



I/O expansion, integrated, 24 V DC, 6DI, 4DO(R)

**Part no.** EC4E-221-6D4R1  
**Catalog No.** 114296

**EL-Nummer (Norway)** 4560853

## Delivery program

|                            |  |  |                                      |
|----------------------------|--|--|--------------------------------------|
| Product range              |  |  | Remote I/O systems<br>Compact PLCs   |
| Subrange                   |  |  | I/O expansions digital/analog        |
| Basic function             |  |  | Expansions                           |
| Description                |  |  | usable via CANopen®                  |
| Function                   |  |  | CANopen® expansion EC4E              |
| <b>Inputs</b>              |  |  |                                      |
| Inputs expansion (number)  |  |  | Digital: 6                           |
| <b>Additional features</b> |  |  |                                      |
| Real time clock            |  |  | #                                    |
| Supply voltage             |  |  | 24 V DC                              |
| For use with               |  |  | XC100<br>XC200<br>EC4P               |
| For use with               |  |  | XC100/200, EC4P, MFD4 (via CANopen®) |

## Technical data

### General

|                        |  |    |                                                                                                  |
|------------------------|--|----|--------------------------------------------------------------------------------------------------|
| Dimensions (W x H x D) |  | mm | 71.5 x 90 x 58 (4 PE)                                                                            |
| Weight                 |  | kg | 0.2                                                                                              |
| Mounting               |  |    | Top-hat rail IEC/EN 60715, 35 mm or screw fixing using fixing brackets ZB4-101-GF1 (accessories) |

### Terminal capacities

|                        |  |                 |                       |
|------------------------|--|-----------------|-----------------------|
| Solid                  |  | mm <sup>2</sup> | 0.2/4 (AWG 22 - 12)   |
| Flexible with ferrule  |  | mm <sup>2</sup> | 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               |
| Storage                       | 8 | °C | -40 - +70                                                       |

### Ambient conditions, mechanical

|                   |  |  |                        |
|-------------------|--|--|------------------------|
| 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                                                                                                                             |
| Electromagnetic fields (RFI) to IEC EN 61000-4-3              |  | V/m | 10                                                                                                                            |
| Burst                                                         |  | kV  | according to IEC/EN 61000-4-4                                                                                                 |
| power pulses (Surge)                                          |  |     | 2 kV (supply cables, symmetrical, EASY...AC)<br>0.5 kV (supply cables, symmetrical, easy-DC)<br>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                             |

### Power supply

|                           |                |   |                  |
|---------------------------|----------------|---|------------------|
| Rated operational voltage | U <sub>e</sub> | V | 24 DC (-15/+20%) |
|---------------------------|----------------|---|------------------|

|                   |                |    |                                     |
|-------------------|----------------|----|-------------------------------------|
| Permissible range | U <sub>e</sub> |    | 20.4 - 28.8 V DC                    |
| Residual ripple   |                | %  | ≤ 5                                 |
| Input current     |                |    | 150 mA at U <sub>e</sub> at no load |
| Voltage dips      |                | ms | ≤ 20<br>(IEC/EN 61131-2)            |
| Heat dissipation  | P              |    | Normally 3.5 W                      |

## Interfaces

|                                          |  |        |                                                                                                   |
|------------------------------------------|--|--------|---------------------------------------------------------------------------------------------------|
| CANopen®                                 |  |        |                                                                                                   |
| Data transfer rate                       |  |        | 500 kBit/s, 25 m250 kBit/s, 40m125 kBit/s, 125 m50 kBit/s, 300 m20 kBit/s, 700 m10 kBit/s, 1000 m |
| Bus termination (first and last station) |  |        | Via integrated Dip switch                                                                         |
| Connection types                         |  |        | 2 x terminals (see terminal capacity)                                                             |
| Mode slave                               |  |        |                                                                                                   |
| Stations                                 |  | Number | max. 62                                                                                           |
| PDO type                                 |  |        | Asynchronous, cyclic, acyclic                                                                     |
| Control contact rated current            |  |        | to DS301V4                                                                                        |

## Digital inputs 24 V DC

|                           |                |      |                                                                                                                       |
|---------------------------|----------------|------|-----------------------------------------------------------------------------------------------------------------------|
| Number                    |                |      | 6                                                                                                                     |
| Potential isolation       |                |      | from the outputs: yes                                                                                                 |
| Rated operational voltage | U <sub>e</sub> | V DC | 24                                                                                                                    |
| Input voltage             |                | V DC | < 5 (R1 - R6) at signal "0"<br>> 15 (R1 - R6) at signal "1"                                                           |
| Input current on 1 signal |                |      |                                                                                                                       |
| Input current at signal 1 |                | mA   | 3.3 (R1 to R6 (R12))                                                                                                  |
| Deceleration time         |                | ms   | 20 (from "0" to "1", debounce ON)<br>Normally 0.25 (R1 - R12) (from "0" to "1", debounce OFF)<br>20 (from „1“ to „0“) |
| Cable length              |                | m    | 100 (unshielded)                                                                                                      |

## Relay outputs

|                                                                           |                |                   |                                                                                                                                                                                      |
|---------------------------------------------------------------------------|----------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Outputs in groups of                                                      |                |                   | 1                                                                                                                                                                                    |
| Parallel switching of outputs for increased output                        |                |                   | Not permissible                                                                                                                                                                      |
| Protection of an output relay                                             |                |                   | Miniature circuit-breaker B16 or fuse 8 A (slow)                                                                                                                                     |
| Potential isolation                                                       |                |                   | from power supply: yes<br>From the inputs: yes<br>to PC interface, memory card, network NET, easyLink<br>Safe isolation according to EN 50178: 300 V AC<br>Basic isolation: 600 V AC |
| Lifespan, mechanical                                                      | Operations     | x 10 <sup>6</sup> | 10                                                                                                                                                                                   |
| Contacts                                                                  |                |                   |                                                                                                                                                                                      |
| Conventional thermal current (10 A UL)                                    |                | A                 | 6                                                                                                                                                                                    |
| Recommended for load: 12 V AC/DC                                          |                | mA                | > 500                                                                                                                                                                                |
| Short-circuit-proof cos φ = 1, characteristic B16 at 600 A                |                | A                 | 16                                                                                                                                                                                   |
| Short-circuit-proof cos φ = 0.5 to 0.7, characteristic B16 at 900 A       |                | A                 | 16                                                                                                                                                                                   |
| Rated impulse withstand voltage U <sub>imp</sub> of contact coil          |                | kV                | 6                                                                                                                                                                                    |
| Rated operational voltage                                                 | U <sub>e</sub> | V AC              | 250                                                                                                                                                                                  |
| Rated insulation voltage                                                  | U <sub>i</sub> | V AC              | 250                                                                                                                                                                                  |
| Safe isolation according to EN 50178                                      |                | V AC              | 300 between coil and contact<br>300 between two contacts                                                                                                                             |
| Breaking capacity                                                         |                |                   |                                                                                                                                                                                      |
| AC-15, 250 V AC, 3 A (600 Ops./h)                                         | Operations     |                   | 300000                                                                                                                                                                               |
| DC-13, L/R ≤ 150 ms, 24 V DC, 1 A (500 S/h)                               | Operations     |                   | 200000                                                                                                                                                                               |
| Filament bulb load                                                        |                |                   |                                                                                                                                                                                      |
| 1000 W at 230/240 V AC                                                    | Operations     |                   | 25000                                                                                                                                                                                |
| 500 W at 115/120 V AC                                                     | Operations     |                   | 25000                                                                                                                                                                                |
| Fluorescent lamp load                                                     |                |                   |                                                                                                                                                                                      |
| Fluorescent lamp load 10 x 58 W at 230/240 V AC                           |                |                   |                                                                                                                                                                                      |
| With upstream electrical device                                           | Operations     |                   | 25000                                                                                                                                                                                |
| Uncompensated                                                             | Operations     |                   | 25000                                                                                                                                                                                |
| Fluorescent lamp load 1 x 58 W at 230/240 V AC, conventional, compensated | Operations     |                   | 25000                                                                                                                                                                                |

|                                                            |  |                   |                        |
|------------------------------------------------------------|--|-------------------|------------------------|
| Switching frequency                                        |  |                   |                        |
| Mechanical operations                                      |  | x 10 <sup>6</sup> | 10                     |
| Switching frequency                                        |  | Hz                | 10                     |
| Resistive load/lamp load                                   |  | Hz                | 2                      |
| Inductive load                                             |  | Hz                | 0.5                    |
| UL/CSA                                                     |  |                   |                        |
| Uninterrupted current at 240 V AC                          |  | A                 | 10                     |
| Uninterrupted current at 24 V DC                           |  | A                 | 8                      |
| AC                                                         |  |                   |                        |
| Control Circuit Rating Codes (utilization category)        |  |                   | B 300 Light Pilot Duty |
| Max. rated operational voltage                             |  | V AC              | 300                    |
| max. thermal continuous current cos $\varphi$ = 1 at B 300 |  | A                 | 5                      |
| max. make/break cos $\varphi$ ≠ capacity 1 at B 300        |  | VA                | 3600/360               |
| DC                                                         |  |                   |                        |
| Control Circuit Rating Codes (utilization category)        |  |                   | R 300 Light Pilot Duty |
| Max. rated operational voltage                             |  | V DC              | 300                    |
| Max. thermal uninterrupted current at R 300                |  | A                 | 1                      |
| Max. make/break capacity at R 300                          |  | VA                | 28/28                  |

## Network easyNet

|                                          |  |  |                           |
|------------------------------------------|--|--|---------------------------|
| Bus termination (first and last station) |  |  | Via integrated Dip switch |
|------------------------------------------|--|--|---------------------------|

## Design verification as per IEC/EN 61439

|                                                                                                                        |                   |    |                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------|-------------------|----|----------------------------------------------------------------------------------------------------------------------------------|
| Technical data for design verification                                                                                 |                   |    |                                                                                                                                  |
| Rated operational current for specified heat dissipation                                                               | I <sub>n</sub>    | A  | 0                                                                                                                                |
| Heat dissipation per pole, current-dependent                                                                           | P <sub>vid</sub>  | W  | 0                                                                                                                                |
| Equipment heat dissipation, current-dependent                                                                          | P <sub>vid</sub>  | W  | 0                                                                                                                                |
| Static heat dissipation, non-current-dependent                                                                         | P <sub>vs</sub>   | W  | 3.4                                                                                                                              |
| Heat dissipation capacity                                                                                              | P <sub>diss</sub> | 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. |
|---------------------------|--|--|----------------------------------------------------------------------------------------------------------|

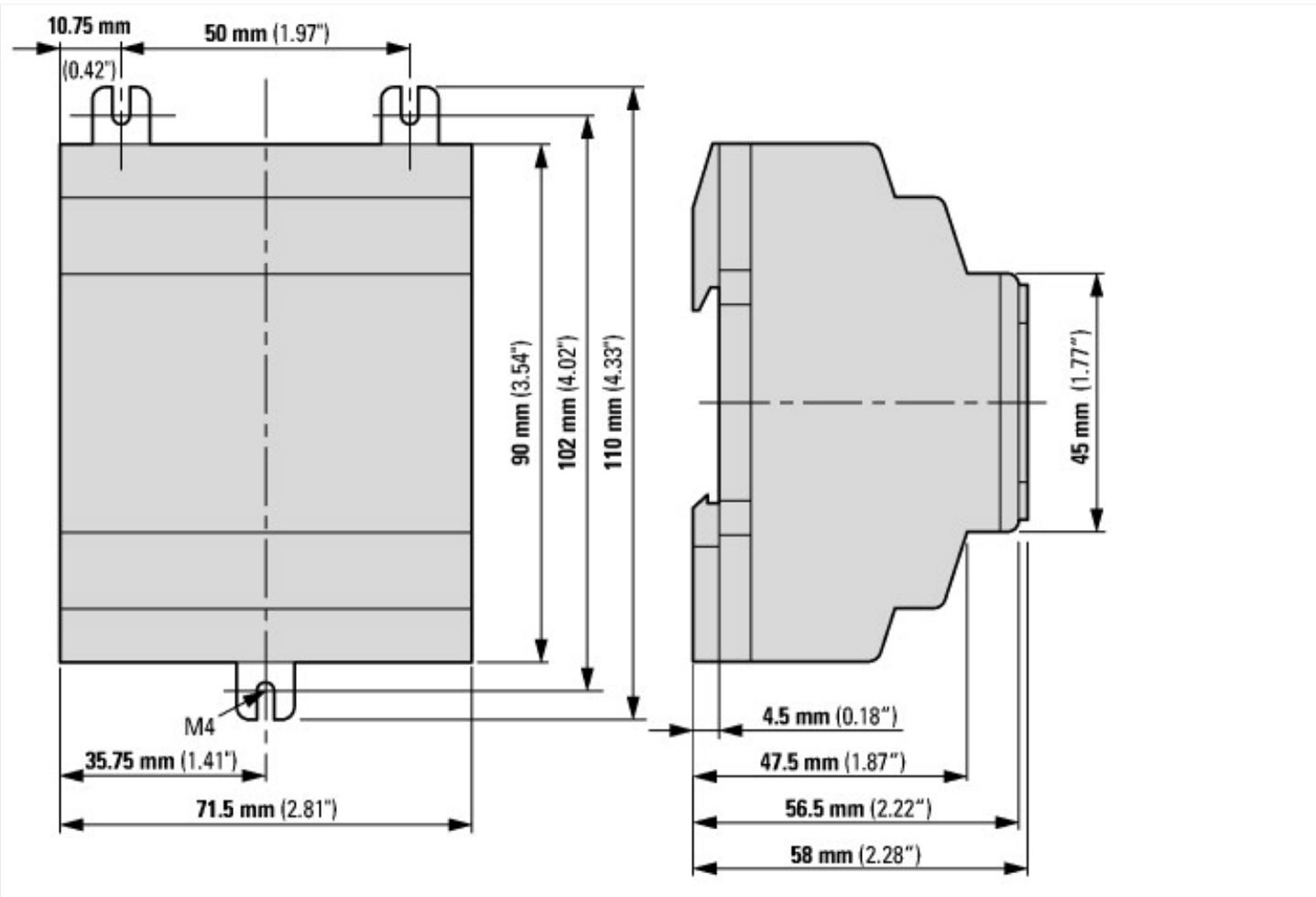
## Technical data ETIM 7.0

|                                                                                                                                                                                     |    |  |                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|--|------------------|
| PLC's (EG000024) / PLC digital I/O-module (EC001419)                                                                                                                                |    |  |                  |
| Electric engineering, automation, process control engineering / Control / Programmable logic control (SPS) / SPS digital input/output module (ecl@ss10.0.1-27-24-22-04 [AKE527014]) |    |  |                  |
| Supply voltage AC 50 Hz                                                                                                                                                             | V  |  | 0 - 0            |
| Supply voltage AC 60 Hz                                                                                                                                                             | V  |  | 0 - 0            |
| Supply voltage DC                                                                                                                                                                   | V  |  | 20.4 - 28.8      |
| Voltage type of supply voltage                                                                                                                                                      |    |  | DC               |
| Number of digital inputs                                                                                                                                                            |    |  | 6                |
| Number of digital outputs                                                                                                                                                           |    |  | 4                |
| Digital inputs configurable                                                                                                                                                         |    |  | No               |
| Digital outputs configurable                                                                                                                                                        |    |  | No               |
| Input current at signal 1                                                                                                                                                           | mA |  | 3.3              |
| Permitted voltage at input                                                                                                                                                          | V  |  | 0 - 0            |
| Type of voltage (input voltage)                                                                                                                                                     |    |  | DC               |
| Type of digital output                                                                                                                                                              |    |  | Relay            |
| Output current                                                                                                                                                                      | A  |  | 8                |
| Permitted voltage at output                                                                                                                                                         | V  |  | 0 - 0            |
| Type of output voltage                                                                                                                                                              |    |  | AC/DC            |
| Short-circuit protection, outputs available                                                                                                                                         |    |  | No               |
| Redundancy                                                                                                                                                                          |    |  | No               |
| Type of electric connection                                                                                                                                                         |    |  | Screw connection |
| Time delay at signal exchange                                                                                                                                                       | ms |  | 20 - 20          |
| Suitable for safety functions                                                                                                                                                       |    |  | No               |
| Category according to EN 954-1                                                                                                                                                      |    |  |                  |
| SIL according to IEC 61508                                                                                                                                                          |    |  | None             |
| Performance level acc. 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 |  | 71.5             |
| Height                                                                                                                                                                              | mm |  | 90               |
| Depth                                                                                                                                                                               | mm |  | 58               |

## Approvals

|                                      |  |  |                              |
|--------------------------------------|--|--|------------------------------|
| North America Certification          |  |  | Request filed for UL and CSA |
| 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 IL05013026Z CANopen digital modules EC4E-221-6D4R1, EC4E-221-6D4T1 |                                                                                                                                                                                   |
| Instruction leaflet IL05013026Z CANopen digital modules EC4E-221-6D4R1, EC4E-221-6D4T1 | <a href="https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL05013026Z2018_02.pdf">https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL05013026Z2018_02.pdf</a> |
| Manual CAN digital module EC4E MN05002003Z (AWB2724-1614)                              |                                                                                                                                                                                   |
| Handbuch digitales CAN-Modul EC4E MN05002003Z (AWB2724-1614) - Deutsch                 | <a href="https://es-assets.eaton.com/DOCUMENTATION/AWB_MANUALS/MN05002003Z_DE.pdf">https://es-assets.eaton.com/DOCUMENTATION/AWB_MANUALS/MN05002003Z_DE.pdf</a>                   |
| Manual CAN digital module EC4E MN05002003Z (AWB2724-1614) - English                    | <a href="https://es-assets.eaton.com/DOCUMENTATION/AWB_MANUALS/MN05002003Z_EN.pdf">https://es-assets.eaton.com/DOCUMENTATION/AWB_MANUALS/MN05002003Z_EN.pdf</a>                   |
| Technical Data                                                                         | <a href="http://ecat.moeller.net/flip-cat/?edition=HPLEN&amp;startpage=14.75">http://ecat.moeller.net/flip-cat/?edition=HPLEN&amp;startpage=14.75</a>                             |
| Product overview (WEB)                                                                 | <a href="http://www.eaton.eu/ec4p">http://www.eaton.eu/ec4p</a>                                                                                                                   |