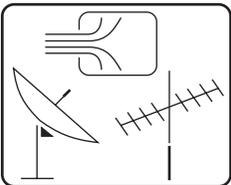
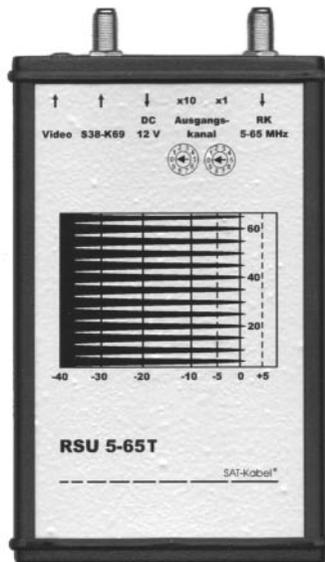


OPERATING INSTRUCTIONS

RSU 5-65T

Return path spectrum converter (analyser)
with measuring data transfer



SAT-Kabel®

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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.

General

The Return path spectrum converter (analyser) *RSU 5-65* scans the signals of the return path (5 – 65 MHz) and convert this graphic representation in a free selectable TV-channel in the range of S38 – Ch69. Thus the return path signals of the CATV system under test can be displayed with an usual TV set. The "T" in the name characterizes, that this instrument sends additional telemetry measuring value data in the selected TV channel.

Delivery volume

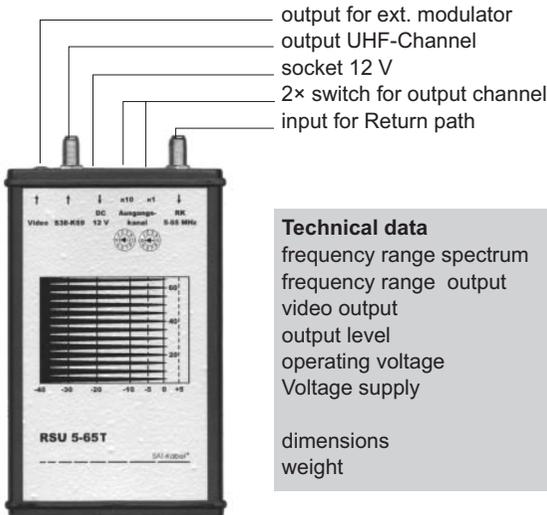
1 RSU 5-65

1 Plug-in power supply unit AC/DC

1 Plastic case

Operating instructions

Operational elements



Technical data

frequency range spectrum

5 – 65 MHz

frequency range output

channel S38 – Ch69 switchable

video output

for adjacent channel suited modulator

output level

ca 70 dB μ V

operating voltage

12 VDC

Voltage supply

plug power supply 12 VDC

min. 300 mA

dimensions

175 × 135 × 38 [mm]

weight

ca. 0,4 kg

Cleaning and maintenance

The surface of the housing can be cleaned with a dry, soft and lintfree cloth. Do not use aggressive solvents for the cleaning.

For attention!

- Do not measure at live objects >65V AC !
- Do not expose incident solar radiation, heat and extreme coldness!
- The working temperature range is 0 °C until +40 °
- 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.

Operating instructions

- The plug power supply (containing in the delivery) is connected to the socket "DC". The LED "L" indicates the operating readiness. First the *RSU 5-65* is to calibrate. For that purpose the output "S38–K69" is connected to the input of a TV set or an antenna measuring equipment, adjusted to the receiving channel K31.
On this channel takes place the graphic display of the obtained spectrum. The channel K31 is preset, but can be adjusted on a channel in the range of S38 to K69 on the modulator of the *RSU 5-65*, e.g. 08 = S38, 09 = S39, 10 = S40, 11 = S41, 21 = K21 etc. Now the connected *RSU 5-65* creates 7 vertical white level lines on the screen. These level lines represent from left to right the steps : -40 dB, -30 dB, -20 dB, -10 dB, -5 dB, 0 dB and +5 dB.
- If a carrier spectrum of a *RFG 6* (or *RSG 5-65*)(level app. 100 dB μ V) is connected on the input "RK", the obtained carrier are displayed on the screen from the bottom (lowest frequency) to the top (highest frequency).
The *RSU 5-65* has an input sensitivity of about 70 dB μ V. Therefore it is absolutely necessary to reduce the input level by means of fixed or adjustable attenuators or taps to calibrate the *RSU 5-65* on the value 0 dB. The frequency display of the *RSU 5-65* takes place as a result on the screen from 5 MHz (screen bottom) up to 65 MHz (screen top).
- Now the calibrated attenuation arrangement is to disconnect from the *RFG 6* (or *RSG 5-65*) and is to connect to the return path diplexer of the house connecting point or to the headend to separate the forward path (range 85 – 862 MHz) from the return path (range 5 – 65 MHz).
- The basic principle of the gain adjustment in the return path aim to obtain still a level of about 80 dB μ V on the input of every return path amplifier after the return path connected in series, if their gain is 20 dB.
For that purpose a frequency spectrum with a level of about 100 dB μ V from the *RFG 6* (or *RSG 5-65*) is fed into the test socket (-20 dB) of the return path amplifier resp. of the forward amplifier. Than the gain and the equalization of the return path amplifier can be adjusted.
The procedure is as follows:
A TV set or antenna measuring equipment with screen is adjusted to a forward channel, e.g. channel K31, and the level display of the *RSU 5-65* is graphic displayed on the screen. Now the adjustment of the Parameters can happen to the line "0 dB" for the frequency response 5-65 MHz.
- To adjust the return path of a distribution system this procedure is carried out beginning from the headend or the house connection point over every amplifier up to the last subscribers system outlet.

Transfer of telemetry measuring value data

The "T" in the name characterizes, that this instrument sends additional telemetry measuring value data in the selected TV channel. These data can be received with the *SPM 22 KF*, *SPM 22 MMC* und *SPM 22 PC* with KF option and are displayed under the menu point "RSU" as a scan.

The *RSU 5-65 T* measures the data sending in the frequency range from 4 to 68 MHz with a frequency raster of currently 200 kHz. The measuring and sending of the measuring data takes about 6.0 seconds. The *SPM 22* with KF-option receives the data und displays it in real time on the display screen. Thus by means of the *RFG 6*, *SPM 22* with KF-option and the *RSU 5-65 T* amplifiers can be adjusted and measured.

Additional at the *SPM 22 MMC* these received data can be stored on a multi media card in order to evaluate and to log they with a PC.

Extension since 11/2004

Programming of the Street names resp. of the display text

Before switch on the operating voltage set the switches for the output signal "x10" to 9 and "x1" also to 9. Connect a measuring instrument or a TV set to the modulator output of the *RSU 5-65*. The modulator operates at the switch position 99 in the UHF-channel 31. If now the operating voltage is switched on, you are in the programming mode. A cursor blinks on the first place:

"x10" – responsible for position change in the character chain

turn to the right – cursor moves to the right / turn to the left – cursor moves to the left

"x1" – responsible for the character change at the position of the cursor.

turn to the right – characters are increased at one

turn to the left – characters are decreased at one

After every position change the whole character chain is stored at change of a character. After 20 s without position or character change the character chain will be stored automatically and the programming mode is finished.

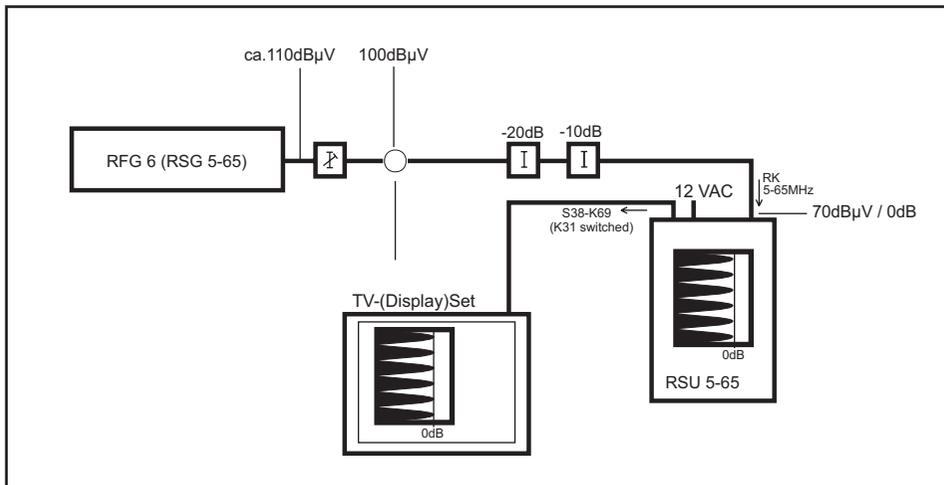
Connexion of a RCS 8 over a supply diplexer to the channel output S38 – K69 of the RSU (option)

At connexion the actual switched cluster number will be displayed.

In the programming mode of the *RCS 8* the actual parameter is displayed at the *RSU 5-65* (number of the connected cluster or the cycle time) and can thus be adjusted.

Return path adjustment in CATV-networks

1. Calibrating of the RP-Spectrum-Converter RSU 5-65 on 0dB



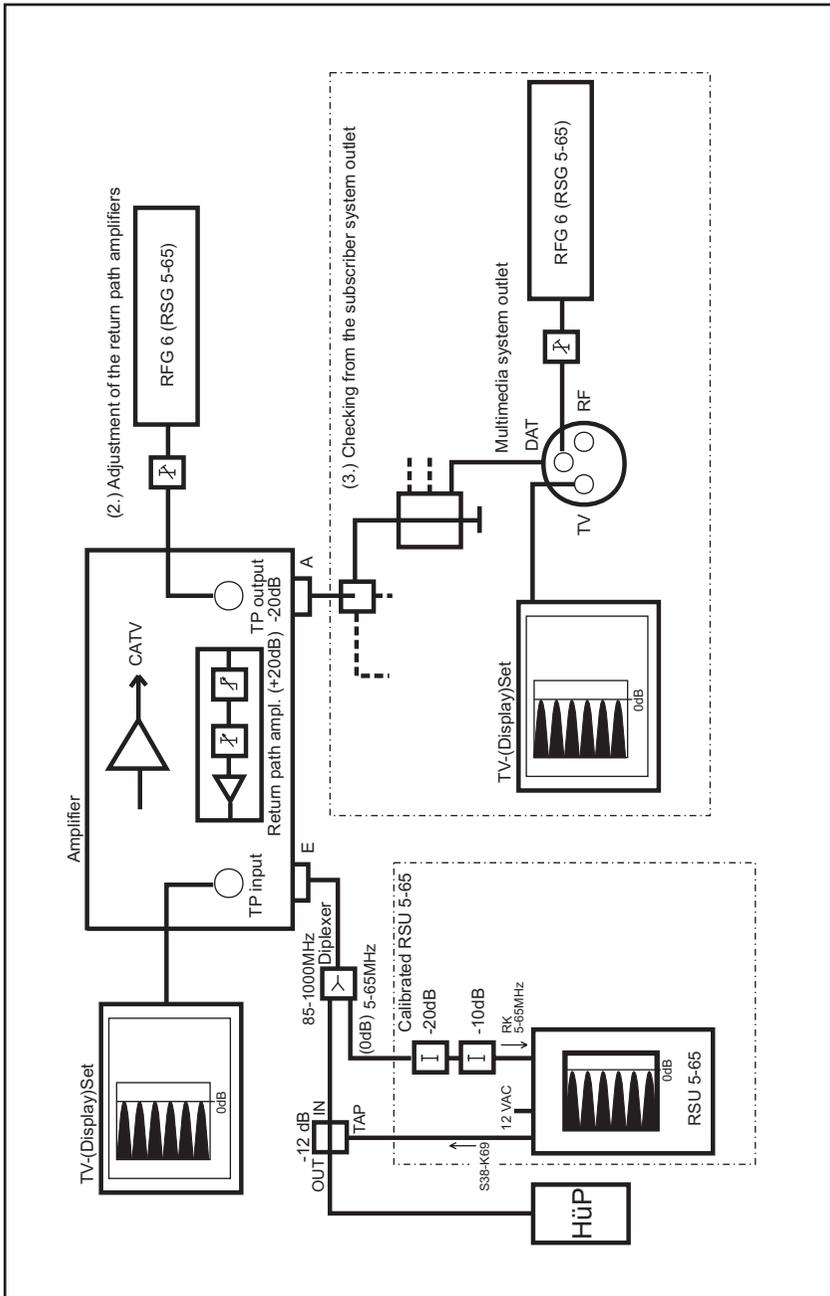
The necessary return path level will be set by means of the RP-Spectrum-Generator *RFG 6* (or *RSG 5-65*) and the attenuators connected in series. This level is defined as 0 dB. This procedure can be checked by means of a TV-Set or the screen of an antenna level measuring

2. Adjustment of the return path amplifiers

Beginning from the headend resp. the house connection point the return path amplifiers are adjusted so that the *RSU 5-65* supplies a spectrum adjusted to 0 dB from the house connection point resp. headend.

3. Checking from the subscriber system outlet

Now a checking of the return path is possible from every subscriber.



Scheme: return path adjustment with RFG 6 (RSG 5-65) and RSU 5-65

Annotation:

This operating instruction has been drawn up to the best of our knowledge. Errors, technical amendments and developments are subject to change without notice!
Updated operating instructions in PDF form can be also downloaded from our internet homepage. (www.sat-kabel.de)

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.
- 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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