

## **C4MAX-4MUSAC\_V4 - INSTALLATION GUIDE**

**V 1.2**

**17/09/2018**



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## Preface

The information contained in this installation guide is subject to changes in order to improve the reliability, design or features without prior notice. Mobile Devices Ingénierie reserves the right to make changes in the content without obligation to notify any person or organisation of such changes or improvements. Mobile Devices Ingénierie can in no event be held liable for technical or editorial errors or omissions herein, nor for incidental, special or consequential damages from the furnishing, performance or use of this installation guide.

Please contact our technical support for current updates and supplemental information concerning the use and operation of this or other Mobile Devices Ingénierie products.

## Warnings and notices



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

Please read the installation guidelines, as well as the safety and operating instructions before operating your device. Follow all instructions and heed all warnings in the installation guide.

There is a risk of explosion if the battery is replaced by a wrong battery type. Please discard empty battery according to local regulations.

## FCC Regulations

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiated radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-Consult the dealer or an experienced radio/TV technician for help.

Caution: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## FCC RF Exposure Information

This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the United States.

In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20 cm (8 inches) during normal operation.

The FCC has granted an Equipment Authorization for this model device with all reported RF exposure levels evaluated as in compliance with the FCC RF exposure guidelines. RF exposure information on this model device is on file with the FCC and can be found under the Display Grant section of [www.fcc.gov/oet/ea/fccid](http://www.fcc.gov/oet/ea/fccid) after searching on FCC ID: **A6GC4MAX-4MUSACV4**.

## 1. Hardware features

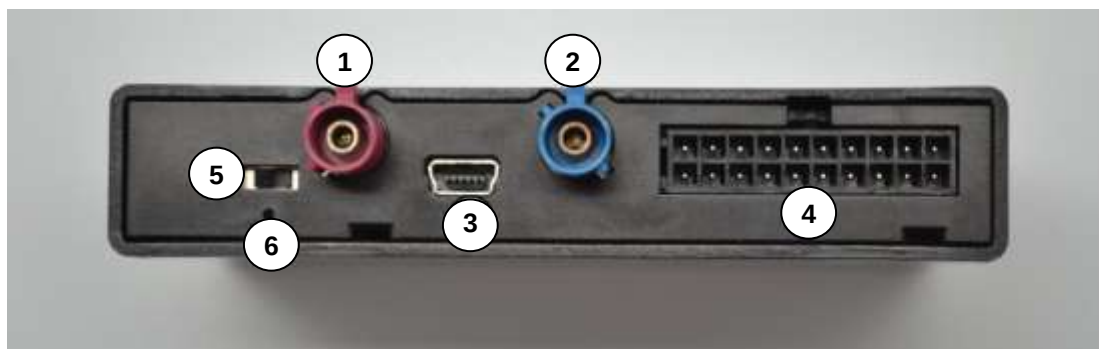
| <b>C4MAX v4</b>                 |                                       |                                                    |
|---------------------------------|---------------------------------------|----------------------------------------------------|
| Performance                     | Processor                             | ARM Cortex - A5 CORE (500MHz)                      |
|                                 | RAM                                   | 1 Gbytes                                           |
|                                 | NAND Flash                            | 2 Gbytes                                           |
| Power supply                    | External power supply                 | 8-32V                                              |
|                                 | External voltage measurement          | 8-32V                                              |
|                                 | Li-ion battery charger                | Yes                                                |
|                                 | Li-ion battery                        | 900mA.h                                            |
| Communication                   | Modem                                 | 4G Cat-M1 data module (ME910C1-NA)                 |
|                                 | Modem antenna                         | External Fakra connector                           |
| Positioning                     | GNSS receiver                         | U-blox M8 (GPS, GLONASS, BeiDou)                   |
|                                 | GNSS antenna                          | External Fakra connector                           |
| Inertial sensors                | Internal 3-axis accelerometer         | ±2g, ±4g, ±6g, ±8g, ±16g                           |
|                                 | Internal 3-axis gyroscope             | No gyroscope                                       |
| Interface & Telematics features | (Mini) USB 2.0                        | Host / Device / UART powered (5V out, 500mA max.)  |
|                                 | Digital Input / Analog input          | 3 (Ignition, alarm and 1 input active low) / 2     |
|                                 | Digital Outputs                       | 2 (relay-control & immobilizer on option)          |
|                                 | 1-wire (for driver ID or temp sensor) | Yes                                                |
|                                 | LEDs                                  | 2 (1 controlled by software)                       |
|                                 | RTC                                   | Yes                                                |
|                                 | CAN 2.0B interface                    | Yes                                                |
|                                 | J1708 interface                       | Yes                                                |
|                                 | RS232                                 | 2 (1 with RTS/CTS, 1 without)                      |
|                                 | Bluetooth                             | Bluetooth 4.1BLE dual-mode (with internal antenna) |
| Environmental                   | Wifi                                  | IEEE Std 802.11b/g/n (with internal antenna)       |
|                                 | Connectors                            | microFIT 20 pins                                   |
|                                 |                                       | Mini-USB                                           |
|                                 |                                       | 2 Fakra connectors for the external antennas       |
|                                 | Operating temperature *               | -30/+70°C                                          |
|                                 | Dimensions                            | 96x65x18mm                                         |
|                                 | SIM card                              | Mini SIM slot (2FF)                                |
|                                 | Dual GSM/GPS external antenna         | 3 meters cable With 27mm Fakra connectors          |

\*without internal battery

## 2. Hardware description

### 2.1. C4MAX v4 with external antenna

**Front :**



1. Modem antenna connector
2. GNSS antenna connector
3. USB connector
4. Molex (20pins) connector
5. Inner battery switch
6. Leds

**Inside :**



1. Internal battery
2. SIM card slot

## 2.2. Recommendations :

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→ **Move the switch inwards (I) to activate the internal battery.**

The switching ON of the internal battery requires a running system. This is about 10 seconds after ignition (the led 4 must be lit then unlit).



→ **Move the switch outwards (O) to deactivate the internal battery.**

The switching OFF of the internal battery is instant. Thus, don't switch off the internal battery if the device is running without be connected to an external battery.

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The SIM card PIN code must be deactivated.

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### 3. Preparing/installing the device

#### 3.1. Open the device to insert a SIM card

Insert a flat screwdriver into the 2 holes and pry it to remove the front cover.



Unscrew the screw at the back of the device



Afterwards pull on the PCB to release it.



### 3.2. Connect the external antennas

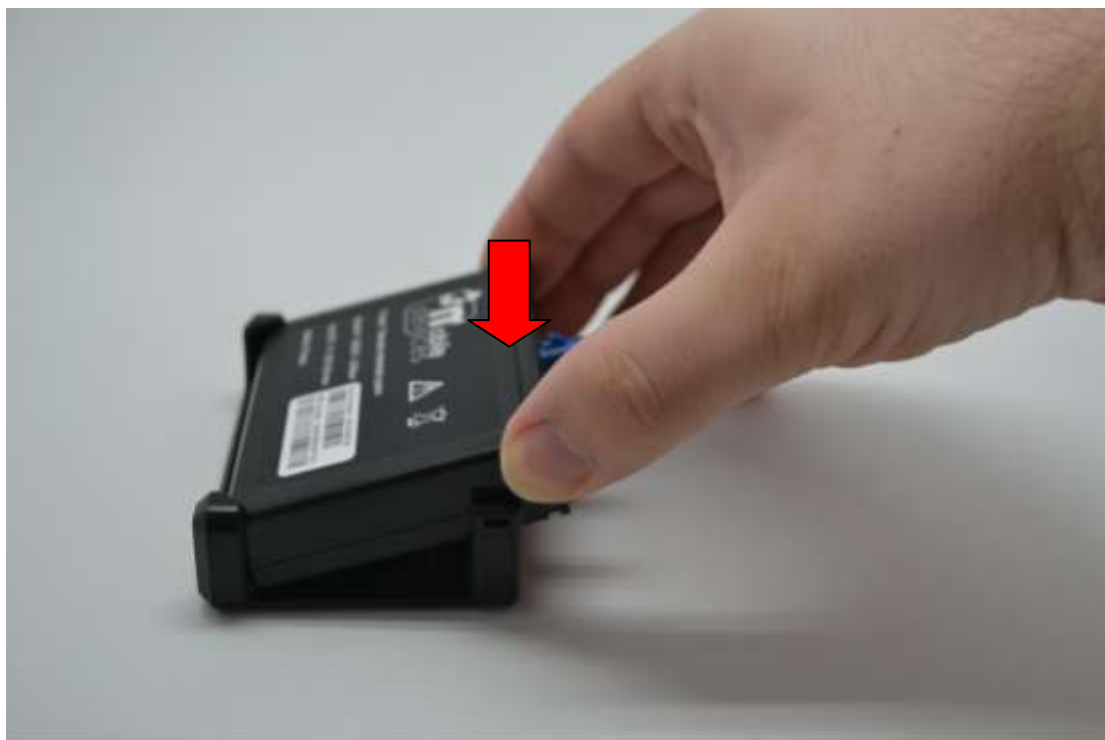


### 3.3. Choose the appropriate location for mounting

The ideal location for mounting the device is under the dashboard. However, some types of coated windshields, as well as windshields with an in-screen heating system can block GNSS signals. External antenna should never be covered by any kind of object or material, especially not by metal or aluminium. Transmission and reception of GNSS signal is however not hindered by plastic or normal glass. Moreover, put at least 20 cm between the antenna and a speaker.

### 3.4. Insert the device on harness





### 3.5. Pin out & Wires description

| Signal                  | Pin | Colour            |
|-------------------------|-----|-------------------|
| DIG_OUT1                | 1   | Purple            |
| DIG_OUT2                | 2   | Blue              |
| RS485_A                 | 3   | White with black  |
| RS485_B                 | 4   | Red with black    |
| DIG_IN1<br>/ TACHO DATA | 5   | Green             |
| RS232_CTS1              | 6   | Blue with black   |
| RS232_RXD2              | 7   | Green with black  |
| RS232_RTS1              | 8   | Grey with black   |
| ONE_WIRE                | 9   | Grey              |
| AN_IN1                  | 10  | Brown             |
| VBAT                    | 11  | Red               |
| GND                     | 12  | Black             |
| CANL                    | 13  | Yellow with black |
| CANH                    | 14  | Purple with black |
| IGNITION                | 15  | White             |
| ALARM                   | 16  | Orange            |
| RS232_RXD1              | 17  | Orange with black |
| RS232_TXD1              | 18  | Brown with black  |
| RS232_TXD2              | 19  | Black with white  |
| AN_IN2                  | 20  | Yellow            |



|    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|
| 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 |
| 10 | 9  | 8  | 7  | 6  | 5  | 4  | 3  | 2  | 1  |

Power supply may be derived directly from the vehicle's main power or from the board installation. In the first case, it is an absolute must that a fuse on the main cable is present.



Ignition wire must always be connected to the vehicle's ignition OR tied with the permanent positive to the vehicle's battery.

Ground must be always connected first. It is mandatory to add a fuse (2A) to the permanent positive. The closer to the connection point with vehicle power.

### 3.6. Plug the device to the external power

The device must have a direct connection with the main power (external battery). Mobile Devices advise against the use of intermediate system.

1. Check that all the inputs implied in the wake-up reasons configured on your device are not connected.
2. Plug the device (black wire) to the ground of the external battery.
3. Plug the device (red wire) to the permanent positive of the external battery.
4. Plug the device (white wire) to the ignition (after contact).

In some case, the use of a circuit breaker can let the ignition (after contact) active. Thus, the device will be ON indefinitely. So, it's important to find a signal where the ignition can be ON or OFF.

Moreover, it is imperative to insulate the GNSS antenna in order to avoid it get in touch with the car's chassis.

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**The device should be always plugged to :**

- The ground of the external battery.
- A ground point defined by the vehicle manufacturer (if different from the ground of the external battery).



**A circuit breaker should never be enabled as long as:**

- Ignition is active.
- Ignition goes OFF since less than 2 minutes. This is the time for the device to do a proper shutdown.

It is mandatory to add a fuse (2A) to the permanent positive. The closer to the connection point with vehicle power.

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## 4. Inputs activation threshold

Here are inputs activation thresholds (voltage).

- **Ignition (active high)** is active if voltage greater than 3V (disabled if smaller than 1V)
- **Alarm (active low)** is active if voltage is below 1V (disabled if greater than 3V)
- **Digital Input1 (active low)** is active if voltage is below 0.5V (disabled if greater than 3V)

**Note:** Range voltage on inputs is 0-30V

## 5. Ouputs information

The two Outputs are active low and they can deliver up to 300mA.

**Note:** Outputs have a pull-up resistance of 10Kohms

## 6. LEDs sequences

| Green LED (Soft) |                                           | Red LED (System)     |                                       |
|------------------|-------------------------------------------|----------------------|---------------------------------------|
| Sequence         | Meaning                                   | Sequence             | Meaning                               |
| No GPRS/No GPS   | 3 times (50ms ON/100ms OFF)<br>3550ms OFF | C4Max OFF            | OFF                                   |
| No GPRS/Fix GPS  | 2 times (50ms ON/100ms OFF)<br>3700ms OFF | Ext. Power/Run       | ON                                    |
| GPRS OK/No GPS   | 1 time (50ms ON/100ms OFF)<br>3850ms OFF  | Int. Bat/Run         | ON                                    |
| GPRS OK/Fix GPS  | 2000ms ON<br>2000ms OFF                   | Shutdown (hibernate) | 5ms ON/2000ms OFF                     |
|                  |                                           | Idle/Sleep (idle)    | twice (5ms ON/50ms OFF)<br>1895ms OFF |

## 7. Support

For all questions not related in this installation guide, please contact the support team by email at [support@mobile-devices.fr](mailto:support@mobile-devices.fr)