



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

Part no. EC4P-221-MTXX1
Catalog No. 106392

EL-Nummer (Norway) 4519733

Delivery program

| | | | |
|--------------------------------|--|--|--|
| Description | | | Expandable: Inputs/outputs and bus systems individual laser inscription possible with EC4-COMBINATION-* |
| | | | easyNet/CANopen® on board |
| Inputs | | | |
| Digital | | | 12 |
| of which can be used as analog | | | 4 |
| Outputs | | | |
| Transistor | | | 8 |
| 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 | | mm ² | 0.2/4 (AWG 22 - 12) |
| Flexible with ferrule | | mm ² | 0.2/2.5 (AWG 22 - 12) |
| Standard screwdriver | | mm | 0.8 x 3.5 |
| 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 | 9 | °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 | |  |
| | | ① Backup time (hours) with fully charged double layer capacitor ② Service life (years) |
| 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 ¹⁰) (Read-write cycles) |
|--------------------------------------|--|---|

Power supply

| | | | |
|---------------------------|----------------|----|-----------------------------------|
| Rated operational voltage | U _e | V | 24 DC (-15/+20%) |
| Permissible range | U _e | | 20.4 - 28.8 V DC |
| Residual ripple | | % | ≤ 5 |
| Input current | | | normally 140 mA at U _e |
| Voltage dips | | ms | ≤ 10 (IEC/EN 61131-2) |
| Heat dissipation | P | | Normally 3.4 W |

CPU

| | | | |
|--|--|-------|-------------------------------|
| Processor | | | Infineon XC161 |
| Memory | | | |
| Program code/data | | kByte | 256/14 segments of 16 KB each |
| Marker/retentive data | | KByte | 16/4/4/8 |
| Cycle time for 1 k of instructions (Bit, Byte) | | ms | < 0.3 |

Interfaces

| | | | |
|--|--|--------|--|
| PRG interface RS232 | | | |
| Data transfer rate | | kBit/s | 4.8, 9.6, 19.2, 38.4, 57.6, 115.2 (character format: 8 bit data, no parity, 1 stop bit) |
| Connection types | | | RJ45-bus |
| Potential isolation | | | none |
| Master mode | | | |
| Data transfer rate | | kbit/s | 0.3, 0.6, 1.2, 2.4, 4.8, 9.6, 19.2, 38.4, 57.6 |
| Character formats | | | 8E1, 8O1, 8N1, 8N2, 7E2, 7O2, 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 | 10 MBit/s, 100 m |
| 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 | | | |
| 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 |

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 M Ω) 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 m Ω | | 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 | | Operation 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 %) | | Operation | 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 | 4500 |
| 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 %) | | Operation | 4500 |
| With external suppressor circuit | | | |
| Utilization factor | | g | 1 |
| Duty factor | | % DF | 100 |
| Max. switching frequency, max. duty factor | | Operation | 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 | | | |
| 10.2.2.1 Verification of thermal stability of enclosures | | | Meets the product standard's requirements. |
| 10.2.2.2 Verification of resistance of insulating materials to normal heat | | | Meets the product standard's requirements. |
| 10.2.2.3 Verification of resistance of insulating materials to abnormal heat and fire due to internal electric effects | | | Meets the product standard's requirements. |

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|--|--|--|
| 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

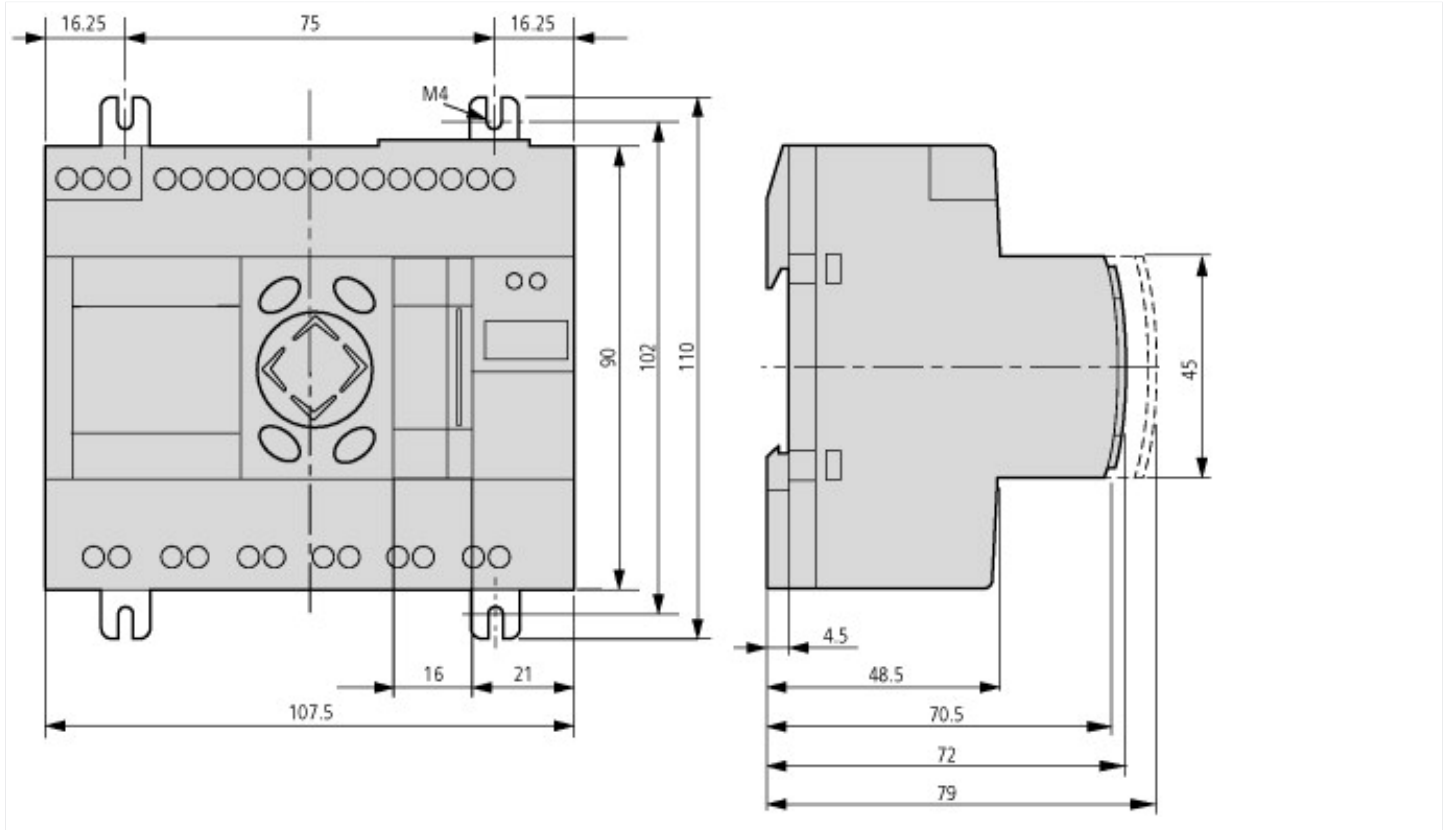
| | | |
|--|--|-----|
| PLC's (EG000024) / PLC device set (EC002581) | | |
| Electric engineering, automation, process control engineering / Control / Programmable logic control (SPS) / PLC device set (ecl@ss10.0.1-27-24-22-19 [BAA707013]) | | |
| Contains function building blocks | | Yes |
| Contains basic device | | Yes |
| Contains module rack | | No |
| Contains power supply | | Yes |
| Contains analogue input module | | Yes |
| Contains analogue output module | | No |
| 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" IL05003003Z (AWA2724-2334) https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL05003003Z2018_02.pdf

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

Instruction leaflet "power supply unit, communication module" IL05013018Z (AWA2528-2175) https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL05013018Z2018_02.pdf

MN05003003Z Manual easyControl, programmable PLC EC4-200

MN05003003Z Handbuch easyControl, SPS EC4-200 - Deutsch https://es-assets.eaton.com/DOCUMENTATION/AWB_MANUALS/MN05003003Z_DE.pdf

MN05003003Z Manual easyControl, programmable PLC EC4-200 - English https://es-assets.eaton.com/DOCUMENTATION/AWB_MANUALS/MN05003003Z_EN.pdf

From the Control Relay to the Automation System http://www.moeller.net/binary/ver_techpapers/ms13en_easycontrol.pdf

f1=1454&f2=1179;Labeleditor <http://applications.eaton.eu/sdlc?LX=11&f1=1454&f2=1179;Labeleditor>

Product overview (WEB) <http://www.eaton.eu/ec4p>