

Specifications



Eaton 106403

Eaton EC4P Compact PLC, 24 V DC, 12DI(of 4AI), 8DO(T), 1AO, ethernet, CAN, display

General specifications

PRODUCT NAME	Eaton EC4P Compact PLC
CATALOG NUMBER	106403
MODEL CODE	EC4P-222-MTAD1
EAN	4015081061730
PRODUCT LENGTH/DEPTH	72 mm
PRODUCT HEIGHT	90 mm
PRODUCT WIDTH	107.5 mm
PRODUCT WEIGHT	0.314 kg
CERTIFICATIONS	CSA File No.: 012528 CSA-C22.2 No. 142-M CSA-C22.2 No. 0-M UL508 UL CSA Class No.: 2252-01 IEC/EN 61000-4-2, Level 3 CE UL Category Control No.: NRAQ UL File No.: E135462 CSA
CATALOG NOTES	Expandable: Inputs/outputs and bus systems

Ambient conditions, mechanical

CONSTANT ACCELERATION	2 g, 57 - 150 Hz, according to IEC/EN 60068-2-6, Vibrations
CONSTANT AMPLITUDE	0,15 mm, 10 - 57 Hz, according to IEC/EN 60068-2-6, Vibrations
DROP AND TOPPLE	50 mm Drop height, Drop to IEC/EN 60068-2-31
HEIGHT OF FALL (IEC/EN 60068-2-32) - MAX	1 m
MOUNTING POSITION	Horizontal Vertical
SHOCK RESISTANCE	15 g, Mechanical, according to IEC/EN 60068-2-27, Half-sinusoidal shock 11 ms, 18 Impacts

Climatic environmental conditions

AIR PRESSURE	1080 hPa (operation)
AMBIENT OPERATING TEMPERATURE - MAX	55 °C
AMBIENT STORAGE TEMPERATURE - MAX	70 °C
AMBIENT OPERATING TEMPERATURE - MIN	-25 °C
AMBIENT STORAGE TEMPERATURE - MIN	-40 °C
ENVIRONMENTAL CONDITIONS	Clearance in air and creepage distances according to EN 50178, UL 508, CSA C22.2, No. 142 Condensation: prevent with appropriate measures
RELATIVE HUMIDITY	5 - 95 % (non-condensing)

Communication

BUS TERMINATION	EASY-NT-R plug (incl. bus terminating resistor 120 Ω), first and last station, CANopen®
CHARACTER FORMATS	8E1, 8O1, 8N1, 8N2, 7E2, 7O2, 7N2, 7E1, PRG interface RS232, Master mode
CONNECTION TYPE	RJ45, PRG Interface RS232 RJ45, Ethernet 2 x RJ45, 8 pole, CANopen®
CYCLE TIME	< 0.3 ms, for 1 k of instructions (Bit, Byte), CPU
DATA TRANSFER RATE	50 kBit/s at 300 m, CANopen® 250 kBit/s at 60 m, CANopen® 19.2 kBit/s, PRG interface RS232, Master mode 500 kBit/s at 25 m, CANopen® 0.6 kBit/s, PRG interface RS232, Master mode 38.4 kBit/s, PRG interface RS232, Master mode 10 MBit/s, 100 m, Ethernet
	125 kBit/s at 125 m, CANopen® 57.6 kBit/s, PRG interface RS232, Master mode 0.3 kBit/s, PRG interface RS232, Master mode 1.2 kBit/s, PRG interface RS232, Master mode 20 kBit/s at 700 m, CANopen® 2.4 kBit/s, PRG interface RS232, Master mode 4.8 kBit/s, PRG interface RS232, Master mode 9.6 kBit/s, PRG interface RS232, Master mode 10 kBit/s at 1000 m, CANopen®
MEMORY	16 kByte Marker Memory 4 kByte Output Memory 14 segments of 16 kByte Program memory data 4 kByte Input Memory 8 kByte Retain Memory 256 kByte Program memory code

Design verification

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.
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 RESIST. OF INSUL. MAT. TO ABNORMAL HEAT/FIRE BY INTERNAL ELECT. 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	Does not apply, since the entire switchgear needs to

NUMBER OF BYTES	190 transmission bytes (in a block)
NUMBER OF MODULES	Max. 126 (slaves)
STATION	To DS 301 V4, Control contact rated current, Mode slave, Interfaces
WRITE CYCLES OF THE RETENTIVE MEMORY	10,000,000,000 read-write cycles

COMPONENTS	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.
10.9.2 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.
EQUIPMENT HEAT DISSIPATION, CURRENT-DEPENDENT PVID	0 W
HEAT DISSIPATION CAPACITY PDISS	0 W
HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID	0 W
RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)	0 A
STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS	3.4 W

Electro magnetic compatibility

AIR DISCHARGE	8 kV
BURST IMPULSE	2 kV, Supply cable According to IEC/EN 61000-4-4, level 3 2 kV, Signal cable
CONTACT DISCHARGE	6 kV, Electrostatic discharge (ESD)
ELECTROMAGNETIC FIELDS	10 V/m (according to IEC EN 61000-4-3)
IMMUNITY TO LINE-CONDUCTED INTERFERENCE	10 V (according to IEC/EN 61000-4-6)
RADIO INTERFERENCE CLASS	Class B (EN 55011) Class B (EN 55022)
SURGE RATING	2 kV, Supply cables, symmetrical, EASY...AC, power pulses (Surge), EMC According to IEC/EN 61000-4-5, power pulses (Surge), EMC 0.5 kV, Supply cables, symmetrical, EASY...DC, power pulses (Surge), EMC

Features & functions

FEATURES

Overload and short-circuit protection
190 received bytes in a block (PRG interface RS232, Master mode)
Parallel connection of transistor outputs with resistive load, inductive load with external suppressor circuit, combination within a group - Group 2: Q5 - Q8
Parallel connection of transistor outputs with resistive load, inductive load with external suppressor circuit, combination within a group - Group 1: Q1 - Q4
Asynchronous, cyclic, acyclic PDO types (operating modes of the slave)

FITTED WITH:

Power supply
Digital input module
Monitor
Engineering software
Basic device
Communication module
Memory unit
Documentation
Ethernet on board
easyNet/CANopen® on board
Analog output module
Digital output module
Other components
Analog input module
Control unit
Display
Function module
Libraries
Keypad

FUNCTIONS

Thermal cutout
Building blocks

INSCRIPTION

Individual inscription possible with EC4-COMBINATION-*

PROCESSOR

Infineon XC161

General information

CABLE LENGTH	100 m, unshielded, Digital inputs 24 V DC 30 m, screened, Analog inputs
CURRENT CONSUMPTION	2 A, max. total current of Transistor outputs (Caution! Outputs must be actuated simultaneously and for the same length of time.)
DEGREE OF PROTECTION	IP20
DISPLAY TEMPERATURE - MAX	55 °C
DISPLAY TEMPERATURE - MIN	0 °C
MOUNTING METHOD	Screw fixing using fixing brackets ZB4-101-GF1 (accessories) Top-hat rail fixing (according to IEC/EN 60715, 35 mm)
OVERVOLTAGE CATEGORY	II
POLLUTION DEGREE	2
RATED OPERATIONAL VOLTAGE	24 V DC (-15 %/+ 20 % - power supply) 20.4 - 28.8 V DC 20.4 - 28.8 V DC (Transistor outputs)
RECOVERY TIME	100 µs
RESIDUAL CURRENT	0.1 mA (on signal "1" per channel)
RESOLUTION	• 0.01 V analog (Analog inputs) • 0.01 V DC analog (Analog outputs) • 0.01 V digital (Analog inputs) • 10 Bit (value 0 - 1023, Analog inputs) • 10 Bit (value 0 - 1023, digital, Analog outputs)
SHORT-CIRCUIT PROTECTION	Yes, electronic (Q1 - Q4), thermal (Q5 - Q8), (analysis via diagnostics input I16, I15), Transistor outputs

Input/Output

ACCURACY	1 %, Analog outputs at 25 °C ± 5 s/day (± 0.5 h/year), Real-time clock, normally 2 %, Analog outputs at -25 °C - 55 °C ± 3 %, of actual value, two devices (Analog Inputs) ± 2, (I7, I8, I11, I12) ± 0.12 V, of actual value, within a single device (Analog Inputs)
CONVERSIONS	Each CPU cycle, Analog outputs Each CPU cycle for Analog inputs
DELAY TIME	0.02 ms typ., Digital inputs 24 DC (I1 - I4), Delay time from 0 to 1 0.25 ms typ., Digital inputs 24 DC (I5 - I12), Delay time from 0 to 1
DUTY FACTOR	100 % (Inductive load to EN 60947-5-1, Without external suppressor circuit, T0.95 = 15 ms, R = 48 Ω, L = 0.24 H) 100 % (Inductive load to EN 60947-5-1, With external suppressor circuit) 100 % (Inductive load to EN 60947-5-1, Without external suppressor circuit, DC-13, T0.95 = 72 ms, R = 48 Ω, L = 1.15 H) 100 % (Inductive load to EN 60947-5-1, Without external suppressor circuit, T0.95 = 1 ms, R = 48 Ω, L = 16 mH)
INCREMENTAL COUNTER	Value range: 32 Bit Counter frequency: ≤ 40 kHz Pulse shape: Square Reference input: I3 Signal offset: 90° Number of counter inputs: 1 (I1, I2, I3, I4) Counter inputs: I1, I2 Input for reference switch: I4
INDICATION	LCD-display used as Output status indication of Transistor outputs LCD-display used as status

	indication of Digital inputs 24 V DC
INPUT	Voltage (DC)
INPUT CURRENT	140 mA 3.3 mA (I1 - I6, at 24 V DC, at signal 1) 2.2 mA (I11 - I12, at 24 V DC, at signal 1) 1 mA (Analog inputs) 3.3 mA (I9 - I10, at 24 V DC, at signal 1) 2.2 mA (I7 - I8, at 24 V DC, at signal 1)
INPUT IMPEDANCE	11.2 k Ω
INSULATION RESISTANCE	According to EN 50178
LAMP LOAD	5 W (without Rv per channel)
LOAD RESISTANCE	1 k Ω
NUMBER OF INPUTS (ANALOG)	4 (I7, I8, I11, I12)
NUMBER OF INPUTS (DIGITAL)	4 (can also be used as analog inputs) 4 (I7, I8, I11, I12, can also be used as analog inputs) 12 12 (24 V DC)
NUMBER OF OUTPUTS	Max. 4 (for parallel connection) 8 Transistor Outputs
NUMBER OF OUTPUTS (ANALOG)	1
OPERATING FREQUENCY	40000 Operations/h at resistive load Depending on the suppressor circuit (Inductive load to EN 60947-5-1, With external suppressor circuit, Max. switching frequency, max. duty factor)
OUTPUT	Voltage (DC)
OUTPUT CURRENT (MA) - MAX	100 mA
PEAK SHORT-CIRCUIT CURRENT	32 A
RAPID COUNTER INPUTS	2 (I1, I2) at 16 Bit or 1 (I1) at 32 Bit 50 kHz, Counter frequency Cable length: $\leq$ 20 m (shielded) Pulse shape: Square 16/32 Bit (value range)

RATED OPERATIONAL CURRENT (IE)	Max. 0.5 A at signal „1“ DC per channel
RATED OPERATIONAL VOLTAGE (UE) AT DC - MAX	24 V
SHORT-CIRCUIT TRIPPING CURRENT	$0.7 \leq I_e \leq 2$ per output, For $R_a \leq 10 \text{ m}\Omega$, Transistor outputs
SIGNAL RANGE	0 - 10 V DC, Analog inputs
SWITCHING FREQUENCY	Max. 1500 Operations (Inductive load to EN 60947-5-1, without external suppressor circuit, $T_{0.95} = 15 \text{ ms}$, $R = 48 \text{ }\Omega$, $L = 0.24 \text{ H}$, $f = 0.5 \text{ Hz}$ (max. DF = 50 %)) Max. 1500 Operations (Inductive load to EN 60947-5-1, without external suppressor circuit, $T_{0.95} = 1 \text{ ms}$, $R = 48 \text{ }\Omega$, $L = 16 \text{ mH}$, $f = 0.5 \text{ Hz}$ (max. DF = 50 %)) Max. 1500 Operations (Inductive load to EN 60947-5-1, without external suppressor circuit, DC-13, $T_{0.95} = 72 \text{ ms}$, $R = 48 \text{ }\Omega$, $L = 1.15 \text{ H}$, $f = 0.5 \text{ Hz}$ (max. DF = 50 %))
UTILIZATION FACTOR	0.25 (Inductive load to EN 60947-5-1, Without external suppressor circuit, $T_{0.95} = 15 \text{ ms}$, $R = 48 \text{ }\Omega$, $L = 0.24 \text{ H}$) 0.25 (Inductive load to EN 60947-5-1, Without external suppressor circuit, $T_{0.95} = 1 \text{ ms}$, $R = 48 \text{ }\Omega$, $L = 16 \text{ mH}$) 1 (Inductive load to EN 60947-5-1, With external suppressor circuit) 0.25 (Inductive load to EN 60947-5-1, Without external suppressor circuit, DC-13, $T_{0.95} = 72 \text{ ms}$, $R = 48 \text{ }\Omega$, $L = 1.15 \text{ H}$)
SHORT-CIRCUIT CURRENT	16 A, Transistor outputs

Power supply

HEAT DISSIPATION	3.4 W
INPUT VOLTAGE	Signal 1: > 15 V DC (I1 - I6, I9 - I10, Digital inputs, 24 V DC) Signal 0: < 8 V DC (I7 - I8, I11 - I12, Digital inputs, 24 V DC) Signal 1: > 8 V DC (I7 - I8, I11 - I12, Digital inputs, 24 V DC) Signal 0: < 5 V DC (I1 - I6, I9 - I10, Digital inputs, 24 V DC)
OUTPUT VOLTAGE	Max. 2.5 V (at signal 0 at external load < 10 MΩ, transistor outputs) $U = U_e - 1 \text{ V}$ (signal 1 at $I_e = 0.5 \text{ A}$, transistor outputs)
RESIDUAL RIPPLE	5 % (transistor outputs) ≤ 5 %
SUPPLY CURRENT	18/32 mA, Normally/max., On 0 signal, Transistor outputs 24/44 mA, Normally/max., On 1 signal, Transistor outputs
SUPPLY VOLTAGE AT DC - MAX	24 VDC
VOLTAGE DIPS	≤ 10 ms According to EN 61131-2

Terminal capacities

SCREWDRIVER SIZE	3.5 x 0.8 mm, Terminal screw
TERMINAL CAPACITY (FLEXIBLE WITH FERRULE AWG)	22 - 12
TERMINAL CAPACITY (FLEXIBLE WITH FERRULE)	0.2/2.5 mm ²
TERMINAL CAPACITY (SOLID AWG)	22 - 12
TERMINAL CAPACITY (SOLID)	0.2/4 mm ²
TIGHTENING TORQUE	0.6 Nm

Safety

POTENTIAL ISOLATION	Supply voltage UAUX: yes Between Analog inputs and Outputs: yes Between Analog inputs and Interface/memory card: no Between Digital inputs 24 V DC and Outputs: yes Between Transistor outputs and Power supply: yes Between Digital inputs 24 V DC and network easyNet, easyLink Between Transistor outputs and Memory card: yes Between Transistor outputs and Inputs: yes
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.)

Resources

CATALOGUES	eaton-product-overview-for-machinery-catalogue-ca08103003zen-en-us.pdf
CHARACTERISTIC CURVE	eaton-electrical-timers-easy-control-relays-characteristic-curve.eps eaton-modular-plc-easy-module-ec4p-compact-plc-dimensions.eps
DRAWINGS	eaton-general-m22-standards.eps eaton-general-approval-easy-control-relays-standards.jpg
ECAD MODEL	DA-CE-ETN.EC4P-222-MTAD1
INSTALLATION INSTRUCTIONS	IL05003003Z IL05013018Z

MANUALS AND USER GUIDES	MN05003003Z_EN
	DA-CS-easy800
MCAD MODEL	eaton-compact-plc-mcad-drawings-easy800.dwg
SALES NOTES	eaton-control-relay-easye4-flyer-fl050007en-en-us.pdf

PROJECT NAME:

PROJECT NUMBER:

PREPARED BY:

DATE:



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