


## CPE0106, CPE0108, CPE0208

## Processor modules

Processor modules of the CPE100 series combine outstanding environmental robustness with very compact dimensions.

Thanks to an integrated power supply unit, which can also provide power to the I/O modules, and integrated communication interfaces, complete basic systems can be realized within a single module width, without requiring additional space on the backplane. The industrial processors used with scalable clock frequencies offer sufficient CPU performance for small to medium-sized applications.

Machine control, simple motion control, a wide range of communication tasks or condition monitoring can be implemented easily and cost efficiently with this platform. Different programs can be executed priority-controlled and virtually in parallel thanks to the real time multi-tasking. If the CPU performance has to be increased, applications can be transferred easily to more powerful CPU models thanks to the standard programming model.

The generous thermal design and special coating processes enable fanless use in extreme operating conditions from -30 °C to +70 °C.

| Part type designation | Part number |
|---|---|
| CPE0106 | 00042919-00 |
| CPE0106 EC | On request |
| CPE0108 | 00042923-00 |
| CPE0108 EC | On request |
| CPE0208 | 00042927-00 |
| CPE0208 EC | On request |

**Features**

- Industrial processor at up to 1000 MHz
- Single- or dual-core CPU
- Real-time symmetrical multi processing
- Up to 1 GB LPDDR4 working memory
- 128 kB remanent memory (retain)
- Up to 4 GB internal storage medium
- microSD card slot for removable media
- Up to 3x Ethernet 100/1000 Mbit/s with IEEE 1588
- Trusted Platform Module
- Minimum cycle time: 500 µs
- Diagnostics and status LEDs

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| Common properties | CPE0106 | CPE0108 | CPE0208 |
|---|---|---|---|
| Basic function | **C**entral **P**rocessing Unit **E**co | | |
| | Single-core processor module with integrated station power supply for the M100 system | | Dual-core processor module with integrated station power supply for the M100 system |
| | 1x RJ45 interfaces 100/1000 Mbit/s | 3x RJ45 interfaces 100/1000 Mbit/s | |
| | – | 1x USB-A 2.0 interface | |
| | 1x USB-C (service interface)<br>2x rotary switch | | |
| System | Bachmann system M100 | | |

| Processor and memory | CPE0106 | CPE0108 | CPE0208 |
|---|---|---|---|
| Processor | ARM | | |
| Cores | 1 | | 2 |
| Base clock frequency | 800 MHz | 1000 MHz | |
| RAM | 512 MB LPDDR4 | 1 GB LPDDR4 | |

| Mass storage | CPE0106 | CPE0108 | CPE0208 |
|---|---|---|---|
| Internal Storage | 1 GB pSLC | 2 GB pSLC | 4 GB pSLC |
| Removable Storage | – | microSD [1)] | |
| Retentive data storage | 128 kB NVRAM | | |
| Persistent data storage | 256 kB (eMMC) | | |

[1)] *Storage medium not included if not mentioned explicitely in order text.*

| Module bus interface | CPE0106 | CPE0108 | CPE0208 |
|---|---|---|---|
| System | M100 | | |
| Slot type | 0/C | | |

| Interfaces | CPE0106 | CPE0108 | CPE0208 |
|---|---|---|---|
| Ethernet | 1x 100/1000 Mbit (RJ45) | 3x 100/1000 Mbit (RJ45) | |
| USB | – | 1x USB-A 2.0 | |

| Synchronization/clocks | CPE0106 | CPE0108 | CPE0208 |
|---|---|---|---|
| Real time clock | RTC (battery-backed) | | |
| Synchronization | PTP, SNTP, NTP | | |

| Diagnostics | CPE0106 | CPE0108 | CPE0208 |
|---|---|---|---|
| Electronic type plate | Yes (application interface and in the engineering tool) | | |
| Machine readable type plate | Yes (application interface and in the engineering tool) | | |
| Environmental conditions sensor | Integrated temperature sensor | | |
| Diagnostics interface | USB-C socket | | |
| Operational indications | LED "MOD" (red/green) module status<br>LED "COM" (red/green) communication status<br>LED "APP" (red/green) application-controlled indication<br>LED "SAF" (red/green) safety status indication | | |

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| Energy supply | CPE0106 | CPE0108 | CPE0208 |
|---|---|---|---|
| Supply voltage, nominal | 24 V DC | | |
| Power consumption, continuous, max. | 27 W | | |
| Power dissipation | • 3.6 W @ 24 V DC, $T_a$ = 40 °C, $P_{out}$ = 12 W<br>• 4.3 W @ 32 V DC, $T_a$ = 40 °C, $P_{out}$ = 12 W<br>• 4.8 W @ 24 V DC, $T_a$ = 40 °C, $P_{out}$ = 20 W<br>• 5.8 W @ 32 V DC, $T_a$ = 40 °C, $P_{out}$ = 20 W | • 4.0 W @ 24 V DC, $T_a$ = 40 °C, $P_{out}$ = 12 W<br>• 4.7 W @ 32 V DC, $T_a$ = 40 °C, $P_{out}$ = 12 W<br>• 5.2 W @ 24 V DC, $T_a$ = 40 °C, $P_{out}$ = 20 W<br>• 6.2 W @ 32 V DC, $T_a$ = 40 °C, $P_{out}$ = 20 W | • 4.3 W @ 24 V DC, $T_a$ = 40 °C, $P_{out}$ = 12 W<br>• 5.0 W @ 32 V DC, $T_a$ = 40 °C, $P_{out}$ = 12 W<br>• 5.5 W @ 24 V DC, $T_a$ = 40 °C, $P_{out}$ = 20 W<br>• 6.6 W @ 32 V DC, $T_a$ = 40 °C, $P_{out}$ = 20 W |
| Power consumption from backplane | 2.6 W | | |

| Product safety | CPE0106 | CPE0108 | CPE0208 |
|---|---|---|---|
| Galvanic isolation | 850 V AC | | |
| Degree of protection acc. IEC 60529 | IP40, terminal block IP30 | | |
| Protection class acc. IEC 61010-1, IEC 61010-2-201 | III | | |
| Overvoltage category acc. IEC 61010-1 | II | | |

| Environmental conditions | CPE0106 | CPE0108 | CPE0208 |
|---|---|---|---|
| Temperature range, operating | -30 °C to +70 °C | | |
| Temperature range, transport and storage | -40 °C to +85 °C | | |
| Installation altitude, max. | Up to 2000 m without temperature derating<br>2000 m to 4500 m: Reduction of the max. ambient temperature by 0.1 °C per 100 m elevation | | |
| Air pressure | 106 kPa to 58 kPa (0 m to 4500 m) | | |
| Relative humidity, operation | Standard: 0 % to 100 % noncondensing<br>Extended Climate: 0 % to 100 % with temporary condensation | | |
| Pollution degree acc. IEC 61010-1 | Standard: 2, noncondensing<br>Extended Climate: 2 | | |
| Vibration | With BPS1nn:<br>• 4 g (11.5 Hz to 500 Hz)<br>• 7.5 mm amplitude (2 Hz to 11.5 Hz)<br>• Test duration: 15 h<br>With BPR1nn:<br>• 4 g (IACS E10, IEC 61131-2) | | |
| Shock | 45 g max. (test scope 18 shocks)<br>20 g permanently (test scope 6000 shocks) | | |

| Approvals/certificates | CPE0106 | CPE0108 | CPE0208 |
|---|---|---|---|
| Product safety | CE, UKCA: in preparation<br>cULus (NRAQ, NRAQ7): in preparation | | |
| Hazard area operation | ATEX: Ex II 3G Ex ec IIC Gc: in preparation | | |
| Maritime | ABS, BV, DNV, KR, LR, NK, RINA: in preparation | | |
| Hazardous substances and waste treatment | RoHS, RoHS China, REACH, WEEE | | |
| Quality management | ISO 9001 for development and production | | |

| Engineering | CPE0106 | CPE0108 | CPE0208 |
|---|---|---|---|
| Configuration tool | SolutionCenter (≥ V2.95) | | |
| Firmware package update | Yes | | |
| Secure boot / root-of-trust | Yes | | |

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| Software | CPE0106 | CPE0108 | CPE0208 |
|---|---|---|---|
| Operating system | Linux Embedded (Debian) | | |
| **Mounting/installation** | **CPE0106** | **CPE0108** | **CPE0208** |
| Mounting type | Inserting and screwing onto the backplane with integrated M4 screw | | |
| Number of fixings | 1 | | |
| **Dimensions** | **CPE0106** | **CPE0108** | **CPE0208** |
| Number of slots | 1 | | |
| Size unpacked W × H × D | 46.6 mm x 152.5 mm x 95.7 mm | | |
| Mass unpacked | 335 g | 345 g | 355 g |

## Order data

| Part type designation | Part number | Description |
|---|---|---|
| CPE0106 | 00042919-00 | CPU module for M100 system, 800 MHz single-core<br>512 MB LPDDR4; 128 kB nvRAM; 1 GB pSLC file flash; 1x Eth100/1000 |
| CPE0106 EC | On request | Like CPE0106; Extended Climate Range |
| CPE0108 | 00042923-00 | CPU module for M100 system, 1000 MHz single-core<br>1 GB LPDDR4; 128 kB nvRAM; 2 GB pSLC file flash; 3x Eth100/1000; 1x USB 2.0; TPM; microSD slot |
| CPE0108 EC | On request | Like CPE0108; Extended Climate Range |
| CPE0208 | 00042927-00 | CPU module for M100 system, 1000 MHz dual-core<br>1 GB LPDDR4; 128 kB nvRAM; 4 GB pSLC file flash; 3x Eth100/1000; 1x USB 2.0; TPM; microSD slot |
| CPE0208 EC | On request | Like CPE0208; Extended Climate Range |

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## Accessories

| Part type designation | Part number | Description |
|---|---|---|
| BPR1nn | 00039235-nn | Backplane for DIN-rail mounting<br>Active backplane system M100: BPR1nn with nn = 04 to 16 slots in increments of 1, as well as 20, 24, 28, 32 slots, for DIN-rail mounting; delivery without backplane slot covers and without mounting rail |
| BPR1nn EC | 00039236-nn | Like BPR1nn; Extended Climate Range |
| BPS1nn | 00039237-nn | Backplane for direct screw mounting<br>Active backplane system M100: BPS1nn with nn = 04 to 16 slots in increments of 1, as well as 20, 24, 28, 32 slots, for direct screw mounting; delivery without backplane slot covers and without screws |
| BPS1nn EC | 00039238-nn | Like BPS1nn; Extended Climate Range |
| TPI100_W4_P5.0_Cgy_Lsup | | Supply terminal block<br>Completely removable terminal block, push-in spring connector for system M100, 4-way/contacts, pitch 5.0 mm, female, conductors flexible 0.2 mm² to 2.5 mm² (24 to 14 AWG), solid 0.2 mm² to 1.5 mm² (24 to 16 AWG), with wire end ferrules 0.25 mm² to 1.5 mm² (24 to 16 AWG), stripping length: 10 mm, rating: 300 V / 8 A per contact, connector color: gray, push-release: yellow, labeling: 1+/1-/2+/2- |
| TKP106 | | Keying element<br>Keying element for signal terminal blocks and supply terminal blocks TPI100 for system M100, plastic ring with 6 keying elements |
| PSI135 | 00028967-00 | Power supply module for backplane / M100 system modules<br>Power supply module 35 W, galvanically isolated, multiply plugable for extended power or availability, outage buffering PS2 acc. IEC 61131-2, extended diagnostics, without terminal block |
| PSI135 EC | 00040514-00 | Like PSI135 with Extended Climate Range |
| microSD Card 16GB pSLC | 00046481-00 | Removable Storage<br>microSD card 16GB pSLC |

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