



Data Sheet

# PLUS+1<sup>®</sup> Controllers

## MC050-010 and MC050-012



### Mobile Machine Management

The MC050-010 and MC050-012 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 MC050-010 employs a Digital Signal Processor (DSP), providing the controller with extremely fast single cycle processing speed and 256K internal flash. The MC050-012 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

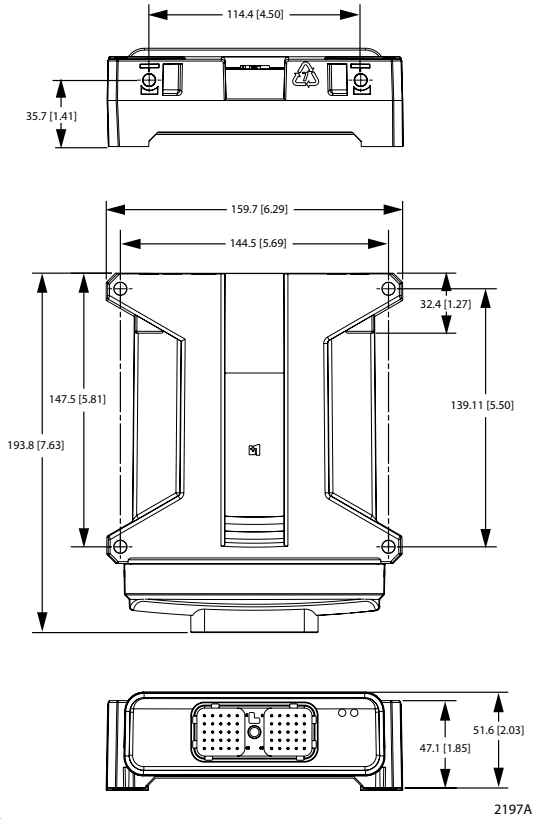
Users develop MC050-010 and MC050-012 applications with PLUS+1 GUIDE. This Microsoft® Windows® based development environment features a user-friendly, field proven, icon-based graphical programming tool, application downloader, and service/diagnostic tool.

### 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
- 22 inputs
  - (6) 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
  - (6) digital (DIN) configurable as pull up (5 Vdc), pull down (0 Vdc)
  - (4) 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
  - (4) analog (AIN/Temp/Rheo) 0 to 5.25 Vdc or 0 to 10,000 ohm rheostat
  - (2) fixed range analog (AIN/CAN shield) 0 to 5.25 Vdc or CAN shield pin
- 16 outputs
  - (10) universal (PWMOUT/DOOUT/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/DOOUT/PVGOUT can be used to provide reference power to one PVG valve
  - (3) digital (DOOUT) (3 A), configurable as source only
  - (3) digital/PVG power supply (DOOUT/PVG Pwr)
  - (3 A), user-configurable; one DOOUT/PVG Pwr will power up to three PVGs
- 9 to 36 Vdc 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 Vdc to 450 mA, monitored and regulated internally
- 2 LEDs under user control
- 3 mounting alternatives: stack, end, or side
- MC050-012 contains application key required to run Danfoss developed machine control application software
- CE compliant

**Dimensions and Pin Assignments**

MC050-010 and MC050-012 Mounting Dimensions in Millimeters [Inches]



**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**

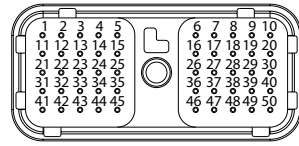
*Product Parameters*

<b>Supply voltage</b>	9 to 36 Vdc
<b>Operating temperature (ambient)</b>	-40°C to 70°C [-40°F to 158°F]
<b>Storage temperature</b>	-40°C to 85°C [-40°F to 185°F]
<b>Programming temperature</b>	0°C to 70°C [32°F to 158°F]
<b>IP rating (with mating connector attached)</b>	IP 67
<b>EMI/RFI rating</b>	100 V/M
<b>Weight</b>	0.53 kg [1.16 lb]
<b>Vibration</b>	IEC 60068-2-64
<b>Shock</b>	IEC 60068-2-27 test Ea
<b>Maximum current, sourcing</b>	40 A
<b>Maximum current, sinking</b>	8 A

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MC050-010 and MC050-012 50 Pin Connector



Connector

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

\* Recommendation is to not use pin C1p26 as a frequency input. If used, recommendation is to disable internal filtering and use filter inside the application instead.

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

*Product Part Number*

<b>MC050-010</b>	10100900
<b>MC050-012</b>	11013734

*Related Products Part Numbers*

<b>CG150 CAN/USB Gateway</b>	10104136	
<b>Deutsch® mating connector bag assembly</b>	10102024 (16 to 20 AWG)	10100946 (20 to 24 AWG)
<b>PLUS+1 GUIDE single user license</b>	10101000	

Danfoss comprehensive *technical information* on line at: [www.danfoss.com](http://www.danfoss.com)

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