



Data Sheet

# PLUS+1<sup>®</sup> Controller SC024-020 and SC024-022



**Advanced mobile machine management**

These PLUS+1<sup>®</sup> controllers are advanced elements of the PLUS+1<sup>®</sup> family of mobile machine management products. The design of this general purpose controller includes features required for sophisticated machine control strategies. It is equally suited for use in safety related or general machine control applications.

**Product highlights**

These controllers are pin compatible with the PLUS+1<sup>®</sup> MC equivalent controller. These controllers have dual micro controllers with the secondary having access to all controller inputs and supervisory control of outputs. These controllers support smart digital inputs. Current measurement capability has been added to some multifunction inputs. Device outputs can be individually controlled by the secondary processor. These controllers support low power capability.

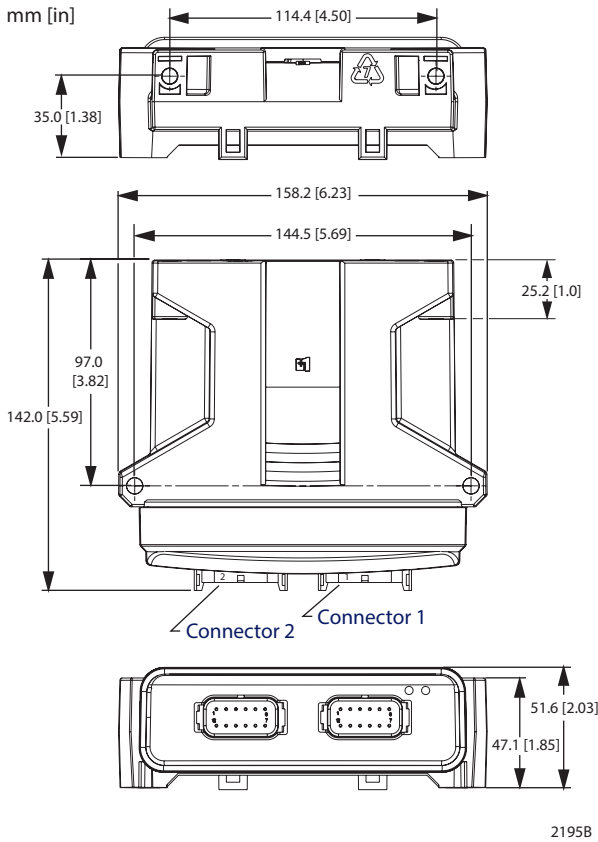
**Application development**

These controllers have an application key that enables the use of Danfoss developed GUIDE machine control solutions. The same Guide HWD file is used with both controllers. The user can develop these controllers' applications using either the PLUS+1<sup>®</sup> GUIDE development environment or C-code. Application code can be written in both the primary and secondary micro processors.

**Features**

- Programmable in PLUS+1<sup>®</sup> GUIDE
- Same general I/O content as the PLUS+1<sup>®</sup> MC024-020 controller
- Dual processors:
  - Primary: 512kB flash, 128kB RAM
  - Secondary: 128kB flash, 64kB RAM
  - Internal micro to micro UART
- 12 bit analog to digital converter
- 7 to 36 Vdc power supply, monitored internally
- (8) user-defined inputs
  - (5) Digital/Analog/Frequency
  - (1) Digital/Analog/CAN shield
  - (1) Digital/Analog/1.6 Vdc sensor power (for smart digital input capability)
  - (1) Digital/Analog/3.3 Vdc sensor power (for smart digital input capability)
- (8) user-defined 3A PWM outputs
  - Digital: Configurable as source or sink
  - PWM: (33 to 4000 Hz or 20 kHz) configurable as open or closed loop with current control
  - Analog voltage: Open loop PWM at 20,000 Hz
- Each PWM output may have a unique frequency
- (1) CAN 2.0B ports, the shield pin can be configured as a DIN/AIN
- User-defined 3 to 12 Vdc regulated power supply for external sensors
- (2) LEDs under user control
  - Both have alternate yellow color under kernel control to indicate low-level software/hardware failures
- Power supply for external sensors rated at 5 Vdc to 500 mA
- Operating temperature range: -40° C to +85° C
- EMC rating is 150 V/m

Mounting dimensions and pin assignments



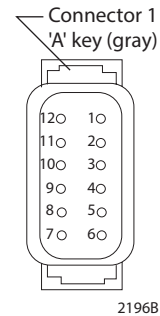
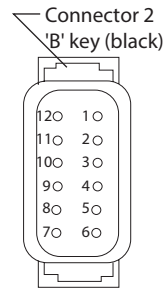
Pin connector

Connector 2

Pin	Controller function
C2-P1	DIN/AIN/FreqIN
C2-P2	DIN/AIN/FreqIN
C2-P3	PWMOUT/CrntOUT/DOOUT
C2-P4	PWMOUT/CrntOUT/DOOUT
C2-P5	PWMOUT/CrntOUT/DOOUT
C2-P6	PWMOUT/CrntOUT/DOOUT
C2-P7	PWMOUT/CrntOUT/DOOUT
C2-P8	PWMOUT/CrntOUT/DOOUT
C2-P9	PWMOUT/CrntOUT/DOOUT
C2-P10	PWMOUT/CrntOUT/DOOUT
C2-P11	Power supply +
C2-P12	Power supply +

Connector 1

Pin	Controller function
C1-P1	Power ground -
C1-P2	Power supply +
C1-P3	CAN0 +
C1-P4	CAN0 -
C1-P5	DIN/AIN/CAN shield
C1-P6	DIN/AIN/SnsrPwr1.6Vdc
C1-P7	DIN/AIN/SnsrPwr3.3Vdc
C1-P8	3-12 Vdc SnsrPwr +
C1-P9	SnsrPwr - (sensor ground)
C1-P10	DIN/AIN/FreqIN
C1-P11	DIN/AIN/FreqIN
C1-P12	DIN/AIN/FreqIN



**Caution**  
PCB damage may occur. All device power supply + pins must be connected to battery +.

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

Use care when wiring mating connector.  
Above pinouts are for device pins.

Specifications – product parameters

Supply voltage	7 to 36 Vdc
Operating temperature (ambient)	-40° C to 85° C [-40° F to 185° F]
Storage temperature	-40° C to 85° C [-40° F to 185° F]
Programming temperature	-40° C to 85° C [-40° F to 185° F]
IP rating (with mating connector attached)	IP 67
EMI/RFI rating	150 V/M
Weight	0.40 kg [0.88 lb]
Vibration	IEC 60068-2-64
Shock	IEC 60068-2-27 test Ea
Maximum current, sourcing	24 A
Maximum current, sinking	8 A

Product part number

SC024-020	11099062
SC024-022	11103248

Related products part numbers

CG150 CAN/USB Gateway	10104136
Deutsch® mating connector bag assembly	10102023 (16 to 20 AWG)
PLUS+1® GUIDE single user license	10101000

Danfoss comprehensive technical information is on line at: [www.danfoss.com](http://www.danfoss.com)

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