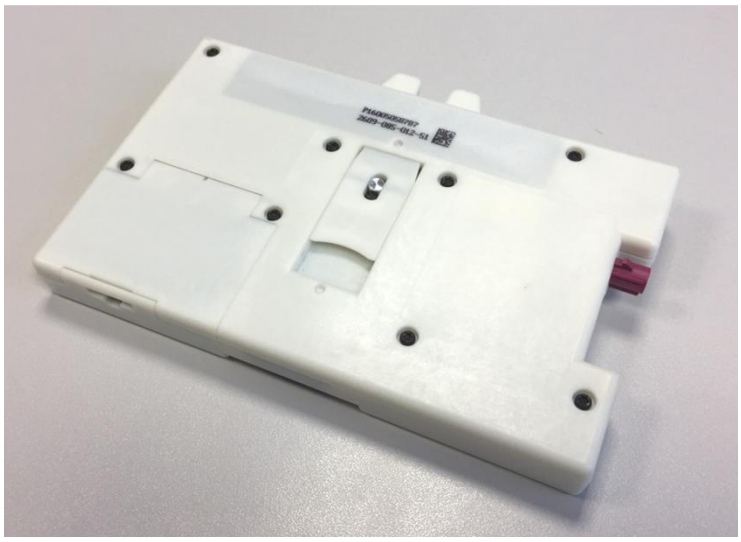
Comfort and Driving Assistance Systems

Statement for User Manual

Advanced Telecommunication Module (ATM-02)
Roof & Trunk Version

Rev. 1.3
Release



peiker acustic confidential and proprietary

Name of model:	ATM-02 roof variant / ATM-02 trunk variant
Status:	Release
Revision:	1.3
Date:	13.02.2018

Table of Contents

1. Change Dokumentation

Date	Revision	Name	Changes /Comment
08.12.2017	1.0	Roman Leimenstol	Initial Version
31.01.2018	1.1	Roman Leimenstol	Updated version on all variants
08.02.1018	1.2	Roman Leimenstol	Add frequency bands
13.02.2018	1.3	Roman Leimenstol	Add frequency bands for each variant

Notice

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2. Introduction

2.1. Scope

2.1.1. Purpose of the document

The Advanced Telecommunication Module (ATM-02) roof and trunk variant is manufactured by peiker acustic GmbH (grantee) and sold as an OEM product.
According to the US Code of Federal Regulations (47 CFR 2.909, 2.927, 2.931, 2.1033, 15.15(b) etc.), the grantee must ensure the end-user has the applicable and appropriate operating instructions for the device. In the case of this product the grantee must notify the OEM to notify the end-user.

Peiker acustic GmbH will supply this document to the reseller or distributor to inform him what must be included in the end user's manual for the commercial product and which installations guidelines for the antenna are applicable.

2.1.2. General Information

The ATM-02 is assembled in the car during production. There are no other distribution channels than assembly in the cars production line or spare part replacement within car service. Please be advised that this product will need special trained professionals in configuring and installing the product. The product will be distributed through controlled distribution channel which has special trained professionals to install this product and will not be sold directly to the general public through retail stores.

The ATM02 trunk variant is mounted invisible to the driver in the car behind the trunk cover panels. There are no direct interfaces to the driver or passengers. The ATM-02 is connected to the cars internal bus and control systems. The ATM-02 uses the external antenna of the car for cellular communications.

2.1.3. Contact Information

peiker acustic GmbH

Max-Planck-Straße 28-32
D-61381 Friedrichsdorf
Germany

http://www.valeo.com

3. Description of the product

The Advanced Telecommunication Module 2 (ATM-02) is designed and produced by peiker acustic exclusively for OEM. The ATM-02 is assembled in the car during production. There are no other distribution channels than assembly in the cars production line or spare part replacement within car service.

The ATM-02 is mounted invisible to the driver in the car under the roof plane or in the trunk area. In the roof version, the antenna is directly connected to the ATM-02. The trunk version is connected by wire to the antennas. The only direct interface of the ATM to the driver or passenger is a dedicated push button and LED (i.e. Mayday LED) to trigger an emergency call and signal the call status. Except this button and the LED, there are no direct interfaces of the ATM to the driver or passengers.

The ATM-02 is connected to the internal bus and control systems of the car. The ATM-02 uses the external antenna of the car and contains an internal backup antenna. The ATM-02 uses a factory mounted embedded SIM card (MFF2).

3.1 Use Cases of the product

The Advanced Telecommunication Module 2 is designed as the car's interface to the outer world in form of data and voice communication. Typical use cases are as follows:

- Exchange of diagnostic data between the vehicle and the OEM server and OEM backend.
- Voice connection between vehicle and public safety answering point or vehicle and OEM call centers
- Interface to networks for data exchange to support infotainment and comfort functions.
- Network access service for data exchange e.g. supporting OEM-specific assist services and other online services like weather, maps, emails for in car use.
- Contains a GNSS receiver supporting GPS, GLONASS and Galileo satellite navigation systems for position determination to be used with further services

The ATM-02 is connected to the vehicle internal bus (CAN-Bus) and network interface (OABR). It is automatically powered up if it receives a special signal via the car bus (CAN-Bus), e.g. when the car is in drive mode. The ATM-02 is also powered up with an out of band signaling from the cellular network, e.g. via a receiving SMS from the OEM service center (wake up message).

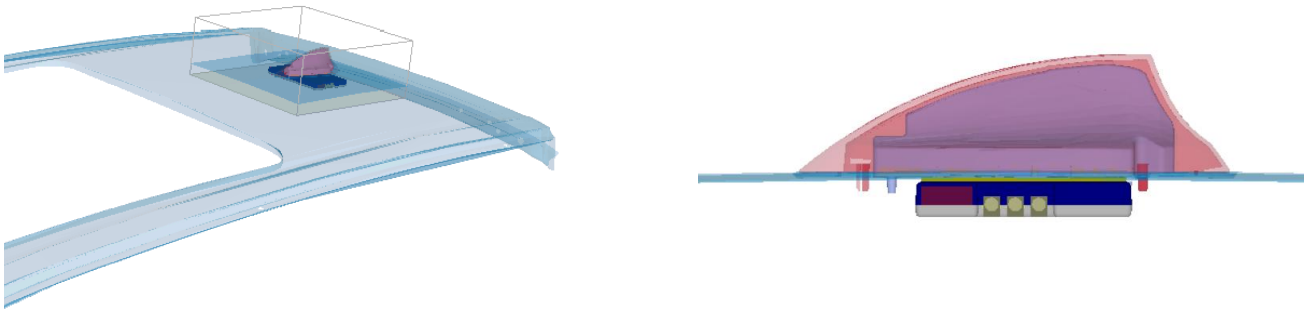
The concierge calls (i.e. service calls) are performed via the multimedia audio interface of the vehicle and the head unit (HU) provides the user interface for this type of call. The audio signal is transmitted digitally via VoIP.

In case of an emergency OEM Assist call the ATM-02 is able to perform an autonomous mobile originated call using the microphone and the loudspeaker connected directly to the device. The voice call itself is fully handled by the ATM-02. This call is originated automatically e.g. in case of a crash triggered by the Airbag ECU or manually with a service button in the control panel of the vehicle. In this case the head unit of the car is not involved in the connection.

3.2 Roof and Trunk version of ATM-02

For ATM-02 there are two assembly situations in the vehicle. Therefore, two versions of the ATM-02 are used: the roof version and the trunk version.

The roof version is direct mounted with the roof antenna and has a direct connector with it. Also a internal backup antenna is included in the roof version of ATM-02. RF signals, which are not use from ATM-02 as DAB or SDARS, go through the ATM-02 to an external connector. Telephone antennas are connected via a splitter to provide the signal also to the vehicle.



The trunk version is installed in the trunk. In each case spatially separated from the antennas. The main antennas and the backup antenna are external. The trunk version of the ATM-02 does not contain an internal backup antenna.

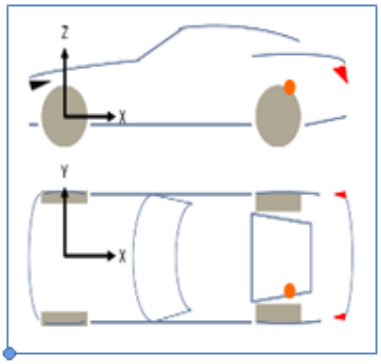
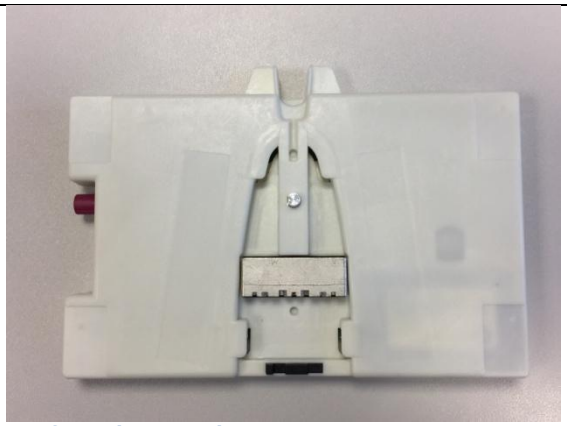
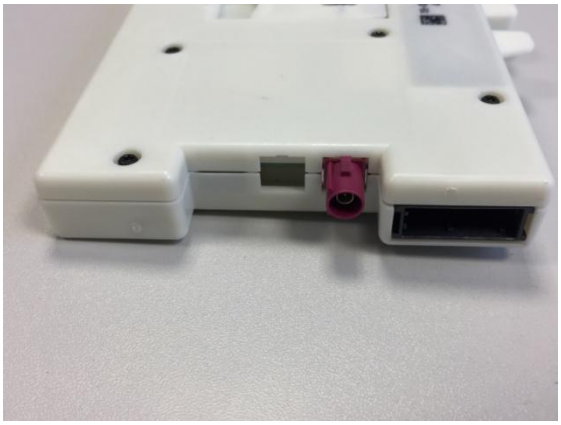
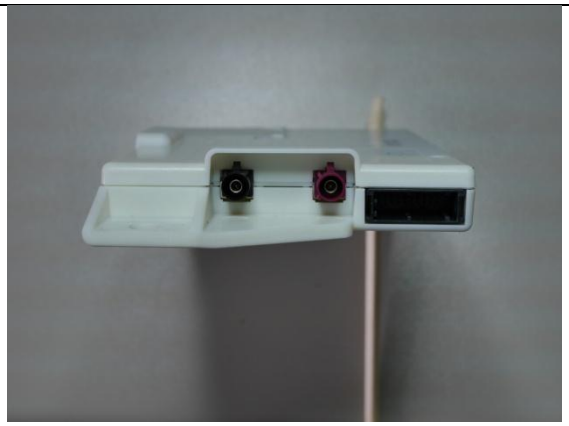
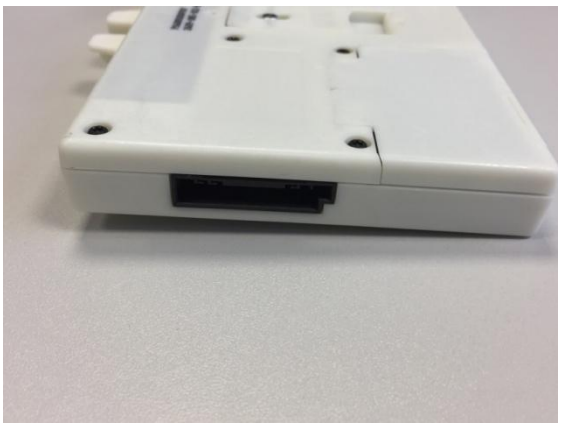
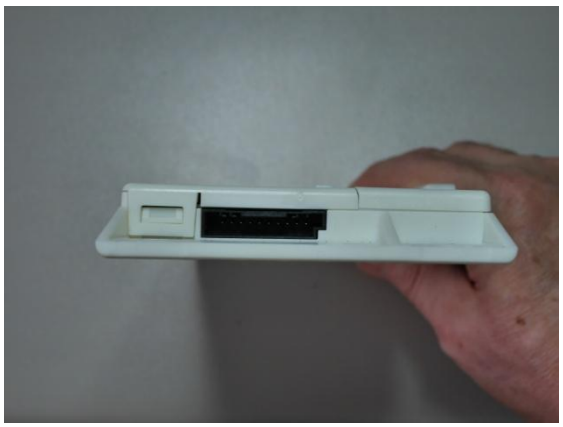


Figure 1: drawing - ATM-02 trunk version (orange) mounting example

Both variants are equipped with the same PCB board based on the same master circuit diagram. The 10-pole and 20-pole connectors to the vehicle infrastructure are identical. Both versions are using identical materials for the housing and are equipped with the same backup battery type and battery protection circuits. The internal backup antenna is only assembled in the ATM-02 roof variant.

3.3 Photos

ATM-02 roof version	ATM-02 trunk version
 Roof VersionTop view	 Trunk version Top view
 Roof version Left side view (not US)	 Trunk version Left side view
 Roof version Right side view	 Trunk version Right side view

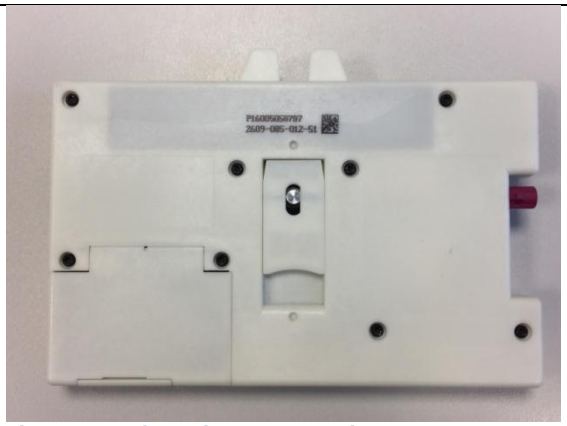
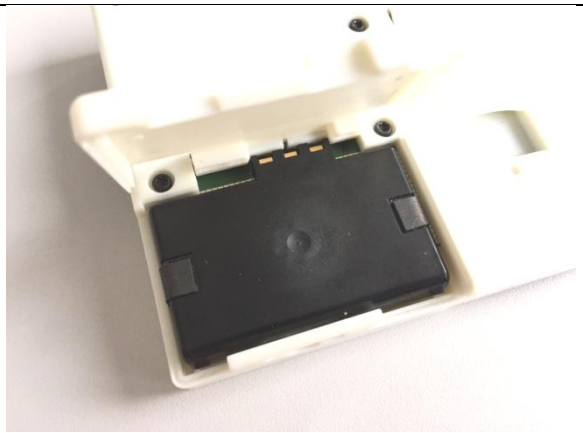


Photo - Roof version Bottom view

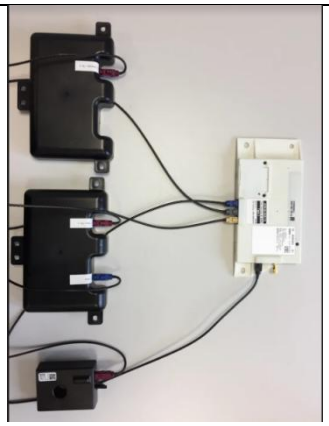
Photo - Trunk version Bottom view



Roof version Internal backup battery

Trunk version Internal backup battery

Roof version Side view with mounted antenna



Trunk version View with connected antennas

3.4 Dimensions

	length	width	height	weight
ATM-02-[XXX]-R1	160mm	112mm	18mm	286g
ATM-02-[XXX]-T1	217mm	100mm	22,9mm	235g

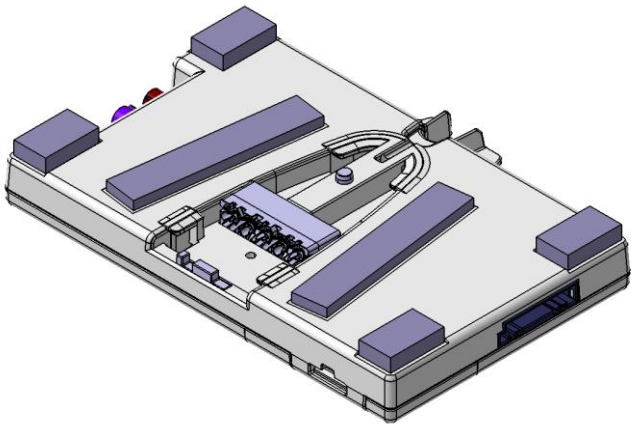


Figure 2: ATM-02 Roof Isometric View Front View

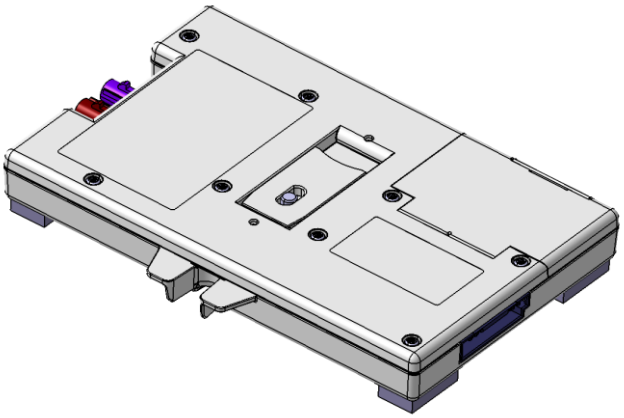


Figure 3: ATM-02 Roof Isometric View Back View

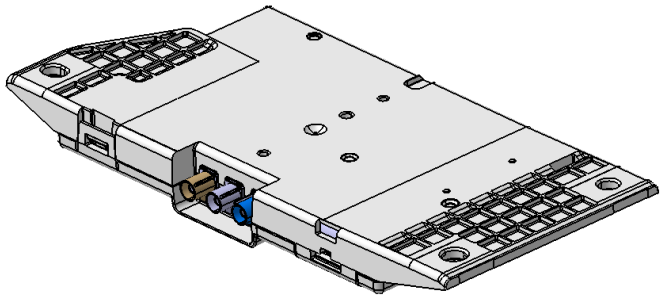


Figure 4: ATM-02 Trunk Isometric View Back View

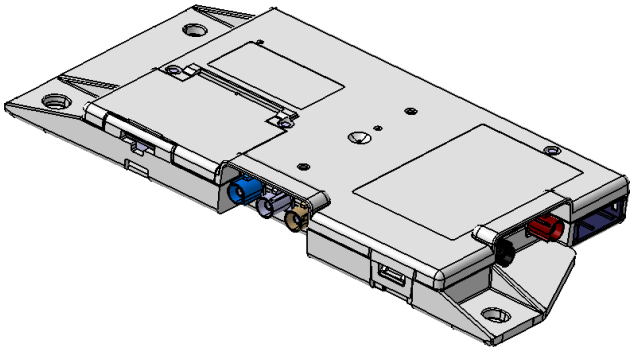


Figure 5: ATM-02 Trunk Isometric View Back View

3.5 Product variants

The ATM-02 is available in country specific variants. The variants supporting different cellular radio access technologies in different frequency bands. All variants are equipped with a GPS, GLONASS and Galileo GNSS receiver.

The naming convention (model ID) of the specific variant is *ATM-02-**[XXX]**-**[Y]**1*.

Example: the European variant of the roof version has the model ID *ATM-02-ECE-R1.*

Table 1: Model id country variants

[XXX]	Country / Area
ECE	Europe, Russia, India, Kuwait, Malaysia, Taiwan, South Korea, Singapore
CHN	China, Macau, Hong Kong
US	USA, Canada, Puerto Rico
RoW	Japan, Australia, New Zealand, South African Area, Brazil
MEX	Mexico

Table 2: model id roof/trunk version tag

[Y]	Version / Mounting location in vehicle
R	Antenna is directly mounted on top of the ATM device (Roof Version) The device is mounted directly at the roof of the vehicle.
T	Antenna cables are connected to the RF-connectors (Trunk Version) The device is mounted in the trunk area of the vehicle.

The implemented module, the attached antenna as well as the embedded SIM card are depending on the country specific variant. Not all variants are listed in the tables above.

4. Hardware

4.1 Features

Following Technologies and wireless protocols are implemented:

Name	Short description
GSM/GPRS/EDGE Rel. 9	Multi slot class 33
WCDMA/HSPA+ Rel. 9	up to HSDPA CAT 24 (42,2 Mbit/s) depending on variant HSUPA CAT 6 (5.76 Mbit/s)
LTE Rel. 11	LTE-FDD and LTE-TDD, DL Cat 11
GNSS	GPS, Galileo, Glonass, BeiDou, SBAS, QZSS

RAT	Max transmitter power	Modulation (TX)
GSM850, 900	Class 4 (2W)	GMSK
GSM1800, 1900	Class 1 (1W)	GMSK
EDGE850, EDGE900	Class E2 (0.5W)	8-PSK
EDGE1800, EDGE1900	Class E2 (0.4W)	8-PSK
WCDMA Rel.99, HSPA+	Class 3 (0.25W)	QPSK, 16-QAM, 64-QAM, BPSK
LTE	Class 3 (0.25W)	QPSK, 16-QAM, 64-QAM,

4.2 Environmental conditions

Temperature range name	Range values	Comment
Operating temperature range	-40°C … +90°C	Performance may slightly deviate from 3GPP specifications
Operating temperature range (3GPP conform)	-20°C … +65°C	conform to 3GPP specifications
Storage temperature range	-40°C … +85°C	

Name	Value
Operating relative humidity	5% – 93% non-condensing

Norm	Value
International Protection Marking according to ISO 20653	IP40

4.3 Frequency bands

4.3.1 ATM-02-ECE-R1 and ATM-02-ECE-T1

Supported frequency bands	Frequencies / MHz
GSM 900 **UMTS VIII** **LTE 8**	880 - 915
GSM 1800 **LTE 3**	1710 - 1785
UMTS I **LTE 1**	1920 - 1980
UMTS III	1747,5 - 1785
LTE 7	2500 - 2570
LTE 20	824 - 862
LTE 28A	703 – 718
LTE 32	1452 - 1496
LTE 38	2570 - 2620

4.3.2 ATM-02-US-R1 and ATM-02-US-T1

Supported frequency bands	Frequencies / MHz
GSM 850 **UMTS V,** **LTE 5**	824 - 862
LTE 4	1710 - 1785
GSM 1900 **UMTS II** **LTE 2**	1850 - 1910
UMTS IV	1732,5 – 1755
LTE 12	699 – 716
LTE 7	2500 - 2570
LTE 29	717 - 729

4.3.3 ATM-02-CHN-R1 and ATM-02-CHN-T1

Supported frequency bands	Frequencies / MHz
GSM 900 **UMTS VIII**	880 - 915
GSM 1800 **LTE 3**	1710 - 1785
UMTS I **LTE 1**	1920 - 1980
LTE 7	2500 - 2570
LTE 38	2570 - 2620
LTE 40	2300 – 2400
LTE 41	2496 - 2690

4.3.4 ATM-02-MEX-R1 and ATM-02-MEX-T1

Supported frequency bands	Frequencies / MHz
GSM 850 **UMTS V,** **LTE 5**	824 - 862
LTE 8	880 - 915
LTE 4	1710 - 1785
GSM 1900 **UMTS II** **LTE 2**	1850 - 1910
UMTS IV	1732,5 – 1755
LTE 12	699 – 716
LTE 7	2500 - 2570
LTE 29	717 - 729

4.3.5 ATM-02-ROW-R1 and ATM-02-ROW-T1

Supported frequency bands	Frequencies / MHz
GSM 850 **UMTS V, UMTS VI** **LTE 5, LTE 19**	824 - 862
GSM 900 **UMTS VIII** **LTE 8**	880 - 915
GSM 1800 **LTE 3**	1710 - 1785
GSM 1900 **UMTS II**	1850 - 1910
UMTS I **LTE 1**	1920 - 1980
UMTS III	1747,5 - 1785
UMTS XIX	1750 – 1784,8
LTE 7	2500 - 2570
LTE 9	1749,9 – 1784,9
LTE 21	1447,9 – 1462,9
LTE 28B	718 – 748
LTE 40	2300 – 2400

5. Warning Statements for the User Manual

The following certification markings and hints should be printed in the end user's manual:

5.1 Europe

This device must be supplied by a limited power source according to EN 62368-1. The clearance and protected creepage distances required by the final product must be withheld when the module is installed. The cooling of the final product shall not negatively be influenced by the installation of the module.

5.2 US /Canada

This device complies with Part 15 of the FCC Rules and with Industry Canada license-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.

5.3 Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by peiker acustic GmbH could void the user's authority to operate the equipment.

Note: The provisions of CFR § 15.105 (Information to the user) paragraphs (a) and (b) do not apply to this device. It is exempted from the technical standards under the provisions of § 15.103(a).

5.4 RF Exposure Statement (MPE)

The antenna(s) must be installed such that a minimum separation distance of at least 20 cm is always maintained between the radiator (antenna) and the human body. This device must not be co-located or operating in conjunction with any other antenna or transmitter.

5.5 Brazil

Este equipamento opera em caráter secundário, isto é, não tem direito a proteção contra interferência prejudicial, mesmo de estações do mesmo tipo, e não pode causar interferência a sistemas operando em caráter primário.

5.6 Taiwan

低功率警語

Low Power device warning

依據低功率電波輻射性電機管理辦法

第十二條

※經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條

※低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

-前項合法通信，指依電信法規定作業之無線電通信。

-低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

(Article 12 Without permission granted by the NCC, any company, enterprise, or user is not allowed to change frequency, enhance transmitting power or alter original characteristic as well as performance to a approved low power radio-frequency devices.
Article 14 The low power radio-frequency devices shall not influence aircraft security and interfere legal communications; If found, the user shall cease operating immediately until no interference is achieved. The said legal communications means radio communications is operated in compliance with the Telecommunications Act. The low power radio-frequency devices must be susceptible with the interference from legal communications or ISM radio wave radiated devices.)

- 減少電磁波影響，請妥適使用
  (For Reducing RF Influence, Use Properly)

- 為維護隱私權，請妥適使用
  (For protect individual privacy, Use Properly)

- 輸入電源端之功率不得超過250VA
  (Input power cannot exceed 250VA)

- 輸入電源需使用附的保險絲於產品前端做保護
  (The accessory fuse must be used for input power to make protection at the front end)

- 本器材須經專業工程人員安裝及設定，始得設置使用，且不得直接販售給一般消費者。
(This device must be installed by expert and will not be sold directly to the general public through retail store)

5.7 Mexico

La operación de este equipo está sujeta a las siguientes dos condiciones:

(1) es posible que este equipo o dispositivo no cause interferencia perjudicial y

(2) este equipo o dispositivo debe aceptar cualquier interferencia, incluyendo la que pueda causar su operación no deseada.

5.8 Japan

This device is granted pursuant to the Japanese Radio Law (電波法) and the Japanese Telecommunications Business Law (電気通信事業法)

This device should not be modified; otherwise the granted designation number will become invalid.

5.9 China

Class A product's warning:

警告使用者： 此为 A 级产品，在生活环境中， 该产品会造成无线干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施

5.10 Korea

“본 기기는 인체로부터 20cm 이상 이격하여 사용하는 것을 권장합니다.”
("This unit is recommended to use at least 20cm apart from the human body.")

6. Battery replacement

Open the battery compartment located on the lower right corner of the device.

Remove the battery and replace it with a new one of the same type (BMW 6833994-02).

Close the battery compartment by pushing the lid towards the housing until it is locked.