



# Information Package

## No.1 Revision A

### EN, FCC and ISED Approval for:

#### Car-Access-Module

All of the information contained in this document is strictly confidential and should not be available for a third party.

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## 1 Product Description

### 1.1 General and Function:

The „Car-Access-Module“ (CAM) collects and processes telematics data and locks and unlocks vehicles by phones.

It is used for determining detailed information about movement of fleet vehicles and sending that information to appropriate servers. The information is illustrated to a fleet manager by a resource management software to make an optimized use of the vehicles possible.

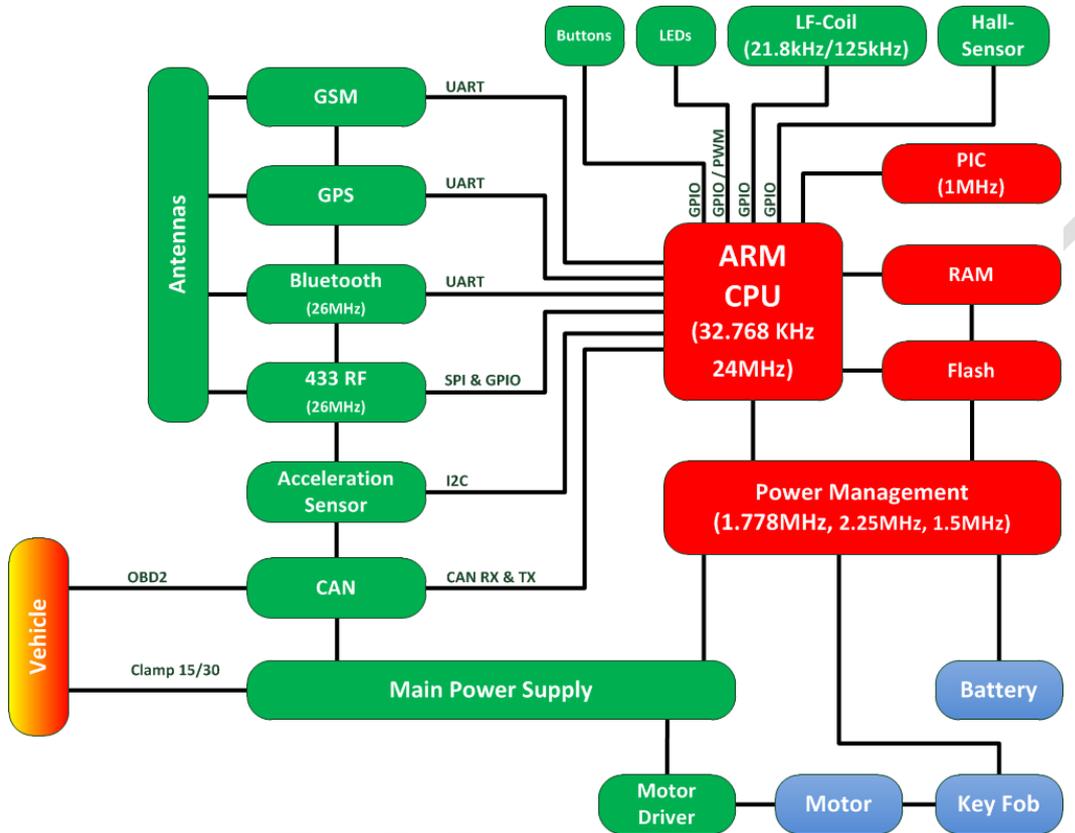
The electronic control unit (ECU) is an independent unit, which is able to determine GPS coordinates, acceleration values, states of vehicle equipment and CAN information. All that information can be sent to a resource management server or a smartphone via an European mobile communication network.

Additionally the CAM is able to press the buttons of a car key which is placed inside of the CAM by a electro mechanical system. Thereby the car can be locked and unlocked. The key is continually located inside of the car. Therefore the CAM is able to stop the communication between the car and the key to avoid an unauthorized use of the car.

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## 1.2 System Overview (with oscillator frequencies)



The CPU of the CAM is an ARM Cortex-A8 (Sitara). It is controlling all interfaces or modules and also the motor with the aid of the driver.

As power supply there are available the vehicle power (12 V) and a rechargeable battery which is used as backup.

The CAM electronics has two PCBs called Main PCB and LF PCB. Most of the components are placed on the Main PCB. On the LF PCB there are the Hall Effect Sensor and the LF-Coil.

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## 1.3 Module Descriptions

The CAM has 4 wireless interfaces: GSM, Bluetooth, GPS und 433 MHz RF.

### GSM:

- **Maximum Output Power:**
  - GSM 850 / E-GSM 900: **32.2 dBm**
  - DCS 1800 / PCS 1900: **29.2 dBm**
- **Antenna:** external: Hirschmann Glonass 1890 LP/LC/P: **0 dBi**

### Bluetooth:

- **Maximum Output Power:** **10 dBm**
- **Antenna:** Panasonic PAN1326C with Chip Antenna: **0.9 dBi**

### GPS:

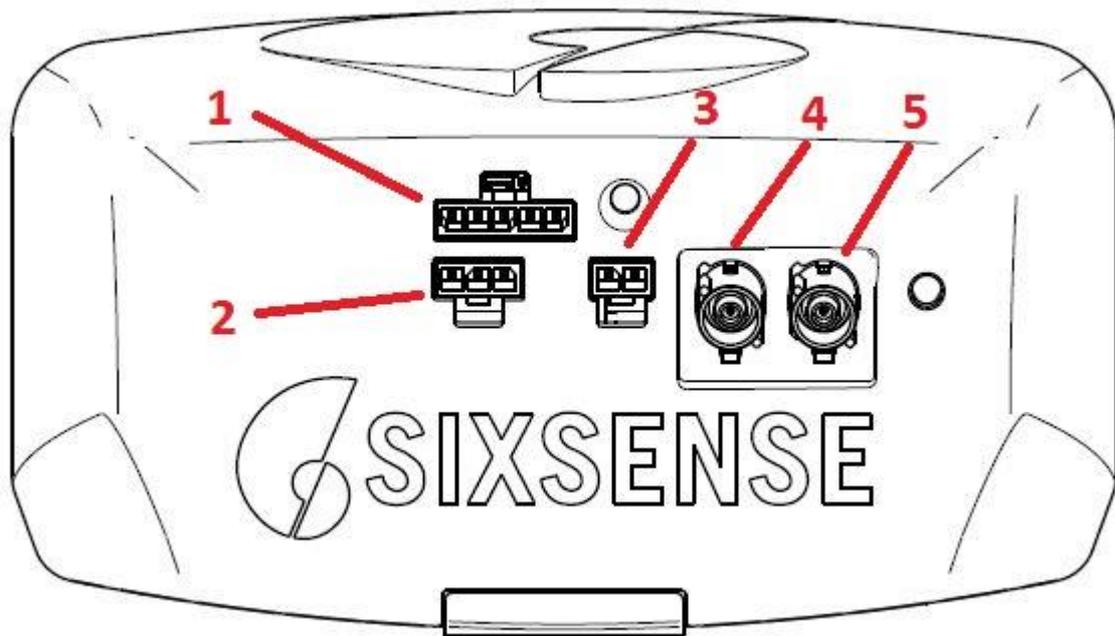
- **Antenna Gain: 4.0 dBi:**
- **Antenna:** external: Hirschmann Glonass 1890 LP/LC/P: **1 dBic**

### 433 MHz RF Receiver:

- **Antenna:** PCB Antenna
- **Modulation: 2-FSK**

## 1.4 Interfaces

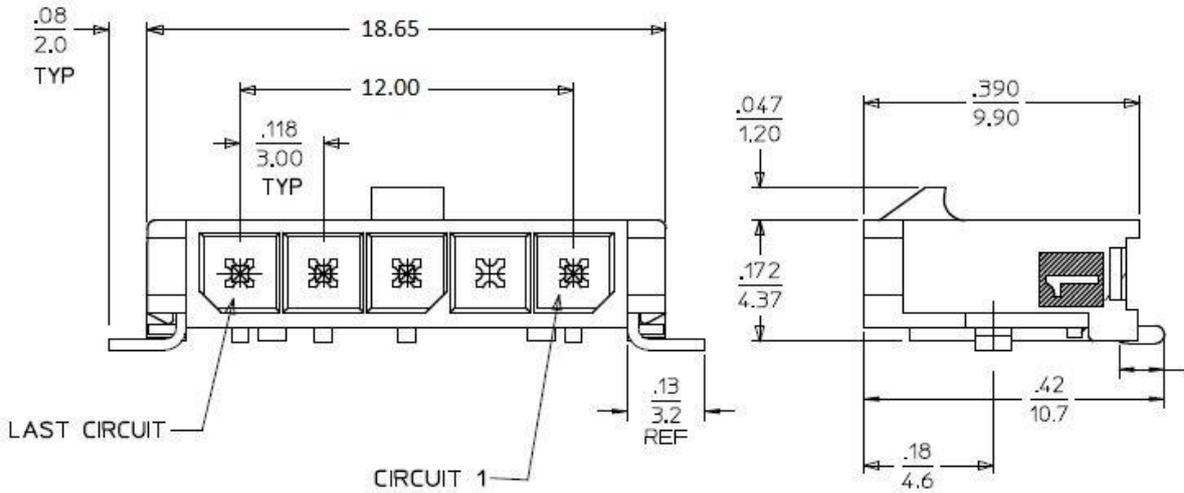
(rear of the housing)



### 1.4.1 Main Connector (1)

As main connector there is used a 5 pin Molex connector of the Micro-Fit 3.0 series with the part number 43650-0512.

It is providing connections for power supply and for the CAN bus.



The cables for the 5 pin Molex connector are a 240 mm OBD adapter and a 1800 mm mandatory extension cable with a 3 A fuse. The OBD adapter consists of 2 x AWG20 and 3 x AWG22 FLRY wires. The type of the extension cable is 24AWG; PLTD; PVC; WH; OD1.16; UL1061. The cable harness is coated with a hose or coated spirally with a fiber ribbon over the entire length.

Pin-No.	Function	Description
1	Supply (GND) Kl. 31	Supply (GND)
2	CAN-H	CAN (twisted with pin 2)
3	CAN-L	CAN (twisted with pin 3)
4	Ignition Kl. 15	Ignition
5	Supply (Ubat) Klemme 30	Supply (Ubat)

### Clamp 30:

The ECU is permanently connected to clamp 30.

### Clamp 15:

Clamp 15 can be used for setting the ECU into the Run Mode. When clamp 15 is detected as active, the ECU starts collecting data and sending these to the server.

### CAN Bus:

The CAN Bus is used for a connection to the on-board diagnostic interface OBDII.

The Baud rate can be selected between 250kBaud or 500kBaud.

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## 1.4.2 Debug Connector (2)

For debugging purposes there is a 3 pin Molex Micro-Fit connector which is providing a half-duplex communication.

Pin-No.	Function	Description
1	Debug_Rx	Data Signal
2	GND	Supply (GND)
3	+12V	Supply (Ubat)

## 1.4.3 Immobilizer Connector (3)

To be able to connect a relay for the immobilizer there is an additional 2 pin Molex Micro-Fit Connector.

Pin-No.	Function	Description
1	IN	IN
2	OUT	OUT

## 1.4.4 Antenna Connectors (4 + 5)

The Fakra connectors are implemented to connect the external antennas for GPS (blue) and GSM (violet)

## 1.5 Battery

As a backup power supply there is a lithium polymer battery. Its nominal voltage is 3.7V and its capacity is 210 mAh. There is integrated a protection IC which handles short circuits and over charging.

## 1.6 Motor

To press the buttons of the car key there is used an Minebea motor with the part number SA15M1.

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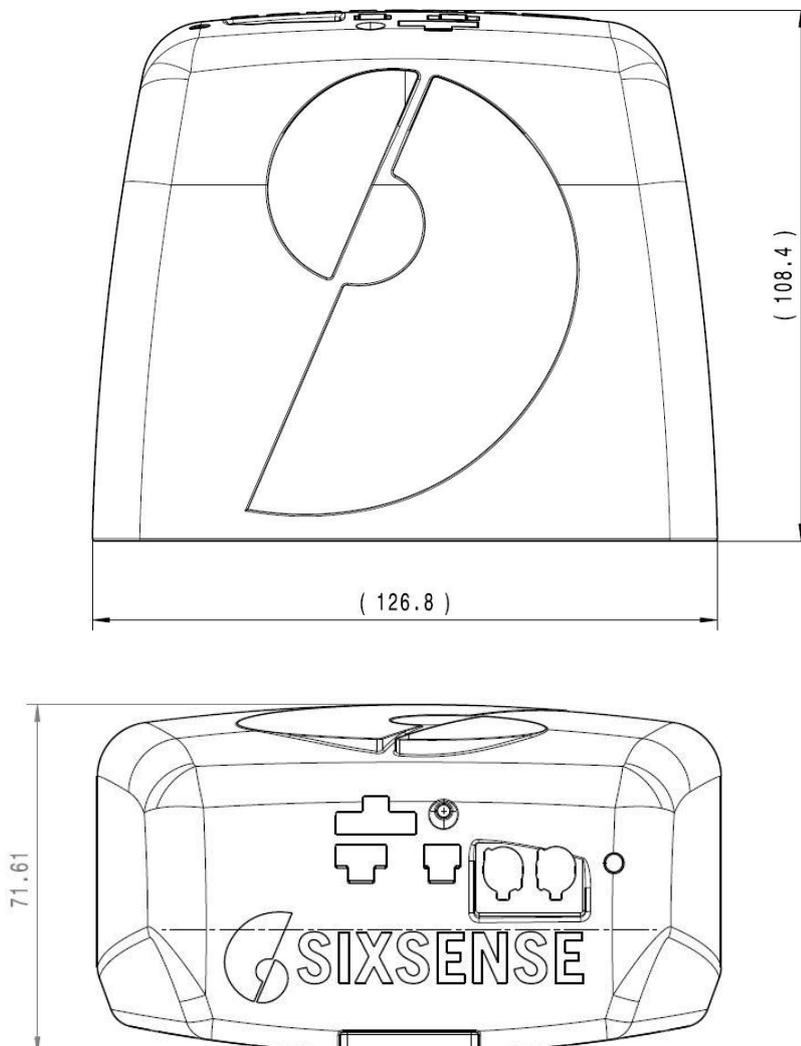
## 2 Technical Data

Temperature: -40 °C to 70 °C

Power Supply: Typ: +12 V Min: 8 V Max: 16 V

Nominal current in RUN mode (GSM Module sending, Motor running):  $\leq 1.5$  A

Dimensions: 108.4 x 126.8 x 71.61 mm (LxWxH)

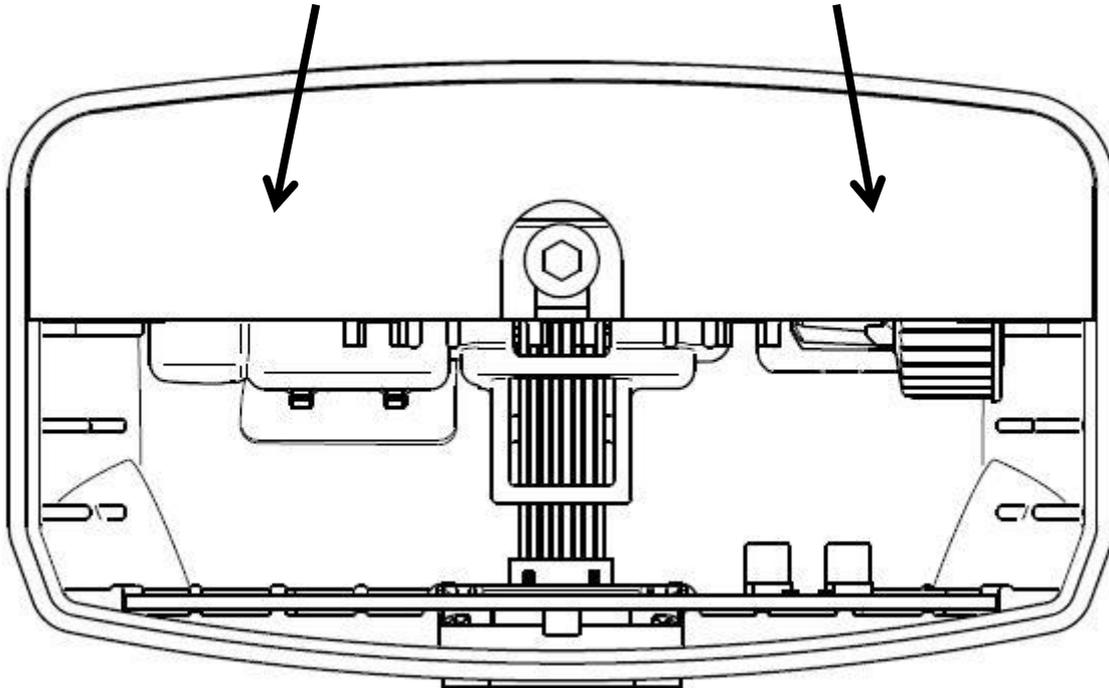
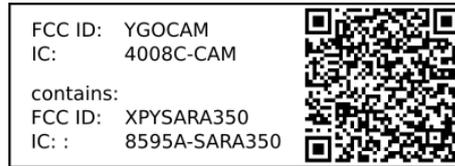


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### 3 Product Label

Label: each 18 mm x 50 mm



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## 4 Description of Variants

It will be checked the HUF Part Number H000079. The Part Number is shown on the label as follows Hxxxxxx.

The tested part number is the fully populated variant of the hardware. It is possible to manufacture partly populated variants. These variants are marked with their own Huf part number.

## 5 Housing

Material: Plastic PA6 GF30

## 6 Assembly Instructions

The housing is mounted into the car with a mounting plate. This mounting plate is fixed alternatively by screws, cable straps or adhesive.

Mounting into the car will be made by an authorized garage

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## Declaration of Conformity

### Radio equipment authorization to FCC in USA

#### FCC ID: YGOCAM

According to 47 CFR 15.19 (labeling requirements) the car manufacturer will print the following text in the appropriate User's Manual of the car:

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.

Usually this is followed by the following FCC caution:

Any changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

### Radio equipment authorization to RSS-210 in Canada

#### IC ID: 4008C-CAM

According to RSS-210 (labeling requirements) the car manufacturer will print the following text in the appropriate User's Manual of the car:

This device complies with Industry Canada licence-exempt RSS standard(s). 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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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Usually this is followed by the following RSS caution:  
Any changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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