

HDP 850 GPS 204500003  
CAP 850 GPS 203500001

**KATHREIN**

Digital Systems GmbH

# Fully Automatic Camping Satellite Antenna System with 85 cm Parabolic Reflector



Only with CAP 850 GPS

## Instruction Manual

For information on the parking position see  
„Turntable in Parking Position While Driving“ on page 9

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## About This Manual

This document is part of the product. Read the Instruction Manual before using the antenna set for the first time. Perform all operating steps described in the manual in the specified sequence.

For the most up-to-date version of this document, go to [www.kathrein-ds.com](http://www.kathrein-ds.com).



Keep this manual in a safe place for future reference and enclose it with the unit when passing it on to the next user.

## Intended Use

The CAP 850 GPS and HDP 850 GPS fully automatic camping satellite systems are intended to be used for receiving digital TV and radio channels via satellite. The automatic positioners are intended to be used as a turntable for the Kathrein parabolic reflector.

The turntable is intended to be used for receiving digital TV and radio signals in the frequency range from 10.70 to 12.75 GHz. This antenna cannot receive terrestrial signals (e.g. DVB-T, DVB-T2).

The CAP 850 GPS is a receiver-independent solution and can be used in conjunction with any satellite-enabled end device. The CAP converter manages the communication and control of the system and converts the signals received from the end device into CAP-compliant signals. This enables the fully automatic alignment of the parabolic reflector for the reception of digital satellite signals.

The turntable is designed for use on parked/stationary caravans or motor homes.

**Any use other than that specified above will invalidate the warranty or guarantee.**

**The following circumstances will result in the loss of warranty and liability claims against the manufacturer:**

- improper installation
- use of non-specified mounting materials, which cannot guarantee the mechanical reliability of the camping satellite antenna system
- unauthorised use, such as using the parabolic mirror as a storage space
- structural changes or interference with the components and mounting accessories of the set, which may endanger both the mechanical and functional safety
- opening the components improperly or by force
- use of solvent-containing cleaners such as acetone, nitro-thinner, petrol or similar
- non-observance of installation and safety instructions in this manual

## Features

- All-in-one fully automatic satellite reception system, including control unit
- Aerodynamic design: **only 17 cm** high (in parking position)
- Streaming of live TV using UFZ 132 USB/Wi-Fi adapter and free CAPcontrol app
- Software update via satellite
- Large reception area due to high-gain 85 cm parabolic reflector
- Twin LNB for connecting a second receiver or TV set
- Automatic alignment with other satellites when changing channels
- GPS receiver for exact site determination for quick alignment of the antenna
- Low number of cables (2 x coax and one power cable) simplifies installation
- Automatically lowers to parking position when the engine is started

## Scope of Supply



- ① Turntable with integrated control unit
- ② Twin LNB
- ③ Parabolic reflector Ø 85 cm
- ④ CAP converter
- ⑤ LNB arm support

### Scope of supply of the CAP 850 GPS

The CAP 850 GPS consists of:

- Turntable with integrated control unit ① and pre-installed twin LNB ②
- Parabolic reflector ③ with 6 mounting screws
- Mounting plate
- Complete set of cables:
  - 1 x master coaxial cable<sup>1)</sup>, 3 m, red marking, for connection of “Antenna” / “IF Input” to the CAP converter<sup>2)</sup>
  - 1 x slave coaxial cable<sup>1)</sup>, 3 m, for connection to a second receiver/TV set incl. receiver
  - 1 x power supply cable<sup>1)</sup>, 3 m
  - 1 x extension coaxial cable, 5 m, F-socket to F-plug
  - 1 x extension power supply cable, 7 m, for connection to the on-board power supply
  - 1 x flat fuse and flat fuse holder
- Roof gland with sealing gasket
- CAP converter ④ with 12 V connection cable and LED/pushbutton cable <sup>3)</sup>
- LNB arm support ⑤
- CAP 850 GPS Instruction Manual

<sup>1)</sup> Firmly connected to the turntable.

<sup>2)</sup> To connect the TV set to the CAP converter, a coaxial cable F socket/F socket is required; the cable length depends on the distance between TV set and CAP converter. This cable is not included.

<sup>3)</sup> Only with CAP 850 GPS

## Optional Accessories

### LCD 89 (Order No. 21510004)

Always use the supplied extension cable to extend the coaxial cables. If the enclosed extension cable is not sufficient, use the LCD 89 antenna cable with the FM-Mini-TD QM5.0 (092500004) F compression socket from KATHREIN Digital Systems.



### HDS 50 (Order No. 20410070)

The external HDS 50 control unit enables you to operate the turntables easily and conveniently without having to switch on a receiver or TV set. Selecting a satellite and lowering the turntable to the parking position are examples of the functions that can be called up via an intuitively structured menu. An LC display provides the necessary overview.



### HDS 42 (Order No. 2040000006)

The HDS 42 is a master/slave switch and is connected between a receiver-independent CAP turntable and the HDS 166 antenna set. It automatically passes on the received satellite signal without having to reconnect the coaxial cable on the TV set.



### HDZ 100 (Order No. 20410032)

The HDZ 100 is a cable interface installed on the caravan roof to be used with the camping satellite antenna systems of the CAP series. The protective housing accommodates up to two RF cables and one power cable. The cables can either be run underneath the HDZ 100 housing into the car interior or out of the housing and onto the car roof.



### UFZ 132 (BN: 204500005)

You can use the UFZ 132 USB/Wi-Fi adapter, in conjunction with the free CAPcontrol app, to make settings on your turntable and control unit and to play live TV/radio on your mobile device (smartphone, tablet, notebook). The USB/Wi-Fi adapter is plugged into the CAP converter.



### HDS 52 (Order No. 20410079)

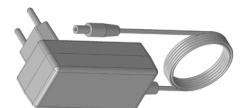
The CI-BUS adapter enables you to operate your Kathrein satellite antenna system of the CAP series with the vehicle-specific control panel of your motorhome/caravan. Please contact your vehicle manufacturer for further information.



### 12 V Power Supply Unit (Order No. 1683660)

For connection to 230 V sockets. The adapter cable (Order no. 197500004) is also required. You can order this plug-in power supply unit from our factory repair centre:

KATHREIN Digital Systems GmbH  
Factory repair center  
Bahnhofstr. 110  
83224 Grassau  
Germany  
Tel.: +49 8641 69984-27  
Email: [camping-service@kathrein-ds.com](mailto:camping-service@kathrein-ds.com)  
Internet: [www.kathrein-ds.com](http://www.kathrein-ds.com)



## Turntable

### Legal Notes

Hereby, KATHREIN Digital Systems GmbH declares that the radio equipment types HDP 850 GPS, BN: 204500003 and CAP 850 GPS, BN: 203500003 are in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity are available at the following internet address: [www.kathrein-ds.com](http://www.kathrein-ds.com)

KATHREIN Digital Systems GmbH is not liable for product damage due to external influences, wear or improper handling, unauthorised repair, modifications or accidents.

### Safety Instructions and General Notes



#### **Danger to life from electric shock when touching electrical installations!**

- ▶ Maintain a minimum clearance of 1 m from all electrical devices during installation.
- ▶ Disconnect the turntable and all the units connected to it from the power supply during installation/repairs/dismantling.
- ▶ Make sure that modifications to the electrical installations in the vehicle are only carried out by a specialist. Do not make any unauthorised changes to the turntable!
- ▶ The fuse in the power cable and the disconnection point on the battery must be easily accessible!



#### **Risk of severe injuries during installation/repairs/dismantling on the vehicle roof!**



- ▶ Position the vehicle horizontally.
- ▶ Wear stable shoes with non-slip soles.
- ▶ Use a working platform.
- ▶ Make sure that the person carrying out the installation or repair has a secure position to stand and hold on whilst working.
- ▶ Make sure that the person carrying out the installation or repair does not suffer from vertigo and can move around safely on the roof of the caravan or motor home.
- ▶ Make sure that the vehicle roof is sufficiently strong and stable. If in doubt, contact a qualified specialist dealer or the manufacturer of your vehicle.
- ▶ Make sure that there is nobody below the turntable inside the caravan/motor home during installation/repairs/dismantling.
- ▶ Make sure that the roof and climbing aid are dry, clean and non-slip.



#### **Risk of severe injuries due to moving parts, especially risk of crushing!**



- ▶ Make sure that during operation of the turntable no one, especially no children, is in the immediate vicinity of the turntable and that no one can touch any moving parts.
- ▶ Disconnect the turntable and all units connected to it from the power supply during installation/repairs/dismantling.



#### **Risk of damage when the permissible wind speeds or vehicle speeds are exceeded! Risk of accidents due to collision of the turntable with objects.**

An increase in the normal vehicle height due to the turntable not being lowered can lead to an increased risk of accidents. The driver bears sole responsibility for the condition of superstructures and attachments! In stormy weather, the turntable and the vehicle could be damaged.

- ▶ Follow the instructions in the installation and operating manuals for the units used and for the external fittings and superstructures.
- ▶ Before commencing a journey or if there is a storm warning (with wind speeds exceeding **70 km/h**), lower the turntable to the horizontal position (parking position).
- ▶ Do not exceed the maximum permissible vehicle speed of **130 km/h**.



- ▶ Malfunction or material damage due to operation outside the permissible temperature range!
- ▶ When selecting the installation and setup location, ensure that the turntable is sufficiently ventilated.

## Proper Installation and Safety

- 
- The system should only be installed by qualified specialist personnel!**

  - ▶ To prevent hazards during installation, operation or when driving on public highways, the instructions and information in this manual must be strictly adhered to. Proper installation and connection of the turntable are prerequisites for conformity with the corresponding standards.
  - ▶ This is documented in advance by the CE mark and the declaration of conformity in the appendix to this manual.

### Essential information

A crucial safety factor is proper performance of installation and electrical connection work, and the specified alignment of the turntable in the direction of travel (parking position).

- ▶ Comply as precisely as possible with the installation conditions and steps described.

### Sealing adhesive

The turntable is attached to the vehicle roof by adhesive and is secured by additional screws. The adhesive is not included. Use a sealing adhesive for automotive applications with a tensile strength (DIN 53505) = 1.8 MPa and a shear strength (DIN 53283) = 2.5 MPa. We recommend **Dekasyl MS-5 Kraftkleber** (manufacturer: Deka Kleben & Dichten GmbH, 63691 Ranstadt, Germany) or Sikaflex-291i (manufacturer: Sika AG, 6341 Baar, Switzerland).

Please refer to the manufacturer's safety data sheet and technical data sheet for information on the use of the adhesive.

- 
- Risk of material damage due to improper use of the sealing adhesive!**

  - ▶ During installation work, follow the processing and safety instructions of the manufacturer of the sealing adhesive.

## Road Traffic Licensing Regulations (StVZO)

The applicable regulations of the German StVZO must be observed in respect of fixed installation of the turntable on a vehicle which is driven on public highways. In particular, Articles 19/2; 30 C; 32 (2) and EC directive 74/483 EEC are applicable.

Briefly, they state that an entry in the vehicle documents is not required provided that the turntable is at a height of more than 2 m when the vehicle is loaded and the antenna unit does not protrude beyond the lateral, outer vehicle outline. The maximum permissible height of 4 m (vehicle and antenna unit) must not be exceeded.

## Laying and Connecting the Cables

- 
- Risk of smouldering fire!**

Tying the cables up with a wire or the like could cause a smouldering fire.

  - ▶ Disentangle and remove any wire or the like. Disconnect the turntable and all the units connected to it from the power supply during installation/repairs/dismantling.
- 
- Trip hazard due to cables!**

Crushing or excessively stretching cables can cause a smouldering fire

  - ▶ Lay cables in such a way that no one can tread on them or trip over them.

- 
- Parasitic induction or interference emissions!**

An inappropriate cable or extension cable may cause parasitic induction or interference emissions degrading image quality and interfering with communication with the turntable.

  - ▶ When extending the antenna cable, use a 75  $\Omega$  coaxial cable with a screening factor of at least 75 dB.
  - ▶ We recommend an extension cable that has at least the electrical characteristics of the Kathrein cable LCD 89!

- 
- Material damage due to reversed polarity!**
- When connecting the power cables, reversed polarity can lead to thermal overload and damage to components when the equipment is powered up.
- ▶ Never reverse the poles of the power cables used to connect the CAP converter and the turntable to the vehicle electrical system.

## Supply Voltage, Fusing

- 
- Risk of severe injuries due to cable fire!**
- Removing or bypassing the fuse in the cable can cause cable fire.
- ▶ Do not remove or bypass the fuse in the cable.

- 
- Material damage due to the absence of a blade fuse in the cable!**
- ▶ Protect the positive wire (red) of the power supply cable by using a 15 A blade fuse (included).
  - ▶ The fuse must be installed professionally.
  - ▶ If the fuse is blown, replace it by a fuse of the same rating (15 A).
  - ▶ Eliminate the cause of the fault.

To ensure a reliable function of the turntable:

- ▶ Operate the turntable on the (12 V) vehicle battery or on a suitable power supply unit. The power supply unit must ensure a stable output voltage of 12 V, a continuous current of 5 A and 10 A (20 ms) surge current. The short-time power consumption may be up to a maximum of 7 A (for approx. 5 ms).
- ▶ Connect the power supply cable directly to the battery.

The power supply cable is connected to the ignition circuit by means of the wire marked “Zündung” (ignition). This ensures the automatic lowering of the turntable. The lowering takes place as soon as the vehicle ignition circuit is turned on.

- ▶ When connecting the turntable to the on-board power supply, make sure that the 12 V, earth and ignition wires cannot be disconnected by switches, as this could deactivate the automatic lowering function.

The turntable is lowered within 5 seconds after the ignition has been switched on, even if the CAP converter is switched off.

## Checks Before Departure

To ensure a safe journey:

- ▶ Always lower the turntable to the horizontal position (parking position) before starting a journey.
- ▶ After collision with fixed or moving objects, check if the turntable is still securely attached.
- ▶ As the turntable is subject to vibration loads during driving, check the system at regular intervals, depending on the frequency of operation, to ensure that it is firmly attached and tighten any loose parts.
- ▶ Do not exceed the maximum permissible speed of 130 km/h for vehicles with a receiver unit mounted on the roof.

## Turntable in Parking Position While Driving

- 
- During travel, the turntable must always be lowered to the horizontal position (parking position). As a reminder, stick the enclosed sticker where you will see it when you start your vehicle.

## Installation and Connection

For more information on mounting, see *Installing and Connecting the Turntable*, p. 40.

### Installing and Connecting the Turntable

#### Required Tools and Equipment

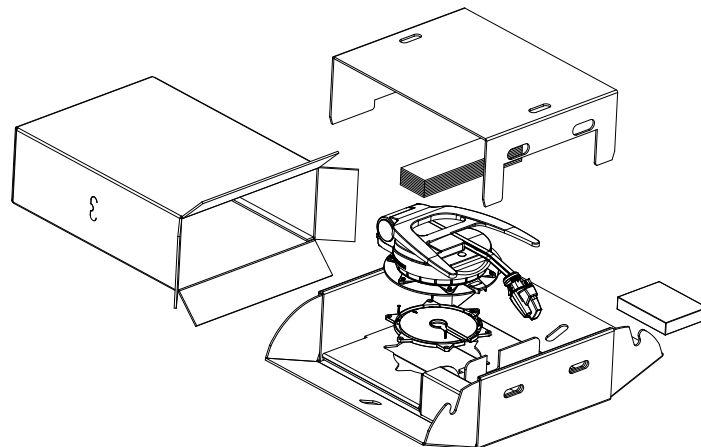
- Circular drill, Ø 38 mm
- Power drill
- The following screws, depending on the roof structure:
  - 6 sheet metal pan-head screws DIN 7981 – Ø 4.8 or
  - 6 pan-head screws DIN 7985 – M5 with washers and nuts  
(material: galvanized steel or stainless steel)
- Twist drill, Ø 2.5 or 5.5 mm
- Round file and/or emery paper
- Detergent
- Open-ended or ring spanners, 10 and 11 mm across flats
- Knife
- Crosshead screwdriver for M5 screws
- Torx screwdriver, size 20
- Torque wrench, capacity 5 to 11 Nm
- Hexagon socket key, 5 mm
- Two wooden beams to place the turntable on
- Sealing adhesive (not included)

#### Unpacking and Preparing



##### **Risk of material damage during transport!**

- ▶ Leave the turntable in the packaging to transport it to the vehicle roof.



Unpacking the turntable



- ▶ The packaging can be opened in the middle. This gives you better access to the fixing screws after the unit and the inserts have been removed from the packaging.
- ▶ Keep the original packaging: If it is necessary to send the unit for repair, use the original packaging to prevent transport damage. The manufacturer accepts no liability for possible damage due to insufficient packaging.

1. Loosen the six fastening screws (width across flats: 10 mm).
2. Carefully lift the turntable off the mounting plate and place it on the two wooden beams. Make sure that the cables are not crushed where they emerge from the underside of the turntable.

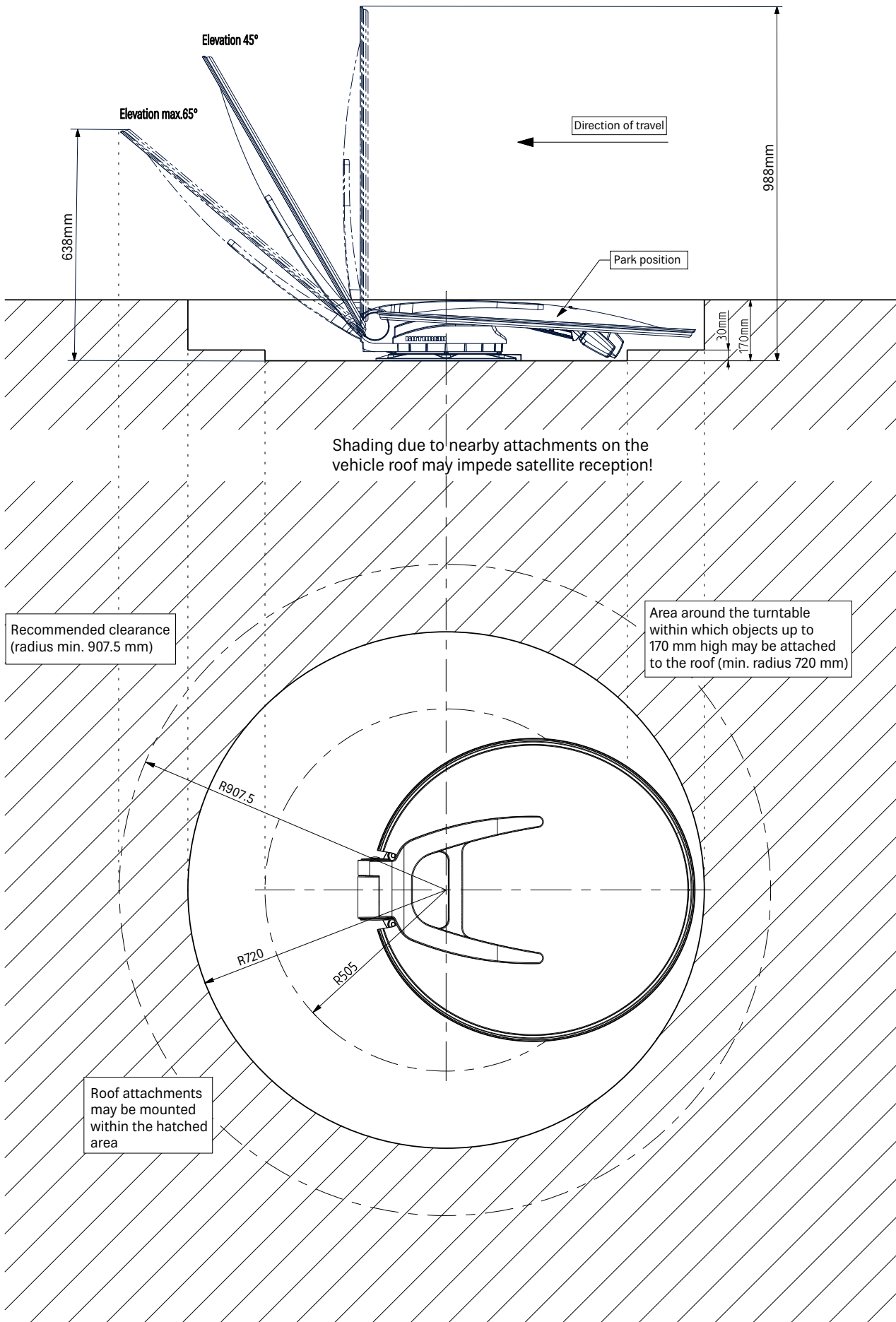
## Installing the Turntable

### Selecting the Installation Site

The cable lengths of the supplied components and parts allow free choice of the installation location on the caravan or motor home.

Observe the following points when selecting the installation location:

- ▶ Before installation, find out whether the operating manual for your vehicle permits the installation of non-vehicle-specific parts or which requirements must be met to do so.
- ▶ For good satellite reception, there should be no obstacles between the turntable and the satellite. Make sure that the turntable is not shaded by roof structures such as roof boxes, air conditioners, solar panels or similar.
- ▶ The problem of shading also applies when choosing a parking place for the vehicle. For interference-free satellite reception, the turntable needs a clear view to the south at an angle of 0° to 65° (depending on location) in relation to the horizontal plane.
- ▶ When selecting the installation position, observe the operating range of the turntable. There should not be any attachments on the roof within this operating range (risk of collision). To be on the safe side, keep slightly more than the required area free. This facilitates installation and any subsequent removal (see **Required free space on the roof**, p. 12).
- ▶ Choose an installation position on the roof that is as horizontal as possible or only slightly sloping, depending on the location of the vehicle, since roof inclinations greater than 5° may lead to problems when searching for the satellite. To ensure secure adhesion, the height difference of the roof curve should not be more than 1 cm over a length of 2 m, as otherwise the gap between the roof and the mounting plate would be too large to be filled by the sealing adhesive.
- ▶ As the vehicle is constantly subjected to vibration loads during travel, the roof below the turntable is also subject to significant loads. Please note, regarding the condition and load capacity of your vehicle roof, that the weight of the turntable is approx. **11.8 kg** (see the operating manual of the vehicle). If in doubt, consult a qualified specialist dealer or your vehicle's manufacturer.
- ▶ The roof gland provides a watertight seal through which the three cables (2 x coaxial cables and power supply cable) are fed into the interior of the vehicle directly underneath the turntable. If you prefer a different method of laying the cables, you can run them out from the rear of the turntable via the channel provided in the mounting plate. The cables must then be run along the roof of the vehicle in a protective cable duct and through a separate roof gland HDZ 100 (neither of them is included in the scope of delivery).
- ▶ The HDZ 100 roof gland is available as an accessory (order no. 20410032) from specialist dealers.

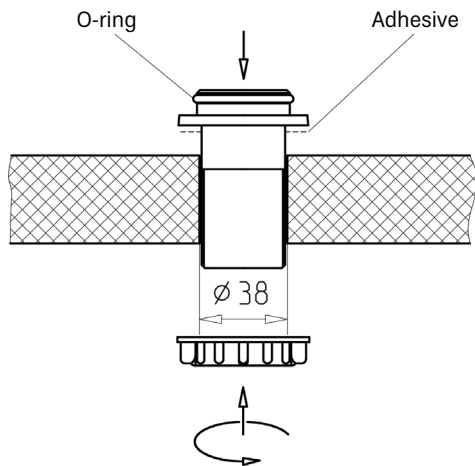


Required free space on the roof

## Installing the Cable Gland Underneath the Turntable



If you have previously used a Kathrein HDM 140/141 jointed tripod mast or another mast with a diameter of 34 mm, you can continue using the existing through hole in the roof. There is no need to enlarge this hole, as the roof gland also requires a borehole of 38 mm diameter.



Installing the cable gland

1. In the centre of the intended position of the turntable, drill the opening for the cable gland with a circular drill of 38 mm diameter.
2. Deburr the hole using a round file or emery paper.
3. Insert the roof gland provisionally into the drill hole (see  Installing the cable gland, p. 13).
4. Continue with: Installing the Mounting Plate, p. 13.

## Installing the Cable Gland Outside the Turntable



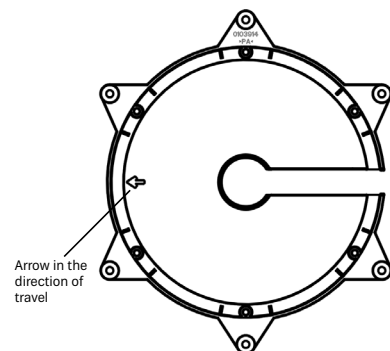
If a feed-through underneath the turntable, as described in Installing the Cable Gland Underneath the Turntable, p. 13, is not possible, you can use our external roof gland HDZ 100 to make an alternative feed-through.

1. When installing the external roof gland, please observe the HDZ 100 instruction manual. It can be found under <https://www.kathrein-ds.com/support/downloadbereich>.
2. Continue with: Installing the Mounting Plate, p. 13.

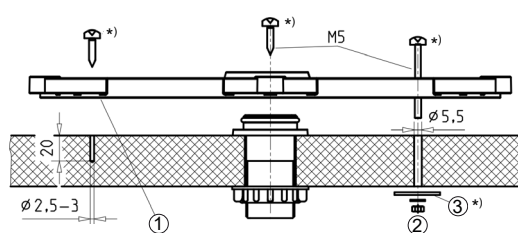
## Installing the Mounting Plate



The size of the holes and the choice of fastening screws to be used (not included) depend on the type and thickness of the materials used in the roof structure. If the roof panelling (plastic roof) is strong enough, it is recommended to use round head screws, plain washers and self-locking nuts to secure the mounting plate.

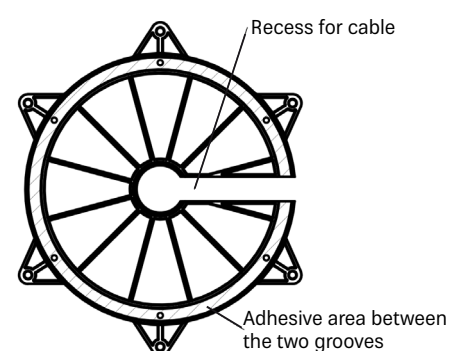


Aligning the mounting plate



- ① Adhesive area between the two grooves
- ② Alternative roof fastening
- ③ Washer (not included)

Fixing the mounting plate



Applying adhesive

**The mounting plate should always be screwed and glued on. Alternatively, having a certified specialist dealer glue on the mounting plate professionally may eliminate the need for screwing it on.**

1. Place the mounting plate on the roof of the vehicle so that the centre hole is aligned centrally to the cable gland. The **arrow symbol** must be visible from above and point forwards in the **direction of travel** (see  **Aligning the mounting plate**, p. 13).
2. Mark out the positions of the six circularly arranged mounting holes on the vehicle roof.
3. If the roof panel material is very thin and the insulation material does not provide sufficient support either, drill through holes (Ø 5.5 mm) into the interior of the vehicle and use sufficiently long galvanised M5 round head screws. Make sure to use a sufficiently strong counter support that can withstand the bolt loads (large washer or reinforcing plate).
4. Drill the holes required for fixing the mounting plate (see  **Fixing the mounting plate**, p. 13).
5. In addition to screwing on the mounting plate, support and roof gland, glue them onto the roof and seal them. To do this, use a sealing adhesive which is suitable for this purpose (e.g. DEKAsyl MS power adhesive). Pay attention to the following:
  - **Before working with the sealing adhesive, carefully read through the safety data sheet and the technical data sheet of the sealing adhesive!**
  - To ensure good adhesion, ensure that the surface is clean, dry and free of grease. Clean the roof surface in a radius of 35 cm around the borehole with a suitable cleaning agent and allow the surface to dry well.
6. Proceed as follows when gluing on the mounting plate and the support:
  - Before starting to work with the sealing adhesive, ensure that the processing temperature of the materials to be glued together and the sealing adhesive is between +5 °C and +35 °C. Prepare all necessary fastening elements and tools.
  - Prepare the sealing adhesive according to the enclosed instructions.
  - Pull out the roof gland (see  **Installing the cable gland**, p. 13) and apply the sealing adhesive evenly to the underside of the roof gland flange.
  - Insert the roof gland into the drilled hole and press it against the vehicle roof.
  - Apply the sealing adhesive evenly to the underside of the mounting plate, completely covering the area inside the circular groove (see  **Applying adhesive**, p. 13). Glue this area completely to the vehicle roof to achieve the necessary bonding force.
  - Place the mounting plate on the vehicle roof as you did before for marking the drill holes. Make sure that the arrow on the mounting plate points in the forward direction of the vehicle and that the fastening holes are aligned with the drilled holes.
  - Fasten the mounting plate using the prepared screws, evenly tightening the six screws in a diagonal sequence.



**Material damage by overtightening the screws!**

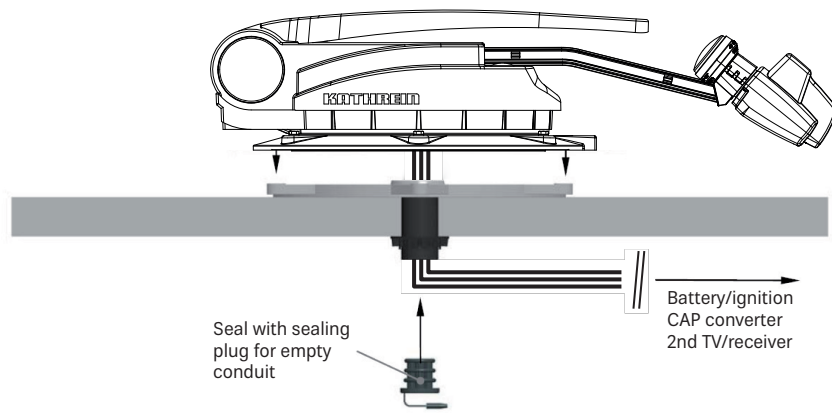
The sealing adhesive will fill small gaps resulting from the curvature of the vehicle roof. Applying too much force when tightening the screws may bend the mounting plate.

- Tighten the screws carefully.

- Use a clean colourless cloth to remove any sealing adhesive leaking from the sides. Pay attention to the following:
  - Do not use cleaning agents or thinners containing solvents, as this could damage the sealing adhesive applied underneath the mounting plate.
  - Soak the cloth in acetone or MEK. Test acetone or MEK on an inconspicuous spot first to be sure that it does not damage the surface.
  - Use only cleansing paste and water to clean your hands.
- Fasten the cable gland. To do this, screw on the enclosed knurled nut from inside the vehicle (see  **Installing the cable gland**, p. 13).
- Note that the curing of the sealing adhesive depends on the ambient temperature and humidity. The final adhesive strength can be found in the data sheet of the sealing adhesive. However, the next installation steps can be carried out without delay as the mounting plate is held by the screws.

## Cable Gland Underneath the Turntable

1. Feed the ends of the cables with the connectors as far as possible through the cable gland into the interior of the vehicle.
2. Lift the turntable and carefully place it on the mounting plate in the direction of travel (see  Cable gland underneath, p. 15). Do not step on the connectors or kink/crush the cables.
3. Align the through holes in the turntable with the threaded holes in the mounting plate. When lowering the turntable, make sure that the cables are fed through the cable gland and are not crushed.
4. Apply a little sealing adhesive to the six threaded holes in the mounting plate and screw the fastening screws into the threads. Tighten the screws to a torque of 6 Nm.
5. To prevent water vapour from inside the vehicle from entering the turntable through the roof gland, insert the three cables into the enclosed seal, fold it and insert it as far as possible into the roof gland. Make sure that no tensile load is acting downwards on the seal as this can cause it to fall out over time.



Cable gland underneath

## Cable Gland Outside the Turntable

The outer roof gland is designed as follows: The junctions of the three cables from the turntable and the extensions into the vehicle are arranged in a waterproof housing on the vehicle roof. If necessary, they can be separated again at this point (see  Cable gland outside, p. 15).

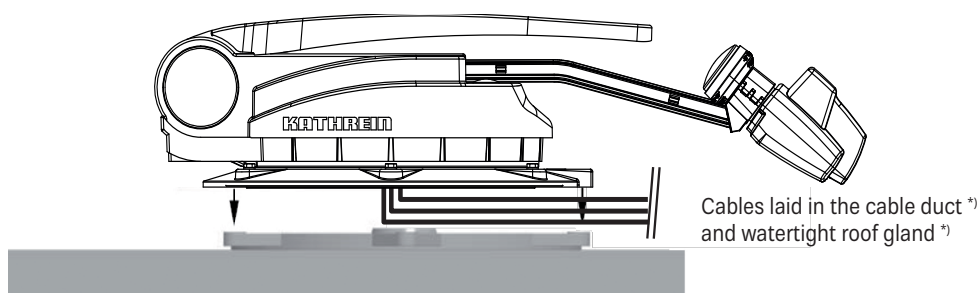
1. Organise the cables in the cable duct when placing the turntable onto the mounting plate. Untangle them and make sure that they are taut so that they cannot be crushed.



### Material damage due to pulling the cables out of the turntable!

- ▶ Do not pull the cables out of the unit.
- ▶ Do not install the roof gland in the area of the turntable.

2. Place the turntable carefully on the mounting plate. Make sure that the through holes on the turntable are perfectly aligned with the threaded holes on the mounting plate.
3. Apply a little sealing adhesive to the six threaded holes in the mounting plate and screw the fastening screws into the threads. Tighten the screws to a torque of 6 Nm.
4. When feeding the connecting cables through the HDZ 100 roof gland, make sure they are not crushed, kinked or damaged. Do not lay cables underneath the LNB.



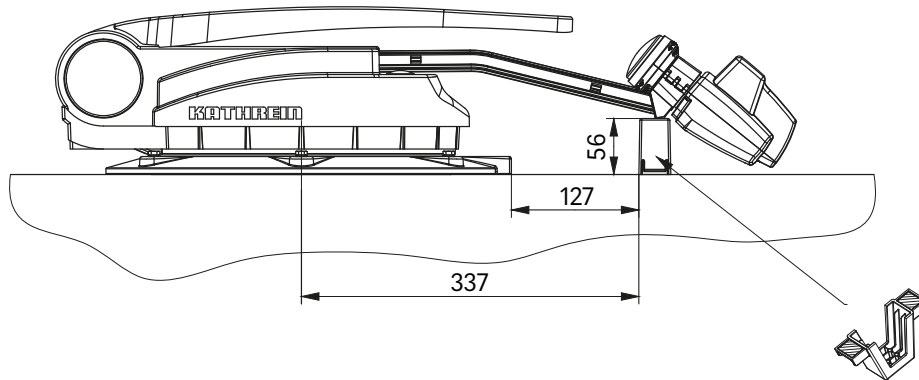
\*) Not included! The HDZ 100 roof gland is available as an accessory under order no. 20410032 from specialist dealers.

Cable gland outside

### Mounting the LNB Arm Support

To ensure that the LNB arm is securely fixed and that no vibrations can occur during travel, the LNB arm is seated on a support.

1. Select a mounting location for the support (see distances in  Mounting the LNB arm support, p. 16).
2. Mark the corner points of the support.
3. Apply sealing adhesive (e.g. DEKAsyl MS power adhesive) to both feet of the support and position the support (proceed as described in: Applying sealing adhesive and attaching the support, p. 40)



Mounting the LNB arm support

### Connecting the Turntable



#### Damage to cables from sharp edges and chafing points!

- Do not lay cables across sharp edges.
- Protect cables against possible chafing points.

Lay the master coaxial cable (marked red) to the control unit (CAP converter - "Antenna/IF Input") and the slave coaxial cable to a second TV with integrated SAT tuner or receiver (if available).



If you are not using a receiver, we recommend that you lay the second slave coaxial cable anyway, so that you can use it later if necessary.

- Lay the power supply cable of the turntable (3-pin plug) to the battery. Use the supplied power extension cable if necessary.
- Connect the master coaxial cable to the "Antenna/IF INPUT" connector on the rear panel of the control unit (CAP converter). Use the coaxial extension cable if necessary.
- Make sure that all voltage feeds to the individual devices are protected with suitable fuses and have been professionally installed. Make sure that all fuses are intact. If a fuse blows, the source of the fault must first be eliminated. The fuse may only be replaced by a fuse with the same rating.



#### Risk of severe injuries due to cable fire!

- Never bypass the fuse in the cable.

- At the connecting point for the power cable, the voltage must not fall below 11.5 V even with a higher load. Should this nevertheless be the case, optimum functioning can no longer be guaranteed.
- **Only for motor homes:** The third, green core of the connecting cable, marked "ZÜNDUNG" (ignition), allows the connection to a circuit in the vehicle that is activated when the ignition key is turned and then carries a continuous 12 V supply voltage. This connection ensures that the turntable is automatically lowered to the parking position when the engine is started (the CAP converter does not have to be turned on for this).
- Make sure that the 15 A fuse was expertly installed to the positive conductor (red) of the power supply cable.



## Malfunction and material damage due to reversed polarity!

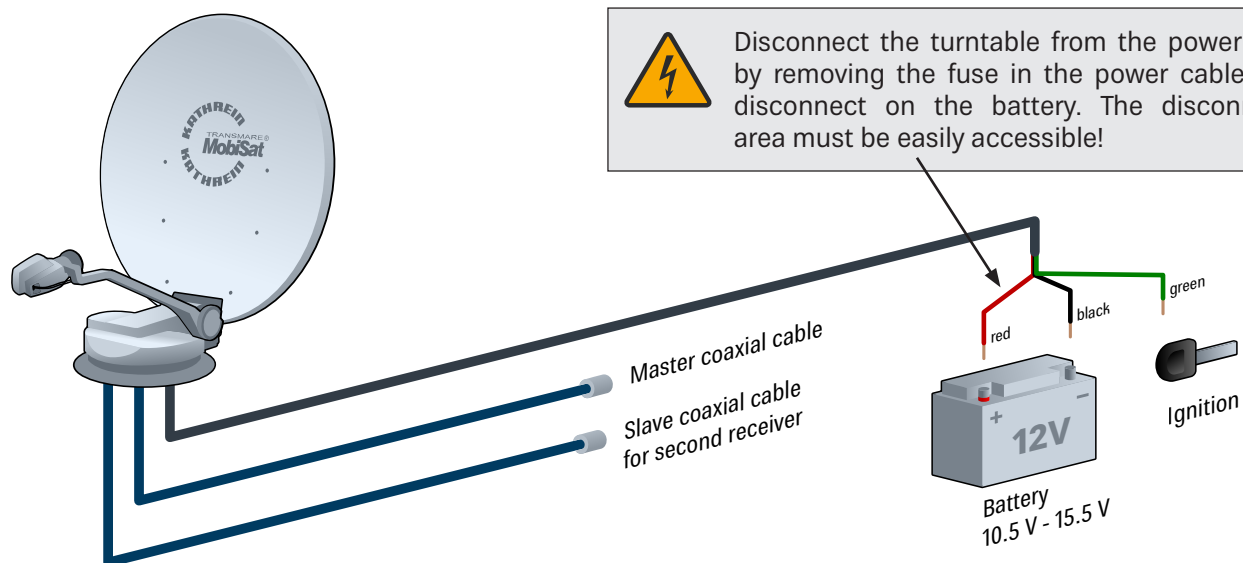
When connecting the power cables, reversed polarity can lead to thermal overload and damage to components when the equipment is powered up. If the earth (-) of the ignition signal and the earth (-) of the vehicle battery for the turntable do not have the same potential, the automatic lowering of the turntable will not work!

- ▶ To ensure sufficient power supply to the automatic turntable, connect the current-carrying wires (red, black) directly to the vehicle battery.
- ▶ In order for the turntable to lower automatically into the parking position, connect the green cable to the ignition and the black cable to the vehicle battery.
- ▶ The supplied fuse must be connected between the positive pole of the battery and the red cable of the turntable.
- ▶ For operation with two batteries, ensure that the earth of the ignition signal has the same potential as the earth of the vehicle battery for the turntable.
- ▶ Never reverse the poles (+ and -) when connecting the power cables (CAP converter and turntable) to the vehicle electrical system.

## Functional Instructions for Connection to the Vehicle Electrical System

Problems may occur if the devices are connected to different connection sockets or circuits/earth potentials. It is recommended to connect the connection sockets for the CAP converter to the same cable. Check the current carrying capacity of the circuit used with respect to the intended application.

### 12 V Battery Wiring Diagram



The complete wiring diagram of the CAP 850 GPS (turntable with control unit) can be found under **Overall Wiring Diagram**, p. 39.



For operation with two batteries, ensure that the earth of the ignition signal has the same potential as the earth of the supply battery for the turntable. Otherwise, the automatic lowering function will not work! Do not reverse the polarity of the cable!



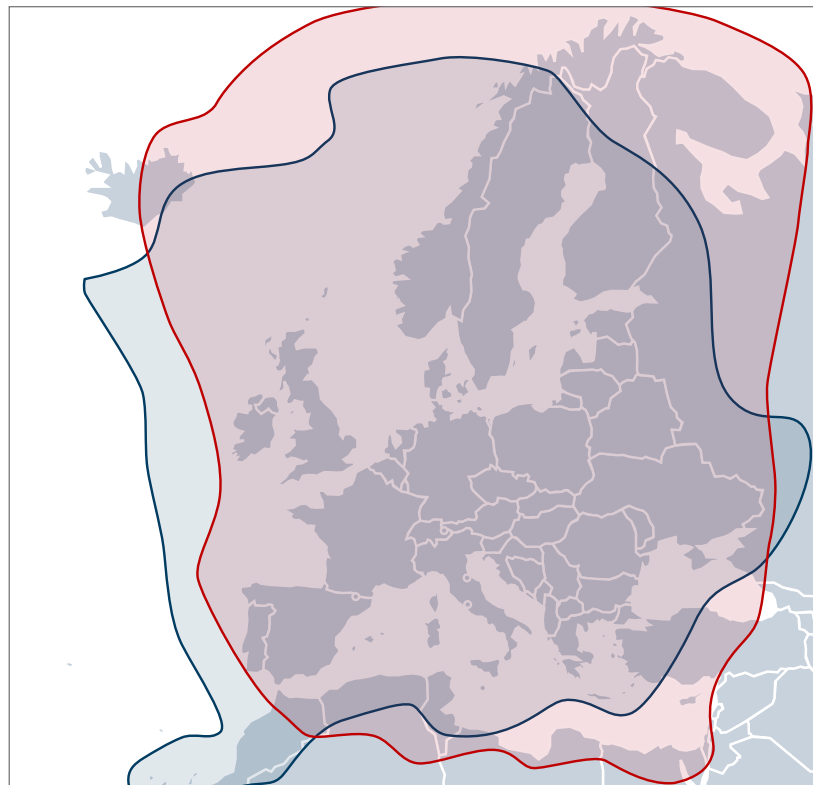
To ensure that the GPS data can be read and that the turntable is automatically lowered to the parking position, connect the green wire to the ignition and the red and the black wire to the supply voltage.

## Reception Range/Footprint

The footprint is the reception area on earth which the satellite covers with its transmission beam (spot) and in which satellite reception is possible. The transmission power is at its highest in the centre of this spot – it becomes progressively weaker towards the edges.

Preferably align your turntable with the position of the ASTRA satellites 19.2° East (blue footprint) or EUTELSAT/ HOTBIRD 13° East (red footprint). The spots for these satellites are shown below.

The blue footprint in the picture below shows the entire area covered by the ASTRA satellite with all transponders.



■ ASTRA 19.2° East     ■ Hotbird 13° East

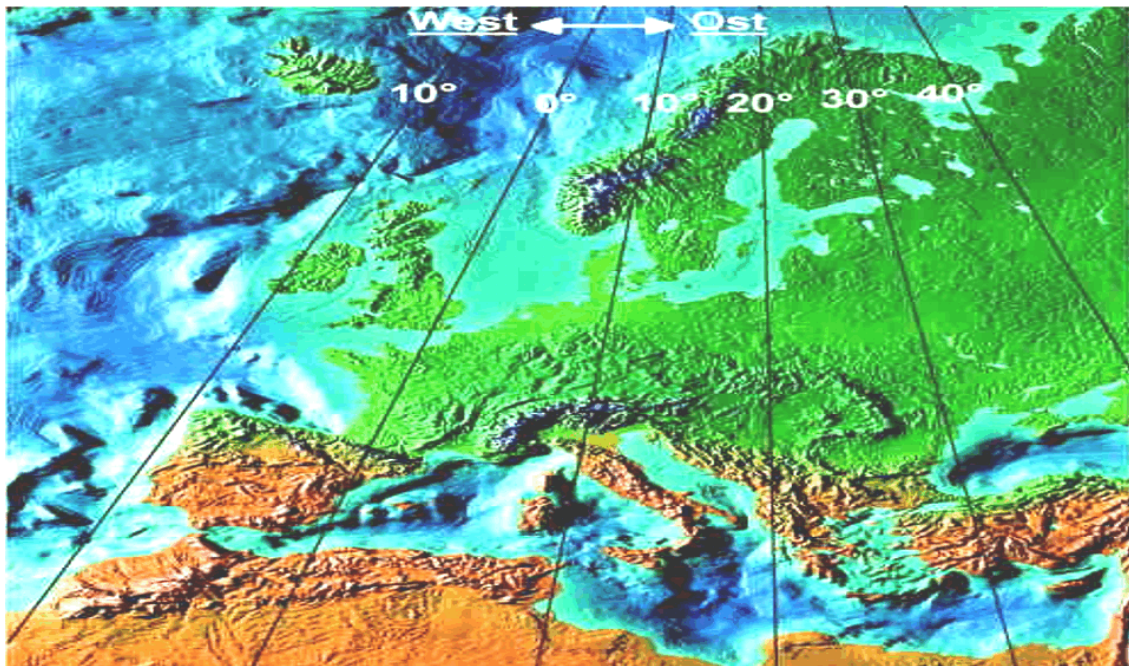
## Polarisation Setting

### Polarisation Setting Explained

The LNB of the turntable is factory-set to the polarisation setting 0. In this position, you can still receive signals from satellites with deviations of 15° to 20° <sup>1)</sup>. For larger deviations it may be useful to set the required polarisation angle by rotating the LNB.

**!** We expressly point out that positioning the LNB at a deviation of up to +45° or up to -45° from the centre position only makes sense if a satellite to the far west or the far east is actually to be preferred for reception.

The respective setting angle required for the polarisation can be found in the following table.



| Country        | HOTBIRD 13° East | ASTRA 19.2° East | ASTRA 28.2° East |
|----------------|------------------|------------------|------------------|
| Sweden         | -8               | -7               | -3               |
| Norway         | -8               | -7               | -3               |
| Germany        | -6               | 0                | 7                |
| France         | 2                | 8                | 13               |
| England        | 4                | 6                | 11               |
| Turkey         | -25              | -19              | -12              |
| Southern Italy | -8               | -3               | 9                |
| Southern Spain | 15               | 20               | 27               |
| Portugal       | 16               | 22               | 29               |
| Belgium        | -3               | 4                | 8                |
| Greece         | -19              | -13              | 0                |
| Austria        | -6               | 0                | 7                |
| Switzerland    | -6               | 0                | 7                |

<sup>1)</sup> Deviation between the longitude of the desired reception area and the orbit position of the satellite

## Safety Instructions



Observe the Safety Instructions and General Notes, p. 7.



**Risk of material damage due to obstacles in the range of rotation or malfunction due to incorrect setting!**

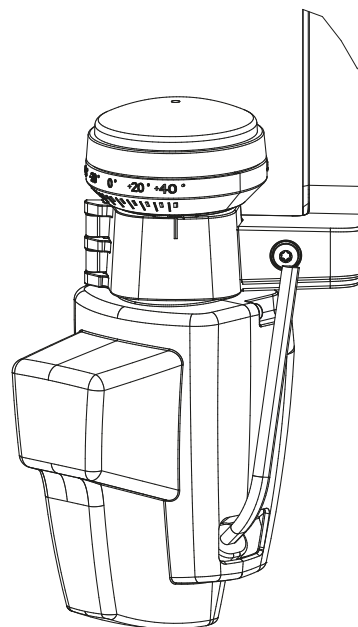
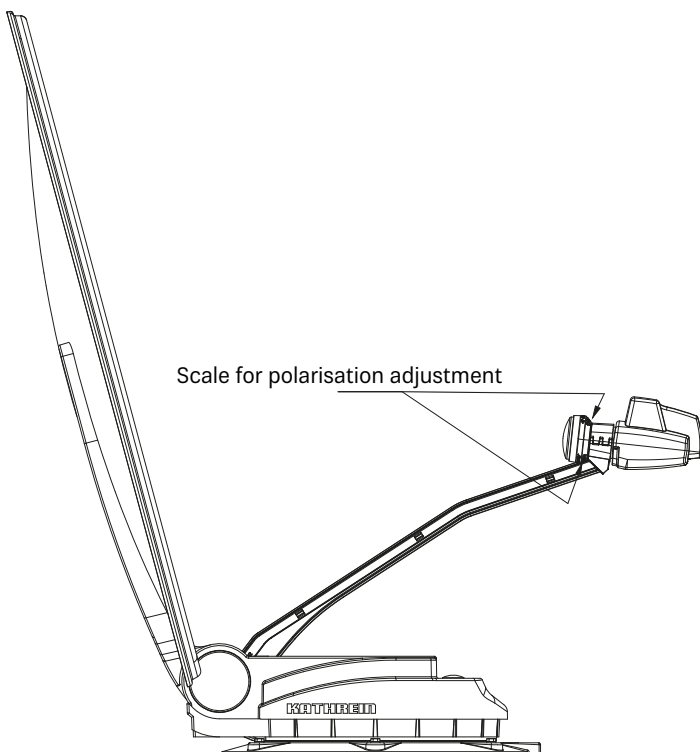
- Make sure that there are no obstacles in the range of rotation of the turntable.
- Do not alter the settings of the LNB yourself if you are not familiar with the setting operations. Contact a technician or try to find a technically skilled person to do the settings.

## Setting Operations

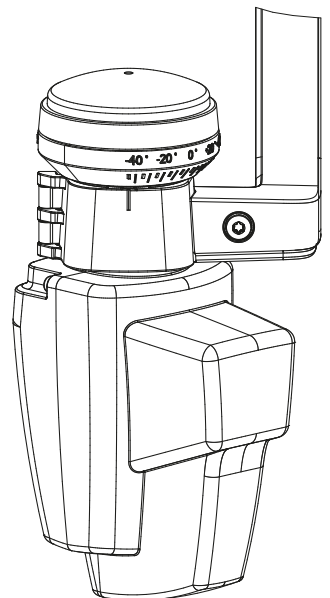
The following description assumes that the complete turntable has been properly assembled, installed and set up as described in the previous sections.

The turntable is disconnected from the power supply.

1. Use a Torx screwdriver size 20 to loosen the fixing screw of the clamp on the LNB.
2. Rotate the LNB by the desired degree.
3. Retighten the fixing screw with a torque of 3.3 - 3.5 Nm.
4. Leave the installation location.
5. Reconnect the turntable to the power circuit.
6. The turntable is ready for use.



View after installation +45°



View after installation -45°

## What to Do in the Event of Faults

### Removing the Turntable for Repair

If repairs to the system or individual components are necessary, contact your specialist dealer or our service centre.



#### **Risk of injury from opening the turntable!**

- ▶ Never open the turntable.



#### **Material damage to the unit by cutting cables!**

- ▶ Never cut the cables.
- ▶ Disconnect the cables protruding from the turntable from the cables laid inside the vehicle at the designated cable junction. To do this, disconnect the plug of these cables.



Observe the Safety Instructions and General Notes, p. 7.

1. Remove the parabolic reflector



2. Move the turntable to the parking position and disconnect it from the power supply and the CAP converter.



3. Loosen the six M6 screws which secure the turntable to the mounting plate.



4. Remove the turntable from the mounting plate.



5. Pull the cables out through the roof gland.

6. Use the original packaging to ship the turntable.

7. Seal the opening in the vehicle roof appropriately to protect it against the ingress of moisture.

8. When using the HDZ 100 roof gland, close the cable ducts that are no longer in use with the integrated dummy plugs after removal.

## Manually Lowering the Turntable to the Parking Position

- ! Risk of material damage due to a defect in the electronic controls!**
- In the event of a defect in the electronic control system, the turntable cannot automatically move to the parking position. After some disassembly work, the turntable can be manually folded into the park position. Before manually folding in the turntable, note the following:
- ▶ If you drive to the nearest garage with the turntable raised, drive slowly and remember that the vehicle is **+99 cm** higher than usual. **Driving to the nearest garage is safer than manually folding in the turntable!**
  - ▶ Do not attempt to manually fold in the turntable yourself if you are not familiar with repair work. Contact a technician or try to find a technically skilled person.
  - ▶ Have the turntable recalibrated by an authorised garage after it has been manually folded into the parking position.



### **Risk of severe injuries when disassembling the turntable on the vehicle roof!**

- ▶ Do not hold onto the turntable, as the rocker will come free during disassembly.



### **Risk of severe injuries from moving or falling parts or crushing!**

When removing the screws from the turntable, the rocker may come loose very suddenly.

- ▶ Before uninstalling the turntable, always disconnect it from the power supply.
- ▶ Secure and support the turntable to prevent it from tipping over.



Observe the Safety Instructions and General Notes, p. 7.



1. Lever out the plastic cap in the centre of the axle using a narrow flat-bladed screwdriver.  
→ You will see an M8 hexagon head screw (width across flats 13 mm).
2. Remove the M8 hexagon head screw using a socket wrench (width across flats 13 mm).  
→ Another thread becomes visible.



3. Screw an M12 x 40 screw (minimum length: 40 mm) into this thread.  
→ The rocker on the cone of the tapered shaft is loosened and the locking mechanism is released.



### **Damage on the unit!**

- ▶ Screw in the M12 screw only as far as is necessary to loosen the rocker on the cone of the tapered shaft.



Fold the antenna into the parking position.

4. Remove the M12 screw.

→ The rocker can be put back on the tapered shaft.

5. Screw the M8 screw back in and tighten it.



6. Insert the plastic cap.

**Rocker displacement**

Loosening the rocker from the tapered shaft changes the zero position of the rocker.

► Have the rocker recalibrated by an authorised specialist dealer.

7. Contact an authorised specialist dealer.

## Updating the Turntable via the CAP converter

The turntable can only be updated manually via the CAP converter. The procedure is described in the service manual.

### GPS Signal

The turntable is equipped with GPS: After receiving a valid GPS signal, the inclination angle of the turntable is automatically adjusted. This eliminates the need to enter the location and considerably reduces search times after a major change of location!

► In order to receive a GPS signal, the turntable must be moved into parking position and connected to the 12 V on-board power supply.

If the turntable does not receive a valid GPS signal, the location can be entered as usual via the HDS 50 control panel or the CI-BUS control panel.

**Note!**

As soon as a valid GPS signal is received, the location display in the CI-BUS control unit is no longer active!

The GPS signal can also be obtained via your smartphone/tablet in conjunction with the CAPcontrol app. To do so, connect the CAP converter to your smartphone/tablet via the UFZ 132. The turntable now automatically retrieves the GPS signal from your mobile device (provided GPS on your smartphone/tablet is switched on).

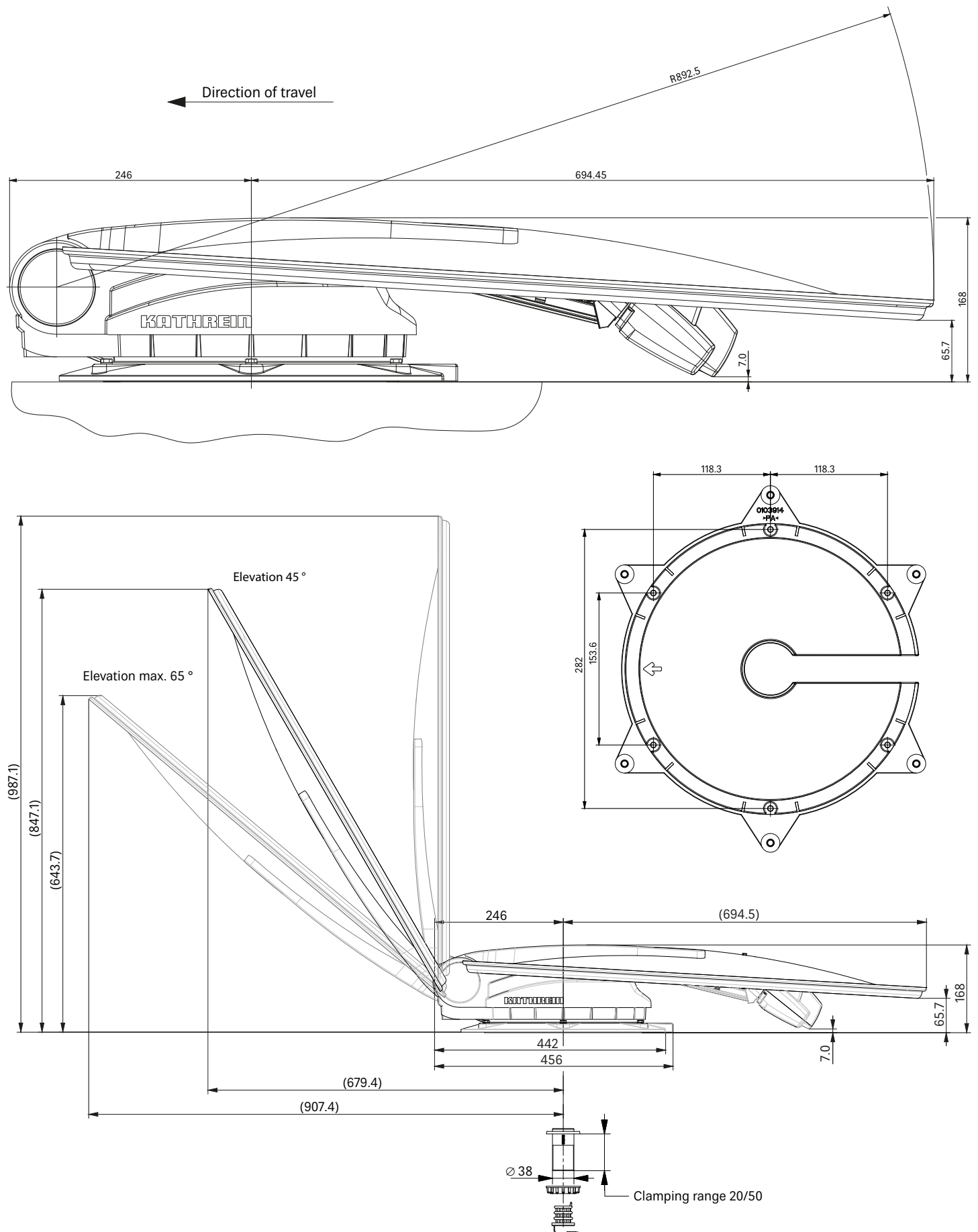
## Technical Data and Dimensions

### Technical Data

| Type / Order No.                                         |          | HDP 850 GPS / 204500003<br>CAP 850 GPS / 203500001      |
|----------------------------------------------------------|----------|---------------------------------------------------------|
| LNB                                                      | V<br>kHz | 2 switchable outputs:<br>V/H (14/18)<br>Low/High (0/22) |
| Supply voltage LNB                                       | V        | Vertical: 11.5 – 14<br>Horizontal: 16 – 19              |
| Input frequency                                          | GHz      | 10.70 – 12.75                                           |
| Output frequency                                         | MHz      | 950 – 1950/1100 – 2150                                  |
| Oscillator frequency (L. O.)                             | GHz      | 9.75/10.60                                              |
| Figure of merit (G/T) at 11.3/12.5 GHz                   | dB/K     | 13.3/13.7                                               |
| Supply voltage (car battery)                             | V        | 10.5 – 15.5                                             |
| <b>Power consumption from the 12 V electrical system</b> |          |                                                         |
| Inrush current                                           | A        | Typically 4, max. 7                                     |
| Duration of the inrush current                           | ms       | Approx. 5                                               |
| Satellite search                                         | A        | Typically 3.5                                           |
| TV reception                                             | A        | Typically 1.2                                           |
| Standby                                                  | mA       | < 30                                                    |
| Current consumption from the CAP converter               | mA       | Typically 160                                           |
| <b>Setting range</b>                                     | °        |                                                         |
| Elevation                                                |          | 0 – 140                                                 |
| Azimuth                                                  |          | 0 – 370                                                 |
| Skew                                                     |          | ± 45                                                    |
| Max. permissible wind speed during the reception         | km/h     | 70                                                      |
| Weight of the turntable with parabolic reflector         | kg       | 11.8                                                    |
| Permissible ambient temperature                          | °C       | -20 to +45                                              |
| Packing unit/weight                                      | pc./kg   | 1/22                                                    |
| Ignition signal                                          | V        | 10.5 – 15.5                                             |
| Search time for first satellite                          | s        | Typically 10 – 60                                       |
| Search time for further satellites                       | s        | Typically 2 – 30                                        |
| LSP <sup>1)</sup> search time                            | s        | 2 – 15                                                  |

<sup>1)</sup> LSP = Last Satellite Position

## Dimensions



## Important Information

In the following operating instructions, we assume that the CAP converter and the turntable have been properly installed and connected. If you have not already done so, read the safety instructions in this installation and operating manual and observe them when handling the CAP converter and the turntable!



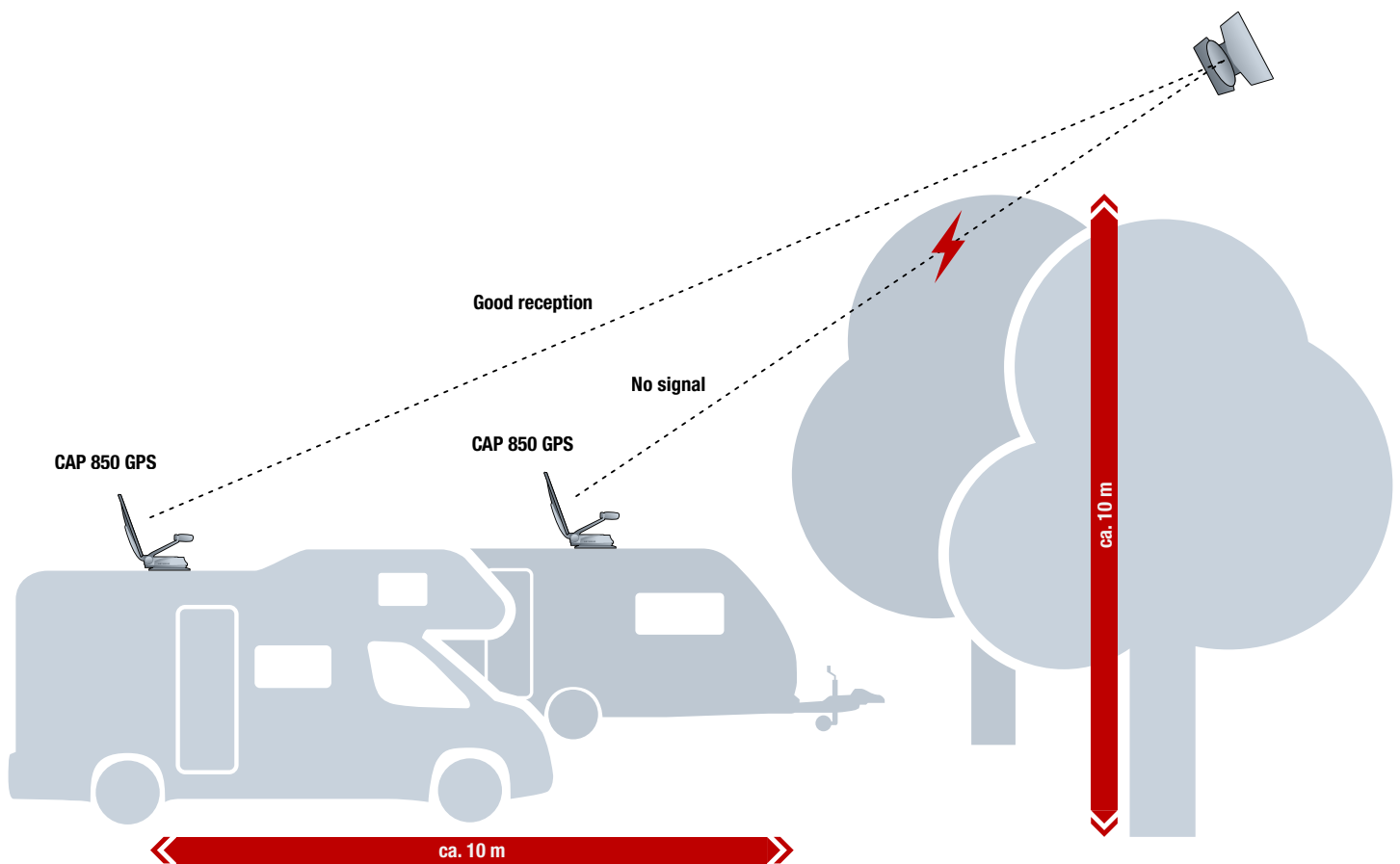
Your location has a clear view of the satellite positions to the south and is not shaded by trees or other obstacles (see  **Correct location of caravan/motor home, p. 26**).



### **Malfunctions and material damage to the unit due to overheating of the turntable motor!**

If the turntable motor operates without interruption for longer than 20 minutes, it may overheat. None of the automatically initiated search procedures requires as much as 20 minutes of operation. Only repeated unsuccessful search procedures or manual overrides by the user can cause this limit to be exceeded.

- ▶ Do not let the turntable motor run continuously for longer than 20 minutes.



Correct location of caravan/motor home

## Control Unit

### Safety Instructions and General Notes



#### **WARNING!**

**Risk of death due to electric shock and risk of fires resulting from electric current. Note the following points:**  
**12 V connection (vehicle power supply)**

- ▶ Make sure that the 12 V connection cable (power supply cable) is not reversed and damaged during installation.

#### **Power supply unit**

- ▶ Make sure that the power supply unit (power supply cable) is not damaged or does not become damaged.
- ▶ A unit with a damaged power supply unit must be disconnected from the mains (pull the mains plug!) and repaired by an electrical specialist before being used again.

#### **Power supply voltage**

- ▶ Operate the unit only at the specified mains voltage. The mains voltage is shown on the rear of the unit and on the power supply unit.
- ▶ The unit may only be connected to the mains and turned on once it has been connected to the turntable and the TV set or the cable network and the PC.

#### **Accessibility of the mains socket**

- ▶ Place the device close to an easily accessible power outlet so that you can disconnect the device from the power supply at any time.



#### **Playing children**

- ▶ Make sure that children do not insert any objects into the ventilation slots.

#### **Cleaning**

- ▶ Unplug the connection cable/power supply unit before cleaning the unit.
- ▶ Do not open the unit.
- ▶ Do not insert any objects into the ventilation slots.
- ▶ Use a dry cloth for cleaning.
- ▶ Restrict cleaning to the outer surface of the unit.

#### **Ambient conditions**

The CAP converter and the power supply unit are for indoor use only.

- ▶ Protect the unit from moisture, dripping and splash water.
- ▶ Do not operate the unit in damp rooms.
- ▶ Only use the unit in a moderate climate, not in tropical conditions.
- ▶ Do not place any liquid-filled objects (such as vases) on top of the unit.



#### **Overheating**

Observe the following points, so that the heat generated in the unit is adequately dissipated.

- ▶ Unless otherwise specified in the supplied instructions, maintain the following clearances around the unit: 20 cm above, 2 cm to the side and 5 cm to the front and back.
- ▶ Never cover or block the ventilation slots or the fan of the unit, e.g. with other equipment, magazines, tablecloths, clothing or curtains.
- ▶ Do not place any objects on top of the unit.
- ▶ Do not place the unit near the heater and do not place naked flames, such as candles, on the unit.
- ▶ Do not expose the unit to direct sunlight.

**Effects of waste heat from the unit**

- ▶ Every electronic device generates heat. The temperature rise of the unit lies within the permissible range. Sensitive furniture surfaces and veneers may, however, discolour over time due to constant exposure to heat.
- ▶ The feet of the unit can cause colour changes on treated furniture surfaces. To avoid possible discolouration, place the unit on a suitable, firm and level surface.

**Incorrect wiring of the connections**

Incorrect wiring of the connections can lead to malfunctions or defects in the unit.

**Data loss and software damage if the CAP converter is disconnected from the mains during operation.**

Always wait until the control unit is in standby mode before disconnecting it from the vehicle power supply or mains. This ensures that any data that is new or has been changed will be saved by the control unit.

**Long periods of absence or storms**

In case of prolonged absence or thunderstorms, always switch off the unit (from stand-by mode) at the mains switch.

**How to use these instructions**

- ▶ Read the instructions carefully before setting up the unit.
- ▶ Keep the instructions for future reference and pass them on to any new owner.

**Updates**

The information in this manual was correct at the time of going to press. However, we reserve the right to make changes at any time without prior notice. If new software which affects the information in this manual (e.g. changes to functions) is released for your CAP converter, we will, if we consider it necessary, provide a new manual for download at [www.kathrein-ds.com](http://www.kathrein-ds.com).

**Repair**

Make sure that repairs to the unit are only carried out by qualified personnel.

- ▶ Improper work on the unit can impair its electrical safety.
- ▶ The manufacturer accepts no liability for accidents caused by the user opening the unit.
- ▶ Opening the unit and attempting to repair it yourself voids all warranty claims.

## Installation and Connection

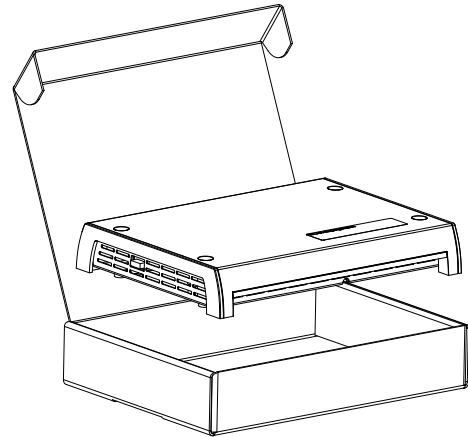
For more information on the installation, see *Installing and Connecting the Turntable*, p. 40.

### Installing and Connecting the CAP converter

#### Unpacking and Preparing



- ▶ The packaging of the CAP converter can be opened at the front. The converter is packed in an antistatic fleece; remove this fleece.
- ▶ Keep the original packaging: If it is necessary to send the unit for repair, use the original packaging to prevent transport damage. The manufacturer accepts no liability for possible damage.



#### Selecting the Installation Site



When choosing the place of installation, bear in mind that the rear of the CAP converter should always be accessible. The CAP converter is equipped with a power saving circuit, which means that the unit does not need to be placed where it is visible. This allows you to install the CAP converter out of sight in any position, e.g. on cabinet walls, side panels or storage shelves.

The four screw holes make it possible to place the CAP converter on a firm horizontal surface but also to screw it on in any desired position.

When choosing the installation place, observe the following:

- The wall thickness of the installation surface must be at least 15 mm, as otherwise the screws will break through on the other side or damage the surface.
- The cabinet or storage compartment in which the unit is to be installed must be sufficiently ventilated to prevent heat accumulation. Carpet-covered walls are unsuitable for installation.
- When screwing in the screws, do not damage any cables or similar that are laid behind or in the installation wall.
- The CAP converter is exclusively intended for installation in dry indoor areas.
- The cable lengths must be taken into account when choosing the installation place.
- Strain-relieve the connecting cables.

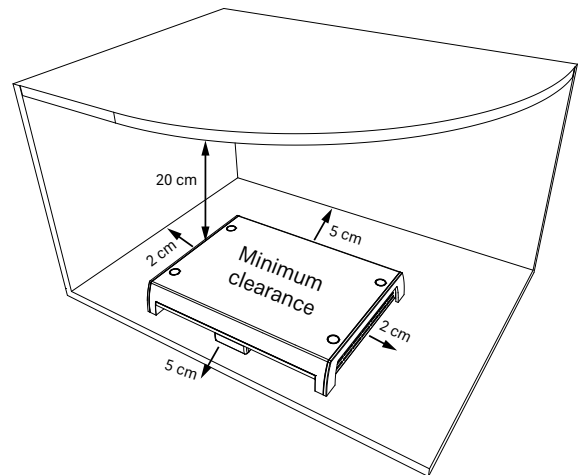
#### Connections and fuses

All connecting cables are connected to the rear of the CAP converter. Viewed from the front, there is a fuse inserted from the outside on the left side of the CAP converter. This fuse must also be accessible after installation of the CAP converter so that it can be easily replaced if necessary. For more information about the type of fuse, see the sticker on the CAP converter and the fuse itself.

## Ventilation

The heat generated in the CAP converter is dissipated on all sides of the housing. When selecting the installation place, make sure that these sides are not obstructed or covered. If the device is permanently insufficiently ventilated, this can have a negative effect on the service life of the device!

Maintain a clearance of at least 20 cm above/below, 2 cm to each side and 5 cm behind and in front of the device to allow unobstructed heat dissipation.



### Material damage due to insufficient ventilation!

The device monitors its own operating temperature. Continuous operation of the device above the recommended operating temperature due to insufficient ventilation can lead to premature failure of the device. This is not a warranty/guarantee case!

The CAP converter may only be operated at the recommended operating temperature.

## Important Instructions for Installation



### Danger to life due to high voltage!

Wood screws can come into contact with live parts and cause danger to life through electric shock.

- Never use the wood screws to install the CAP converter on another electrical appliance (e.g. TV set).



### Material damage to the device due to countersunk screws!

- Never use countersunk screws for installation.



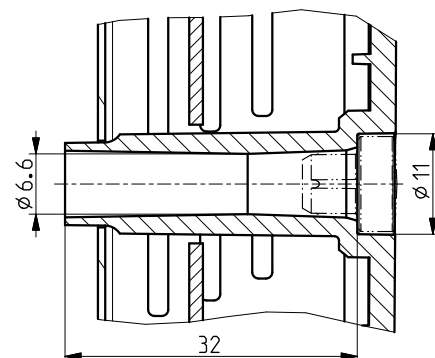
### Material damage to the device and malfunction due to overheating!

If the CAP converter is installed on another electrical device (e.g. TV set), the mutual heating can lead to overheating.

- Before installing the CAP converter on another electrical device, ask the manufacturer of the device or refer to the documentation supplied with the device to find out whether this is permissible and, if so, which aids (screws etc.) are required/may be used.

## Using other screws

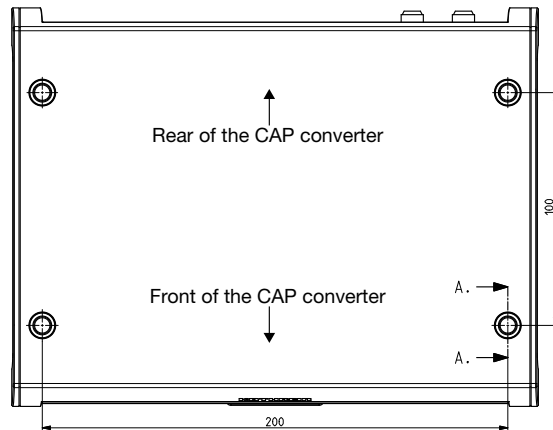
If the supplied screws cannot be used due to the installation place or the condition of the installation place, please refer to the figure on the right to select the correct screws. It shows a cross-section of the screw holes of the CAP converter. It also specifies the required characteristics of the fixing screws that are inserted into the bracket of the CAP converter, e.g. diameter, type of screw head, etc.



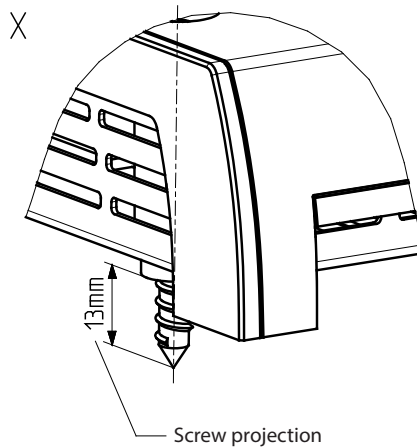
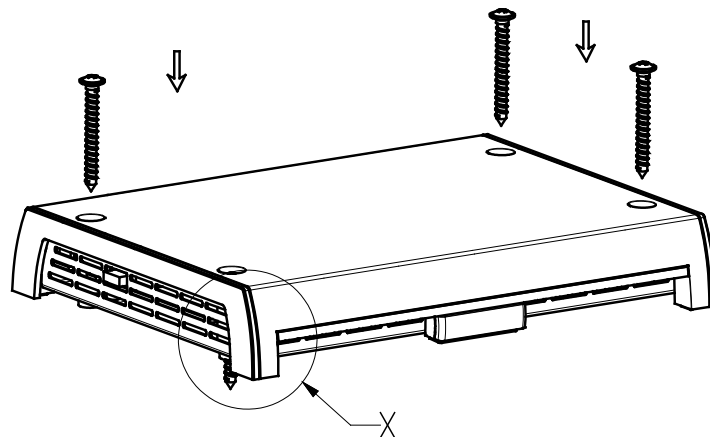
## Installing the CAP Converter

The distances of the drilling points can be seen in the diagram below.

**! Material damage to the device by overtightening the screws!**  
If you apply too much force when tightening the screws, you may damage the screw holes and the housing of the CAP converter or any cables already connected to it.  
► Tighten the screws carefully.



Installation on a wooden surface:



## Installing the CAP Converter on the Rear Panel of a TV Set



### Danger to life due to high voltage!

Screws that are screwed in too deeply may damage the TV set beyond repair and cause danger to life through electric shock.

- ▶ Before starting any installation work, disconnect all units from the mains.
- ▶ Before installing the CAP converter, check with the manufacturer of the device or in the documentation supplied with it whether this is permissible, and if so, what aids (screws, etc.) are necessary or can be used.



### Material damage and risk of injuries due to overheating of the devices and fire!

- ▶ Do not install the CAP converter between a TV set and a wall bracket.
- ▶ Only install the CAP converter on the rear panel of a TV set if the TV sits on a stand that is fixed somewhere else.

Only two screws are required to secure the CAP converter to the rear panel of the TV set. Before installing the CAP converter, note the following:

- The TV set must have one of the following hole patterns for wall brackets on its rear panel: 100 x 100; 100 x 200; 200 x 200 or 200 x 400. If this is not the case, a VESA adaptor plate can be obtained from a specialist dealer.
- Before mounting the CAP converter, read the chapter on wall mounting in the operating manual of your TV set to find out about the screw diameter (M4, M6 or M8) and the permitted screw-in depth.

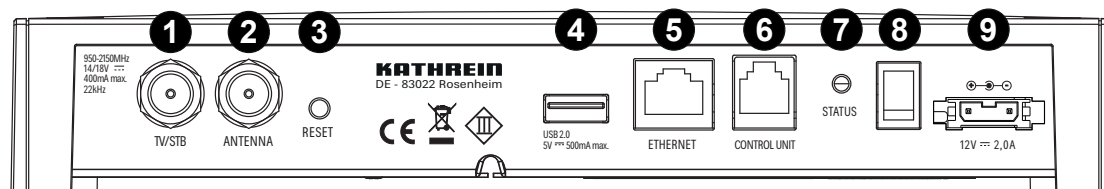
## Connecting the CAP Converter



The CAP converter may only be operated with a supply voltage of 10.5 - 30.0 V. The earth connection of the CAP converter must be connected to the negative pole of the motor home or caravan battery. Disconnect the vehicle electrical system (main switch "off" or disconnect the positive pole from the vehicle electrical system battery) before starting the following work.

- Connect the master coaxial cable (coming from the turntable) to the F socket "IF Input", on newer units "Antenna", at the rear of the CAP converter.
- Connect the "IF Output" socket, on newer units "TV/STB", of the CAP converter and a receiver or TV set with integrated tuner to a coaxial cable.
- Connect the supplied power cable (depending on the power supply available in your motor home or caravan, 12 V or 230 V with mains adapter) to the "12 V 2.0 A" plug-in connection of the CAP converter.
- Check the connections before you reconnect the on-board power supply.

### Connections on the CAP converter

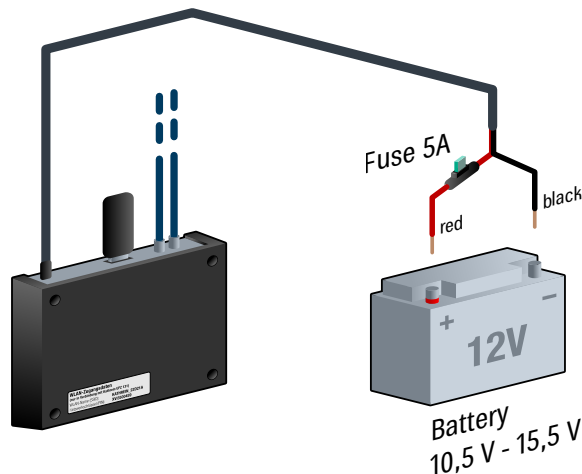


- |                |                                                 |
|----------------|-------------------------------------------------|
| ① TV/STB       | Output satellite signal to TV/receiver          |
| ② ANTENNA      | Input satellite signal from the turntable       |
| ③ RESET        | Reset button                                    |
| ④ USB 2.0      | Type A USB port                                 |
| ⑤ ETHERNET     | Network socket, RJ 45                           |
| ⑥ CONTROL UNIT | Connection for push-button/HDS 50/HDS 52, RJ 12 |
| ⑦ STATUS       | Status LED to indicate the operating status     |
| ⑧ Power switch |                                                 |
| ⑨ 12 V 2.0 A   | Power supply                                    |

## Functional Instructions for Connection to the Vehicle Electrical System

Problems may occur if the devices are connected to different connection sockets or circuits / earth potentials. If none are available, it is recommended to connect the connection sockets of the turntable to the same cable. Check the current carrying capacity of the circuit used with respect to the intended application.

### 12 V Battery Wiring Diagram



The CAP converter should be protected by a 5 A fuse. This is to be connected between the red connection cable and the battery.

The complete wiring diagram of the CAP 850 GPS (turntable with control unit) can be found under **Overall Wiring Diagram**, p. 39

## Operating the CAP Converter

### External Pushbutton

Plug the included Kathrein push button into the CONTROL UNIT RJ12 socket ⑥ on the CAP converter (see **Connecting the CAP Converter**, p. 32).

### Moving the Turntable from the Parking Position

Press the button

- The turntable moves to the last satellite position.

### Moving the Turntable to the Parking Position

Press the button

- The turntable moves to the parking position.

### Resetting the Turntable

Keep the button pressed for 5 seconds

- The turntable is being reset. The LED flashes 3 x green and 1 x red until the turntable is in the parking position.

## HDS 50 Control Unit

Plug the HDS 50 control unit (optional accessory) into the CONTROL UNIT RJ12 socket on the CAP converter (see **Connecting the CAP Converter**, p. 32).

The HDS 50 control unit can take over the complete control of your CAP 850 GPS (see **HDS 50 (Order No. 20410070)**, p. 6). Please refer to the HDS 50 user manual for detailed operating instructions.

## CAPcontrol App

To control the CAP 850 GPS via the CAPcontrol app, you need the UFZ 132 USB/Wi-Fi adapter (optional accessory). The adapter must be plugged into the USB port ④ of the CAP converter (see **Connecting the CAP Converter**, p. 32).

Then download the CAPcontrol app from the Play Store (Android) or App Store (iOS) and install it on your mobile device. The exact functionality of the app can be found in the instructions that are included in the app.

## Software Update

### Updating the Channel List

- ✓ A USB stick formatted to FAT32 is available.
- 1. On the USB stick, create the folder „kathrein“ with the subfolder „capconverter“.
- 2. Download the channel.xml file with the current channel list from <https://www.kathrein-ds.com/support/downloadbereich/>
- 3. On the USB stick, save the channel.xml file in the subfolder „capconverter“.
- 4. Plug the USB stick into the USB port of the CAP converter and switch off the CAP converter at the power switch.
- 5. Switch the CAP converter on again.
  - ⇒ The channel list is loaded automatically when the CAP converter starts. The LED status indicates whether the channel list has been loaded successfully or whether a problem has occurred, see LED status display.

### Preparing a Software Update

- ✓ A USB stick formatted to FAT32 is available.
- 1. Download a country-specific zip file e.g. „CAP-Konverter\_Germany\_08.19.zip“ from <https://www.kathrein-ds.com/support/downloadbereich/>
- 2. Open the downloaded ZIP file with a double click and execute the exe file with a double click.
- 3. Click on the „...“ button to select the previously FAT32 formatted USB stick that you want to use for the update.
- 4. Confirm the selection with „OK“.
- 5. Click on the „Extract“ button.
  - ⇒ The required files are automatically unpacked to the corresponding folder structure on the USB stick.

### Performing a Software Update

- 1. Switch off the CAP converter at the power switch.
- 2. Plug the USB stick into the USB port of the CAP converter.
- 3. Keep the “Reset” button on the back of the CAP converter pressed and simultaneously switch on the CAP converter at the power switch.
  - ⇒ During the update process the LED starts to light up yellow.
- 4. The “Reset” button can be released.
  - ⇒ The update process lasts about 90 seconds. The successful update is indicated by fast “red-green-yellow” flashing. An error during the update is indicated by red flashing (see **LED Status Indicator on the CAP Converter/External Push-button**, p. 35).
- 5. After a successful update, switch off the CAP converter at the power switch, remove the USB stick and restart the CAP converter.



**The update only works if the reset button on the back of the CAP converter is pressed!**

## LED Status Indicator on the CAP Converter/External Pushbutton

| Function | LED Colour | Signal                                             | Description                 |
|----------|------------|----------------------------------------------------|-----------------------------|
| Error    | Red        | LED flashes 1 x for 0.5 sec, then pauses for 2 sec | No connection to CAP        |
|          |            | LED flashes 2 x for 0.5 sec, then pauses for 2 sec | Satellite not found         |
|          |            | LED flashes 3 x for 0.5 sec, then pauses for 2 sec | Ignition active             |
|          |            | LED flashes 4 x for 0.5 sec, then pauses for 2 sec | Turntable blocked           |
|          |            | LED flashes 5 x for 0.5 sec, then pauses for 2 sec | Battery voltage too low     |
|          |            | LED flashes 6 x for 0.5 sec, then pauses for 2 sec | Temperature warning         |
|          |            | LED flashes 7 x for 0.5 sec, then pauses for 2 sec | Faulty channel list         |
|          |            | LED flashes 8 x for 0.5 sec, then pauses for 2 sec | CAP software not up-to-date |
|          |            | LED flashes 9 x for 0.5 sec, then pauses for 2 sec | CAP requires calibration    |



### To run the CAP converter in normal operation again:

1. Check the cause of error.
2. Press the pushbutton once to acknowledge the error so that the CAP converter can return to normal operation.

|                  |           |                                        |                                                           |
|------------------|-----------|----------------------------------------|-----------------------------------------------------------|
| Normal operation | Green     | LED flashes slowly                     | CAP is in parking position                                |
|                  |           | LED flashes 3 x, then pauses briefly   | CAP is moving to a position, e.g. to the parking position |
|                  |           | LED flashes quickly                    | CAP is searching satellite position                       |
|                  |           | LED is permanently on                  | Satellite found                                           |
|                  | Red       | LED is permanently on                  | Stand-by                                                  |
|                  | Green-Red | LED quickly flashes 3 x green, 1 x red | CAP is reset and moving to the parking position           |

|            |                      |                                                      |                                 |
|------------|----------------------|------------------------------------------------------|---------------------------------|
| USB Update | Yellow <sup>1)</sup> | LED is permanently on                                | Loading data from USB           |
|            | Red-Green-Yellow     | LED flashes quickly                                  | Update successful               |
|            | Red                  | LED flashes 1 x for 0.5 sec, then pauses for 1.5 sec | Data carrier not found          |
|            |                      | LED flashes 2 x for 0.5 sec, then pauses for 1.5 sec | Directory/update file not found |
|            |                      | LED flashes 3 x for 0.5 sec, then pauses for 1.5 sec | Invalid update file             |
|            |                      | LED flashes 4 x for 0.5 sec, then pauses for 1.5 sec | Saving of update file failed    |

<sup>1)</sup> The red and the green LED on the external pushbutton light up simultaneously.

## Technical Data and Dimensions

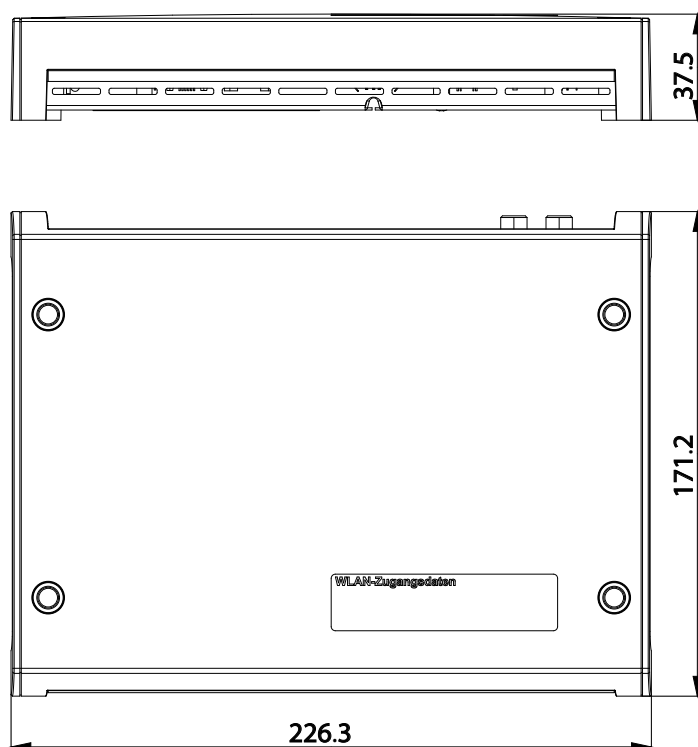
### Technical Data

| Type / Order No.                                             |         | CAP Converter / 204500001      |
|--------------------------------------------------------------|---------|--------------------------------|
| Colour                                                       |         | Black                          |
| Sat IF range                                                 | MHz     | 950-2150                       |
| Input level range                                            | dBμV    | 44-83                          |
| Modulation, FEC, demultiplexer                               |         | DVB-S(2)                       |
| Input data rate                                              | MSymb/s | 2-45 (30 at DVB-S2 / 8PSK)     |
| Supply voltage (car battery)                                 | V       | 10.5 – 30.0                    |
| Power consumption at 230 V<br>(max./typ. operation/stand-by) | W       | 14 / 12 / 0,2                  |
| LNB supply (horiz./vert.)                                    | V/mA    | 14 / 18; Max. 400              |
| Antenna or IF Input <sup>1)</sup>                            |         | 1 x F-type socket              |
| TV/STB or IF Output <sup>2)</sup>                            |         | 1 x F-type socket              |
| Supported control signals (TV input)                         |         | DiSEqC™1.0 / 22 kHz; 14 / 18 V |
| USB                                                          |         | 1 x 2.0                        |
| Ethernet                                                     |         | 1 x RJ45                       |
| Control Unit                                                 |         | 1 x RJ12                       |
| Permissible ambient temperature                              | °C      | -10 to +45                     |
| Weight                                                       | kg      | 0.5                            |

<sup>1)</sup> "TV/STB" for newer CAP converters

<sup>2)</sup> "Antenna" for newer CAP converters

### Dimensions



## Important Information



### Satellite configuration in the CAP converter

The CAP converter allows 4 satellite positions to be controlled directly via a connected satellite receiver or TV set<sup>1)</sup>. To do so, the sequence of the satellite positions in the receiver/TV set and in the CAP converter must match.

The CAP converter has the following default settings for satellite positions:

- Satellite 1: Astra 19.2°E
- Satellite 2: Hotbird 13°E
- Satellite 3: Astra 23.5°E
- Satellite 4: Astra 28.2°E

### Satellite settings in the CAP converter

The satellite positions in the CAP converter can be changed as follows:

- Via the free CAPcontrol app (available for Android and iOS)
    - ▶ To change the satellite position, open the app and go to "Settings > Satellite selection". The app requires either a LAN connection to the router or the USB/Wi-Fi adapter UFZ 132<sup>2)</sup> with WLAN hotspot function.
  - Via the external control unit HDS 50<sup>2)</sup>
    - ▶ Enter the desired changes via the setting keys.
  - By updating the satellite XML file created on the computer via USB update. Ready-to-use config.xml files are available free of charge at <https://www.kathrein-ds.com/support/downloadbereich/> or via our service centre in Ulm.
1. On a USB stick, create the folder **kathrein** with the subfolder **capconverter** (use lower case for the folder name).
  2. Copy the config.xml file to the subfolder **capconverter**.
  3. Plug the USB stick into the switched-on CAP converter.
    - The config.xml file is installed automatically.
    - During the installation the yellow LED glows. After successful installation, the green and then the yellow LED will light up for 1 second each.
    - If the installation failed, the red and then the yellow LED will light up for 1 second each. Check the folder structure. Make sure that the folder names are written in lower case letters.

For information on setting the satellite positions of your receivers, please refer to the operating instructions or contact the hotline of the respective equipment manufacturers.

<sup>1)</sup> TV with a built-in satellite receiver

<sup>2)</sup> Available as accessory

## Parabolic Reflector

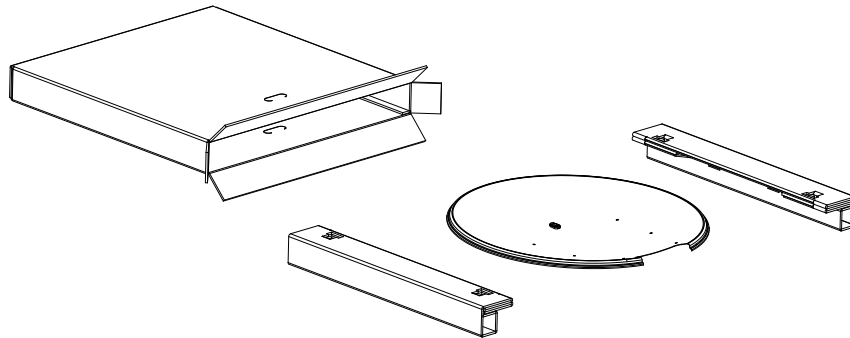
### Installing the Parabolic Reflector

#### Required Fitting Aids and Tool

- 6 fixing screws M6 x 6 (included)
- Allen key (5 mm AF)

### Unpacking the Parabolic Reflector

For space and shipping reasons, the parabolic reflector is packed separately.

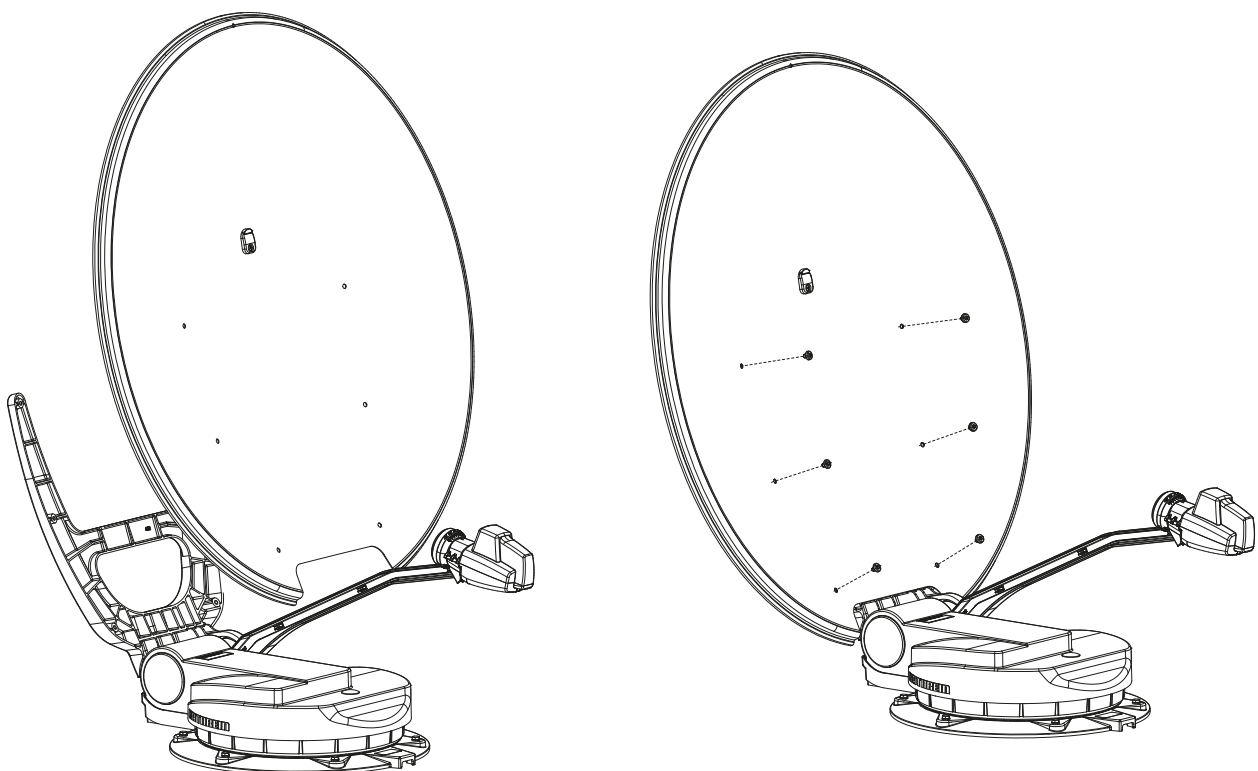


- ▶ The packaging of the parabolic reflector can be opened at the side.
- ▶ Keep the original packaging: If it is necessary to send the unit for repair, use the original packaging to prevent transport damage. The manufacturer accepts no liability for possible damage due to insufficient packaging.

### Installing the Parabolic Reflector

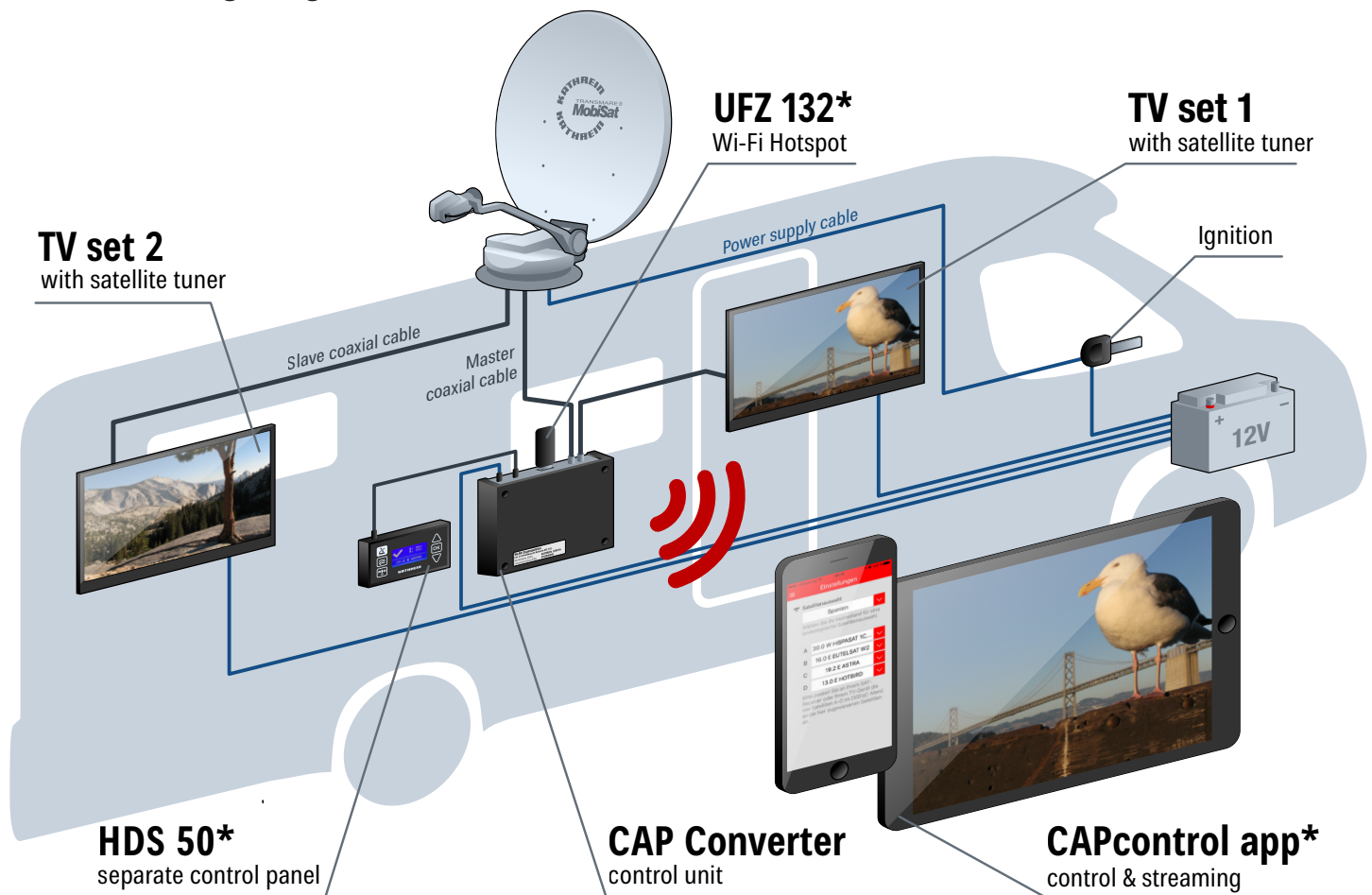
Before taking the parabolic reflector into operation, it must be mounted on the turntable.

1. Move the turntable to the raised position and stop it at approx. 30° elevation (switch off CAP converter)
2. Fasten the parabolic reflector to the bracket using the enclosed M6 x 6 screws; tighten the screws to a torque of 5 Nm
3. Move the turntable back into parking position



## Further Information

### Overall Wiring Diagram



\*) Optional accessories

## Installing and Connecting the Turntable

**!** Pages 40 to 42 show the installation steps required to install the turntable (without the parabolic reflector) on the vehicle roof and the control unit inside the vehicle. All other detailed instructions in this operating manual must also be observed.

1. Determine the installation place for the turntable.  
Observe the following:
  - Clean the installation place
  - Mark out the installation place
2. Determine the installation place for the support.  
Observe the following:
  - Clean the installation place
  - Mark out the installation place
3. Drilling the hole for the roof gland
  - Drill a Ø 38 mm hole for the roof gland
  - Deburr and clean the drill hole
4. Applying sealing adhesive and attaching the roof gland
  - Insert the connecting piece into the bore
  - Screw on the knurled nut



5. Applying sealing adhesive and attaching the support
  - Press the support on with your hand
6. Unscrew the mounting plate from the turntable
  - 6 screws (10 mm AF)



### **Risk of skin injuries!**

- Avoid any skin contact with the sealing adhesive.
- Observe the safety information of the adhesive.

7. Align the mounting plate
  - Arrow in the direction of travel
  - Mark out and drill the holes for the mounting plate



8. Applying the sealing adhesive
  - Apply the adhesive in wavy lines between the two grooves
  - Spread with a spatula or similar tool



### Risk of skin injuries!

- Avoid any skin contact with the sealing adhesive.
- Observe the safety information of the adhesive.

9. Glue on and screw tight the mounting plate
  - Place mounting plate on roof gland
  - Fasten the mounting plate with suitable screws



10. Feed the cable of the turntable through the roof gland (roof gland below the turntable)



### Damage to cables due to sharp edges and chafing points!

- Do not lay cables over sharp edges or bend them.
- Secure cables against possible chafing.

11. Place the turntable on the mounting plate
  - Continue to feed cables through the roof gland
  - LNB arm must lie exactly on the support



12. Screw the turntable to the mounting plate using a torque wrench



**Material damage due to impermissible tightening torque!**

- ▶ If the torque is too high, the thread in the mounting plate can be destroyed. If the torque is too low, the screws can come loose due to vibrations
- ▶ Observe tightening torque of 6 Nm!

13. Connecting the turntable to the vehicle electrical system

- Red cable directly to the battery (12 V)
- Green cable to the ignition
- Black cable to the earth of the vehicle

14. Laying the coaxial cables

- Lay the master cable (red heat shrink tubing) to the control unit
- Lay the slave cable to a second TV (if there is one)

**Material damage to the device and malfunction due to reversing the polarity!**

- ▶ Mixing up the poles when connecting the power cables can lead to thermal overload and destruction of components when starting up the turntable.

15. Determine the installation place for the control unit

- Clean the installation place
- Mark out the installation place

16. Attaching the control unit

- Use suitable screws

17. Connecting the control unit

- Master cable (red) to "Antenna" / "IF-Input"
- Connect TV to "TV/STB" / "IF Output"
- Connect pushbutton/control unit to the RJ12 socket

18. Connecting the control unit to the vehicle electrical system

- Red cable directly to the battery (12 V)
- Black cable to the earth of the vehicle

**Malfunction and material damage due to reversing the polarity!**

- ▶ Mixing up the poles when connecting the power cables can lead to thermal overload and destruction of components when starting up the turntable.

19. Installing the parabolic reflector

- Raise the turntable and stop it
- Install the reflector using the enclosed screws



## Addresses

### Service and Support

Customer Support  
Eiselauer Weg 13  
89081 Ulm, Germany

Phone: +49 731 270 909 70  
Email: [support@kathrein-ds.com](mailto:support@kathrein-ds.com)

Business Hours:  
Monday to Thursday 8 am to 5 pm | Friday 8 am to 4 pm  
(CET)

### Factory Repair Centre

KATHREIN Digital Systems GmbH  
Factory repair center  
Bahnhofstr. 110  
83224 Grassau  
Germany

Tel.: +49 8641 69984-27  
Email: [camping-service@kathrein-ds.com](mailto:camping-service@kathrein-ds.com)  
Internet: [www.kathrein-ds.com](http://www.kathrein-ds.com)

Business hours:  
Monday to Thursday 8 am to 4 pm | Friday 8 am to 3 pm  
(CET)

### Service Partners

You can find service partners under:

<https://www.kathrein-ds.com/support/servicestellen/>

## Disposal



### Electronic equipment

Electronic equipment is not domestic waste – in accordance with directive 2012/19/EC OF THE EUROPEAN PARLIAMENT AND THE COUNCIL dated 04th July 2012 concerning used electrical and electronic appliances, it must be disposed of properly. At the end of its service life, take this unit for disposal at a designated public collection point.