



Data Sheet

# PLUS+1<sup>®</sup> Controllers

## MC050-155 and MC050-15B



### Mobile machine management

MC050-155 and MC050-15B 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

Both controllers employ a 32 bit Cortex-M3 Processor, providing the controllers with extremely fast single cycle processing speed and 512K internal flash. Both controllers feature three CAN ports, one 1.66 and one 3.3 or 5 volt regulated sensor supply. The MC050-15B 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.

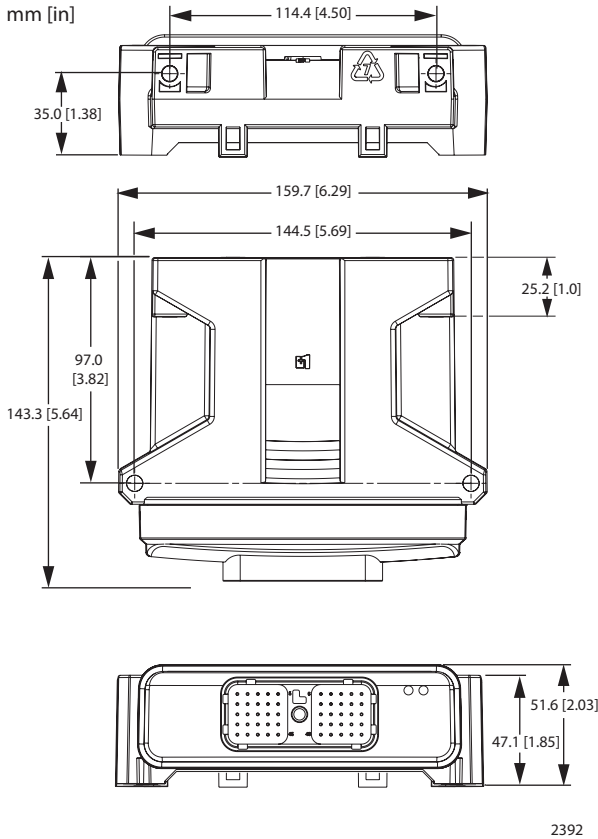
### Application development

Users develop MC050-155 and MC050-15B applications using PLUS+1 GUIDE. This Microsoft<sup>®</sup> Windows<sup>®</sup> 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
- ARM 32 bit Cortex-M3 running at 120 MHz
- FRAM non-volatile memory
- 12 bit analog-to-digital converter
- 36 inputs
  - 4 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
  - 29 digital/analog (DIN/AIN) that are user-defined as either:
    - Digital:* pull up (5 Vdc), pull down (0 Vdc) or pull to center (2.5 Vdc)
    - Analog:* 0 to 5.25 Vdc or 0 to 36 Vdc
  - 3 fixed range analog (AIN/CAN shield) 0 to 5.25 Vdc or CAN shield pin
- 3 outputs
  - 2 universal (PWMOUT/DOU/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/DOU/PVGOUT can be used to provide reference power to one PVG valve
  - 1 digital/PVG Pwr (DOU/PVG Pwr) sourcing only One DOU/PVG Pwr will power up to 3 PVG's
- 9 to 36 Vdc power supply, monitored internally
- 3 CAN 2.0 B ports, the fixed range analog inputs can be used as the shield pin
- Power supply for external sensors, monitored and regulated internally
  - 1.6 Vdc rated at 500 mA
  - 3.3 Vdc rated at 450 mA
  - 5.0 Vdc rated at 450 mA
- 2 LEDs under user control
- 3 mounting alternatives: stack, end, or side
- MC050-15B contains the application key required to run Danfoss developed machine control application software
- CE compliant

**MC050-155 and MC050-15B dimensions and pin assignments**



**Caution**

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

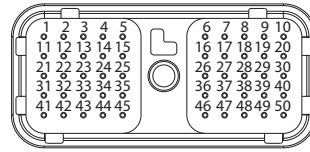
**Caution**

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

**Specifications**

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	-40°C to 70°C [-40°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]
Maximum current, sourcing	8 A
Maximum current, sinking	6 A

MC050-155 and MC050-15B 50 pin connector



Connector

2198B

Pin	Controller function	Pin	Controller function
C1-P1	Power ground -	C1-P26	DIN/AIN
C1-P2	Power supply +	C1-P27	DIN/AIN
C1-P3	CAN0+	C1-P28	DIN/AIN
C1-P4	CAN0-	C1-P29	DIN/AIN
C1-P5	AIN/CAN0 shield	C1-P30	DOUT/PVG Pwr
C1-P6	CAN1+	C1-P31	DIN/AIN
C1-P7	CAN1-	C1-P32	DIN/AIN
C1-P8	3.3/5 Vdc sensor power +	C1-P33	DIN/AIN
C1-P9	Sensor power ground -	C1-P34	DIN/AIN
C1-P10	1.66 Vdc sensor power +	C1-P35	DIN/AIN
C1-P11	CAN2+	C1-P36	DIN/AIN
C1-P12	CAN2-	C1-P37	DIN/AIN
C1-P13	AIN/CAN1 shield	C1-P38	DIN/AIN
C1-P14	AIN/CAN2 shield	C1-P39	DIN/AIN
C1-P15	DIN/AIN	C1-P40	PWMOUT/DOUT/PVGOUT
C1-P16	DIN/AIN	C1-P41	DIN/AIN
C1-P17	DIN/AIN	C1-P42	DIN/AIN
C1-P18	DIN/AIN	C1-P43	DIN/AIN
C1-P19	DIN/AIN	C1-P44	DIN/AIN
C1-P20	DIN/AIN	C1-P45	DIN/AIN
C1-P21	DIN/AIN	C1-P46	DIN/AIN/FreqIN
C1-P22	DIN/AIN	C1-P47	DIN/AIN/FreqIN
C1-P23	DIN/AIN	C1-P48	DIN/AIN/FreqIN
C1-P24	DIN/AIN	C1-P49	DIN/AIN/FreqIN
C1-P25	DIN/AIN	C1-P50	PWMOUT/DOUT/PVGOUT

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

**Ordering information**

MC050-155	11130958
MC050-15B	11130959

Related product	Danfoss material number	
CG150 CAN/USB Gateway	10104136	
DEUTSCH mating connector bag assembly	10102024 (16 to 20 AWG)	10100946 (20 to 24 AWG)
PLUS+1 GUIDE single user license	10101079	

Danfoss product literature on line at: [www.danfoss.com](http://www.danfoss.com)

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