI), 8DO(T), 1AO, CAN

Part no. **EC4P-221-MTAX1**
Article no. **106396**



Powering Business Worldwide™

Delivery program

Description		Expandable: Inputs/outputs and bus systems individual laser inscription possible with EC4-COMBINATION-*	
Inputs		easyNet/CANopen® on board	
Digital	12		
of which can be used as analog	4		
Outputs			
Transistor	8		
Analog	1		
Supply voltage	24 V DC		

Technical data

General

Dimensions (W x H x D)	mm	107.5 x 90 x 72 without/79 with adapter for MCC (6 SU)
Weight	kg	0.3
Mounting		Top-hat rail IEC/EN 60715, 35 mm or screw fixing using 3 fixing brackets ZB4-101-GF1 (accessories)

Terminal capacities

Solid	mm²	0.2/4 (AWG 22 - 12)
Flexible with ferrule	mm²	0.2/2.5 (AWG 22 - 12)
Standard screwdriver	mm	3.5 x 0.8
Max. tightening torque	Nm	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
LCD display (clearly legible)	°C	0 - 55
Storage	θ °C	-40 - +70
Relative humidity, non-condensing (IEC/EN 60068-2-30)	%	5 - 95
Air pressure (operation)	hPa	1080 - 1080

Ambient conditions, mechanical

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)

Overvoltage category/pollution degree		II/2
Electrostatic discharge (ESD)		
applied standard		IEC EN 61000-4-2, Level 3
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	kV	IEC/EN 61000-4-4, level 3
Burst		
Supply cable	kV	2
Signal lines	kV	2

power pulses (Surge)		2 kV (supply cables, symmetrical, EASY...AC) 0.5 kV (supply cables, symmetrical, easy-DC) according to IEC/EN 61000-4-5
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
Back-up of real-time clock		
Back-up of real-time clock		
Accuracy of the real-time clock	s/day	part no. ± 5 (± 0.5 h/Year)
Retentive memory		
Write cycles of the retentive memory		10000000000 (10^{11}) (Read-write cycles)
Power supply		
Rated operational voltage	U _e	V
Permissible range	U _e	20.4 - 28.8 V DC
Residual ripple		%
Input current		normally 140 mA at U _e
Voltage dips		ms
Heat dissipation	P	≤ 10 (IEC/EN 61131-2)
Heat dissipation	P	Normally 3.4 W
CPU		
Processor		Infineon XC161
Memory		
Program code/data		kByte
Marker/retentive data		KByte
Cycle time for 1 k of instructions (Bit, Byte)		ms
Interfaces		
PRG interface RS232		
Data transfer rate		kBit/s
Connection types		RJ45-bus
Potential isolation		none
Master mode		
Data transfer rate		kbit/s
Character formats		8E1, 801, 8N1, 8N2, 7E2, 702, 7N2, 7E1
Number of transmission bytes in a block		190 bytes
Number of received bytes in a block		190 bytes
Ethernet		
Data transfer rate		Mbit/s
Connection types		RJ45
Potential isolation		No
CANopen®		
Data transfer rate		500 kBit/s, 25 m 250 kBit/s, 60m 125 kBit/s, 125 m 50 kBit/s, 300 m 20 kBit/s, 700 m 10 kBit/s, 1000 m
Bus termination (first and last station)		EASY-NT-R plug (incl. bus terminating resistor 120 Ω)
Connection types		2 x RJ45, 8 pole
Master mode		
Number		8
Mode slave		
Stations	Number	max. 126
PDO type		Asynchronous, cyclic, acyclic
Control contact rated current		To DS 301 V4
Digital inputs 24 V DC		
Number		12

Inputs can be used as analog inputs			4 (I7, I8, I11, I12)
Status Display			LCD-Display
Potential isolation			from the outputs: yes to network easyNet, easyLink
Rated operational voltage	U _e	V DC	24
Input voltage		V DC	< 5 (I1 - I6, I9 - I10) < 8 (I7, I8, I11, I12) at signal "0" > 15.0 (I1 - I6, I9, I10) > 8.0 (I7, I8, I11, I12) at signal "1"
Input current on 1 signal			
Input current at signal 1		mA	3.3 (I1 to I6) 2.2 (I7, I8) 3.3 (I9, I10) 2.2 (I11, I12)
Deceleration time		ms	normally 0.02 (I1 - I4), normally 0.25 (I5 - I12) (from "0" to "1") normally 0.02 (I1 - I4), normally 0.25 (I5 - I12) (from "0" to "1")
Cable length		m	100 (unshielded)
Incremental counter			
Number of counter inputs			1 (I1, I2, I3, I4)
Value range			32 Bit
Counter frequency		kHz	 40
Pulse shape			Square
Counter inputs			I1, I2
Reference input			I3
Input for reference switch			I4
Counter inputs I1 and I2, I3 and I4			1
Signal offset			90°
Rapid counter inputs			
Number			2 (I1, I2) at 16 Bit or 1 (I1) at 32 Bit
Value range			16/32 Bit
Cable length		m	 20 (screened)
Counter frequency		kHz	< 50
Pulse shape			Square

Analog inputs

Number			4 (I7, I8, I11, I12)
Potential isolation			from the outputs: yes to interface/memory card: no
Input type			DC voltage
Signal range			0-10 V DC
Resolution			0.01 V analog 0.01 V digital 10 Bit (value 0 - 1023)
Input impedance		kΩ	11.2
Accuracy of actual value			
Two EASY devices		%	± 3
Within a single device		%	± 2, (I7, I8, I11, I12) ± 0.12 V
Conversion time, analog/digital		ms	each CPU cycle
Input current		mA	< 1
Cable length		m	 30, screened

Analog outputs

Number			1
Output type			DC voltage
Max. output current		A	0.01
Load resistance			1 kΩ
Overload and short-circuit protection			Yes
Resolution			0.01 V DC analog 10 Bit (value 0 - 1023) digital
Recovery time		μs	100
Accuracy			
-25 °C - 55 °C		%	2
25°C		%	1

Conversion time, analog/digital	ms	each CPU cycle
Transistor outputs		
Number		8
Rated operational voltage	U _e	V DC 24
Permissible range	U _e	20.4 - 28.8 V DC
Residual ripple		% 5
Supply current		mA Norm./max. 18/32 at signal 0 24/44 at signal 1
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		from power supply, inputs to the memory card: yes From the inputs: 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
Residual current on 0 signal per channel		mA < 0.1
Max. output voltage		V 2.5 (signal 0 at external load < 10 MΩ) U = U _e - 1 V (signal 1 at I _e = 0.5 A)
Short-circuit protection		Yes, electronic (Q1 - Q4), thermal (Q5 - Q8), (analysis via diagnostics input I16, I15)
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 16
Peak short-circuit current		A 32
Thermal cutout		Yes
Max. operating frequency with constant resistive load		Operations/h 40000
Parallel connection of outputs		
With resistive load, inductive load with external suppressor circuit, combination within a group		Group 1: Q1 - Q4 Group 2: Q5 - Q8
Number of outputs	max.	4
Max. total current		A 2 (Caution! Outputs must be actuated simultaneously and for the same length of time.)
Output status indication		LCD-display
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 500
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 500
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 500
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
Supply voltage U_{Aux}		
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		Yes
Network easyNet		
Bus termination (first and last station)		EASY-NT-R plug (incl. bus terminating resistor 120 Ω)

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	3.4
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 6.0

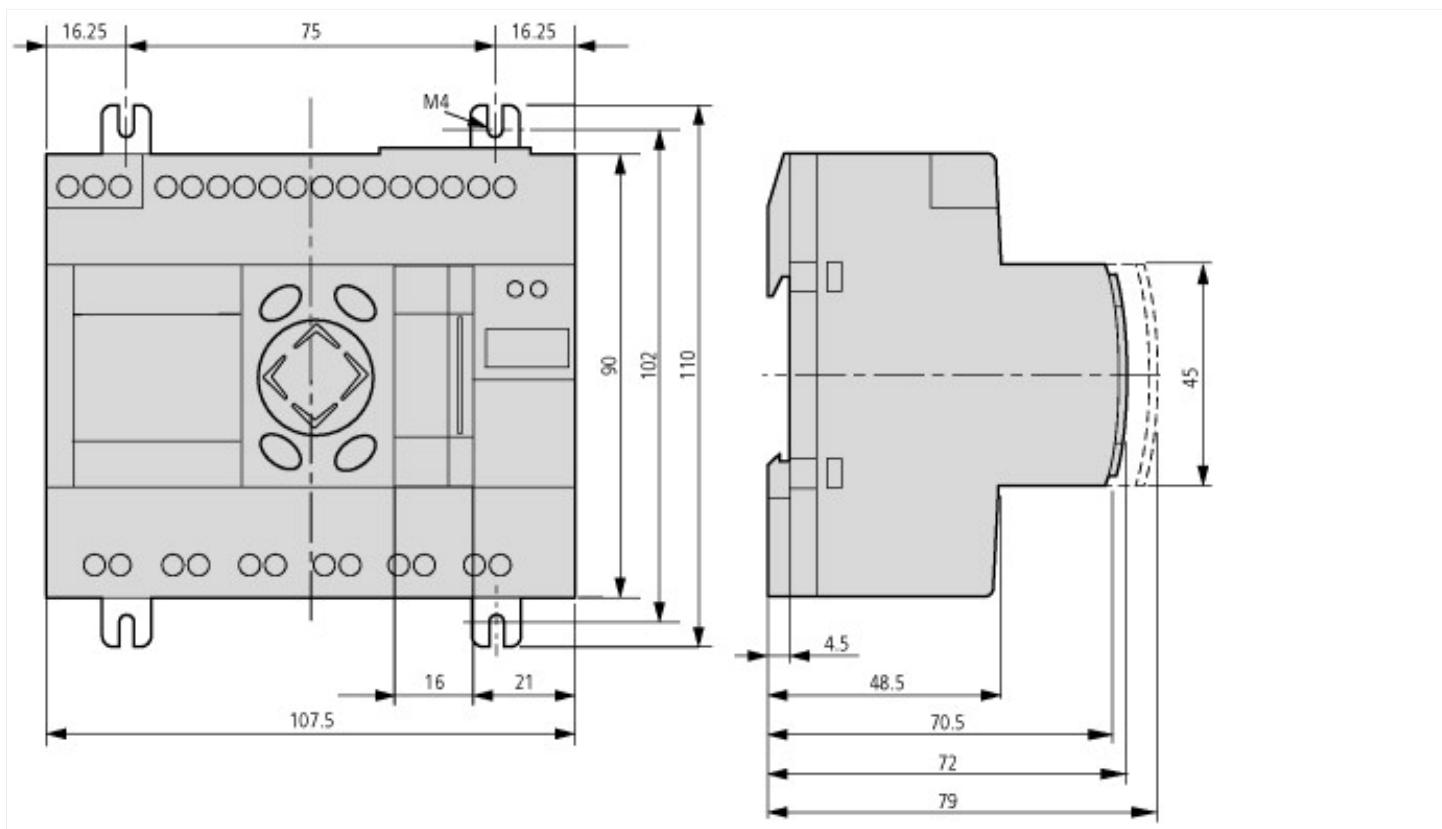
PLC's (EG000024) / PLC device set (EC002581)	
Electric engineering, automation, process control engineering / Control / Programmable logic control (SPS) / PLC device set (ecl@ss8.1-27-24-22-19 [BAA707010])	
Contains function building blocks	Yes
Contains basic device	Yes
Contains module rack	No
Contains power supply	Yes
Contains analogue input module	Yes
Contains analogue output module	Yes
Contains digital input module	Yes
Contains digital output module	Yes
Contains function module	Yes
Contains technology module	No
Contains communication module	Yes
Contains memory unit	Yes
Contains simulation module	No
Contains connection cable	No
Contains control unit	No
Contains monitor	No

Contains programming software	No
Contains engineering software	Yes
Contains visualization	No
Contains libraries	Yes
Contains documentation	Yes
Contains other components	Yes
Software preinstalled	No

Approvals

Product Standards	IEC: see Technical Data; UL508; CSA-C22.2 No. 0-M; CSA-C22.2 No. 142-M; CE marking
UL File No.	E135462
UL Category Control No.	NRAQ
CSA File No.	012528
CSA Class No.	2252-01
North America Certification	UL listed, CSA certified
Specially designed for North America	No
Current Limiting Circuit-Breaker	No
Degree of Protection	IEC: IP20, UL/CSA Type: -

Dimensions



Additional product information (links)

Instruction leaflet "easyControl: compact PLC" IL05003003Z (AWA2724-2334)

Instruction leaflet "easyControl: compact PLC" ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL05003003Z2010_11.pdf
IL05003003Z (AWA2724-2334)

Instruction leaflet "power supply unit, communication module" IL05013018Z (AWA2528-2175)

Instruction leaflet "power supply unit, communication module" IL05013018Z ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL05013018Z.pdf
(AWA2528-2175)

MN05003003Z Manual easyControl, programmable PLC EC4-200

MN05003003Z Handbuch easyControl, ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN05003003Z_DE.pdf
Programmierbare Steuerung EC4-200 - Deutsch

MN05003003Z Manual easyControl, ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN05003003Z_EN.pdf
programmable PLC EC4-200 - English

From the Control Relay to the Automation
System

http://www.moeller.net/binary/ver_techpapers/ms13en_easycontrol.pdf

Labeleditor (Beschriftungssoftware)

<http://downloadcenter.moeller.net/de/software.f6023a63-5acb-42c7-a51c-ccf99091cace>