DL–1 DIGILINE

QPSK – QAM – COFDM MODULATIONS

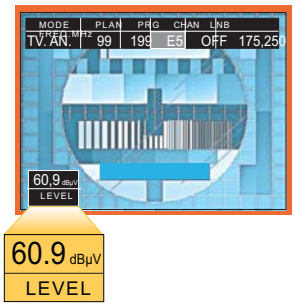
COMBINED ANALOG & DIGITAL ANALYZER for RADIO–TV & SAT signals (47–2150 MHz)

Ideal also for the test and calibration of filters, amplifiers, coaxial cables, sockets, splitters, taps, etc.

SHOCK–PROOF, DUST–PROOF & RAIN–PROOF FRONT PANEL

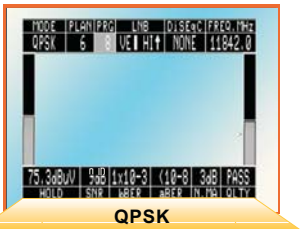
4 SELECTABLE MEASUREMENT LEVELS

1: BASIC



60.9 dBµV
LEVEL

2: SIMPLE



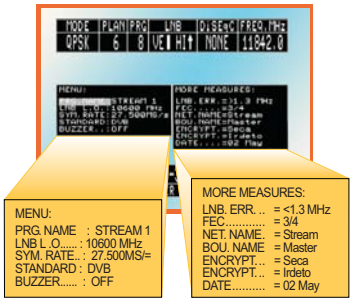
QPSK

75.3dBµV	9dB	1x10–3	<10–8	3dB	PASS
HOLD	SNR	bBER	aBER	N.MA	QLTY

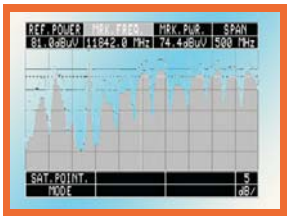
QAM & COFDM

57.1 dBµV	35 dB	1x10–7	2 dB	PASS
AV. POWER	f C/N	BER	FLAT	EMUL.QLTY

3: COMPLETE



4: SPECTRUM



Spectrum with and without peak memory

Digital Level Solutions!

- Demodulated QPSK, SCPC and MCPC
- Emulated COFDM and QAM ®
- Interchangeable input connector: "F", "IEC", "BNC", "N" ®
- Level/power 20–126 dBµV
- Easy to use, with separate or simultaneous visualization of the various measurements ®
- Indication of: Modulation, Plan, Prog. No., Prog. name, Channel, Freq., DiSEqC ®
- 99 mixed RD–TV–SAT plans, one for each city or for each installation ®
- More than 10000 storable programs ® manually or by PC
- Possibility of storing the name of analog TV and SAT programs ®
- C/N, SNR, bBER, aBER measurements
- Automatic test of digital programs: FAIL–MARG–PASS ®
- Very high resolution OSD graphics, with stable word indications even without signals ®
- Bar chart for power and quality with HOLD memory and minimum quality limit indication ®
- Automatic noise margin measurement in dB ®
- Digital network identification, network name, bouquet & encryption systems, day, month, year ®
- LNB–13V, 18 V, 22 KHz
- DiSEqC a, b, c, d, (4–8–12 or 16 cables) ®
- Vertical TV and SAT professional spectrum, with menu selection of: resolution (high, average, low), visualiz. (outlines only or full white), mode (auto or manual), Max Hold (on/off), ΔMRK, MRK BW, MRK C/N, MRK PWR. ®
- Automatic satellite dish pointing function (SAT–POINT) and V. SAT spectrum ®
- Analog TV and SAT programs pictures/sound
- Teletext for analog TV and SAT programs
- Test pattern video generator for CCTV installations ®
- Synchro area visualization to show noise, interference, intermodulations, reflections and saturations ®
- DATA LOGGER, measurement and spectrum memorization, FILE MANAGER memory and print–outs
- PC connection for print–outs via the RS232/USB socket
- SW up–grades via Internet ®
- Supplied with high–capacity batteries
- Fast battery charge with charge/discharge control to guarantee long battery duration ®
- Complete with water–proof bag, adjustable light shield, transparent document pocket and shoulder strap
- Very light: weighs only 5.2 Kg, including batteries
- High resolution cathode ray tube, B/W, 4.5", anti–shock, encased

®= *Esclusive to ROVER–Instruments*

ROVER INSTRUMENTS

N.06

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DL–1 DIGILINE MAIN TECHNICAL SPECIFICATIONS

ANALOG TV

- **Frequency band:** 47–878 MHz
- **Direct selection and memorization of**: memory plan, modulat., prog. no., prog. name, chan., freq
- **Frequency resolution:** 25 KHz
- **Input impedance:** 75 ohm
- **Interchangeable input connector:** "F" or "IEC" or "BNC" or "N"
- **Analog measure. dynamic range at RF IN:** from 20 to 130 dBuV, from –40 to + 70 dBmV, from –88 to +22 dBm (selectable)
- **Measurement resolution:** 0.1 dB
- **Level measurement accuracy:** 1 dB typ. (1.5 max) with software correction (after 5 minutes' warm–up)
- **C/N & A/V ratio measurement accuracy:** 1.5 dB typ. (3 dB max.)
- **Measurement filter band width:** 130 KHz @ –3 dB
- **Measurement stability versus temperature, between –10 and 50°C:** 0.1 dB/°C
- **Multi–standard:** M–N–B–G–I–D–K (L opt.) PAL–SECAM–NTSC.

ANALOG SAT

- **Frequency band:** 930–2250 MHz
- **Direct selection and memoriz. of:** memory plan, modul., prog. no., prog. name, freq., LNB, DiSEqC
- **Frequency resolution:** 0.1 MHz
- **Input impedance:** 75 ohm
- **Interchangeable input connector:** "F" or "IEC" or "BNC" or "N"
- **Analog measure. dynamic range at RF IN:** from 25 to 126 dBuV, from –35 to +66 dBmV, from –73 to +18 dBm (selectable)
- **Measurement accuracy:** 0.1 dB
- **Level measurement accuracy:** 1.5 dB typ. (2.5 dB max.) with software correction (after 5 minutes' warm–up)
- **Measurement filter band width in SAT mode:** 2 MHz @ –3 dB
- **Measurement filter band width in V.SAT mode:** 0.2 MHz @ –3 dB (opt.)
- **Measurement filter band width in picture demodulation**: 27 MHz
- **Measurement stability versus temperature between –10 and 50°C:** 0.15 dB/°C
- **LNB local oscillator frequency:** continuous from 0 to 20.000 MHz, for bands, "L" (direct IF–SAT reading), "C", "KU", "KA"
- **Multi–standard:** PAL–SECAM–NTSC
- **Audio demodulation:** from 4.5 to 8.5 MHz

RADIO FM

- **Frequency band:** can be tuned from 47 to 870 MHz
- **Frequency resolution:** 25 KHz
- **Audio demodulation:** FM
- **Demodulation filter band width:** 100 KHz @ –3 dB, built–in loudspeaker volume: 0.5 W adjustable

QAM (Emulated)

- **QAM frequency band:** 47–870 MHz
- **Direct selection and memoriz. of:** memory plan, modulation, prog. no., bouquet name, chan., freq.
- **Frequency resolution:** 25 KHz
- **Input impedance:** 75 ohm
- **Interchangeable input connector:** "F" or "IEC" or "BNC" or "N"
- **Power measurement dynamic range at RF IN:** from 20 to 126 dBuV, from –40 to +66 dBmV, from –88 to +18 dBm (selectable)
- **Power measurement resolution:** 0.1 dB
- **Power measurement accuracy:** 1 dB typ. (2 dB max.) with software correction (after 5 minutes' warm–up)
- **C/N ratio measurement accuracy:** 1.5 dB typ. (3 max.)
- **Measurement filter bandwidth:** 130 KHz @ –3 dB
- **Measurement stability versus temperature between 10 and 50°C:** 0.1 dB/°C
- **BER measurement:** up to 2 x 10–8 (emulated)
- **TEST PASS–MARG–FAIL:** digital signal evaluation
  - "C/N NEAR" (with "N" noise measurement on adjacent channel)
  - "C/N FAR" (with "N" noise measurement on the first free channel)

COFDM (Emulated)

- **COFDM frequency band:** 47–870 MHz
- **Frequency resolution:** 25 KHz
- **Memorized frequency offset:** in 25 KHz steps
- **Input impedance:** 75 ohm
- **Interchangeable input connector:** "F" or "IEC" or "BNC" or "N"
- **Power measurement dynamic range at RF IN:** from 20 to 126 dBuV, from –40 to +66 dBmV, from –88 to +18 dBm (selectable)
- **Power measurement resolution:** 0.1 dB
- **Power measurement accuracy:** 1 dB typ. (2 dB max.) with software correction (after 5 minutes' warm–up)
- **C/N ratio measurement accuracy:** 1.5 dB typ. (3 max.)
- **Measurement filter band width:** 130 KHz @ –3 dB
- **Measurement stability versus temperature, between –10 and 50°C:** 0.1 dB/°C
- **aBER measurement:** up to 2x10–8 (emulated)
- **PASS–MARG–FAIL TEST:** digital signal evaluation
  - "C/N NEAR" (with "N" noise measurement on the adjacent channel)
  - "C/N FAR" (with "N" noise measurement on the first free channel)

DEMODULATED QPSK

- **Frequency band:** 930–2250 MHz
- **Direct selection and memorization of:** memory plan, modulation, program number, frequency, bouquet name, LNB, DiSEqC
- **Frequency resolution:** 0.1 MHz
- **Input impedance:** 75 ohm
- **Interchangeable input connector:** "F" or "IEC" or "BNC" or "N"
- **Digital power measurement dynamic range at RF input:** from 30 to 126 dBuV, from –30 to +66 dBmV, from –78 to +18 dBm (selectable)
- **Power measurement resolution:** 0.1 dB
- **Power measurement accuracy:** 1.5 dB typ. (2 dB max.) with software correction (after 5 minutes' warm–up)
- **Measurement filter band width in SAT mode:** 2 MHz @ –3 dB
- **Measurement filter band width in V.SAT mode:** 0.2 MHz @ –3 dB
- **Power measurement stability versus temp. between –10 and 50°C:** 0.15 dB/°C
- **QPSK Symbol Rate setting:** 2.00/45 MS/s, 1 KS/s steps
- **BER measurement before and after Viterbi:** bBER up to 2 x 10–4, aBER up to 2 x 10–9
- **FEC, automatic selection and reading of the received value:** FEC 1/2, 2/3, 3/4, 4/5, 5/6, 6/7, 7/8,8/9
- **Quality TEST:** FAIL, MARGINAL, PASS (auto.)
- **Noise margin measurement:** from –2 to 12 dB with special algorithm which automatically takes variations into consideration
- **SNR measurement accuracy:** 0.5 dB typ. with software correction
- **LNB frequency selection:** continuous from 0 to 20.000 MHz, for bands "L" (direct IF–SAT reading), "C", "KU", "KA"
- **Digital SAT standard selection:** DVB/DSS

DIGITAL NETWORK IDENTIFICATION

- **Digital network identification name and data:** network name, bouquet name, coding system, date (included).

SPECTRUM ANALYSIS

- **Frequency band:** TV 47–870 MHz, SAT 930–2250 MHz
- **Dynamic range:** TV >60 dB, SAT >30 dB
- **Measurement resolution:** 0.1 dB
- **Measurement filter band width:** TV 130 KHz, SAT 2 MHz, VSAT 0.2 MHz
- **Reference level:** TV from 0 to 130 dBµV, SAT from 0 to 130 dBµV
- **Spectrum setting:** Spectrum measurement can be automatic or manual (selectable)
- **Passing from spectrum to measurement:** If you pass from measurement mode (MEAS) to spectrum mode (SPECT) you will immediately see only the spectrum of received prog./chan., perfectly and automatically aligned with the reference level in automatic mode.
- **Parameters set automatically**
  - Ref level: at the top of the screen with level indication on the display (corresponds to the attenuator in previous instruments)
  - Span: 10 MHz in TV (50 MHz in SAT)
  - dB/division: 10dB/ in TV (5 dB/ in SAT)
  - Frequency/level marker position on the video carrier for analog TV (in center band for all digital SAT and TV signals) with level and frequency indication on the display.
  - Analog or digital signal measurement indication and correlation: A/D on the display
- **Other spectrum selections**
  - Ð MARKER (2° marker)
  - MARKER BW (for band width, 3 markers)
  - PICTURE (frame o full)
  - DEFINITION (high, medium, low)
  - V. SAT (V. SAT spectrum)
  - SAT POINTING (dish pointing)
- **TV Span:** 2–5–7–10–20–50–100–200–500–1000 -VHF–UHF–FULL
- **SAT span:** 20–50–100–200–500–FULL
- **No.3 Markers:** level, frequency & bandwidth

OTHERS

- **RF input power feed:** +12/+18 Vdc, 0.3 A in TV band
- **LNB feed:** Analog OFF +13, +18/22 KHz (0.3 A)
- **DiSEqC 1.1:** 16 DiSEqC polariz. "a.b.c.d" already pre–programmed in sequence and very easy to use. It can drive any type of LNB (analog or DiSEqC, single or dual feed) and any type of multiswitch (analog or DiSEqC, 4, 8, 12, 16-way, taps & terminals)
- **Buzzer:** with parameter selection
- **Power supply:**
  - Built–in rechargeable batteries: 12 V x 4.5 A
  - External power supply: 17 Vac or 20/24 Vdc (2 A), (Ø 5.5 x 2.2 connector)
  - AC/AC adaptor: 230 Vac (117 V opt.), output: 17 Vac (2-3 supplied)
- **Battery duration at 25°C:** 3 hours in TV, 2 hours in digital SAT
- **Low battery indicator**: on CRT
- **Fast battery recharge time:** 2 hours for approx. 50% capacity, 6 hours for complete recharge, micro-controller electronic control of charge and discharge
- **Instrument size**: H 110 x L 280 x D 370 mm
- **Instrument weight:** 5.2 Kg with batteries
- **Casing structure:** plastic–coated aluminium and silicon rubber protections
- **RS232 interface:** for software up-grades via internet or measurement print–outs via PC (using optional RJ45/SUB-D adaptor)
- **Audio/video input/output:** Scart/Peritel socket, CE standard
- **Picture display:** 4.5", CRT, B/W (encasted)
- **Auto off timer:** after 5 minutes without use (on/off selectable, starts up from last function)
- **Auto test menu:** Selftest and instrument data
- **RF input overload protection:** electronic up to 60 Vac, or total with manual safety switch on the side of the instrument

SUPPLIED ACCESSORIES

- **TRASF–MKA57**
  AC/AC adaptor
  – Input: 230 V
  – Output: 17 V, 1.6 A.....

- **BORSA–DL1**
  Instrument protective bag with side pocket for tools and accessories, light shield and transparent document holder, shoulder strap for transport purposes .....

- **CNN–F–0150**
  Interchangeable F/F female double input connector .....

- **TRA–FFEM–CEIFEM**
  Interchangeable F/IEC female double input connector .....

- **TRA–BNCF–FFEM**
  Interchangeable F/BNC female double input connector .....

- **MAN–HP3–01**
  Spare contrast and brightness control knob .....

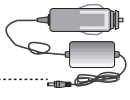
OPTIONAL ACCESSORIES

- **TSI–CNG**
  Calibrated noise generator, 0.5–2150 MHz, 70 dBµV/10 dBmV with "F" and "BNC" cable for the calibration and test of filters, amplifiers, cables, etc.. .....

- **DL1B–RS232–OPT**
  RJ45 electric interface and SUB–D socket to connect the meter to a PC for printing purposes and software upgrades via internet

- **TRASF–PSU40B–6**
  AC/DC electronic adaptor ultralight input: 110–240 V, output: 24 Vdc, 1.6 A .....

- **VCA-1224**
  Vehicle cigarette lighter, charger, adapter (input 12 V, output 24 Vdc) .....



- **DL1B–AML–OPT**
  Audio TV a modulazione d'ampiezza for France only ("L" standard)

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