

Specifications



Eaton 106399

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

General specifications

PRODUCT NAME	Eaton EC4P Compact PLC
CATALOG NUMBER	106399
MODEL CODE	EC4P-222-MTXD1
EAN	4015081061693
PRODUCT LENGTH/DEPTH	72 mm
PRODUCT HEIGHT	90 mm
PRODUCT WIDTH	107.5 mm
PRODUCT WEIGHT	0.314 kg
CERTIFICATIONS	CSA IEC/EN 61000-4-2, Level 3 UL File No.: E135462 CSA-C22.2 No. 142-M CSA Class No.: 2252-01 UL508 CE UL UL Category Control No.: NRAQ CSA File No.: 012528 CSA-C22.2 No. 0-M
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	Vertical Horizontal
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	Condensation: prevent with appropriate measures Clearance in air and creepage distances according to EN 50178, UL 508, CSA C22.2, No. 142
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, Ethernet RJ45, PRG Interface RS232 2 x RJ45, 8 pole, CANopen®
CYCLE TIME	< 0.3 ms, for 1 k of instructions (Bit, Byte), CPU
DATA TRANSFER RATE	19.2 kBit/s, PRG interface RS232, Master mode 500 kBit/s at 25 m, CANopen® 125 kBit/s at 125 m, CANopen® 10 kBit/s at 1000 m, CANopen® 9.6 kBit/s, PRG interface RS232, Master mode 1.2 kBit/s, PRG interface RS232, Master mode 2.4 kBit/s, PRG interface RS232, Master mode 38.4 kBit/s, PRG interface RS232, Master mode 10 MBit/s, 100 m, Ethernet 0.6 kBit/s, PRG interface RS232, Master mode 4.8 kBit/s, PRG interface RS232, Master mode 57.6 kBit/s, PRG interface RS232, Master mode 250 kBit/s at 60 m, CANopen® 50 kBit/s at 300 m, CANopen® 0.3 kBit/s, PRG interface RS232, Master mode 20 kBit/s at 700 m, CANopen®
MEMORY	4 kByte Input Memory 4 kByte Output Memory 8 kByte Retain Memory 256 kByte Program memory code 14 segments of 16 kByte Program memory data 16 kByte Marker Memory

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 2 kV, Signal cable According to IEC/EN 61000-4-4, level 3
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	0.5 kV, Supply cables, symmetrical, EASY...DC, power pulses (Surge), EMC According to IEC/EN 61000-4-5, power pulses (Surge), EMC 2 kV, Supply cables, symmetrical, EASY...AC, power pulses (Surge), EMC

Features & functions

FEATURES

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 1: Q1 - Q4
Parallel connection of transistor outputs with resistive load, inductive load with external suppressor circuit, combination within a group - Group 2: Q5 - Q8
Asynchronous, cyclic, acyclic PDO types (operating modes of the slave)

FITTED WITH:

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

FUNCTIONS

Thermal cutout
Building blocks

INSCRIPTION

Individual inscription possible with EC4-COMBINATION-*

PROCESSOR

Infineon XC161

General information

CABLE LENGTH	30 m, screened, Analog inputs 100 m, unshielded, Digital inputs 24 V DC
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	Top-hat rail fixing (according to IEC/EN 60715, 35 mm) Screw fixing using fixing brackets ZB4-101-GF1 (accessories)
OVERVOLTAGE CATEGORY	II
POLLUTION DEGREE	2
RATED OPERATIONAL VOLTAGE	20.4 - 28.8 V DC 20.4 - 28.8 V DC (Transistor outputs) 24 V DC (-15 %/+ 20 % - power supply)
RESIDUAL CURRENT	0.1 mA (on signal "1" per channel)
RESOLUTION	• 0.01 V analog (Analog inputs) • 0.01 V digital (Analog inputs) • 10 Bit (value 0 - 1023, Analog inputs)
SHORT-CIRCUIT PROTECTION	Yes, electronic (Q1 - Q4), thermal (Q5 - Q8), (analysis via diagnostics input I16, I15), Transistor outputs

Input/Output

ACCURACY	± 5 s/day (± 0.5 h/year), Real-time clock, normally ± 2, (I7, I8, I11, I12) ± 0.12 V, of actual value, within a single device (Analog Inputs) ± 3 %, of actual value, two devices (Analog Inputs)
CONVERSIONS	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, Without external suppressor circuit, T0.95 = 1 ms, R = 48 Ω, L = 16 mH) 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, With external suppressor circuit)
INCREMENTAL COUNTER	Pulse shape: Square Input for reference switch: I4 Signal offset: 90° Number of counter inputs: 1 (I1, I2, I3, I4) Reference input: I3 Value range: 32 Bit Counter inputs: I1, I2 Counter frequency: ≤ 40 kHz
INDICATION	LCD-display used as status indication of Digital inputs 24 V DC LCD-display used as Output status indication of Transistor outputs
INPUT	Voltage (DC)
INPUT CURRENT	3.3 mA (I1 - I6, at 24 V DC, at signal 1)

	2.2 mA (I7 - I8, at 24 V DC, at signal 1) 3.3 mA (I9 - I10, at 24 V DC, at signal 1) 2.2 mA (I11 - I12, at 24 V DC, at signal 1) 140 mA 1 mA (Analog inputs)
INPUT IMPEDANCE	11.2 kΩ
INSULATION RESISTANCE	According to EN 50178
LAMP LOAD	5 W (without Rv per channel)
NUMBER OF INPUTS (ANALOG)	4 (I7, I8, I11, I12)
NUMBER OF INPUTS (DIGITAL)	4 (I7, I8, I11, I12, can also be used as analog inputs) 12 12 (24 V DC) 4 (can also be used as analog inputs)
NUMBER OF OUTPUTS	Max. 4 (for parallel connection) 8 Transistor Outputs
OPERATING FREQUENCY	Depending on the suppressor circuit (Inductive load to EN 60947-5-1, With external suppressor circuit, Max. switching frequency, max. duty factor) 40000 Operations/h at resistive load
PEAK SHORT-CIRCUIT CURRENT	32 A
RAPID COUNTER INPUTS	Cable length: ≤ 20 m (shielded) Pulse shape: Square 2 (I1, I2) at 16 Bit or 1 (I1) at 32 Bit 16/32 Bit (value range) 50 kHz, Counter frequency
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 ≤ Ie ≤ 2 per output, For Ra ≤ 10 mΩ, 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, T0.95 = 1 ms, R = 48 Ω, L = 16 mH, f = 0.5 Hz (max. DF = 50 %)) Max. 1500 Operations (Inductive load to EN 60947-5-1, without external suppressor circuit, DC-13, T0.95 = 72 ms, R = 48 Ω, L = 1.15 H, f = 0.5 Hz (max. DF = 50 %)) Max. 1500 Operations (Inductive load to EN 60947-5-1, without external suppressor circuit, T0.95 = 15 ms, R = 48 Ω, L = 0.24 H, f = 0.5 Hz (max. DF = 50 %))
UTILIZATION FACTOR	0.25 (Inductive load to EN 60947-5-1, Without external suppressor circuit, DC-13, T0.95 = 72 ms, R = 48 Ω, L = 1.15 H) 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, T0.95 = 15 ms, R = 48 Ω, L = 0.24 H) 0.25 (Inductive load to EN 60947-5-1, Without external suppressor circuit, T0.95 = 1 ms, R = 48 Ω, L = 16 mH)
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	$U = U_e - 1 \text{ V}$ (signal 1 at $I_e = 0.5 \text{ A}$, transistor outputs) Max. 2.5 V (at signal 0 at external load < 10 M Ω , transistor outputs)
RESIDUAL RIPPLE	5 % (transistor outputs) $\leq 5 \%$
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	$\leq 10 \text{ ms}$ 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

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

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	ETN.EC4P-222-MTXD1
INSTALLATION INSTRUCTIONS	IL05003003Z

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

PROJECT NAME:

PROJECT NUMBER:

PREPARED BY:

DATE:



Eaton Corporation plc Eaton House
30 Pembroke Road
Dublin 4, Ireland
Eaton.com

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