

Data Sheet

# PLUS+1<sup>®</sup> XM100 Autonomous Controller



## Powerful data processing

The XM100 Autonomous Controller provides the high processing power required for state-of-the-art autonomous mobile machines. This controller is designed to meet the needs of autonomous machines by interfacing with GNSS, LiDAR, Radar and inertial sensors and performing autonomous navigation tasks. Ethernet and CAN connectivity allow the controller to manage complex tasks and command machine sub-systems, such as propel, steering and work function.

## Product highlights

The controller includes a powerful quad-core i.MX 6 platform with a Linux OS operating at 1.0 GHz. It has 8GB of flash and 2GB of DDR3 RAM to execute large, complex autonomous applications. This central processing unit delivers the power that will drive the future of your autonomous machine development.

## Application development

Users develop applications with PLUS+1<sup>®</sup> platform that enables novice programmers to quickly develop advanced applications. The PLUS+1<sup>®</sup> Autonomous Control Library works seamlessly with the controller to enable autonomous machine functionality. PLUS+1<sup>®</sup> GUIDE is a Microsoft<sup>®</sup> Windows<sup>®</sup> based development environment and features a user-friendly, field-proven, graphical programming tool, application downloader, and service/diagnostic tool.

## Features

- Programmable with PLUS+1<sup>®</sup> GUIDE
- 2 x 12-pin DEUTSCH DTP connectors
- Processor: i.MX 6 QuadPlus, 1.0 GHZ
- 8 GB flash, 2 GB DDR3 RAM
- 4 CAN ports
- 4-wire Ethernet port (10/100)
- Audio out
- 2 RGB LEDs
- 6-Axis Inertial Measurement Unit
- GNSS Receiver position accuracy 1.5m CEP50
- 5 Vdc sensor supply output
- 9 to 36 Vdc power supply, monitored internally
- Wake over digital input

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

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## XM100 Autonomous Controller

### 8 inputs

- 4 universal (DIN/AIN/FreqIn/Rheo/4-20 mA) that are user-defined as either:
  - Analog: with configurable ranges 0 to 5.25 Vdc (with over range protection) 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
  - Rheostat: (Resistance) from 0 to 1000 Ohm
  - Current: 4 to 20 mA
- 2 digital/analog (DIN/AIN) that are user-defined as either:
  - Analog: 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);
- Ignition Input (K15)
- Wake Input (DigIn)

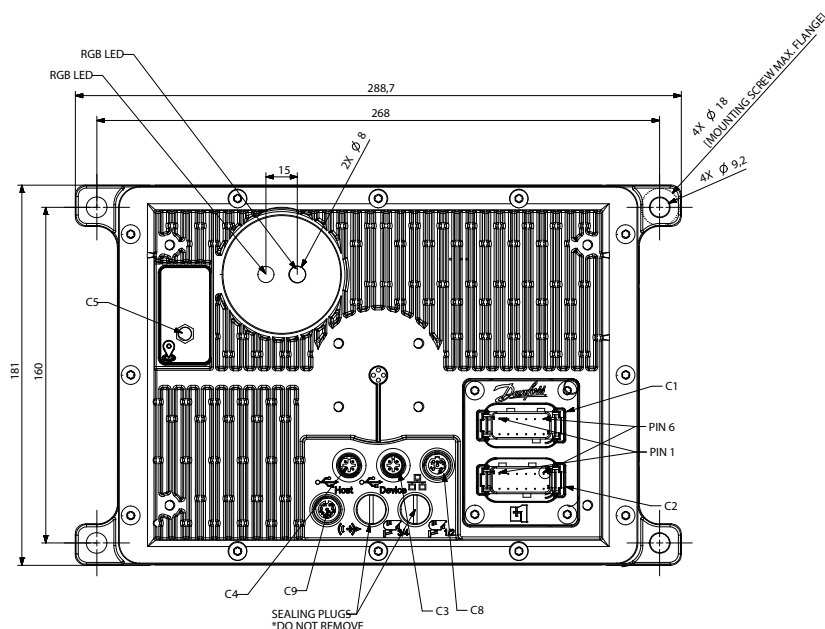
### 5 outputs

- 4 digital (Sinking DOUT) 500 mA
- Sensor Supply (+5 Vdc)

### Technical Specifications

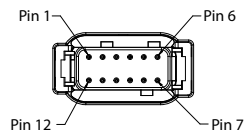
<b>Processor</b>	i.MX6
<b>Supply Voltage</b>	9-36 Vdc
<b>Connector</b>	DEUTSCH DTM06-12SA
<b>IP Rating</b>	IP66 and IP67 front and back
<b>Operating Temperature</b>	-30°C to +70°C [-22°F to 158°F]
<b>Storage Temperature</b>	-40°C to +85°C [-40°F to 185°F]
<b>Vibration/Shock</b>	IEC 60068-2-64 (7.67g) /2-27 (50g)
<b>EMI/RFI Rating</b>	100 V/m
<b>Humidity</b>	IEC 60068-2-78, 60068-2-30
<b>Transients</b>	ISO 7637/1, 2, 3
<b>Certifications</b>	FCC, IC, RCM, RoHS

### Pin locations and controller dimensions



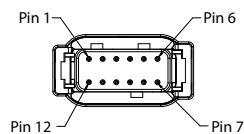
**XM100 Autonomous Controller**

**C1 - DEUTSCH DTM06-12SA, 12 pin**



C1 pin	Function
1	Power ground -
2	Power supply +
3	CAN 0+
4	CAN 0-
5	Anin / CAN shield
6	CAN 1+
7	CAN 1-
8	Sensor supply out (+5 V)
9	Clamp15 (KL15) Power hold input / Digin
10	Multifunction input (Digin/Anin/ Freq/4-20mA/Rheostat)
11	Multifunction input (Digin/Anin/ Freq/4-20mA/Rheostat)
12	Digital out (0.5A sinking)

**C2 - DEUTSCH DTM06-12SB, 12 pin, "B" key**



C2 pin	Function
1	Sensor ground
2	Digital out (0.5A sinking)
3	CAN 2+
4	CAN 2-
5	Anin / CAN shield
6	CAN 3+
7	CAN 3-
8	Multifunction input (Digin/Anin/ Freq/4-20mA/Rheostat)
9	Multifunction input (Digin/Anin/ Freq/4-20mA/Rheostat)
10	Clamp15 (KL15) Power hold input / Digin
11	Digital out (0.5A sinking)
12	Digital out (0.5A sinking)

**C3 - M12 4 pin, USB Device, "A" key**



C3 Pin	Function
1	Device data +
2	Device data -
3	Device Vbus
4	Ground

**C4 - M12 4 pin, USB Host, "D" key**



C4 Pin	Function
1	Host data +
2	Host data -
3	Host Vbus
4	Ground

**C5 - GNSS antenna SMA coaxial**



Antenna must be installed properly to the machine to avoid interference and to ensure the line of site to the sky.

C5 Pin	Function
Threads	Ground
Pin	Signal

**C8 - M12 5 pin female, Ethernet, "D" key**



C8 Pin	Function
1	TxD+
2	RxD+
3	TxD-
4	RxD-

## C9 - M12 8 pin female, Stereo, "A" key



C9 Pin	Function
1	TxD
2	RxD
3	Ground
4	NC
5	Left channel
6	Right channel
7	Ground
8	NC

**Product part number**

<b>11321919</b>	XM100,ESSN Autonomous Controller
<b>11321920</b>	XM100, ADVN Autonomous Controller

**Related products part numbers***Connector kit*

<b>10100944</b>	DEUTSCH 12-pin Connector Kit (DTM06-12SA)
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*Connection tools*

<b>10100744</b>	DEUTSCH stamped contacts terminal crimp tool, size 20
<b>10100745</b>	DEUTSCH solid contacts terminal crimp tool

*Cable kit*

<b>11231512</b>	Cable, M12 4-pin to USB device (2m)
<b>11130713</b>	Cable, M12 8-Pin to Lead Wires (1.5m)
<b>11130712</b>	Cable, M12 5-Pin to Lead Wires (1.5m)

*Antenna*

<b>11283266</b>	External GNSS Antenna (5m) Antenna supports L1/L2 bands and is an active antenna.
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*Software*

<b>11179523 (renew annually with 11179524 to keep software updates)</b>	PLUS+1 <sup>®</sup> GUIDE Professional Software (includes 1 year of software updates, a single user license, Service and Diagnostic tool and Screen Editor)
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