CCpilot XM2 and CrossCore XM2

Technical manual

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Contents

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1   Introduction

CCpilot XM2 and CrossCore XM2 family is a PC-based on-board display computer and controller with a rich set of integrated functions. With its powerful Intel Atom dual core CPU with Windows or Linux it is an open platform that facilitates easy implementation of premium user interaction, reliable controls and integrated fleet management.

This technical manual and reference handbook provides important information regarding the hardware and basic usage. For software and operating system specifics please see additional documentation.

1.1 Product models

This documentation is applicable for both CCpilot XM2 and CrossCore XM2. They offer the same level of hardware and interfaces, with the following difference:

- CCpilot XM2 is the display version, available with 10.4" and 12.1" screens.

- CrossCore XM2 offers the same features and high performance as CCpilot XM2 but without the display.

Both XM2 versions offers integrated functions and interfaces such as CAN, USB, Ethernet, Audio and Video. The platform also enables customization of hardware and software. Described herein are the possibilities which can be obtained using above product models, additional features are described in model specific documentation.

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1.2 Conventions and definitions

CCpilot XM2 and CrossCore XM2 are in most cases identical in functionality and usage. The following definition is used to separate unit specific details. The observe symbol is also used to highlight such difference.

Defines	Use
CCpilot XM2	Information that is specific for CCpilot XM2
CrossCore XM2	Information that is specific for CrossCore XM2
XM2 device	Information that applies to both CCpilot XM2 and CrossCore XM2

The observe symbol is used to highligt information in this document, such as differences between product CCpilot and CrossCore product models.

The exclamation symbol is used to highlight important information.

Text formats used in this document.

Format	Use
Italics	Paths, filenames, definitions.
Bold	Command names and important information

1.3 Identification

On the side of the XM2 device there is a label containing version and serial numbers which identify your unique computer. Take note of them. During service and other contact with the supplier it is important to be able to provide these numbers.

1.4 Care

- During welding or other service on the machine, all cables to the XM2 device shall be disconnected.

- Serviced shall only be made by authorised personnel. If the unit is opened by unauthorised personnel, the guarantee will cease to be valid.

- Scratches, or in the worst case damages, to the display occur easily if it comes in contact with a sharp edge or hard material. In order to increase the longevity of the screen, this is naturally something which should be avoided.

- The Flash memory used for storage is durable; however as with all flash memory types the write cycles are limited. Avoid unnecessary writing to the flash memory.

- If the unit becomes too hot it will operate at a limited speed and can also be damaged. Therefore, do not cover the unit by covering it, for example hanging a jacket or other clothes on it.

- Consider traffic safety when CCpilot XM2 is installed and whenever it is used. maximatecc does not recommend that CCpilot XM2 or its accessories be used actively by the driver when a risk of injury to people, or damage to property, is present.

- Be advised that the XM2 device draws power from the vehicle battery. This can result in the inability of the vehicle to start if the on-board computer has been on for a period of time without the vehicle engine running.

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1.5 Environment and Environmental Tolerance

The XM2 device has been designed to cope with tough environmental demands. Strict tests have been conducted on the unit in order to ensure that it fulfils the expectations of a rugged unit. Much work has been performed to choose and design internal components so that they, under all circumstances and in the best possible way, provide you with a dependable and user-friendly working instrument. Within the chapter Specifications, a list of standards can be found according to which XM2 device has been tested and approved.

The XM2 device is preferably placed in a way that prevents exposure to water contact. It is also important that it is mounted securely on a stand or the like to inhibit the unit from moving and thereby becoming damaged, damaging the vehicle and/or people during, for example, a traffic accident.

1.6 Cleaning

To ensure proper and reliable functionality over time, the unit shall be wiped cleaned of dirt and dust. Use a suitable light damp rag to clean the unit.

Never use alkaline, alcoholic or other chemicals for cleaning which can damage the unit.

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2   Overview

The XM2 device is a compact, robust and versatile on-board computer. It is equipped with, a large number of connection alternatives such as CAN, COM, Ethernet and USB. CCpilot XM2 is also equipped with a pressure-sensitive touch screen.
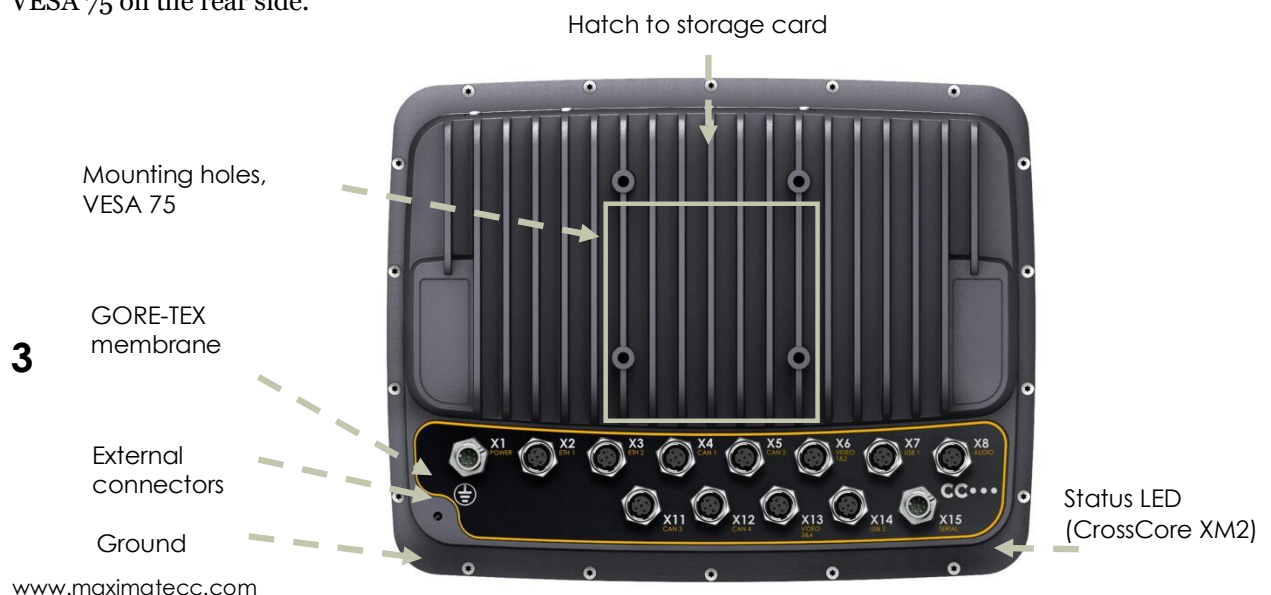
2.1 Front side

On the front face of CCpilot XM2 there is a touch screen, buttons for switching the unit on/off as well adjusting the screens brightness level, a buzzer, status indicator and a light sensor.

Touch screen

Buzzer

ON/OFF button

Increase and decrease the display's brightness level

Status indicator

Light sensor

2.2 Rear side

On the rear side of the XM2 device there are the external connectors, which are described in more detail in the chapter Connectors. There are also mounting holes for fasteners in accordance with VESA 75 on the rear side.

Hatch to storage card

Mounting holes, VESA 75

3

GORE-TEX membrane

External connectors

Ground

Status LED (CrossCore XM2)

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3 Installation

Install the device in such a way that is considered safe and does not expose any unnecessary stress to the unit. In this section, some recommendations are made regarding installation.

3.1 Connecting to power supply

This instruction address vehicle installations but the principle is the same also for other types of installations. See also the description of the pin outs for the Power Supply Connector under the section External interface description.

- Carefully follow the connection instructions below. Make sure that all contacts are angled correctly and that they do not have to be forced, but lock gently and pliant.

- GND (pin 3 and 4) is connected to the vehicle's ground.

- Battery (pin 1 and 2), i.e. the computer's power supply (+24 VDC), should be connected directly to the vehicle's battery through 10 A fuses (F1). Wire gauges shall be dimensioned with respect to cable length, supply voltage etc. Minimum cable area is 2x1 mm2 (2xAWG 18).

- The ON/OFF (pin 5), i.e. the computer's on/off signal is connected via the vehicles turnkey signal or an external on/off switch (S1). If the vehicle has a main power switch (S1) the computer shall be connected after it, as in the illustration below. The maximum allowed input current for the on/off signal is 2.5 mA. The fuse F2 fuse rating and wire gauge shall be dimensioned for the total switch current.
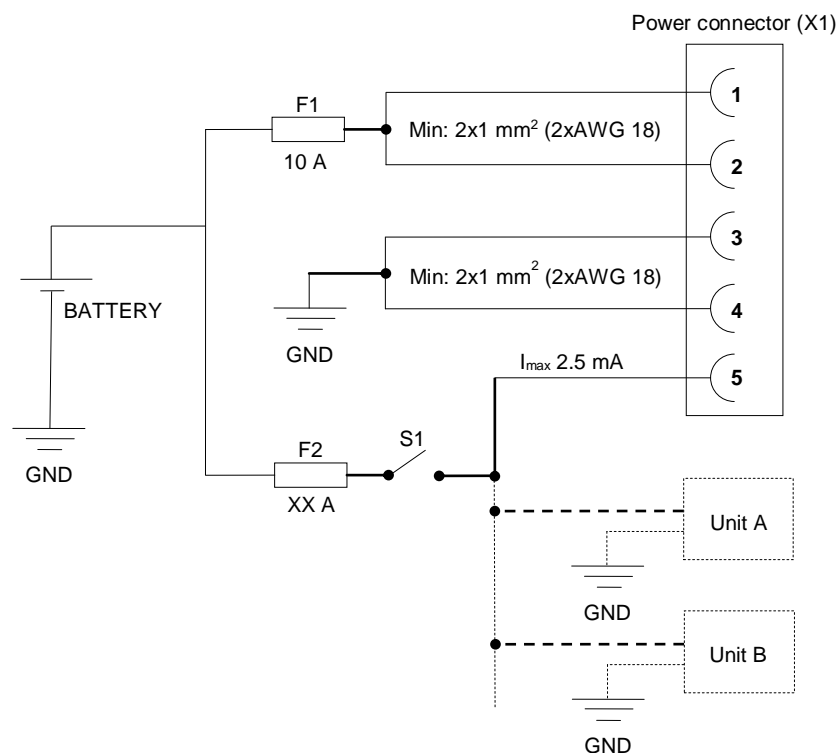
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By connecting the power supply according to the illustration above, the device will automatically start when the main switch or turnkey is turned on, and shut down when the switch or turnkey is turned off. While the main switch is in the ON position, the computer can also be turned off and on with the On/Off-button.

3.1.1   Precautions

If applicable connect the power supply to the device before any main switch, as per the illustration above. If this is not possible, ensure that the device is turned off using for example the on/off button or turnkey functionality before turning off the main switch or in any other way making the computer powerless.

Sudden power disruptions may cause the device to shut down, potentially causing lost or corrupt data. If for example the power fluctuates when starting the vehicle engine, the device should be started after the vehicle engine is running.

Ensure that any application data is saved before turning off the device.

During welding or other service on the machine, all cables to the XM2 device shall be disconnected.

3.2 Mounting

CCpilot XM2 is preferably mounted on a VESA 75 bracket which allows adjustment of the display's position and angle.

To fasten, use the appropriate M6 cap screw of type MC6S (Allen) or MRT (Torx). The enclosure has blind holes, which give a maximum thread depth in the enclosure of 12.5 mm. The maximum torque for 8.8 graded screws is 9.8 Nm. Apply a thread locker in all bolt holes, e.g. Loctite 222.

CrossCore XM2 is preferably mounted using the mounting lugs on the base plate.

Ensure that CrossCore XM2 is mounted to a smooth, flat surface. Fastening the unit to an uneven surface may stress the enclosure, damage the outer flange or possibly even flex the circuit board inside, leading to a premature failure.

Ensure the mounting M8 Allen screws are of grade 8.8 or higher, are clean and dry, and apply torque of about 25 Nm (18 ft-lbs). Use lock washers.

3.3 Environmental considerations

- The device shall be placed in a way that prevents the unit from direct exposure to water.

- Use caps on any connectors that do not have attached cables.

- On the back side of the unit is a GORE-TEX® membrane located, seen as a small hole. This membrane must never be faced upwards when the unit is mounted. Be cautious not to insert any object into this hole since it can puncture the GORE-TEX® membrane, leaving the unit unprotected from moisture and dust intrusion. If the membrane is punctured the guarantee is void.

- To enable sufficient cooling, the XM2 device must be installed so that air is able to circulate around the device, avoid installing the device near hot air vents or the like. There must be at least 50 mm free distance around the unit.

- Loose mounting bolts are the most common reason for excessive vibration. Mounting bolts may become loose due to improper techniques such as missing lock washers, over

tightening or under tightening. Proper tightening requires clean dry bolts, and a torque wrench.

- When CCpilot XM2 or any device is installed in a vehicle environment it is important that the installation is traffic-safe. maximatecc does not recommend that CCpilot XM2 or its accessories are used actively by the driver or operator when a risk of injury to people, or damage to property, is present.

3.4 Cables

Cables shall be installed in such a way that they don't run any risk of being damaged, pinched or worn.

- Avoid bending and twisting cables

- Strain-relief on cables near the connection to the respective unit

- Properly screw the connectors to give good contact and avoid unnecessary strain.

- Shielded cables is recommended and in some cases necessary to ensure reliable communication and appliance with industrial EMC standards.

Through adapter cables, as supplied by maximatecc, standard connectors can be connected to the unit. The installation of these adapter cables should be placed in a protected, moisture-free space and should be secured as well as strain-relived.

4 Basic operations

This section covers basic operation of the XM2 device such as start-up and shut-down.

4.1 Starting Up

Start CCpilot XM2 by pressing and releasing the On/Off button. The status indication LED will start flashing indicating that the unit is starting up

CrossCore XM2 is started through a signal in the power connector, i.e. a turnkey functionality. For more information see the chapter Connecting to power supply. This way can also be used to start CCpilot XM2.

4.1.1 Preheating

An internal temperature control prevents the XM2 device from starting in to cold or hot temperatures. When starting the unit in extremely low temperatures, by default -25 °C, preheating is activated to warm the unit before continuing the start-up sequence. When the internal temperature reaches -25 °C the preheating is deactivated and the unit continues to start up.

Note that preheating consumes energy from the vehicle's battery. This can result in the vehicle not starting, after prolonged preheating, due to a discharged battery.

4.2 Turning off

There are several ways to turn off the XM2 device and also alternatives to enter suspend mode instead of completely shutting down the unit.

Suspend is as a faster alternative to shutting down and starting up the unit. In suspend mode the data remains in RAM memory and the device must be connected to power to maintain its state.

The behaviour of the On/Off button and the On/Off signal through the Power connector can be adjusted in the CCpilot XM2 settings application.

4.2.1 Shutting Down

To ensure that data does not get lost or the flash memory becomes corrupt, it is recommended that all necessary data shall be saved and all programs closed before the unit is shut down.

There are three ways to turn off the XM2 device:

- By releasing the power connectors On/Off signal, i.e. using the turn key functionality.

- By selecting any of the operating systems shut-down alternatives.

- CCpilot XM2 can also be turned off by pressing the On/Off button on the display for four seconds and then releasing it. The times for the On/Off button can be adjusted in settings and it can also be disabled so that the unit cannot be shut down using the button, to prevent turning the computer off accidentally.

When performing any of the above, the XM2 device will shut down. The status LED will flash in yellow to indicate that releasing the On/Off button will result in the unit starting shut down.

4.2.2   Suspend to RAM

Suspend to RAM is initiated by:

- By releasing the power connectors On/Off signal, i.e. using the turn key functionality.

- By selecting any of the operating systems suspend alternatives

- CCpilot XM2 can also be suspended by a short press on the On/Off button

A user configurable time can be set for how long the unit shall be in suspend mode before the unit is completely shut down.

4.2.3   Forced Shut Down

If the device is not responding, a forced shut down can be performed by pressing and hold the On/Off button until the computer is turned off. The time for the forced shut down is double the normal shut down time, by default eight seconds.

Any information which was not saved will be lost when performing a forced shut down. It is not recommended to use the forced shut down since it immediately shuts down the computer regardless of the operating system state.

4.3 Adjusting the screen brightness

Press the respective brightness button to gradually increase or decrease the CCpilot XM2 display brightness.

The brightness can also be controlled from software, which also allows for automatic adjustment of the brightness using the light sensor.

4.4 Using the touch screen

The CCpilot XM2 display is equipped with touch functionality which gives the opportunity to provide a very easy-to-use HMI (Human Machine Interface) for the user.

4.4.1   Double and right click on the touch screen

Double click is performed similar to using an external pointing device. Tap the screen twice in the same place.

Tap and hold the on the touch screen to perform the equivalent to a right click.

4.5 Status LED indicators

The status LED indicator on the XM2 device indicates different device states using colours and flashing patterns. The LED behaviour can be controlled both by the operating system and by the applications executing on the device.

4.6 Clock back-up battery

Time and date information is stored in a memory sustained by a back-up battery. This battery has a limited life time and must therefore be exchanged at regular intervals. The life time of the battery is approximately 10 years.

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5 Interface overview

This section describes the interfaces on the XM2 device. Note that depending on product model, all interfaces may not be present. See the section standard product model equipment level for information on the respective unit configuration.

5.1 Storage memory

A CFast memory card is used for data storage. This makes the XM2 device robust to vibrations which would be a problem when using rotating hard discs.

The CFast card is industrial grade classified has both static and dynamic wear levelling to prevent a premature aging and to ensure the longest lifetime of the memory card, still it has a limited number of write cycles. It is recommended that the amount of writing to storage is limited within the application. Rather keep information in RAM memory and write larger blocks at one time instead of frequently writing smaller pieces.

5.2 Light sensor

A light sensor is placed in the front of the CCpilot XM2. Using this, ambient light levels can be measured and used for example by software to automatically adjust the screen brightness.

5.3 Buzzer

A buzzer that can be used for user notifications exists in the front of CCpilot XM2. The buzzer is application controllable with adjustable volume and frequency.

5.4 Audio output & input

The audio output can play everything from warning sound to music when the XM2 device is connected to a sound system. The output offers a line-out stereo signal.

Audio can be recorded through the stereo line in or microphone input.

Volume is controlled through the operating system.

5.5 Video

The XM2 device has a total of four video inputs, divided on two connectors, for attachment of video sources such as rear view or surveillance cameras, or for taking and storing snap shot images. It supports PAL as well as NTSC.

On CCpilot XM2, two video feeds can simultaneously be displayed in separate areas of the screen.

Each of the four channels have an on/off application controllable output voltage. The output voltage is 12VDC and has a current limit to 250 mA at 12 VDC or 1 A total.

The cable which is used to connect the camera to the device shall be a 75-Ω coaxial cable, e.g. M17/94-RG179. Shielded cables shall be used to ensure reliable communication and EMC immunity.

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5.6 CAN

The XM2 device has four CAN interfaces according to CAN ISO 11898 2.0B. To avoid interference caused by EMC the max speed should be limited to 250 Kbit/s. Using higher bit rates requires adapted filtering, available as an optional adaption, and shielded cables.

A CAN supply output is available with a maximum total supply current of 2 A. The output voltage will be the same as the unit supply voltage. The CAN supply output is application on/off controllable.

The CAN channels are over current and short circuit protected. The CAN connectors follow the CANopen standard.

5.7 USB

USB ports enable connection of a multitude of devices to the XM2 device. The USB ports follow the USB 2.0 standard. Due to data communication safety using M12 connectors it is recommended to limit the transmission speed to full speed (up to 12 Mbps). Shielded cables shall be used to ensure reliable communication and EMC immunity.

The USB ports can supply up to 500 mA each. The USB ports are internal over current and short circuit protected.

5.8 Ethernet

The XM2 device has two Ethernet connections, fully compatible with the 10BASE-T and 100BASE-TX standards and is galvanically isolated (500 VAC or 707 VDC). Shielded cables shall be used to ensure reliable communication and EMC immunity.

Be aware that connecting the device to a network environment can impose a security threat.

5.9 Serial port

The serial port follows the RS232 standard but with a limited set of signals, listed in the connector's description. The supported communication speed for these ports is 2.4 to 115.2 kbps.

To comply with industrial EMC standards EN 61000-6-2 the COM cable must be shielded.

5.10 Digital inputs

There are four digital inputs available on the XM2 device.

The digital input trip level is half the input voltage, without hysteresis, and the voltage level follows the input voltage to the unit. They are internally pulled up by 5 kOhm to input Voltage.

The digital inputs has a maximum sample frequency of 100Hz.

6 Connectors

All connectors are accessible from the rear of the unit. The connectors are marked with an X and a number as well as a short descriptive text, e.g. X1 USB1.

In order to give the XM2 device its high environmental classification, the unit is equipped with DIN M12 connectors. maximatecc provides adapter cables which convert from DIN M12 to standard connectors.

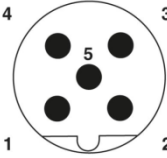Use caution and avoid plugging/unplugging of connectors when the computer is on.

Always replace a damaged cable. If the pins become bent or damaged they may not function correctly, or in the worst case, the on-board computer or other equipment may be damaged.
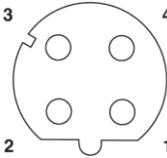
6.1 Connector layout

Notice that the connector descriptions are those which are located on the unit, not those that the attached cables shall have in order to mate with them.
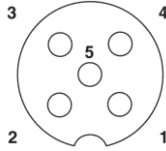
X1 - Power supply connector

Pin #	Default signal	Comments	DIN M12 x 1 male, 5-pole, B-coded Rotation 180°
1	+10…+30 VDC, 10A max.	Main Power Input	
2	+10…+30 VDC, 10A max.	Main Power Input	
3	GND	Main Ground Input	
4	GND	Main Ground Input	
5	ON/OFF	ON/OFF input signal	

X2, X3 - Ethernet Connector
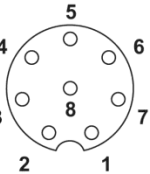
Pin #	Default signal	Comments	DIN M12 x 1 female, 4-pole, D-coded Rotation 180°
1	Tx+		
2	Rx+		
3	Tx-		
4	Rx-		
Housing	Shield		

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X4, X5, X11, X12 - CAN Connector

Pin #	Default signal	Comments
1	CAN Shield	Connected to chassis ground
2	V+	
3	CAN_GND	
4	CANH	
5	CANL	
Housing	CAN shield	

DIN M12 x 1 female, 5-pole, A-coded Rotation 180°
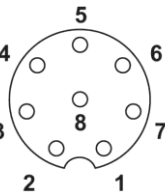
X6, X13 - Analogue Video Connector

Pin #	Default signal	Comments
1	Signal 1 GND	
2	Signal 1 in	
3	V 1 out	
4	V 1 GND	
5	V 2 GND	
6	Signal 2 GND	
7	Signal 2 in	
8	V 2 out	
Housing	Shield	

DIN M12 x 1 female, 8-pole, A-coded Rotation 180°
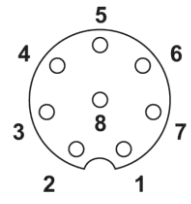
X7, X14 - USB Connector

Pin #	Default signal	Comments
1	Vbus out	5 Volt
2	D-	
3	D+	
4	NC	
5	GND	
Housing	Shield	
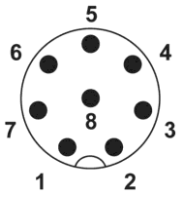
DIN M12 x 1 female, 5-pole, A-coded Rotation 180°

X8 - Audio Connector

Pin #	Default signal	Comments
1	Rout	Right channel out
2	Lout	Left channel out
3	GND Right	GND for outputs
4	GND Left	GND for outputs
5	Rin	Right channel in
6	Lin	Left channel in
7	MIC in	Microphone in
8	GND in	GND for inputs
Housing	Shield	

DIN M12 x 1 female, 8-pole, A-coded Rotation 180°

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X10 – I/O Connector

Pin #	Default signal	Comments	DIN M12 x 1 female, 8-pole, A-coded Rotation 180°
1	DIG 1	Digital input	
2	DIG 2	Digital input	
3	DIG GND	Digital GND	
4	NC		
5	DIG GND	Digital GND	
6	DIG GND	Digital GND	
7	DIG 3	Digital input	
8	DIG 4	Digital input	
Housing			

X15 - Serial Port Connector

Pin #	Default signal	Comments	DIN M12 x 1 male, 8-pole, A-coded Rotation 180°
1	NC		
2	RxD		
3	TxD		
4	NC		
5	GND		
6	NC		
7	RTS		
8	CTS		
Housing	Shield		

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7   Specifications

The specification may vary depending on your computer configuration.

7.1 Standard models connectivity level

Interface / Feature	CCpilot XM2 CrossCore XM2
CAN bus	4
USB Host	2
Ethernet port	2
RS232 Serial Port	1
Video in	4
Audio In / Out	1
Digital In	4

7.2 Technical data

Kernel	
Processor	Intel Atom E3826 dual core, 1.46 GHz
Data storage	8 GB, Industrial grade CFast
RAM memory	2 GB, DDR3L
Graphics	Intel HD Graphics

Interfaces	
CAN	
Type	CAN ISO 11898-2, 2.0B, (High Speed CAN)
Driver	MAX13053ESA
Baud Rate	Configurable 20 – 250 kbit/s, optional up to 1 Mbit/s[1]
USB	
Type	Host, V 2.0
Speed	Full speed, max 12 Mbit/s
Host port	5 V, max 500 mA, over current and short circuit protected
Ethernet	
Type	According to 10BASE-T and 100BASE-TX standards
Isolation voltage	500 VAC / 707 VDC
Serial	
Type	RS232
Max speed	Up to 115 200 baud
Present signals	Rx, Tx, RTS, CTS, GND

Video In	
Supported signal type	Composite video signal, PAL and NTSC
Power control	Application controllable, shared supply source and protection
Output Voltage	12 VDC
Output Current	250 mA@12 VDC / channel or 1 A total

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[1] To avoid interference caused by EMC the max speed should be limited to 250 Kbit/s. Using higher bit rates requires adapted filtering, available as an optional adaption, and shielded cables.
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Protection	Short circuit protected
Audio out	Stereo line out
Line out level	1 V RMS at 10 k
Protection	Short-circuit protected
Audio in	Stereo line in, Mono Mic in
Line in level	Max 2.73 V(pk-pk) @ 0dB gain, 0.69V @ +12dB gain (max)
Mic in level	Max 2.73 V(pk-pk) vid 0dB gain, 0.26V vid +20dB gain (max).
Input impedance	20 kOhm

HMI	
Status LED	Tricolor led status indicator with configurable behaviour

Software	
Operating system	Windows 7 or Linux
Additional software	CCsettings, CCvideo. API's are available to access settings, video and other equipment from software

Display	
10.4"	
Type	TFT, 4:3, anti-glare coated
Resolution	XGA,1024 x 768
Colour depth	24 bit
Backlight	LED, 480 cd/m^2
12.1"	
Type	TFT, 4:3, anti-glare coated
Resolution	XGA,1024 x 768
Colour depth	24 bit
Backlight	LED, 400 cd/m^2

Power Supply	
Supply Voltage	12 or 24 V nominal
Power Consumption	< 1.5 A at 24 V with no external loads
	< 4.0 A at 24 V with full load on USB, video power and CAN power

7.3 Environmental tolerance

Environmental Test	Standard	
Dry Heat	IEC 60068-2-2	Operating: +70°C, 24h Storage: +85°C, 24h
Damp Heat	IEC 60068-2-30	Operation: +25°C / +55°C >93% RH 6*24h
Cold	IEC 60068-2-1	Operating: -25°C, 24h Storage: -40°C, 24h
Change of temperature	IEC 60068-2-14	-25°C to +30°C, 5C/min 3hr hold time, 20 cycles
Vibration	IEC 60068-2-64	0,01 g2/Hz 10-200 Hz 3x0.5h
Shock	IEC 60068-2-29	5 g / 11ms 3x ±1000 bumps

EMC Electrical Transient	ISO 7637-2	Pulse 1: -50V
		     2: +25V
		     3a: -35V
		     3b: +35V
		     4: -5V
		     5: +70V

EMC Immunity, ESD	EN 61000-4-2	8 kV air, 6 kV contact

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| EMC Immunity, RF | ISO 11452-2 | RF electromagnetic field 200-1000MHz 30V/m |
| | ISO 11452-4 | Bulk Current Injection 20-200MHz 60mA |

EMC Emission	ISO 14982	Radiated Nar.b. Bro.b.
		MHz dBµV/m dBµV/m
		30-75 54-44 64-54
		75-400 44-55 54-65
		400-1000 55 65

| EMC Radiated RF immunity | EN 61000-4-3 | RF electromagnetic field 80M-1GHz 10V/m 1G-2GHz 3V/m 2G-2,7GHz 1V/m |

EMC Burst	EN 61000-4-4	±2kV DC , ±1kV signal
EMC Surge	EN 61000-4-5	±0.5kV DC, ±1kV signal
EMC Induced RF [1]	EN 61000-4-6	0.15-80MHz 10V

EMC Radiated RF emission	EN 55011	MHz dBµV/m
		30-230MHz 40
		230-1000MHz 47

| Enclosure | EN 60529 | IP65 |

1) Requires shielded cables for Serial, Ethernet, USB and Video.

The tests are performed with 24 V power level. The environmental tolerance may be affected by external factors like mounting and shielded cables etc.

7.4 Weight and dimensions

7.4.1   CCpilot XM2 10.4"

	Description
Enclosure size	278 x 215 x 71 mm (W x H x D)
Weight	2.9 Kg
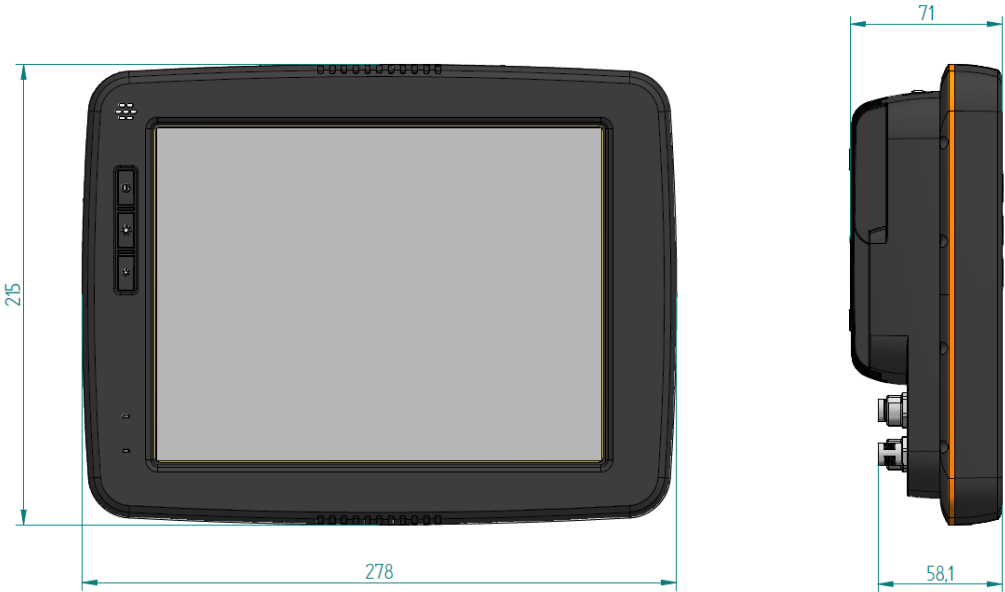
7.4.2   CCpilot XM2 12"

	Description
Enclosure size	316 x 251 x 72.5 mm (W x H x D)
Weight	3.5 Kg

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7.4.3 CrossCore XM2

Description	
Enclosure size	294 x 191 x 58.5 mm (W x H x D)
Weight	2.6 Kg
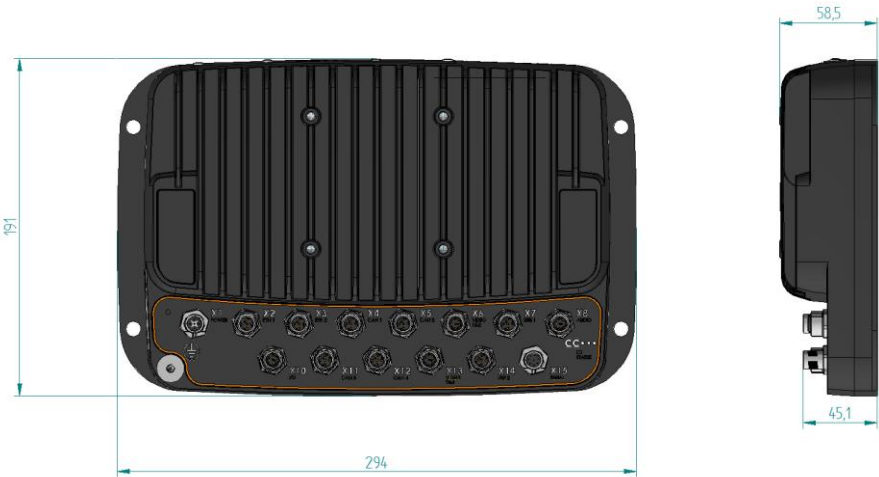
8   Technical Support

Contact your reseller or supplier for help with possible problems with your XM2 device. In order to get the best help, you should have your XM2 device in front of you and be prepared with the following information before you contact support.

- Part number and serial number of the unit, which you find on the brand label

- Date of purchase, which is found on the invoice

- The conditions and circumstances under which the problem arises

- LED indicator flash patterns.

- Possible error messages which are shown.

- Operating system type and its version number.

- The XM2 Device log files (if possible)

- Prepare a system report on the XM2 device, from within *CCsettings* (if possible).

- Information regarding possible external equipment which is connected to the XM2 device.

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9   Trade Mark, etc.

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