

TELECOMMUNICATIONS TEST EQUIPMENT



COMMITTED TO QUALITY ISO 9001



PRODUCTS

Our products include a wide range of telecommunications test instruments to provide testing solutions for cable, satellite and digital terrestrial television. In this catalogue we have included a new range of optical-fibre test equipment, which proves our continuous research for new business opportunities.



EXPANSION

The equipment is distributed worldwide through a mix of direct and indirect sales network. **PROMAX** has already set up 18 Calibration Centres and several Service Centres worldwide. Our target is to continue this process to deliver technical support, at the same time that we make the product available to our customers.

RESEARCH & DEVELOPMENT

PROMAX was founded in 1963 by Jose Clotet in Barcelona. The company's first developments included instruments to generate television and radio signals and analysers to check the reception quality.

Today, **PROMAX** is a leading company in providing test and measurement solutions worldwide to support the information technology revolution. The company invests about 15% of its turnover in Research & Development.



MANUFACTURING

PROMAX manufactures more than 200 different products in our Barcelona manufacturing facilities. The use of the latest technological resources allows a high efficiency rate.



TV & Satellite level meters



PROLINK-4 / PROLINK-4C	
TV & Satellite Level Meter and Spectrum Analyzer with MPEG analyser	
QPSK / COFDM / QAM measurements and Li-Ion batteries included	3
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Cable TV Analysers



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PROLINK**A BIG FAMILY**

The PROLINK series of **PROMAX** Signal Level Meters are an ideal solution for those companies that need multifunctional equipment for installation, certification and maintenance purposes in terrestrial, cable and satellite television or data systems. Due to the type of measurements performed and its accuracy, these instruments are adequate for quality assurance both in analogue and digital systems.

They are durable and light at the same time and built for rough field use in all kinds of weather.

They have a very intuitive user interface which allows for quick learning in the use of all their functions. They have an icon-based keyboard and multi-lingual onscreen menus.



ALL IN ONE

PROLINK-4



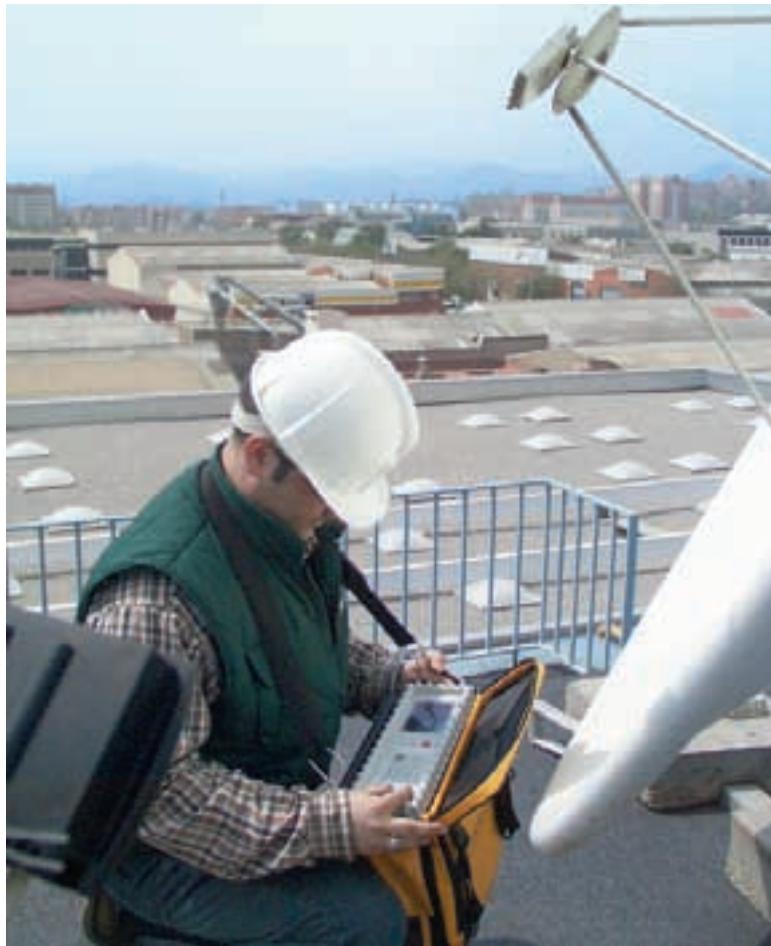
RECOMMENDED APPLICATION	PROLINK-2	PROLINK-3+	PROLINK-4
Terrestrial	Included	Included	Included
Digital Terrestrial (DVB-T)	—	Optional	Included
Cable	(No return path)	Included	Included
Digital Cable (DVB-C)	—	Optional	Included
Satellite	Included	Included	Included
Digital Satellite (DVB-S)	Included	Optional	Included
MPEG decoding	—	—	Included
Conditional access	—	—	Optional
B&W or colour screen	(B&W only)	Included	Included
Li-Ion long operating time battery	—	Optional	Included

PROLINK-4

The **PROLINK-4** incorporates functions to determine the quality of both analogue and digital signals. For analogue signals the measurements are Level, Video/Audio, Carrier/Noise and for digital signals Channel Power, Carrier / Noise, Bit Error Rate and DVB Digital Channel Identification (DCI).



TOMORROW'S ENGINEERING



Digital Satellite (QPSK DVB-S)

The **PROLINK-4** measures BER before and after Viterbi (also known as FEC). It also includes the DCI function, patented by PROMAX, which allows for a fully automatic identification of the tuned channel.

The Bit Error Rate measurement before the first correction stage (Viterbi) is most sensitive to changes in the reception quality. Measurement after Viterbi can be compared with quality limits required by DVB and defined by the Quasi Error Free (QEF) threshold.

Digital Cable (QAM DVB-C)

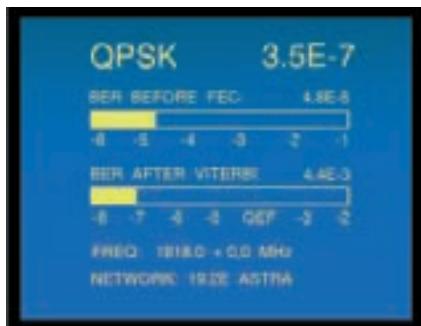
Both BER and MER can be measured on QAM digital signals. It also includes the DCI function.

The BER, as in the case of QPSK or COFDM, can be compared to DVB quality limits. In QAM it is also interesting to use another parameter which is representative of quality and brings complimentary information mostly when quality of signals is high. MER will display better than BER an improvement in a good quality signal.

Digital Terrestrial (COFDM DVB-T)

The **PROLINK-4** can measure both the BER to compare with quality limits and the CSI.

The CSI (Channel Status Information) gives a very valuable information about the quality of the multiple carriers the COFDM channels are made of. CSI value must be as low as possible and helps to determine which is the safety margin to ensure proper reception. This is especially interesting if some changes such as those related to the weather can be expected.



FOR TODAY'S APPLICATIONS

PROLINK-4

Dynamic quality analysis

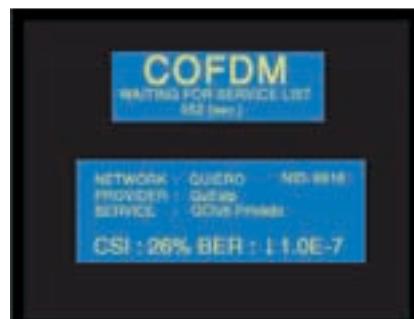
When the BER measurement is indicating an acceptable reception quality and the DCI information is displaying the channel we are looking for, we are ready to request the analysis of the MPEG-2/DVB Transport Stream Wrong packets.

The equipment stores the transmission cuts and the type of event that has produced them. An example based on the information is displayed on the following screenshot: the demodulator has detected 45 events of W.P., that is to say incorrigible packets, starting at 13:23 and within an interval of 3 minutes time.

The events registered according to the ETSI TR 101 209 Standard.



DTV	Digital television service
DR	Digital radio sound service
DAT	Data broadcast service
MOS	Mosaic service
-	Operator reserved type



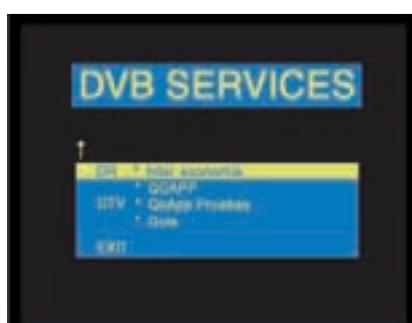
Service List

As a result of demodulating the QPSK, QAM or COFDM digital signal what we could relate to a baseband digital signal is obtained which is a sequence of bytes named "Transport Stream". These bytes are structured in packets and tables. Some of these tables are of special interest, such as the NETWORK Identification Table, the BOUQUET Association Table and the SERVICE Description Table.



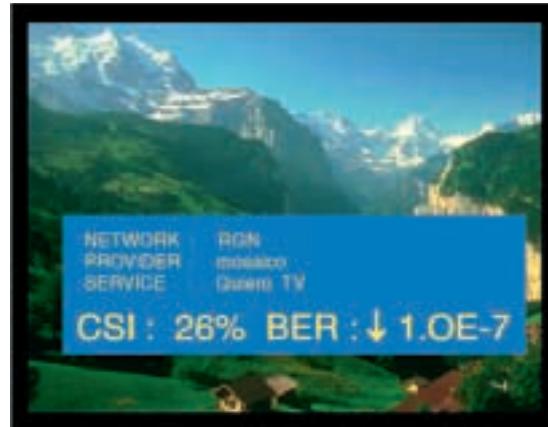
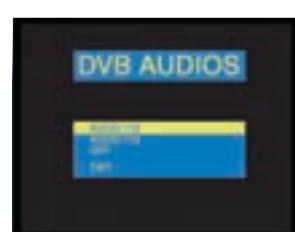
Encrypted Channels

The equipment also has a Smart Card reader incorporated. As an option, there is the possibility to upgrade the **PROLINK-4** with the capability to display programs encrypted with conditional access systems such as Viaccess, Mediaguard, Conax...



MPEG-2 Digital Picture

The **PROLINK-4** has a MPEG-2 decoder built-in. This module allows to view all free to air programs in a digital transponder, including demodulation of video and audio contents.



When available the complete Service List will be displayed along with the information on the type of service, and with an asterisk (*) in those cases where the operator is indicating this particular service is totally or partially encrypted.

PROLINK-4

TOP IN ITS CLASS

Digital channel power

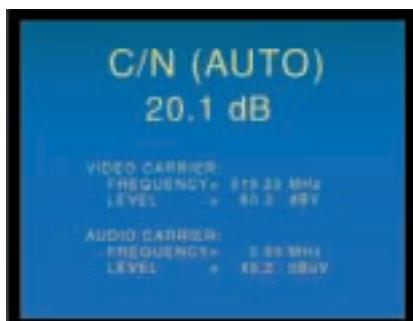
The CHANNEL POWER of a digital signal can be calculated by averaging out or by taking into consideration the spectral distribution of



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. PROLINK-4 uses both.

Measuring Carrier/Noise (C/N)

Measuring the C/N ratio is essential to certify the immunity of a TV installation against noise, whether analogue or digital. With the

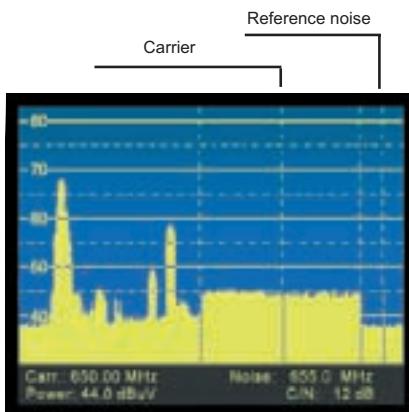


PROLINK-4 the user can perform this measurement either in AUTO or REFERENCED mode.

In AUTO mode, the PROLINK-4 automatically defines the frequency to measure the noise.

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

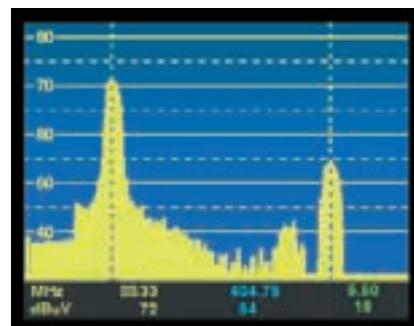
Fast, calibrated and simple Spectrum Analyser

As a spectrum analyser the PROLINK-4 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.

When DUAL MARKER mode is selected, two



markers appear on the screen with indication of level and frequency gap 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.

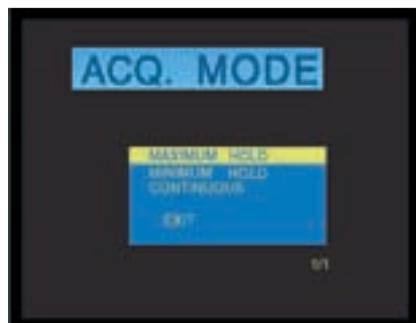
On selecting the measurement of a digital signal, the cursors automatically place themselves to measure channel power at both ends of the channel, according to the selected BW (8 MHz in the example).



STILL AFFORDABLE

Return Path measurements

There are applications such as noise or interference detection in the return path where it is very interesting to have the possibility to change the spectrum analyser acquisition mode so that signal minimum's or maximum's taking place in a given time period can be displayed.



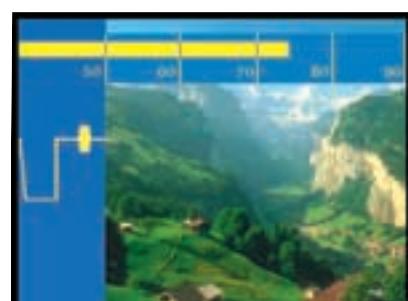
TV, LV, SYNC Modes

Additional to the television monitor operation the **PROLINK-4** can work in TV mode as an analogue signal level indicator and can display the line synchronism pulse just like it would appear on an oscilloscope screen.



Line synchronism + level + TV

Qualitative analysis of TV signal quality as it will be watched is possible based on line synchronism display.



DiSEqC 1.2

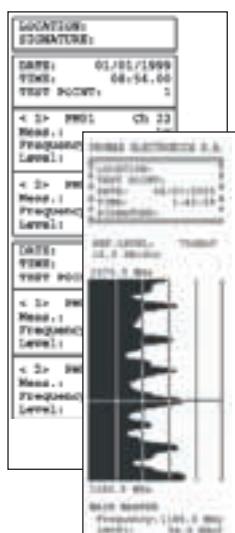
DiSEqC 1.2 compatible devices such as LNBs, switches, positioners, etc... can be controlled by means of this function.



Both **PROLINK-2** and **PROLINK-3** have the possibility to make a sequence of commands which can be executed or edited at any time.

Acquisition and data processing

The **PROLINK-4** can be used as a data acquisition system. It can analyse up to 99 channels at any 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.



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

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

PROLINK-4

In addition **PROLINK-4** can store up to 10 programs with various combinations or sequences of commands.



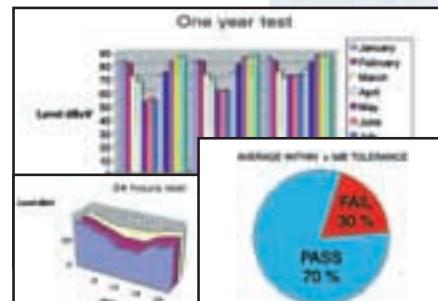
Teletext

The Teletext is an information contained inside the analogue television signal itself. It is very sensitive to noise and therefore it is very useful to evaluate the quality of an installation.

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 location. With the help of the **RM-104** software package all data can be downloaded to a computer to be analysed with more detail.



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



PROLINK-4

ADVANCED TECHNOLOGY

TUNING	Digital frequency synthesis. Continuous tuning from 5 to 862 MHz and from 900 to 2150 MHz Frequency, Channel or Memory Configurable 5-862 MHz: 50 kHz 900-2150 MHz: 500 kHz	Sound Input Outputs Demodulation	Scart Built in speaker, Scart AM, FM, TV and NICAM (PAL BG, I and SECAM L), selectable
Automatic search Memory	Threshold level selectable 99 positions	Digital Measuring	
RF Input Impedance Connector Maximum signal	75 Ω BNC, F or TV adapter 130 dBμV	COFDM Tuning Level Parameters Carriers QAM Tuning Level Parameters Demodulation Symbol rate QPSK: Tuning Level Parameters Symbol rate Wrong packets	from 40 to 870 MHz (Bw = 8, 7, 6 MHz) 45 dBμV to 100 dBμV BER after Viterbi CSI (Channel Status Information) 2k / 8k (Selected by the user). Modulation QPSK, 16-QAM, 64-QAM from 47 MHz to 862 MHz from 45 dBμV to 110 dBμV BER before FEC (Forward Error Correction) MER (Modulation Error Ratio) 16/32/64/128/256 QAM 1 to 7 Mbauds from 950 MHz to 2150 MHz 44 dBμV to 114 dBμV BER before Viterbi BER after Viterbi from 2 to 45 Mbauds Wrong packets over time ETSI TR 101 290 levels 1.1, 1.2, 1.3 and 2.1
Level measurement Measurement range Terrestrial TV & FM bands Satellite TV band Reading Analogue Measurement bandwidth Audible indicator Accuracy Sub-band Terrestrial bands Satellite band	20 dBμV to 120 dBμV (10 μV to 1 V) 30 dBμV to 120 dBμV (31,6 μV to 1 V) Auto-range, Absolute value calibrated in dBμV, dBmV or dBm Analogue bar on the screen 230 kHz (Terrestrial band) + 4 MHz (Satellite band) A tone with pitch proportional to signal strength ±1.5 dB (30-120 dBμV, 5-45 MHz) (22°C ± 5°C) ±1.5 dB (30-120 dBμV, 48,25-862 MHz) (22°C ± 5°C) ±1.5 dB (40-100 dBμV, 900-2150 MHz) (22°C ± 5°C)		
Measurements in TV modes Terrestrial bands Analogue channels Digital channels Satellite band Analogue channels Digital channels ACQUISITION 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	DCI Function	DVB channel identifier
Spectrum analyser Satellite band Terrestrial bands Measurement bandwidth Terrestrial Satellite Span Terrestrial Satellite Markers Measurements Terrestrial bands Analogue channels Digital channels Satellite band Analogue channels Digital channels	30 dBμV to 120 dBμV (31,6 μV to 1 V) 20 dBμV to 120 dBμV (10 μV to 1 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 Level, Video-Audio ratio and Carrier/Noise ratio (Referenced). Channel power (Integration method) and Carrier-Noise ratio (Referenced) Bit Error Rate (BER) Level and Carrier/Noise ratio (Referenced) Channel power (Integration method) and Carrier-Noise ratio (Referenced) Bit Error Rate (BER)	Digital video Format Conditional access Viaccess Viaccess + Mediaguard Viaccess + Conax Baseband signal transport Stream interface Input Teletext Interface	MPEG-2 / DVB (MP-ML) Uncoded FTA standard (Optional) (Optional) (Optional) DVB-PI parallel LVDS. D-25 Connector Decodes at 1.5 level RS-232C
		External unit power Terrestrial Satellite 22 kHz signal Maximum power	Through the RF input connector External or 13/15/18/24 V External or 13/15/18 V Selectable 5 W
		DiSEqC Generator	According to DiSEqC 1.2 standard
		Power Supply Internal Battery Autonomy (PROLINK-4C) Recharging time External Voltage Consumption	7.2 V 11 Ah Li-Ion battery Over 3 hours with LNB Over 2 hours with LNB and MPEG-2 4 h starting from a complete discharge (instrument turned off) 12 V 51 W
Monitor Display Monitor Colour system TV standard	4,5" B&W CRT (PROLINK-4) 4,5" colour LCD (PROLINK-4C) PAL, SECAM and NTSC M, N, B, G, I, D, K and L	Operating environmental conditions Altitude Temperature range Max. relative humidity	Up to 2000 m From 5 to 40°C 80 % (up to 31°C), decreasing linearly up to 50% to 40°C.
Video Signal External video input Video output	Scart Scart	Mechanical features Dimensions Weight	294 (W) x 94 (H) x 274 (D) mm (without rubber protector) 5.1 kg

FOR ROUGH USE

Li-Ion long operating time batteries

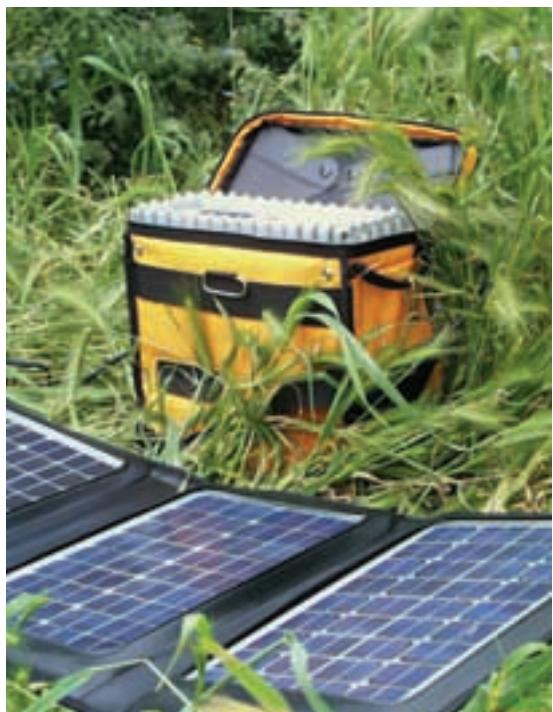
The PROLINK-4 comes with the latest generation batteries (Li+) which allow for an operating time over 3 hours even supplying power to external devices.

It is possible to check the remaining power available from the batteries at any time. This function is combined with the measurement of the voltage and current being supplied to the external devices.



Another of the advantages of Li+ technology and specially that of the PROLINK-4 power supply is the great flexibility it has which allows for quick 2-3 hour charging time from the mains or through car lighter adapter. Alternatively it can also accept slower charging sessions from less powerful sources. The instrument can be operated while batteries are charged simultaneously and user can know what is the evolution of the charging process.

In all environments



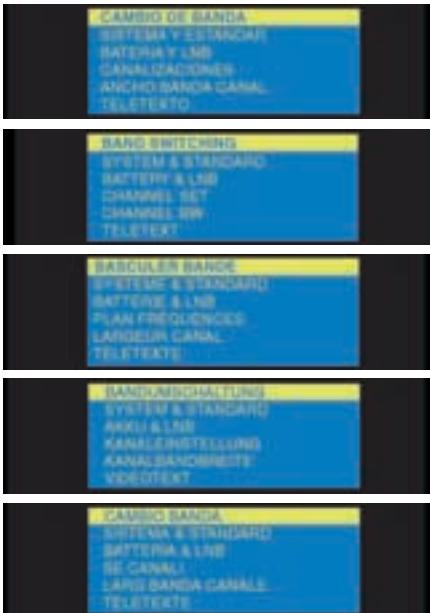
Every detail has been taken into consideration so that PROLINK-4 can be operated in any environment.



The PROLINK-4 is very light and durable. Lightweight metal chassis, special TV monitor fixing brackets, water resistant flat panel and rubber protectors are some of the key factors involved into the hit and drop protection.

Language

Menus in English, Spanish, French, German and Italian are available in the PROLINK-4.



PROLINK-4



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.



A viewing hood has been incorporated to the carrying bag itself to improve screen contrast when working against direct sunlight.



PROLINK-3+



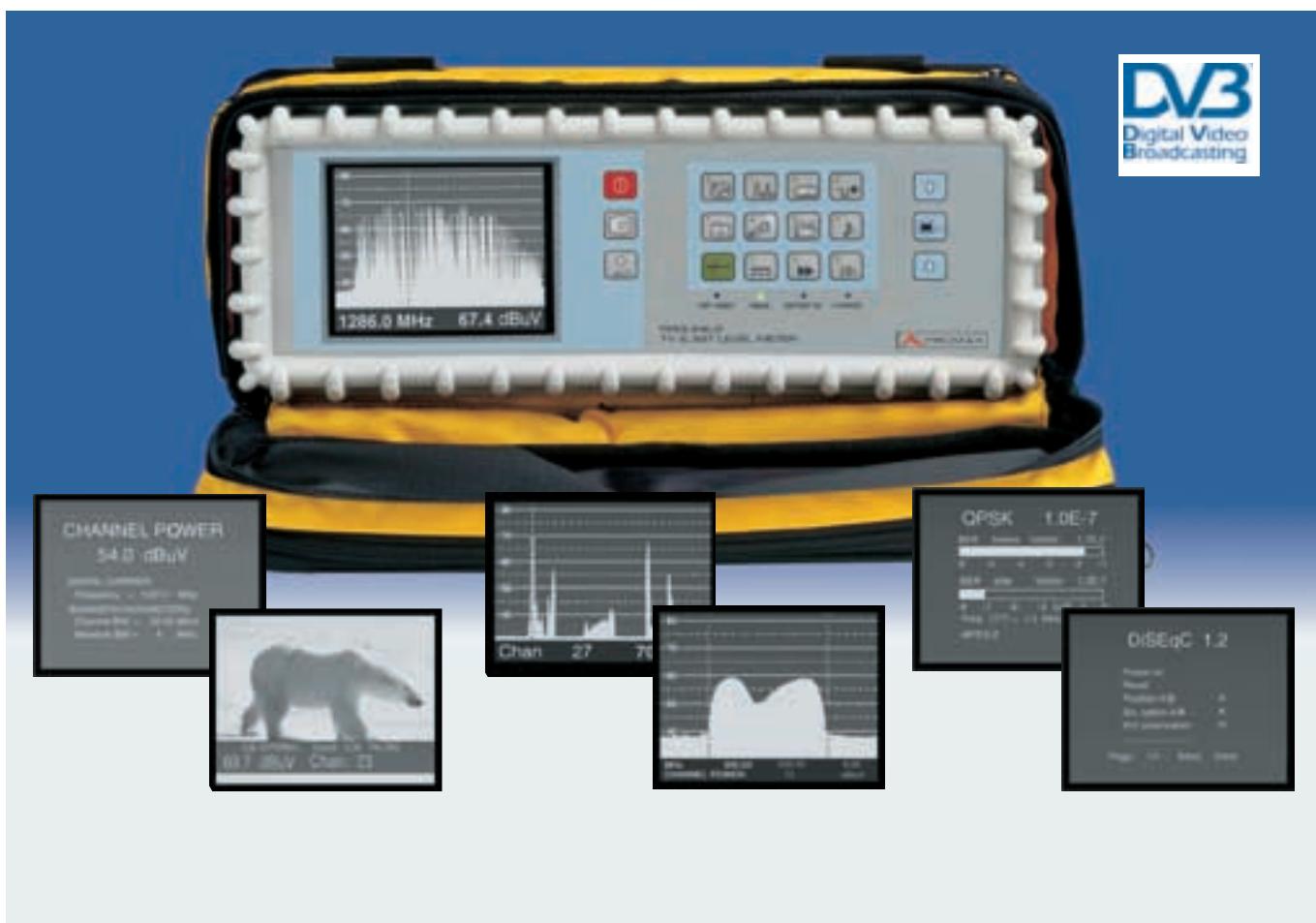
The PROLINK-3+ with black and white CRT monitor and the PROLINK-3C+ with colour LCD display are two high performance signal level meters that allow to be configured to suit a wide range of applications. It is possible to choose among different options for BER measurement and a long operating time Li-Ion battery as well.

Datalogger
Sub-band

BER for digital satellite (QPSK DVB-S) optional
BER for digital satellite (QPSK DVB-S) and digital terrestrial (COFDM DVB-T) optional
BER for digital satellite (QPSK DVB-S) and digital cable (QAM DVB-C) optional
Long operating time Li-Ion Battery optional

Specifications	PROLINK-3+ / PROLINK-3C+	QPSK measurements	Optional (OP-103-81) BER before and after Viterbi (FEC) Wrong packets
Tuning Tuning modes	5 to 862 MHz and from 920 to 2150 MHz. Frequency, Channel or Memory. Channel plan configurable on demand	QAM measurements	Optional (OP-103-85) BER before FEC Wrong packets
Resolution Automatic Memory	50 kHz Threshold level selectable 99 positions for measurement configurations	COFDM measurements	Optional (OP-103-86) CSI and BER after FEC Wrong packets
Level measurement Measurement range	Terrestrial TV & FM bands from 20 dBµV to 130 dBµV (10 µV to 3.16 V), Satellite band 30 dBµV to 120 dBµV (31.6 µV to 1 V) Auto-range, reading is displayed on an OSD	DCI	DVB channel identifier.
Reading		External unit power	Through the RF input connector
Measurement bandwidth Audible indicator	230 kHz (terrestrial) + 4 MHz (satellite) LV audio. A tone with pitch proportional to signal strength.	DiSEqC Generator	According to DiSEqC 1.2 standard
Accuracy Terrestrial bands Satellite band	±1.5 dB (30-120 dBµV, 48.25-861 MHz) ±1.5 dB (40-100 dBµV, 920-2150 MHz)	Mechanical features Dimensions Weight	280 (W) x 95 (H) x 250 (D) mm 4.2 kg
Monitor	4.5" B & W CRT (PROLINK-3+) 4.5" colour LCD (PROLINK-3C+)		

PROLINK-2



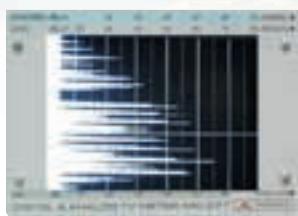
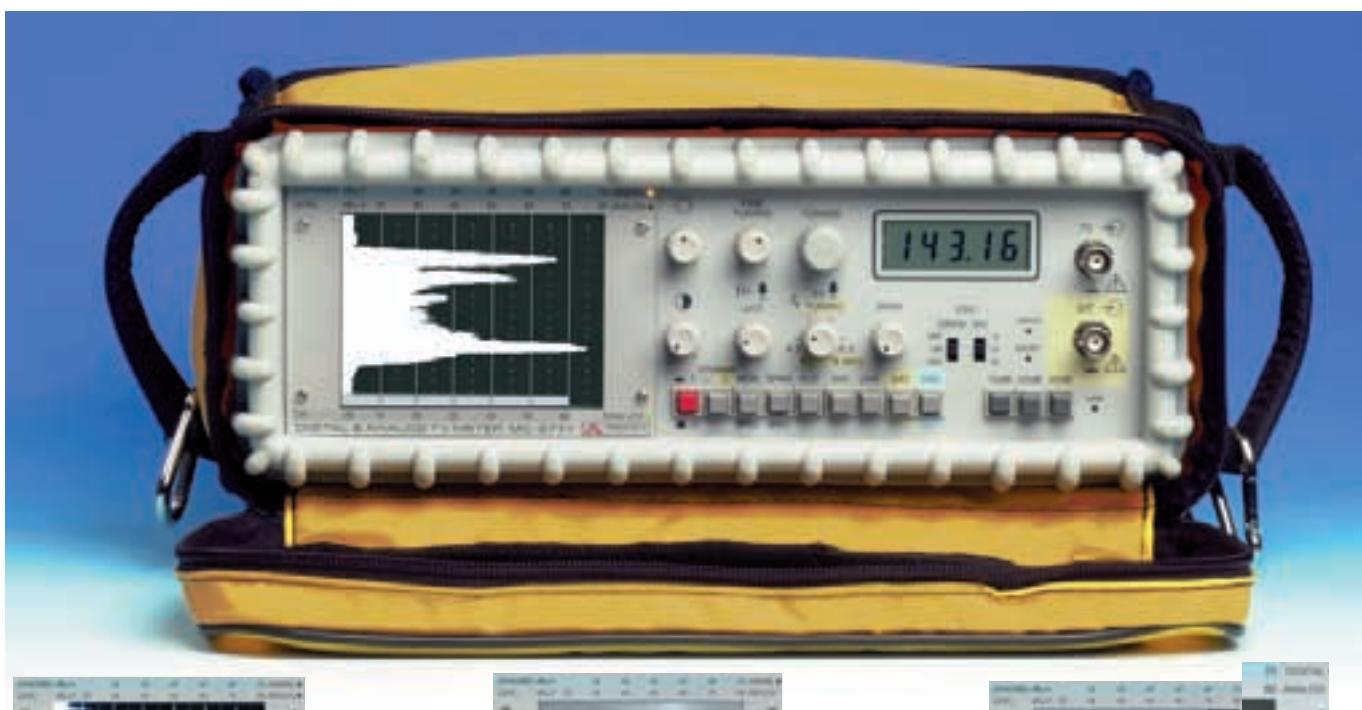
The **PROLINK-2** combines in one single instrument the functions most required by the installers with an optimum price/features ratio. It is an ideal equipment for satellite TV applications, including as well functions to cover the terrestrial television range.

The instrument gives the BER measurement before and after Viterbi (FEC) for digital satellite signals (QSK DVB-S) as well as the number of wrong packets detected on the reception site.

DiSEqC
BER for digital satellite (QPSK DVB-S) included

Specifications	PROLINK-2	Accuracy	
Tuning Tuning mode	45 to 862 MHz and from 920 to 2150 MHz. Frequency, Channel or Memory. Channel plan configurable on demand. 50 kHz	Terrestrial bands Satellite	±1.5 dB (30-120 dB μ V, 48.25-861 MHz) ±1.5 dB (40-100 dB μ V, 920-2150 MHz)
Resolution Automatic search Memory	Threshold level selectable 99 positions for measurement configurations	Monitor	4.5" B & W CRT
Level measurement Measurement range	Terrestrial TV & FM bands from 20 dB μ V to 130 dB μ V (10 μ V to 3.16 V), Satellite band 30 dB μ V to 120 dB μ V (31.6 μ V to 1 V) Auto-range, reading is displayed on a OSD	QPSK measurements	BER before and after Viterbi (FEC) Wrong packets
Reading	230 kHz (terrestrial) + 4 MHz (satellite)	External unit power	Through the RF input connector
Measurement bandwidth Audible indication	LV audio. A tone with pitch proportional to signal strength.	DiSEqC Generator Mechanical features Dimensions Weight	According to DiSEqC 1.2 standard 280 (W) x 95 (H) x 250 (D) mm 5.4 kg

MC-377+



SPECTRUM ANALYSER



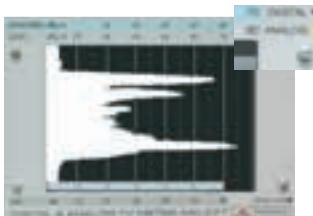
MONITOR



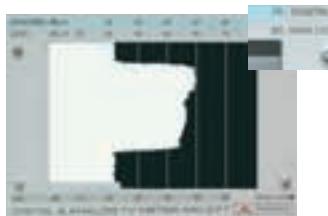
LEVEL MEASUREMENT + SYNCHRONISM



POWER OF DIGITAL CHANNELS



C/N ANALOGUE SIGNALS



C/N RATIO-DIGITAL SIGNALS

The MC-377+ is a basic low cost instrument for satellite and terrestrial TV, both analogue and digital.

It incorporates MONITOR, SPECTRUM ANALYSER and LEVEL MEASUREMENT OF ANALOGUE SIGNALS. In addition it permits the measurement of DIGITAL CHANNEL POWER and the CARRIER TO NOISE RATIO of ANALOGUE AND DIGITAL SIGNALS. For this purpose the instrument includes a switch (ANALOGUE/DIGITAL) and two scales for the measurement of the power and C/N ratio of digital channels.

Its simplicity of use, its portability and low cost are the most outstanding characteristics of this model.

Specifications	MC-377+	Sound	Analogue channels
Tuning Resolution	48 to 856 MHz, 950 to 2050 MHz 10 kHz VHF and UHF, 100 kHz SAT	Terrestrial Satellite Audible indicator level	According standard or selectable from 4.5 to 6.5 MHz Selectable from 5 to 8 MHz
Measurement Total accuracy	Analogue signals level, Power of digital channels and C/N (ANL and DIG) ratio ± 4 dB (TV), ± 6 dB (SAT)	External unit power	0/13/18 V, 350 mA ± 22 kHz (TV and SAT)
Monitor Operation modes Standard Monitor TV Version MC-377+/1 MC-377+/2 MC-377+/4	4.5" B & W CRT Monitor / Spectrum analyser B, G, H and L M, N and L D, K and L I and L	External video Input Output	SCART (automatic) SCART (automatic)
		Mechanical features Dimensions Weight	280 (W) x 95 (H) x 250 (D) mm 5.7 kg

SATELLITE HUNTER



The non measuring approach

The **PRODIG-1** Satellite Hunter is a non measuring instrument designed to secure the maximum number of installations with top possible quality regardless of the technical skills of the installer.

It does not measure signal level, it does not measure Bit Error Rate, it does not measure carrier to noise... Well, it does not display all those measurements to the installer though it makes all measures and processes them internally. The **PRODIG-1** is giving to the installer just the information required to make the job as easy as possible.



In the **PRODIG-1** the ultimate measurement to determine the signal quality is the Bit Energy to Noise ratio which is directly equivalent to Bit Error Rate. The instrument will display 'BER' when the BER is $<2 \times 10^{-4}$ (equivalent to good quality) and 'ber' when the BER is $>2 \times 10^{-4}$ (equivalent to poor quality). This threshold can be reprogrammed to better adapt to the specific requirements.

Long-life battery Li-Ion

The **PRODIG-1** has been designed to allow continuous supply to universal LNB for over two hours.

The charging time is short; just one hour for a nearly-complete charge and it can be made from the mains or from the car lighter adapter.

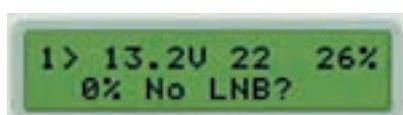


Selective identification

If properly programmed according to the needs of a determined area, it can be used as an automatic installation tool for specific satellites or program packages.

Detection of short circuits

The equipment detects LNB consumption as well as short circuits, cable cuts or LNB malfunctions.



Specifications	PRODIG-1		
Tuning Frequency range Measurement points	950 MHz to 2150 MHz 16 maximum, configurable via PC Software and serial cable included	Output voltage Maximum output current 22 kHz signal	13 V, 18 V ± 1 V 300 mA Selectable
RF input Connector Level range Maximum signal level	Universal, with BNC or F adapter 30 dB μ V to 90 dB μ V 120 dB μ V	Power supply Battery Low battery indication Autonomy Charging time	Li-Ion battery 7.2 V 2.2 Ah Acoustic indication and a message on the display. 2 h. typically, powering a universal LNB 3 hours starting from a complete discharge. 1 h 80%.
QPSK signal parameters Symbol rate Code rate Spectral inversion	1 to 30 Mbauds. Auto and 1/2, 2/3, 3/4, 5/6, 6/7, 7/8 Automatic	Mains Adapter Maximum consumption	90 - 250 V/50-60 Hz/18W 18 W
External units Power supply	Through the RF input connector.	Mechanical features Dimensions Weight	195 W x 101 H x 44 D mm 462 g

PRODIG-1

Easy to use



1.-Detection of satellite.

It works as a wide band detector indicating the relative power of all satellites present on the trajectory of the antenna.



2.- Identification.

The instrument tunes to preset test points, reads the Transport Stream and displays the identification of the service on the display. It allows identification of one specific service or satellite.



3.- Optimisation.

Based on measurements made on the demodulated signal user can optimise the skew and fine-tune the dish.



Robust Construction

The equipment is built into a tough ABS box with a fully watertight front panel.

The input connector is replaceable and the instrument is shipped with BNC and F connectors.

The equipment includes a carrying bag with a belt, freeing the installer's hands for carrying out readings.

PRODIG-2



Easy to use

The PRODIG-2 makes all the calculations to determine Digital Terrestrial TV signals quality.

Special attention has been given to the mechanical design to confer the maximum ease of use and robustness. An only selector allows channel under test tuning and the selection of the rest of hidden functions, such as, selection of channel tables, external units supply, power-off mode, etc. The front panel, without connectors nor keys, assures the maximum protection against dust, water, etc.

Selected channel

This is the only parameter that the equipment permits to select directly. When selecting a channel all the measuring parameters will be adjusted automatically. This avoids any type of interpretation error and makes it extremely easy to perform measurements.

Level / Power measurement

When identifying the signal as analogue, the equipment is set to measure the Level. If signal is identified as digital, the equipment will measure channel Power automatically.

55 PWR
dB μ V

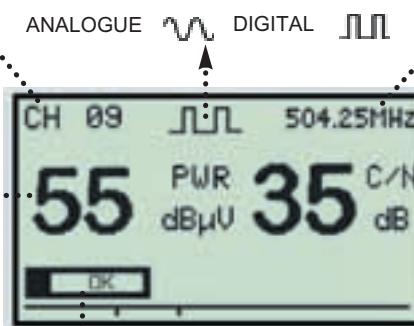
62 LVL
dB μ V

Digital signal
measurement

Analogue signal
measurement

Automatic identification

The PRODIG-2 can identify automatically whether a signal is analogue or digital.



Bargraph

The bargraph shows the level / power of the TV channel and the noise level. The OK indication appears when the measured level/power is within the recommended margins and the C/N ratio is greater than the recommended value.

Frequency corresponding to channel

It shows the frequency corresponding to the tuned channel. This is an indicative value only, since the tuning is made by channels only. The configuration menu permits to select different channel tables.

C/N ratio measurement

This is the most important measurement provided by this equipment in order to evaluate the signal quality.

6 dB test

The PRODIG-2 incorporates an output specially designed for the 6 dB margin test, which is very important in digital TV installations, as it allows correct operation to be guaranteed with a safety margin over the threshold level.

External units supply

The PRODIG-2 also enables external units, such as mast amplifiers, to be powered with voltages of 12, 15, 18 and 24 V.

Specifications	PRODIG-2	External units powering Output for 6 dB test	12, 15, 18 and 24 V Calibrated output with 6 dB attenuation and DC coupled
Tuning	45 to 920 MHz by channels		
Automatic Demodulation Identification	Analogue / Digital	Power supply Internal External Battery charger	NiCd, Ni-MH batteries DC-12 V power supply Built-in
Measurements Analogue signals Digital channels	Video carrier level Carrier Noise (C/N) Channel Power Carrier Noise (C/N)		
Diagnosis Indication of the measured signal quality Presentation	Back light LCD graphic display.	Mechanical features Dimensions Peso	197 (W) x 87 (H) x 190 (D) mm 2.6 kg

MC-360B



MC-160B

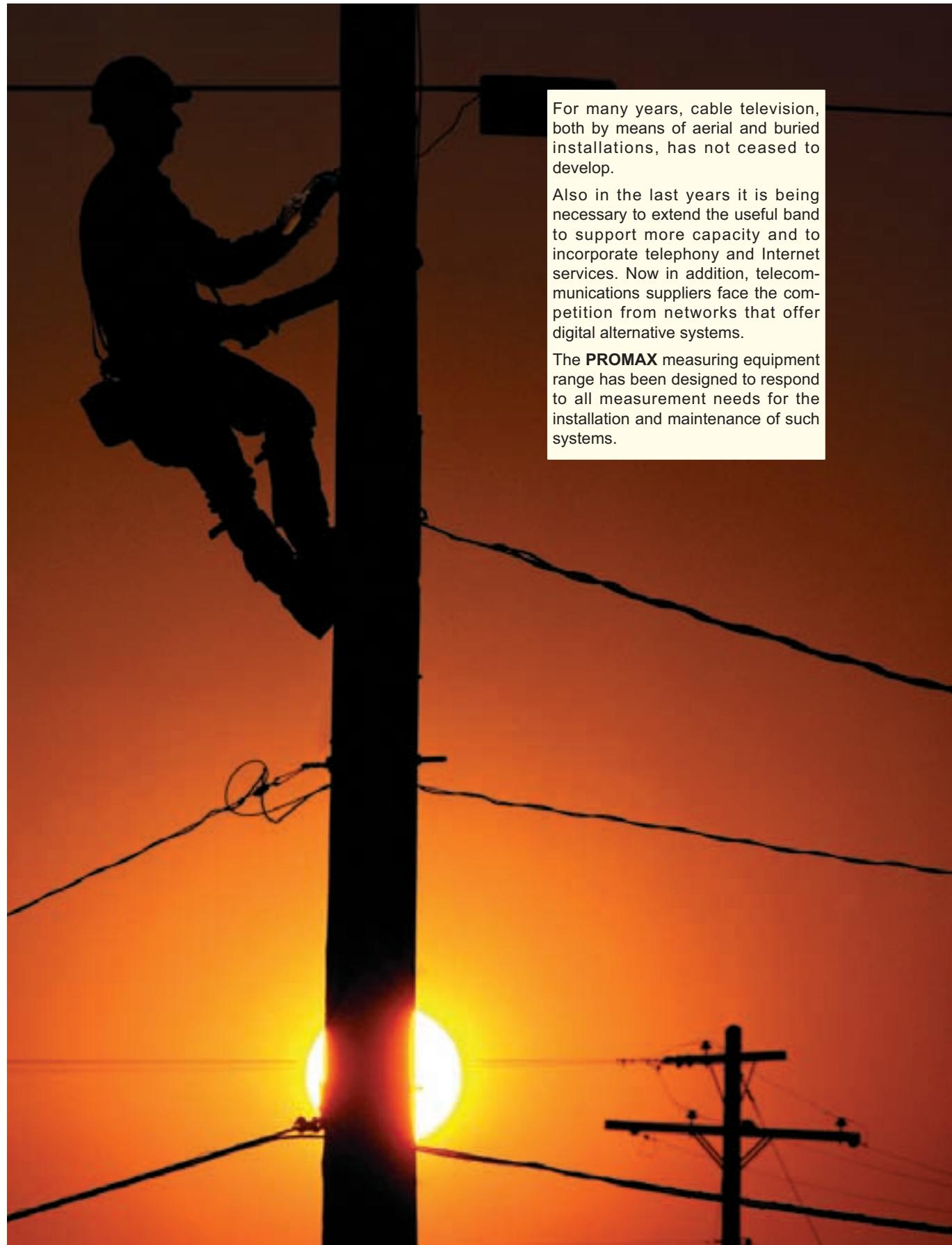


MS-250



Specifications	MC-360B	MC-160B	MS-250
Tuning Frequency range Terrestrial Satellite (SAT TV 1 st IF) Frequency indication Resolution AFC	From 46 to 856 MHz From 950 to 2050 MHz Digital frequency meter, 5 digits LCD 100 kHz In all bands	From 46 to 856 MHz in 4 bands Digital frequency meter, 4 digits LCD 100 kHz In all bands	From 950 to 2050 MHz
Level measurement Input impedance Max. input signal TV SAT Measuring range TV SAT Reading Analog Scale range Attenuators TV SAT IF bandwidth TV SAT Total accuracy (22°C ±5) TV SAT Audible indicator	75 Ω (BNC) 130 dBµV 100 dBµV 20 dBµV to 110 dBµV From 50 to 100 dBµV Scale in dBµV (see options) 30 dB 20 dB (FI), 40 dB (RF) 20 dB (RF) 300 kHz 27 MHz ± 2 dB ± 2 dB (0.95 - 2.05 GHz) (0 dB atten.) +2/-4 dB (0.95 - 2.05 GHz) (20 dB atten.) Audible tone varies with the signal level	75 Ω (BNC) 130 dBµV 20 dBµV-110 dBµV Scale in dBµV (see options) and µV 30 dB 20 dB (FI), 40 dB (RF), 20 dB steps 300 kHz ± 2.7 dB Audible tone varies with the signal level	75 Ω ("F") From -30 to 5 dBm Level indicador Audible tone varies with the signal level
Sound TV band demodulation Output power Loudspeaker	AM/FM 0.25 W Built-in	AM/FM 0.25 W Built-in	
Power to LNB SAT From the unit From receiver	12, 15, 18 V selectable/350 mA max. 400 mA maximum		External, through RF line Measure range 12 to 21V
Output to indoor unit Impedance Signal level	75 W (BNC) -10 dB approx.		
Power supply Internal Autonomy at 30% ON / OFF External Internal charger	6 x 1.5 V R14 batteries 5 h (SAT/TV) / 2 h (SAT+LNB) 12 to 15 VDC AL-11, 198 to 253 V AC or AL-21, 104 to 132 V AC 180 mA regulator for 15 h charge	6 x 1.5 V R14 batteries (not included) 17 h (alkaline) / 5 h (NiCd) 12 to 15 VDC (power adaptor not included) AL-11, 198 to 253 V AC or AL-21, 104 to 132 V AC 180 mA regulator for 15 h charge	
Mechanical features Dimensions Weight	W. 197 x H. 87 x D. 190 mm 2.6 kg	W. 197 x H. 87 x D. 138 mm 1.9 kg	W. 82 x H. 64 x D. 39 mm 150 g

PROMAX SUPPORTING THE CHANGE



For many years, cable television, both by means of aerial and buried installations, has not ceased to develop.

Also in the last years it is being necessary to extend the useful band to support more capacity and to incorporate telephony and Internet services. Now in addition, telecommunications suppliers face the competition from networks that offer digital alternative systems.

The **PROMAX** measuring equipment range has been designed to respond to all measurement needs for the installation and maintenance of such systems.

PROMAX-10

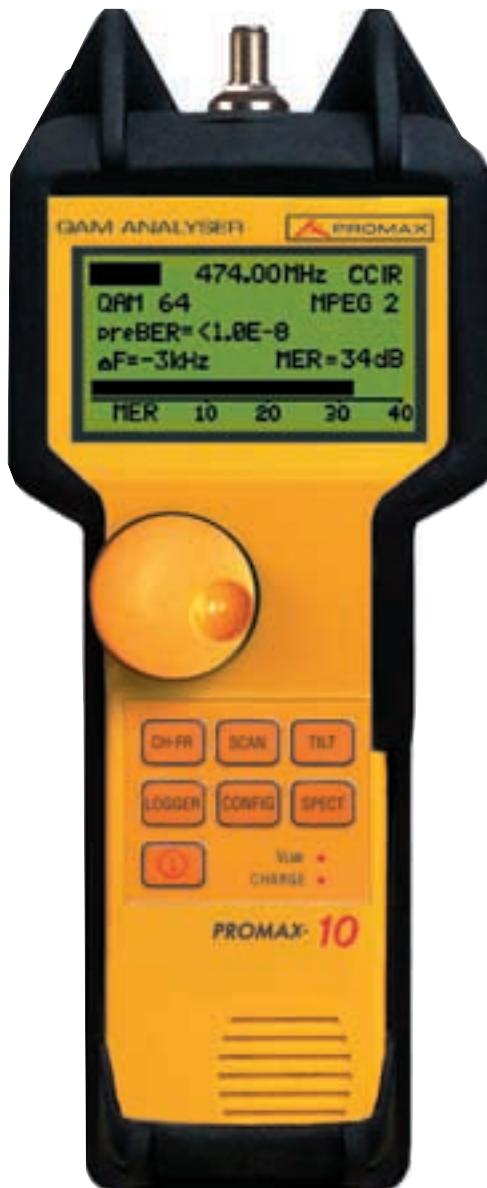
- * BER & MER ON QAM DIGITAL SIGNALS
- * MULTISTANDARD ANNEX A / B / C
- * ANALOGUE CHANNELS
- * DIGITAL CHANNELS
- * SCAN
- * C/N, CSO, CTB
- * TRANSIENT DETECTOR
- * MAX AND MIN HOLD
- * CHANNEL POWER BY INTEGRATION
- * TILT
- * DATALOGGER
- * PRINTING
- * CONNECTION TO PC

Analogue and digital

PROMAX-10 is a multi purpose CATV Analyser ideal for all size MSO's and contractors as a service and installation tool. The most outstanding feature of this unique meter is its capability to measure MER and BER on QAM digital channels but it is not missing any of the measurements a meter of its class must have.

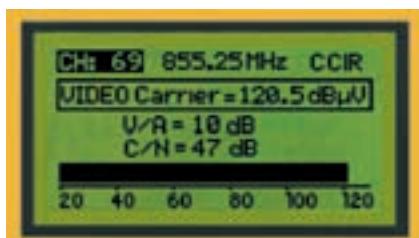
As a signal level meter it can be tuned by frequency or by channel. Various channel tables are available on board and they are all customer definable. Operating via a customized channel table can offer several advantages such as:

- Automatic selection of analog or digital measurement mode
- Faster tuning via rotating tuning knob
- No need to type-in channel number or frequencies
- Combined multi-measure display (video, video/audio, carrier/noise)



Multifunctional Display

The **PROMAX-10** displays with each of the measurements all the information required for the evaluation of the quality of signal under test. It has a GRAPHIC BAR for the interpretation, adjustment and convenient optimization of any cable television system, microwave link or terrestrial aerial.



It is also possible to tune the audio carrier, allowing demodulation to listen to the sound via a built-in loudspeaker.

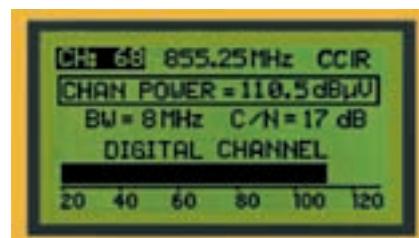
Carrier to Noise (C/N)

To evaluate the signal quality, the Carrier / Noise Ratio is an important parameter both in analogue and digital transmission. In the menu this C/N ratio is displayed together with Signal Level or Channel Power, Audio Level and Video / Audio Ratio.

Digital channel power

To correctly measure the power of a digital channel, independently of the type of modulation (QAM, QPSK, COFDM) or application

(Digital Television, CATV modems), we cannot assume that the digital channel has uniform spectral distribution within its band-



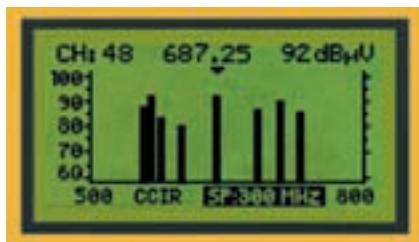
width as, in practice, it is distorted by undesired effects such as impedance matching, incorrect frequency response, etc. **PROMAX-10** integrates thus avoiding such traps.

PROMAX-10

Scan

In this mode we can see all the channels of the selected channel plan graphically represented with their associated signal levels. A MARKER can be placed on any of the channels displayed on the screen in order to find their frequency or their signal level.

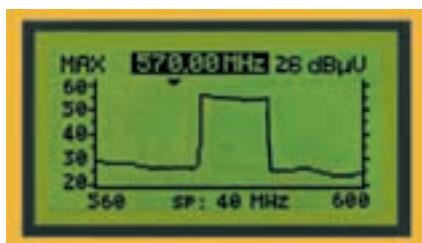
The SPAN and the REFERENCE LEVEL can be changed in order to adapt the presentation to the users test requirements.



Spectrum Analyser

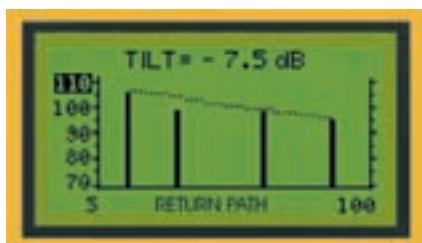
It can be very helpful for interference and noise troubleshooting both in the forward and return bands. It can be essential to solve cable modem related problems.

It is provided with a HOLD function to maintain maximums and minimums, this is of great value for identifying interfering signals, for example, in the return band.



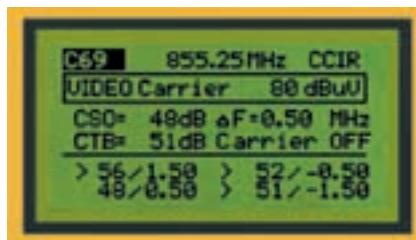
Tilt

The Tilt function provides a graphic and numeric representation of the absolute level of any 4 defined pilot frequencies and the difference between two of them. An interesting application is found in the return path where the PROMAX-10 together with the RP-100, Pilot Generator, will permit to evaluate the frequency response in a graphical and comfortable mode.



Intermodulation (CTB/CSO)

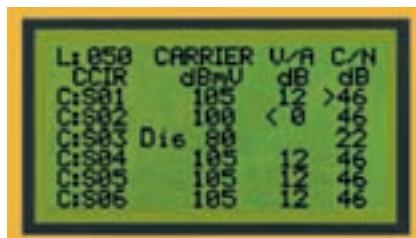
The Composite Triple Beat (CTB) and Composite Second Order (CSO) are an indication of the level of interference in the television channel generated by intermodulation of signals from other channels. Usually, other channels from the same system. Over certain level CTB and / or CSO the interference becomes visible on the television signal.



Data Logger

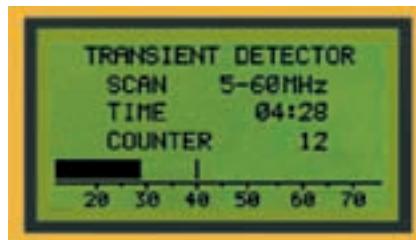
In this mode of operation the PROMAX-10 can acquire the measurements that are required and can memorize them for a subsequent review, for printing or transfer to a PC.

Carrier levels, digital channel powers, V/A or C/N ratios can be saved in the PROMAX-10 without the need for any external device. The channels to be analysed by the data logger can be selected from the channel plan by means of the configuration.



Transient detector

The function of transient detector in the PROMAX-10 enables it to count how many of these pulses have exceeded a limit level pre-defined by the user.



Language

It can be selected among English, French, German and Spanish.

Leakage

PROMAX-10 is not a leakage meter but many users find it useful for that application too.

The frequencies used for leakage detection can be manually tuned or programmed as part of the channel tables

Input connector

The input connector is a frequent point of breakdown in field instruments. Therefore we have designed a replaceable F/F adapter.



Robustness

Both units were designed according to the recommendations of IEC standard on mechanical robustness. Their construction with a mixture of ABS and Polycarbonate provides them both with resistance and elasticity. The PROMAX-10 is supplied with a rubber shock-absorption protector (DC-284) to ensure maximum protection.



Power supply

The instrument can be supplied from its internal rechargeable batteries or from an external DC source. When connected to the mains or to the car lighter adapter it is possible to simultaneously operate the instrument while charging the batteries.

MULTIFUNCTION

Data processing

RM-010 software package is a perfect complement to the **PROMAX-10**.

This program has three main functions:

a) Datalogger: Allows to open stored Data Loggers in the **PROMAX-10** (up to a maximum of 55) or to transfer a Data Logger acquisition from the **PROMAX-10** to the PC.



b) Config: Allows to transmit, receive, save and modify all the Configuration Parameters of the **PROMAX-10**.

c) Upgrade: Allows to upgrade the **PROMAX-10** internal control software (firmware) to newer versions.



PROMAX-8+

PROMAX-8+ does the same as **PROMAX-10** but without the BER and MER QAM signals measurement capabilities.

SPECIFICATIONS	PROMAX-10 / PROMAX-8+	Accuracy	
TUNING			
Tuning range	From 5 to 862 MHz.	Analogue channels	± 2 dB (de 0 to 40 °C) Negative video modulation
Tuning mode	By channels or by frequency	Digital channels	± 3 dB (de 0 to 40 °C) For 8 MHz channel bandwidth
Channel plan	Selectable		
Resolution	10 kHz		
Indication	Graphic display with backlight		
LEVEL MEASUREMENT		Digital measurements (PROMAX-10 only)	
Measurement		MER	From 22 dB to 34 dB for 64 QAM
Analogue Channels	Signal level measurement on video carrier	BER	Before Reed-Solomon
Digital Channels	Channel power measurement by integration through channel bandwidth	Locking range	-10 dBmV to 60 dBmV
Measurement range	From 25 to 120 dB μ V (De -35 dBmV to 60 dBmV)	Symbol rate	1 to 7 Msym/s
Maximum input level	120 dB μ V (60 dBmV)	Channel bandwidth	16/32/64/128/256 QAM
From 5 to 862 MHz	60 V DC or RMS		ITU J1 annex A/B/C
DC to 60 Hz	Digital in dB μ V, dBmV or dBm and analogue by Graphic display with backlight.		6/8 MHz
Reading	1 dB resolution.	Mechanical features	W. 70 (90 at display) x H. 218 x D. 50 mm
		Dimensions	825 g.
		Weight	

PROMAX-4/5/6



The **PROMAX-6** **PROMAX-5** and **PROMAX-4** are analysers designed for the **installation** and **maintenance** of systems for the reception and distribution of television signals. They are especially suited to **cable television** systems, since they integrate all the basic functions required for signal analysis in an easy-to-use, accurate, robust and low-cost device.

While the PROMAX-4 offers coverage of all television channels between 45 MHz and 862 MHz, the PROMAX-5 and PROMAX-6 also covers the return channels (5 MHz to 862 MHz).

Both of them enable the signal level to be measured with a high degree of accuracy. They incorporate a series of functions for evaluating the image quality. They include a calculation of the **Video/Audio** (V/A) ratio and the **Carrier/Noise** (C/N) ratio **in the Channel (Patented Method)**.

The implementation of all these functions in instruments which weigh just half a kilo makes them incomparable working tools.

Every detail has been carefully studied in order to achieve optimum balance between the characteristics and their functionality.

The result is a device with advanced functions which is easy to use and can be operated by non-specialist personnel.

Video / Audio measurement

The V/A ratio indicates the relation between the level of the Video carrier and the Audio carrier. There are certain optimum values for each standard.

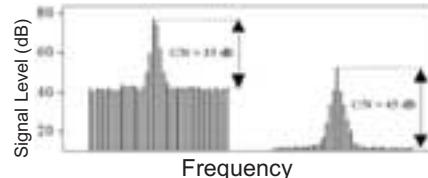
It frequently occurs that the audio carrier levels are not checked when the installation takes place. Sometimes it is taken for granted that it is enough to check the demodulated audio signal, but it should be noted that an unsuitable V/A ratio may cause interference in the video.



Carrier / Noise measurement

Carrier / Noise Measurement is another factor which enables us to evaluate the signal quality. The C/N function measures the ratio between the carrier level and the noise level.

PROMAX has developed and **patented** a method for calculating this ratio **in the channel** in which the measurement is made.



As can be seen in the illustration, it is not rare that a signal with a higher carrier level than another may have a lower C/N ratio, so this measurement is essential.



Safety

They have been designed according to the requirements of the European standard on electrical safety, EN61010-1. The recommendations regarding the level of protection against water and dust in the outside materials have also been taken into account and incorporated to level IP21. As with all PROMAX devices, they also comply with the regulations on electromagnetic compatibility, EN55014, regarding radio interference.

Direct reading

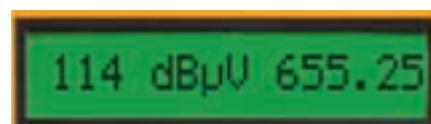
Both instruments have a dynamic range from 20 dB μ V (-40 dBmV) to 120 dB μ V (60 dBmV). In order to achieve a **direct reading** of the signal level, the measurement is automatic and the device itself selects the input attenuator most suitable for each signal. In applications



for which a value must be set for the attenuators, the Manual mode may be used. The units may be displayed in dB μ V or in dBmV.

Selection modes

A rotary selector allows any one of the three tuning modes to be selected: by Frequency, Channels or Programs. The **Frequency** mode allows user to tune into any frequency between 5 and 862 MHz (between 45 and 862



MHz for the PROMAX-4) with a resolution of 62.5 kHz.



Access by **Channel** depends on the channel plan selected. Tuning by **Programs** enables direct access for up to 64 channels. The number of programs may be limited to adapt the measuring cycles to the capacity of the network.



PROMAX-4/5/6

Specifications	PROMAX-4	PROMAX-5	PROMAX-6
Tuning			
	From 45 to 862 MHz	From 5 to 862 MHz	
	Through channels, frequency or programs	Through channels or frequency	
	One channel plan, configurable from PC Through RM-006		
	62.5 kHz		
Operating modes			
	Level measurement		
	Measurement range	20 dB μ V to 120 dB μ V	25 dB μ V to 120 dB μ V
	Reading	Digital in dB μ V or dBmV. Resolution 1 dB	
	IF bandwidth	230 kHz \pm 50 kHz	
Video / Audio	Input impedance	75 Ω	
	Audible indicator	Audible tone varies with the signal level	
	Accuracy	\pm 2 dB (from 0 to 40° C)	
	Analogue channels		\pm 3 dB (de 0 to 40° C)
	Digital channels		
Carrier-to-noise (C/N)	Measurement range	From 0 to 40 dB	
	Analogue channels	10 to 40/ 50 dB	
	Digital channels		15 to 40 dB
Sound	Demodulation	AM/FM/Level	
	Output	Internal speaker / external headphones	
Power requirements	NiCd battery	7.2 V - 0.8 Ah	
	Low battery	Display indicator	
	Auto power off	Automatic power off after few minutes without operation	
	Battery charger	By external fast charger	
	Battery autonomy	1 h 45' (30% on/off)	
Mechanical features	Dimensions	W. 70 (90 at display) x H. 218 x D. 50 mm	
	Weight	580 g (battery included)	

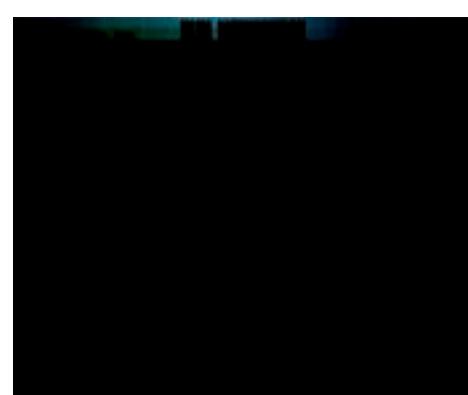
Shoulder Strap DC-286



Carrying Case DC-234



Control Software RM-008+



PROLINK-1B



Analogue and Digital TV

The **PROLINK-1B** is an instrument that covers the terrestrial, cable TV and microwave distribution (MMDS) frequency bands. It is ideal for those applications where it is envisaged there will be a requirement to measure analogue and digital signals. The **PROLINK-1B** offers excellent technical specification with unparalleled monitoring system performance.

DIGITAL CARRIER



Frequency ranges

This instrument covers the entire 46 to 870 MHz frequency band. The option OPT-101-67 provides a frequency extension of 5 to 48 MHz, this being of invaluable for 'return path' cable TV measurements.

64 dB μ V 5.00

Signal level measurement

The level reading can be in the form of a numeric or a bar graph display. The numeric display is of benefit where definitive measurements must be made, for example, at outlet taps or amplifier points. The bar graph is ideal for FM, UHF and MMDS aerial alignment work. The large alphanumeric LCD display has a back light, being useful under adverse lighting conditions.

The LCD display is fast acting and the meter has good signal sensitivity, making this new style approach to level measurements most acceptable. The measurement units can be chosen before delivery or by the user with the RM-101 software. The attenuation is semiautomatic featuring a 30 dB scale range.

64 dB μ V C24

■■■■ C24

Channels or frequencies

The use of frequency synthesis guarantees high stability and leads to high measurement accuracy.

The **PROLINK-1B** makes advantage of new technology whilst maintaining links with established measurement practice. For instance, channels and frequencies continue to be selected by means of rotary encoder with two speeds, so that access to the required channel is quick and simple. The instrument allows the user to select any channel plan by means of the **RM-101** software.

Supply to auxiliar devices

The OP-101-16 option makes it possible to supply volts to mast head amplifiers and external units in MMDS microwave link applications.

EXT. SUPPLY: ON



PROLINK-1B

Audio / Video ratio measurement

The Video/Audio ratio shows the difference between the video and audio carriers.

There are optimum values for this parameter in every television standard. It is quite common to ignore this measurement when supervising installations, but it must be borne in mind that an incorrect Video/Audio ratio will result in lower audio quality as well as serious possibilities for interference in the video. The audio carrier can be selected for different television standards. The PROLINK-1B is also able to demodulate FM and AM radio signals. It includes a loudspeaker.

MEASURE: VID/AU

Connection to computer

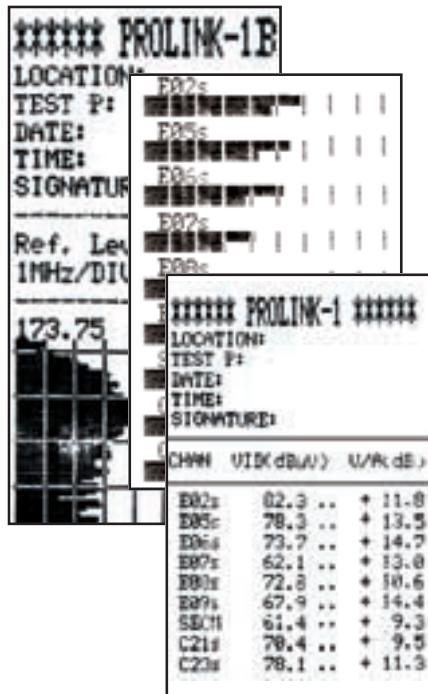
The user can control the different functions of the PROLINK-1B through the RS-232C connector, this being a standard on the meter. With the RM-101 it is also possible to edit channel plans, measurement parameters, and so on from the computer.



Connection to printer

One of the main characteristics of the meter is that it enables the user to obtain printed information on any RS-232C compatible printer.

If the instrument is set to the Numerical Mode, the printed list will show numerical values. In the Graphic Bar Mode, the report will show a bar graph for the video level and another for the audio level on all channels. This list will be very useful for checking the channel equalisation. Finally, there is the possibility of printing the spectrum of every single channel.



Automatic measurement

When connected to the printer, reports can be related to one channel or any number of preselected channels.

With just one instruction, the PROLINK-1B will allow the user to obtain printed results on all channels. The ease of use will make the testing of all TV inputs of an installation simple yet highly rewarding.



Configuration storage

The PROLINK-1B has many functions, and to simplify the operation it is possible to store the measurement configuration.

At switch on the preferred configuration is chosen from memory, making the meter very easy to use. In the most simple set-up, the user selects the channel and then reads the level directly from the back lit LCD.

Power supply

The meter is supplied with internal rechargeable sealed lead acid battery and an external A.C. mains charger unit. Carry case and coaxial adapters are also supplied as carrying standard.

SPECIFICATIONS		PROLINK-1B	Reading	0.1 dB Resolution. Out of range indicator	
Tuning	Digital frequency synthesis	Digital	Digital	Bar graph on display	
Continuous mode	Selectable 62.5 kHz or 1MHz	Analogue	Analogue	30 dB RF manual attenuator	
Channel mode	Channels list under request	Attenuators	Accuracy	±2.5 dB (20 °C ±5 °C, 40% at 70% HR)	
Frequency range	From 48.25 to 870 MHz				
Display	16 digits LCD	Serial interface		Video and audio histogram of the selected channels	
Resolution	alphanumeric display	Histogram	Spectrum	Especrum of the tuned channel	
Synthesized freq. accuracy	62.5 kHz	Digital Levels	Digital Levels	Video and V/A levels of tuned channels	
Memory	+/-32 kHz	Connection to computer	Connection to computer	RS-232C for remote control with optional software	
Level measurement		Power supply			
Sound demodulation	Direct reading (video, audio and video / audio ratio)	Battery	Battery	Pb, 6 V - 1.2 Ah	
Detector	AM, FM with tone proportional to signal level (with built in loud speakers)	Autonomy	Autonomy	3 hours (30 % ON/OFF)	
Input	Seletable according to analogue or digital carrier	Protection	Protection	Low battery indication	
Maximum input voltage	75 Ω (BNC)	Battery charger	Battery charger	Internal. 10 hours approx.	
Measurement ranges	130 dBµV (3.16 V)			External mains adapter	
Low (0 dB ATT RF)	From 30 dBµV to 90 dBµV (MATV)			12 V AC/DC (included)	
High (30 dB ATT RF)	From 60 dBµV to 120 dBµV, (Cable TV)	Mechanical features			
		Dimensions	Dimensions	W. 199.5 x H. 60.5 x D. 131.5 mm	
		Weight	Weight	1.2 kg (including battery)	

RP-300



The need for interactivity

The use of the return band in cable networks is in expansion. Internet services, Pay Per View and Video On Demand are increasing the need for interactivity. The systems have to adapt to the new requirements and test instruments for installation, adjustment and maintenance with features covering these applications are becoming a must.

To test the return band there are two alternatives. The basic solution requires injection of signal at the remote site and checking of the reception levels in the head-end. This will normally involve two persons calling each other for adjustments. The more sophisticated method allows all testing by only one engineer on the field with a signal generator and some monitoring equipment. The former is a solu-

tion that involves at least two persons and the latter requires heavy investments in test equipment.

Low cost & high efficiency

Now **PROMAX** presents a compromise solution where only one operator is required for testing and adjustment of the return path with a low cost system.

On the remote site, the **RP-100** Return Path Multi-carrier Generator injects one or two carriers (up to 4 with **RP-100Q**) into the network.

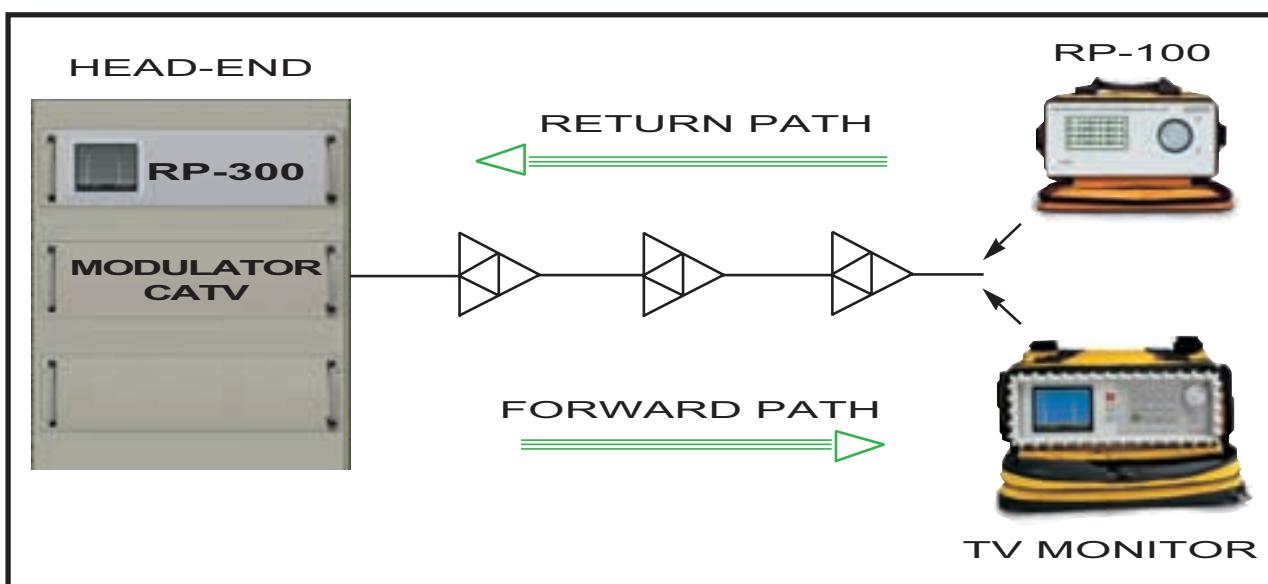
Frequency of the carriers can be selected in the range of 5 to 100 MHz. Level can be set from 90 dBuV to 110 dBuV (30 dBmV to 50 dBmV) in 1 dB steps.

Return Path

The Return Path Monitor **RP-300** displays the return band at the head-end showing the status in which the injected carriers are received there.

This screen can now be modulated into a free channel and transmitted back through the forward path. At the remote site, the engineers will be receiving a real time picture of the signals seen at the head-end, and for those operators who already own a spectrum analyser, such as the **PROLINK-3**, no further investment in test equipment should be needed.

By selecting the right frequency and level for the various carriers on the **RP-100** it will be possible to easily and efficiently test and equalise the return path.



Simultaneous tests

With the **RP-300** & **RP-100** test set it is not only possible to properly install the system but it also allows a safety margin to prevent potential problems that may affect to service quality in the future. This is not possible if systems with fixed carriers are used.

* 19" RACK MOUNTED



* BNC VIDEO OUTPUT

* SPECTRUM ANALYSER

* 4 PILOT HISTOGRAM

* BUILT-IN CRT MONITOR



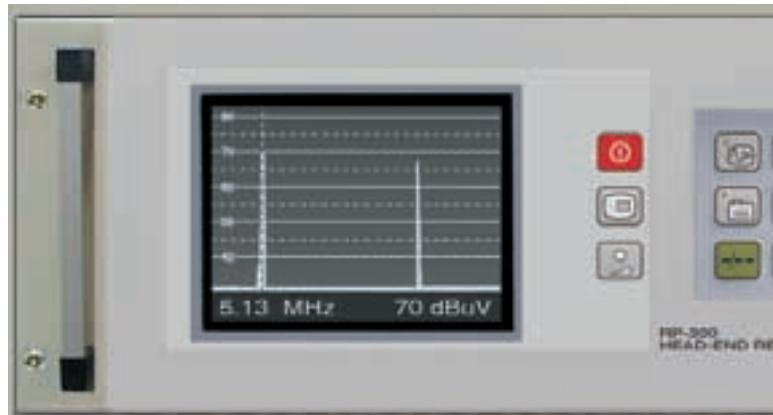
* COMPATIBLE WITH ANY TONE GENERATOR

* EASY TO INSTALL

Another interesting advantage of using this system is that it allows to carry out tests from different sites simultaneously. The only condition will be to set different frequencies so that each engineer can easily identify its source.

Additional features

The **RP-300** includes all features in **PROLINK-3+** so that being a Head-end unit it can also be used to test several parameters in the network. Specially interesting is the spectrum analyser which can be used at any time as an online analyser.



Specifications	RP-300	Monitor	4.5" B&W CRT
Tuning Tuning modes Resolution Automatic search Memory	5 to 862 MHz Frequency, Channel or Memory. Channel tables configurable on demand 50 kHz Threshold level selectable 99 positions for measurement configurations	Measurements Analogue channels Digital channels Return path	Level and Carrier-Noise ratio Channel power and Carrier-Noise ratio Graphic analysis of up to 4 carriers in the return path
Level measurement Measurement range Reading Measurement bandwidth Audible indication	Terrestrial TV & FM bands from 20 dB μ V to 130 dB μ V (10 μ V to 3.16 V) Auto-range, reading is displayed on a OSD 230 kHz LV audio. A tone with pitch proportional to signal strength.	Video Video output	BNC (75 Ω). Monostandard composite video signal depending on the selected version (PAL-B/G/D/K, NTSC-M, PAL-M...) The contents of the screen are reproduced in video
Accuracy Terrestrial bands	± 1.5 dB (30-120 dB μ V, 48.25-861 MHz)	Mechanical features Dimensions Weight	482 (W) x 132 (H) x 329 (D) mm Rack 19" 3 U F266 mm 7 kg

RP-100



The **RP-100** is a Multicarrier Signal Generator designed for the activation and later verification of the return path in CATV systems.

The unit generates up to four independent carriers where frequency and output levels can be set by the user. Combined with a cable TV analyser, for example the **PROMAX-10** or the **PROMAX-8+**, it becomes a highly useful tool to carry out the TILT measurements in the return path.

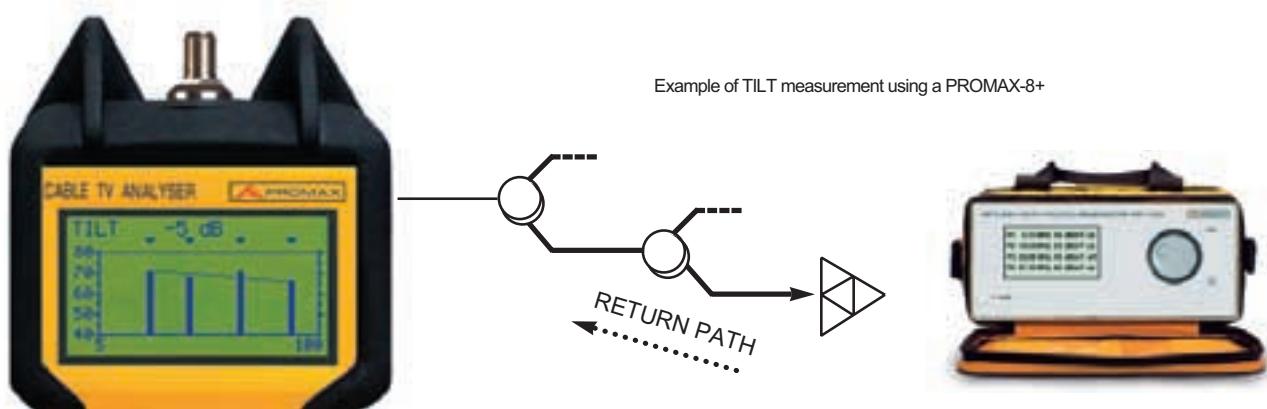
The **RP-100** incorporates an auxiliary RF input to allow for signals to be continued with other RF sig

Easy to use

The **RP-100** is designed for minimal set-up and adjustment, just turning and pushing the rotary selector it is possible to define all the configuration parameters (carriers level and frequency).

Power supply

The **RP-100** is powered by internal rechargeable batteries. The battery charger is built-in and there is an input connector for external powering through a DC adapter.



Specifications	RP-100 / RP-100-Q	Flatness	± 1 dB
Carriers	2 (4 in RP-100-Q)	Insertion loss	1 dB
Carriers level	From 30 dBmV to 50 dBmV (90 dB μ V to 110 dB μ V)	Power supply	NiCd battery
Level range	1 dB	Internal	DC- 12 V
Resolution	± 2 dB	External	Incorporated
Level precision		Battery charger	
Carrier frequency	From 5 to 100 MHz	Mechanical features	197 (W) x 87 (H) x 190 (D) mm
Frequency range	10 kHz	Dimensions	2.6 kg (battery included) approx.
Resolution		Weight	



RP-050 IF simulator

The RP-050 is a low cost signal generator designed specifically to test IF satellite distribution systems. It becomes especially useful in those cases where the installation needs to be tested before any real signal is available.

It generates 4 frequencies, three of them in the satellite IF band and one in the UHF. The frequencies are precisely 537.5 MHz / 1,075 MHz / 1,612.5 MHz / 2,150 MHz. Two output levels are available: 90 dB μ V in "LOW" mode and 105 dB μ V in "HI" mode.

It can also detect 13 / 18 V and the 22 kHz signal.

The generator can be supplied through the RF output or from an external DC source.



CV-550 Sub-band Converter

The **CV-550** converts sub-band channels to VHF for their measurement by TV/FM field strength meters.



ST-240 LNB & Satellite receiver tester

The **ST-240** is a compact, easy to use and low cost signal generator that allows an efficient verification of satellite receivers and LNB's

- * 13 V, 18 V LNB power supply test
- * 22 kHz switching signal verification
- * Video and audio demodulation test
- * LNB verification, vertical and horizontal polarizations



PC-108 Polarisation Controller

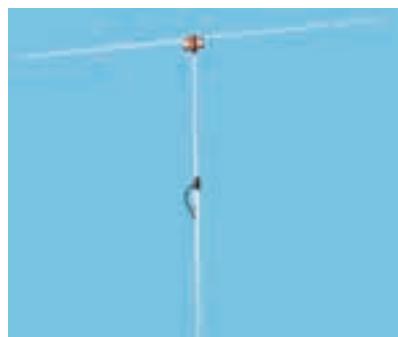
The **PC-108** is a universal magnetic polarisation controller. It is powered by the input connector without interrupting power to the LNB.



NG-281/NG-282 Noise Generators

The NG-281/NG-282 noise generators are large bandwidth devices especially designed for application in all kinds of television installations, whether terrestrial, cable or satellite distribution. The frequency range of the NG-282 is from 950 to 2000 MHz, and the NG-281 from 5 to 1000 MHz.

Powered by battery or mains adapter, they enable the user to perform measurements in combination with field level meters or spectrum analysers in highly complex installations. Obtaining the frequency responses of active and passive circuits, measuring impedance adaptation and the relation of standing waves in combination with a reflection bridge, and the detection of anomalies in transmission lines, are some of the functions where **NG-281/NG-282** noise generators are of great assistance.



AMC/1 Master Aerial

The AMC/1 master aerial is a dipole with interchangeable arms (in function to the band), mounted on a hand-held mast, which, connected to field strength meter, permits the value of the electric field intensity at a particular location to be found.

In order to do this, it is necessary to configure the aerial in function of the frequency, connect it to the field strength meter, and add the corresponding correction factor to the read value..



LN-370B Low-Noise Amplifier

The **LN-370B** is a low-noise amplifier which enables the dynamic range of spectrum analysers and field strength meters to be extended, in order to measure signals with very weak amplitudes.

PROLITE TOWARDS THE FUTURE

Until recent years cable TV and telecommunication systems have been using copper cable as the main physical support for the transmission of the information.

A large number of new installations are transferring to the type known as Hybrid Fibre Coaxial (HFC), this is to say, a metallic and optical combined support. This means some part of the new networks will be supported by optical fibre cabling, whilst other sections are supported by coaxial cable or by pair cable.

The new optical-fibre instruments, like the new PROLITE, are the indispensable complement for installation and maintenance tasks for this new hybrid systems generation.



OPTICAL POWER METERS

PROLITE-20, 21

The **PROLITE** range has been developed for the installation and maintenance of optical fibre installations.

It is made up of one power meter and two light sources, one LED source (850-1300 nm) and one LASER source (1310-1550 nm).

The **PROLITE-20/21** are two optical power meters with wavelengths between 820 and 1650 nm. The dynamic range of measurement is from -70 dBm to 5 dBm for the **PROLITE-21** and from -50 dBm to 25 dBm for the **PROLITE-20** for Cable TV applications and measurements on EDFA amplifiers (Erbium Doped Fibre Amplifier).

These units offer the acoustic detection of 270 Hz, 1 kHz and 2 kHz signals for optical fibre identification purposes. The measuring mode can be selected as ABSOLUTE or RELATIVE. In the Relative mode, the user acquires the reference level and the rest of measurements are done starting from this value. The readout is shown numerically or by means a bar graph on LCD display, which has a back light.

Wavelength selection is made sequentially by single pressing the rotary selector. The meters are powered by a rechargeable NiCd battery, which can be replaced with extreme ease.

PROLITE-20/21 are ideal tools for working in the field since they are robust, they adapt perfectly to the hand and they have a weight below 500 gr.



LIGHT SOURCES

PROLITE-80, 81



The **PROLITE** range consists of two light sources: the **PROLITE-80** LASER allows to select wavelengths between 1310 nm and 1550 nm whereas the **PROLITE-81** LED allows the selection between 850 nm and 1300 nm.

Both light sources can be modulated with 270 Hz, 1 kHz and 2 kHz signals, with the aim to allow optical fibre identification when working with systems containing a large number of optical fibres.

They are compact and easy to use.

They only have two controls, one key to select the desired wavelength and another key to activate the modulation,



AD-070 CONECTOR ST
AD-071 CONECTOR E 2000
AD-072 CONECTOR SC
AD-073 CONECTOR FC

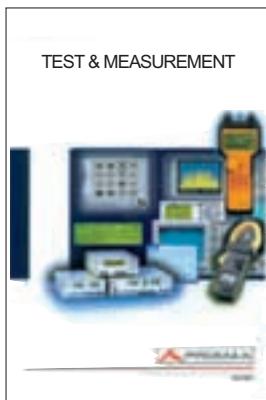
The **PROLITE-82** visual failure finder is an economic solution for the detection of cuts and leakages in fibre optic cables.

Specifications	PROLITE-20 / 21	Specifications	PROLITE-80 / 81
Measurement range		Wavelength	1310 nm, 1550 nm
PROLITE- 20	-50 dBm to + 25 dBm	PROLITE-80 LASER	850 nm, 1300 nm
PROLITE- 21	-70 dBm to +5 dBm	PROLITE-81 LED	
Units	dBm, dB	Level	-5 dBm typical (SM 9/125 mm fibre)
Wavelength range	820 to 1650 nm	PROLITE-80 LASER	-15 dBm typical (MM 62.5 / 125 mm fibre)
Indication	Alphanumeric display, 16 digits with back-light	Modulation	270 Hz, 1 kHz and 2 kHz internal, or through external signal
Accuracy	0.2 dB (5%)	Stability	± 0.1 dB
Resolution	0.01 dB	Power supply	NiCd battery, 7.2 V, 1.5 A
Power supply	NiCd battery 7.2 V- 0.8 Ah	Battery	Through external charger
Battery charge	Through external charger	Mechanical features	Dimensions
Mechanical features		Weight	84 (W) x 165 (H) x 29 (D) mm
Dimensions	70 (W) (90 at the Display) x 218 (H) x 50 (D) mm		380 g (battery included)
Weight	495 g (battery included)		

PROLINK-4	PROLINK-3+ / 3C+	MC-377+	PRODIG-2
VERSIONS PROLINK-4 4.5" B&W CRT PROLINK-4C 4.5" COLOUR LCD OPTIONS OP-104-V VIACCESS OP-104-M MEDIAGUARD OP-104-C CONAX OP-104-VM VIACCESS + MEDIAGUARD OP-104-VC VIACCESS + CONAX	VERSIONS PROLINK-3+ 4.5" B&W CRT PROLINK-3C+ 4.5" COLOUR LCD OPTIONS OP-103-11 LONG OPERATING TIME BAT. OP-103-61 CHANNEL PLANS PROGRAMMING OP-103-81 QPSK MEASUREMENTS OP-103-85 QPSK / QAM MEASUREMENTS OP-103-86 QPSK / COFDM 2 k / 8 k MEASUREMENTS	VERSIONS MC-377+/1 TV: M,N STANDARD SAT: MULTISTANDARD, MC-377+/2 TV: D,K STANDARD + B, G, I MANUAL TUNING SAT: MULTISTANDARD, MC-377+/4 TV: I STANDARD + B, G, D, K MANUAL TUNING SAT: MULTISTANDARD OPTIONS OP-377-63 EXTENSION TO 2100 MHz	OPTIONS OP-202-61 CHANNEL PLANS PROGRAMMING OP-202-01 AL-023 (USA) MAINS ADAPTOR

PROLINK-1B	PROMAX-10 / 8+	PROMAX-6	PROMAX-5
OPTIONS OP-101-01 AL-023 (USA) MAINS ADAPTOR OP-101-16 SUPPLY VOLTAGE FOR MMDS OP-101-61 CHANNEL PLANS PROGRAMMING, MEASURING, UNITS, ETC. OP-101-67 EXTENSION OF FREQUENCY RANGE TO COVER THE SUB-BANDA FROM 5 TO 45 MHz	OPTIONS OP-010-E SYMBOL RATE TO 7200 MS/S OP-010-01 AL-022 MAINS ADAPTOR (OP-008-01) (USA) OP-010-02 AL-032 MAINS ADAPTOR (OP-008-02) (UK) OP-010-03 AL-042 MAINS ADAPTOR (OP-008-03) (AUS) OP-010-04 AL-052 MAINS ADAPTOR (OP-008-04) (JAP) OP-010-61 PROGRAMMING, (OP-008-61) MEASURING, UNITS, ETC.	OPTIONS OP-006-01 AL-022 (USA) MAINS ADAPTOR OP-006-02 AL-032 (UK) MAINS ADAPTOR OP-006-03 AL-042 (AUS) MAINS ADAPTOR OP-006-04 AL-042 (JAP) MAINS ADAPTOR OP-006-61 PROGRAMMING, MEASURING, UNITS, ETC.	OPTIONS OP-005-01 AL-022 (USA) MAINS ADAPTOR OP-005-02 AL-032 (UK) MAINS ADAPTOR OP-005-03 AL-042 (AUS) MAINS ADAPTOR OP-005-04 AL-042 (JAP) MAINS ADAPTOR OP-005-61 PROGRAMMING, MEASURING, UNITS, ETC.

PROMAX-4	MC-360B	MC-160B	RP-100
OPTIONS OP-004-01 AL-022 (USA) MAINS ADAPTOR OP-004-02 AL-032 (UK) MAINS ADAPTOR OP-004-03 AL-042 (AUS) MAINS ADAPTOR OP-004-04 AL-042 (JAP) MAINS ADAPTOR	OPTIONS OP-360-1 AL-21 MAINS ADAPTOR OP-360-10 SCALE IN dBmV	OPTIONS OP-160-10 SCALE IN dBmV	VERSIONS RP-100 2 Frequencies RP-100-Q 4 Frequencies OPTIONS OP-100-01 AL-022 (USA) MAINS ADAPTOR OP-100-02 AL-032 (UK) MAINS ADAPTOR OP-100-03 AL-042 (AUS) MAINS ADAPTOR OP-100-04 AL-042 (JAP) MAINS ADAPTOR

**TEST AND
MEASUREMENT**

**TV AND MONITOR
PATTERN GENERATORS**

**ELECTRONIC TRAINING
EQUIPMENT**
