

Data Sheet

PLUS+1[®] Controllers

MC050-020 and MC050-022



Mobile machine management

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

Product highlights

The MC050-020 employs a Digital Signal Processor (DSP), providing the controller with extremely fast single cycle processing speed and 256K internal flash.

Application development

The MC050-022 employs an application key that enables the use of Danfoss developed PLUS+1[®] GUIDE machine control solutions. The same PLUS+1[®] GUIDE HWD file is used with both controllers.

Users develop MC050-020 and MC050-022 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)
- 50 pins: (1) DEUTSCH DRC connector
- 32 bit fixed-point DSP running at 150 MHz
- 12 bit analog-to-digital converter
- 24 inputs
- 14 outputs
- 9 to 36 V_{DC} power supply, monitored internally
- 2 CAN 2.0 B ports, the fixed range analog input can be configured as the shield pin
- Power supply for external sensors rated at 5 V_{DC} to 500 mA, and regulated internally
- 2 LEDs under user control
- 3 mounting alternatives: stack, end, or side
- MC050-022 contains application key required to run Danfoss developed machine control application software
- CE compliant

Comprehensive technical literature online
at powersolutions.danfoss.com

24 Inputs

- (6) universal (DIN/AIN/FreqIN) that are user-defined as either:
 Analog: with configurable ranges 0 to 5.25 V_{DC} (with over range protection) or 0 to 36 V_{DC};
 Digital: pull up (5 V_{DC}), pull down (0 V_{DC}) or pull to center (2.5 V_{DC});
 Frequency (timing): 1 Hz to 10 kHz
- (10) digital (DIN) configurable as pull up (5 V_{DC}), pull down (0 V_{DC})
- (4) digital/analog (DIN/AIN) that are userdefined as either:
 Digital: pull up (5 V_{DC}), pull down (0 V_{DC}) or pull to center (2.5 V_{DC});
 Analog: 0 to 5.25 V_{DC} or 0 to 36 V_{DC}
- (2) analog (AIN/Temp/Rheo) 0 to 5.25 V_{DC} or 0 to 10,000 ohm rheostat
- (2) fixed range analog (AIN/CAN shield) 0 to 5.25 V_{DC} or CAN shield pin

Characteristics

Specifications

Supply voltage	9 to 36 V _{DC}
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	0.53 kg [1.16 lb]
Vibration	IEC 60068-2-64
Shock	IEC 60068-2-27 test Ea
Max. current, sourcing	40 A
Max. current, sinking	8 A

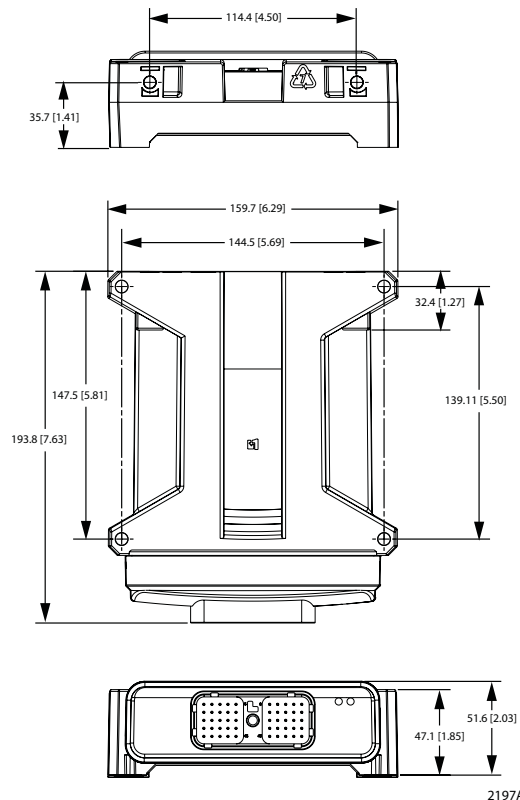
14 Outputs

- (6) 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
- (6) digital (DOUT) (3 A), configurable as source only
- (2) digital/PVG power supply (DOUT/PVG Pwr) (3 A), user-configurable; one DOUT/PVG Pwr will power up to three PVGs

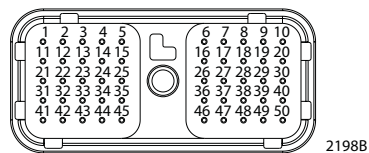
Dimensions and pin assignments

Mounting dimensions and pin assignments

Dimensions in mm [in]



Pin connector



Pin	Controller function	Pin	Controller function
C1-P1	Power ground -	C1-P26	DIN/AIN/FreqIN
C1-P2	Power supply +	C1-P27	DIN/AIN/FreqIN
C1-P3	CAN0 +	C1-P28	DIN/AIN/FreqIN
C1-P4	CAN0 -	C1-P29	DIN/AIN/FreqIN
C1-P5	AIN/CAN0 shield	C1-P30	DIN/AIN/FreqIN
C1-P6	DIN	C1-P31	AIN/Temp/Rheo
C1-P7	DIN	C1-P32	AIN/Temp/Rheo
C1-P8	5 V _{DC} sensor power +	C1-P33	DOUT
C1-P9	Sensor power ground -	C1-P34	DOUT
C1-P10	DIN	C1-P35	DOUT
C1-P11	DIN	C1-P36	DOUT
C1-P12	DIN	C1-P37	DOUT
C1-P13	DIN	C1-P38	DOUT
C1-P14	DIN	C1-P39	DOUT/PVG Pwr
C1-P15	DIN	C1-P40	DOUT/PVG Pwr
C1-P16	DIN	C1-P41	PWMOUT/DOUT/PVGOUT
C1-P17	DIN	C1-P42	PWMOUT/DOUT/PVGOUT
C1-P18	DIN/AIN	C1-P43	PWMOUT/DOUT/PVGOUT
C1-P19	DIN/AIN	C1-P44	PWMOUT/DOUT/PVGOUT
C1-P20	CAN1 +	C1-P45	PWMOUT/DOUT/PVGOUT
C1-P21	CAN1 -	C1-P46	PWMOUT/DOUT/PVGOUT
C1-P22	AIN/CAN1 shield	C1-P47	Power supply +
C1-P23	DIN/AIN	C1-P48	Power supply +
C1-P24	DIN/AIN	C1-P49	Power supply +
C1-P25	DIN/AIN/FreqIN	C1-P50	Power supply +

! Caution

PCB damage may occur.

To prevent damage to the module all module power supply + pins must be connected to the vehicle power supply to support advertised module maximum output current capacity. DO NOT use module power supply + pins to supply power to other modules on a machine.

! Caution

Warranty will be voided if device is opened.

Device is not field serviceable. Do not open the device.

Use care when wiring mating connector. Pinouts are for device pins.



Product part number

MC050-020	10100994
MC050-022	11013735

Related products part numbers

CG150 CAN/USB Gateway	11153051	
DEUTSCH mating connector bag assembly	10102024 (16 to 20 AWG)	10100946 (20 to 24 AWG)
PLUS+1[®] GUIDE Professional	11179523	

Comprehensive information

<i>MC0XX-0XX Controller Family Technical Information</i>	520L0719
<i>MC050-020 Application Program Interface (API)</i>	10102372.doc

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