



I/O module with temperature measuring, range B, 6DI(2AI), 2I-Pt100, 4DO-Trans

Part no. **MFD-TP12-PT-B**
 Catalog No. **106043**

EL-Nummer (Norway) **4519716**

Delivery program

| | | | |
|--------------------------------|--|--|---|
| Description | | | Configurable temperature range |
| Supply voltage | | | 24 V DC |
| Inputs | | | |
| Digital | | | 6 |
| of which can be used as analog | | | 2 |
| Pt100, Pt1000, Ni1000 | | | 2 |
| Outputs | | | |
| Transistor | | | 4 |
| Temperature range | | | |
| Temperature detector | | | -200...+200 °C 0...+850 °C |
| For use with | | | MFD-CP8... from device version 08 MFD-CP10.. |
| Connection type | | | screw terminal |

Technical data

General

| | | | |
|------------------------|--|----|--|
| Standards | | | EN 61000-6-1/-2/-3/-4, IEC 60068-2-6, IEC 60068-2-27 |
| Dimensions (W x H x D) | | mm | 89 x 90 x 25 (installed) |
| Weight | | kg | 0.14 |
| Mounting | | | Fitted into the power supply unit. |

Terminal capacities

| | | | |
|-----------------------|--|-----------------|----------------------|
| Solid | | mm ² | 0.24 (AWG 24 - 12) |
| Flexible with ferrule | | mm ² | 0.22.5 (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 (supply cables, symmetrical) |
| 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 | | | 6 |
| Inputs can be used as analog inputs | | | 2 (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 | $< 5.0 (I1 - I4) < 8.0 (I11, I12)$ |
| On 1 signal | U_e | V DC | $> 15.0 (I1 - I4) > 8.0 (I11, I12)$ |
| Input current on 1 signal | | | |
| I11, I12 | | mA | 2.2 (at 24 V DC) |
| Delay time from 0 to 1 | | ms | |
| Debounce ON | | ms | 20 |
| Debounce OFF | | ms | Normally 0.1 (I1 - I4), Normally 0.25 (I11 - I12) |
| Delay time from 1 to 0 | | ms | |
| Debounce ON | | ms | 20 |
| Debounce OFF | | ms | Normally 0.1 (I1 - I4), normally 0.2 (I11, I12) |
| Cable length (unscreened) | | m | 100 |
| Frequency counter | | | |
| Quantity | | | 4 (I1, I2, I3, I4) |
| Counter frequency | | kHz | < 3 |
| Pulse shape | | | Square |
| Incremental counter | | | |
| Quantity | | | 2 (I1 + I2, I3 + I4) |
| Counter frequency | | kHz | ≤ 3 |
| Pulse shape | | | Square |
| Signal offset | | | 90° |
| Rapid counter inputs | | | |
| Number | | | 4 (I1, I2, I3, I4) |
| Counter frequency | | kHz | < 3 |
| Pulse shape | | | Square |
| Cable length, screened | | m | < 20 |

Analog inputs

| | | | |
|---|--|------|------------|
| 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 | Each CPU cycle |
| Input current | | mA | < 1 |
| Cable length screened | | m | < 30 |

Analog inputs temperature resistance Pt100 or Ni1000 sensors

| | | | |
|---|--|----------|---|
| Number | | | 2 x Pt 100 or 2 x Ni1000 (according to part no.) |
| Input type resistance sensor | | | Platinum sensor Pt100 according to DIN EN 60751, IEC 751: MFD-TP12-PT... Nickel sensor Ni1000 according to DIN 43760: MFD-TP12-NI... |
| Temperature range | | °C, (°F) | Pt100, area A, selectable: -40 — +90, (-40 — +194); 0 — +250 (+32 — +482); 0 — +400, (+32 — +752) Ni1000, area A, selectable: -40 — +90, (-40 — +194); 0 — +250 (+32 — +482) Pt100, area B: -0 — +850, (+32 — +1562); -200 — +200 (-328 — +392) |
| Potential isolation | | | |
| From power supply | | | No |
| From the digital inputs | | | No |
| From the outputs | | | Yes |
| to PC interface, memory card, easyNet, easyLink | | | Yes |
| Resolution digital, scaling per sensor | | | With operands "IA" and "MD", selectable under scaling: 12 (0- 4095) Bit With operand "MD", selectable under scaling: 1, 0.1 °C (1, 0.1 °F) |
| Measurement value resolution analog/digital | | Bit | Depending upon the scaling |
| Measuring current | | mA | < 1.6 |
| Damage limit (in the case of a wiring error) | | | Apply external voltage |
| Measuring principle | | | Two or three wire per sensor, selectable by connection of sensor |
| Accuracy (without electromagnetic compatibility interference) | | % | Two MFD devices between each other: Typically 1; max. 1.6 (Pt), 1.2 (Ni) Pt100 sensor (offset error, linearity error, repetition accuracy, temperature error of device included): ± 0.8 of measuring range Ni1000 sensor (offset error, linearity error, repetition accuracy, temperature error of device included): ± 0.8 of measuring range |
| Conversion time, analog/digital | | ms | without sampling time setting, selectable per sensor: 200 with sampling time (adjustable), selectable per sensor: 200 - 65535 |
| additional measurement aids | | | Filtering (software), smoothing of analog input signal (PT1 behavior), only with set sampling time, selectable per sensor: yes Filter for the suppression of certain frequencies and their multiples: 50, 60, 250, 500 Hz |
| Diagnostics | | | Card diagnostic: yes Wire break diagnostic per sensor: yes Wire break diagnostic per sensor: yes below lower measurement range: yes Upper sensor measuring range exceeded: yes |
| Cable length screened | | m | < 10 |

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 $I_0 = 0.5$ A | | V | $U = U_0 - 1$ V |
| Short-circuit protection | | | |
| Short-circuit tripping current for $R_a \leq 10$ mΩ | | | A |
| Total short-circuit current | | | 8 |
| Peak short-circuit current | | | 16 |
| Thermal cutout | | | Yes |
| Max. operating frequency with constant resistive load | | | Operation 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 %) | | | 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 4 Depending on the suppressor circuit |

Analog outputs

| | | | |
|----------------------------|--|--|----|
| Potential isolation | | | |
| From power supply | | | No |
| From the digital inputs | | | No |

Point-to-point connection

| | | | |
|----------------------------|--|--|-----|
| Potential isolation | | | |
| From power supply | | | Yes |

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 6.0

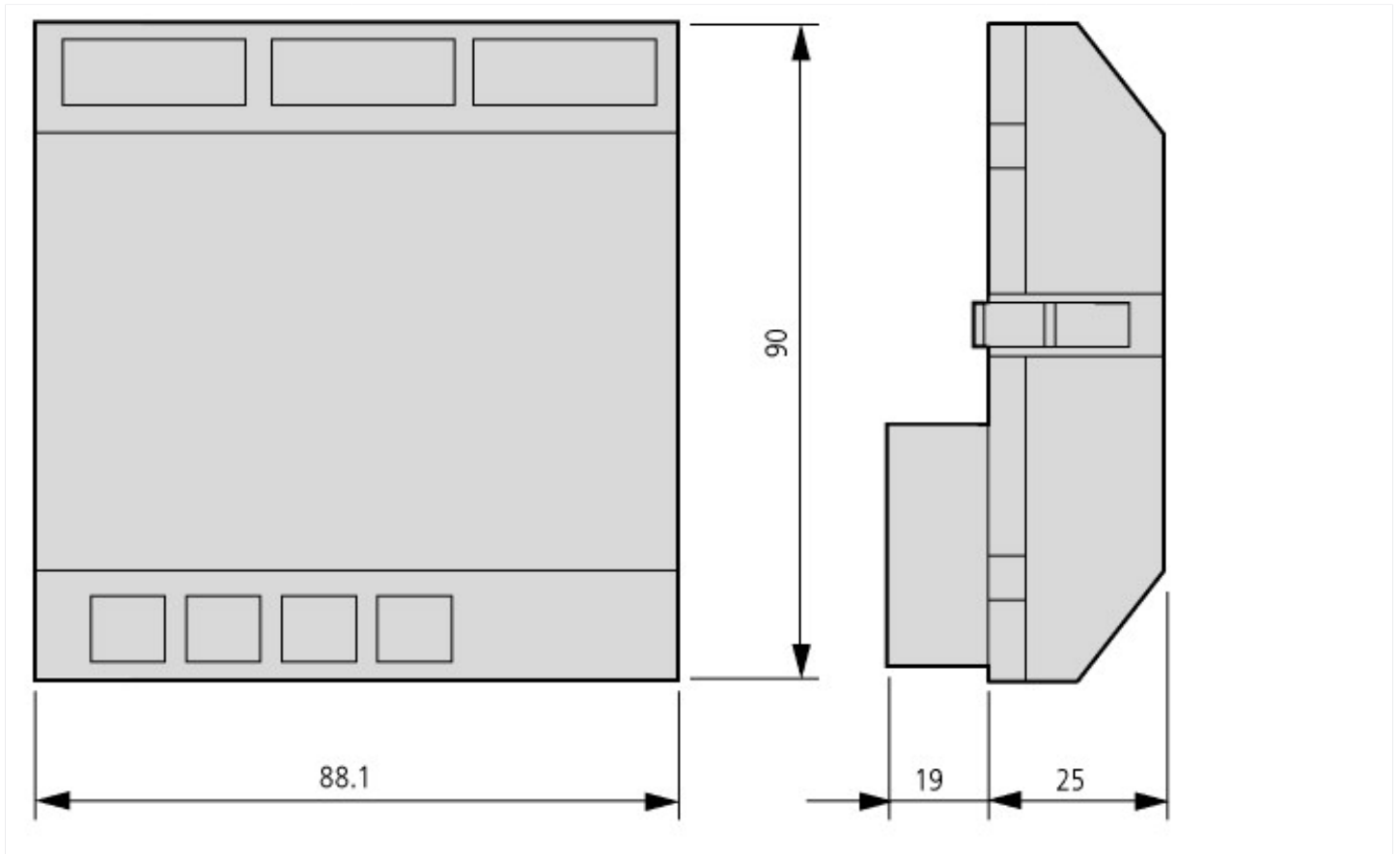
| | | | |
|---|--|-----|-------------------------|
| PLC's (EG000024) / PLC analogue I/O-module (EC001420) | | | |
| Electric engineering, automation, process control engineering / Control / Programmable logic control (SPS) / SPS analog input/output module (ecl@ss8.1-27-24-22-01 [AKE524011]) | | | |
| Number of analogue inputs | | | 2 |
| Number of analogue outputs | | | 0 |
| Analog inputs configurable | | | No |
| Analog outputs configurable | | | No |
| Input, current | | | No |
| Input, voltage | | | Yes |
| Input, resistor | | | No |
| Input, resistance thermometer | | | Yes |
| Input, thermocouple | | | No |
| Input signal, configurable | | | Yes |
| Resolution of the analogue inputs | | Bit | 12 |
| Output, current | | | No |
| Output, voltage | | | No |
| Output signal configurable | | | No |
| Resolution of the analogue outputs | | Bit | 0 |
| Type of electric connection | | | Spring clamp connection |
| Suitable for safety functions | | | No |
| Category according to EN 954-1 | | | |
| SIL according to IEC 61508 | | | None |
| Performance level acc. to 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 | 90 |
| Height | | mm | 25 |
| Depth | | mm | 89 |

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



Additional product information (links)

f1=1454&f2=1179;Labeleditor

<http://applications.eaton.eu/sdlc?LX=11&>