

Data Sheet

# PLUS+1<sup>®</sup> Controllers

## MC090-020 and MC090-022



### 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 MC090-022 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<sup>®</sup> 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<sup>®</sup> GUIDE software. 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)
- 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-P7, C2-P8, C2-P30 and C2-P35
- 1 independent CPU and start up functions power supply 9 to 36 Vdc (also provides power to C2-P38)
- Power supply for external sensors rated at 5 Vdc to 500 mA, regulated internally
- 2 LEDs, user controlled
- 2 Can 2.0B-ports
- The MC090-022 contains an application key required to run Danfoss developed machine control application software



- 8 user-defined inputs/outputs that are defined as
  - Digital inputs (DIN/DOOUT 0.5 A)
  - 0.5 A Digital output: Configured as source only

**Inputs**

- 42 user-defined inputs
  - 18: Digital (DIN)
  - 11: Digital/Analog (DIN/AIN)
  - 4: Rheostat (Rheo)
  - 8: Digital with StartUp Function (DIN Start Up)
  - 1: Analog/CAN shield (AIN/CAN shield) configured as 0 to 5.25 Vdc or CAN shield pin

**Outputs**

- 29 user-defined outputs
  - 2: 0.5 A Digital: Configured as source only (DOOUT 0.5 A)
  - 5: 1.5 A Digital: Configured as source only (DOOUT 1.5 A)
  - 3: 3 A Digital: Configured as source only (DOOUT 3 A)
  - 10: 6 A Digital/Digital Input: Configured as source only (DOOUT 6 A)
  - 6: Universal (PWMOUT/DOOUT) that are user-defined as either: *Digital* (1.5 A) configurable as source or sink; *PWM* (33 to 4000 Hz), configurable as open or closed loop with current control
  - 2: Universal (PWMOUT/DOOUT 15 A) that are user-defined as either: *Digital* (15 A) configurable as source or sink; *PWM* (13 kHz fixed), open loop mode only
  - 1: 6 A PWM (195 Hz fixed), open loop and sourcing only

**Specifications**

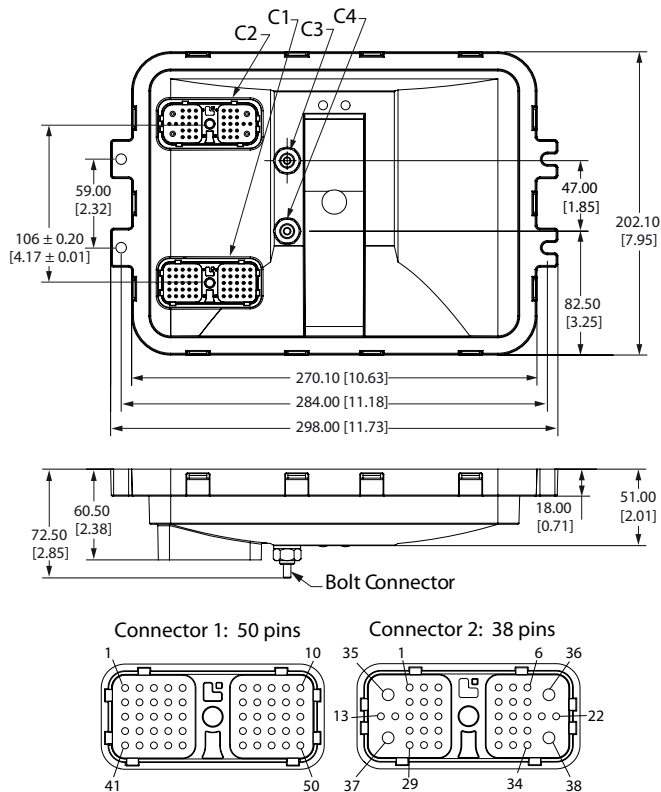
*Product parameters*

<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>	1368 g [3.016 lb]
<b>Maximum current, sourcing</b>	86.5 A
<b>Maximum current, sinking</b>	85 A

**Dimensions**

*Mounting dimensions and pin assignments*

Dimensions in mm [in]



P109258

*Related products part numbers*

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

**! Caution**

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

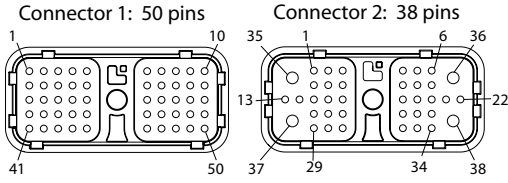
This device's entire back surface must be supported when mounting (flatness within 1 mm). Mount device any direction.

**Ordering information**

*Product part number*

<b>MC090-020</b>	11081998
<b>MC090-022</b>	11162753

Pin connector



Pin C1	Controller function	Pin C2	Controller function
C1-P1	DIN	C2-P1	DOUT 0.5A/DIN
C1-P2	DIN	C2-P2	DOUT 0.5A/DIN
C1-P3	CAN 0 +	C2-P3	DOUT 0.5A/DIN
C1-P4	CAN 0 -	C2-P4	DOUT 0.5A/DIN
C1-P5	CAN Shield/AIN	C2-P5	DOUT 0.5A
C1-P6	N/A	C2-P6	DOUT 0.5A
C1-P7	N/A	C2-P7	DOUT 1.5A
C1-P8	Sensor Power +	C2-P8	DOUT 1.5A
C1-P9	Sensor Power Ground -	C2-P9	DOUT 1.5A
C1-P10	DIN	C2-P10	DOUT 1.5A
C1-P11	DIN	C2-P11	DOUT 1.5A
C1-P12	DIN	C2-P12	DOUT 3A
C1-P13	DIN	C2-P13	DOUT 3A
C1-P14	DIN	C2-P14	DOUT 3A
C1-P15	DIN	C2-P15	DOUT 6A
C1-P16	DIN	C2-P16	DOUT 6A
C1-P17	DIN	C2-P17	DOUT 6A
C1-P18	DIN	C2-P18	DOUT 6A
C1-P19	DIN	C2-P19	DOUT 6A
C1-P20	DIN	C2-P20	DOUT 6A
C1-P21	DIN	C2-P21	DOUT 6A
C1-P22	DIN	C2-P22	DOUT 6A
C1-P23	DIN	C2-P23	DOUT 6A
C1-P24	DIN	C2-P24	PWMOUT/DOUT 1.5A
C1-P25	DIN	C2-P25	PWMOUT/DOUT 1.5A

Pin C1	Controller function	Pin C2	Controller function
C1-P26	CAN 1 +	C2-P26	PWMOUT/DOUT 1.5A
C1-P27	CAN 1 -	C2-P27	PWMOUT/DOUT 1.5A
C1-P28	DIN/AIN	C2-P28	PWMOUT/DOUT 1.5A
C1-P29	DIN/AIN	C2-P29	PWMOUT/DOUT 1.5A
C1-P30	DIN/AIN	C2-P30	PWMOUT/DOUT 6A
C1-P31	DIN/AIN	C2-P31	DOUT 0.5A/DIN
C1-P32	DIN/AIN	C2-P32	DOUT 0.5A/DIN
C1-P33	Rheo	C2-P33	DOUT 0.5A/DIN
C1-P34	Rheo	C2-P34	DOUT 0.5A/DIN
C1-P35	Rheo	C2-P35	DOUT 6A
C1-P36	Rheo	C2-P36	PWMOUT/DOUT 15A
C1-P37	DIN/AIN	C2-P37	PWMOUT/DOUT 15A
C1-P38	DIN/AIN	C2-P38	CPU Power (Batt +)
C1-P39	DIN/AIN	-	-
C1-P40	DIN/AIN	-	-
C1-P41	DIN/AIN	-	-
C1-P42	DIN/AIN	-	-
C1-P43	DIN StartUp	-	-
C1-P44	DIN StartUp	-	-
C1-P45	DIN StartUp	-	-
C1-P46	DIN StartUp	-	-
C1-P47	DIN StartUp	-	-
C1-P48	DIN StartUp	-	-
C1-P49	DIN StartUp	-	-
C1-P50	DIN StartUp	-	-

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

CPU power supply C2-P38 also provides power to pins C2-P7, C2-P8, C2-P30 and C2-P35 for start up functions.

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