

Data Sheet

PLUS+1® Controllers MC090-010 and MC090-012

Mobile Machine Management

This product is designed as flexible, expandable, powerful, cost effective stand-alone modules for smaller machined systems or as total machine management systems with intelligence in every node. These modules communicate with one another and other intelligent systems over a machine Controller Area Network (CAN data bus).

Product Highlights

The MC090 controller employs a Digital Signal Processor (DSP), providing the controller with extremely fast single-cycle processing speed and 1.3 MB flash.

The MC090-012 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

PLUS+1[®] hardware modules have input or output pins that support multiple functions. Pins that support multiple input or output types are user-configurable using PLUS+1[®] GUIDE software. This Microsoft[®] Windows[®] based development environment features a user-friendly, field proven, icon-based graphical programming tool, application downloader, and service/diagnostic tool.

Features

- 32 bit fixed-point DSP running at 150 MHz
- 12 bit analog-to-digital converter
- 2 MB serial flash vault memory
- 90 pins
 - 1: DEUTSCH DRC26-50 connector
 - 1: DEUTSCH DRC26-38 connector
 - 2: M5 power bolts
- 1 independent power supply for all outputs except C2-P30 and C2-P31
- 1 independent CPU and start up functions power supply 9 to 36 Vdc (also provides power to C2-P30 and C2-P31)
- Power supply for external sensors rated at 5 Vdc to 500 mA, regulated internally
- · 2 LEDs, user controlled
- 2 Can 2.0B-ports



Comprehensive technical literature is online at www.danfoss.com



9 user-defined inputs/outputs defined

- 7: Digital inputs (DIN/DOUT 1.5 A); 1.5 A Digital output: Configured as source only
- 2: Digital inputs (DIN/DOUT 6 A); 6 A Digital output: Configured as source only

22 user-defined inputs

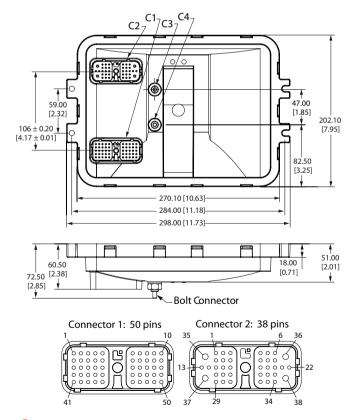
- 1: Digital/Analog/Frequency/4 to 20 mA Current (DIN/AIN/FreqIN/Crntln)
- 3: Digital/Analog/Frequency (DIN/AIN/FreqIN)
- 13: Digital/Analog (DIN/AIN)
- 3: Analog/Rheostat (AIN/Rheo)
- 1: D+ Digital (D+DIN) fixed pull-up, specifically designed for alternator D+ signals
- 1: Analog/CAN shield (AIN/CAN shield), configured as 0 to 5.25 Vdc or CAN shield pin

47 user-defined outputs

- 2: NPN Digital: Configured as sink only (DOUT 6 A NPN)
- 4: 0.5 A Digital: Configured as source only (DOUT 0.5 A)
- 12: 1.5 A Digital: Configured as source only (DOUT 1.5 A)
- 3: 3 A Digital: Configured as source only (DOUT 3 A)
- 10: 6 A Digital/Digital Input: Configured as source only (DOUT 6 A)
- 14: Universal (PWMOUT/DOUT) that are user-defined as either: *Digital* (3A): Configured as source or sink; *PWM* (33 to 4000 Hz): Configured as open or closed loop with current control
- 2: Universal (PWMOUT/DOUT) that are user-defined as either: *Digital* (12 A): Configured as source or sink; *PWM* (1.144 kHz fixed): Open loop mode only

Dimensions and pin connectors

Dimensions in mm [in]





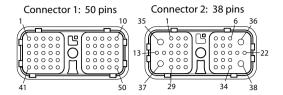
This device is not field serviceable. Opening the device housing will void the warranty.

This device's entire back surface must be supported when mounting (flatness within 1 mm). Mount device any direction.

2 | © Danfoss | August 2019



Pin assignments



Pin C1	Controller function	Pin C2	Controller function
C1-P1	DOUT 1.5 A	C2-P1	DOUT 6 A
C1-P2	CPU Power	C2-P2	DOUT 6 A
C1-P3	CAN0+	C2-P3	DOUT 6 A
C1-P4	CAN0-	C2-P4	DOUT 6 A
C1-P5	AIN/CAN Shield	C2-P5	DOUT 6 A
C1-P6	N/A	C2-P6	DOUT 6 A
C1-P7	N/A	C2-P7	DIN/AIN
C1-P8	5 Vdc Sensor Power +	C2-P8	DIN/AIN
C1-P9	Sensor Power Ground -	C2-P9	DIN/AIN
C1-P10	DOUT 6 A/NPN	C2-P10	DIN/AIN
C1-P11	DOUT 1.5 A	C2-P11	DIN/AIN
C1-P12	DOUT 1.5 A/DIN	C2-P12	DIN/AIN/FreqIn
C1-P13	DOUT 1.5 A/DIN	C2-P13	DIN/AIN
C1-P14	DOUT 1.5 A	C2-P14	DIN/AIN
C1-P15	DOUT 1.5 A	C2-P15	DIN/AIN
C1-P16	DOUT 1.5 A/DIN	C2-P16	DIN/AIN
C1-P17	DOUT 1.5 A	C2-P17	DIN/AIN
C1-P18	DOUT 1.5 A	C2-P18	DIN/AIN
C1-P19	DOUT 1.5 A/DIN	C2-P19	DIN/AIN
C1-P20	DOUT 1.5 A/DIN	C2-P20	DIN/AIN/FreqIn
C1-P21	DOUT 1.5 A	C2-P21	DIN/AIN/FreqIn
C1-P22	DOUT 1.5 A	C2-P22	DOUT 6A
C1-P23	DOUT 1.5 A	C2-P23	DIN/AIN
C1-P24	DOUT 1.5 A	C2-P24	AIN/Pheo
C1-P25	D+ DIN	C2-P25	AIN/Pheo

Pin C1	Controller function	Pin C2	Controller function
C1-P26	DOUT 1.5 A/DIN	C2-P26	DOUT 0.5 A
C1-P27	PWMOUT/DOUT	C2-P27	DOUT 0.5 A
C1-P28	PWMOUT/DOUT	C2-P28	DIN/AIN/Freq/Crntln
C1-P29	PWMOUT/DOUT	C2-P29	AIN/Rheo
C1-P30	DOUT 6 A/NPN	C2-P30	DOUT 1.5 A
C1-P31	CAN1+	C2-P31	DOUT 1.5 A
C1-P32	CAN1-	C2-P32	DOUT 0.5 A
C1-P33	PWMOUT/DOUT	C2-P33	DOUT 0.5 A
C1-P34	PWMOUT/DOUT	C2-P34	DOUT 6 A
C1P-35	PWMOUT/DOUT	C2-P35	PWMOUT/DOUT 12 A
C1P-36	PWMOUT/DOUT	C2-P36	DOUT 6 A
C1-P37	PWMOUT/DOUT	C2-P37	PWMOUT/DOUT 12 A
C1-P38	PWMOUT/DOUT	C2-P38	DOUT 6 A
C1-P39	PWMOUT/DOUT	-	-
C1-P40	PWMOUT/DOUT	-	-
C1-P41	PWMOUT/DOUT	-	-
C1-P42	DOUT 1.5 A/DIN	-	-
C1-P43	DOUT 3 A	-	-
C1-P44	DOUT 3 A	-	-
C1-P45	DOUT 3 A	-	-
C1-P46	DOUT 6 A/DIN	-	-
C1-P47	PWMOUT/DOUT	-	-
C1-P48	PWMOUT/DOUT	-	-
C1-P49	DOUT 6 A/DIN	-	-
C1-P50	PWMOUT/DOUT	-	-

Use care when wiring mating connector. Pinouts listed are for device pins. CPU power supply C1-P2 also provides power to pins C2-P30 and C2-P31.

© Danfoss | August 2019 Al00000203en-000701 | 3



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	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	1378 g [3.038 lb]
Maximum current, sourcing	100 A
Maximum current, sinking	85 A

Product part number

MC090-010	11081997
MC090-012	11162814

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 Professional	11179523	

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequent changes being necessary in specifications already agreed.

All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.

4 | © Danfoss | August 2019 Al00000203en-000701