



Operating manual

ANCOR

Active Noise Cancelling offered by recalM



recalm GmbH

Harburger Schloßstraße 6–12

21079 Hamburg, Germany

Phone: +49 40 766 29 -3881

Email: service@recalm.com

Web: <http://www.recalm.com>

Service requests: <http://service.recalm.com>

© Copyright recalml GmbH:

These operating manual may only be reproduced, translated or made accessible to third parties with the express permission of recalml GmbH.

Original operating manual

Table of contents

1	About this operating manual	5
1.1	Relevant documents and web links	5
1.2	Presentation of information	6
1.2.1	Warnings	6
1.2.2	Abbreviations used	7
1.2.3	Symbol	7
2	Important safety instructions	9
2.1	Intended use	9
2.2	Non-intended use	10
2.3	Qualification of users	11
2.4	General safety instructions	11
2.5	Work on electrical equipment	13
2.6	Behavior in an emergency	13
2.7	Behavior under increased noise pollution	13
3	Specifications	15
3.1	ANCOR	15
3.2	A2B-Sensor	18
4	Scope of delivery	19
5	Device description	20
5.1	Device Overview	20
5.2	Function	23
5.3	LED Overview	24
6	Assembly	25
6.1	Disassemble the headrest	25
6.2	Mount ANCOR on the headrest	27
6.3	Mounting A2B sensors	29
7	Commissioning	30
7.1	Connecting the supply cable	30
7.2	Producing a power supply	31
8	Service 33	
8.1	Activate and deactivate ANC on the button	33

8.2	Operation of the ANCOR app	34
8.2.1	Connect your mobile device via Bluetooth.....	35
8.2.2	Configuring ANCOR for Vehicle Variant	37
8.2.3	Live View User Interface	40
8.2.4	Enable and disable ANC in the app	41
8.3	Retrieve statistical data (optional)	42
9	Cleaning and maintenance	44
9.1	Cleaning ANCOR	44
9.2	Maintain ANCOR	44
10	Troubleshooting	45
10.1	Measures to remedy faults	45
10.2	Read error codes and submit service requests	47
10.3	Troubleshoot Bluetooth connection issues	49
10.4	Uncheck over-temperature shutdown	50
10.5	Fix ANC feature limitation.....	50
11	Decommissioning and dismantling	52
11.1	Decommissioning ANCOR	52
11.2	Disassemble the headrest.....	53
11.3	Detach ANCOR from the headrest.....	54
12	Storage	
13	Disposal.....	57

1 About this operating manual

These operating instructions apply to the acoustic system ANCOR, which is used for active noise reduction. It contains information on correct installation, commissioning, operation and troubleshooting.

This operating manual is aimed at people who integrate the ANCOR into a vehicle, put it into operation and operate it for the first time.

1.1 Relevant documents and web links



The QR code next to it opens the web link <https://www.recalm.com/datasheets>. Current and supplementary information on the ANCOR can be viewed there, e.B data sheets and this operating instructions.



The ANCOR app is required to configure the ANCOR. This contains supplementary documentation and guides the user through all the necessary steps of configuring the ANCOR. The QR code next to it leads to the download of the ANCOR app from the App Store.



All approved vehicle variants on which the ANCOR can be used are stored in the ANCOR app as part of the configuration settings or can be viewed via the web link <https://www.recalm.com/machine-directory>.



Service requests can be made via the web link <https://service.recalm.com>.


1.2 Presentation of information

For fast and safe work with the ANCOR, uniform warnings, symbols, terms and abbreviations are used in this operating manual. For a better understanding, these are explained in the following chapters.

1.2.1 Warnings

In these operating instructions, warnings are provided before a sequence of actions in which there is a risk of personal injury or property damage. The described security measures must be complied with.

Warnings are structured as follows:

 SIGNAL WORD
<p>Type or source of danger!</p> <p>Consequences of non-observance.</p> <p>▶ Security measure.</p>

The signal words have the following meaning:


Signalword	Meaning
DANGER	Indicates a danger that is sure to lead to death or serious injury if you do not avoid the danger.
WARNING	Indicates a danger that can lead to death or serious injury if you do not avoid the danger.


Signalword	Meaning
CAUTION	Indicates a hazard that can lead to mild to moderate injuries if you do not avoid the danger.
ATTENTION	Indicates possible damage to property. The environment, property or the device itself can be damaged if you do not avoid the danger.

1.2.2 Abbreviations used

ANC	Active Noise Cancelling (aktive Geräuschunterdrückung)
EVEN	Active Noise Cancelling offered by recalM
A2B	Automotive Audio-Bus (interface for data transmission for noise cancellation)
CAN-Bus	Controller Area Network bus (interface for data exchange between several ECUs)
dB	Dezibel (logarithmic unit of measurement of the sound pressure level; an increase of 10 dB corresponds to twice the volume)
dB(A)	Dezibel by frequency rating filter A (sound pressure level in dB calculated according to A rating and depending on the distance and frequency range of the sound source)
GND	Ground (voltage designation of the ground)
WINE	Input voltage (input voltage)

1.2.3 Symbol

	If this information is not observed, the device cannot be used or operated optimally.
---	---

▶	Instructions for action: Describes activities that must be performed.
▷	Result: Describes the result of an executed instruction.
	QR code: Indicates further web links or access to the ANCOR app.
<i>Menu</i>	Menu items of the ANCOR app are displayed in <i>italics</i> .
[button]	Buttons of the ANCOR app are shown in square brackets.

2 Important safety instructions

The ANCOR has been manufactured according to the recognized rules of technology. Nevertheless, there is a risk of personal injury and property damage if the following basic safety instructions and the warnings before instructions for action in these operating instructions are not observed.

- ▶ Read this instruction manual thoroughly and completely before using the ANCOR.
- ▶ Keep the instruction manual so that it is legible. Ensure that it is accessible to all users at all times.
- ▶ Always pass on the ANCOR to third parties together with these operating instructions.

2.1 Intended use

The ANCOR is an acoustic device for active noise reduction in closed vehicle cabins and is mounted on the headrest of the vehicle for operation.

The ANCOR may only be used by competent persons and in the industrial or commercial sector.

The ANCOR may only be used in construction and land vehicles that recalM GmbH considers permissible and stored as a configuration setting in the ANCOR app.

In order to ensure effective use, the ANCOR must be configured before operation for the respective vehicle variant on which the device is used.

The operating conditions specified in the technical data must always be complied with.

Noise reduction by means of the ANCOR is only possible in a limited range of frequencies and sound pressure levels, see section "Field of Application" in chapter "3 Specifications".

The ANCOR may only be used together with the approved parts from the scope of delivery.

The intended use also includes that these operating instructions and in particular the chapter "2 Important safety instructions" are read and understood in full.

2.2 Non-intended use

Any improper use is prohibited. A non-intended use shall be deemed to be if:

- the ANCOR is used differently from that described in "2.1 Intended use",
- the ANCOR is used under operating conditions which differ from those described in these instructions,
- of the ANCOR or parts of the scope of delivery are converted or technically modified.

If the ANCOR is not used as intended, all warranty claims expire.

The manufacturer is not liable for damage to the ANCOR or for personal injury caused by improper use.

2.3 Qualification of users

The activities described in this owner's manual require knowledge of the functioning and structure of the vehicle on which the ANCOR is used. Therefore, in order to ensure operational safety, these activities may only be carried out by a person who is sufficiently instructed in handling the vehicle and, if necessary, safety precautions and who has a suitable driving license.

The ANCOR may only be assembled, put into operation and operated by persons who have familiarized themselves with the use of the ANCOR and the associated dangers on the basis of these operating instructions.

2.4 General safety instructions

- ▶ Be sure to follow the instructions in this owner's manual in order to exclude hazards and avoid damage.
- ▶ Carry out assembly, commissioning and cleaning work as well as possible troubleshooting at the ANCOR only when the vehicle is switched off.
- ▶ Use the ANCOR and all supplied components only in technically perfect condition and exclusively in the performance range specified in the technical data (see Chapter 3).
- ▶ Do not use the ANCOR in explosive or corrosive environments.
- ▶ Do not expose the ANCOR to radiation, e.g. microwave, UV, laser or X-ray radiation.
- ▶ Protect the ANCOR from damage caused by the ingress of solid foreign bodies or liquids and from fiber flight.
- ▶ If the vehicle is not in operation for a long time, disconnect the ANCOR from the power supply. Depending on the vehicle variant, the on-board voltage socket is supplied with voltage even when the ignition of the vehicle is switched off.

- ▶ Maintenance and repair work on the ANCOR is not carried out independently. This work may only be carried out by recalms-Service.
- ▶ Ensure that the driver's field of vision remains sufficiently illuminated on all sides even after the ANCOR has been installed. Use devices for indirect vision on the vehicle, e.g. reversing cameras or mirrors.
- ▶ If the driver's seat is rotated or the position of the backrest is changed, collisions may occur between the mounted ANCOR and parts of the vehicle cabin. The vehicle operation can be triggered accidentally. Avoid collisions within the vehicle cabin as well as unwanted operation and starting the vehicle.
- ▶ Do not hold on to the ANCOR when entering the vehicle, as this can lead to damage to the device.
- ▶ In the event of severe weather or strong winds, noise and measurement errors may occur on the A2B sensors and on the microphones of the ANCOR. In this case, do not use the ANCOR.
- ▶ Ensure that the speakers and microphones on the device frame are not obscured by garments or other textiles.

2.5 Work on electrical equipment

Any modifications to the electrical equipment of the device may only be made by the recalm service.

The device may only be opened by the recalm service.

- ▶ Regularly check the ANCOR and the supplied components for obvious defects, e.g. loose bindings or damage to the insulation.
- ▶ In case of defects in the electrical equipment, disconnect the power supply from the ANCOR and contact the recalm service.
- ▶ Never remove or damage the seallabel at the service interfaces of the ANCOR. The use of the service interface is reserved for the recalm service.

2.6 Behavior in an emergency

Malfunctions or dangerous situations may lead to an immediate risk of injury to persons or to a risk of damage to the ANCOR or other devices in the working environment.

- ▶ If necessary, stop the vehicle and put it out of service.
- ▶ Disconnect the ANCOR from the power supply.
- ▶ If necessary, leave the vehicle and seek help.
- ▶ Have malfunctions eliminated by the recalm service.

2.7 Behavior under increased noise pollution

In rare cases, the sound pressure level of the interference source can be increased by a malfunction of the ANCOR. Sound pressure levels of up to 105 dB(A) can be emitted. If a person is exposed to such noise exposure for more than 5 minutes, there is a risk of permanent hearing damage.

- ▶ Be careful not to expose yourself to noise pollution for more than 5 minutes. If the problem cannot be eliminated by the following action steps, leave the vehicle cabin and move away from the sound source.
- ▶ If the ANCOR does not deactivate the ANC automatically, deactivate the ANC manually via the button on the device frame or via the ANCOR app (see Chapter 8.1
- ▶ Re-enable the ANC.

If the malfunction persists:

- ▶ Deactivate the ANC again and disconnect the ANCOR from the power supply.
- ▶ Contact the recalM service.

3 Specifications

3.1 ANCOR

General data	
Dimensions (W x H x D)	560 mm x 250 mm x 230 mm
Weight	3.5 kg
Protection class housing	IP54
Environmental and operating conditions	
Distance of head restraint rods (center to center)	min. 112 mm Max. 193.5 mm
Diameter of the headrest rods	min. 10 mm Max. 14 mm
Headrest width	Max. 30 cm
Application	Frequency band: 50 to 500 Hz Sound level: up to 100 dB(A)
Operating temperature	-40 to +70 °C
relative humidity	Max. 70%
Overtemperature shutdown	from 75 °C with 10 °C hysteresis (transition to normal operation from 65 °C)
Use in earthquake zones	Yes
Vibration resistance according to DIN EN 60068-2-64/-27	Random vibration: up to 2.97 g Shock vibration: up to 25 g
Keeping clean according to cleanroom/cleanroom class	no

Storage	
Temperature	-55 to +105 °C
relative humidity	Max. 70%
Electrical data	
Connection of supply cable	Deutsch DT06-6S-CE 13, 6-polig
Supply voltage	8–24 V DC
Power consumption	Max. 120 th /m
Short-circuit strength	yes, individual pins from the supply plug to GND and to the supply voltage
Reverse polarity protection	Yes
Dew protection	Yes
Interfaces	1x A2B 1x CAN-Bus 1x Ethernet 1x RS232 1x USB

Electromagnetic compatibility	
Current injection test (BCI) according to ISO 11452-4:2011	Class A (up to 60mA, P _{max} 25 W)
Test pulses on supply lines according to ISO 7637-2:2011 and ISO 7637-3:2007	1: Class C 2a: Class A 2b: Class C 3a: Class A 3b: Class A a + b: Class A
Test pulses on supply lines according to ISO 16750-2:2012	Starting impulse: Class A Load Dump Pulse: Class C
Immunity test against electrostatic discharges (ESD) according to ISO 10605:2008	Class A
Interference emissions	
30 to 75 MHz, BB	64 to 54 dB(μV/m)
75 to 400 MHz, BB	54 to 65 dB(μV/m)
400 to 1000 MHz, BB	65dB(μV/m)
In accordance with	
EMC Directive 2014/30/EU	
DIN EN ISO 13766-1:2018: Arithmetic and construction machinery – EMC of machines with internal electrical on-board electrical system – Part 1: General EMC requirements	
DIN EN ISO 14982:2009: Agricultural and forestry machinery – EMC – Test methods and evaluation criteria	

3.2 A2B-Sensor

General data	
Dimensions (W x H x D)	44,5 mm x 36 mm x 110 mm
Weight	90 g
Protection class housing	IP67
Operating temperature	-40 to +105 °C
Electrical data	
Connection	I know SAL8 RSC3
Short-circuit strength	no
Dew protection	Yes
Interface A2B	1x Input 1x Output

4 Scope of delivery

The scope of delivery includes:

- One Acoustic unit ANCOR
- One A2B sensor
(optional: additional A2B sensors incl. sensor cable)
- a supply cable
- two clamping rings
- an operating manual

5 Device description

5.1 Device Overview

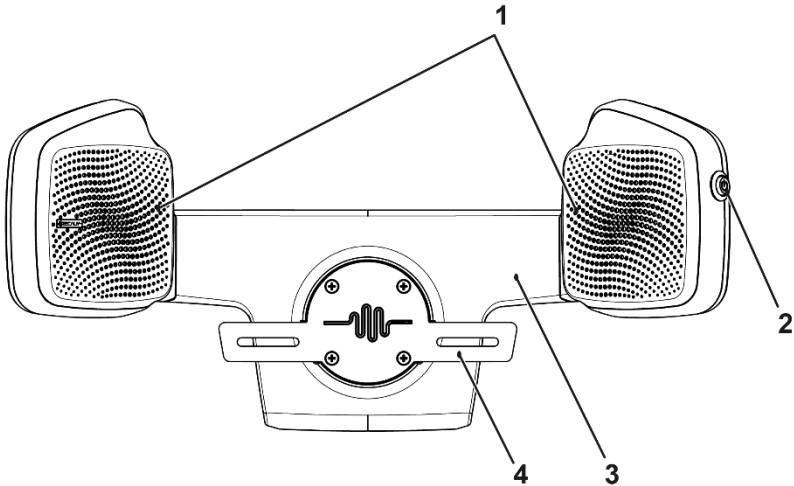


Abb. 1 Front view of the ANCOR

1	Speaker
2	Buttons with two LEDs (see chapter 5.3LED Overview)
3	Body Frame
4	Bracket

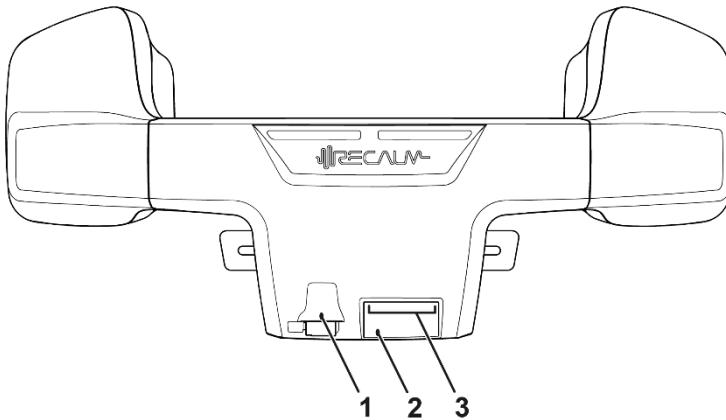


Abb. 2 Rear view of the ANCOR

1	Connector for 6-pin German connector (supply voltage, CAN bus, A2B bus)
2	Type plate with device name and QR code for digital operating instructions
3	Service connections with seal label (only for recalm service): 1x CAN Bus Interface 1x Ethernet port 1x USB port (retrieval of statistical data)

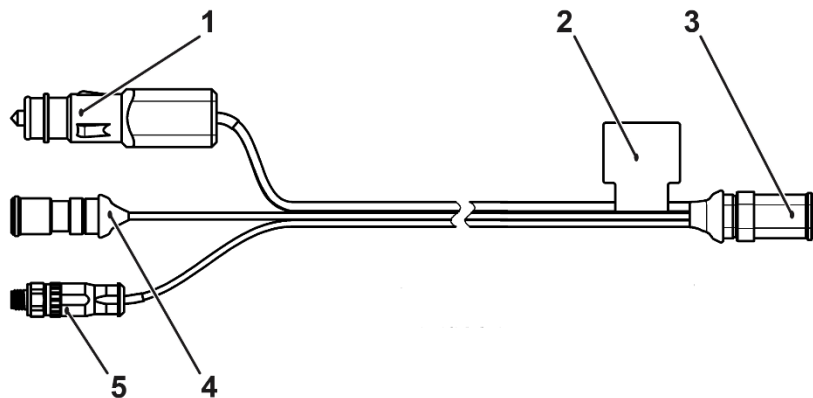


Abb. 3 Connections of the supply cable

1	Car Plugs
2	Label
3	German plug DT06-6S-CE 13, 6-pin
4	CAN bus connector, DT06-2S-CE 13, 2-pin
5	M8 connector, 3-pin

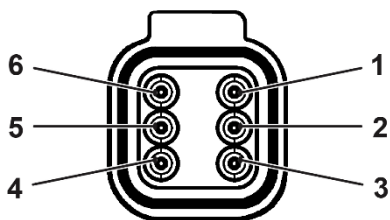


Abb. 4 Pin assignment of the 6-pin German connector

1	VIN (root)	4	CAN_P (green)
2	GND (schwarz)	5	A2B_A_N / A2B_B_N (green)
3	CAN_N (yellow)	6	A2B_A_P / A2B_B_P (yellow)

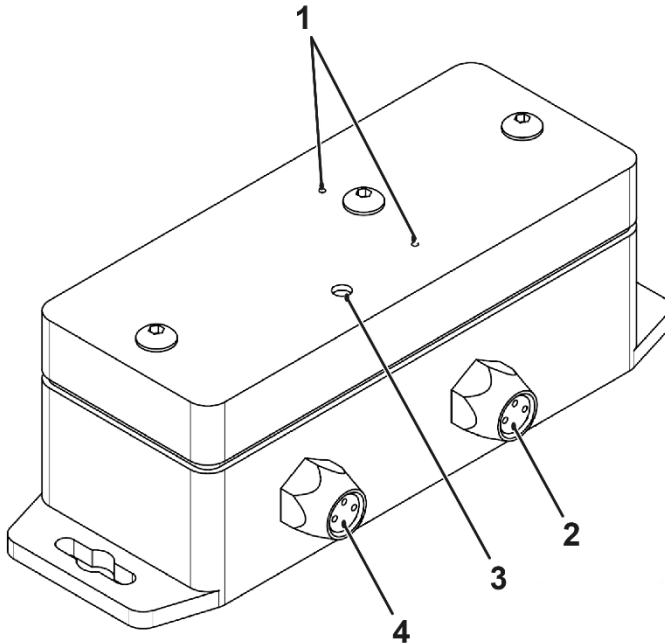


Abb. 5 A2B-Sensor

1	Microphones
2	Connection "OUTPUT"
3	LED „LINK OK“
4	Connection "INPUT"

5.2 Function

The ANCOR is an acoustic device for active noise reduction in vehicle cabins and is based on the principle of Active Noise Cancelling (ANC). Disturbing and health-endangering sound pressure levels are reduced with the help of artificially generated counter-noise.

The internal sensors of the ANCOR as well as external A2B sensors are used to measure and digitize airborne and structure-borne noise in the environment. The control unit of the ANCOR calculates a signal with opposite polarity from this interference sound, the counter sound. The counter-sound is emitted via the loudspeakers on the ANCOR. The opposite waves of counter sound and interference sound overlap and extinguish each other in a certain frequency range (destructive interference). The interference noise is thereby reduced in the area of the user.

A2B sensors detect the noise as quickly as possible and close to the noise source. As a result, the control unit is given more calculation time in order to determine the necessary counter-noise and to be able to reduce it as accurately as possible.

5.3 LED Overview

The button on the device frame of the ANCOR has two LEDs that indicate the current operating status of the ANCOR.

LED	Operating status
blue off	ANC inactive
blue glows constantly	ANC active
blue flashing	Bluetooth mode active
red off	ANCOR without malfunction
red glows constantly	Overtemperature shutdown active or malfunction during the start-up process
red flashes	Fault is present

6 Assembly

Preconditions:

- The driver's seat has a headrest with headrest rods.
- The dimensions of the headrest of the driver's seat comply with the requirements specified in the technical data (see Chapter 3

6.1 Disassemble the headrest

DANGER

Risk of injury due to uncontrolled operation of the vehicle!

If the driver's seat is adjusted, parts of the vehicle operation can be triggered. People can be seriously injured by starting up or uncontrolled movements of the vehicle.

- ▶ Carry out work on the driver's seat only when the vehicle is switched off.

CAUTION

Risk of minor injuries due to clampable parts!

When working on the clampable parts of the headrest and the bracket of the ANCOR, fingers or parts of the skin can be pinched.

- ▶ Proceed with caution during the work.

- ▶ Fold the backrest of the driver's seat into a horizontal position.
- ▶ Pull out the headrest of the driver's seat as far as possible.

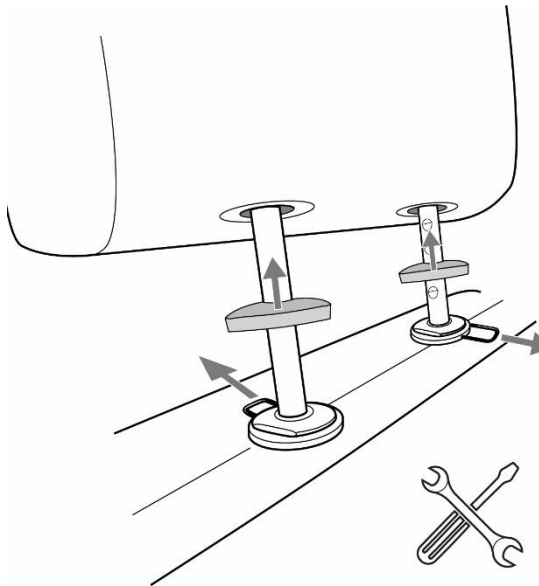


Abb. 6 Release the headrest

- ▶ Remove the covers of the headrest guide in which the headrest rods are inserted.
- ▶ Pull the retaining clip out of the recess of the headrest guide. If necessary, use a tool ,e.g. screwdriver or wrench.
- ▶ Pull the headrest completely out of the headrest guide.
- ▶ Insert the retaining clips back into the recesses of the headrest guide.
- ▶ Slide the covers down from the headrest rods and place them back on the respective headrest guide.
- ▶ Fold the backrest of the driver's seat back into the upright position.

6.2 Mount ANCOR on the headrest

CAUTION

Risk of minor injuries and property damage!

If the headrest is held to the vehicle with the mounted ANCOR during entry or exit, people can easily injure themselves and the ANCOR may fall down.

- ▶ Before getting in or out, place the headrest with the ANCOR in the driver's seat.

ATTENTION

Collision warning!

If the ANCOR is installed within the vehicle cabin, there is a risk of collision between the person carrying the vehicle, the ANCOR and parts of the vehicle cab or vehicle operation.

- ▶ Carry out the assembly exclusively outside the vehicle cabin.
- ▶ Place the ANCOR outside the vehicle cab on a flat surface.
- ▶ Guide the headrest rods through the clamping cylinders of the bracket on the ANCOR. The clamping cylinders can be moved at a distance from each other.

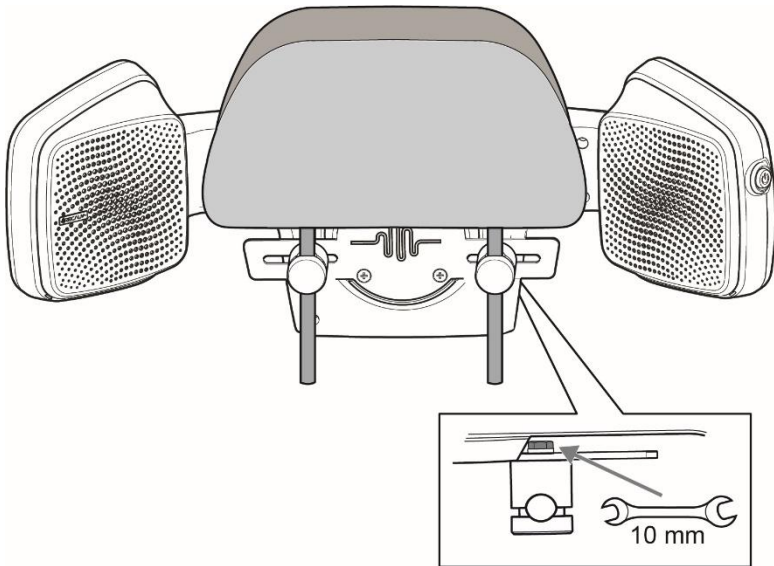


Abb. 7 ANCOR mounting

- ▶ Tighten the screws on the back of the clamping cylinders with a wrench (width 10 mm).
- ▷ The clamping cylinders of the ANCOR are fixed.



The supplied clamping rings can additionally fix the headrest in its position, so that the weight of the ANCOR does not unintentionally pull the headrest downwards.

To fix the headrest in height:

- ▶ Slide the clamping rings over the headrest rods to the height on which the headrest is later to be held in the headrest guide.
- ▶ Tighten the maggot screws of the clamping rings with an Allen wrench (3mm).

- ▶ Place the headrest with the mounted ANCOR on the seat of the driver's seat and enter the vehicle cabin.
- ▶ Fold the backrest of the driver's seat into a horizontal position.
- ▶ Insert the headrest rods back into the headrest guide and adjust the desired height of the headrest.

6.3 Mounting A2B sensors



The positioning of the A2B sensors on the vehicle influences the effectiveness of the ANC. An overview of possible positioning can be viewed via the web link <https://www.recalm.com/machine-directory>. The approved vehicle variant for the configuration of the ANCOR are also stored there.

- ▶ Attach one or more A2B sensors as close as possible to the loudest sources of interference, e.g. in the direction of the vehicle engine. To do this, use cable ties or the gland noses on the housing of the sensors.

7 Commissioning

7.1 Connecting the supply cable

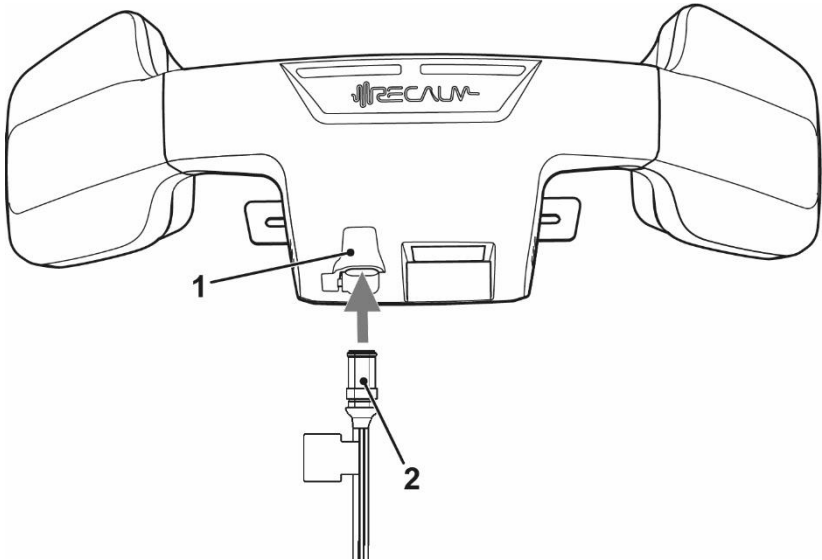


Abb. 8 Connecting the supply cable

- ▶ Connect the 6-pin German connector (2) to the connector on the bottom of the ANCOR (1).
- ▶ Connect the 3-pin M8 connector to the "INPUT" connector on the A2Bsensor.

ATTENTION: Risk of damage to the cable connection on the M8 connector.

- ▶ When connecting the M8 connector, turn exclusively on the metal thread without moving the plastic thread.

If multiple A2B sensors are used:

- ▶ Connect one end of the supplied sensor cable to the "OUTPUT" connector of the A2B sensor that is already connected to the ANCOR.
- ▶ Connect the other end of the sensor cable to the "INPUT" connector of the additional A2B sensor.

7.2 Producing a power supply

ATTENTION

Danger of battery discharge on the vehicle!

Depending on the vehicle variant, the on-board voltage socket is supplied with voltage even when the ignition of the vehicle is switched off.

- ▶ Disconnect the car plug from the on-board voltage socket if the vehicle is not in operation for a long time.
- ▶ Plug the car plug into the on-board voltage socket in the vehicle.

ATTENTION: Risk of damage to the car plug.

- ▶ **Do not** remove the red cap of the car plug. This serves the better hold in the on-board voltage socket.

- ▶ Turn on the ignition of the vehicle to establish the power supply.
 - ▷ The ANCOR begins the boot process.
 - ▷ The red LED on the button of the ANCOR is constantly lit.
 - ▷ As soon as the boot process is successfully completed (after about 60 seconds), the red LED goes out, the beep "System ready" sounds.
 - ▷ The "LINK OK" LED on the A2B sensor lights up blue.

If the boot process does not complete successfully and the red LED on the button is still lit:

- ▶ Disconnect the ANCOR from the power supply and repeat the above steps.
- ▶ In the event of repeated malfunctions, contact the recalm service.

8 Service

The use of the ANCOR app is recommended, as the app offers more extensive usage possibilities (see chapter 8.2 Operation of the ANCOR app). For the basic operation of the ANC, the app is not necessary.

Preconditions:

- 7.2
- The ANCOR is in a trouble-free operating state.
- To use the ANCOR app, the ANCOR is connected to your mobile device via Bluetooth (see Chapter 8.2.1
- 8.2.2

8.1 Activate and deactivate ANC on the button



Desired background noise, e.g. by radio or hands-free system, can impair the perception of noise reduction. However, this does not restrict the actual function of the ANC.

- ▶ To activate the ANC, press the button on the ANCOR.
 - ▷ The blue LED of the button is constantly lit.
- ▶ To deactivate the ANC, press the button on the ANCOR again.
 - ▷ The blue LED of the button turns off.

8.2 Operation of the ANCOR app

This chapter explains only the most important functions of the ANCOR app, which are a prerequisite for optimal use of the ANCOR.

More detailed information on operation is available as part of the onboarding within the app.

The ANCOR app supports the following functions:

- Settings for the Bluetooth connection (see Chapter 8.2.1)
- Onboarding for the introduction to app operation
- Initial configuration of the ANCOR for a vehicle variant (see Chapter 8.2.2)
- Display of the current configuration setting
- Enabling and disabling the ANC (see Chapter 8.2.4)
- Visualization of the current performance of the ANC (see Chapter 8.2.3)
- Reading error codes in the event of a fault and forwarding the error codes to the recalm service (see Chapter 10.2)
- Download and automatically trigger firmware updates for the ANCOR and/or the ANCOR app
- Retrieval of statistical data on the performance of the ANCOR (see Chapter 8.3)

8.2.1 Connect your mobile device via Bluetooth



The exact device name of the ANCOR is stored on the type plate on the underside of the device.

- ▶ If you encounter problems with the Bluetooth connection, refer to the chapter "10.3 Bluetooth connection problems".




- ▶ Open the link to the ANCOR app using the adjacent QR code.
- ▶ Download the ANCOR app from the mobile device's AppStore.
- ▶ Install the ANCOR app on the mobile device.
- ▶ Enable Bluetooth on the mobile device and make the device visible to other devices.
- ▶ Press and hold the **BUTTON** of the ANCOR for at least 5 seconds until the blue LED on the button flashes.
 - ▷ The Bluetooth mode of the ANCOR is started.

To connect the ANCOR to the mobile device for the first time:

- ▶ Perform a pairing of both devices. This is done via the Bluetooth settings of the operating system on the mobile device.

If the ANCOR is paired with the mobile device:



- ▶ Open the ANCOR app and press the "Settings"  button.

- ▶ Select the Menu item *Configurati*on .

- ▷ The *Bluetooth Pairing* view opens.



- ▶ Wait for the desired ANCOR to appear in the list of available devices.

- ▶ Select the ANCOR.

- ▷ The two devices will be connected to each other and will connect automatically in the future as soon as Bluetooth is activated on the mobile device.

- ▷ The blue LED of the ANCOR turns off and the Bluetooth mode is terminated.

8.2.2 Configuring ANCOR for Vehicle Variant

In order to ensure effective use, the ANCOR must be configured before operation for the respective vehicle variant on which the device is used. The function of the ANCOR is adapted to the acoustic characteristics of the vehicle cabin of the respective vehicle. The design of the vehicle cab significantly influences the course of the interference sound as well as the reflections of the counter-sound that the ANCOR emits. The position of the A2B sensor on the vehicle also has an influence on the calculation of the counter-sound.


The configuration to a specific vehicle variant ensures particularly effective noise reduction within the quiet zone on the ANCOR loudspeakers.



All approved vehicle variants are stored in the ANCOR app as part of the configuration settings or can be viewed via the web link <https://www.recalm.com/machine-directory>. The link can be accessed via the adjacent QR code. The recal service offers configuration support.

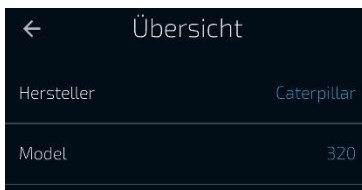
To configure the ANCOR for a vehicle variant:



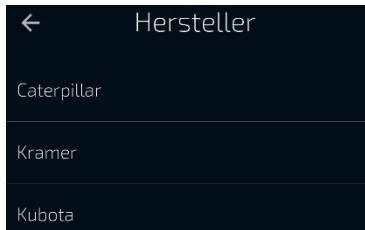
- ▶ Open the ANCOR app and press the "Settings"  button.
- ▶ Select the Menu item *Configurati-
on* .
 - ▷ The *Bluetooth Pairing* view opens.



- ▶ Wait for the desired ANCOR to appear in the list of available devices.
- ▶ Select the ANCOR.
 - ▷ The *Overview* menu with the configuration data opens.



- ▶ Press the menu item *Manufac-
turer* .
 - ▷ The *Manufacturer* menu opens.

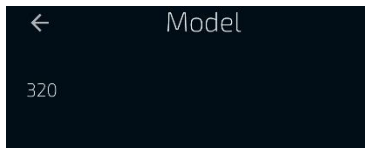


- ▶ Select the appropriate manufacturer of the vehicle variant from the list.

- ▷ The *Overview* menu opens again.

- ▶ Press the Menu item *Model*.

- ▷ The *Model* menu opens.



- ▶ Select the appropriate model of the vehicle variant from the list.

- ▷ The *Overview* menu opens again.



- ▶ Press the [Save Configuration] button.

- ▷ The ANCOR app saves the configuration settings.

- ▷ After successful saving, the *Overview* menu opens again.

8.2.3 Live View User Interface

If the mobile device is connected to the ANCOR via Bluetooth, the ANCOR app switches to live view after opening.

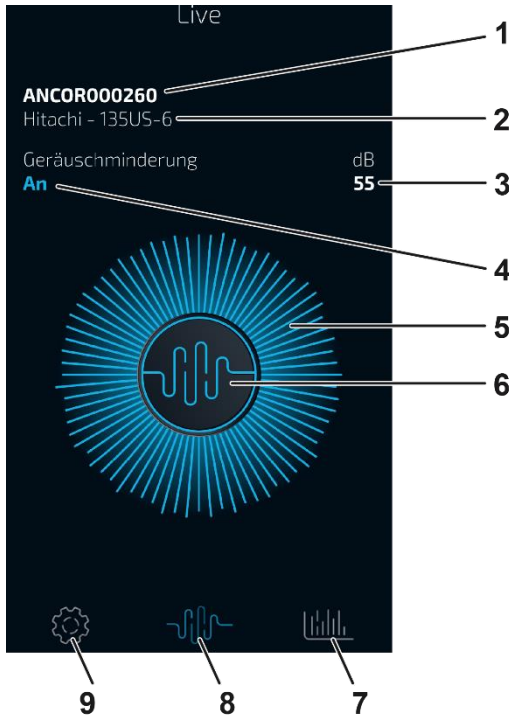





Abb. 9 Live view of the ANCOR app

1	Connected ANCOR	5	Visualization of performance
2	configured vehicle variant	6	[ANC On/Off] button
		7	Dashboard button []
3	Noise level according to ANC	8	Live View button []
4	ANC Activity	9	Settings button []

8.2.4 Enable and disable ANC in the app

i Desired background noise, e.g. by radio or hands-free system, can impair the perception of noise reduction. However, this does not restrict the actual function of the ANC.


► Open the ANCOR app.



Abb. 10 Live view with ANC disabled



Abb. 11 Live view with ANC enabled

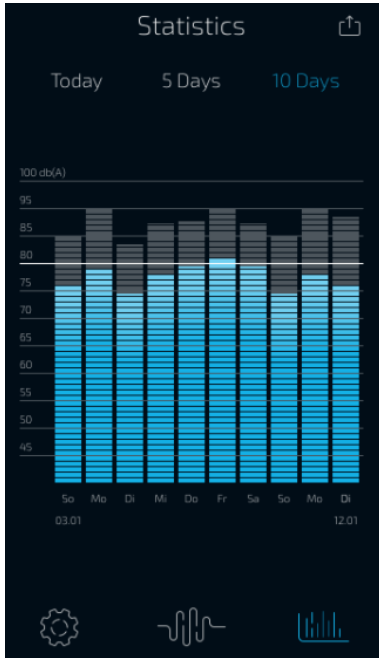
- ▶ Press the "Live View" -button.
 - ▷ The ANCOR app switches to Live View.
 - ▷ The live view shows a visualization of the current performance of the ANC (even if THE ANC is deactivated).
- ▶ To activate the ANC, press the [ANC on/off] button.
 - ▷ The [ANC On/Off] button is highlighted in blue.
 - ▷ The blue LED of the button on the ANCOR is constantly lit.
- ▶ To disable the ANC, press the [ANC On/Off] button again.
 - ▷ The blue deposit of the [ANC On/Off] button expires.
 - ▷ The blue LED of the button on the ANCOR goes out.


8.3 Retrieve statistical data (optional)

Statistical data on the past performance of one or more ANCOR can be viewed on a dashboard. This provides an overview of the effectiveness and benefits of all ANCOR used.

The statistical data can be read out either via the ANCOR app or via a subsequently available LTE stick. The LTE stick is available on request from the recalM service.

To retrieve the statistical data via the ANCOR app:



- ▶ Open the ANCOR app and press the "Dashboard" [] button.
 - ▷ The statistical data of the ANCOR are transferred and displayed on a dashboard within the app.
- ▶ Select the time period for which you want the data to be displayed. The periods of the last five or ten days as well as the current day are available.

In order to retrieve the statistical data via an LTE stick, a mobile device with Internet access is required. Together with the LTE stick, a user ID is assigned. When calling up the dashboard in the web browser, the user ID must be appended to the URL mentioned below.

- ▶ If you are interested, request the necessary LTE stick and further information from the recalm service.
- ▶ Retrieve the dashboard in the web browser via [https://dashboard.recalm.com/\[User ID\]](https://dashboard.recalm.com/[User ID]).

9 Cleaning and maintenance

9.1 Cleaning ANCOR

- ▶ Regularly check whether the area of the loudspeakers on the ANCOR or the microphones of the A2B sensors are clogged with dust or dirt.
- ▶ Remove coarse dirt using a slightly damp cleaning cloth.

9.2 Maintain ANCOR

Maintenance work is carried out exclusively by employees of recalM-Service.

It is recommended that you perform existing updates to the ANCOR or ANCOR app. If an update is available, it is displayed by a push notification in the ANCOR app.

- ▶ Confirm the execution of updates within the ANCOR app.

10 Troubleshooting

10.1 Measures to remedy faults

The following table gives an overview of any malfunctions occurring at the ANCOR or an the A2B sensors, their possible causes as well as information on how to eliminate the faults.

Disturbance	Possible cause	Remedy
The ANC function exhibits irregular behavior or there is no discernible noise reduction. The red LED on the ANCOR does not blink.	ANCOR misconfigured	8.2.2
	limited ANC function	10.5
The red LED on the ANCOR is constantly lit.	Startup process unsuccessful	Disconnect and restore the power supply, see Chapter 7.2 recal service in case of repeated occurrence
	Overtemperature shutdown active	Remove overtemperature shutdown, see Chapter 10.4

Disturbance	Possible cause	Remedy
A beep sounds and the rote LED on the ANCOR flashes.	limited functionality	Press and hold the button for at least 10 seconds; in case of repeated occurrence, read error codes and submit service requests, see Chapter 10.2
The "LINK OK" LED on the A2B sensor is not lit.	A2B sensor faulty or not connected at all	7.1
The "LINK OK" LED on the A2B sensor is flashing.	A2B sensor not configured correctly	8.2.2
Bluetooth connection to a mobile device is not possible.	Bluetooth settings of the mobile device incorrect	10.3
	Bluetooth mode of the ANCOR not activated	

10.2 Read error codes and submit service requests

If there is a fault on the ANCOR, a beep sounds and the red LED on the button flashes.

- ▶ Press and hold the button on the ANCOR for at least 10 seconds.
 - ▷ The ANCOR performs a reboot.
- ▶ Wait until the ANCOR is ready for operation and check whether the fault is still present.

In the event of repeated malfunctions, the error code available at ANCOR must be read out via the ANCOR app and transmitted to the recal service.

Preconditions:


- The red LED on the button of the ANCOR flashes.
- The Bluetooth connection to the ANCOR can be established.

If the red LED on the button of the ANCOR is constantly lit and a Bluetooth connection is not possible:

- ▶ Ensure that the overtemperature shutdown is not active (see chapter "10.4Uncheck over-temperature shutdown
- ▶ Contact the recal service to make the ANCOR operational again.

To read an error code:



- ▶ Open the ANCOR app and press the "Settings" button [].
- ▶ Select the menu item *Support* .
 - ▷ The error data available at ANCOR is read out and written to an error log.
 - ▷ The mobile device's email program opens and the error log is automatically inserted into the attachment of a new email.



- ▶ Send the email to service@recalm.com. Alternatively, <https://service.recalm.com> make the service request via the web link.
- ▶ Wait until the recalm service contacts you.

10.3 Troubleshoot Bluetooth connection issues

It is possible that the ANCOR does not appear in the list of available devices within the ANCOR app. If no available device is generally found, the ANCOR app automatically opens the Bluetooth settings of the mobile device for verification. The Bluetooth mode of the ANCOR is terminated.

- ▶ Press and hold the button on the ANCOR for at least 10 seconds or disconnect the ANCOR from the power supply and then restore the power supply.
 - ▷ The ANCOR performs a reboot.
- ▶ Wait for the ANCOR to be operational.
- ▶ Check the Bluetooth settings of the mobile device, especially the visibility to other devices.
- ▶ Make sure that the ANCOR and the mobile device are not too far apart (within a radius of about 100 meters).
- ▶ Press and hold the button on the ANCOR for at least 5seconds.
 - ▷ The Bluetooth mode of the ANCOR is started.
- ▶ In the Bluetooth settings of the mobile device, make sure that the ANCOR is already paired with the mobile device.
- ▶ Wait for the desired ANCOR to appear in the list of available devices within the ANCOR app and select the ANCOR.
- ▶ If the ANCOR is still not displayed in the list of available devices, contact the recalm service.

10.4 Uncheck over-temperature shutdown

The ANCOR has an overtemperature shutdown that prevents damage to the device when used at very high temperatures. In this case, the ANCOR switches off automatically.

- ▶ Comply with the specified environmental conditions when operating the ANCOR (see chapter "3Specifications").

If the overtemperature shutdown is active:

- ▶ Reduce the ambient temperature in the vehicle cabin, e.g. with the help of the vehicle's air conditioning system.
- ▶ Wait for the ANCOR to cool down and automatically turn back on.
- ▶ If the ANCOR cannot be put back into operation, contact the recalM service.

10.5 Fix ANC feature limitation

If there is no detectable noise reduction by ANC or if the ANC function has irregularities:

- ▶ Ensure that the ANCOR is configured for the vehicle variant on which the device is used.
- ▶ Disable the ANC and disconnect the ANCOR from the power supply.
- ▶ Restore the power supply.
 - ▷ The ANCOR performs a reboot.
- ▶ Activate the ANC and check its functionality.

If the ANC function is still restricted:

- ▶ Repeat the above steps.

After the third boot process with possible instabilities, the ANCOR automatically switches to error mode and the red LED on the button starts flashing.

Follow the steps in chapter "10.2 Read error codes and submit service requests".

11 Decommissioning and dismantling

Decommissioning of the ANCOR is required if

- malfunctions that cause increased noise pollution,
- the ANC behaves irregularly,
- **Fehler! Verweisquelle konnte nicht gefunden werden.**
- of the ANCOR is to be dismantled.

11.1 Decommissioning ANCOR

- ▶ Unplug the car plug from the on-board voltage socket in the vehicle.

ATTENTION: Risk of damage to the car plug.

- ▶ **Do not** remove the red cap of the car plug. This serves the better hold in the on-board voltage socket.

- ▶ Disconnect the 6-pin German connector from the connector on the bottom of the ANCOR.
- ▶ Disconnect the 3-pin M8 connector from the "INPUT" connector on the A2B sensor.

ATTENTION: Risk of damage to the cable connection on the M8 connector.

- ▶ When loosening the M8plug, turn exclusively on the metal thread without moving the plastic thread.

11.2 Disassemble the headrest

 **DANGER**

Risk of injury due to uncontrolled operation of the vehicle!

If the driver's seat is adjusted, parts of the vehicle operation can be triggered. People can be seriously injured by starting up or uncontrolled movements of the vehicle.

- ▶ Carry out work on the driver's seat only when the vehicle is switched off.

⚠ CAUTION

Risk of minor injuries due to clampable parts!

When working on the clampable parts of the headrest and the bracket of the ANCOR, fingers or parts of the skin can be pinched.

- ▶ Proceed with caution during the work.
- ▶ Fold the backrest of the driver's seat into a horizontal position.
- ▶ Remove the covers of the headrest guide in which the headrest rods are inserted.
- ▶ Pull the retaining clips out of the recess of the headrest guide. If necessary, use a tool, e.g. screwdriver or wrench.
- ▶ Pull the headrest completely out of the headrest guide with the ANCOR and place it safely.
- ▶ Insert the retaining clips back into the recesses of the headrest guide.
- ▶ Slide the covers down from the headrest rods and place them back on the respective headrest guide.
- ▶ Fold the backrest of the driver's seat back into the upright position.

11.3 Detach ANCOR from the headrest

CAUTION

Risk of minor injuries and property damage!

If the headrest is held to the vehicle with the mounted ANCOR during entry or exit, people can easily injure themselves and the ANCOR can fall down.

- ▶ Before getting in or out, place the headrest with the ANCOR in the driver's seat.

ATTENTION

Collision warning!

If the ANCOR is dismantled within the vehicle cabin, there is a risk of collision between the person carrying out the vehicle, the ANCOR and parts of the vehicle cab or vehicle operation.

- ▶ Carry out the dismantling exclusively outside the vehicle cabin.
- ▶ Place the headrest with the ANCOR outside the vehicle cabin on a flat surface.

If the supplied clamping rings e have been used:

- ▶ Loosen the maggot screws of the clamping rings with an Allen wrench (3 mm) and remove the clamping rings from the headrest rods.
- ▶ Loosen the screws on the back of the clamping cylinders with a wrench (width 10mm).
- ▶ Pull the headrest rods out of the clamping cylinders.
 - ▷ The ANCOR is detached from the headrest.
- ▶ Place the ANCOR safely.
- ▶ Insert the headrest rods back into the headrest guide and adjust the desired height of the headrest.
- ▶ Disconnect the cable connections between the A2B sensors used and remove the sensors from the vehicle.

12 Storage

- ▶ Comply with the storage conditions (see chapter "3Specifications").
- ▶ Store the ANCOR exclusively in enclosed, non-hazardous rooms.
- ▶ Make sure the storage space is well ventilated and dry.

13 Disposal

- ▶ Dispose of the ANCOR and the supplied components in accordance with the legal regulations of the respective country.
- ▶ Do not dispose of the ANCOR in household waste. G collect used electrical appliances separately in accordance with the European Directive 2012/19/EU on waste electrical and electronic equipment and recycle it through a local recycling company for environmentally sound recovery.
- ▶ For the disposal of the packaging, observe the legal regulations for waste separation of the respective country. Further information on the recycling of these products can be found at the municipal administration or the municipal collection or collection points.

Index

A

A2B	7
A2B Sensors	
Feature	24
Mount	29
Abbreviations	7
ANC	
activate and deactivate on button	33
activate and deactivate via app	41
Meaning	7
Feature	23
Fixing faults	50
ANCOR-App	
Enabling and disabling ANC	41
User interface	40
Operation	34
Bluetooth-Verbindungsprobleme	49
Configuring the vehicle variant	37
Connect mobile device via	
Bluetooth	35
retrieve statistical data	42
Connection	
A2B Sensors	31
Power supply	31
Versorgungskabel	30
Connections Supply cable	22
Decommissioning	52
B	
Operation	33
ANCOR-App	34
Button	33
Intended use	9
Operating states LEDs	24

Bluetooth	
Connect mobile device	35
Troubleshoot connection issues	49
Bluetooth connection	35

C

CAN-Bus	7
---------	---

D

Dashboard	42
dB	7
dB(A)	7
Dismantling	
ANCOR by headrest	54
Headrest from the driver's seat	25, 53

And

Electrical equipment	13
Disposal	57
Increased noise pollution	14

F

Configure vehicle variant	5, 37
Error	45
Reading error codes	47
Fehlgebrauch	10
Feature	23
A2B sensors	24
ANC	23

G

Device description	20
Device overview	20
GND	7

I

Commissioning	30
---------------	----

Maintenance	44	Statistical data	
K		Dashboard	42
Configuration of vehicle variant	5, 37	LTE-Stick	42
Disassemble headrest	25, 53	Retrieving statistical data	42
L		Disturbances	
Storage	56	ANC function	50
LEDs	24	eliminate	45
Scope of delivery	19	Bluetooth	49
Live View	40	Table	45
LTE-Stick	42	Störungsbeseitigung	45
M		T	
Relevant documents	5	Operate buttons	33
Connect your mobile device via		Technical data	15
Bluetooth	35	A2B-Sensor	18
Mount	25	STILL	15
A2B sensors	29	In the	
ANCOR on headrest	27	Overview	
N		6-pin German connector	22
Improper use	10	A2B-Sensor	23
Emergency	13	ANCOR Frontansicht	20
Q		ANCOR Rückansicht	21
Qualification of users	11	Versorgungskabel	22
R		Übertemperaturabschaltung	50
Cleaning	44	In	
S		Behaviour under increased noise	
Buttons ANCOR app	40	pollution	14
Make a service request	6, 47, 48	Emergency behavior	13
Security	9	Versorgungskabel	
General safety instructions	11	connect	30
Increased noise pollution	14	disconnect	52
Signalwörter	6	Purpose	9
Emergency behavior	13	WINE	7
Warnings	6	In	
Signalwörter	6	Warnings	6
Producing a power supply	31		