

**DVB-S2 Meter**

**smartmeter S20**



**User Manual**

**Version: 18.01.2013 - English**

**SMA-RT**<sup>®</sup>  
ENJOY YOUR ENTERTAINMENT

## Preface

Dear Customer,

Thank you for purchasing the digital DVB-S meter smartmeter S20.

This user manual contains all the information required

- to connect,
- to operate,
- to clean, and
- to dispose of the device.

Please read the user manual carefully before you start using the meter.

smart electronic GmbH  
Industriestraße 29  
78112 St. Georgen  
Germany

Service Hotline: +49 (0) 7724 94 78 555  
Telefax: +49 (0) 7724 94 78 333  
E-Mail: [service@smart-electronic.de](mailto:service@smart-electronic.de)  
Internet: [www.smart-electronic.de](http://www.smart-electronic.de)

© smart electronic GmbH 2013

All rights, technical changes, errors as well as printing mistakes reserved. Any reproducing or copying of the contents requires prior written permission from smart.

# Contents

<b>1</b>	<b>User Information .....</b>	<b>6</b>
1.1	Use of this Manual .....	6
1.2	Signs, Symbols, Layout .....	6
<b>2</b>	<b>Product Description .....</b>	<b>6</b>
2.1	Scope of Delivery .....	7
2.2	Meter .....	8
2.3	Guarantee .....	9
<b>3</b>	<b>Safety Notes .....</b>	<b>10</b>
3.1	Safety of persons .....	10
3.2	Appropriate Usage .....	10
3.3	Hazards from Improper Use .....	10
3.4	Lithium Polymer Battery .....	11
<b>4</b>	<b>Initial Setup .....</b>	<b>12</b>
4.1	Charging the Battery .....	12
4.2	Switching the Meter On and Off .....	12
4.3	Entering and Exiting the Menu .....	13
4.4	Navigating through the Menu .....	13
<b>5</b>	<b>Aligning the Satellite Dish .....</b>	<b>14</b>
<b>6</b>	<b>Menu TP Search .....</b>	<b>15</b>
6.1	Renaming a Satellite .....	15
6.2	Adding a Satellite .....	15
6.3	Deleting a Satellite .....	16
6.4	Searching for a Transponder .....	16
6.5	Deleting a Transponder .....	16
6.6	Adding a Transponder .....	17
6.7	Searching Channels .....	17
6.8	NIT .....	18
<b>7</b>	<b>Menu Satellite Identify .....</b>	<b>18</b>
<b>8</b>	<b>Menu Packet Control .....</b>	<b>19</b>
8.1	Showing Measurement Values of five Transponders .....	19
8.2	Searching Channels .....	20

<b>9</b>	<b>Menu DiSEqC Search .....</b>	<b>20</b>
<b>10</b>	<b>Menu DiSEqC Motor Search .....</b>	<b>21</b>
10.1	DiSEqC 1.2.....	22
10.2	USALS.....	22
<b>11</b>	<b>Menu Spectrum.....</b>	<b>22</b>
<b>12</b>	<b>Menu Watch Program.....</b>	<b>23</b>
12.1	Selecting a Channel .....	24
12.2	Sorting the Channel List .....	24
12.3	Switching Between TV Channel List and Radio Channel List .....	25
12.4	Deleting a Channel from the Channel List .....	25
<b>13</b>	<b>Menu Settings .....</b>	<b>25</b>
13.1	Hiding the OSD .....	25
13.2	Switching off the Screen.....	25
13.3	Setting Display Brightness.....	26
13.4	Selecting Energy Unit .....	26
13.5	Setting Volume Level .....	26
13.6	Switching On/Off the Beeper .....	26
13.7	Activating the Automatic Standby Function .....	26
13.8	Selecting the OSD Language.....	26
13.9	Restoring Factory Settings .....	26
<b>14</b>	<b>Menu PC Update.....</b>	<b>26</b>
14.1	Showing the Software Version.....	27
14.2	Performing a Software Upgrade .....	27
14.3	Editing the Channel List.....	28
<b>15</b>	<b>Saving a Screenshot.....</b>	<b>29</b>
15.1	Capturing a Screenshot .....	29
15.2	Displaying a Screenshot .....	29
<b>16</b>	<b>Operation in a Unicable System .....</b>	<b>30</b>
16.1	About Unicable .....	30
16.2	Allocation of IF channels and frequencies .....	31
16.3	Installation.....	31

---

<b>17</b>	<b>Cleaning the Meter .....</b>	<b>32</b>
<b>18</b>	<b>Transporting and Storing the Meter .....</b>	<b>32</b>
<b>19</b>	<b>Troubleshooting.....</b>	<b>32</b>
<b>20</b>	<b>Disposal.....</b>	<b>33</b>
<b>21</b>	<b>Specifications .....</b>	<b>33</b>
21.1	General .....	33
21.2	LNB/Tuner input .....	34
21.3	System Resources.....	34
21.4	Video Decoder .....	34
21.5	Data Interface .....	34
21.6	Power Supply .....	34
21.7	Dimensions and Weight.....	34
21.8	Temperatur .....	35
<b>22</b>	<b>Declaration of Conformity .....</b>	<b>35</b>

# 1 User Information

## 1.1 Use of this Manual

- This manual is intended for the DVB-S2 Meter smartmeter S20.
- Please carefully read this user manual before operating the device for the first time.
- Please note all warnings and notes included in this user manual.
- Consider this user manual to be an integral part of the product, and store it at a well accessible location.
- This user manual should also be enclosed when handing over the device to a third party.
- In case of loss, the current version of the user manual can be downloaded at the support center on our website [www.smart-electronic.de](http://www.smart-electronic.de).
- The software is still being further developed even after your purchase of the device. Thus, it may be possible that certain operation steps do not fully correspond to the user manual.

## 1.2 Signs, Symbols, Layout

Symbol/layout	Meaning
	<b>WARNING</b> Danger due to electric shock with possible severe bodily injury
	<b>CAUTION</b> Warnung vor einem möglichen Sachschaden
	<b>NOTE</b> Useful information and hints
	You are requested to perform an action.
1. 2.	Perform these steps in the stated order.
•	List
<i>kursiv</i>	The various possibilities of settings as well as image captions are stated in <i>Italics</i> .
<b>fett</b>	The designations of keys are printed in <b>bold</b> letters.
<b>fett &amp; kursiv</b>	Menu windows and menu items (that often include further hidden menu items or direct settings) are printed in <b>bold &amp; italic</b> letters.

# 2 Product Description

The smartmeter S20 is a handy digital DVB-S2 measuring device for a quick and easy alignment of satellite antennas. If a satellite is found, the smartmeter S20 shows it on the display and emits an audible signal. Signal strength and quality are displayed as numerical values and bar graphs.

Another measurement value is the forward error correction (FEC<sup>1</sup>), the carrier-to-noise ratio (C/N), the bit error rate after Viterbi (VBER), and the Modulation error rate (MER<sup>2</sup>). In addition, the picture quality can be revised on the high-resolution 3.5-inch TFTLCD screen.

Many satellites are pre-programmed in order to allow a quick antenna adjustment.

There is a protective pouch for transport and as a protection.

## 2.1 Scope of Delivery

Please check if the delivery is complete.

Included in delivery:

- DVB-S2 Meter smartmeter S20
- 12 V plug-in power supply
- 12 V car adapter cable
- Quick-F connector
- Carrying bag
- User manual

If the delivery should be incomplete, contact your specialist dealer or the smart electronic GmbH.

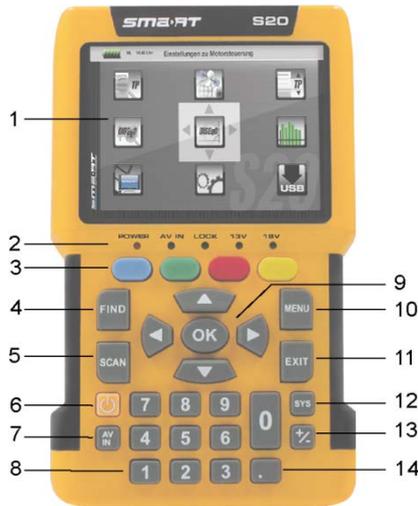
---

<sup>1</sup> FEC = Forward Error Correction: In each data packet there are control bits. FEC 5/6 means, that there are 5 data bits and 1 control bit. The better the ration between data and control bits, the less errors are at the receiver's side. With FEC 3/4 the ratio is better than with FEC 5/6. Possible values are FEC 1/2, 2/3, 3/4, 5/6, 7/8 und 8/9.

<sup>2</sup> Modulation error rate = all signal disturbances are summarized to one measurement value. The higher the MER value, the better is the signal quality.

## 2.2 Meter

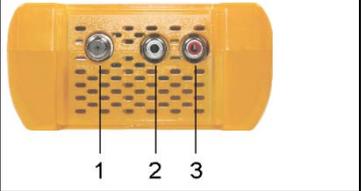
### 2.2.1 Front View



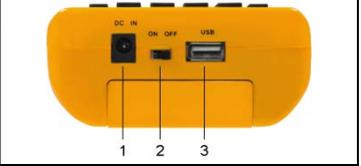
No.	Description		
1	<b>LC-Display</b>	Display of the TV picture, the menu and the measured values..	
2	<b>POWER</b>	<b>LED</b>	<ul style="list-style-type: none"> <li><b>green</b> the meter is on</li> <li><b>off</b> the meter is turned off</li> </ul> Charging: <ul style="list-style-type: none"> <li><b>red</b> during charging</li> <li><b>green</b> the battery is fully charged</li> </ul>
	<b>AV IN</b>		Lights if the meter is switched to the analog video input.
	<b>LOCK</b>		Lights when a signal is received.
	<b>13V</b>		Lights if there is a 13 V signal for the polarization control (vertical)
	<b>18V</b>		Lights if there is a 18 V signal for the polarization control (horizontal)
3	<b>FUNCTION keys</b>	Different functions depending on the menu. The functions are displayed at the bottom of the screen.	
4	<b>FIND</b>	Call of the channel search function.	
5	<b>SCAN</b>	Start of the automatic channel scan.	
6	<b>POWER</b>	Switch device on/off.	
7	<b>AV IN</b>	Switch to the analog video input.	
8	<b>Numeric keys</b>	Direct entry of numbers.	

No.	Description	
9	<b>Cursor cross</b>  <b>OK</b>	Press to navigate through menus/submenus: Press ▲, ▼ to switch between stations, Press ◀, ▶ to adjust the volume. Press to confirm your selection / display station list.
10	<b>MENU</b>	Display the main menu.
11	<b>EXIT</b>	Leave the current menu, cancel operation.
12	<b>SYS</b>	TV mode: call of the menu <i>OSD Setting</i> , Menu: volume control.
13	<b>+/-</b>	Call of the media player.
14	●	Pressing this key copies a screenshot to a connected USB disk.

### 2.2.2 Top View

No.	Description	
1	Digital satellite signal input	
2	Analog audio input (mono)	
3	Analog video input (Composite Video)	

### 2.2.3 Bottom View

No.	Description	
1	Low-voltage socket (for power plug)	
2	Switch for battery (for separating the smartmeter S20 electronics from the rechargeable battery)	
3	USB port for external data storage devices	

The above figures show the smartmeter S20 without the black part covering at the top of the device.

### 2.2.4 Rear View

At the rear is the battery compartment. Normally, you must not open it. If you suspect that the lithium-polymer battery must be replaced, contact your dealer.

## 2.3 Guarantee

The digital meter smartmeter S20 of smart electronic GmbH comes with a guarantee in accordance with legal requirements as applicable at the time of the purchase.

## 3 Safety Notes

### 3.1 Safety of persons

Ensure that nobody can be hurt by falling tools or parts of the satellite antenna during the adjustment and installation of the antenna. For your own security use a rope on sloping roofs.

### 3.2 Appropriate Usage

The measuring device smartmeter S20 was developed to measure signals of digital satellite antennas and satellite systems. It is exclusively for this purpose and should only be used for this purpose. Use the equipment only for the purpose, which is described in this manual.

Any other usage is rated as not properly and can result in damage or even injury. There will be no liability for damages caused by a non-intended use.

### 3.3 Hazards from Improper Use



**CAUTION!**

- Make sure the meter and especially the power plug are always kept dry.
- Do not expose the meter to temperatures below 0° C.
- Connect the power plug only to 100-240 V AC, 50/60 Hz.
- Charge the meter only with the supplied power plug.
- During electrical storms, disconnect the meter from the aerial and from the power supply.
- Do not put heavy objects onto the meter.
- Avoid mechanical influences that can damage e.g. the LCD display or the housing of the meter.
- Do not bend or crimp the cables.
- Do not start to use the meter if you can see signs of damage or if you can hear loose parts inside the device.



**WARNING!**

#### **Danger of electrical shock from high voltage**

Damages on the housing of the power plug or an improperly repaired power plug can expose the user to mains voltage.

- Do not open the supplied power plug.
- Have the power plug repaired by qualified personnel only.



Taking the device from cold into warm temperatures can lead to condensation forming inside the device.

- **Do not connect** the device instantly. Leave it switched off for a few hours.

### 3.4 Lithium Polymer Battery

The smartmeter S20 is provided with a lithium polymer battery. Please observe the following safety notes for the battery:



**WARNING**

#### Fire and explosion hazard

Any kind of heat (from inside or outside) can trigger uncontrollable chain reactions inside the battery.

- Do not store or use the battery in temperatures above 40 °C.
- Never connect the two poles (+ and -).
- Never expose the battery to high temperatures, e.g. close to stoves or cookers or other hot objects.
- Charge the battery only with the supplied power plug.



**WARNING**



**CAUTION!**

#### Risk of injury

Damages on and improper use of the battery can lead to fumes leaking from the battery. When inhaled, these fumes can irritate the respiratory tracts.

- Avoid any damaging of the battery.
- If fumes leak from the battery, open the window and seek medical advice if you experience health problems that may result from inhaling battery fumes.



**CAUTION!**

#### Damages to other objects

Defective batteries can leak and spill battery liquid onto close-by objects.

- Check the objects affected.
- Clean or, if necessary, replace the objects affected.

## 4 Initial Setup

### 4.1 Charging the Battery



- Charge the battery completely before you use the meter for the first time.  
The battery can be charged regardless of
  - whether the meter is switched on or off or
  - whether the battery-switch on the underside of the meter is set to On or Off.

An integrated automatic charging system ensures optimum charging of the battery.

- Switch off the meter, if it is not yet switched off, to ensure that the complete power of the power supply can be used to charge the battery.



Basically, the meter is also charged if it is switched on, then the charging period becomes longer.

- Plug the power plug into a 230-V socket.
- Connect the low-voltage plug of the power plug to the low-voltage socket on the bottom of the meter.

The battery starts charging as soon as you connect the smartmeter S20 to the power plug.



- When you charge the battery **for the first time**, charge it for at least 5 hours.  
The maximum charging time is 12 hours.

#### 4.1.1 Charge Control

- Charging is indicated by a continuously moving battery symbol in the display:  




  
The **POWER LED** lights red..
- Completed charging is indicated by a steady battery symbol filled with four bars:   
The **POWER LED** lights green.

#### 4.1.2 State of Charge

The current status of the battery is continuously displayed:

- If the battery is not adequately charged, the battery charging icon will be displayed in red with 1 or 2 lines (corresponding to the state of charge). You should charge the battery.
- If the battery is sufficiently charged, the battery charging icon will be displayed in green with 3 or 4 lines.

### 4.2 Switching the Meter On and Off

#### 4.2.1 Switching On

1. Ensure that the battery-switch on the underside of the meter is set to an *ON* position.
2. Press the **POWER** key to switch on the meter. The **POWER LED** lights green.



In case of disconnected power supply, the smartmeter S20 will be turned on, once you put the battery switch from the OFF to the ON position.

If the power supply is plugged in, the battery switch will be useless, meaning that the smartmeter S20 can be switched on regardless of the switch position.

#### 4.2.2 Switching Off

- Press the **POWER** key once again to switch off the meter after use.



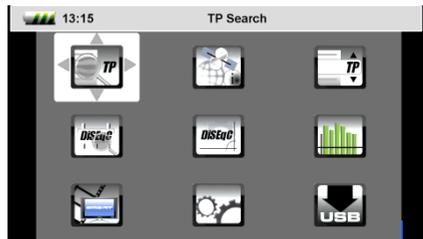
For long operational pauses, please also separate the smartmeter S20 electronics from the battery by setting the battery switch on the underside of the device to the *OFF* position.

### 4.3 Entering and Exiting the Menu

- Press **MENU** to enter the main menu. The display shows the OSD<sup>3</sup> main menu.

The display shows the main menu window when you switch the smartmeter S20 on and when you re-enter the menu.

- Press **EXIT** to exit the menu or to return to the previous menu level.



Depending on the submenu you are in, you may have to press the **EXIT** key several times to return to the **main menu**.

### 4.4 Navigating through the Menu

Use the **colored function keys** and the **navigation keys** to navigate through the menu:

- Press **▶** / **the yellow function key** to select the menu item to the right or to increase the selected value.
- Press **▼** / **the red function key** to select the menu item below.
- Press **◀** / **the blue function key** to select the menu item to the left or to decrease the selected value.
- Press **▲** / **the green function key** to select the menu item above.
- Press **OK** to enter the selected menu item.

Activated menu items are highlighted by color.

<sup>3</sup> OSD = On Screen Display



The function keys may call different functions, dependent on the regarding menu.

Instead of changing a value by using the keys ► und ◀, with many menu items you can also press the **OK** key, select a new value from the list, and confirm such value by again pressing the **OK** key.

## 5 Aligning the Satellite Dish

1. Press **MENU**.
2. Use the keys ◀ / ► and ▲ / ▼ to select the menu item **TP SEARCH** and confirm your selection with **OK**.
3. Select the desired satellite in the setting field with the keys ◀ / ►.
4. Go to **LNB Freq** and select the right value for the used LNB. You also can change the LNB frequencies with the **blue function key**.

### Possible values for *LNB Freq* (MHz)

5150	10600	Universal (9750 - 10600)
5750	10700	UnicableA (9750 - 10600)
5950	10750	UnicableA (10200)
9750	11250	UnicableB (9750 - 10600)
10000	11300	UnicableB (10200)
10050	5150 - 5750	
10450	5750 - 5150	

5. If you use a multifeed antenna, go to **DiSEqC1.0** and select the port for the selected satellite. You also can change the DiSEqC1.0 port with the **yellow function key**.
6. If you can receive signals from more than four satellites select **DiSEqC1.1<sup>4</sup>** and set the port for the selected satellite. Factory setting is **Disable**.
7. Go to **Transponder** and use the keys ◀ / ► to select the transponder, broadcasting the channel, which you want to use for adjusting your antenna. Signal strength and signal quality (of the selected transponder) are displayed on the bottom of the window. Alternatively go to **Transponder**, press **OK**, select the corresponding transponder from the list and confirm by pressing **OK**.
8. Turn the dish until the **LOCK LED** lights or the bar graph displays signal strength and signal quality. If the **LOCK LED** lights there is also an acoustic signal



In the menu **OSD Setting** → **Beeper** you can set, whether an acoustic signal should be output (*On*) or not (*Off*), if a signal is found.

9. Fixate the Dish in the position with the best signal strength.

<sup>4</sup> DiSEqC1.1 supports 16 satellite positions

10. Vary the angle of inclination until the bargraph displays even more signal strength and signal quality.
11. Press **EXIT**, several times to get to the TV mode. In the info window on the bottom of the window signal strength **S**, signal quality **Q**, **FEC**, **VBER** (bit error rate after Viterbi), and **MER** (modulation error rate) are shown.
12. Fixate the Dish in the position with the best **VBER** quality.



The **VBER** value with good reception is 10E-8 (so almost 0). The higher **VBER** is, the worse is the signal (e. g. antenna wrong aligned).

## 6 Menu TP Search

- Select the menu **TP Search** and press **OK**.

In the menu **TP Search** a list of the stored satellites is shown.

10 satellites are displayed on each page. To display further satellites use the keys **▲** and **▼**.

13:15 TP Search	
1	Astra 1 E 19.2
2	Hot Bird 6/8/9 E 13.0
3	Turksat 2A/3A E 42.0
4	Astra 3A/3B & Th E 23.5
5	Astra 4A E 4.8
6	C_Thor 5/6 W 0.8
7	Ku_Thor 5/6 W 0.8
8	Amos 2/3 W 4.0
9	C_Atlantic Bird W 5.0
10	Ku_Atlantic Bird W 5.0

### 6.1 Renaming a Satellite

1. Select the satellite you'd like to rename in the list with the keys **▲** and **▼**.
2. Press the **blue function key (Edit)**. A screen keyboard opens.
3. Give a new name for the satellite. Use the keys **◀/▶** and **▲/▼** to mark a character and confirm each character with **OK**.
4. Repeat until you have the desired name.
  - Press the **blue function key (Delete)** to delete the respectively selected character.
  - Press the **yellow function key (CAPS)** to switch between upper case and lower case.
  - Press the **red function key (Cancel)** to discard the changes made so far and to close the window **Rename**.
  - Press the **green function key (OK)** to accept the changes made so far and to close the window **Rename**.

### 6.2 Adding a Satellite

1. Press the **green function key (Add)**. A screen keyboard opens.
2. Give a name for the new satellite. Use the keys **◀/▶** and **▲/▼** to mark a letter and confirm each letter with **OK**.
3. Repeat until you have the desired name.
  - Press the **blue function key (Delete)** to delete the respectively selected character.

- Press the **yellow function key (CAPS)** to switch between upper case and lower case.
- Press the **red function key (Cancel)** to discard the changes made so far and to close the window **Rename**.
- Press the **green function key (OK)** to accept the changes made so far and to close the window **Rename**.



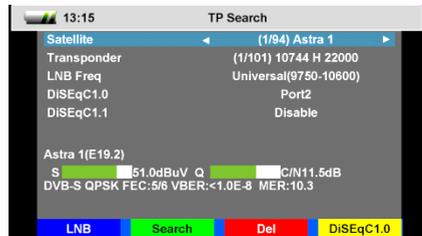
The transponder list of the new satellite is empty. Create a new transponder as described below (Adding a new Transponder).

### 6.3 Deleting a Satellite

1. Select the satellite you'd like to delete from the list with the keys **▲** and **▼**.
2. Press the **red function key (Delete)**.
3. Use the keys **◀/▶** to mark the button **Yes** and confirm with **OK** to delete the satellite from the list.  
Mark the button **No** and confirm with **OK** to go back to the menu **TP Search**, without deleting the satellite.

### 6.4 Searching for a Transponder

- Select with the keys **▲** and **▼** the satellite on which you'd like to look for a transponder.
- Press **OK**.
- With the keys **◀** and **▶** you can know change once more the satellite.



- Go to **LNB Freq** and select the right value for the used LNB. The possible values are listed in the section "Aligning the Satellite Dish". You also can change the LNB frequencies with the **blue function key**.
- If you use a multifeed antenna, go to **DiSEqC1.0** and select the port for the selected satellite. You also can change the DiSEqC1.0 port with the **yellow function key**.
- If you can receive signals from more than four satellites select **DiSEqC1.1** and set the port for the selected satellite. Factory setting is **Disable**.

### 6.5 Deleting a Transponder

1. Select in the sub menu **TP search** with the keys **▲** and **▼** the satellite on which you'd like to delete a transponder and press **OK**. With the keys **◀** and **▶** you can know change once more the satellite.
2. Select with the keys **▲** and **▼** the line **Transponder** and press **OK**.
3. Select with the keys **▲** and **▼** the Transponder you want to delete and press **OK**.
4. Press the **red function key (Del)**.

- Use the keys ◀/▶ to mark the button **Yes** and confirm with **OK** to delete the transponder from the list.  
Mark the button **No** and confirm with **OK** to go back to the menu **TP Search**, without deleting the transponder.

## 6.6 Adding a Transponder

- Select in the sub menu **TP search** with the keys ▲ and ▼ the satellite on which you'd like to add a transponder and press **OK**. With the keys ◀ and ▶ you can now change once more the satellite.
- Select with the keys ▲ and ▼ the line **Transponder** and press **OK**.
- Select with the keys ▲ and ▼ the last position **New TP** in the list and press **OK**. The window **Add TP** opens.
  - Select with the keys ▲ and ▼ the line **Frequency** and insert with the numeric keys the frequency (in MHz) of the new transponder.
  - Select with the keys ▲ and ▼ the line **Symbol Rate** and insert with the numeric keys the symbol rate (in kS/s) of the new transponder.
  - Select with the keys ▲ and ▼ the line **Polarity** and insert with the keys ◀ and ▶ the polarization of the new transponder.  
H= horizontal  
V= vertical
- Press the **green function key (OK)** to confirm the new transponder.

## 6.7 Searching Channels

- Select in the sub menu **TP search** the satellite containing the transponder on which you'd like to look for receivable channels and press **OK**.
- Go to **Transponder** and select with the keys ▲ and ▼ from the list the transponder on which you'd like to look for receivable channels and press **OK**.
- Go to **LNB Freq** and select the right value for the used LNB. The possible values are listed in the section "Aligning the Satellite Dish". You also can change the LNB frequencies with the **blue function key**.
- If you use a multifeed antenna, go to **DiSEqC1.0** and select the port for the selected satellite. You also can change the DiSEqC1.0 port with the **yellow function key**.
- If you can receive signals from more than four satellites select **DiSEqC1.1** and set the port for the selected satellite. Factory setting is *Disable*.
- Press the **green function key** to go to the search window:
  - Select **Only FTA**<sup>5</sup> to determine if scan should be made only for FTA channels (**Yes**) or for all channels (**No**).
  - Select at **Scan Channel** if you want to perform scan only for TV channels, only for radio channels or for TV + radio channels..
  - Select at **Network Search** if you want to search for an individual channel (**No**) or all channels of a channel network (**Yes**), e.g. PRO7, SAT1, KABEL1, SIXX.
  - Press **OK** to start the channel search.

<sup>5</sup> FTA = **Free To Air** = unencrypted channels

- Press the **red function key** to stop the search at any time.

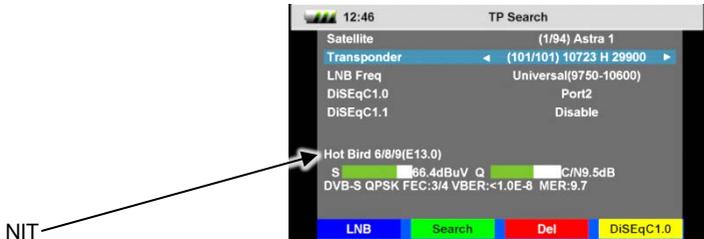
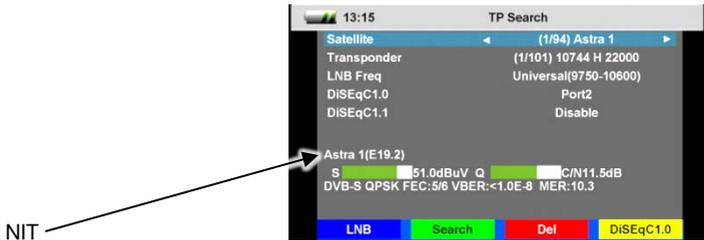
Found programs are attached to the rear of the channel list.

## 6.8 NIT

The smartmeter S20 is equipped with NIT. NIT means Network Information Table and is transmitted in the data stream of the satellite. It contains data regarding to transponders and channels, such as frequency, sound carrier or symbol rates.

To align a satellite antenna you can also use the NIT display. When a signal is found worthy to receive, the NIT display tells you to which satellite your antenna is actually aligned.

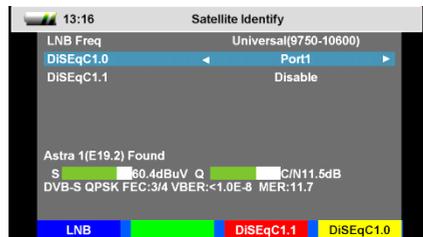
Examples:



 In order that a satellite can be found, the remaining data, especially transponder data and DiSEqC port must be correct.

## 7 Menu Satellite Identify

1. In TV mode press the **MENU** key (or navigate to main menu).
2. Select the sub menu **Satellite Identify** and confirm with **OK**.



- Go to **LNB Freq** and select the right value for the used LNB. The possible values are listed in the section “Aligning the Satellite Dish”. You also can change the LNB frequencies with the **blue function key**.
- If you use a multifeed antenna, go to **DiSEqC1.0** and select the port for the selected satellite. You also can change the DiSEqC1.0 port with the **yellow function key**.
- If you can receive signals from more than four satellites select **DiSEqC1.1** and set the port for the selected satellite. You also can change the DiSEqC1.1 port with the **red function key**. Factory setting for **DiSEqC1.1** is *Disable*.

You can see on the screen, which satellite is currently received. Also, signal strength and signal quality are displayed.



**Satellite Identify** uses the transponder lists stored in the smart-meter S20.

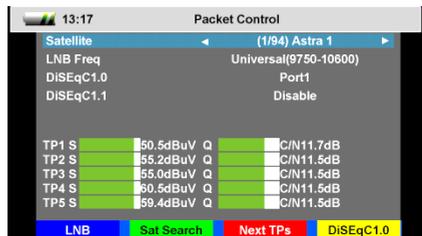
## 8 Menu Packet Control

In this menu you can

- display signal strength and signal quality of five consecutive transponders as well as
- perform a channel search.

### 8.1 Showing Measurement Values of five Transponders

- In TV mode press the **MENU** key (or navigate to main menu).
- Select with the keys **◀/▶** and **▲/▼** the sub menu **Packet Control** and confirm with **OK**.
- Select at **Satellite** with the keys **▶** and **◀** the satellite where you can find the transponders to display.
- Go to **LNB Freq** and select the right value for the used LNB. The possible values are listed in the section “Aligning the Satellite Dish”. You also can change the LNB frequencies with the **blue function key**.
- If you use a multifeed antenna, go to **DiSEqC1.0** and select the port for the selected satellite. You also can change the DiSEqC1.0 port with the **yellow function key**.
- If you can receive signals from more than four satellites select **DiSEqC1.1** and set the port for the selected satellite. Factory setting is *Disable*.



You can see on the screen signal strength **S** and signal quality **Q** of five consecutive transponders.

- Press the **red function key (Next TPs)** to display the values of the next five transponders in the transponder list.

## 8.2 Searching Channels

- Press the **green function key** to open the window *Single Satellite Search* where you can search for channels on one satellite.



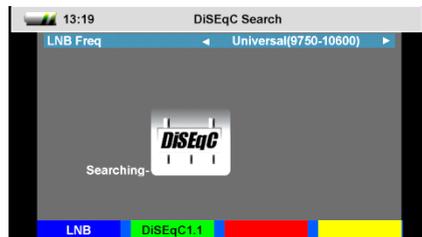
You also can reach the window *Single Satellite Search* by pressing of the key **SCAN**.

- Select at *Satellite* with the keys ◀ and ▶ the satellite on which you want to perform the scan.
- Select *Only FTA*<sup>6</sup> to determine if scan should be made only for FTA channels (Yes) or for all channels (No).
- Select at *Scan Channel* if you want to perform scan only for TV channels, only for radio channels or for TV + radio channels..
- Select at *Network Search* if you want to search for an individual channel (No) or all channels of a channel network (Yes), e.g. PRO7, SAT1, KABEL1, SIXX. The item *Network Search* is only active, if you selected the *Scan Mode Preset Scan*.
- Select the scan mode at the menu item *Scan Mode*:
  - *Preset Scan* (Standard Scan): considering only the frequencies included in the TP list (of the regarding satellite).
  - *Auto Scan* (Blind Scan): considering all frequencies, regardless of whether they are included in the TP list or not.
- Press the **green function key** to start the channel scan.
- Press the **red function key** to stop the search at any time.

## 9 Menu DiSEqC Search

In this menu you can scan the DiSEqC switch. As result of the scan you see on which port which Satellit is received.

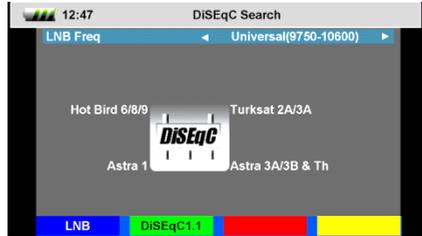
1. In TV mode press the **MENU** key (or navigate to main menu).
2. Select the sub menu *DiSEqC Search* and confirm with **OK**.



<sup>6</sup> FTA = **Free To Air** = unencrypted channels

The DiSEqC search begins automatically. One after another, all four DiSEqC1.0 ports are scanned. After completing the scan, the screen might look like this:

- Press the **blue function key** to select the right frequency for the used LNB.
- Press the **green function key** to switch between *DiSEqC1.0* und *DiSEqC1.1*.

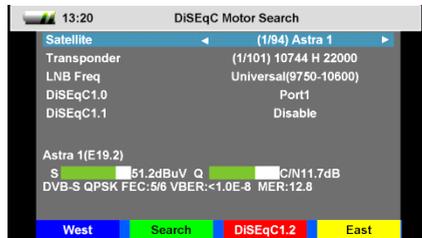


## 10 Menu DiSEqC Motor Search

This menu is used to set up a motor antenna and its control system.

In all menu windows (e. g. moving dish) you see signal strength **S** and signal quality **Q**.

1. In TV mode press the **MENU** key (or navigate to main menu).
2. Select the sub menu *DiSEqC Motor Search* and confirm with **OK**.



- Press the **blue function key** to turn the satellite dish to the west.
- Press the **yellow function key** to turn the satellite dish to the east.
- Press the **green function key** to start a channel search for the current transponder (see section 6.7 „Searching Channels“). Since you use DiSEqC1.2 or USALS for the antenna control, normally you can ignore the lines *DiSEqC1.0* and *DiSEqC1.1*. There are special cases (e. g. cascading of DiSEqC switches) where additionally to DiSEqC1.2 you need *DiSEqC1.1*.

- Press the **red function key** to set the details for the motor control:
  - Select at **Satellite** with the keys ◀ and ▶ the satellite for the following settings should be valid.



- Select **Transponder** to set the transponder which should be reference for the antenna position (generally the transponder which broadcasts your favorite channel).
- Select **Motor Type** to set the used control technique. Select between *DiSEqC1.2* and *USALS* (depending on the used motor). Depending on your choice, different settings are available.

## 10.1 DiSEqC 1.2

- Select **Position No & Save** to set a position number as which the current satellite (the current antenna position) will be saved.
- Select **Go To X** to call a position from which you want start the settings (the value *Reference* is the zero position).
- Select **Save** and move the dish with the keys ► and ◀ to the west or the east. Look for the maximum values of signal strength and signal quality which are shown at the bottom edge of the screen.
- Then press **OK** to save the found position.
- If necessary, repeat these steps for other satellites / transponders.
- Select **Recalculation** and press **OK** to discard all settings and define once more the antenna positions. A query window opens. Confirm the deletion with the **green function key (Yes)** or cancel it with the **red function key (No)**.

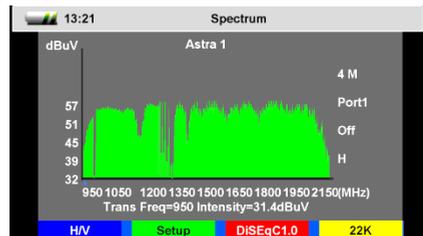
## 10.2 USALS

- Select **Local Longitude** to enter the longitude of your antenna's position with the numeric keys **0 ... 9**.
- Select **Local Latitude** to enter the latitude of your antenna's position with the numeric keys **0 ... 9**.

# 11 Menu Spectrum

In this submenu, you can check the different transponders across the entire spectrum.

1. In TV mode press the **MENU** key (or navigate to main menu).
2. Select the sub menu **Spectrum** and confirm with **OK**.



- Press the **blue function key** to switch the polarization between horizontal (**H**) and vertical (**V**).
- Press the **green function key** to change the sample rate:
  - 4 M: very exact scan,
  - 8 M: middle precision
  - 16 M: less precise



The more accurate the scan, the longer it takes to capture the entire frequency range.

- Press the **red function key** to select the DiSEqC port and thus the satellite.
- Press the **yellow function key** to set the 22 kHz control voltage for the switch between high band and low band:

<i>On</i>	Permanent on,
<i>Off</i>	Permanent off,
<i>Auto</i>	automatic

The permanent settings are required, for example, for certain antenna systems or to avoid interferences.

## 12 Menu Watch Program

To check the TV reception, you can put the smartmeter S20 in the TV mode.

- In the main menu select the sub menu **Watch Program** and confirm with **OK** or press **EXIT** in the main menu to switch to TV mode.



After the first switch-on (or after resetting to factory settings), no programs are stored, the channel list is empty. You receive an error message: „**No Channel!**“

In addition to the live TV picture an infobar appears with the following information:

- Satellite, current date, current time
- Position in the current channel list, channel name with video PID, audio PID, PCR PID.
- Transponder data: frequency / symbol rate / polarization
- Error correction rate FEC
- Transmission standard, modulation
- Bit error rate VBER (bit error rate after error correction)
- Modulation error rate MER: all signal disturbances are summarized to one measurement value. The higher the MER value, the better is the signal quality.  
The MER can be worsened by these issues: Noise (C/N), Low frequency hum (50/100 Hz), Inter modulation errors (overridden amplifiers), I/Q modulation errors (phase/amplitude), Signal overlap (DECT phone), Standing waves (maladaptation or unfavorably mounted cables)
- Signal strength S, signal quality Q
- Press **EXIT** to open a toolbar (with four buttons) instead of the infobar.
- Press the blue function key (Information) to open the infobar.
- Press the **green function key (Full Screen)** to close the toolbar and to show only live TV.
- Press the **red function key (Mute)** to switch off the TV sound.
- Press the **yellow function key (Audio)** to select the audio mode:  
Use the keys **▶** and **◀** to select between: *Left, Right, Stereo, Mono*

and

the keys ▲ and ▼ to select another language or Dolby AC3 (Dolby Digital).



When selecting AC3 there is no TV sound. This option is only for verifying such programs / channels.

## 12.1 Selecting a Channel

You have several possibilities to select a channel.

### 12.1.1 Direct Channel Selection

- Select the desired channel by using the keys ▲ and ▼.

With each change of channel, an information window with information on the current channel will be displayed (see above).

### 12.1.2 Channel Selection via Selection Window

1. Press the **OK** key to display a selection window with all available channels.
2. Select the channel list with the desired channel by using the keys ► and ◀. You can select between a channel list for all satellites, channel lists for each satellite and you favorite lists.



You can create favorites lists only with the channel list editor (see "edit channel list using the editor program", page 28)

3. Select the channel to be displayed by using the keys ▲ and ▼ and confirm your selection by pressing **OK**. The channel will be correspondingly switched.

### 12.1.3 Channel Selection via Search Function

The channel lists can be quite comprehensive; correspondingly, the smartmeter S20 offers the possibility to search for channels in the list:

1. Press the **FIND** key to open the window **Find** with an on-screen-keyboard.
2. Select a character by using the keys ◀/► and ▲/▼ and respectively confirm by pressing **OK** to accept such character.
3. As soon as the first selected character has been confirmed by pressing **OK**, a second window will open, showing all channels starting with this character (in most cases, the first character is a letter).

Press **EXIT** to close the window **Find**, provided that selection is sufficiently arranged for your purposes. Now, you can select the desired channel in the other window by using the keys ▲ and ▼, and confirm by pressing **OK**.

4. Return to entry of characters (see step 2) to further limit channel selection.

## 12.2 Sorting the Channel List

1. In TV mode press **OK**.
2. Press the **blue function key (Sort)** to open a window for determining sorting criteria.
3. Select **Name(A-Z)** to sort the channel list in ascending alphabetical order **or** Select **Name(Z-A)** to sort the channel list in descending alphabetical order **or**

Select **Free/Scramble** to first list all free channels and then all encrypted channels in the channel list.

4. Press **OK** to confirm.
5. Press the **yellow function key (Play)** to go back to the TV mode.

## 12.3 Switching Between TV Channel List and Radio Channel List

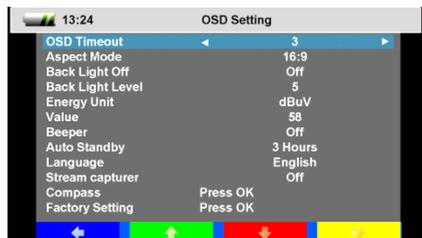
1. In TV or radio mode press **OK**.
2. Press the **green function key (TV/Radio)** to switch between TV channel list and radio channel list (or vice versa).
3. Press the **yellow function key (Play)** to go back to TV mode or radio mode.

## 12.4 Deleting a Channel from the Channel List

1. In TV mode press **OK**.
2. Select with the keys **▶** and **◀** the channel list including the channel you want to delete. If necessary, switch between TV channel list and radio channel list.
3. Select with the keys **▲** and **▼** the the channel you want to delete.
4. Press the **red function key (Delete)** to delete the channel. A safety query opens:
  - Press the **green function key (Yes)** to complete the deletion.
  - Press the **red function key (No)** to cancel the deletion and go back to the channel list.
5. Press the **yellow function key (Play)** to go back to TV mode.

# 13 Menu Settings

1. In TV mode press the **MENU** key (or navigate to main menu).
2. Select the sub menu **Settings** and confirm with **OK**. The window **OSD Setting** opens.



## 13.1 Hiding the OSD

- Select **OSD Timeout**, to set with the keys **◀** and **▶** the number of seconds when the OSD should be hidden. You can select values between **1** and **10** seconds. Factory setting is **3s**.

## 13.2 Switching off the Screen

- Select **Back Light Off** to set with the keys **◀** and **▶** the number of minutes when the screen should be switched off. You can select values between **Off** and **30 Minutes**. Factory setting is **5 Minutes**.

### 13.3 Setting Display Brightness

- Select **Back Light Level** to set with the keys ◀ and ▶ the display brightness. You can select values between 1 (dark) and 5 (light). Factory setting is 5.

### 13.4 Selecting Energy Unit

- Select **Energy Unit** to set with the keys ◀ and ▶ in which unit you want to show the voltage measures during spectrum analysis. You can select between *dBm* and *dBμV*. Factory setting is *dBμV*.

### 13.5 Setting Volume Level

- Select **Value** to set with the keys ◀ and ▶ the level of the TV sound plus the beeper sound level when a signal is found. You can select values between 10 and 100. Factory setting is 50.

### 13.6 Switching On/Off the Beeper

- Select **Beeper** to set with the keys ◀ and ▶ whether there should be a beeper sound when a satellite signal is found (*On*) or not (*Off*). Factory setting is *On*.

### 13.7 Activating the Automatic Standby Function

- Select **Auto Standby** to switch on or switch off the automatic standby function, and if on after which time the meter should go to standby mode, using the the keys ◀ and ▶. You can select values between *Off* and *3 Hours*. Factory setting is *3 Hours*.

### 13.8 Selecting the OSD Language

- Select **Language** to set with the keys ◀ and ▶ the OSD language. Factory setting is *Deutsch*.

### 13.9 Restoring Factory Settings

1. Select **Factory Setting** and press **OK** to restore factory settings.
2. Press the **green function key (Yes)** to complete the restore  
or  
press the **red function key (No)** to cancel the restore and go back to the menu window.



**A factory reset will erase all channels in your channel list!**

## 14 Menu PC Update

The sub menu **PC Update** is mainly intended to update the operating software via the USB port.

1. In TV mode press the **MENU** key (or navigate to main menu).
2. Select the sub menu **PC Update** and confirm with **OK**. The window **Upgrade by USB** opens.



## 14.1 Showing the Software Version

- Press the **blue function key (Version)** to display software and hardware version of your smartmeter S20.

## 14.2 Performing a Software Upgrade



### CAUTION!

- Make absolutely sure that the smartmeter S20 is supplied during the upgrade.
- During the update supply the smartmeter S20 with electrical power by power supply unit.

1. Look for the current software release packed as a zip archive in the support area of [www.smart-electronic.de](http://www.smart-electronic.de).
2. Unpack it and save the file with the extension \*.abs on your USB disk.



Tips and hints to extract and update can be found in the support area of [www.smart-electronic.de](http://www.smart-electronic.de).

3. Connect the USB disk to the smartmeter S20.
4. Select the line **Upgrade File**.
5. Select the new software file (\*.abs) (must be in the root directory of the connected USB disk!).
6. Select the line **Upgrade Mode**.
7. Make sure that the **Upgrade Mode** is *All Code*. If necessary, you must change the value by pressing the keys ◀ and ▶. With *All Code* the software, the current channel list and the "factory" channel list (default setting is empty) are newly loaded into the smartmeter S20.
8. Use the keys ▲ and ▼ to select the button **Start** and press **OK** or press the **green function key (Start)** to start the upgrade process. You will see a security warning asking if you really want to burn the flash memory:
  - Press the **green function key (Yes)** to start the Upgrade. After it is completed, the meter will be restarted.
  - Press the **red function key (No)** to cancel the Upgrade and go back to the window **PC Update**.

**CAUTION!**

- Never switch off the smartmeter during the upgrade process.

## 14.3 Editing the Channel List

You can save the channel list of the smartmeter S20 on a USB disk, edit it in conjunction with the appropriate editor program.<sup>7</sup> and then load it from USB disk. Also, you can create a "fixed" channel list that is preserved even at a factory reset.

### 14.3.1 Saving the Channel List on a USB disk

1. Select - with a connected USB disk - in the window **Upgrade By USB** with the keys ▲ and ▼ the line **Upgrade Mode** and then use the keys ◀ and ▶ to select the value **Dump**. The file name (ending in ".abs") appears in the line **Upgrade File**.

In this file these items are stored:

- the operation software,
  - the current channel list ("your channel list") and
  - the "factory" channel list (default setting is empty).<sup>^</sup>
2. Select with the keys ▲ and ▼ the button **Start** and press **OK** or press the **green function key (Start)** to start the saving.

### 14.3.2 Editing the Channel List with the Editor Program

1. Download from [www.smart-electronic.de](http://www.smart-electronic.de) (Support / Zubehör / smartmeter S20 / smartmeter S20 Downloads) the compressed file "Kanallisten-Editor.zip" and save it on your PC.

"Kanallisten-Editor.zip" contains these files:

- Kanallisten-Editor.exe
  - script.ini
  - User\_Manual.pdf (user manual in English)
  - BA\_Kanallisten-Editor\_S1\_S20.pdf (user manual in German)
2. Unzip the zip file into a directory of your choice.
  3. Start the program "Kanallisten-Editor\_S1.exe".

With the channel list editor, you can

- load both your channel list (User Database) or the work list (Default Database) which you have previously saved on your USB disk,
- move channels in the channel list,
- edit channel parameters,
- create up to 32 favorites lists and

<sup>7</sup> Kanallisten-Editor.zip, available free of charge in the support area (German) of [www.smart-electronic.de](http://www.smart-electronic.de) under Zubehör / Antenne / smartmeter S20 / smartmeter S20 Downloads.

- save the edited list as an “own” channel list (User Database) as well as a new “factory” list (Default Database) and then load it into your smartmeter S20 (as *User Database* or *Default Database*).

**CAUTION!**

- When delivered, the “factory list” is empty, i.e. there are no channels available.

### 14.3.3 Loading the Channel List from USB

#### 14.3.3.1 Loading the “Own” Channel List from USB

1. Select - with a connected USB disk - in the window **Upgrade By USB** with the keys ▲ and ▼ the line **Upgrade File**.
2. Select with the keys ◀ and ▶ the “channel list file” (\*.abs), containing the “own” channel list you want to transfer to your smartmeter S20 (must be located in the root directory of the USB disk!).
3. Select with the keys ▲ and ▼ the line **Upgrade Mode** and select with the keys ◀ and ▶ the value *User Database*.
4. Select with the keys ▲ and ▼ the line **Start** and press **OK** or press the **green function key (Start)** to start the loading.

#### 14.3.3.2 Loading the “Factory” Channel List from USB

1. Select - with a connected USB disk - in the window **Upgrade By USB** with the keys ▲ and ▼ the line **Upgrade File**.
2. Select with the keys ◀ and ▶ the “channel list file” (\*.abs), containing the “factory” channel list you want to transfer to your smartmeter S20 (must be located in the root directory of the USB disk!).
3. Select with the keys ▲ and ▼ the line **Upgrade Mode** and select with the keys ◀ and ▶ the value *Default Database*.
4. Select with the keys ▲ and ▼ the line **Start** and press **OK** or press the **green function key (Start)** to start the loading.

## 15 Saving a Screenshot

### 15.1 Capturing a Screenshot

If a USB data storage device is connected to the meter, you can save a screenshot of the display to the data storage device (e.g. to document measuring values).

- Press the  (14) key.  
A screenshot of the display is saved to the USB data storage device in a bmp file.

### 15.2 Displaying a Screenshot

1. In TV mode press the **MENU** key (or navigate to main menu).
2. Select the sub menu **PC Update** and confirm with **OK**. The window **Upgrade by USB** opens.

3. Press the **yellow function key (Snapshot)**.
4. Press **▼** to select the connected data storage, and confirm by pressing **OK**.  
The present directories and files will be displayed.
5. Select the image to be displayed (on the right side of the screen you see a preview image).
6. Press **OK** to display the image in full screen mode.



By default, the playback mode for images is slide show mode. You can stop the slide show mode by pressing the keys **▼** or **▲** (go backward or go forward).

### 15.2.1 Renaming an Image

1. Press during preview of an image the **red function key**. A screen keyboard opens.
2. Press first (if necessary for several times) the **blue function key (delete)** to delete the last character. Enter a new name for the image by highlighting the characters on the screen keyboard using the keys **◀ / ▶** and **▲ / ▼** and confirm them with **OK**.
3. Repeat this step, until the desired name is completed.
  - Press the **green function key (OK)** to confirm the inserted name and go back to the list of images.
  - Press the **red function key (Cancel)** to go back to the list of images, without renaming the image.
  - Press the **yellow function key (CAPS)** to switch between upper case and lower case.

### 15.2.2 Rotating an Image



"Rotate an Image" does not change the respective files, but only change the current view!

1. Select the image to be rotated.
2. Press **OK** to display the image in full screen mode.
3. Press the keys **◀** and **▶** once or several times to rotate the image clockwise/counterclockwise by 90 degrees.

## 16 Operation in a Unicable System

### 16.1 About Unicable

The smartmeter S20 allows for changing the receiving mode to the unicable standard. This makes it possible - depending on the antenna type - to connect up to eight independent receivers to only one main line.

For this, an own IF channel and a corresponding frequency should be set for each receiver via the settings menu.

Allocation of channels and frequencies depends on the used LNBS and/or multi-switches.

The data sheet and the technical documentation of your LNB and/or multi-switch include an allocation table similar to the following table.

## 16.2 Allocation of IF channels and frequencies

Receiver	IF channel	Exemp. frequency (MHz)	Frequency (MHz)
Receiver 1	1	1284	
Receiver 2	2	1400	
Receiver 3	3	1516	
Receiver 4	4	1632	
Receiver 5	5	1748	
Receiver 6	6	1864	
Receiver 7	7	1980	
Receiver 8	8	2096	



- Enter the frequencies of your receiving system into the last column of the table so that all relevant information is quickly available. Rule of thumb: highest frequency → shortest cable path.

## 16.3 Installation

1. Select the menu item **TP Search** and press **OK**.
2. Select with the keys ▲ and ▼ a satellite and press **OK**.
3. Select with the keys ▲/▼ the line **LNB Freq.**
4. Select with the keys ◀ and ▶ the right value for the used Unicable LNB (according to the LNB specs).
5. Select with the keys ▲/▼ the line **DiSEqC1.0** and switch off the DiSEqC port use with the keys ◀ and ▶. Ensure that also **DiSEqC1.1** is *disabled*.
6. Select with the keys ▲/▼ the line **IF Channel** and set with the keys ◀ and ▶ the IF channel according to the specs of the unicable system.
7. Select with the keys ▲/▼ the line **Centre Freq** and set with the keys ◀ and ▶ the frequency according to the specs of the unicable system.

The assignment of channels and frequencies depends on the LNB or multiswitch manufacturer.



You can also input the **Centre Frequency** (if you selected a Unicable LNB) by pressing the **yellow function key**.

## 17 Cleaning the Meter



**WARNING!**

### Danger of electric shock during cleaning:

- Before you start cleaning the meter, disconnect the meter from the power plug. Unplug the power plug from the socket.
- Never use a wet wipe to clean the meter or power plug.
- Make sure that meter and power plug are always kept dry.



**CAUTION!**

### Risk of damages to the meter during cleaning:

- Always use solvent-free cleaning agents (no benzene, no thinner).
- Use a soft lint-free wipe to clean the housing and display of the meter. If the meter is very dirty, you may use mild, solvent-free soapsuds or spirit for cleaning.



You may use compressed air (max. 2 bar) to clear the keypad of dirt. Do not use any solvents for cleaning.

## 18 Transporting and Storing the Meter

**If you want to transport the meter or if you intend to stop using the meter, handle the device as follows:**

1. Disconnect the meter and all connected devices from the power supply.
2. Remove the aerial cable from the device.
3. Remove all other cables connected to the meter.
4. Put the meter, the cables and the user manual into the original packing.
5. Store the meter and the accessories in a dry and dust-free place.
6. Make sure that the meter is protected from frost.

## 19 Troubleshooting

Fault phenomenon	Probable reasons	Solutions
Device does not react.	The battery is empty.	Charge the battery.
Bad picture , block defect	The antenna is not adjusted to the satellite.	Adjust the antenna.
	The LNB is defect	Replace the LNB.
No or only faint signal.		Please check all cable connections. Adjust the antenna.

Fault phenomenon	Probable reasons	Solutions
No picture, no sound.	Display/ Sounds turned off	Turn on the display by pushing the F1 button. Turn on the sound by pushing the F2 or ► button.

If the troubleshooting suggestions do not help to correct a malfunction, please contact your specialist dealer.



You can find an FAQ-list with updated troubleshooting suggestions in the support section on our website at [www.smart-electronic.de](http://www.smart-electronic.de).

## 20 Disposal



**CAUTION!**

- Do not dispose of the meter or battery in your normal household waste.



- Ask your municipal authorities about how to dispose of the device in an eco-friendly and proper manner.
- Take spent batteries to an official collection point.



The WEEE<sup>8</sup> symbol on the product or the product packing indicates that this is an electrical or electronic device.

Thus, you will contribute to protecting the environment and people's health. Material recycling helps to reduce the consumption of raw materials.

You can help to preserve the environment we live in.

## 21 Specifications

### 21.1 General

- 3,5" TFT-LCD, 720 x 576 pixel
- Physical separation of meter and battery (on-off-switch)

<sup>8</sup> The WEEE symbol stands for the Waste Electrical and Electronic Equipment Directive (2002/96/EC). This Directive was introduced to reduce the ever growing quantity of electronic waste from spent electrical and electronic devices. The aim is to avoid and reduce growing quantities of electronic waste and to promote eco-friendly disposal of such waste through extended manufacturer responsibilities.

- Period of operation 4 – 8 hrs. (depending on operation mode)
- Display of signal strength and signal quality:  
numeric / bar graph
- Spectrum Analyzer
- Signal with good reception: optical and acoustical

## 21.2 LNB/Tuner input

LNB connector	F socket
Frequency range	950 MHz to 2150 MHz
Input level	-65 dBm to -25 dBm
Input resistance	75 Ω
LNB power supply	13/18 V, max. 700 mA
LNB control signal	22 kHz
DiSEqC control	yes

## 21.3 System Resources

CPU-Frequenz	216MHz
SDRAM	16Mbyte DDR
FLASH	2MByte

## 21.4 Video Decoder

Front-End-Modul	QPSK
Symbol rate	2 Mbps to 45 Mbps
Data rate	up to 60 Mbit/s
Video resolution	720×576(PAL) 720×480(NTSC)
FEC	1/2, 2/3, 3/4, 5/6, 7/8

## 21.5 Data Interface

Connection type	USB
-----------------	-----

## 21.6 Power Supply

Supply voltage	12.6 V
Li-Polymer battery	2700 mAh
Supply voltage (charger)	175 - 250 V ~, 50/60 Hz

## 21.7 Dimensions and Weight

Length x Width x Height	10.5 cm x 16.5 cm x 4.5 cm
Weight	0.48 Kg

## 21.8 Temperatur

Operating temperature	0° C to +40° C
Storage temperature	-40° C to +65° C

## 22 Declaration of Conformity

The company smart electronic GmbH, Industriestraße 29, 78112 St. Georgen hereby declares conformity with the following guidelines and standards for this product:

- **Guideline for electromagnetic compatibility 2004/108/EG**
  - EN61326-1:2006
  - EN61000-3-2:2006+A1:2009+A2:2009
  - EN61000-3-3:2008
- **Guideline for low voltage 2006/95/EG**
  - EN61010-1:2001

**SMA**  **RT**  
**ENJOY YOUR ENTERTAINMENT**

Art.-Nr.: 90-60-01-0122

