

Data Sheet

# PLUS+1<sup>®</sup> Controllers

## MC050-01E



### Mobile machine management

MC050-01E controllers are elements of the flexible, powerful, expandable, and affordable PLUS+1<sup>®</sup> 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 MC050-01E employs a Digital Signal Processor (DSP), providing the controller with extremely fast single cycle processing speed and 256K internal flash. The MC050-01E 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 MC050-01E applications with PLUS+1<sup>®</sup> 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<sup>®</sup> 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
- 16 outputs
- 11 to 36 V<sub>DC</sub> 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 up to 8V<sub>DC</sub> (depending on sensor load)
- 2 LEDs under user control
- 3 mounting alternatives: stack, end, or side
- CE compliant

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[Comprehensive technical literature online at powersolutions.danfoss.com](http://powersolutions.danfoss.com)

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### Inputs

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

### 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

### Specifications

#### Product parameters

<b>Supply voltage, minimum</b>	Reference: Sensor power supply specification table
<b>Supply voltage, maximum</b>	36 V <sub>DC</sub>
<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 (with all power supply and pins connected)
<b>Maximum current, sinking</b>	8 A

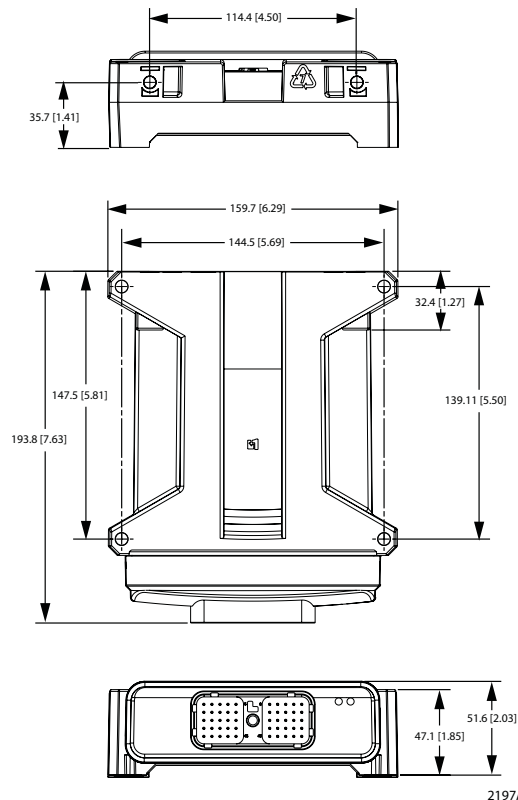
#### Sensor power supply specification

Sensor power output (V <sub>DC</sub> )	Minimum controller supply voltage (V <sub>DC</sub> )		
	100 mA sensor load	200 mA sensor load	250 mA sensor load
8	11.6	12.4	12.8
7	10.5	11.3	11.6

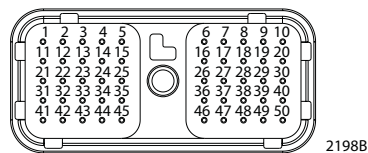
## Dimensions and pin assignments

### 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	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	DOUT
C1-P7	DIN	C1-P32	DOUT
C1-P8	8 V <sub>DC</sub> sensor power +	C1-P33	DOUT
C1-P9	Sensor power ground -	C1-P34	DOUT/PVG Pwr
C1-P10	DIN	C1-P35	DOUT/PVG Pwr
C1-P11	DIN	C1-P36	DOUT/PVG Pwr
C1-P12	DIN	C1-P37	PWMOUT/DOUT/ PVGOUT
C1-P13	DIN	C1-P38	PWMOUT/DOUT/ PVGOUT
C1-P14	DIN/AIN	C1-P39	PWMOUT/DOUT/ PVGOUT
C1-P15	DIN/AIN	C1-P40	PWMOUT/DOUT/ PVGOUT
C1-P16	DIN/AIN	C1-P41	PWMOUT/DOUT/ PVGOUT
C1-P17	DIN/AIN	C1-P42	PWMOUT/DOUT/ PVGOUT
C1-P18	DIN/AIN/FreqIN	C1-P43	PWMOUT/DOUT/ PVGOUT
C1-P19	DIN/AIN/FreqIN	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/FreqIN	C1-P48	Power supply +
C1-P24	DIN/AIN/FreqIN	C1-P49	Power supply +
C1-P25	DIN/AIN/FreqIN	C1-P50	Power supply +

### ! Caution

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

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

Using C1P26 as a frequency input is not recommended. If used as a frequency input, disable internal filtering and use filter inside the application instead.



Product part number

<b>MC050-01E</b>	11085640
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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<sup>®</sup> GUIDE single user license</b>	10101000	

Comprehensive technical information:

*PLUS+1<sup>®</sup> Controller Family Technical Information, 520L0719 and MC050-01E Application Program Interface (API)*

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