ENGINEERING TOMORROW

Data Sheet

PLUS+1® Controllers
MC050-01E

Mobile machine management

MC050-01E 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 MC050-01E 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® 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
- 16 outputs
- 11 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 up to 8V_{DC} (depending on sensor load)
- 2 LEDs under user control
- 3 mounting alternatives: stack, end, or side
- CE compliant

Comprehensive technical literature online at *powersolutions.danfoss.com*

Inputs

- (6) universal (DIN/AIN/FreqIN) that are userdefined 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
- (6) digital (DIN) configurable as pull up (5 V_{DC}), pull down (0 V_{DC}) or pull to center (2.5 V_{DC})
- (4) digital/analog (DIN/AIN) that are user-defined 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}
- (4) 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

Outputs

- (10) 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
- (3) digital (DOUT) (3 A), configurable as source only
- (3) digital/PVG power supply (DOUT/PVG Pwr)
  - (3 A), user-configurable; one DOUT/PVG Pwr will power up to three PVGs

Specifications

Product parameters

Supply voltage, minimum	Reference: Sensor power supply specification table
Supply voltage, maximum	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
Maximum current, sourcing	40 A (with all power supply and pins connected)
Maximum current, sinking	8 A

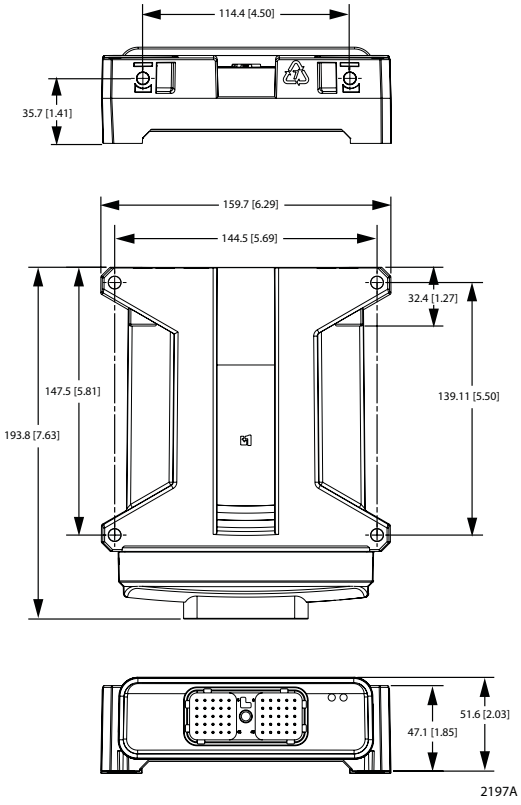
Sensor power supply specification

Sensor power output (V_{DC})	**Minimum controller supply voltage (V_{DC})**		
	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]



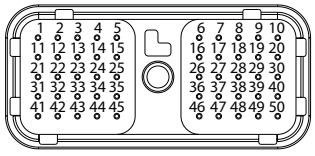
Caution

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.

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_{DC} 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 +

Product part number

MC050-01E	11085640

Related products part numbers

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	10101000	

Comprehensive technical information:

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