

## Data Sheet

# PLUS+1<sup>®</sup> Safety Controllers

## SC024-110 and SC024-112

### Advanced mobile machine management

Danfoss PLUS+1<sup>®</sup> controllers are elements of the flexible, powerful, expandable, and affordable 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.

These controllers are pin compatible with the Danfoss 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.

The SC024-112 controller has an application key that enables the use of Danfoss developed GUIDE machine control solutions. The same GUIDE HWD files are used with both controllers. The user can develop applications for these controllers using the PLUS+1<sup>®</sup> GUIDE development environment. Application code can be written for both the primary and secondary processors.

### Features

- User-programmable with PLUS+1<sup>®</sup> GUIDE (Graphical User Integrated Development Environment)
- Same general I/O content as the PLUS+1<sup>®</sup> MC024-010 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
- 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
- Power supply for external sensors rated at 5 Vdc to 500 mA
- Operating temperature range is -40°C to +85°C
- EMC rating is 150 V/m
- CE compliant
- Certified SIL 2 Capable per IEC 61508 to IEC 61508 : 2010 Parts 1-7 and IEC 62061:2005+ A1:2012+ A2:2015

Comprehensive technical literature is online at [www.danfoss.com](http://www.danfoss.com)



**14 User-defined Inputs**

- 6 Digital/Analog/Resistance/4-20 mA current
- 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)

**4 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

**Specifications**

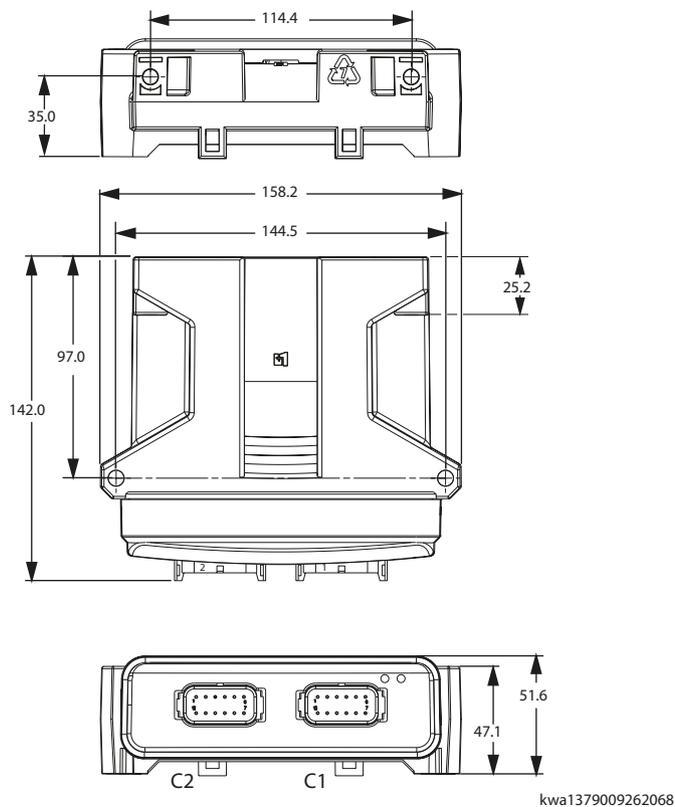
*Product parameters*

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

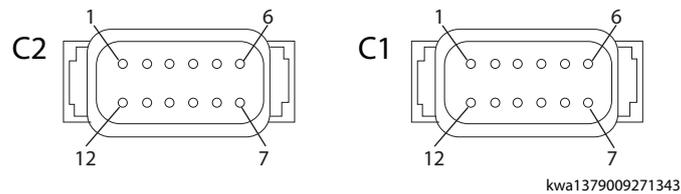
**Dimensions and pin assignments**

*Mounting dimensions and pin assignments*

Dimensions in mm [in]



*Pin connector*



Pin	Controller function	Pin	Controller function
C2-P1	DIN/AIN/ResIN/ CrntIN	C1-P1	Power ground -
C2-P2	DIN/AIN/FreqIN	C1-P2	Power supply +
C2-P3	DIN/AIN/FreqIN	C1-P3	CAN0 +
C2-P4	DIN/AIN/FreqIN	C1-P4	CAN0 -
C2-P5	DIN/AIN/FreqIN	C1-P5	DIN/AIN/CAN shield
C2-P6	DIN/AIN/FreqIN	C1-P6	DIN/AIN/SnsrPwr1.6Vdc
C2-P7	DIN/AIN/ResIN/ CrntIN	C1-P7	DIN/AIN/SnsrPwr3.3Vdc
C2-P8	DIN/AIN/ResIN/ CrntIN	C1-P8	3-12 Vdc SnsrPwr +
C2-P9	PWMOUT/CrntOUT/ DOU/PVGOUT	C1-P9	SnsrPwr - (sensor ground)
C2-P10	PWMOUT/CrntOUT/ DOU/PVGOUT	C1-P10	DIN/AIN/ResIN/CrntIN
C2-P11	PWMOUT/CrntOUT/ DOU/PVGOUT	C1-P11	DIN/AIN/ResIN/CrntIN
C2-P12	PWMOUT/CrntOUT/ DOU/PVGOUT	C1-P12	DIN/AIN/ResIN/CrntIN

**Caution**

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

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.



**Ordering information**

*Product part number*

<b>SC024-110</b>	11159589
<b>SC024-112 (with application key)</b>	11159592

*Related products part numbers*

<b>CG150-2 CAN/USB Gateway</b>	11153051
<b>DEUTSCH mating connector bag assembly</b>	10102023 (16 to 20 AWG)
<b>PLUS+1<sup>®</sup> GUIDE single user license</b>	10101000

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