

CrossCore XA

Technical manual

CrossCore XA
CrossCore XA All-Integrated
CrossCore XA Logger



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Revision history

| Rev | Date | Comments |
|-----|------------|--|
| 1.4 | 2011-10-20 | Added information on powering through USB-port. |
| 1.3 | 2011-05-30 | Connector type for all antennas is TNC, not RP-TNC. Corrected. |
| 1.2 | 2011-03-08 | Updated introduction and CAN description. |
| 1.1 | 2010-09-16 | Clarifications regarding GORE-TEX® membrane Ethernet connector description update |
| 1.0 | 2010-07-01 | |

1. Introduction

The *CrossCore XA* product family consists of devices designed for vehicles and machines operating in critical environments and provides various types of interfaces.

All these units are based on ARM 9 processor and using Linux as operating system. They are easy to administrate and configure using remote connection or the built in web server.

They fit in distributed and decentralized systems where you want to be able to put electronics close to the I/O that will be managed. The modules are highly configurable, and have their interfaces distributed over a number of M12 connectors.

1.1. CrossCore XA product models

This document is intended to describe all three products models, i.e. *CrossCore XA*, *CrossCore XA All-Integrated* and *CrossCore XA Logger*. The term *CrossCore XA* is used to refer to these device types simultaneously.

CrossCore XA is a general, flexible controller with a large set of interfaces. It is a CAN bus node and by configuring the node properties, the module can be set up to automatically send and receive I/O to and from the CAN bus network.

CrossCore XA All-Integrated also provides, in addition to all features of *CrossCore XA*, a rich set of telematic interfaces such as GPRS, GPS, WLAN and Bluetooth*.

CrossCore XA Logger is a “flight recorder” for CAN bus traffic enabling you to detect potential problems in a CAN network. It acts as a black box saving all traffic on the bus to its memory while at the same time being completely silent to ensure no interactions with other units on the bus. This is a useful tool in distributed systems where some of the modules might be from different suppliers or simply when there are uncertainties about the integrity of the bus. The recorded traffic content is easily be accessed through the module’s build in web server.

For information on the levels of interfaces in the different models see the section standard model equipment levels.

*) Bluetooth is an optional feature not included in any of the standard models.

1.2. Conventions and defines

Text formats used in this document.

| Format | Use |
|----------------|---|
| <i>Italics</i> | Paths, filenames, Product names. |
| Bolded | Command names and important information |



Is used to highlight important information.

The term *CrossCore XA* is used when the functionality is described in general for all product models. Where the descriptions are specific for *CrossCore XA All-Integrated* or *CrossCore XA Logger*, their respective names are used. The below symbols are also used to indicate such a difference.

A Is used to highlight information regarding *CrossCore XA All-Integrated*.

L Is used to highlight information regarding *CrossCore XA Logger*.

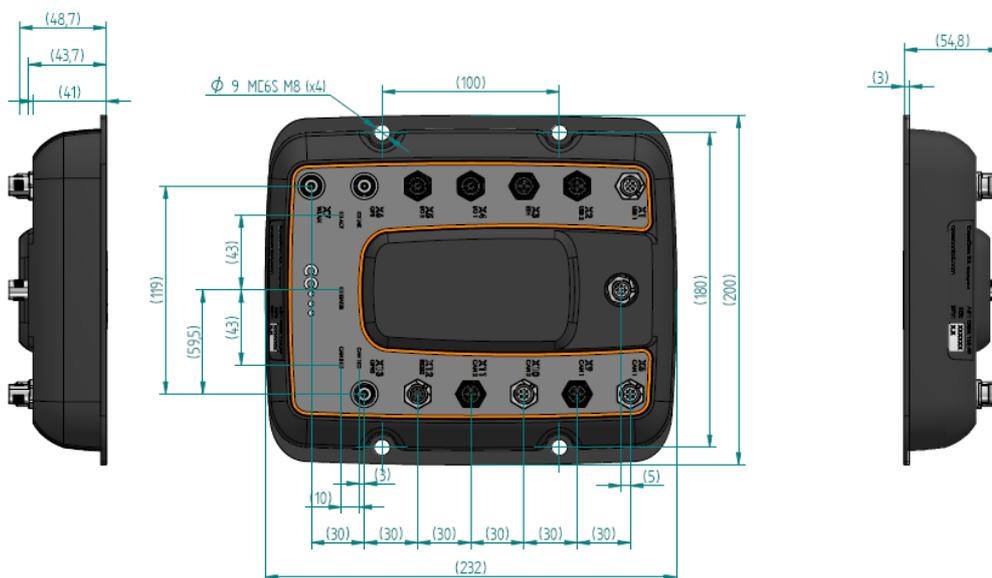
1.3. References

This document covers the physical aspects of the *CrossCore XA* device. For full information regarding the usage please see the following documentation:

- CrossCore XA - Software User Guide
- CrossCore XA - Programmers Guide

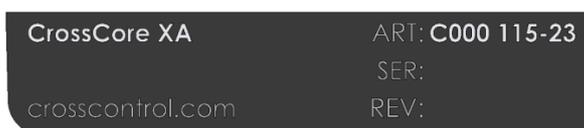
1.4. Dimensions

The *CrossCore XA* dimensions and placement of the four mounting holes on is illustrated below. The four mounting lugs have clearance for M8 Allen bolts. The only physical difference between the three products is the number of connectors. The picture below shows a *CrossCore XA All-Integrated*.



1.5. Identification

There is a label on the lower ledge of *CrossCore XA*. On the label there are numbers which identify your unique module. Take note of them. During service and other contact with the supplier it is important to be able to provide these numbers.



1.6. Environmental Tolerance

CrossCore XA is 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 integral components so that they, in the best possible way and under all circumstances, provide you with a dependable working instrument. In the specification section, a list of standards can be found according to which the *CrossCore XA* have been tested and approved.

Despite thorough design requirements and testing specifications, it is always best to install and handle *CrossCore XA* with care. For more information, read further.

2. Installation

CrossCore XA should be installed in such a way that the module is not exposed to any unnecessary stress, heat, vibration or moisture. In this section, some recommendations are made on unit installation.

A 2.1. Installing the SIM card



The unit does not include any serviceable parts and should not be opened. However, installing the SIM card for the GPRS/GSM functionality requires the module to be opened. In such case these preparations and precautions must be obeyed

- Make sure all cables are disconnected from the unit's connectors
 - Place the unit on a dry, clean and ESD protected area
 - The unit is potted with a silicone compound for increased vibration and moisture resistance. Do not touch this compound since it might irritate your eyes.
1. Turn around the unit so the flat bottom plate is facing upwards.
 2. Remove the 14 pcs M3 screws using a T10 Torx screwdriver.
 3. Remove the bottom plate from the unit.
 4. The SIM card holder is located on the smaller circuit board above the silicone compound. Open the flap on the SIM card holder and place the SIM card into the holder, being careful to slide the card all the way into the holder. Close the flap.
 5. Assembly the unit in reverse order. Tighten the 14 pcs M3 screws with a torque of 0.9 Nm (0.66 ft-lbs).



2.2. Mounting



Ensure that *CrossCore XA* 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.



On the right 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.



Ensure there is adequate clearance to insert/remove all of the connectors.

Cables shall be installed so that they don't run the risk of being damaged, pinched or worn. Avoid bending and twisting cables. In order to avoid stress to the unit's contacts strain-relief shall be arranged on cable assemblies near the connection to the respective unit. The connectors shall always be screwed-in securely to give good contact and avoid unnecessary strain. The connectors are placed in such way that the cables should be leading towards the centre of the unit and upwards.

L 2.3. Antenna

To use the wireless interfaces available on CrossCore antennas must be attached. For information regarding each antenna type, i.e placement, impedance and max gain, see the chapter Interface overview.

2.4. Cooling

Although *CrossCore XA* can operate in relatively high temperatures, cooling should still be considered when installing it. If the unit becomes too warm it may not perform to its full capacity and, with high temperature, cease to function. Select an appropriate location where adequate cooling is achievable. It is not recommended to install the module near a vehicle's exhaust system, for example.

If the mounting surface is normally cooler than the ambient air, then mount *CrossCore XA* directly to that surface to improve heat dissipation. If the surface can become much warmer than the ambient air, then it is recommended to leave a gap between the unit and the surface, using washers, or standoffs. An insulating material can also be considered to shield the unit from the heat from the mounting surface.



Inadequate cooling may lead to overheating, causing permanent damage to the unit.

2.5. Vibration

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.

We recommend installing *CrossCore XA* in such a way that it is not unnecessarily exposed to vibration or other stress.



2.6. Rain/Moisture

CrossCore XA shall preferably be placed under a roof in order to prevent direct exposure to water.

2.7. Power



CrossCore XA shall be connected to the power line using a cable area of at least 1.5 mm². It is highly recommended to utilize all available pins in the M12 power connector. An external fuse of maximum 10A should be used. *CrossCore XA* is protected against reversed polarity and short circuit.

CrossCore XA can also be powered using the USB Device port. It shall although be noted that powering through the USB port is not for field usage and not all functionality, such as the All-Integrated functionality, is available when powering through the USB port.

3. Basic operation

For full information on device usage and operation, see the software user guide.

3.1. Starting up

After power is connected to *CrossCore XA* device the normal system will start-up. When the system is operational the status LED will show a static GREEN. For more information regarding the LED indicators during start up see chapter LED indicators.

If the device cannot start into normal system the device will try to start into backup system instead. For more information regarding backup system see the additional documentation *CrossCore XA - Software user guide*.

3.2. Shutting down

CrossCore XA is shut down by removing power to the device. *CrossCore XA* detects that the power is removed and will start its shut down sequence to ensure that the device is turned off in a controlled way.



CrossCore XA has a built in power reserve to ensure a controlled shut down. To avoid drain the power reserve before the shut down procedure is completed it is important that the application calls the power interface to turn off all unnecessary built-in peripherals.

3.3. Status LED indicators

The status LED indicator on *CrossCore XA* indicates different device states using colours and flashing patterns, as described in the following table. The LED behaviour can also be set by the applications executing on *CrossCore XA*.

| LED state | Meaning | Comments |
|----------------------|-------------------------------|---|
| OFF | Device is OFF | No power applied or a defect device |
| GREEN ON | Device is ON in main system | Working with no errors detected |
| GREEN flashing 2 Hz | Device is ON in backup system | Working in backup system mode |
| AMBER ON | Device in BOOT mode | Boot loader and kernel execution |
| AMBER flashing 2 Hz | Device in BOOT mode | User space execution, possibility that some hardware peripherals have not started working |
| AMBER flashing 7 Hz | Device is shutting down | Normal shutdown initiated |
| AMBER flashing 15 Hz | System Check | System checking file systems and similar actions |
| RED ON | Device is faulty | Internal fault or life-time of the device ending |
| RED Flashing 2 Hz | Firmware Update | Device is updating the firmware |
| RED Flashing 7 Hz | System repair and recovery | System running factory reset system and clearing out all user data |

3.3.1. CAN Indicators

The CAN1 and CAN2 status LED is designed to indicate CAN status for each CAN channel on CrossCore XA. The behaviour of these LED's is designed to be controlled by the application and will per default not indicate any status.

3.3.2. Ethernet Indicators

The LNK LED indicates Ethernet link state when the Ethernet cable is connected and a proper link has been established.

The ACT LED indicates Ethernet activity.

4. Interface Overview

This section describes the basic interfaces on the *CrossCore XA* unit. 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.

4.1. CAN

It is possible to connect two CAN-channels to *CrossCore XA* to connect a control system or, for example, the FMS system in a vehicle. The contact for CAN-connections follows the CANopen standard. CAN-drivers are installed on the onboard computer and are included, in this case, with the delivery.

To avoid interference caused by EMC the max speed is limited to 250 Kbit/s. Using higher bit rates requires adapted filtering, available as an optional adaption.

It is advisable to use shielded cables for the CAN interfaces, especially when utilizing high bit rates and/or long cables. As an option, isolated CAN (500 VDC) is available on special request.

└ *CrossCore XA Logger* can be powered through the CAN bus and thus eliminating the need for a specific power cable.

4.2. USB

CrossCore XA offers USB ports of both host and device type. The USB host port supports attachment of USB memories that are automatically detected. The USB device port facilitates connection between CrossCore XA and PC.

The USB ports are fully compatible with the USB 2.0 standard full speed, with a maximum bit rate of 12 Mbit/s. The USB device port is protected against reversed polarity while the USB host port, available on all models except *CrossCore XA Logger*, is protected against over current and short circuit.

It is possible to power the unit through the USB Device port. It shall although be noted that powering through the USB port is not for field usage and not all functionality is available, such as the All-Integrated functionality.

4.3. Ethernet

Using the Ethernet connection, *CrossCore XA* can access other units and networks. The Ethernet port is fully compatible with the 10BASE-T and 100BASE-TX standards and is galvanically isolated (500 VAC or 707 VDC).

Be aware that connecting *CrossCore XA* to a network environment can impose a security threat.

4.4. COM

A COM-port with RS-232 support is available on *CrossCore XA*. The COM-port is used to, among other things, connecting serial devices to CrossCore XA.

The signals available in the M12 connector are Rx, Tx, RTS, CTS, GND and Shield.

4.5. I/O

CrossCore XA provides both digital inputs and outputs. There are 4 digital inputs and 1 digital output in each of the two M12 connectors.

The digital input trip level is half the input voltage and the voltage level follows the input voltage to the module when the output is switched on. They are internally pulled up by 20kOhm to input Voltage. The digital input is over/under voltage protected $\pm 30V$.

The digital outputs are of high-side type and the voltage level follows the input voltage. The max current delivery is 100mA, current delivery is 100mA per output and is over current protected as well as short-circuit protected.

Current leakage on the outputs, when switched off, may cause the output level to be read as on/high if connected to a high impedance digital input. Add an output load of 470 kohm to sink this leakage current.

A 4.6. GPS

The internal GPS receiver in *CrossCore XA All-Integrated* follows NMEA-0183 standards. This standard is the most common on the market and most software which uses GPS technology is compatible with the internal GPS receiver.

In order for the internal GPS unit to function, it requires a GPS antenna to be connected to the GPS antenna connector on *CrossCore XA* and that the antenna is mounted correctly.

An 3 Volt active antenna shall be used with a net gain including cable loss in the range of 0dB to +25dB. The impedance should be 50Ohms.

A 4.7. GPRS/GSM

CrossCore XA All-Integrated has an integrated GPRS/GSM modem for data connection and access, for example, the internet or company network. The modem has support for dual band (900/1800 MHz) and GPRS class 10 which gives a maximum transfer speed of 85,6 Kbit/s.

The GSM/GPRS antenna should have an impedance of 50Ohms and a maximum gain of <3dB. It must not be co-located within 20 cm from any other transmitter or person.

A 4.8. WLAN

CrossCore XA All-Integrated has a built-in WLAN adapter, interoperable with the standard 802.11 b/g networks.

The WLAN module delivers high data transfer rate, up to 54Mbps and supports a number of security standard protocols, including AES/CCMP. WEP with TKIP and WPA2, for a safe wireless connection.



Note that the range of the operating temperature for the WLAN module differs from other components in guaranteed temperature.

The WLAN antenna should have an impedance of 50Ohms. It must not be co-located within 20 cm from any other transmitter or person.

A 4.9. Bluetooth

Bluetooth is an optional feature not included in any of the standard models.

The Bluetooth support enables location of other devices and establishment of a wireless connection between devices. Through this connection, *CrossCore XA* can exchange data and interact with other devices through various applications.

CrossCore XA has built in support for HCI Bluetooth. HCI stands for Host Controller Interface and provides a uniform interface method for accessing Bluetooth hardware capabilities. The Bluetooth module complies with the Bluetooth 2.1 standard.

The Bluetooth module is of class 1 type, with a communication range of 100m. The antenna should have an impedance of 50Ohms. It must not be co-located within 20 cm from any other transmitter or person.

4.10. Storage memory

A Compact Flash memory is used for data storage. This makes *CrossCore XA* nearly insensitive to vibrations which can be a problem when using rotating hard discs.

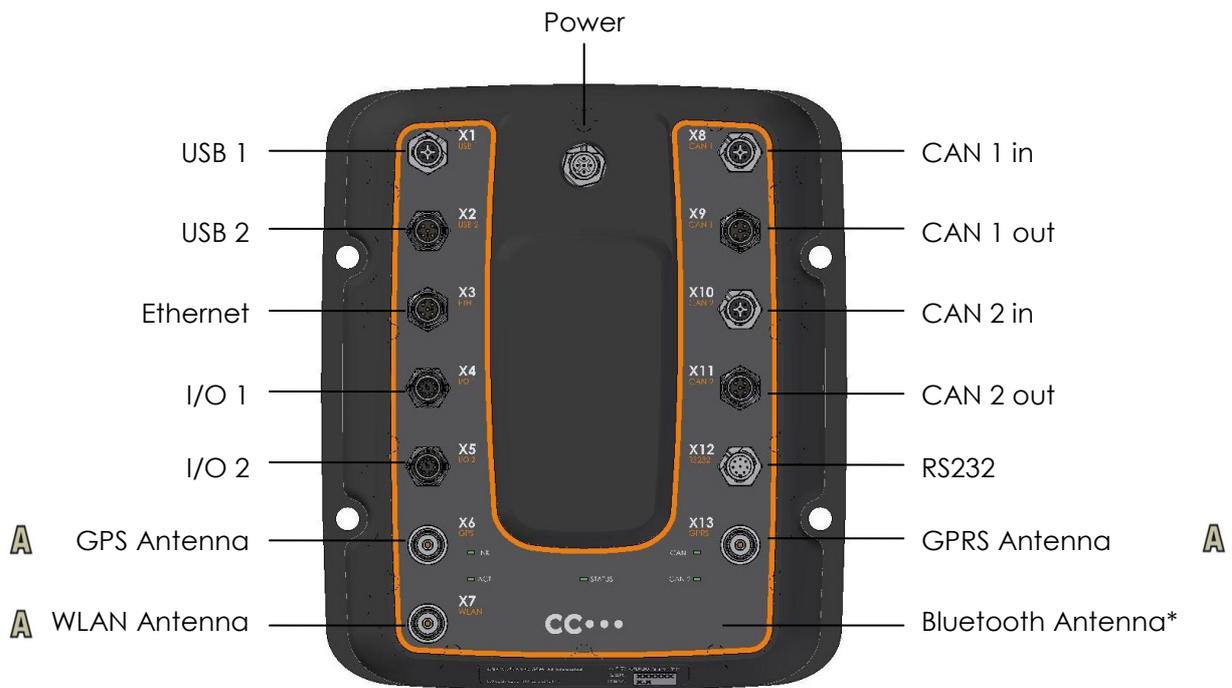


A Compact Flash memory has a limited number of write cycles. The Compact Flash module has both static and dynamic wear levelling to prevent a premature aging but to ensure the longest lifetime of the Compact Flash it is recommended that the amounts of writing to storage are limited within the application. Rather buffer and write larger blocks at a time instead of frequently writing smaller pieces.

5. Connectors

5.1. Connector layout

The following illustration shows the connector layout of *CrossCore XA*.



*) Bluetooth is an optional feature not included in any of the standard models.

The power connector is located at the top centre of the unit. In opposite to the other connectors it does not have any label. The other connectors are marked with an X and a sequence number as well as a short descriptive text, e.g. X1 USB1.

Note that depending on the product model and its interfaces, not all connectors may be present.

5.2. Connector overview

| Connector | Interface type | Characteristic Signal Type |
|------------|----------------|------------------------------|
| Top centre | Power | +24 V Power Supply |
| X1 | USB1 | 5V USB Device |
| X2 | USB2 | 5V USB Host |
| X3 | ETH | Ethernet |
| X4 | I/O1 | Digital I/O, 0/24V |
| X5 | I/O2 | Digital I/O, 0/24V |
| X6 | GPS | GPS antenna interface |
| X7 | WLAN | WLAN antenna interface |
| X8 | CAN1 in | CAN Bus connector |
| X9 | CAN1 out | CAN Bus connector |
| X10 | CAN2 in | CAN Bus connector |
| X11 | CAN2 out | CAN Bus connector |
| X12 | RS232 | Serial port, RS232 |
| X13 | GPRS | GPRS antenna interface |
| X14* | BT* | Bluetooth antenna interface* |



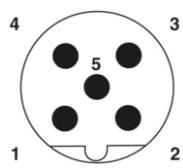
Notice that the connector descriptions are those which are located on the unit, not those that the attached cables shall have in order to mate with them.



Use caution when plugging/unplugging connectors. If the pins become bent or damaged they may not function correctly, or in the worst case, the *CrossCore XA* or other equipment may be damaged.

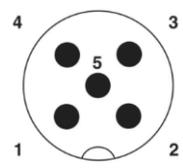
*) Bluetooth is an optional feature not included in any of the standard models.

Power supply connector

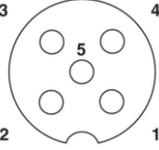
| Pin # | Default signal | Comments | |
|-------|------------------------|-------------------|---|
| 1 | +10...+30 VDC, 2A max. | Main Power Input | DIN M12 x 1 male, 5-pole, B-coded Rotation 0°  |
| 2 | +10...+30 VDC, 2A max. | Main Power Input | |
| 3 | GND | Main Ground Input | |
| 4 | GND | Main Ground Input | |
| 5 | NC | | |

X1 USB 1 Connector

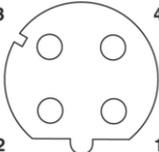
USB Device

| Pin # | Default signal | Comments | |
|---------|----------------|----------|--|
| 1 | Vbus in | 5 Volt. | DIN M12 x 1 male, 5-pole, A-coded Rotation 45°  |
| 2 | D- | | |
| 3 | D+ | | |
| 4 | NC | | |
| 5 | GND | | |
| Housing | Shield | | |

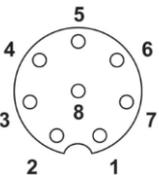
X2 USB 2 Connector USB Host

| Pin # | Default signal | Comments | |
|---------|----------------|----------|--|
| 1 | Vbus out | 5 Volt | DIN M12 x 1 female, 5-pole, A-coded Rotation 45°  |
| 2 | D- | | |
| 3 | D+ | | |
| 4 | NC | | |
| 5 | GND | | |
| Housing | Shield | | |

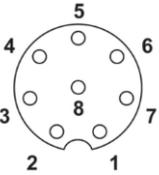
X3 Ethernet Connector

| Pin # | Default signal | Comments | |
|---------|----------------|----------|---|
| 1 | Tx+ | | DIN M12 x 1 female, 4-pole, D-coded Rotation 45°  |
| 2 | Rx+ | | |
| 3 | Tx- | | |
| 4 | Rx- | | |
| Housing | Shield | | |

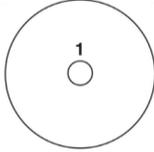
X4 Digital I/O 1 Connector

| Pin # | Default signal | Comments | |
|---------|----------------|----------------|--|
| 1 | DI1 | Digital input | DIN M12 x 1 female, 8-pole, A-coded Rotation 45°  |
| 2 | DI2 | Digital input | |
| 3 | DI3 | Digital input | |
| 4 | DI4 | Digital input | |
| 5 | DO1 | Digital output | |
| 6 | NC | Reserved | |
| 7 | GND | | |
| 8 | GND | | |
| Housing | Shield | | |

X5 Digital I/O 2 Connector

| Pin # | Default signal | Comments | |
|---------|----------------|----------------|--|
| 1 | DI5 | Digital input | DIN M12 x 1 female, 8-pole, A-coded Rotation 45°  |
| 2 | DI6 | Digital input | |
| 3 | DI7 | Digital input | |
| 4 | DI8 | Digital input | |
| 5 | DO2 | Digital output | |
| 6 | NC | Reserved | |
| 7 | GND | | |
| 8 | GND | | |
| Housing | Shield | | |

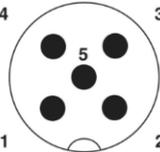
X6 GPS Antenna Connector

| Pin # | Default signal | Comments | |
|---------|----------------|---------------|--|
| 1 | Antenna signal | Digital input | TNC, female, 50ohm  |
| Housing | Antenna ground | Digital input | |

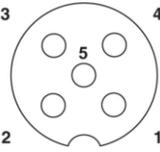
X7 WLAN Antenna Connector

| Pin # | Default signal | Comments | |
|---------|----------------|---------------|--|
| 1 | Antenna signal | Digital input | TNC, female, 50ohm  |
| Housing | Antenna ground | Digital input | |

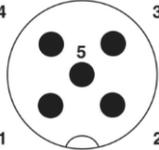
X8 CAN 1 In Connector

| Pin # | Default signal | Comments | |
|---------|----------------|----------|---|
| 1 | CAN Shield | | DIN M12 x 1 male, 5-pole, A-coded Rotation 315°  |
| 2 | V+ | | |
| 3 | CAN_GND | | |
| 4 | CANH | | |
| 5 | CANL | | |
| Housing | CAN shield | | |

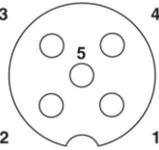
X9 CAN 1 Out Connector

| Pin # | Default signal | Comments | |
|---------|----------------|----------|---|
| 1 | CAN Shield | | DIN M12 x 1 female, 5-pole, A-coded Rotation 315°  |
| 2 | V+ | | |
| 3 | CAN_GND | | |
| 4 | CANH | | |
| 5 | CANL | | |
| Housing | CAN shield | | |

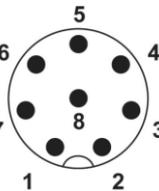
X10 CAN 2 In Connector

| Pin # | Default signal | Comments | |
|---------|----------------|----------|---|
| 1 | CAN Shield | | DIN M12 x 1 male, 5-pole, A-coded Rotation 315°  |
| 2 | V+ | | |
| 3 | CAN_GND | | |
| 4 | CANH | | |
| 5 | CANL | | |
| Housing | CAN shield | | |

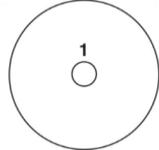
X11 CAN 2 Out Connector

| Pin # | Default signal | Comments | |
|---------|----------------|----------|--|
| 1 | CAN Shield | | DIN M12 x 1 female, 5-pole, A-coded Rotation 315°  |
| 2 | V+ | | |
| 3 | CAN_GND | | |
| 4 | CANH | | |
| 5 | CANL | | |
| Housing | CAN shield | | |

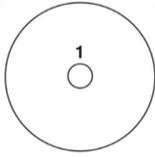
X12 Serial Port Connector

| Pin # | Default signal | Comments | |
|---------|----------------|----------|---|
| 1 | Reserved | | DIN M12 x 1 male, 8-pole, A-coded Rotation 315°  |
| 2 | RxD | | |
| 3 | TxD | | |
| 4 | Reserved | | |
| 5 | GND | | |
| 6 | Reserved | | |
| 7 | RTS | | |
| 8 | CTS | | |
| Housing | Shield | | |

X13 GPRS Antenna Connector

| Pin # | Default signal | Comments | |
|---------|----------------|----------|--|
| 1 | Antenna signal | | TNC, female, 50ohm  |
| Housing | Antenna ground | | |

X14 Bluetooth* Antenna Connector

| Pin # | Default signal | Comments |
|---------|----------------|---|
| 1 | Antenna signal | TNC, female, 50ohm  |
| Housing | Antenna ground | |

*) Bluetooth is an optional feature not included in any of the standard models.

6. Specifications

6.1. Standard models equipment level

| Interface / Feature | CrossCore XA | CrossCore XA All-Integrated | CrossCore XA Logger |
|--------------------------------------|-------------------------------|-------------------------------|---------------------|
| CAN bus | 2 | 2 | 2 |
| USB Device | 1 | 1 | 1 |
| USB Host | 1 | 1 | - |
| Digital I/O | 8 digital in 2 digital out | 8 digital in 2 digital out | - |
| Serial Port | 1 | 1 | - |
| GPRS | - | 1 | - |
| GPS | - | 1 | - |
| WLAN | - | 1 | - |
| Bluetooth | - | - | - |
| Temperature sensor | 1 | 1 | 1 |
| Real time clock w/ battery backup | 1 | 1 | 1 |

6.2. Technical Data

| Kernel | |
|------------------------|---|
| Processor | ARM9, Atmel AT91SAM9263, 240 MHz |
| Data storage | CrossCore XA 2 GB, CrossCore XA All-Integrated 2GB, CrossCore XA Logger 4GB Optional up to 8 GB |
| Program memory | 256 MB NAND flash for operating system |
| RAM | 128 MB SDRAM |
| Interfaces | |
| CAN Interface | 2 x CAN ISO 11898-2, 2.0B, (High Speed CAN) |
| No. of CAN Driver | 2 interfaces with CANin and CANout connectors. TJA1050T |
| Baud Rate | 20 kbit/s - 1 Mbit/s ¹⁾ |
| Isolation | As an option, Isolation 500VDC can be offered |
| USB | 1 x host, 1 x device, V 2.0 |
| Speed | Full speed, max 12 Mbit/s |
| Host port | 5 V, max 500 mA, over current and short circuit protected |
| Device port | 5 V, polarity protected |
| Ethernet | According to 10BASE-T and 100BASE-TX standards |
| Isolation voltage | 500VAC / 707VDC |
| Serial | 1 x RS232 |
| Max speed | 115 200 baud |
| Present signals | Rx, Tx, RTS, CTS, GND and Shield |
| Digital Inputs | 8 pcs |
| Input Voltage | 10 – 24 V (supply voltage) |
| Protection | Over/under voltage protected |
| Digital Outputs | 2 pcs |
| Max Voltage | Supply voltage |
| Max Current | 100 mA |

| | |
|---|--|
| Leakage output current | Less than 50 μ A |
| Protection | Short-circuit and over current protected |
| LED indicators | Status, CAN1, CAN2, LNK, ACT |
| GPS | NMEA-0183 |
| GPRS/ 3G | Quad band GPRS modem 3G modem can be offered as an option |
| WLAN | IEEE 802.11 b/g |
| Bluetooth | Optional, class 1 range |
| Accelerometer | Optional, triaxial, SMB380 type |
| 1) To avoid interference caused by EMC the max speed is limited to 250 Kbit/s. Using higher bit rates requires adapted filtering, available as an optional adaption, and shielded cables. | |

| HMI | |
|---------------------|---|
| Status LED | Tricolor led status indicator with configurable behaviour |
| CAN status | Tricolor LED, application controlled |
| Ethernet status | Activity and Link LED indicator |
| Embedded web server | Built-in web server for configuration and program loading |

| Software | |
|------------------|-------|
| Operating system | Linux |

| Environment | |
|------------------------|--|
| IP class | IP67 (IEC 60529) |
| EMC conformity | Emissions: ISO 14982 Conducted and Radiated RF emission: EN55011 Immunity: ISO 11452-2, ISO 11452-4 and EN 61000-4-3 |
| Vibration | 0.005-0.03 g ² /Hz 5-1000 Hz 3,72 g (RMS) |
| Shock/Impact | Sinus:IEC-60068-2-6 – 4 g, Random:IEC-60068-2-64 – 3.7 grms, 30 g / 6 ms, IEC-60068-2-27 |
| Temperature range [°C] | -40 to +70 operating -40 to +85 storage |

| Power | |
|-----------------------------|--|
| Voltage | 10-30 VDC, 24 VDC nominal |
| Current consumption | < 200 mA at 24 V without external load |
| Reverse Polarity Protection | Requires external fuse max rated to 10 A |
| External fuse | 10 A |
| Energy backup | For safe shut down at power loss |

| Enclosure | |
|------------------|---------------------------------------|
| Material | Aluminium |
| Treatment | White cromated Powder coated paint |
| Connectors | DIN M12, TNC for antennas |

| Dimensions | |
|-----------------------------|--|
| Size (W x H x D) (mm) | 200 x 232 x 55 |
| Weight | 1,8 kg |
| Certifications / Compliance |    |

CE Marking: <http://ec.europa.eu/>

International Standards Organisation: <http://www.iso.org/>

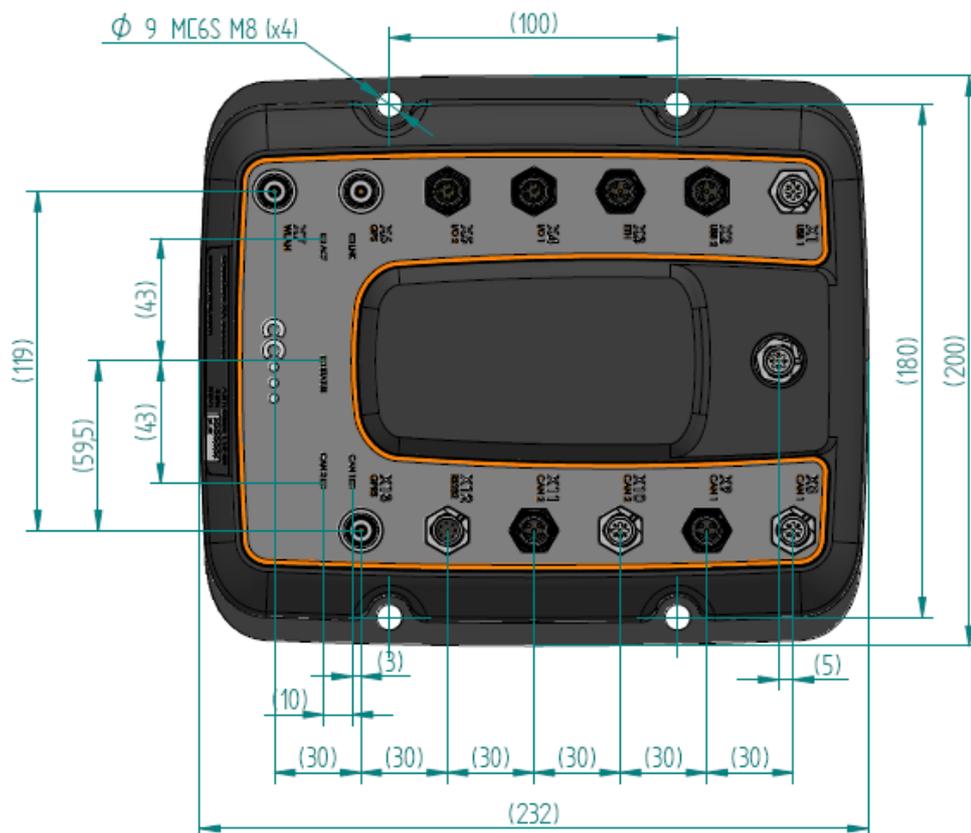
International Electrotechnical Commission <http://www.iec.ch/>

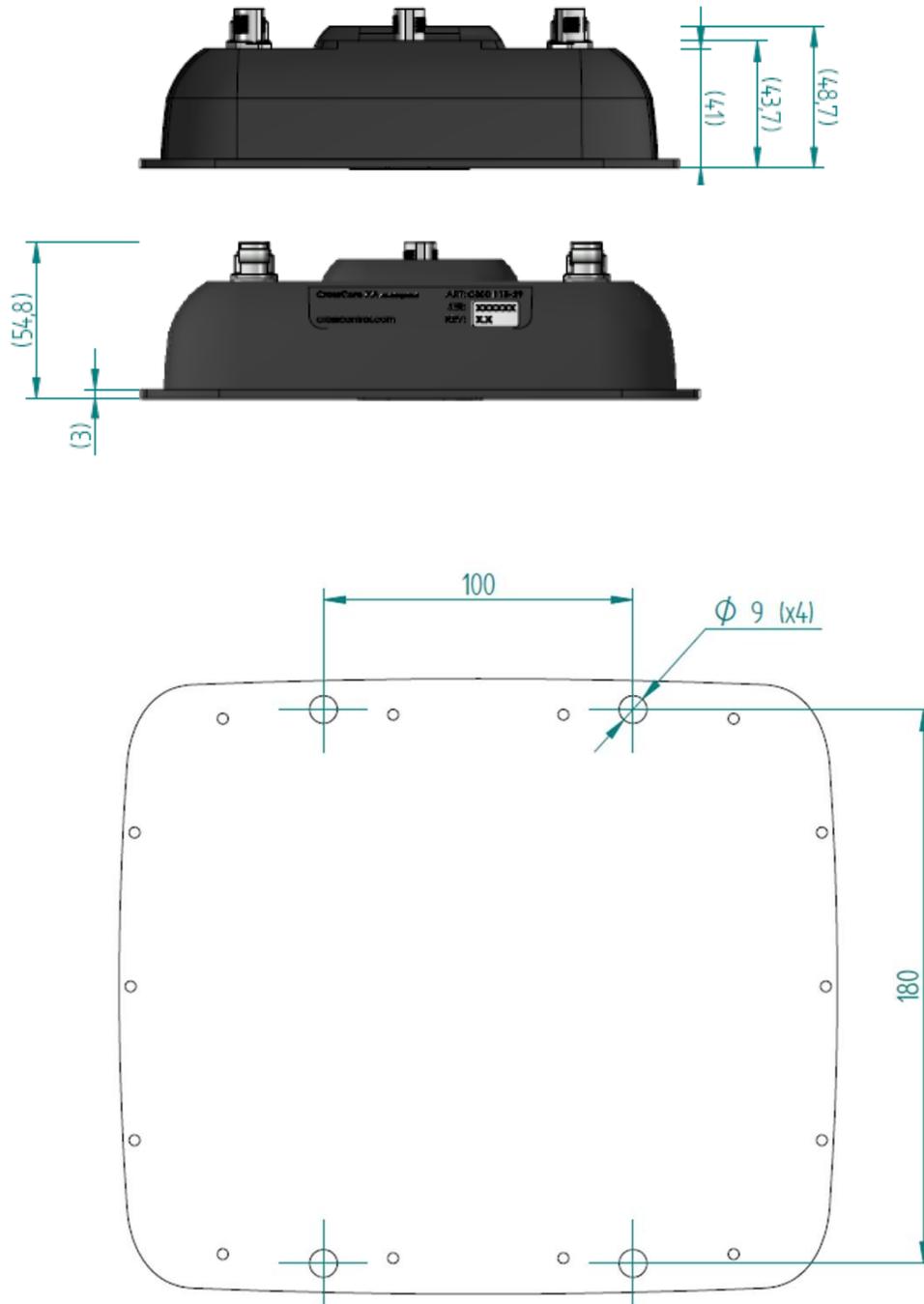
6.3. Environmental tolerances

| Environmental Test | Level | Standard |
|-----------------------|---|------------------|
| High temperature | Functional during test +70°C, 24h Functional after test +85°C, 24 h | IEC 60068-2-2 Bd |
| Low temperature | Functional during test -40°C, 24 h Functional after test -40°C, 24 h | IEC 60068-2-1 Ad |
| Damp heat | Functional during test +25°C to +55°C >95% RH , 2x24h | IEC 60068-2-30 |
| Shock | Functional during test 30 g / 6 ms ±3 impulses in 6 directions | IEC 60068-2-27 |
| Vibration Sinus: | Functional test during test 5-11.5 Hz ± 7.5 mm 11.5-1000 Hz 4 g 3 directions, 10 double sweeps/dir. 1 oct / min | IEC 60068-2-6 |
| Random: | 5-199 Hz 0.03 g ² / Hz 200-399 Hz 0.02 g ² / Hz 400-599 Hz 0.01 g ² / Hz 600-1000 Hz 0.005 g ² / Hz 3.72g (RMS) 3 directions x 1h | IEC 60068-2-64 |
| Electrical transients | Pulse 1: -50V / 2ms 2: +25V / 2ms 3a: -220V / 10ms 3b: +220V / 10ms 4: -5V / 15s 5: +70V | ISO 7637-2 |
| Electrical transients | Burst +/- 2kV on criteria B - Power Burst +/- 1kV on criteria B - Ethernet - CAN in and out - Serial - Digital in/out | EN 61000-4-4 |
| Electrical transients | Surge +/- 500V on criteria B - Power Surge +/- 1kV on criteria B - Ethernet shield cable | EN 61000-4-5 |
| EMC susceptibility | RF electromagnetic field 200 – 1000 MHz | ISO 11452-2 |

| | | | | |
|-------------------------|---|---------------|-------|--------------|
| | 30 V/m 1 kHz sine | | | |
| Bulk current injection | - Power - Ethernet - CAN in and out - Serial - Digital in/out - USB Host 20 – 200 MHz 60 mA , 1 kHz sine | | | ISO 11452-4 |
| Radiated RF immunity | 20V/m | 80MHz-1GHz | | EN 61000-4-3 |
| | 20V/m | 1,4GHz-2GHz | | |
| | 20V/m | 2GHz-2,5GHz | | |
| EMC emissions | Freq | Narrow | Broad | ISO 14 982 |
| | 30-75MHz | 54-44 | 64-54 | |
| | 75-400MHz | 44-55 | 54-65 | |
| | 400-1000MHz | 55 | 65 | |
| Conducted RF emission | 79 dB μ V | 150kHz-500kHz | | EN 55011 |
| | 73 dB μ V | 500kHz-30MHz | | |
| Radiated RF emission | 40 dB μ V/m | 30MHz-230MHz | | EN 55011 |
| | 47 dB μ V/m | 230MHz-1GHz | | |
| Electrostatic discharge | 8 kV air/ 6kV contact | | | EN 61000-4-2 |
| Enclosure | IP67 | | | IEC 60529 |

6.4. Dimensions





7. Notes

Contact Technical Support

Contact your reseller or supplier for help with possible problems with your CrossCore XA. Contact information is found on the front and back cover pages of this handbook.

Preparation before contacting technical support

In order to get the best help, you should have access to your CrossCore XA 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
- Description of external equipment which is connected to the CrossCore XA

Trade Mark, etc.

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