SAUER DANFOSS

Data Sheet

PLUS+1™ MC024-020 and MC024-022 Controllers

PLUS +1™ by SAUER-DANFOSS

MC024-020 and MC024-022 Controllers

Mobile Machine Management

MC024-020 and MC024-022 controllers are elements of the flexible, powerful, expandable, and affordable PLUS+1 family of mobile machine management products. These devices are general-purpose controllers that are equally suited for use as members of a distributed machine control system, with intelligence in every node, or as stand-alone controllers.

Product Highlights

The MC024-020 employs a Digital Signal Processor (DSP), providing the controller with extremely fast single cycle processing speed and 128K internal flash. The MC024-022 has an application key that enables the use of Sauer-Danfoss developed GUIDE machine control solutions. The same GUIDE HWD file is used with both controllers.

Application Development

Users develop MC024-020 and MC024-022 applications with PLUS+1 GUIDE. This Microsoft® Windows® based development environment features a user-friendly, field proven, icon-based graphical programming tool, application downloader, and service/diagnostic tool.

Local Address:

Features

- User-programmable with PLUS+1 GUIDE (Graphical User Integrated Development Environment)
- 24 pins: (2) individually keyed Deutsch® DTM 12 pin connectors
- 32 bit fixed-point DSP running at 150 MHz
  - 12 bit analog-to-digital converter
  - 16 bit timers/counters
- 8 inputs
  - (5) universal (DIN/AIN/FreqIN) that are user-defined as either:
    Analog: with configurable ranges 0 to 5.25 Vdc (with over range protection) or 0 to 36 Vdc;
    Digital: pull up (5 Vdc), pull down (0 Vdc) or pull to center (2.5 Vdc);
    Frequency (timing): 1 Hz to 10 kHz
  - (2) digital (DIN) configurable as pull up (5 Vdc), pull down (0 Vdc) or pull to center (2.5 Vdc)
  - (1) fixed range analog (AIN/CAN shield) 0 to 5.25 Vdc or CAN shield pin
- 8 outputs
  - (8) universal (PWMOUT/DOUT/PVGOUT) that are user-defined as either:
    Digital: (3 A), configurable as source or sink;
    PWM: (30 to 4000 Hz), configurable as open or closed loop with current control;
    Analog voltage: open loop PWM at 4000 Hz
  - Any PWMOUT/DOUT/PVGOUT can be used to provide reference power to one PVG valve
- 9 to 36 Vdc power supply, monitored internally
- 1 CAN 2.0 B port, the fixed range analog input can be configured as the shield pin
- Power supply for external sensors rated at 5 Vdc to 200 mA and regulated internally
- 2 LEDs under user control
- 3 mounting alternatives: stack, end, or side
- MC024-022 contains application key required to run Sauer-Danfoss developed machine control application software
- CE compliant

Dimensions and Pin Assignments

MC024-020 and MC024-022 Mounting Dimensions in Millimeters [Inches]

2195B
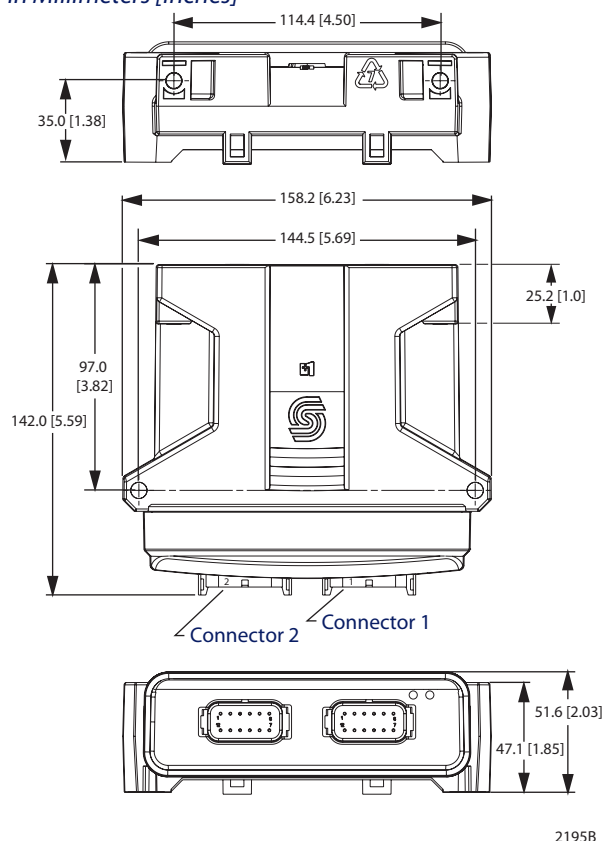
❶ Caution
PCB damage may occur. All device power supply + pins must be connected to battery +.

❶ Caution
This device is not field serviceable. Opening the device housing will void the warranty.

MC024-020 and MC024-022 24 Pin Connectors

Connector 2

Pin	Controller function
C2-P1	DIN/AIN/FreqIN
C2-P2	DIN/AIN/FreqIN
C2-P3	PWMOUT/DOUT/PVGOUT
C2-P4	PWMOUT/DOUT/PVGOUT
C2-P5	PWMOUT/DOUT/PVGOUT
C2-P6	PWMOUT/DOUT/PVGOUT
C2-P7	PWMOUT/DOUT/PVGOUT
C2-P8	PWMOUT/DOUT/PVGOUT
C2-P9	PWMOUT/DOUT/PVGOUT
C2-P10	PWMOUT/DOUT/PVGOUT
C2-P11	Power supply +
C2-P12	Power supply +

Connector 2 'B' key (black)
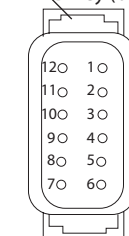
Connector 1

Pin	Controller function
C1-P1	Power ground -
C1-P2	Power supply +
C1-P3	CAN +
C1-P4	CAN -
C1-P5	AIN/CAN shield
C1-P6	DIN
C1-P7	DIN
C1-P8	5 Vdc sensor power +
C1-P9	Sensor power ground -
C1-P10	DIN/AIN/FreqIN
C1-P11	DIN/AIN/FreqIN
C1-P12	DIN/AIN/FreqIN

Connector 1 'A' key (gray)
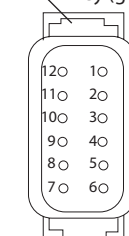
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Use care when wiring mating connector. Above pinouts are for device pins.

Specifications

Product Parameters

Supply voltage	9 to 36 Vdc
Operating temperature (ambient)	-40°C to 70°C [-40°F to 158°F]
Storage temperature	-40°C to 85°C [-40°F to 185°F]
Programming temperature	0°C to 70°C [32°F to 158°F]
IP rating (with mating connector attached)	IP 67
EMI/RFI rating	100 V/M
Weight	0.40 kg [0.88 lb]
Vibration	IEC 60068-2-64
Shock	IEC 60068-2-27 test Ea
Maximum current, sourcing	24 A
Maximum current, sinking	8 A

Product Part Numbers

MC024-020	10100993
MC024-022	11013733

Related Products Part Numbers

CG150 CAN/USB Gateway	10104136	
Deutsch® mating connector bag assembly	10102023 (16 to 20 AWG)	10100945 (20 to 24 AWG)
PLUS+1 GUIDE single user license	10101000	

Comprehensive technical information: *PLUS+1 Controller Family Technical Information,* **520L0719**;
MC024-020 Application Program Interface (API)10102115.doc; MC024-022 API Document
Sauer-Danfoss product literature on line at: www.sauer-danfoss.com