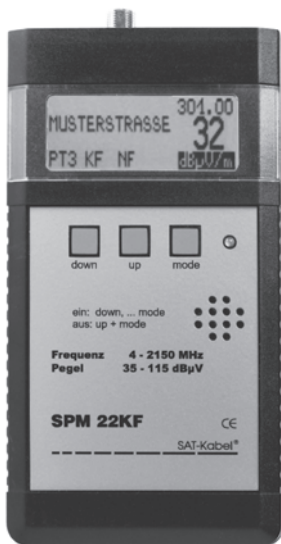




SPM 22 KF

from V43.33



Signal level measuring instrument
with field strength measurement

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**)

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1. General

This processor controlled level measuring instrument from the SPM 22 series is because of its small size and measuring accuracy an ideal tool for troubleshooting and level checking in single and communal aerial systems, CATV networks as well as SAT systems. It has been extended with the menus DVB-T, WLAN according the technical progress.

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. This instrument has been designed for the practical man to measure RF signals. By an automatic self calibration of this instrument the measured values are nearly temperature independent.

2. Delivery volume

- 1 **SPM 22 KF** incl. high-quality NiMH accumulator
- 1 plugin charging device AC/AC
- 1 operating instructions

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 V_{AC}!
- 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.

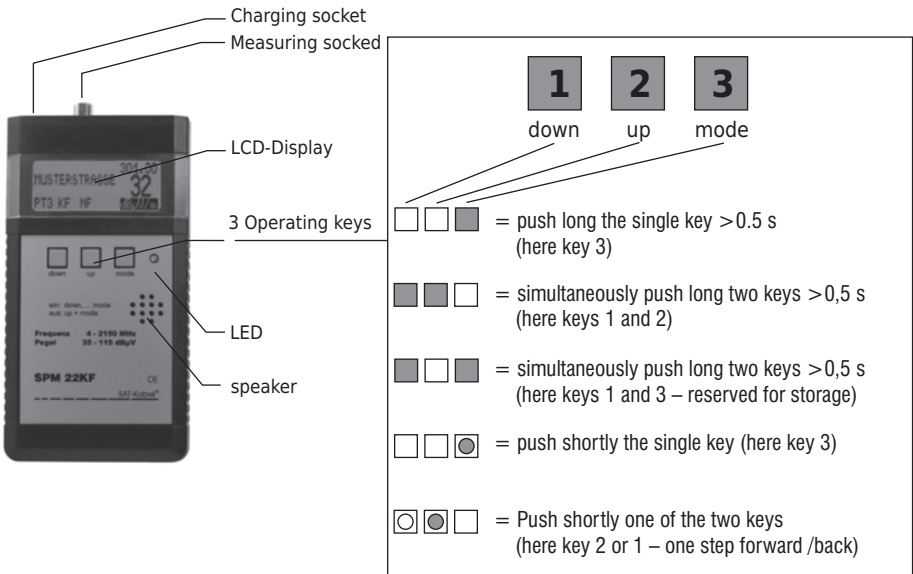
4. Charging the battery

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

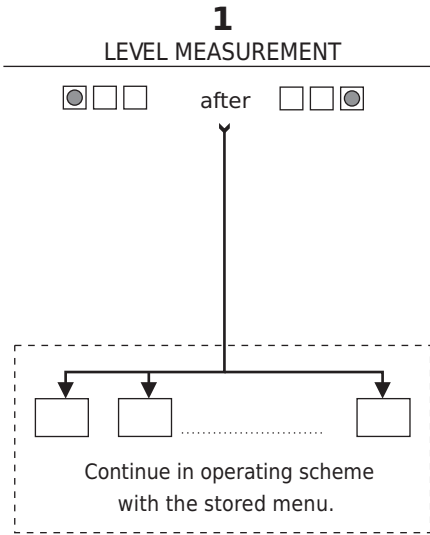
5. Control and functional elements



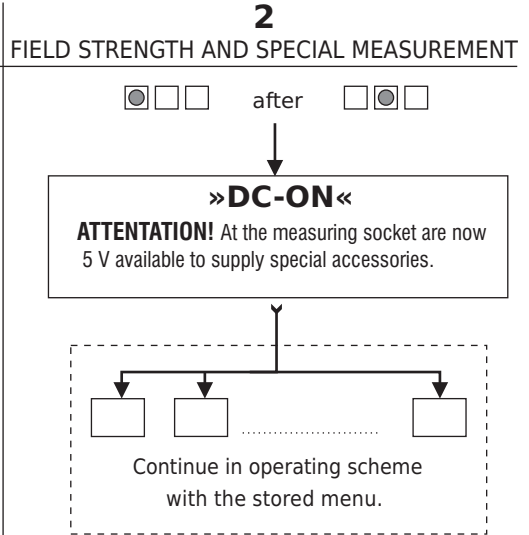
6. Operating functions

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

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 KF** the following ranges are available:



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

6.2 Store switch on measuring range

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

For it the wanted measuring range has to activate:

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

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 well 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.

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!*

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.

7.2 Switching on and off of the tone and the LED display

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 KF** 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.

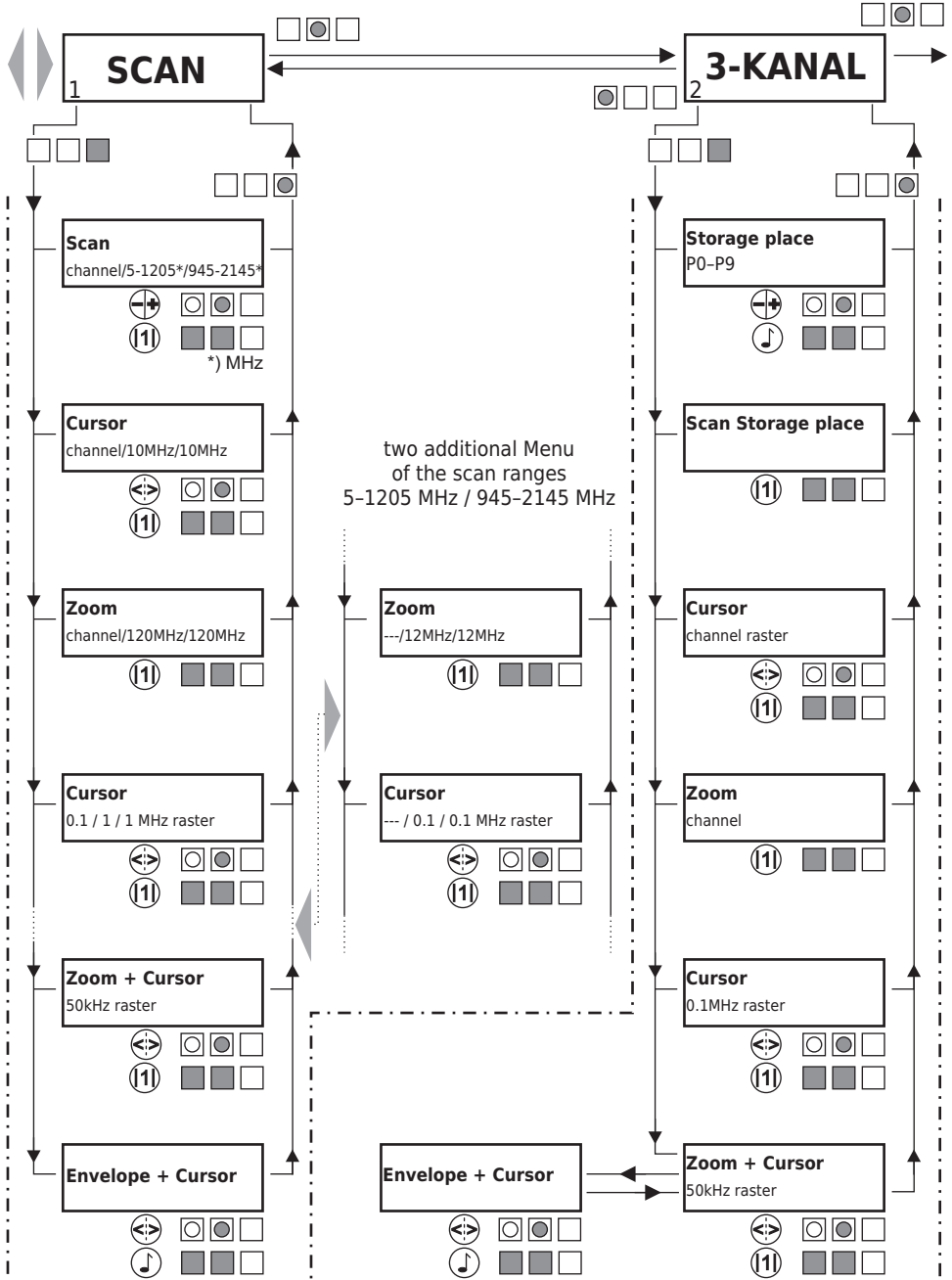
8. Technical Data

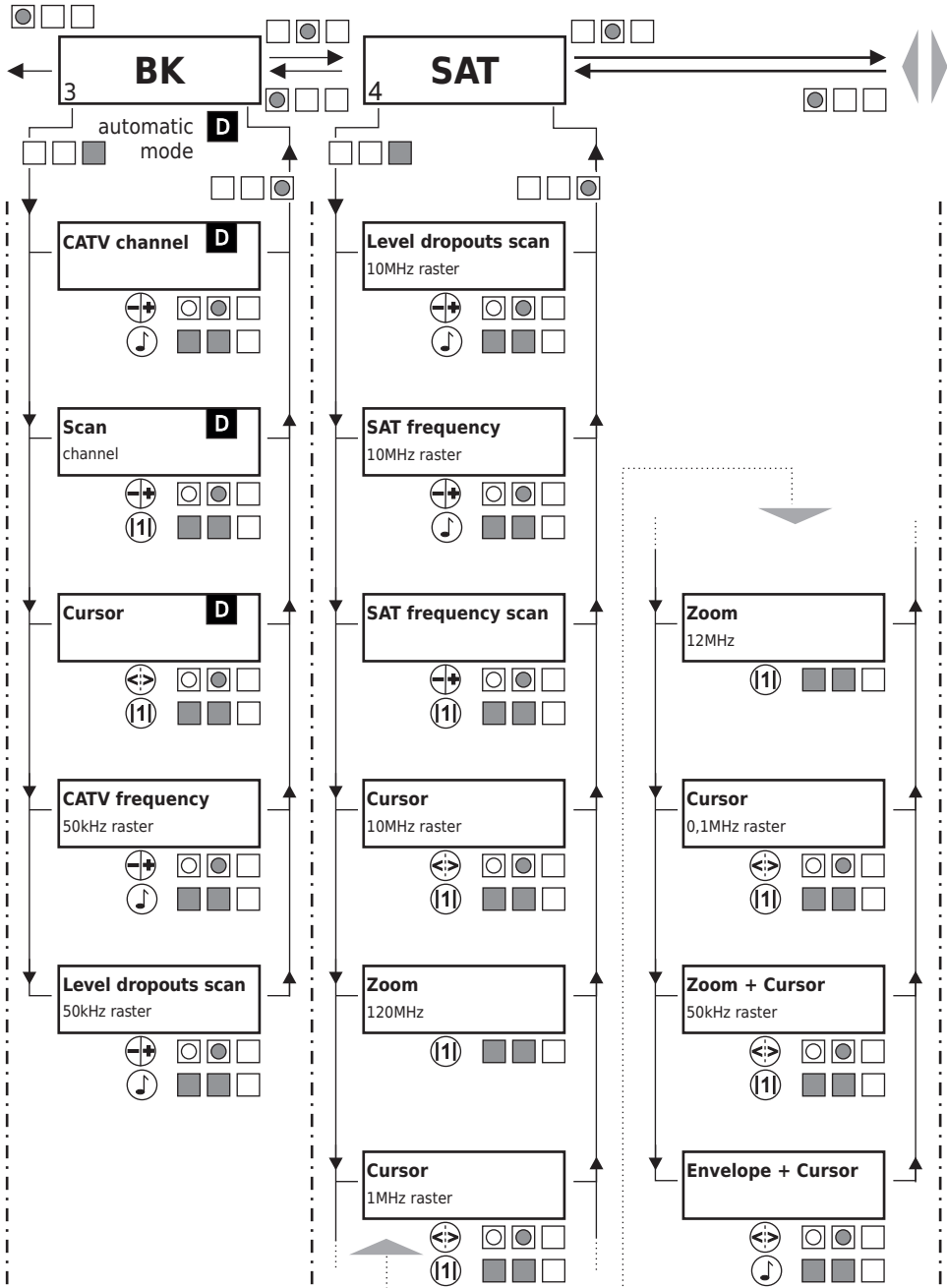
Frequency range	4-2150 MHz; (2.4-2.5 GHz with pre-plug converter)
Resolution	50 kHz (4-2150 MHz)
Level measuring range analog	35...115 dB(µV), -25...55 dB(mV)
Level measuring range CATV-digital	45...115 dB(µV), -15...55 dB(mV)
Field strength measuring range	10-80 dB(µV/m)
Measuring bandwidth	120 kHz
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	graphic 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
Power supply	NiMH accumulator 6 V/750 mAh or AC/AC adapter
Power consumption	ca. 110 mA
Dimensions	157 mm × 84 mm × 30 mm
Weight	ca. 300 g

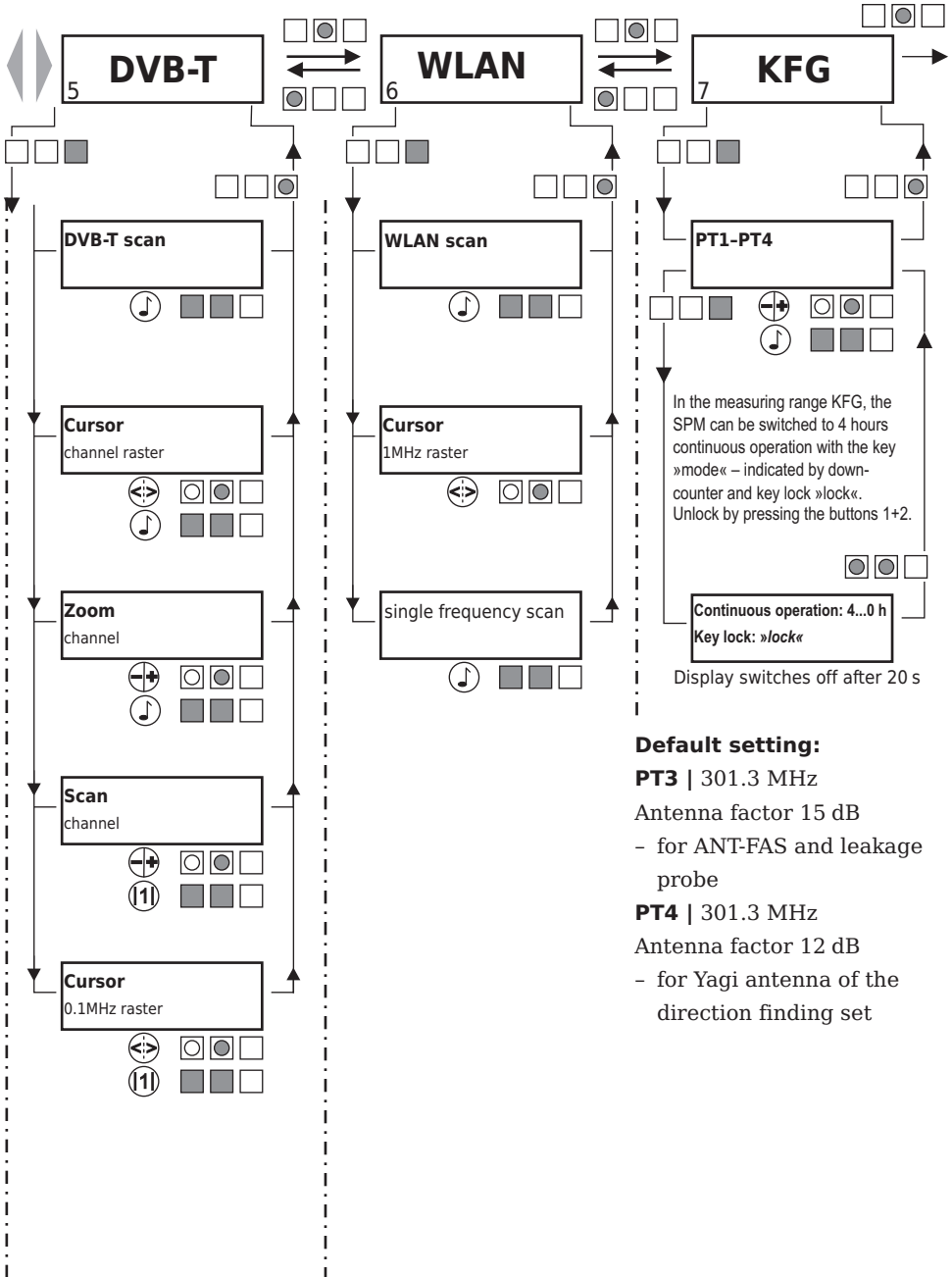
Operating scheme SPM 22 KF

from software version V43.33

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

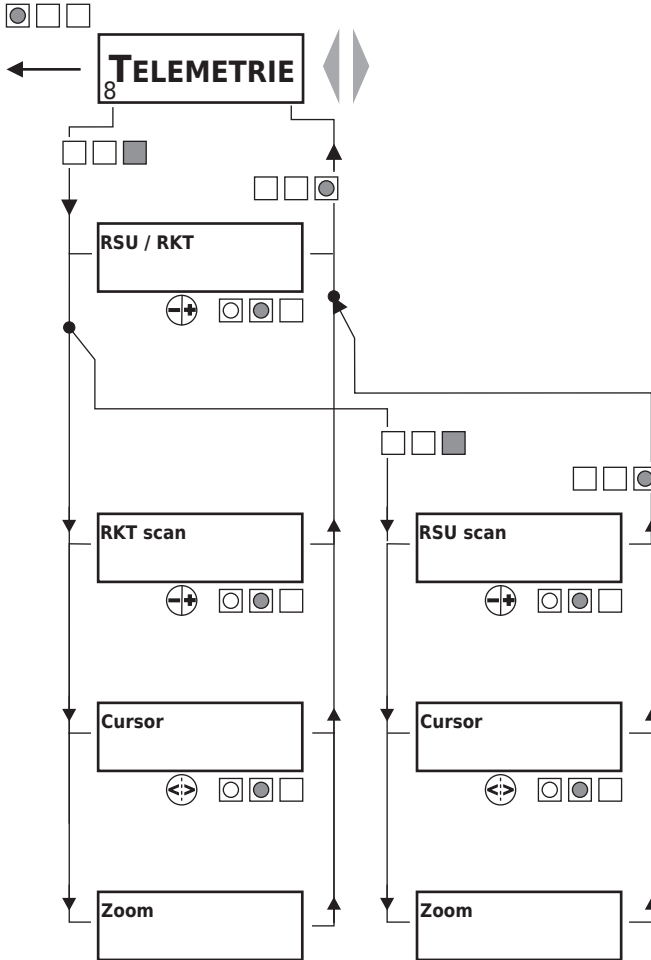






Default setting:

- 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

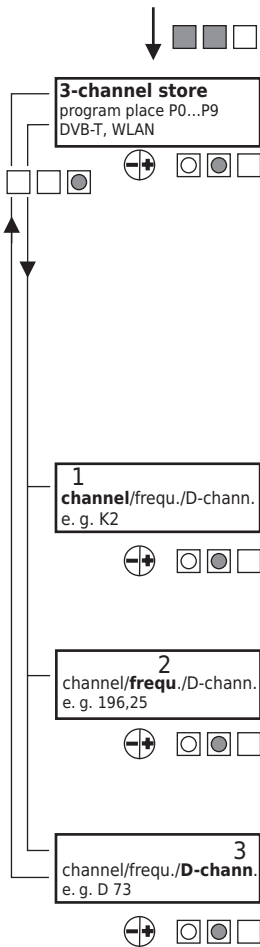


Signs and symbols

<input type="checkbox"/>	= Do not push the key!		= Selection back/forward
<input checked="" type="checkbox"/>	= Push key long >0.5 s		= Shift cursor left/right
<input type="checkbox"/>	= Push shortly the key		= Display sensitivity (3 steps)
<input type="checkbox"/>	= Alternative push key shortly		= Tone and LEDswitch on/off
			= Automatic digital identification

9. Memory values change

3-channell storage (P0...P9)



The instrument is switched off!

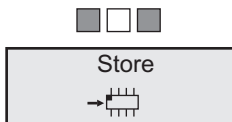
Push the keys »down« and »up« simultaneously until the 3-channel store appears.

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.

9.1 Storage



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.

10. 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

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