SPM 22 SD

from V43.33

Signal level measuring instrument
with field strength measurement
and memory card

We thank you for buying of a product of the company SAT-Kabel®.
This operating instructions shall help you to understand the functions of the instrument and to ease its use. If you have questions about this instrument or suggestions for further improvements, please get in touch with us.

This instruction has been performed to the best of our knowledge. Developments and technical amendments are subject to change without notice.
Topical made operating instructions in a PDF format can also downloaded from our Internet homepage (***www.sat-kabel.de***)
©2012 SAT-Kabel GmbH

©2013 SAT-Kabel GmbH

Content

1.	General	4
2.	Delivery volume	4
3.	Important notes	4
4.	Charging the battery	5
5.	Control and functional elements	5
6.	Operating function	5
6.1	Switch on	6
6.2	Switch-on measuring range store	6
6.3	Switch off	7
7.	Measuring ranges	7
7.1	Additional functions	8
7.2	PC software	9
7.3	Sound and LED display switch on and off	8
	Operating scheme	10–13
8.	Memory values change	14
8.1	Storing	14
9.	Technical data	15
10.	Scheme of data logging on the memory card	16
11.	Guarantee	19

©2013 SAT-Kabel GmbH

1. General

The processor controlled level measuring instrument **SPM 22 SD** is the top instrument of the SPM 22 series and because of its handling and measuring accuracy an ideal device for troubleshooting and level testing in single and communal aerial systems, CATV networks, SAT systems a well as for DVB-T und WLAN. The spectrum display allows the assessment of the slope of amplifiers and serves for the display of disturbing carriers, also in the return path range of CATV networks. By an automatic self calibration of this instrument the measured values are nearly temperature independent.

With the **SPM 22 SD** measured values can be stored on an SD memory card and further processed with our special software. Measurement routines can also be prepared in the office and be passed by the memory card as a service technician job.

2. Delivery volume

1 **SPM 22 SD** incl. high-quality NiMH accumulator
1 plugin charging device AC/AC
1 SD card
1 operating instructions
(software: download from *http://www.sat-kabel.de/download.html)*

optional available:

Imitation leather bag **KLT** or **KLT 2**
Measuring cable with adapter **MKA 150 HQ**
Plastic case **TKSI**
Protective housing green, with carrying strap **SGW**

3. Important notes

- Do not measure at live objects >65 VAC!
- Do not expose incident solar radiation, heath and extreme coldness!
- The working temperature range is 0 °C until +40 °C
- avoid shocks by bumps or falling down. We recommend the use of the imitation leather bag.
- The F-measuring socket is a high-quality component. **This one is designed for a maximum diameter of 1.1 mm of the inner conductor.** We recommend for a good care of the socket to use a measuring cable with F-connector plus an according adapter.
- The surface of the housing can be cleaned with a dry, soft and lintfree cloth. Do not use aggressive solvents for the cleaning.

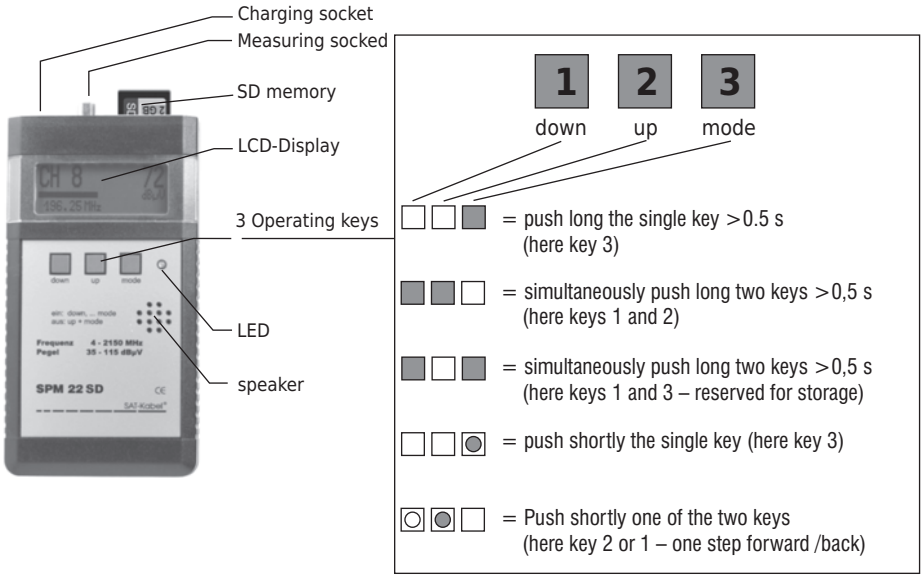
©2013 SAT-Kabel GmbH

4. Charging the battery

Connect the plugin charging device (containing in the delivery volume) to the charging socket (ø5.5/2.1 mm, plus pole inside). The power supply voltage (11…28 V) and charging control is shown on the display.

Charging time: ca. 10 h at empty accumulator
Charging end: 7.2–7.4 V accumulator bar stand idle

5. Control and functional elements

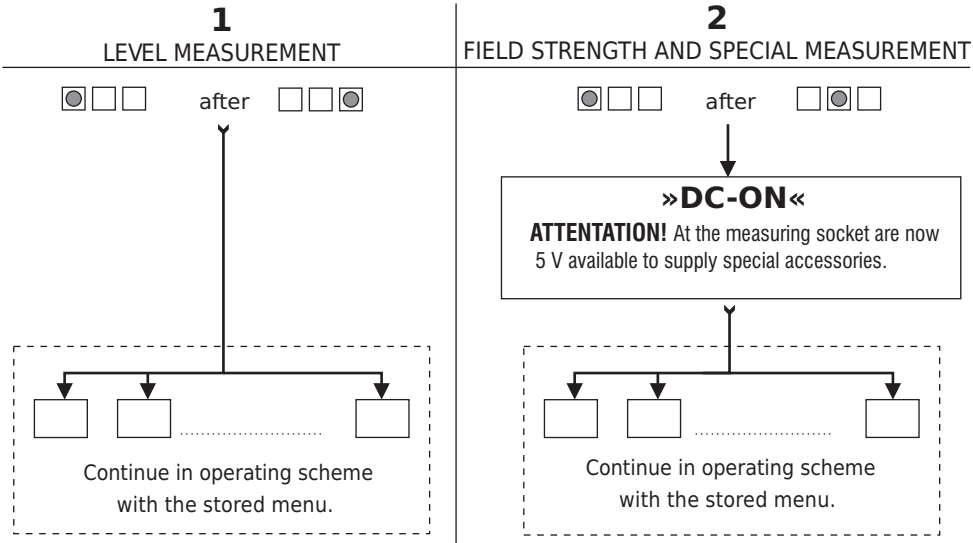


6. Operating functions

Function	**operated from:**		
Switch on 1	Push the key »down« after that key »mode« shortly		
Switch on 2	Push the key »down« after that key »up« shortly		
Switch off	Push the keys »up« and »mode« simultaneously and shortly		
Cursor move	key »down«	shortly	– one step to left
	key »up«	shortly	– one step to right
Menu	key »mode«	long (>0.5 s)	– one menu point forward
	key »mode«	shortly	– one menu point back

©2013 SAT-Kabel GmbH

6.1 Switch on



Menu / Measure	Display
Scan / dB(µV)	
3K / dB(µV)	dBµV
BK / dB(µV)	dBµV
SAT / dB(µV)	
DVB-T / dB(µV) – with antenna	dBµV
WLAN / dB(µV)	dBµV
KFG / dB(µV)	dBµV
TELEMETRIE / dB(µV) – only with RSU 6-65T	dBµV

Menu / Measure	DC-ON	Display
Scan / dB(µV)	×	
3K / dB(µV)	×	dBµV
BK / dB(µV)	×	dBµV
SAT / dB(µV)	×	
DVB-T / dB(µV) – with antenna and VVT 20	×	dBµV
WLAN / dB(µV) – with ANT 2,45and VUW 2,45	×	dBµV
KFG / dB(µV/m) – with ANT-FAS, ANT-TA …	×	dBµV/m

After switch on of the instrument the last stored measuring range appears at the display. With the key »up« or the key »down« can be selected another measuring range. At the **SPM 22 SD** the following ranges are available:

1.) SCAN - 3-KANAL - BK - SAT - DVB-T - WLAN - KFG - TELEMETRIE - SD
2.) SCAN - 3-KANAL - BK - SAT - DVB-T - WLAN - KFG - SD

6.2 Switch-on measuring range store

The measuring range, which shall be available after switch on, can be defined by storage.

©2013 SAT-Kabel GmbH

For it the wanted measuring range has to activate:

SCAN - 3-KANAL - BK - SAT - DVB-T - WLAN - KFG - TELEMETRIE – SD

Push now the keys »down« and »mode« simultaneously until the storage symbol appears. At the next switch on of the instrument this measuring range is available at once.

6.3 Switch off

Push the keys »up« and »mode« simultaneously. This is general possible in all menu points and by that also a kind »emergency exit«.

7. Measuring ranges

SCAN | Used for quick overview of an existing frequency spectrum. It enables the selection of three ranges: channels in the CATV range, frequencies in an extended CATV range and frequencies in the SAT range. The highest measured level is displayed at channel/frequency (at digital signals are to add the following correction values: +8 dB at QAM, COFDM and +13 dB at QPSK). Now it can by repeatedly zooming the displayed channel or frequency range further be analyzed.

3-KANAL | This measuring range is suitable for a quick check, e. g. at the system outlets as ell as especially for evaluation and adjustment of slopes. Here the levels are measured of every three channels / frequencies / »D« channels, which are placed on one of the storage places. Digital frequencies must be stored at this as »D« channel; otherwise there is no automatic level correction! During the subsequent menu »SCAN« is usually carried out a channel scan. Should be programmed on a channel to be measured a frequency or a digital channel, it will then performed a frequency scan.

BK | This measuring range is suitable for fast measurements in CATV systems. In this case can go on switched in the channel raster inclusive return path and fm radio. Digital channels are automatically detected and the precise level value is displayed.

Special feature from V 41.83: If the SPM 22… detect on S2/S3 digital signals, they are considered as 8 MHz channels. (S2: 109–117 MHz; S3: 117–125 MHz)

SAT | This range is designed for the service of SAT receiving systems. The receiving spectrum can be displayed in several resolutions. At digital QPSK-signals are to add +13 dB to the measured level value.

ATTENTION! *For the control and power supply of LNB is the additional accumulator* ***AU-SPM*** *necessary. This one must be ordered separately as accessories.*

DVB-T | Here is measured the special frequency range only. This range contains menus for channel raster and frequency spectrum. As accessories there are several antennas and a preamplifier.

©2013 SAT-Kabel GmbH

WLAN | This is also a special frequency range (2.4–2.5 GHz). For measurements are to use the pre-plug amplifier **VUW 2,45** and a special antenna. These ones are to order separately as accessories.

KFG | From a code frequency generator, which is installed in the head end, the detecting code and the belonging to it level, is displayed. In the mode field strength measurement an assignment of spurious radiation to the corresponding system is possible.

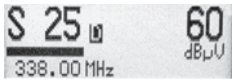
Telemetrie | With this the receipt and the display of measuring data is possible, which are transferred via telemetry over the CATV network. Prerequisite for it is the installation of a **RKT 301** or a **RSU 5-65T**. These measuring data can be stored at the SPM 22 SD on a SD card for a later evaluation on a PC.

> ***NOTE:*** *In all displayed level values are usually the corresponding correction values calculated. However this is only ensured with the original accessories. Furthermore the voltage on the measuring socket serves exclusive at »DC-ON« for the supply of the original accessories and has to be activated only for this reason!*

SD | This measuring range serves the storage of measuring data on a multimedia card. In this case a measuring point is defined and a scan must be performed. The stored measuring data can transfer to a PC for further processing. The software »SPM-Management-Tool« can be downloaded free of charge from our website *http://www.sat-kabel.de/ download.html*

7.1 Additional functions

Bargraph



Digital level in CATV channel

Also from version 40.93 all instruments have a bar display (bargraph) for a faster overview in the CATV and SAT ranges for the level.

From software version 40.93 it is possible to measure digital level in CATV systems. For identification in the display is additionally displayed a **D**

ATTENTION!
In the range »BK«, these »D«" channels are automatically detected.
If in the measurement of a digital channel a »D« appears in the display, it is NOT a level correction necessary.

©2013 SAT-Kabel GmbH

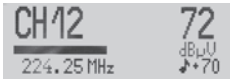
7.2 PC software

The necessary software for the use of the multi media card and an installation instruction you can find in the actual version in Internet under *http://www.sat-kabel.de/download.html* for the corresponding measuring instrument in a free download. In order to use this software, on the used Win-PC must be installed the Java Runtime Environment (JRE) in the version 1.5.0 – also called as version 5. If necessary this software can be free downloaded from the Internet e.g. under *http://www.java.com*.

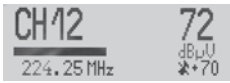
ATTENTION! The SD cards (max. 2 GB) must be formatted only with FAT (FAT12 or FAT16). Do not format with FAT32 or NTFS!

7.3 Sound and LED display switch on and off

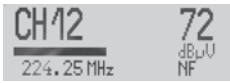
In with (♪) marked menus in the description on the pages 10–13 can switched on by long simultaneously pushing of the keys »up« und »down« the tone output as well as the LED display. The each switched mode is displayed in the display right at the button.



Bearing tone and LED display activated.



Bearing tone switched off, only LED display active



Audio play back

The number »+70« specify in this case the threshold value in dB(µV). At field strength measurement this value is »+25« in dB(µV/m). These values are considered in the instrument.

At the searching of spurious radiation with the **SPM 22 SD** with tone and LED the LED begins to light green from 40 dB(µV) resp. 15 dB(µV/m). It is to hear a constant tone, which is growing higher if the level rises. After reaching of the threshold value is to hear an intermittent tone. The LED flashes in this case red. That means, that the limit value is reached or already for a short time exceeded. If the LED lights red continuously, the limit value has been exceeded.

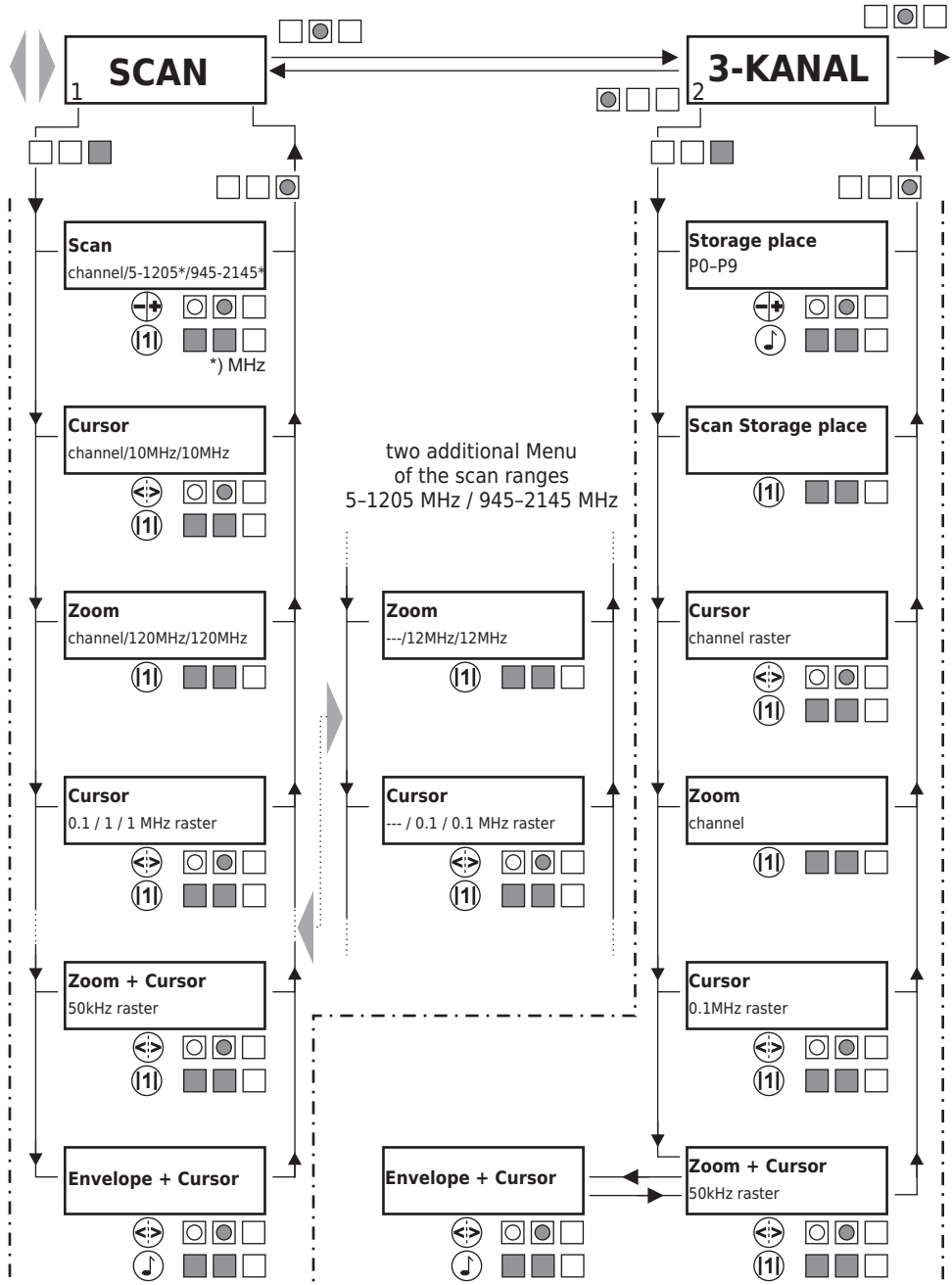
The audio play back means, that e.g. on the TV sound carrier the corresponding sound will be played back. With some practical experience can detect by hearing of the modulation, e.g. of a colour carrier, stronger interferences caused by modulation products.

©2013 SAT-Kabel GmbH

Operating scheme SPM 22 SD

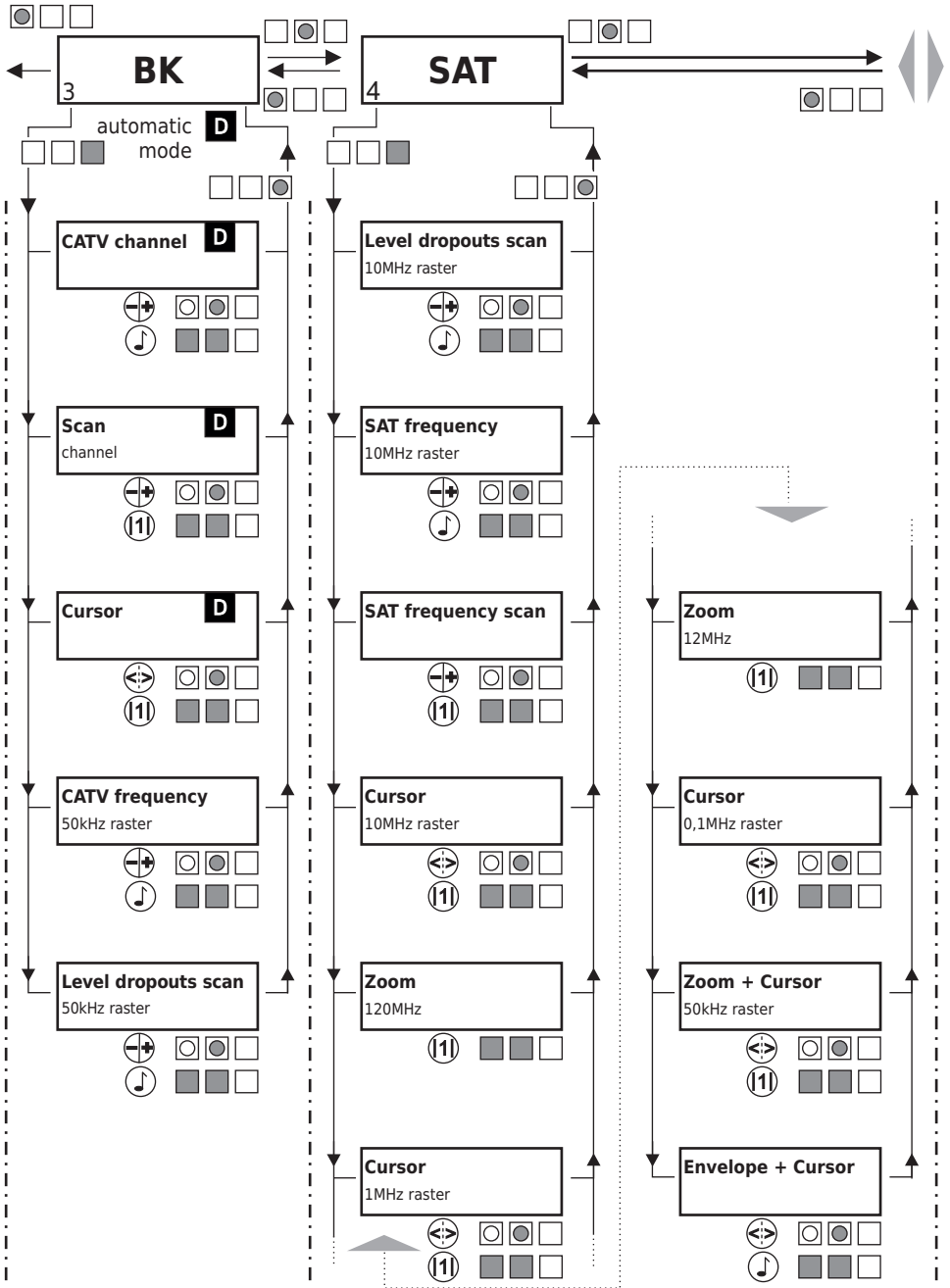
from software version V43.33

After switch on of the instrument a menu point from the highest row will be displayed.

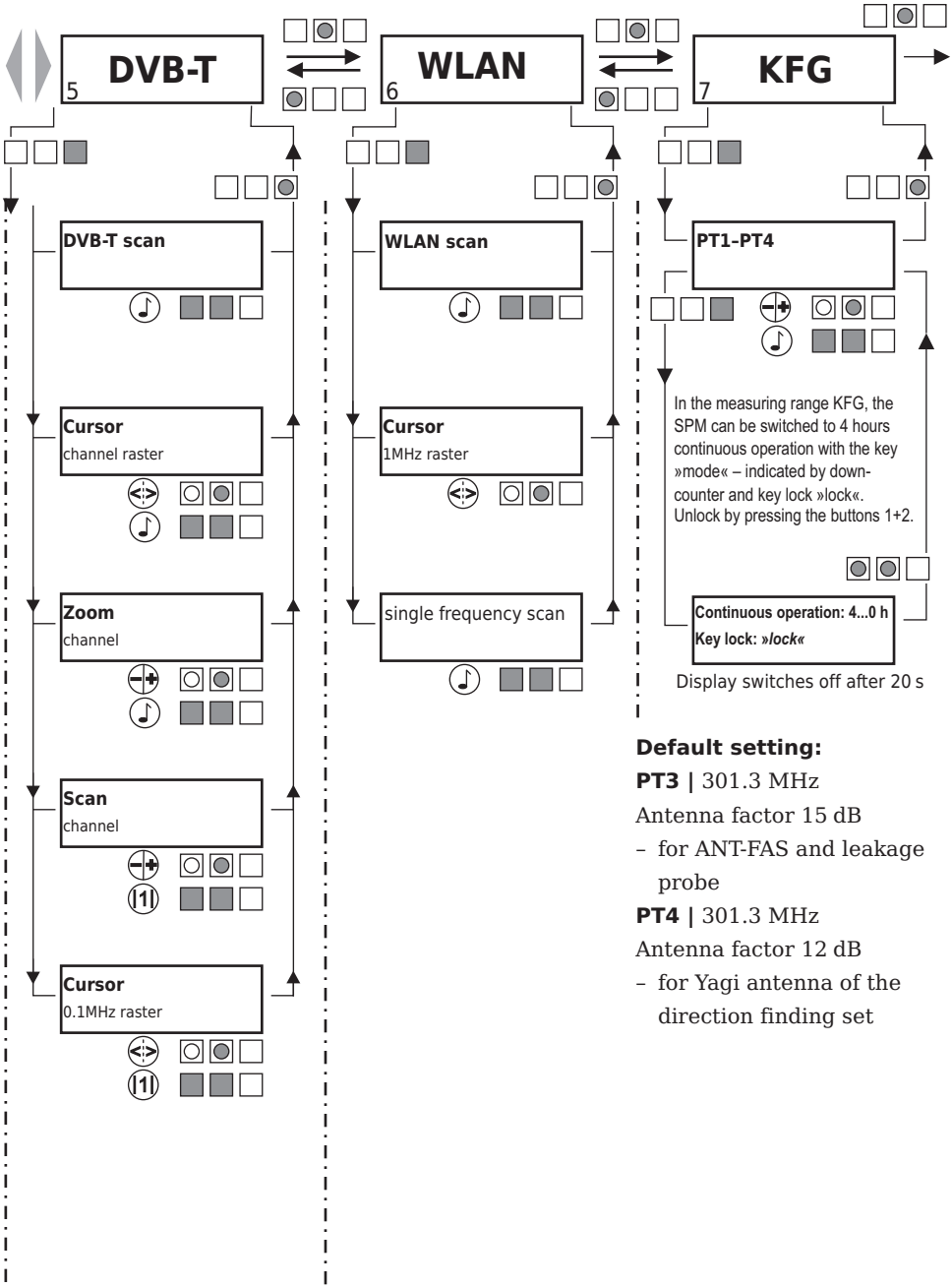


©2013 SAT-Kabel GmbH

signs and symbols see p. 13



©2013 SAT-Kabel GmbH



Default setting:

PT3 | 301.3 MHz

Antenna factor 15 dB

– for ANT-FAS and leakage probe

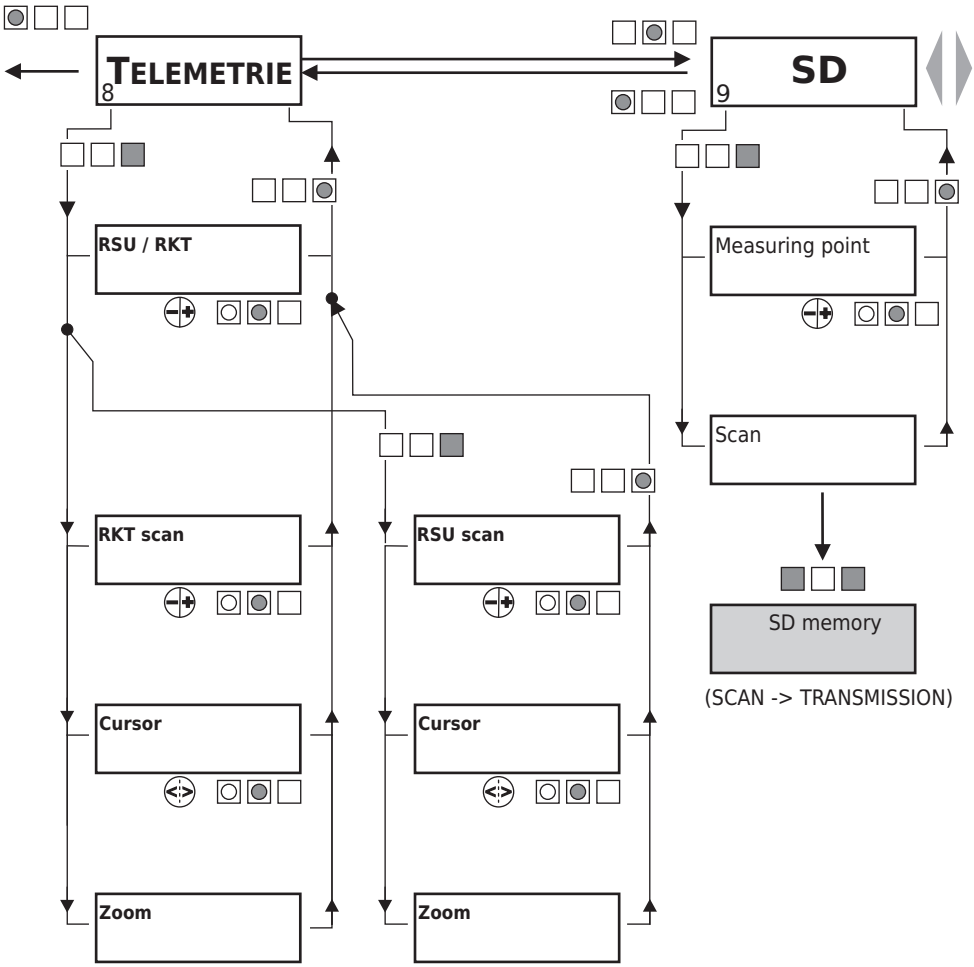
PT4 | 301.3 MHz

Antenna factor 12 dB

– for Yagi antenna of the direction finding set

©2013 SAT-Kabel GmbH

from software version V43.33

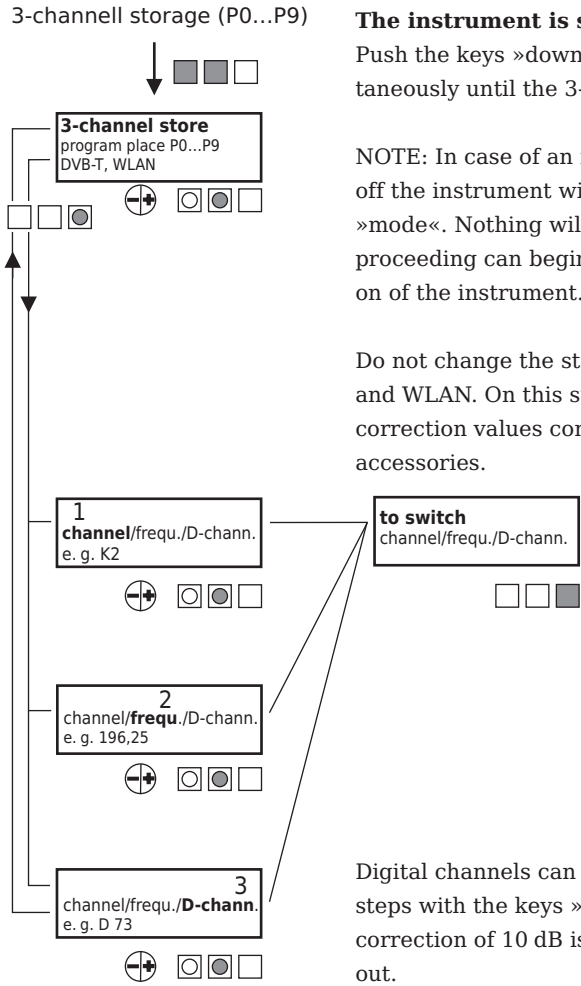


Signs and symbols

- = Do not push the key!
- = Push key long >0.5 s
- = Push shortly the key
- = Alternative push key shortly
- = Selection back/forward
- = Shift cursor left/right
- = Display sensitivy (3 steps)
- = Tone and LEDswitch on/off
- = Automatic digital identification

©2013 SAT-Kabel GmbH

8. Memory values change



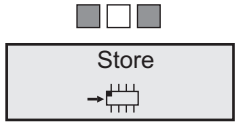
The instrument is switched off!
Push the keys »down« and »up« simultaneously until the 3-channel store appears.

NOTE: In case of an incorrect input switch off the instrument with the keys »up« and »mode«. Nothing will be stored and the proceeding can begin new with the switch on of the instrument.

Do not change the storage places for DVB-T and WLAN. On this storage places are correction values considered for the accessories.

Digital channels can be changed in 1 MHz steps with the keys »up« und »down«. A correction of 10 dB is automatically carried out.

8.1 Storing



DO NOT FORGET!

Push the keys »down« and »mode« simultaneously until the circuit symbol appears. After that with the keys »up« and »mode« switch off the instrument.

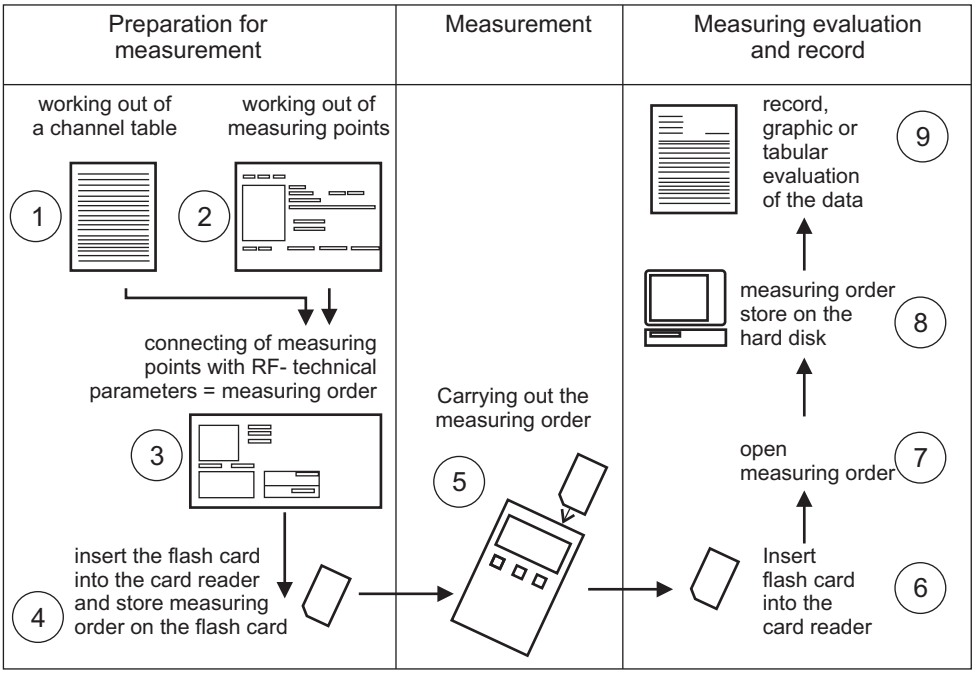
©2013 SAT-Kabel GmbH

9. Technical Data

Frequency range	4–2150 MHz; (2.4–2.5 GHz with pre-plug converter)
Resolution	50 kHz (4–2150 MHz)
Level measuring range analog	35…115 dB(µV), –25…55 dB(mV)
Level measuring range CATV-digital	45…115 dB(µV), –15…55 dB(mV)
Field strength measuring range	10–80 dB(µV/m)
Measuring bandwidth	120 kHz
Level accuracy	±2 dB
Spectrum display	4–2150 MHz and TV channels
	86–110 MHz (RF)
	Cursor fade in with level display
Spectrum resolution	1, 2, 3 dB/pixel, switchable
Special functions	grphic display of level black outs
Storage places	2× 10 fore 3 channels or frequencys each
RF input	F-socket 75 Ohm
Operating	with 3 keys
Displays	LCD Display, 120 × 32 pixel, illuminated
Treshold display	2 colour LED, treshold values adjustable
Bearing tone	switchable
Storage medium	SD card up to max. 2 GB / FAT 16
	(the previous MMC memory cards can still be used)
Power supply	NiMH accumulator 6 V/750 mAh
	AC/AC adapter
Power consumption	ca. 110 mA
Dimensions	157 mm × 84 mm × 30 mm
Weight	ca. 300 g

©2013 SAT-Kabel GmbH

10. Scheme of data logging on the memory card



©2013 SAT-Kabel GmbH

		see software	
	installation of the software start of the program »SPM Management Tool«		
1	working out of a channel table	adjustments	channel division
2	working out of one or more measuring points	adjustments	measuring point administration
3	connecting of measuring points with RF-technical parameters	measuring value logging	giving NEW measuring orders on SD card
4	insert the flash card into the card reader Store of the measuring order on the flash cardremove the flash card out of the card reader	measuring value logging	start measuring order
5	insert the flash card into the SPM 22 SD switch on the SPM 22 SD start the measuring order at the SPM 22 SD remove the flash card out of the SPM 22 SD		
6	insert the flash card into the card reader		
7	open the measuring order	measuring value logging	download of the FINISHED measuring orders from the SD card
8	storage of the measur. orders on the hard disk	measuring value logging	store on the hard disk
9	evaluation of the measuring orders, record, graphic or tabular evaluation of the data	measuring value evaluation	tabular or graphic

©2013 SAT-Kabel GmbH

©2013 SAT-Kabel GmbH

13. **Guarantee** – State July 2006

For this instrument will be granted a service life (in following called guarantee) to following conditions:

- This guarantee is valid for new instruments purchased in Germany.
- New instruments and their components, which are defective because of production faults and/or material faults, are repaired from SAT-Kabel®.
- For wear parts, like accumulators, keyboards, housings, bags, connecting cables this guarantee is valid for 6 month from the purchasing date.
- The guarantee claim expires at matings by the purchaser or third persons.
- At defects, caused by improper handling or operating, by wrong installation or store, by improper connection or mounting, no guarantee is granted.
- For not justified demand of our service we charge for our service the usual payment for material, working hours and forwarding costs.
- Repairs are only made with filled service covering.

Forms for service coverings and further information are found in the standard form contracts under: *www.sat-kabel.de*

©2013 SAT-Kabel GmbH

SAT-Kabel®
Satelliten- und Kabelfernsehanlagen/Industrievertretung GmbH
Telephone: +49 3724 6665-0
Telefax: +49 3724 6665-44
info@sat-kabel.de • www.sat-kabel.de

Errors, technical amendmends and developments are subject to change without notice!

©2013-02-25 SAT-Kabel®