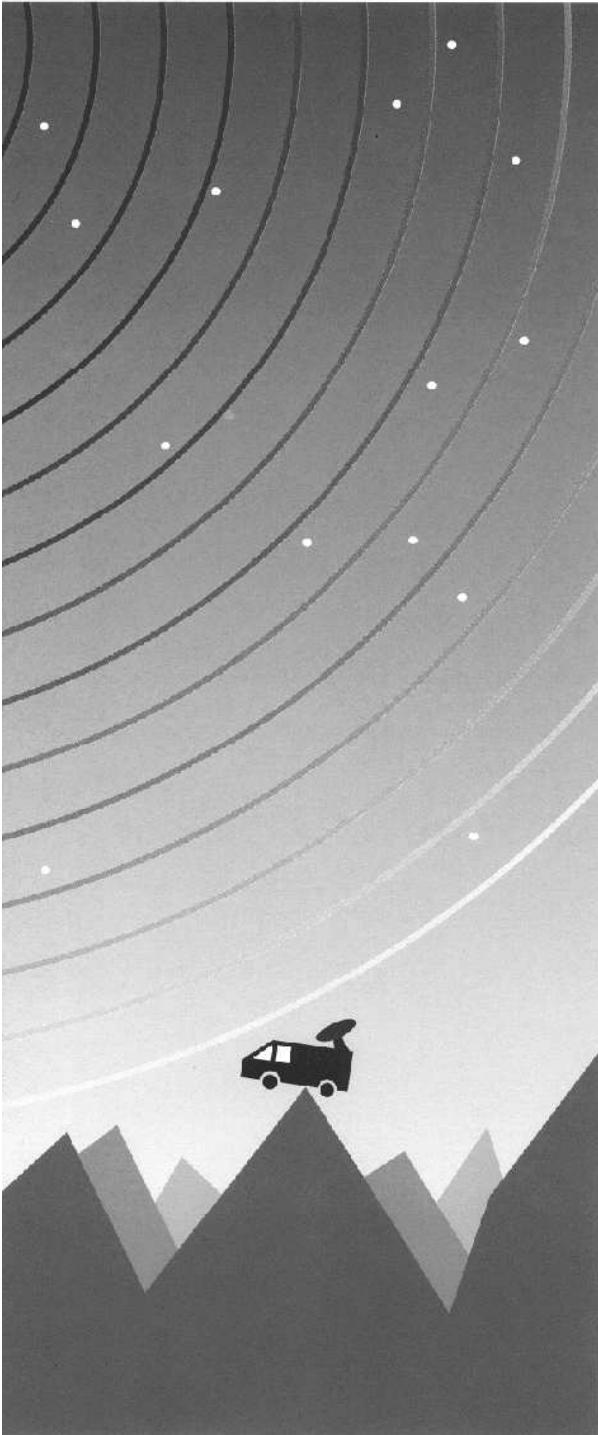


CRYSTOP DISPLAY GMBH



AUTOSAT

Light



DIGITAL
Digital Control Unit

■ Intelligent satellite
Receiver System for
Motor Homes and
Caravans

■ User Manual

AUS

GB

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AutoSat Light DIGITAL

Dear Customer,

congratulations, that you have decided on a **AutoSat light**. This User Manual should help you, to utilise the functions of your new satellite system optimally.

We have kept the operational details as understandable as possible, while keeping them short.

The functional range of your device will be expanded steadily with software updates. That way there may be additional operational steps, which are not explained in this user manual or the operation of functions already available may change. For this reason you should visit the **Crystop** homepage www.crystop.de from time to time, to download the current user manual.

We wish you much joy with your **AutoSat Light** satellite system!

Your

Crystop Team

1 Please read this first

Before commencing the installation, check the consignment for completeness.

The following items are contained in the shipment:

- 1 AutoSat Light Digital Control unit box
- 1 External unit and satellite aerial (dish or flat aerial)
- 1 6-way connecting cable for power supply and receiver, 0.4 m length
- 1 12-way connector housing
- 4 Washers M6, A2
- 4 screws M6 x 12
- 4 Sprengringe M6, A2
- 12 Self-tapping screws 3,9x20
- 1 Cable gland feed through for the roof
- 1 digital receiver (optional)
- 1 User manual
- 1 Guarantee card

1.1 Important Note

Before installation and start-up of your AutoSat light, please read this user manual carefully.

Always make sure (even when your AutoSat light will be retracted by your starter key) that the system has really retracted when starting your vehicle. In case of interrupted supply voltage, for instance, the aerial can no longer be automatically retracted.

Very important: The external unit **must** be mounted on the vehicle roof with the aerial retracted in a direction **opposite to the driving direction**, as otherwise one cannot rule out that the aerial will be blown up by wind during high-speed driving.

When transporting the vehicle on a train, the aerial must be fixed in the retracted position by additional suitable means (expander belts, etc.), due to railway wagons being turned around when re-coupling.

Do not clean your AutoSat light external unit with a steam cleaner. The rubber seals used for sealing will be OK for rain and water spray but cannot survive a water jet with a pressure of several bars. The use of drive-in wash stations is deprecated and is entirely at your own risk.

A condition for satellite reception is **free sight to the satellite**, i.e. even trees cannot be penetrated by a satellite signal !!

1.2 Safety considerations

For your protection, read the safety considerations carefully before you start running your new equipment.

The manufacturer accepts no liability for damages arising from faulty handling and failure to comply with safety provisions.

If the equipment has been modified, Crystop is no longer responsible for ensuring, that the legal requirements (i.e. equipment and product safety laws, electromagnetic compatibility) are complied with. On resale of the modified equipment, the person responsible for the modification becomes the manufacturer and is liable accordingly. Furthermore the Crystop Guarantee becomes inapplicable, which may lead to a loss of warranty rights.

WARNING: In order to prevent damage to your vehicle roof, your AutoSat2 should not be operated in high winds and gusts.

AutoSat light is designed solely for installation and operation in motor vehicles and caravans. The D+ conductor should always be connected.

The screws of the external unit should be checked regularly for tightness.

1.3 Important operating considerations

Installation location/ Ventilation

Like any electronic device, the AutoSat light unit produces heat. However the heat produced is innocuous and is discharged effectively. Do not place any objects on the device. Maintain a space of 5 cm above the device to allow the heat produced in the device to discharge.

Do not place burning objects, i.e. burning candles on the device.

The rubber feet of the device may cause a colour change in treated furniture surfaces. If necessary, place the device on an appropriate mat.

Supply voltage

Operate the control unit with a voltage of 12 to 14.4 V DC only. Never open the device. If repair becomes necessary, it should be carried out by trained personnel.

Moisture

Protect the device from moisture, drips and splashes and do not place objects containing liquids, i.e. vases on it.

Heat/Radiation

Do not place the control unit near a heating element or in direct sun light.

In the following cases disconnect the device from the power supply and ask an expert for help:

- > the device was subjected to moisture i.e. liquid got inside.
- > on major malfunction.
- > on major external damage.

1.4 Disposal considerations

The packaging of your unit consists exclusively of reusable materials which should be recycled.

Make sure, that empty batteries from the remote control unit are not disposed in the household rubbish, but are returned for disposal as hazardous waste to a dealer.

1.5 General considerations

Always make sure (even when your AutoSat light will be retracted by your starter key) that the system has really retracted when starting your vehicle. In case of interrupted supply voltage, for instance, the aerial can no longer be automatically retracted.

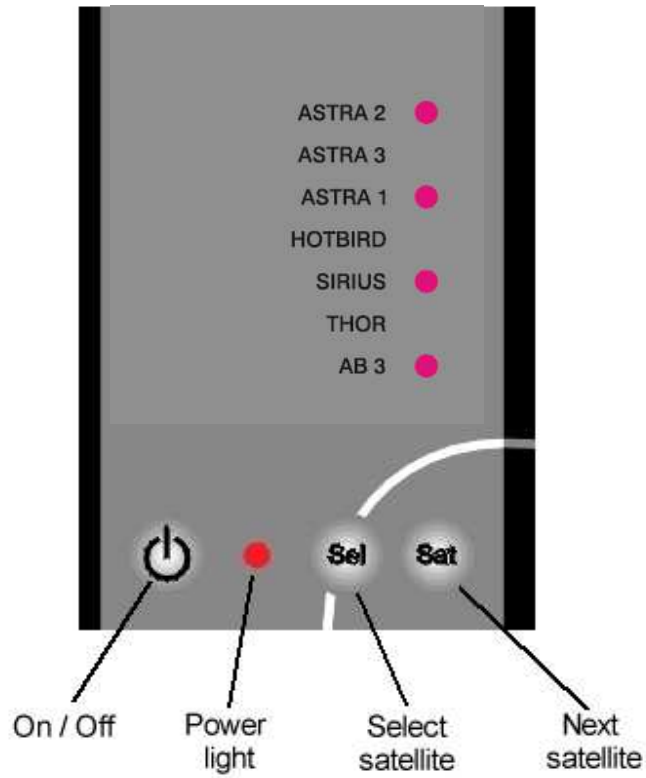
A condition for satellite reception is **free sight to the satellite**, i.e. even trees cannot be penetrated by a satellite signal !!

At the edges of the reception area, signal quality may be improved by turning the LNB:
South western Europe (i.e. Agadir, Canaries): turn LNB by approx. 35° clockwise (looking from LNB to mirror).

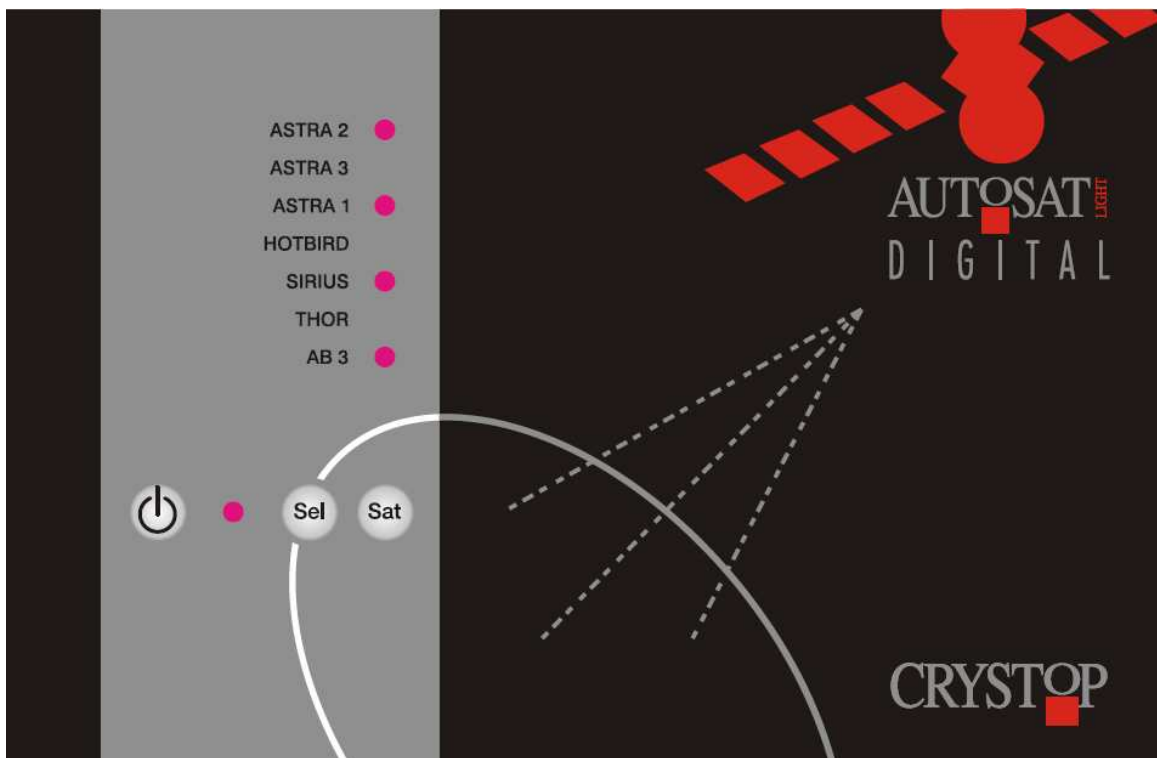
North eastern Europe (i.e. Greece, Western Russia): turn LNB um approx. 15° anti-clockwise.

For Australia consult the LNBF POLARISATION Satellite Signal Location Map.

2 Figure Control Panel



2.1 Figure Digital Control-Box



3 Sequence of automatic satellite search

The AutoSat Light Digital satellite system is turned on with the **“On / Off” button**. After turn on, the satellite to be searched for will be shown in the display by one of the red light-emitting diodes (factory setting ASTRA1 or the last received). You now still have some 5 seconds to change this setting using the **“Sel” button**. To confirm, press the **“Sat” button**.

If no button is pressed, satellite search commences (LED next to the “On / Off” button goes out). Once a satellite has been found by the system, fine positioning is carried out. Following this (LED next to the **“On / Off” button** lights up again), the aerial signal is switched through to the receiver.



If the receiver is set to a program of the requested satellite, the program will now be visible on the TV set. Should this not be the case, there is a possibility, that the AutoSat Light Digital has found a different satellite. By pressing the **“Sat” button**, the search may be continued. If no button is pressed within 120 seconds, the AutoSat Light Digital is deactivated and must be switched on again.

However, if the satellite system had found the correct satellites and you press the **“Sat” key** anyway, it is possible that the satellite required is not found any more. If the required programme cannot be seen, switch the programming locations further on the receiver and check the reception for other TV channels.

After switching off the satellite receiver, the LED next to the **“On / Off” button** (or on the optional remote control) starts to blink, as a reminder, that the antenna is still extended. To retract the antenna you must activate the AutoSat Light Digital by pressing the **“On / Off” button** once and then press it again to retract the antenna. On reaching the parking position, the AutoSat Light Digital switches itself off completely.

4 Operating instructions

4.1 Quick reference

Function	Description	Operation
Switch on 	“On / Off“ button	The satellite system is switched on with the “On / Off“ button on the control unit or on the (optional) remote control unit. After switching on, the system automatically starts to search for the satellite which was set previously.
Retract antenna + Switch off 	“On / Off“ button	If the AutoSat Light Digital is switched off (LED off) the “On / Off“ button is pressed again to retract the antenna after the AutoSat Light Digital is switched on. If the AutoSat Light Digital is already on (LED on) the “On / Off“ button needs to be pressed only once.
Change satellite Sat	“Sat“ button	If the currently found satellite is not the one you require, then a search for the next satellite is initiated by pressing the “Sat“ button .
Satellite selection Sel	“Sel“ button	Press the “Sel“ button to set a new satellite for the following search. To confirm, press the “Sat“ button .

4.2 Special functions

If the **“Sel“ button** is kept pressed during the process of switching on, the system drives to an upright position for mirror and LNB assembly.

4.3 Error code table

In case of fault, the operating display shows an error code next to the **"On / Off"** button. The number of blinks defines the following blink code:

Blink code	Description	Meaning / rectification
1	D+	The vehicle was started. The aerial moves to parking position.
2	Overcurrent azimuth	Aerial mirror has collided with an obstacle in rotational direction. The motor overcurrent fuse has switched the motors off. Remove the obstruction.
3	Overcurrent elevation	Aerial mirror has collided with an obstacle during its lifting or lowering movement. The motor overcurrent fuse has switched the motors off. Remove the obstacle.
4	Azimuth standstill	The rotational movement motor doesn't move any longer. The movement of this motor has run into a timeout. The motor may be blocked by an obstacle.
5	Elevation standstill	The motor for the lifting or lowering movement doesn't move any longer. The motor may be blocked by an obstacle.
10	No satellite found	<ol style="list-style-type: none"> 1) Check that there is a free line of sight to the satellite. Trees will block reception! 2) Make sure that the required satellite can be received with your size aerial at your current location. 3) The Satellite search parameters have changed. Check with us, whether there are new parameters or order a current update. 4) Check the Aerial cable to the external unit (tight fit of the connectors – break in the cable).
11	User abort	A user has aborted the current process by pressing a button
12	Tuner faults	<p>Tuner module registers faults. Try to search again after switching off the control devices.</p> <p>If the fault remains, send-in the control device for repairs.</p>

5 Mounting instructions

!!! Note:

Please read the mounting instructions before starting the installation

5.1 Choice of installation site

Firstly, check the location where you would like to place the AutoSat Light Digital and the receiver. When selecting the installation location for the AutoSat Light Digital, please observe that the system is operated from the device itself. Optionally a remote controller is available, however it cannot be used to change satellite selection. The receiver should be in the vicinity of the TV if possible and visible from your seat because the system is operated using an infrared remote controller. If the receiver has an external infrared receiver, it can also be built in and concealed.

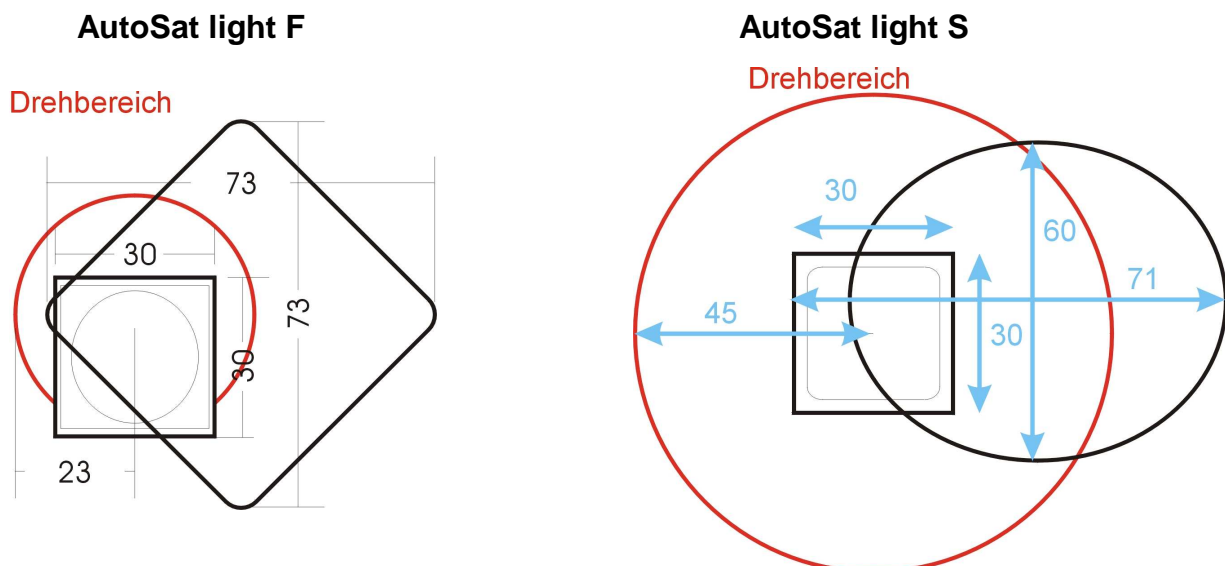
Please keep the following in mind:

- ensure sufficient ventilation for the receiver
- avoid additional sources of heat in the mounting location
- ensure that the cables from the roof to the control unit fit.
- ensure that the cable from the control unit to the receiver fits and that the cable from the receiver to the TV set fits.

5.2 External unit

Offset aerial:

The AutoSat Light (65 cm mirror) has a base of 30 x 30 cm and requires a maximum radius of 40 cm because the LNB, for example in North Europe. The space requirement in the stationary position is shown in the following sketch:



When choosing the mounting location, keep in mind, that the cables to the external unit are 6 m long and that the external unit must have sufficient free space to turn.

Now select a suitable free space on your roof. The direct vicinity of the site selected must be free from objects higher than 20 cm, which might shadow the aerial. When this installation site has been found, once again make sure that the control unit is within a cable length of 4 m. If not, relocate the installation site or the control unit or extend the cable by an additional extension set (obtainable from us).

Please do not extend the cables to the external unit without prior consultation with us.

!!! Note:

Secure the external unit with mechanical fastening systems which preclude loosening or detachment of the unit. For sandwich roofs not offering adequate facilities for fastening, through-screws and internal counter-plates are recommended.

In case of doubt, please consult the manufacturer of your vehicle.

5.3 Mounting the external unit

Please proceed in the following order:

Use **Sikaflex-252** as an adhesive/sealant!

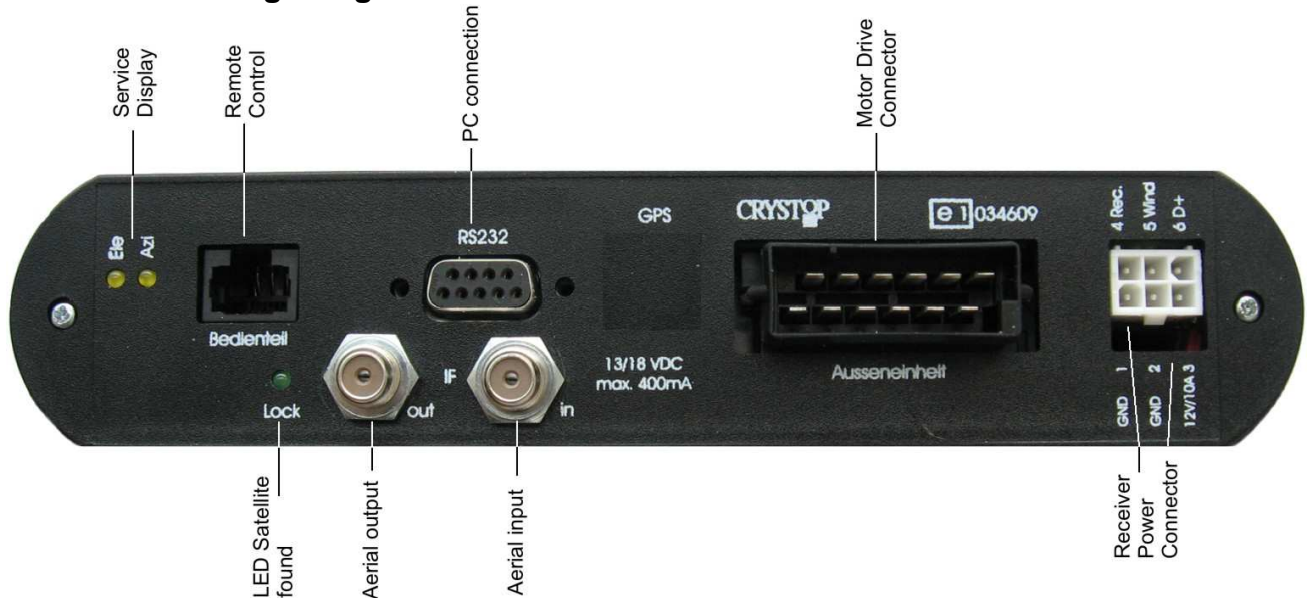
1. Position the external unit with the **outgoing cable** pointing towards the rear of the vehicle.
2. Using the base plate of the external unit as a template, drill 2 holes on diagonally opposite corners with a 2.4 mm drill.
3. Fix the external unit with two 3.9 x 20 self-tapping screws to the roof. Tighten the screws lightly. Please keep in mind that **an aluminium roof coating is only thin and the screws may easily be over-tightened**. Then drill the remaining holes.
4. Raise the external unit and clean the underside and edges of the base plate and the corresponding roof area, removing all dirt and fatty residues. Fully coat the base plate with a 3 mm thin coating of Sikaflex-252 and position the external unit on the roof as envisaged.
5. Before screwing-in the screws, please fill the holes with Sikaflex. Make a sealing joint around edge of the base plate.
6. Drill a hole through the roof for the three outgoing cables (min. 15 mm diameter).
7. Wrap the cable contacts with adhesive tape to avoid damage. Each of the 3 cables is already fitted with a (grey/plastic) PG-gland. Unscrew the 3 narrow plastic nuts and pull them off the cables. Carefully push the cables with the PG-glands through the side into the cable bushing, push the plastic nuts back onto the cables and screw the 3 PG-glands into the holes of the cable bushing. Now push the 3 cables through the roof, clean the roof surface in this area and fix the cable bushing above the hole with Sikaflex-252 and three 3.9 x 25 self-tapping screws. Fix the cables to the roof. We use a 20 x 20 mm cable duct here and stick it to the roof with Sikaflex-252. Finally tighten the sealing caps for the PG gland caps so that the cables cannot be pulled out any longer.

8. The aerial dish can only be mounted after the system has been connected electrically to the power supply and is ready for operation, since the aerial arm has to be raised from its parking position electrically. For this purpose, switch the AutoSat Light Digital on whilst pressing the **"Sel" button** so that the mirror is moved to the upright position. **Use the washers and retainer rings supplied for all four nuts.**

This concludes work on the roof.

5.4 Cable connection to the AutoSat Light Digital

5.4.1 AutoSat Light Digital connectors illustration



Lay cables from the external unit on the inside of the vehicle to the AutoSat Light Digital. The cables should not rub on sharp edges and should not be laid close to sources of heat. Prior to inserting contacts in the connector housing,

ensure that the contacts are in a faultless condition and are not bent. In particular, contact blades must not be excessively spaced.

Insert contacts in the connector housing according to the following sketch. Individual cable cores are marked in colours and connector-housing recesses are numbered to eliminate confusion.

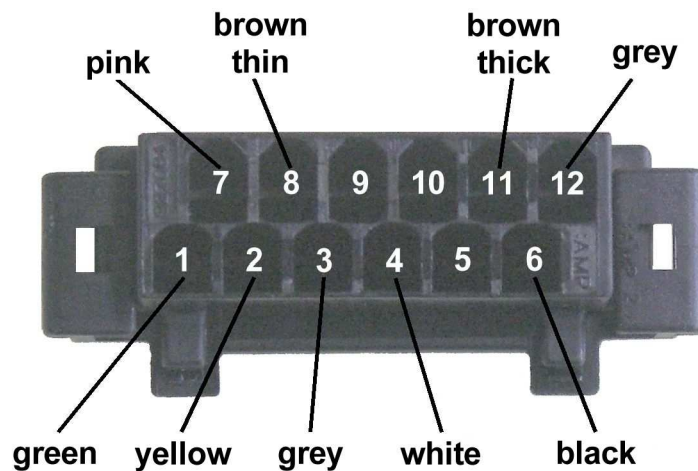
Please work very carefully, because once the contacts have been inserted, they cannot be removed without damage.

Ensure that each contact is fully inserted so that the contact blade is engaged. After all contacts have been inserted, push the connector housing together in a vertical direction to the contacts.

5.4.2 Sketch of connector housing (rear view!!)

6-core Kabel:

3-core Kabel:



5.5 Power supply

Warning:

For 24 volt vehicle mains, a 24 V to 12 V converter will be required.

Run the AutoSat Light Digital only on batteries or a stabilised and regulated battery charger or power pack supplying a continuous current of 5 Amps DC.

A 6 pole connector with a short cable is provided. Connect the 3 wires (red, black, blue) to the vehicle power supply with suitable connectors. The bipolar twin wire with attached circular plug is designed for the 12V supply of a satellite receiver.

Attention! If the power supply cable is altered or a different cable is used, make sure the polarity is correct. If the polarity is wrong, the AutoSat Light Digital will be damaged.

To keep cable losses to a minimum, use a **cable with a cross-section of at least 4 mm²** for the voltage supply. The AutoSat Light Digital should ideally be directly connected to the battery by a dedicated supply cable. Ensure that **no other users** are connected to **the same supply cable**. If others are connected, the cable cross-section must be adjusted to a suitable larger size.

Connect the 1 mm² blue cable to terminal 15 (ignition on) or to D+ (alternator). This will ensure automatic retraction of the dish to the parking position when starting to drive. Both a 12 V and 24 V signal may be connected (applies ONLY to the D+ control cable).

6 Connection and commissioning

6.1 Mounting the AutoSat Light Digital

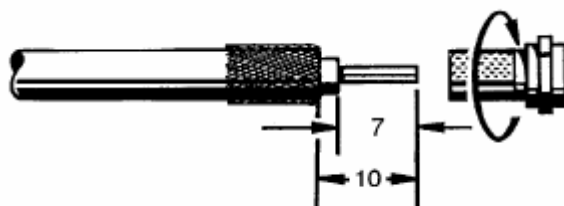
To fix the AutoSat Light Digital or the receiver, it is best to use double-sided adhesive tape Scotch 3M or Tesa Power Strip.

(If screws are used, always make sure they do not make contact with the electronic circuit or cause any other damage.)

6.1.1 Satellite aerial connector

The satellite aerial cable is terminated with an F-Connector on delivery. Check the connector for damage and good seating before mounting. The centre conductor must not be bent. If the aerial cable has been shortened or lengthened, a new F-Connector must be fitted. Either a crimp or screw connector may be used. In either case the cable must be prepared as shown in the following figure:

Warning! Take care, that no small wires of the outer screen touch the inner conductor when mounting the connector, causing a short circuit.



The aerial cable from the external unit is screwed to the left F-connection labelled “in”.

Warning! Do not use any tools to screw up a screw type F-Connector on the cable and to fix the connector at the F-connection. These connections should only be finger tight.

The right F-connection labelled “out” is the connection to the receiver.

6.1.2 Connection external motor unit

Prior to plugging in the connector to the external motor unit, check it again for correct seating of the contacts. If all contacts are fully inserted and in the correct positions (see page 21) the connector may be plugged in.

6.1.3 Connection power supply

Prior to connecting the control unit with the vehicle power supply, check the supply connector again, to avoid possible damage due to incorrect connections.

6.1.4 Connection receiver

The provided 6-pole connector plug comes with a ready-made 12V circular plug with a 2.3-mm diameter for all standard satellite receivers. This connector is designed for receivers with a maximum power input of 20 watts. If your satellite receiver has a different 12V-connector plug, you need to replace that plug.

The receiver is only supplied with 12V when the antenna is extended. This prevents the receiver from consuming power when the antenna is retracted.

6.1.5 Remote control connection

If the AutoSat Light Digital is mounted in a hidden position, an optional external remote control may be connected to the AutoSat Light Digital. The cable connecting the remote control is 2.5 m long. Extensions to 10 m are possible.

Plug the cable to the socket labelled “**Remote**”, located on the underside of the AutoSat Light Digital. Make sure the plug is engaged fully in its socket.

6.1.6 Initial operation

If all the steps described have been carried out, the system can be commissioned. If you are not yet familiar with the details of operation, please read the Operating Instructions first.

7 Fault elimination

Fault	Remedy
Blink codes	See Section 4.3 of these Operating instructions.
No picture, although the aerial is in a receiving orientation	1) Try other programs at the receiver. 2) Maybe the wrong satellite was found -, push the “ SAT “button. 3) Check the connection to the TV set. If the connection is by coax cable check the TV settings (channel). If the connection is by SCART cable, the TV set must set to AV (or channel 0).
Wrong Satellite found	1) Repeat the Satellite search: Press “ SAT “ -> SEARCH SATELLITE
Bad picture quality	1) You are in the fringe zone of the satellite footprint. 2) if 1) does not apply, check the aerial cable to the receiver. (for tight fit of the connectors) 4) LNB has been turned.
System shuts down immediately	1) Check the battery voltage. 2) Your vehicle was started.
Inexplicable error condition	1) Switch your AutoSat Light Digital off and then on again by briefly unplugging the connection plug

8 Technical data

Power supply:

Supply voltage (max. ratings) 10...15V DC
Voltage on control line D+ 10...30V DC

Current / Power input:

Search mode type. 1.5 A / 20 W
Reception mode type. 0.01 A / 0.03 W
Current limit, motors approx. 2.5 A

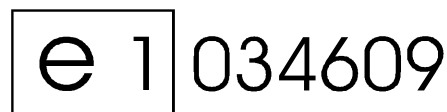
LNB:

LOF 9.75 / 10.6 MHz
Noise level low / high band Single LNB 0.3 dB
 Twin LNB 0.4 dB
LNB-control 14/18 V, max. 400 mA

Measurements:

AutoSat Light Digital: 20 x 15 x 7 cm (W x H x D)


Approval by the German Federal Motor Transport Authority (KBA) of the EC type label (e1) according to the EMC Directive 2005/83/EC for installation and operation in motor vehicles.






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