

PM03-IO Programmable logic controller for industrial and rail. Datasheet



INDUSTRY 4.0 READY





PM03-IO Overview.

High-end performance for solutions involving motors, and any other field actuators, as well as sensing of external signals and connectivity with external devices.

1 PM03-IO: Programmable logic controller.

The perfect solution for railway and industrial mid-range applications. The SIRS is a low-cost, robust and versatile, Programmable Logic Controller (PLC), with hardware compliance to the railway standard IEC-50155 for electronic equipment on rolling stock, to be used in applications of HVAC or interior (door management system, signaling and lighting control) among others. Regarding industrial applications, it is compliant with CE mark and with the IEC 61000 standard for EMC/EMI. The programming of the device is done through an API, in C/C++ for custom solutions. Safetwice PLC can host a webserver so data can be accessed from any point using an ethernet connection. It allows to monitor status, send commands or deploy updates. It also has a TFT LCD display that allows easy and friendly operation by means of browsing through the custom screens.



PM03-IO Datasheet

2 Tables of characteristics

2.1 Main processing unit

| PM03 Specification | |
|--------------------------|--|
| Power input | 24 [Vdc] (-15 % / +20 %) |
| Power consumption | < 2.5W (full LCD brightness) |
| MCU | ARM Cortex M4 32bit 210 DMIPS |
| Program Memory | Up to 1Mb |
| RAM Memory | 192+4 KB |
| Ethernet interface | 10/100 with AutoMDIX on a RJ-45 connector |
| USB interface | USB 2.0 OTG on a type A connector |
| CAN Interface | CAN 2.0B Active on a DB9 connector |
| Serial Interfaces | 1 x RS485/232 (configurable) on a DB9 conn. 1 x RS485 (configurable on Half-Duplex or Full Duplex) on a DB9 connector |
| LCD Interface | Backlighted 5" 800x480 TFT (up to 65K colours) with capacitive touch panel (typically 500:1 contrast, 300 cd/m ²) |
| Features | Undervoltage and overvoltage detection for nominal 24 [Vdc] operating voltage |
| On-request features | -Storage memory (Up to 2Gbit NAND Flash) |
| Operating temperature | -40 [°C] to 85 [°C] (except LCD: -20 [°C] to 70 [°C]) |
| EMC protections | ESD: IEC 61000-4-2 (+/- 30 [kV] contact & air) EFT: IEC 61000-4-4 (50 [A] for 5/50ns) Lighting: IEC 61000-4-5 (5 [A], tp = 8/20us) |
| Dimensions | 200 x 135 x 15 mm (bare board) |
| Software configurability | On-request: USB or Ethernet based configurability; based on SAFETWICE-Architecture. |

2.2 Digital inputs

| Technical data | |
|-------------------------------|--|
| Number of outputs | 8, expandable with the expansion boards |
| Input specification | EN 61131-2, type 2 |
| Input configuration | PNP or NPN, under request |
| Nominal voltage input | 24 [Vdc] (-15 % / +20 %) |
| “0” signal voltage | -3 ... +14 [Vdc] |
| “1” signal voltage | +15 ... +30 [Vdc] |
| Input current | 18 [mA] |
| Electrical isolation | 5000 [Vrms] (Field potential/Logic potential) |
| Rated cross-section (maximum) | 1.5 [mm ²] |
| Operating temperature | -40 [°C] to 85 [°C] |
| EMC protections | ESD: IEC 61000-4-2 (+/- 30 [kV] contact & air) EFT: IEC 61000-4-4 (50 [A] for 5/50ns) Lighting: IEC 61000-4-5 (5 [A], tp = 8/20us) |

2.2 Digital outputs

| Technical data | |
|----------------------------------|--|
| Number of outputs | 8, expandable with the expansion boards |
| Output specification | IEC 61131-2 |
| Output configuration | PNP or NPN, under request |
| Nominal voltage output | 24 [Vdc] (-15 % / +20 %) |
| Maximum output current | 0.5 [A] per channel |
| Current consumption by switching | 12 [mA] + Load |
| Short-circuit protection | Yes, Resettable fuse |
| Electrical isolation | 5000 [Vrms] (Field potential/Logic potential) |
| Rated cross-section (maximum) | 1.5 [mm ²] |
| Operating temperature | -40 [°C] to 85 [°C] |
| EMC protections | ESD: IEC 61000-4-2 (+/- 30 [kV] contact & air) EFT: IEC 61000-4-4 (50 [A] for 5/50ns) Lighting: IEC 61000-4-5 (5 [A], tp = 8/20us) |

2.3 Analog Input (0 – 10 Vdc)

| Technical data | |
|-------------------------------|--|
| Number of inputs | 2 (2 wires) , expandable with the expansion boards |
| Voltage signal range | 0 ... 10 [Vdc] |
| Internal resistance | > 1 [MΩ] |
| Current consumption | Typically, 497 [μV] |
| Input filter limit frequency | 33 [Hz] |
| Resolution | 12 bits |
| Measurement error | TBD |
| Electrical isolation | None |
| Rated cross-section (maximum) | 1.5 [mm ²] |
| Operating temperature | -40 [°C] to 85 [°C] |
| EMC protections | ESD: IEC 61000-4-2 (+/- 30 [kV] contact & air) EFT: IEC 61000-4-4 (50 [A] for 5/50ns) Lighting: IEC 61000-4-5 (5 [A], tp = 8/20us) |

2.4 Analog input (4 – 20 mA)

| Technical data | |
|-------------------------------|--|
| Number of inputs | 2 (2 wires) , expandable with the expansion boards |
| Voltage signal range | 4 ... 20 [mA] |
| Internal resistance | < 170 [Ω] |
| Input filter limit frequency | 33 [Hz] |
| Resolution | 12 bits |
| Measurement error | TBD |
| Short circuit protection | Yes, Resettable fuse for 50 [mA] |
| Special features | Possibility of diagnostic for out of range values |
| Electrical isolation | None |
| Rated cross-section (maximum) | 1.5 [mm ²] |
| Operating temperature | -40 [°C] to 85 [°C] |
| EMC protections | ESD: IEC 61000-4-2 (+/- 30 [kV] contact & air) EFT: IEC 61000-4-4 (50 [A] for 5/50ns) Lighting: IEC 61000-4-5 (5 [A], tp = 8/20us) |

2.5 High-speed digital input (PWM)

| Technical data | |
|-------------------------------|---|
| Input specification | EN 61131-2, type 2 |
| Number of inputs | 1 |
| Input configuration | PNP |
| Nominal voltage input | 24 [Vdc] (-15 % / +20 %) |
| “0” signal voltage | -3 ... +14 [Vdc] |
| “1” signal voltage | +15 ... +30 [Vdc] |
| Input current | 18 [mA] |
| Maximum input frequency | 40 [kHz] |
| Electrical isolation | 3750 [Vrms] (Field potential/Logic potential) |
| Rated cross-section (maximum) | 1.5 [mm ²] |
| Operating temperature | -40 [°C] to 125 [°C] |

| | |
|-----------------|--|
| EMC protections | ESD: IEC 61000-4-2 (+/- 30 [kV] contact & air) EFT: IEC 61000-4-4 (50 [A] for 5/50ns) Lighting: IEC 61000-4-5 (5 [A], tp = 8/20us) |
|-----------------|--|

2.6 High-speed output (PWM)

| Technical data | |
|----------------------------------|--|
| Output specification | IEC 61131-2 |
| Number of outputs | 1 |
| Output configuration | Push-Pull |
| Nominal voltage output | 24 [Vdc] (-15 % / +20 %) |
| Maximum output current | 0.5 [A] |
| Current consumption by switching | 12 [mA] |
| Maximum output frequency | 40 [kHz] |
| Short-circuit protection | Yes, Resettable fuse |
| Electrical isolation | 5000 [Vrms] (Field potential/Logic potential) |
| Operating temperature | -40 [°C] to 105 [°C] |
| EMC protections | ESD: IEC 61000-4-2 (+/- 30 [kV] contact & air) EFT: IEC 61000-4-4 (50 [A] for 5/50ns) Lighting: IEC 61000-4-5 (5 [A], tp = 8/20us) |

2.7 Motor controller

| Technical data | |
|----------------------------------|--|
| Type of controller | Full H-Bridge |
| Maximum operating current | 6 [A] |
| Maximum operating voltage | 40 [Vdc] |
| Maximum frequency of the outputs | 20 [kHz] |
| Protections | Current limitation Short circuit shutdown Overtemperature shutdown |
| Diagnostic bus | SPI |
| Diagnosis features | Short circuit to supply voltage Short circuit to ground Open load detection in ON and OFF states Undervoltage detection |