Data Sheet

PLUS+1® Controllers MC088-015 and MC088-01B

Mobile Machine Management
These PLUS+1 controllers are elements of the flexible, powerful, expandable, and affordable PLUS+1 family of mobile machine management products. These devices are general-purpose controllers with high current outputs. They are suited for use as members of a distributed machine control system, with intelligence in every node, or as stand-alone controllers.

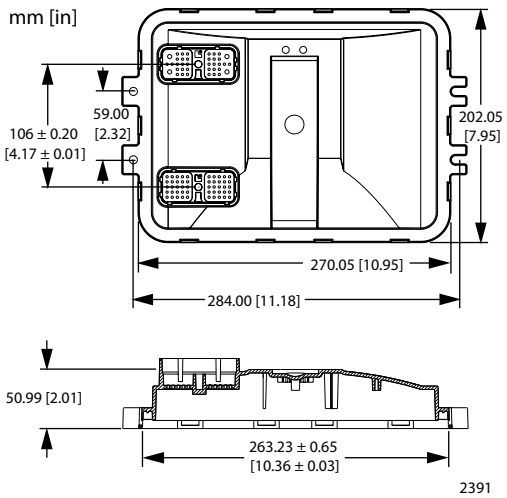
Product Highlights
These controllers employ a Digital Signal Processor (DSP), providing the controllers with extremely fast single cycle processing speed and 256K internal flash. These controllers feature 2 MB of serial flash vault memory reserved for the application log feature of PLUS+1 GUIDE software.

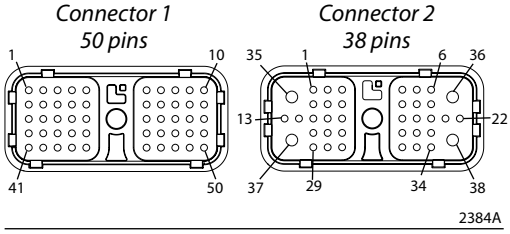
Application Development
The MC088-01B has an application key that enables the use of Danfoss developed GUIDE machine control solutions. The same GUIDE HWD file is used with both controllers.
Users develop these controllers applications with PLUS+1 GUIDE. This Microsoft® Windows® based development environment 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)
- 88 pins:
  - 1 Deutsch® DRC26-50 connector
  - 1 Deutsch® DRC26-38 connector
- 32 bit fixed-point DSP running at 150 MHz
- 12 bit analog-to-digital converter
- 2 MB serial flash vault memory
- 42 inputs:
  - 6 universal (DIN/AIN/FreqIN) that are user-defined as either:
    Analog: With configurable ranges 0 to 5.25 Vdc 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
  - 18 digital (DIN) configurable as pull up (5 Vdc), pull down (0 Vdc)
  - 4 digital/analog (DIN/AIN). Digital inputs have the same characteristics as DIN pins, analog input ranges are user configurable as 0 to 5.25 Vdc or 0 to 36 Vdc
  - 8 analog (AIN/Temp/Rheo) configurable as 0 to 5.25 Vdc or 0 to 10000 Ohm range
  - 4 digital/analog/current (DIN/AIN/4-20 ma IN). Digital inputs have the same characteristics as DIN pins; Analog input ranges are configurable as 0 to 5.25 Vdc or 0 to 36 Vdc; Inputs can be configured to measure current with a 4 to 20 mA range
  - 2 fixed range analog (AIN/CAN shield) configured as 0 to 5.25 Vdc or CAN shield pin
- 32 outputs
  - Outputs are powered by four independent power supply pins (see *Dimensions and Pin Assignments*, back page, for output pin power supply assignments)
  - 13 digital (DOUT) 3 A configurable as source only
  - 6 digital (HDOUT) 6 A configurable as source only
  - 3 digital/PVG power supply (DOUT/PVG Pwr) 3 A configured to be either DOUT or PVG supply power (one DOUT/PVG Pwr pin will power up to three PVGs)
  - 10 universal (PWM/DOUT/PVGOUT) configured to be either:
    Digital: (3 A) source or sink
    PWM: (3 A, 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
- 1 independent ECU power supply, 9 to 36 Vdc
- 4 independent power supplies for powering output pins, 9 to 36 Vdc
- 2 CAN 2.0B ports, the fixed range analog (AIN/CAN shield) pin may be configured as a shield pin
- Regulated 5 Vdc power supply for external sensors rated at 500 mA
- 2 LEDs under application software control
- MC088-01B contains the application key required to run Danfoss developed machine control application software
- CE compliant

Dimensions and Pin Assignments





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

Specifications

Product Parameters

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	0°C to 70°C [32°F to 158°F]
IP rating (with mating connector attached)	IP 67 (with mating connector attached)
EMI/RFI rating	100 V/m
Weight	964 g [2.125 lb]
Maximum current, sourcing	100 A (with all power supply and pins connected)
Maximum current, sinking	24 A (with all ground pins connected)

Product Part Number

MC088-015	10105470
MC088-01B	11071592

Related Products Part Numbers

CG150 CAN/USB Gateway	10104136
Deutsch® mating connector bag assembly	11071844 (16 to 20 AWG)
	10105649 (20 to 24 AWG)
PLUS+1 GUIDE single user license	10101000

Connector 1

Pin	Controller function
C1-P1	CPU power ground -
C1-P2	CPU power supply +
C1-P3	CAN0+
C1-P4	CAN0-
C1-P5	AIN/CAN0 shield
C1-P6	DIN
C1-P7	DIN
C1-P8	5 Vdc sensor power +
C1-P9	Sensor power ground -
C1-P10	DIN
C1-P11	DIN
C1-P12	DIN
C1-P13	DIN
C1-P14	DIN/AIN
C1-P15	Din/AIN
C1-P16	DIN/AIN
C1-P17	DIN/AIN
C1-P18	DIN/AIN/FreqIN
C1-P19	DIN/AIN/FreqIN
C1-P20	CAN1+
C1-P21	CAN1-
C1-P22	AIN/CAN1 shield
C1-P23	DIN/AIN/FreqIN
C1-P24	DIN/AIN/FreqIN
C1-P25	DIN/AIN/FreqIN
C1-P26	DIN/AIN/FreqIN
C1-P27	AIN/Temp/Rheo
C1-P28	AIN/Temp/Rheo
C1-P29	AIN/Temp/Rheo
C1-P30	AIN/Temp/Rheo
C1-P31	DOUT (3 A –Pwr = C2P35)
C1-P32	DOUT (3 A –Pwr = C2P35)
C1-P33	DOUT (3 A –Pwr = C2P35)
C1-P34	DOUT/PVG Pwr (3 A –Pwr = C2P35)
C1-P35	DOUT/PVG Pwr (3 A –Pwr = C2P36)
C1-P36	DOUT/PVG Pwr (3 A—Pwr = C2P36)
C1-P37	PWMOUT/DOUT/PVG OUT (3 A—Pwr = C2P35)
C1-P38	PWMOUT/DOUT/PVG OUT (3 A—Pwr = C2P35)
C1-P39	PWMOUT/DOUT/PVG OUT (3 A—Pwr = C2P35)
C1-P40	PWMOUT/DOUT/PVG OUT (3 A—Pwr = C2P35)
C1-P41	PWMOUT/DOUT/PVG OUT (3 A—Pwr = C2P36)
C1-P42	PWMOUT/DOUT/PVG OUT (3 A—Pwr = C2P36)
C1-P43	PWMOUT/DOUT/PVG OUT (3 A—Pwr = C2P36)
C1-P44	PWMOUT/DOUT/PVG OUT (3 A—Pwr = C2P36)
C1-P45	PWMOUT/DOUT/PVG OUT (3 A—Pwr = C2P36)
C1-P46	PWMOUT/DOUT/PVG OUT (3 A—Pwr = C2P36)
C1-P47	DIN/AIN//4-20 mA IN
C1-P48	DIN/AIN//4-20 mA IN
C1-P49	DIN/AIN//4-20 mA IN
C1-P50	DIN/AIN//4-20 mA IN

Connector 2

Pin	Controller function
C2-P1	DOUT (3 A –Pwr = C2P37)
C2-P2	DOUT (3 A –Pwr = C2P37)
C2-P3	DOUT (3 A –Pwr = C2P37)
C2-P4	DOUT (3 A –Pwr = C2P37)
C2-P5	DOUT (3 A –Pwr = C2P37)
C2-P6	DOUT (3 A –Pwr = C2P38)
C2-P7	DOUT (3 A –Pwr = C2P37)
C2-P8	AIN/Temp/Rheo
C2-P9	AIN/Temp/Rheo
C2-P10	AIN/Temp/Rheo
C2-P11	AIN/Temp/Rheo
C2-P12	DOUT (3 A –Pwr = C2P38)
C2-P13	HDOUT (6 A –Pwr = C2P37)
C2-P14	Power ground -
C2-P15	DIN
C2-P16	DIN
C2-P17	DIN
C2-P18	DIN
C2-P19	DIN
C2-P20	Power ground -
C2-P21	DIN
C2-P22	HDOUT (6 A—Pwr = C2P38)
C2-P23	DIN
C2-P24	DIN
C2-P25	DIN
C2-P26	DIN
C2-P27	DIN
C2-P28	DIN
C2-P29	HDOUT (6 A –Pwr = C2P37)
C2-P30	DOUT (2 A –Pwr = C2P37)
C2-P31	HDOUT (6 A –Pwr = C2P38)
C2-P32	HDOUT (6 A –Pwr = C2P38)
C2-P33	DOUT (2 A –Pwr = C2P37)
C2-P34	HDOUT (6 A –Pwr = C2P38)
C2-P35	Power supply + (20 A)
C2-P36	Power supply + (22 A)
C2-P37	Power supply + (28 A)
C2-P38	Power supply + (28 A)

Use care when wiring mating connector. Pinouts are for device pins.
Power supply + pin C2-P35 and C2-P36 should each be protected with a 25 A fuse; C2-P37 and C2-P38 should each be protected with a 30 A fuse.

Reference Documentation at www.danfoss.com

PLUS+1 Controller Family Technical Information, 520L0719
Application Program Interface (API)

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