



Data Sheet

PLUS+1[®] Controllers

MC024-020 and MC024-022



PLUS+1

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 Danfoss developed GUIDE machine control solutions. The same GUIDE HWD file is used with both controllers.

Application Development

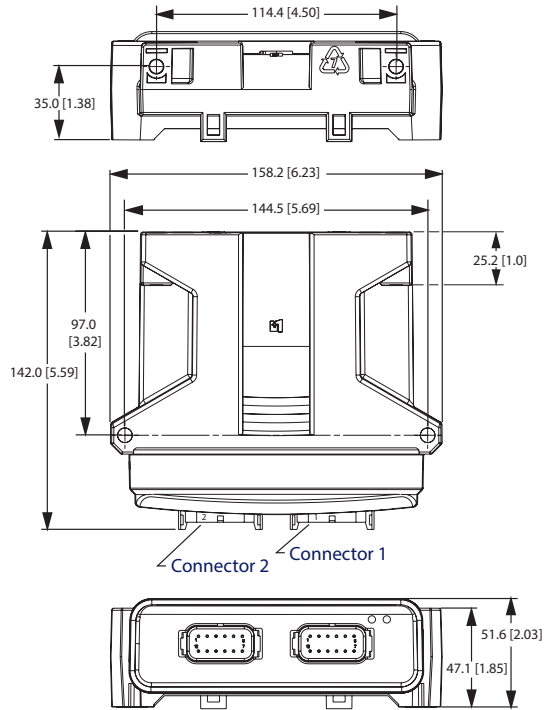
Users develop MC024-020 and MC024-022 applications with PLUS+1 GUIDE. This Microsoft® Windows® based development environment features a user-friendly, field proven, icon-based graphical programming tool, application downloader, and service/diagnostic tool.

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)
 - (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 Danfoss developed machine control application software
- CE compliant

Dimensions and Pin Assignments

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



2195B

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

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

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

MC024-020 and MC024-022 24 Pin Connectors

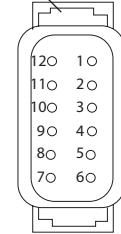
Connector 2

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 +

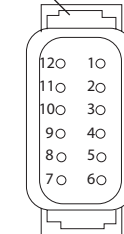
Connector 1

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 2 'B' key (black)



Connector 1 'A' key (gray)



2196B

Use care when wiring mating connector. Above pinouts are for device pins.

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

Danfoss Power Solutions US Company
2800 East 13th Street
Ames, IA 50010, USA
Phone: +1 515 239 6000

Danfoss Power Solutions GmbH & Co. OHG
Krokamp 35
D-24539 Neumünster, Germany
Phone: +49 4321 871 0

Danfoss Power Solutions ApS
Nordborgvej 81
DK-6430 Nordborg, Denmark
Phone: +45 7488 2222

Danfoss Power Solutions (Shanghai) Co. Ltd.
Building #22, No. 1000 Jin Hai Rd
Jin Qiao, Pudong New District
Shanghai, China 201206
Phone: +86 21 3418 5200

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequent changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.