



The **PROLINK-3** is a range of analysers designed for installation and maintenance of television and data systems in terrestrial, cable and satellite transmissions

It incorporates direct measurements for the evaluation of radio, television and data signal quality.

It also measures analogue signals from any TV standard to be demodulated and identification of digital signals.

It is portable, it is rugged and easy to use. In order to make readings easy all measurement results are shown on the screen. It includes a powerful data acquisition system (DATA LOGGER) with capacity to evaluate automatically up to 99 channels.

Two options are provided for measuring digital signals: the Bit Error Ratio (BER) and DVB channel identifier (DCI) which enables the operator and/or program to be identified.

### AN INSTRUMENT FOR EVERY APPLICATION

	Satellite	Terrestre	Sub-Band	Teletext	DiSEqC	Colour
<b>PROLINK-3</b>	✓	✓				
<b>PROLINK-3+</b>	✓	✓	✓	✓	✓	
<b>PROLINK-3C+</b>	✓	✓	✓	✓	✓	✓
<b>PROLINK-3S</b>	✓			✓	✓	

### AVAILABLE OPTIONS

	OPT-103-81 QPSK-SAT	OPT-103-82 QAM-CATV	OPT-103-83 COFDM-DTT	OPT-103-85 QPSK/QAM	OPT-103-86 QPSK/COFDM
<b>PROLINK-3</b>	✓	✓	✓		
<b>PROLINK-3+</b>	✓	✓	✓	✓	✓
<b>PROLINK-3C+</b>	✓	✓	✓	✓	✓
<b>PROLINK-3S</b>	✓				

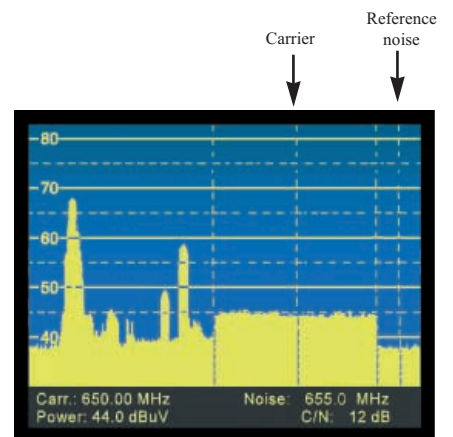
OPT-103-11 long-life batteries option

# PROLINK-3



The PROLINK-3 instruments include functions for signal quality evaluation. For analogue signals these measurements are: Level, Video / Audio and Carrier / Noise. In the case of digital signals: Channel Power, Carrier / Noise and option Bit Error Ratio

consideration the spectral distribution of the signal. The first method has the advantage of being very quick. The second determines signal power with greater precision, especially for degraded digital signals.



## Measuring Carrier/Noise (C/N)

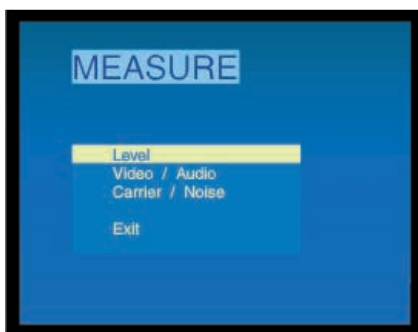
Measuring the C/N ratio is essential to be able to certify the immunity of a TV installation against noise, whether analogue or digital. With the PROLINK-3 the user can perform this measurement either in AUTO or REFERENCED mode.

In AUTO mode, the PROLINK-3 automatically defines the frequency to measure the noise.

## Bit Error Ratio measurement (BER)

The Bit Error Ratio (BER) is the measurement that actually evaluates the quality of a digital signal and determines whether it is enough to be reproduced by the receiver or not. The selectable options are:

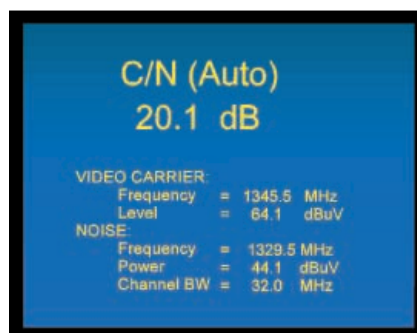
### OPT-103-81 QPSK Measurement



and DVB channel identifier (DCI)

## Digital channel power

The CHANNEL POWER of a digital signal can be calculated by averaging out or by taking into



In REFERENCED mode, it is the user who defines the frequency where the noise level is to be measured.

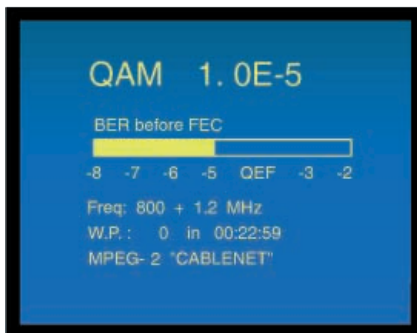
This mode is particularly useful for calculating the Carrier/Noise ratio in environments with a high density of analogue and digital channels.

This option permits BER to be measured before and after Viterbi as well as the total number of wrong packets (WP) within a period of time. Furthermore, it identifies DVB (DCI) signals in MCPC & SCPC Satellite transmissions.

Measuring the error ratio before the first correction (Viterbi) is more sensitive to small variations in the quality of reception. Measuring after Viterbi enables the measurement to conform to the quality minimums laid down by DVB, which are determined by a threshold (QEF).

## OPT-103-82 QAM Measuring

This option permits the measurement of BER and the total number of wrong packets (WP) in a period of time. It also identifies DVB (DCI) signals in Cable TV transmissions.

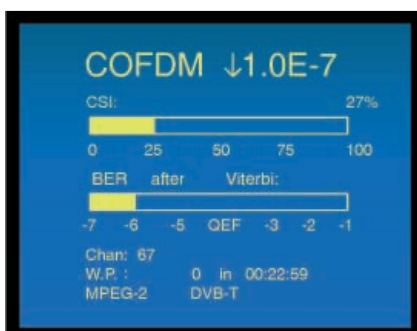


## OPT-103-83 COFDM Measuring

This option permits the measurement of BER after Viterbi, the total number of Wrong Packets (WP), and the identification of DVB (DCI) signals for DVB-Terrestrial signals.

CSI (Channel Status Information) provides additional information on the quality of the carriers forming a COFDM channel. Its value should always be the lowest possible.

Another function that this option allows is the measurement of the number of reception breaks, the period of each one of these breaks and the total time without reception.



## OPT-103-85 QAM & QPSK Measurement

Includes options OPT-103-81 and OPT-103-82

## OPT-103-86 COFDM & QPSK Measurement

Includes options OPT-103-81 and OPT-103-83

## DVB Channel identifier (DCI)

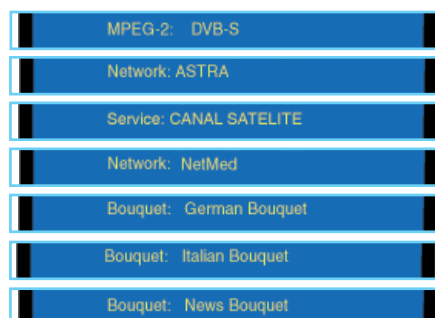
When it comes to determining the quality with which a digital signal is being received, there is no doubt that the Bit Error Ratio (BER) is a fundamental parameter.

To correctly measure the error ratio we need to demodulate the digital channel. This complex process is performed by the PROLINK-3. First the digital channel is tuned and demodulated in radio frequency using a QPSK, QAM or COFDM demodulator depending on the case in hand. This process gives us a digital signal which could be called base band and which in effect is composed of a sequence of bytes known as the "Transport Stream".

The "Transport Stream" can be in parallel (words of 8 bits) or in a series sequence, and is composed of conveniently labelled information packets of 188 bytes each. In DVB systems the packets contain video, audio or data information. The data packets can in turn be grouped together constituting tables, some of these contain information which the network operator can edit in the transmission centre and indicate the type of service being offered to users.

Some of these tables are of special interest, NETWORK Identification Table, BOUQUET Association Table, and SERVICE Description Table.

The different error ratio measuring options of the PROLINK-3 includes the DCI function (DVB Channel Identifier).



The DCI studies the "Transport Stream", determines whether it is DVB or not, then demodulate and analyse the information in the NETWORK, BOUQUET and SERVICE Tables. It then displays it repeatedly on the BER measuring screen.

The DCI function, patented by PROMAX, allows to know which channel has been tuned and to measure it totally automatically. Until now, this was only possible with an MPEG-2 decoder.

On selecting the measurement of a digital signal, the cursors automatically place themselves to measure channel power at both ends of the signal, depending on the selected BW (8 MHz in the example).

## Bit Error Ratio for SCPC

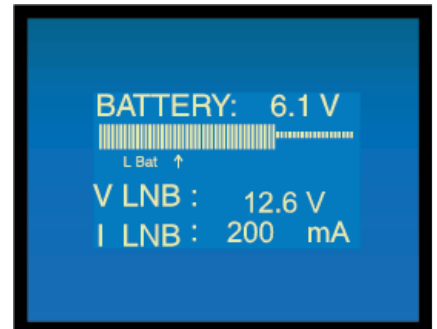
The Bit Error Ratio of QPSK signals allows measurements on MCPC multiplexed channels (Multiple Channels Per Carrier) as well as SCPC channels (Single Channel Per Carrier).

## Battery

One of the main elements of an instrument of these characteristics is the battery. Not only the equipment must have own internal source but also its duration must be enough for a continued use.

Option OPT-103-11 is a long life battery pack, which extends the equipment autonomy to over 3 hours. This option can be provided with the equipment or it can adapted later.

The equipment has a function to verify the battery state at any time.

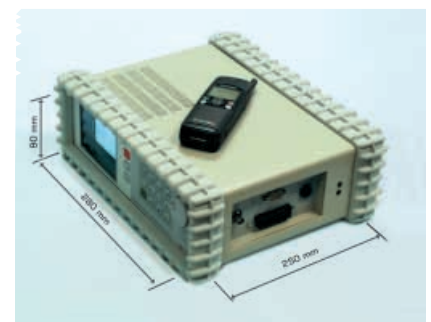


Also it allows measuring the external units current and voltage supply. The Low Bat. indication in the lower side of the horizontal bar indicates the low battery level starting from which it is advisable to charge the battery. In the lower side of the screen it appears the external units voltage supply and the supplied current (I LNB, 200 mA in the example).



## Your comfort our priority

Weighting just 4,9 kg battery included and being so compact, the PROLINK-3 is the only one capable to offer such revolutionary functions in such a small instrument.

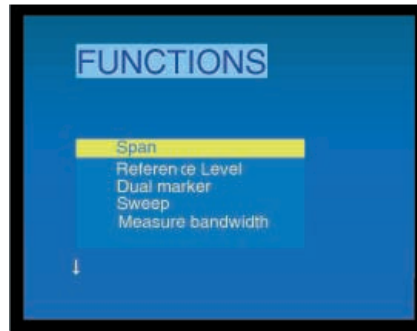


# MORE THAN A SPECTRUM ANALYSER

## Fast, accurate and simple Spectrum Analyser

As a spectrum analyser the PROLINK-3 has been optimised for measurements in television systems. The instrument allows selection of Frequency Range (Span), Reference Level and Sweep Time. These parameters can be adapted for an optimum signal representation in accordance with the type of measurement to be done. For example, when using the equipment to align an antenna, it is very useful to select the Sweep Time as Fast or directly choose the Antenna Alignment function in order that the display follows closely every change in the behaviour of the signal. On the other hand, if the representation must show signal evolution accurately, for example in a Cable TV system, it will be more appropriate to select the Accurate sweep mode.

To keep the operation simple the instrument automatically presets certain configurations depending upon measurement mode selected.



## Rough use protection

Rugged construction has been one of the most important issues taken into account in the PROLINK-3 design. Despite its low weight the chassis and casing are metallic for improved shock protection.



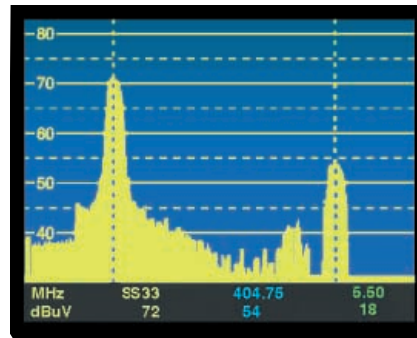
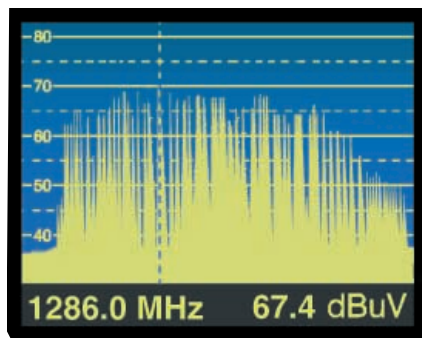
A rubber shock protector and a special mechanism to fix the monitor reduces the effects of accidental drop. The input and output connectors are located on a side of the instrument and the only control knob, which is located on the front panel is protected against ingress of dust and water.

## In all environments

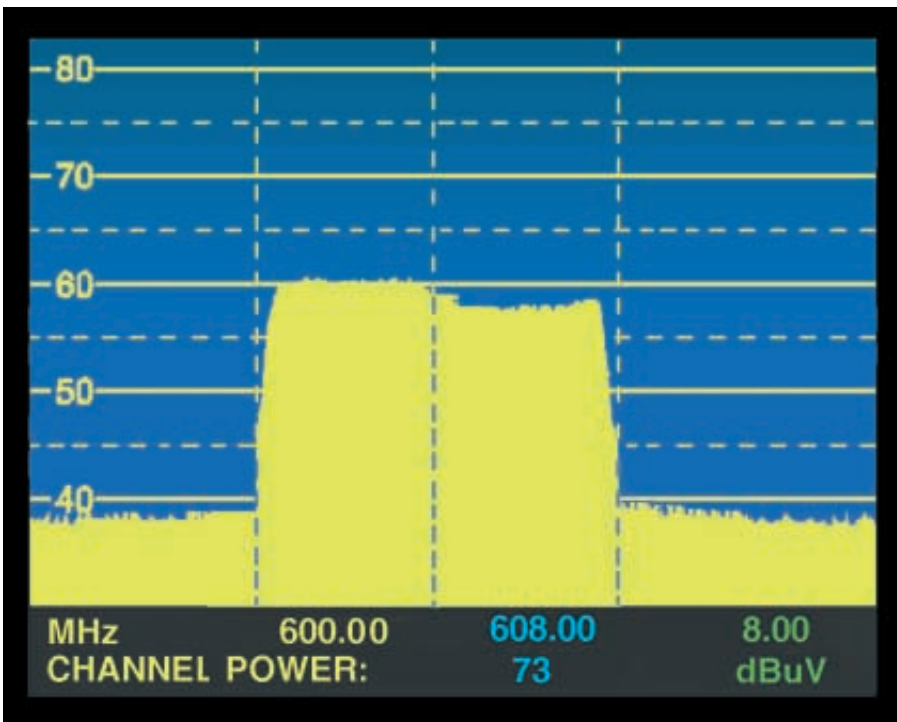
Every detail has been taken into account to ensure the instrument is ideal for operation in any environment.



The carrying bag itself has an incorporated viewing hood to improve monitor contrast when operated in direct sun light.



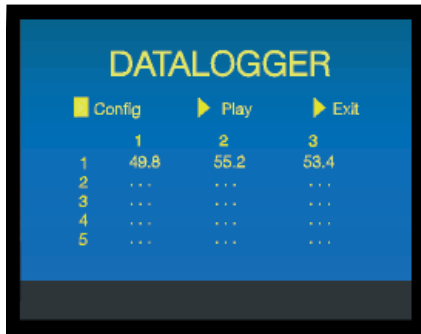
When DUAL MARKER mode is selected two markers appear on the screen with indication of level and frequency difference between them. With 50 dB dynamic range, frequency or channel and level indication simultaneously on the screen the interpretation of the readings is immediate. At any time it is possible to obtain a printed copy of the spectrum display.



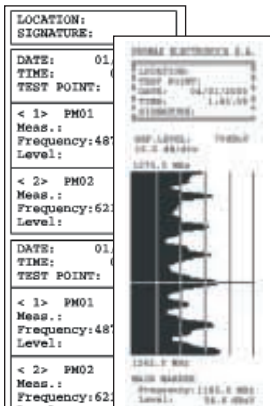
On selecting the measurement of a digital signal, the cursors automatically place themselves to measure channel power at both ends of the channel, according to the selected BW (8 MHz in the example).

## Acquisition and data processing

The PROLINK-3 can be used as a data acquisition system. It can analyse up to 99 channels at one particular outlet with just a command. It can make many kinds of measurements including Bit Error Ratio. The process can be repeated for up to 99 outlets since the capacity of the system is 9,801 measurements.



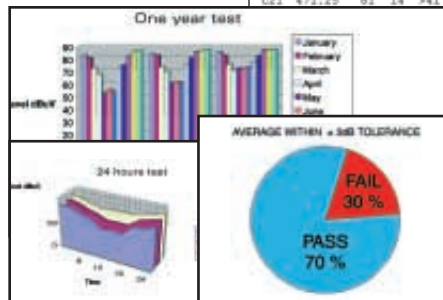
It is also possible to repeat measurements over time. In this mode the instrument will take sets of measurements every given time interval. This function can be very useful for permanent monitoring of signals or intermittent faults local location. With the help of the RM-103 software package all data can be downloaded to a computer to be analysed with more detail.



The results can be stored in the memory or also transferred to a printer to obtain reports just in the place where the measurements are made. For this purpose the CI-023 printer can be attached to the instrument's carrying bag.

Various types of reports, graphics or statistics can be generated using a standard spread sheet or any other data processing software.

CHAN	FREQ	V	V/A	C/N
D02	48.250	55		>38
D04	62.25	83	14	41
D01	105.25	98	12	46
D05	175.25	95	13	40
D06	182.25	84	13	39
D08	196.25	82	12	42
D09	203.25	78	14	38
C12	224.25	81	6	15
C21	271.25	82	14	>41



It is possible to print both data lists and the spectrum display.

## An instrument for every application

To choose the right PROLINK-3 for your application you should refer to the table previously showing. Following is a brief description of what function can be configured in the different versions. There is a PROLINK-3S covering just the satellite TV band. The remaining versions offer both terrestrial

and satellite TV bands. Any of the available Bit Error Ratio options can be added to the selected PROLINK-3 version as shown in the table as well.

## Return-path

The variants that include this function cover the frequency range used in the Cable TV return path. This frequency range runs typically from 5 to 50 MHz.

## Teletext

The teletext is a text information contained inside the analogue television signal itself. It happens to be a digital signal with high sensitivity to noise and that's why it becomes one of the most crucial parameters to be checked in an analogue installation.



## Easy to use

Easy of use was a priority during design of the instrument. Direct access keys and a single selection command allow an immediate selection of the desired function.

An iconographic menu eases the identification of all functions.

The selection of all the functions is made by means of an just one rotary selector.



## Back-pack type carrying case

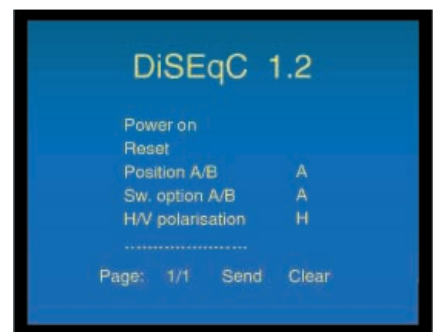
The equipment is delivered with a carrying bag that can be used as a backpack. Making it easier to climb ladders and other difficult locations.



## DiSEqC 1.2

DiSEqC 1.2 compatible devices such as LNBS, switches, positioners, etc. can be controlled by means of this function.

The desired installation configuration will be determined via a program made of a set of simple instructions. This program can contain up to 99 of the instructions and can be saved in memory to be used at a later stage.



## Black & white or colour screen

The screen type desired can be also selected between Black & White CRT or Colour LCD, TFT.

SPECIFICATIONS	PROLINK-3	Measurements	
<b>TUNING</b>  Tuning modes  Resolution Automatic search Memory	Digital frequency synthesis. Continuous tuning from 5 to 862 MHz and from 920 to 2150 MHz Frequency, Channel or Memory. Channel plan configurable on demand 50 kHz Threshold level selectable 99 positions for measurement configurations	Terrestrial bands Analogue channels Digital channels	Level and Carrier-Noise ratio (Referenced) Channel power (Integration method) and Carrier-Noise ratio (Referenced).
		Satellite band Analogue channels Digital channels	Level and Carrier-Noise ratio (Referenced) Channel power (Integration method) and Carrier-Noise ratio (Referenced).
<b>RF Input</b> Impedance Connector Maximum signal Maximum input voltage DC to 100 Hz  5 MHz to 2150 MHz	75 Ω BNC, F or TV by adapter 130 dBμV  50 V rms (powered by the AL-103 power adapter) 30 V rms (not powered by the AL-103 power adapter) 130 dBμV	<b>Monitor Display</b> Monitor Colour system TV standard Synchronism and Burst Spectrum mode Sensitivity Synchronism 50/60 Hz	B & W 4 ½ inches PAL, SECAM and NTSC M, N, B, G, I, D, K and L Graphic representation over the picture Variable span and reference level 40 dBμV for correct synchronism Automatic selection according to the system
		<b>Video Signal</b> External video input Sensitivity Video output	Scart (automatic) 1 Vpp (75 Ω) positive video Scart (75 Ω)
<b>Level measurement</b> Measurement range Terrestrial TV & FM bands Satellite TV band Reading Digital  Analogue  Measurement bandwidth  Audible indicator  Accuracy (typical) Sub-band Terrestrial bands  Satellite band  Out of range indication	20 dBμV to 130 dBμV (10 μV to 3.16 V) 30 dBμV to 120 dBμV (31.6 μV to 1 V) Auto-range, reading is displayed on a (OSD) Absolute value calibrated in dBμV, dBmV or dBm Relative value through an analogue bar on the screen 230 kHz (Terrestrial band) 4 MHz (Satellite band) (maximum band ripple 1 dB). LV audio. A tone with pitch proportional to signal strength.	<b>Sound</b> Input Outputs Demodulation De-emphasis Subcarrier Variable Fixed Terrestrial  Satellite	Scart Built in speaker, Scart AM, FM and TV, selectable 50 μs Digital frequency synthesis From 4 to 9 MHz, 10 kHz resolution  According to the active standard: 4.50 - 5.50 - 5.80-6.00 - 6.50 - 6.65 - 5.74 - AM - FM - LV - OFF. 6.65 - 5.80 - 6.50 - 7.02 - LV - OFF
		<b>Teletext</b>	Decodes at 1.5 level
		<b>RS-232C Interface</b>	
		<b>External unit power SUPPLY</b> Terrestrial Satellite 22 kHz signal Voltage Frequency Maximum power	Through the RF input connector External or 13/15/18 V External or 13/15/18 V Selectable 0.6 V ± 0.2 V 22 kHz ± 4 kHz 5 W
<b>Measurements in TV modes</b> Terrestrial bands Analogue channels  Digital channels  Satellite band Analogue channels  Digital channels  DATA LOGGER function	Level, Video-Audio ratio and Carrier/Noise ratio (Auto and Referenced) Channel power (Auto) and Carrier/Noise ratio (Auto and Referenced).  Level and Carrier/Noise ratio (Auto and Referenced) Channel power (Auto) and Carrier/Noise ratio (Auto and Referenced). Automatic acquisition of up to 9801 measurements	<b>DiSEqC Generator</b>	According to DiSEqC 1.2 standard
		<b>Power Supply</b> Internal Batteries Autonomy Recharging time External Voltage Consumption Auto power off	2 x 6 V 3.3 Ah lead acid batteries > 1 hour non stop 12 h starting from a complete discharge 12 V 42 W After 15 minutes without operating on any control. Can be disabled.
<b>Spectrum analyser mode</b> Satellite band Terrestrial bands Measurement bandwidth Terrestrial Satellite Span Terrestrial  Satellite  Markers	30 dBμV to 120 dBμV (31.6 μV to 1 V) 20 dBμV to 130 dBμV (10 μV to 3.16 V)  230 kHz, 1 MHz selectable 230 kHz, 4 MHz selectable  Full span (full band), 500, 200, 100, 50, 32, 16, 8 MHz selectable. Full span (full band), 500, 200, 100, 50, 32 MHz selectable. 2 with level, frequency, level difference and frequency difference indications.	<b>Operating environmental conditions</b> Altitude Temperature range Max. relative humidity	Up to 2000 m From 5 to 40 °C 80 % (up to 31°C), decreasing lineally up to 50% at 40° C.
		<b>Mechanical features</b> Dimensions Weight	280 (W) x 95 (H) x 250 (D) mm 4.9 kg