

RO.VE.R.
INSTRUMENTS
www.rover-sat.it

INTRODUCES:

"DL4-DIGILINE"

PROFESSIONAL DIGITAL & ANALOG RADIO-TV-CATV & SAT ANALYZER

FREQUENCY: 5-870 & 930-2150 MHz • LEVEL/POWER: 25-126 dBµV • 1 dB ACCURACY

SIMPLE?
SIMPLY AUTOMATIC

Using only 3 Main Keys
**CALL TODAY
& TRY IT!**

5.5 Kg

INCLUDING
BATTERIES
3.5 hr charge
max.

WITH DUAL DISPLAY
& REAL-TIME SPECTRUM

QPSK
DVB-S sat

QAM
DVB-C cabl

COFDM
DVB-T tv

NETWORK
& SIGNAL
IDENTIFIC.

DECODER
MPEG2

CONDITIONAL
ACCESS

TELETEXT

RS232

A/V
IN/OUT

DISEqC
2.0

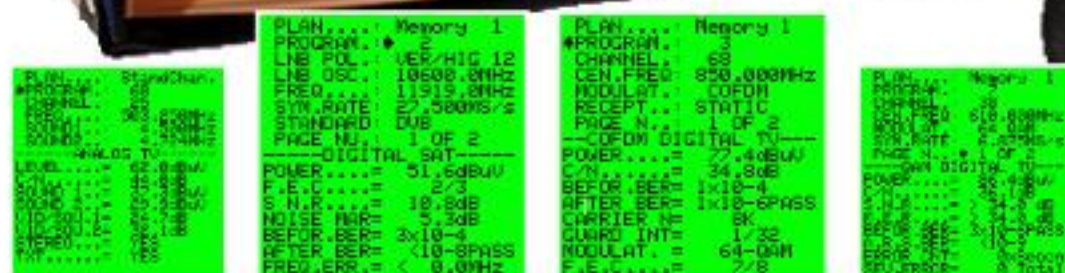
RECORDER
MP3/MP2/MP1
P-BNC-N

RETURN PATH
5-65 MHz

LOW NOISE
PREAMPLIF.

PRECISION
1% GRADE
FOR 3 YEARS

**ALL
TOGETHER**



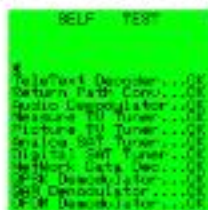
Simultaneously displays all the measurements you need



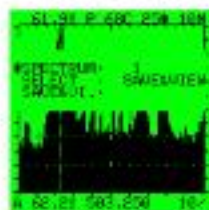
MPEG program stream selection
and network identification menu



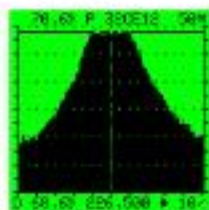
Configuration menu and
presence of optional boards



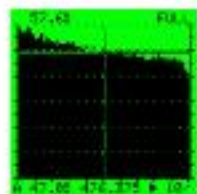
Self-test menu



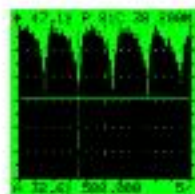
Spectrum memorization menu



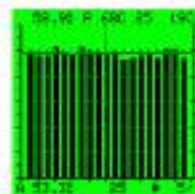
Scalar analysis of single channel
amplifier (or filter, trap, splitter, etc.)



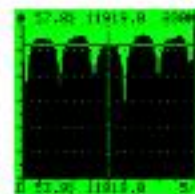
Cable calibration measurement
5-870 MHz or 930-2150 MHz



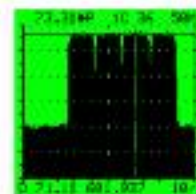
Reflectometer to determine the
distance of a short circuit or
interruption in coaxial cables



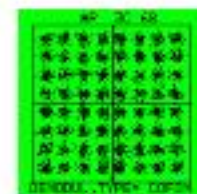
Bar scan to visualize the chan-
nels, from 19 to 120 programs



Automatic or manual digital satellite
spectrum with Frequency, Span,
dB/Gs, Ref. level, Marker selection



Spectrum analysis of 4
adjacent COFDM channels



COFDM Constellation (64 QAM)

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MAIN TECHNICAL SPECIFICATIONS

ANALOG TV & RD

- **Frequency band:** TV & Radio: 5–870 MHz (including I.F. 38.0/38.9/45.75 MHz which can be measured, seen and heard with the TV monitor)
- **Prog./Channel/Freq. reading:** on graphics display
- **Frequency resolution:** TV e Radio: 62,5 KHz
- **Input impedance:** 75 Ω , "F" conn. ("BNC" or "N" opt.)
- **Measurement dynamic range at RF input:** from 15 to 126 dB μ V, from –45 to +66 dBmV, from –93 to +18 dBm (selectable)
- **Measurement resolution:** 0.1 dB
- **Level measurement accuracy at 20°C:** 1 dB typ. (2 dB max.) (with software correction after 5 minutes' warm up)
- **C/N & A/V ratio measurement accuracy at 20°C:** A/V ratio = 1.5 dB typ. (2 dB max.) C/N ratio = 2 dB typ. (4 dB max.) (with 60 dB μ V minimum level, 45/50 dB C/N max. reading)
- **Measurement filter band width:** 100 KHz @ –3 dB
- **Level measurement stability versus temperature between –10 and 50°C:** 0.02 dB/°C
- **Program/Channel plan:** by standard channel or frequency selection, storable memory, AUTO SCAN and relative data logger, up to 600 memory positions
- **Multi-standard:** PAL–SECAM–NTSC M–N–B–G–I–D–K (L optional)

AUDIO/RADIO

- **Audio demodulation:** from 4.5 to 6.5 MHz
- **Radio demodulation:** Tunable from 47 to 870 MHz
- **Demodulation filter bandwidth:** 100 KHz @ –3 dB
Built-in loudspeaker volume: 0,5 W vol. adj.

DVB–Cable with optional QAM board

- **QAM frequency band:** 47–870 MHz
- **Prog./Channel/Freq. reading:** on graphics display
- **Frequency resolution:** 62,5 KHz
- **Input impedance:** 75 Ω , "F" connector ("BNC" or "N" opt.)
- **Power measurement dynamic range at RF input:** from 25 to 116 dB μ V, from –35 to +56 dBmV, from –73 to +8 dBm (selectable) (35/40 dB μ V for picture)
- **Power measurement resolution:** 0.1 dB
- **Power measurement accuracy at 20°C:** 1 dB typ. (2 dB max.) (with software correction after 5 mins' warm up)
- **SNR measurement/ratio at 20 °C** with QAM demodulator (opt.): up to 34 dB, \pm 0.5 dB (1 dB max.)
- **Measurement filter bandwidth:** 100 KHz @ –3 dB
- **Power measurement stability versus temperature from –10 to 50°C:** 0,02 dB/°C
- **QAM symbol rate selection** (with automatic generation of the pre-memorized selection table): 2000 to 7000 MS/s (with 1 KHz steps)
- **BER measurement:**
bBER up to 2×10^{-8} , emulated without demodulator
bBER up to 2×10^{-8} , with optional demodulator board
aBER (after R.S.) up to 2×10^{-9} , with opt. demodulator board
Error counter, per second
Severe error counter, total
- **Digital signal quality test on adjacent channel:** PASS–MARG–FAIL (emulated &/or demodulated meas.)
- **Digital signal quality test on nearest free channel:** PASS–MARG–FAIL (emulated without demodulator)
- **Multiplex flatness analysis:** DIGITAL–DEGRADED–ANALOG (emulated without demod.)
- **Digital power limit indication:** to indicate that the signal power is respectively too low or too high
- **Spectrum inversion:** automatic
- **Constellation:** 64–128–256 (on graphics display)

ANALOG SAT

- **Frequency band:** 930–2150 MHz
- **Frequency/Program reading:** on graphics display
- **Frequency resolution:** 0.1 MHz
- **Input impedance:** 75 Ω , "F" connector ("BNC" or "N" opt.)
- **Measurement dynamic range at RF input:** from 30 to 120 dB μ V, from –30 to +60 dBmV, from –78 to +12 dBm (selectable)
- **Measurement resolution:** 0.1 dB
- **Level measurement accuracy at 20°C:** 1.5 dB typ. (2.5 dB max.) (with software correction after 5 minutes' warm up)
- **Level measurement filter bandwidth:** 8 MHz @ –3 dB to visualize the spectrum and 27 MHz to provide the picture and measurements
- **Measurement stability versus temperature from –10 to 50°C:** 0.03 dB/°C
- **Program/frequency plan:** by frequency or storable memory and relative data logger, up to 300 memory positions
- **Multi-standard:** PAL–SECAM–NTSC
- **Audio demodulation:** from 5.5 to 8.28 MHz

DVB–Terr with optional COFDM board

- **COFDM frequency band:** 170–230/470–870 MHz (for Italy–Australia, 7/8 MHz BW) 470–870 MHz (for UK, Spain, Singapore, etc., 8 MHz BW)
- **Low noise TV RF preamplifier (built-in):** 10 dB gain, 2.5 dB noise, low distortion, automatic or manual selection already calibrated on the measurement (optional)
- **Program/chan./freq. reading:** on graphics display
- **Frequency resolution:** 62.5 KHz
- **Storable frequency offset:** all frequencies from 62.5 KHz up to 10 MHz
- **Input impedance:** 75 Ω , "F" connector ("BNC" or "N" opt.)
- **Power measurement dynamic range at RF input COFDM:** from 25 to 116 dB μ V, from –35 to +56 dBmV, from –73 to +8 dBm (selectable) (30 dB μ V min. for picture)
- **Power measurement resolution:** 0.1 dB
- **Measurement accuracy at 20°C:** 1 dB typ. (2 dB max.) (with software correction after 5 minutes' warm up)
- **C/N measurement/ratio accuracy at 20°C:** up to 40 dB, \pm 1.5 dB (3 max.)
- **Measurement filter band width:** 100 KHz @ –3 dB
- **Power measurement stability versus temperature from –10 to 50°C:** 0,02 dB/°C
- **BER measurement before and after Viterbi:**
aBER up to 2×10^{-8} , emulated without demodulator
bBER up to 2×10^{-3} , with optional demodulator board
aBER up to 2×10^{-7} , with optional demodulator board
- **FEC, guard interval & modulation auto selection & display:** FEC: 1/2, 2/3, 3/4, 5/6, 7/8
Guard interval: 1/2, 1/8, 1/16, 1/32
Modulation: QPSK, 16 QAM, 64 QAM
- **Digital signal quality test on adjacent channel:** PASS–MARG–FAIL (emulated &/or demod. measurements)
- **Digital signal quality test on nearest free channel:** PASS–MARG–FAIL (emulated &/or demod. measurements)
- **Multiplex flatness analysis:** DIGITAL–DEGRADED–ANALOG (emulated without demodulator)
- **Digital power limit indication:** to indicate that the signal power is respectively too low or too high
- **Spectrum inversion:** automatic
- **Constellation:** QPSK–16QAM–64QAM (on graphics display)

DVB-Sat SCPC and MCPC with supplied QPSK board

- **Frequency band:** QPSK: 930–2150 MHz
- **Frequency and program reading:** on display
- **Frequency resolution:** 0.1 MHz
- **Input impedance:** 75 Ω , "F" connector ("BNC" or "N" optional)
- **Power measurement dynamic range at RF input:** from 30 to 120 dB μ V, from –30 to +60 dBmV, from –72 to +12 dBm (selectable)
- **Power measurement resolution:** 0.1 dB
- **SNR accuracy measurement:** up to 20 dB 0.5 dB typ. (1.5 dB max.)
- **Measurement filter bandwidth:** 8 MHz @ –3 dB to visualize spectrum 27 MHz to provide picture and measurements
- **Power measurement stability versus temp. from –10 to 50°C:** 0.03 dB/°C

- **QPSK Symbol Rate setting:** 3.99/45 MS/s (with 1 KHz steps) (with automatic generation of the pre-memorized selection table)
- **BER measurement before and after Viterbi:** bBER up to 2×10^{-4} aBER up to 2×10^{-9}
- **FEC, automatic selection and display:** 1/2, 2/3, 3/4, 4/5, 5/6, 6/7, 7/8, 8/9
- **Quality test:** FAIL, MARGINAL, PASS (automatic)
- **Noise margin measurement:** from –2 to 12 dB
- **Frequency error measurement:** caused by the LNB or a tuning mistake (± 3 MHz).
- **Selectable LNB Oscillator Freq.:** 0 to 12.500 MHz (with 10 MHz steps) with automatic generation of the pre-selection table or direct "L" band freq. reading.
- **Digital satellite standard selection:** DVB/DSS
- **Video output:** PAL–SECAM–NTSC (selectable)

NETWORK & DATA DECODER optional board

- Network name
- Bouquet name
- Orbital position (SAT only)
- Encryption system 1
- Encryption system 2
- Date

AUTOMATIC SPECTRUM ANALYSIS & BAR SCAN

Analog & Digital RADIO-TV-SAT

- The spectrum measurement is completely automatic and connected to the selected program/channel and/or program/channel picture shown on the TV monitor and vice versa. In other words, if you change the program/channel shown on the spectrum display, the program/channel picture shown on the TV monitor will also change and vice versa.
- Passing from Measurement (MEAS) to Spectrum (SPECT) you can immediately see the spectrum of the prog./chan. received perfectly and automatically aligned to the reference level, and also simultaneously see its picture on the TV monitor.
- These parameters are automatically set with the following values:
 - *Reference level: at the top and with level/power indication on the display*
 - *Span: 10 MHz in TV (50 MHz in SAT)*
 - *dB/division: 10 dB/ in TV (5 dB/ in SAT)*
 - *Frequency/level marker position on the analog TV video carrier (at center band for all digital SAT and digital TV) with level and frequency indication on the display.*
 - *Analog or digital signal measurement indication and power correlation: A/D on display.*
 - *Indication of the selected program/chan.: on the display*
- Obviously all the spectrum parameters can be varied manually by simply moving the cursor on the display and each time you change from measurement to spectrum the meter automatically resets all the spectrum parameters.

- **Frequency range:** TV 5–870 MHz, SAT 920–2250 MHz
- **Dynamic range:** TV ≥ 60 dB, SAT ≥ 30 dB
- **Resolution bandwidth:** TV 100 KHz, SAT 8 MHz
- **Reference level:** TV from 15 dB μ V to 126 dB μ V, SAT from 30 dB μ V to 120 dB μ V
- **TV span:** 2–5–7–10–20–50–100–200–500–1000, VHF–UHF–FULL–Return path (5–65 MHz)
- **SAT span:** 20–50–100–200–500–FULL
- **Marker frequency:** TV 5–870 MHz e SAT 930–2250 MHz in frequency
- **Marker level:** TV from 15 dB μ V to 126 dB μ V, SAT from 30 dB μ V to 120 dB μ V
- **Marker analog level measurement:** automatic when selecting ANALOG and with indication on display (A)
- **Marker digital power measurement:** automatic when selecting DIGITAL and with indication on display (D)
- **Bar scan:** from 19 to 120 channels (selectable)
- **Storable spect. & bar scan:** up to 40 display graphics

MPEG2 DECODER optional board DVB fully compliant






This optional board allows you to obtain, on the graphics display, the list of programs/audio and video services available relative to the tuned bouquet, whether it be QPSK SAT, QAM cable TV or OFDM terrestrial TV:

- The program audio and video service selected is shown and heard by means of the TV monitor.
- The video and audio of digital programs are also available on the scart socket. PAL, SECAM or NTSC (selectable).
 - **Signal format:** ETS 300 421
 - **Video resolution:** 720x576, 704x574, 544x576, 480x576, 352x576
 - **Video decompression type:** MPEG1, MPEG2@ML (I, P & B frame decoding)
 - **Output television stand.:** PAL, NTSC, SECAM (selectable)
 - **Audio decompression:** MPEG layer II (MUSICAM)


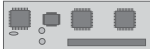





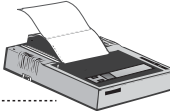

OTHERS

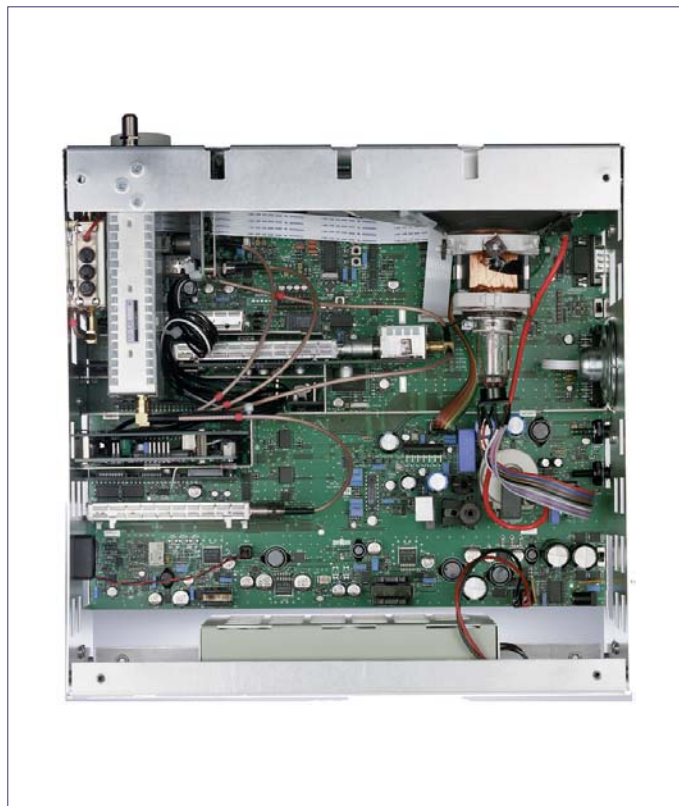
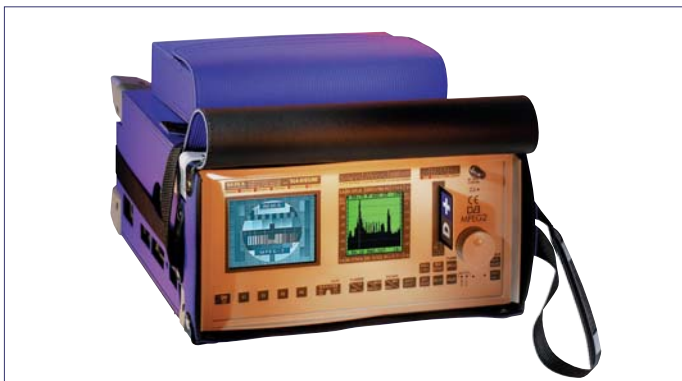
- **Voltmeter function:** AC (square wave), DC, 0 to 100 V, freq.
- **RF IN power feed:** +12/+18 Vdc, 100 mA in TV band
- **LNB feed:** – Analog OFF +13V, +18V/22 KHz (0.2 A)
 - DiSEqC 2.0, 4 polarizations DiSEqC 'A' & 4 polariz. DiSEqC 'B' already pre-programmed in sequence and very easy to use. They can drive any type of analog or DiSEqC, single & double feed LNB & any type of 4 or 8–way, analog or DiSEqC multiswitch.
 - DiSEqC transmission via special menu, can command any type of DiSEqC device now or in the future.
 - DiSEqC reception (tracer) via special menu, to check the communication traffic between the receiver (set top box) and the various DiSEqC devices.
- **Buzzer with parameter selection**
- **Master Copy function** (optional)
- **Power supply:**
 - Built-in NI–CD rechargeable batteries: 10 batt. 12Vx 5.5A
 - External power supply: 17/20 Vac or dc (2A), (conn. $\varnothing 5.5 \times 2.2$ on power pack)
 - AC/AC adapter: 230 Vac (117 V opt.), 17 Vac output
- **Battery duration at 25°C:** 3 hours in analog TV mode & 2 hours in digital SAT & TV
- **Low battery indicator:** on the graphics display
- **Fast batt. recharge time:** 4 hrs approx. with electronic control
- **Instrument size:** H 140 x L 300 X D 303 mm
- **Instr. weight:** 5.5 Kg with batteries (without bag & options)
- **Casing structure:** plastic-coated aluminum
- **RS232 standard serial interface port** available for:
 - downloading and/or printing stored data from DL4 to PC
 - the possibility of up-grading the DL4 software via internet, which will lengthen the life of your meter.
- **Audio/video input/output** with standard scart socket
- **Picture display:** 4.5" B/W CRT only for picture
- **Back light graphic display:** 128 x 128 pixel, 3" for measurement & spectrum
- **Auto off timer:** after 5 minutes without use (selectable)
- **Auto test menu:** to check the main digital circuit
- **Optional board test menu:** to check the installed board
- **Temperature meter indication:** in °C or °F

SUPPLIED

- **mod. "TRASF-R127-230P"**
AC/AC adapter
- 230 V (or 117 V) input
- 17 V, 1.8 A output 
- **mod. "BORSA-DL4"**
Instrument protective bag with side pocket for accessories, handle/shoulder strap for transport purposes 
- **mod. "CNN-F-0150"**
Interchangeable double female F/F input connector 
- **mod. "TRA-FFEM-CEIFEM"**
Interchangeable double female F/IEC input connector 
- **mod. "TRA-BNCF-FFEM"**
Interchangeable double female F/BNC input connector 

OPTIONAL

- **mod. "DL4-NETID-OPT"**
Network data decoder board 
- **mod. "DL4-QAM-OPT"**
DVB-Cable QAM demodulator board 
- **mod. "DL4-COFDM-OPT"**
DVB-Terr COFDM demodulator board 
- **mod. "DL4-MPEG-OPT"**
MPEG decoder board 
- **mod. "DL4-CR-OPT"**
Card reader board for conditional access 
- **mod. "RIGHTS-SE-OPT"** (SECA)
• **mod. "RIGHTS-VI-OPT"** (VIACCESS)
• **mod. "RIGHTS-CO-OPT"** (CONAX)
• **mod. "RIGHTS-NA-OPT"** (NAGRA)
• **mod. "RIGHTS-IR-OPT"** (IRDETO) } Embedded conditional access, 1 or 2 each time
- **mod. "DL4-AML-OPT"**
Audio AM demodulator ("L" standard) 
- **mod. "CAVO-DD-FF-2000"**
RS 232 female/female (Null modem) cable to connect DL4 to PC, for software upgrades via internet 
- **mod. "PRINT-TERM-40"**
Portable printer with built-in rechargeable batteries and RS 232 connection cable, P.S.U. 5 Vdc, 2 A 
- **mod. "TS1-CNG"**
Calibrated noise generator, 0.5-2150 MHz, 70 dB μ V/-40 dBm with "F" & "BNC" cable 



The functions, specifications and accessories are subject to change without notice