



## NEWSLETTER

Number 12 - JANUARY 2004

### 40 Years of research & development 1963-2003

**PROMAX** was established in 1963 by José Clotet Llorca in Barcelona to design, manufacture and sell electronic testing and measuring instruments.

Over its 40 year existence, **PROMAX** has developed a large number of projects in the instrumentation sector that sought to answer specific measuring requirements. Today **PROMAX** is in the position to offer a wide-ranging catalogue of instruments for a large variety of applications.

The first systems that the Company designed were laboratory instruments. Specifically, efforts began with the design of a television signal generator, a voltmeter and a power supply. Sales began one year after foundation. This spirit of innovation of the first years has been maintained to the present day, giving us a dynamic momentum of continuous, consistent growth.



The next few years saw the launch of first oscilloscopes, field meters for radio and television, low frequency generators, AM/FM generators, etc. All these instruments operated using valves, naturally!

The constant advances in the field of electronics and telecommunications have represented a challenge to keep our range of products on the cutting edge. Therefore, while broadening the range, we are constantly striving to maintain a position of leadership and competitiveness with our existing product lines. By investing a steady 15% of our total turnover to R&D, we have fully achieved this double objective.

Over the years, productivity and quality have been the other key factors in our business strategy. To this end, we have always attempted to incorporate the latest manufacturing and process



control technologies in our production plants.

Today, **PROMAX** is a leading Company in the information and communications technology sector, and in the field of measuring and testing equipment. We hold a quantity of patents and manufacture a wide range of instruments for several different applications. Among others, we are well known worldwide for our range of products used in the installation, certification and maintenance of optical fibre networks, baseband systems like MPEG-2, and broadband services such as Cable TV, Satellite and Terrestrial Digital Television, etc.

## News

- New range of digital TV analysers .....PROLINK **Premium**
- Basic spectrum analyser for digital TV .....MC-577
- Low cost satellite hunter .....PRODIG-1+
- Field optical spectrum analyser .....PROLITE-60
- Low cost laser source .....PROLITE-90
- Cable modem analyser .....PROMAX-25
- Analogue TV signal generators .....GV-798+ / GV-898+
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- Function generator .....GF-941
- Radio Communications Analyser .....AC-725

## Digital tv analysers

## PROLINK *Premium*

Since the beginning of digital television broadcasting **PROMAX** has been developing equipment for the installation, certification and maintenance of data and television systems. The need to warranty the quality of systems and installations obliges to a constant product innovation. We are now introducing the new **PROLINK *Premium*** range which will allow our customers to enjoy exclusive features on this type of equipment.

An icon-based keyboard and a multi-lingual on-screen menu system allows a very intuitive user interface.

The instruments are designed for field use, in all kind of weather conditions. They are rough and at same time light and compact following the line of the PROLINK instruments that have already set an industry standard for this type of equipment.

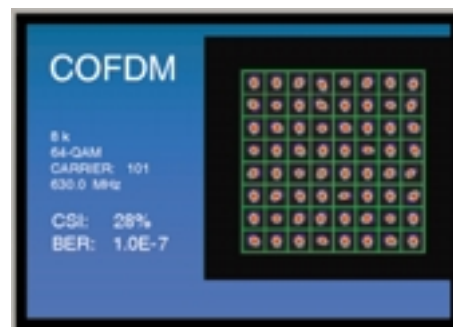


PROLINK <i>Premium</i>	PROLINK-3	PROLINK-3C	PROLINK-4	PROLINK-4C
Digital Terrestrial DVB-T	Optional	Optional	Included	Included
Digital Cable DVB-C	Optional	Optional	Included	Included
Digital Satellite DVB-S	Optional	Optional	Included	Included
MPEG decoding for FTA signals	Optional	Optional	Included	Included
Encrypted channels	—	—	Included	Included
Constellation (QAM & COFDM)	—	—	Included	Included
Transport Stream In-Out	—	—	Included	Included
Color TFT	—	4"	—	5"

### Digital TV Measurements

The PROLINK Premium instruments allow measurement of digital satellite, cable and terrestrial signals.

Digital Cable QAM signals can be measured through BER, MER and constellation. On COFDM digital terrestrial BER, MER and CSI can be measured. It is also possible to analyse constellation for each of the carriers. This is a very useful feature to detect interferences that do not affect to the complete channel.

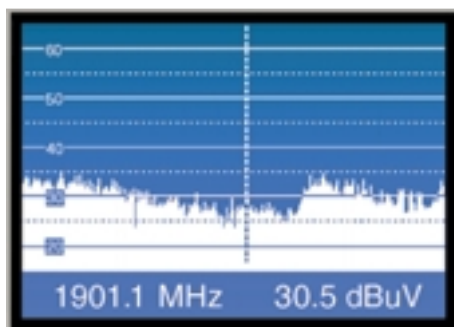


## Digital TV Analysers

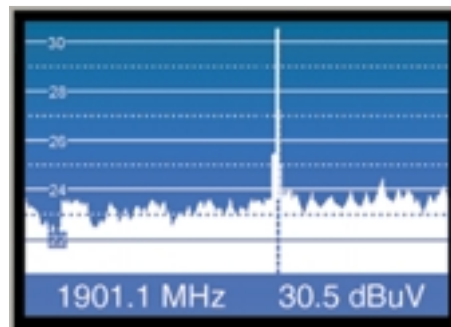
## PROLINK *Premium*

### Spectrum Analyser

In spectrum mode, the instruments from the **PROLINK *Premium*** series offer an excellent resolution. Spans down to 4 MHz with 50 kHz resolution measuring bandwidth can be selected. Using a selectable dynamic range with as low as 2 dB per division it will be possible to display signals that with other meters can not even be detected. This is an important feature for the detection of beacon signals on installation of Satellite News Gathering systems, radio signals, GSM, etc. In the pictures below the difference between display of the same beacon VSAT signal with a **PROLINK *Premium*** and with another instrument is showed.



Other instruments



PROLINK *Premium*

### Demodulation of Encrypted Channels

In pay per view digital television systems, it is widely spread the use of encryption systems, so that the broadcaster codes the signals. The subscriber has a Smart Card to get identified that permits decoding and reception of such channels. The main inconvenience of this solution is that each receiver must be specialized in a specific scrambling system and can not be used for another.



There is an alternative solution so that standard receivers can be used. In this case, the receiver includes a Conditional Access Module slot that allow the use of different CAM's and its corresponding Smart Cards. This allows to end user to access to digital television contents from different providers, using same or different encryption systems.

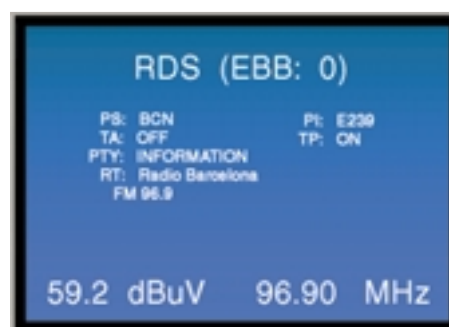
**PROLINK-4 *Premium*** and **PROLINK-4C *Premium*** can decode any encrypted channel with the use of its corresponding CAM and Smart Card. This is a PROMAX patented function.

### Transport Stream Analyser

The WRONG PACKETS function included on the **PROLINK *Premium*** series carries out a detailed analysis of the MPEG-2 digital stream or "Transport Stream". This analysis consists in continuously monitoring the packets, to detect the origin of the impairments in received signals. For instance, it can be a key function to detect impulsive noise. In Digital Terrestrial transmission, this type of electrical interference, caused by vehicles, electrical appliances motors, fluorescent lights, etc. is one of the problems encountered in signal reception.

### RDS Service

The FM function, allows to access to the information associated with the Radio Data System (RDS), along with a qualification of the signal qualities through the EBB (Error Block Balance). This technique offers data in the receiver screen relative to the identification of tuned transmitters network (Service of Program - PS), as well as short messages (Radio TEXT - RT), the program type (PTY), the traffic announcements (TA), the program identification (PI) and traffic program identification (TP) that emits each service.



## Basic Spectrum Analyser for Digital TV

**MC-577**

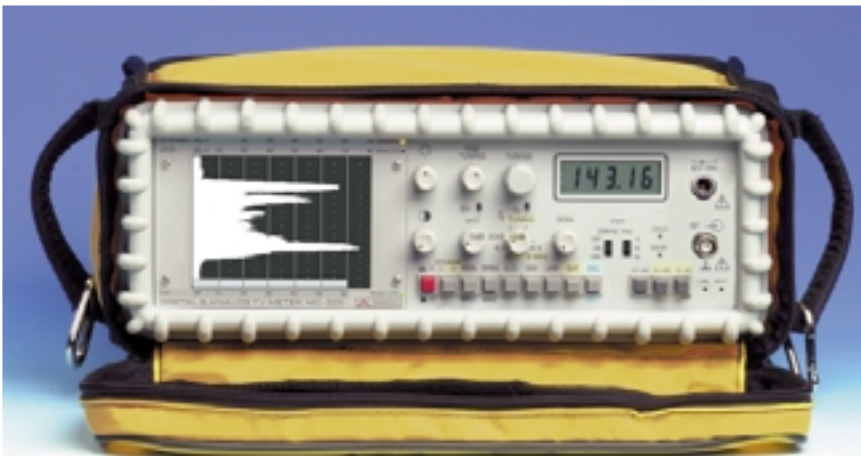
The **MC-577** is a compact, light-weight, portable instrument which offers installers all the basic functions needed to guarantee the good operation of analogue and digital TV installations.

In comparison with former versions it includes a DC input connector to supply from car lighter, one input for both terrestrial and satellite up to 2150 MHz improved spectrum sensitivity.

The Spectrum Analyser mode enables all the signals present in a band to be viewed on the monitor. The bandwidth represented in the spectrum mode can be selected as either the complete band or a bandwidth defined by the user (from approximately 1/3 of the band in use to almost zero).

In the Monitor mode the instrument demodulates the analogue TV signal, which enables a terrestrial or satellite television channel to be identified and its reception observed. The signal level in monitor mode is represented by an analogue bar at the top of the image whose length varies in proportion to the power received. In addition it enables the line synchronism pulse to be observed, overlaid on the top centre of the screen.

The **MC-577** enables you to easily take the following measurements: analogue signal levels, digital channel power and Carrier to Noise ratio (C/N) in analogue and digital channels.



## Low cost Satellite Hunter

**PRODIG-1+**



In the **PRODIG1+** 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.

### Selective 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.

### 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 **PRODIG1+** is giving to the installer just the information required to make the job as easy as possible.



### Robust Construction

The equipment is built into a tough ABS box with a fully water-tight front panel. Now with back light display. The input connector (BNC and F) are replaceable and the instrument is shipped with a carrying bag with a belt, freeing the installer's hands for carrying out readings.

The **PRODIG-1+** is also delivered with a CD ROM and a PC connection cable to change preset channels.



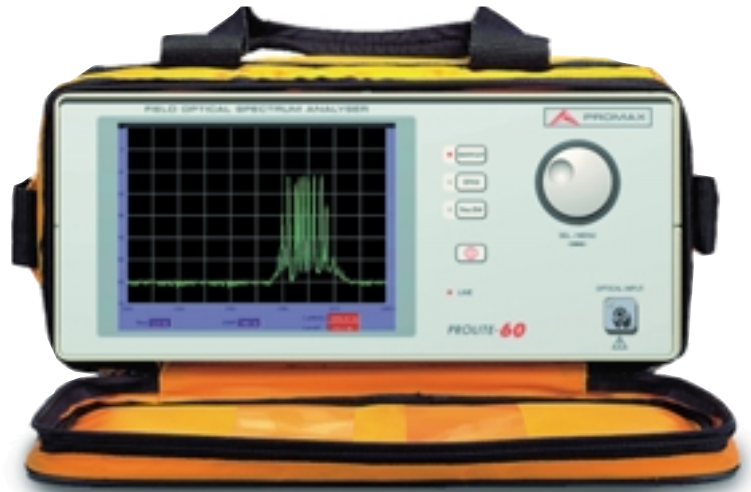
## Field Optical Spectrum Analyser

## PROLITE-60

There is a growing number of applications in today's telecom world involving fibre optic communications using more than one wavelength on the same fibre.

It is not possible to properly install, maintain or troubleshoot systems using these technologies, whether they are the so called CWDM (Coarse Wavelength Division Multiplex) or DWDM (Dense Wavelength Division Multiplex) without having an optical spectrum analyser.

**PROMAX ELECTRONICA S.A.** introduces the **PROLITE-60** the first low cost field optical spectrum analyser. This unique masterpiece is possible thanks to the use of a new type of monochromator recently developed by **PRO-MAX** engineering team.



Specifications	PROLITE-60
Wavelength range	1250-1650 nm
Span range	10 nm - 400 nm
Resolution	0,15 nm
Input range	-60 dBm to 20 dBm
Power supply	From internal battery or from the mains
Dimensions	w. 295 x h.130 x d.180 cm
Weight	6 kg

## Dual wavelength laser light source

## PROLITE-90



### DUAL WAVELENGTH

- 1310 / 1550 nm Laser source
- Multiplexed optical output
- Selectable dual / single wavelength

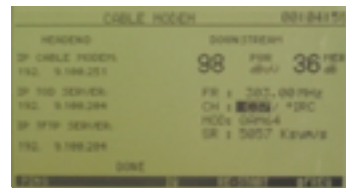
### AUTOMATIC MEASUREMENTS

PROLITE-90 is a compact, battery operated dual wavelength laser light source. Using one single output connector it is ideal for testing of fibres intended to carry more than one wavelength.

Laser sources can be modulated in a special way to make optical power measurements on two different wavelengths easier.

## Cable Modem Analyser

## PROMAX-25



As a complimentary information the instrument displays a summary of the IP address assignment during the communication



In registered mode the **PROMAX-25** sends and receives packets from the CMTS located at the head end. It then displays communication statistics such as packet loss ratio or packet transit times



In non registered mode the **PROMAX-25** communicates with the cable modem head end system, normally referred to as CMTS, displaying information about the attenuation in the return path or downstream DOCSIS channels available among others. This is all obtained in a fully automatic way.



Both in registered and non registered modes is also possible to display constellation diagram of the DOCSIS downstream channel being used. This measurement in combination with the channel power or MER is very helpful to check the quality of the signals received from the head end.

**PROMAX-25** is a cable modem analyser designed for the installation and maintenance of interactive data and video services such as internet, telephony and video on demand television on coaxial cable TV networks using DOCSIS standards.

The instrument communicates with the Cable Modem Termination System (CMTS) located at the head end using the return path for the upstream information and the forward path for the downstream.

It can be used in two different operating modes, registered and non registered. In non registered mode the **PROMAX-25** displays important cable modem system behaviour parameters like the return path attenuation, frequencies in use, MER or constellation.

In registered mode it is also possible to measure statistical data about packet transmission in the network or know IP address assignment.

All measurements can be made in a fully automatic way.

### DOWNSTREAM

93 - 855 MHz frequency range

CHANNEL POWER

QUALITY EVALUATION: MER

### UPSTREAM

5 - 42 MHz frequency range

Unregistered mode

Power level test

Attenuation at CMTS

Symbol rate and bandwidth

Constellation Display

Registered mode:

Ping test

Packet loss ratio

IP report

Weight 1.4 kg

Handheld

## Analogue TV signal Generators

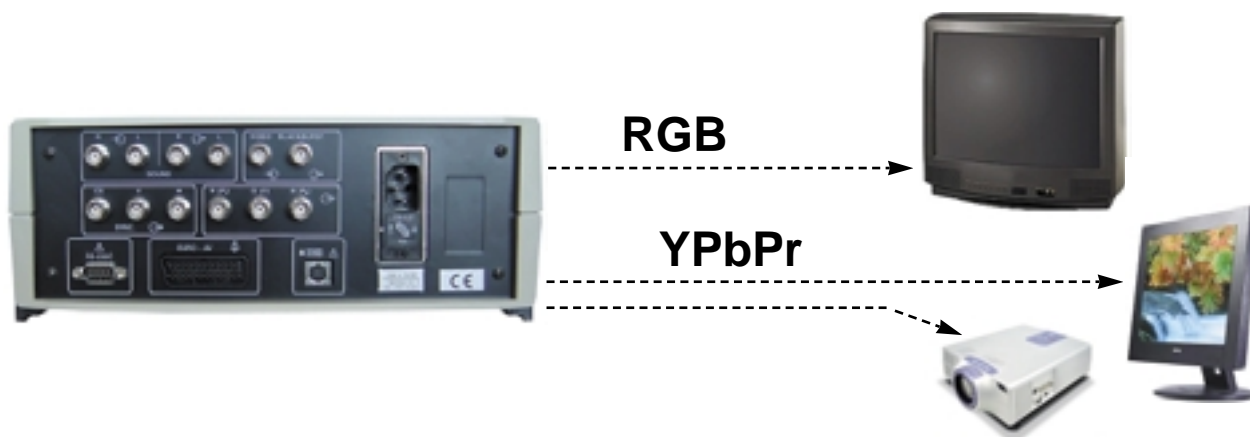
## GV-798+/GV898+

For almost 40 years **PROMAX** has been designing TV and Video Pattern Generators for TV and Video service test departments.

The evolution of the consumer market, and specially the rising of Flat Screen TV's, has made it necessary for **PROMAX** to redesign our high end Analogue Pattern Generators to account for this new applications.

The new evolution of the **GV-798+** (Double Side Band) and the **GV-898+** (Vestigial Side Band) TV Pattern Generators account for the new systems to test, as they include a YPbPr output (commonly known as Analogue Component Input/Output).

All other common interfaces such as S-VHS, RGB, SCART, etc are still available on the rear panel.



## Digital TV signal Generators

## GV-998



With the introduction of Digital Television most of the signal processing has been shifted to digital format. The MPEG-2 standard is the union nexus between the different TV transmission systems. The Transport Stream is to Digital TV what base-band is to Analogue TV. With a right design of the transferred images it is possible to generate test patterns able to detect defects on the new Digital TV receivers.

The **GV-998** is a multi-standard and multi-system TV Generator. It provides all type of analogue standards with A high quality VSB modulation. The digital output signal of the GV-998 complies with the specified standards and it is applicable to QAM, QPSK and COFDM digital modulators.

The **GV-998** provides both TS outputs, the LVDS (Low Voltage Differential Signalling) or parallel output and the ASI (Asynchronous Serial Interface), any of them can be required at any time and both will be available trough the front panel.

With the proper external modulator, the GV-998 now becomes a complete solution for analogue and digital Set Top Box manufacturers.

## Digital Oscilloscope 150 MHz

**OD-560B**

The 16 bit high-speed microprocessor adoption enables the scope to acquire a typical 100,000 points per second and quickly update the picture on the screen.

Its basic memory capacity is 32 kB and captured waveforms can be zoomed in and analysed in detail. Also its built-in 10ns peak detection circuit enables it to capture high frequency noise even at a low speed time/div and magnify and analyse it using the zoom-in function. In addition, it can save up to 10 waveforms and provide diversified analysis function like FFT which is available on high priced products.



## Function Generator

**GF-941**

The **GF-941** Function Generator covers a wide frequency range, from 0.2 Hz to 20 MHz. It is a very versatile device through the possibility of several variations the three main waveforms it generates: sine, triangular and square.

Time symmetry can be changed and overlapping a variable continuous voltage as well.

Two generators are combined into one. One of them is used as an auxiliary generator for both AM and FM modulation functions, sweep function or for triggering the main generator, supplying a given number of selected waveform periods, or burst function, in a recurrent way. Both frequency and the auxiliary waveform can be selected at the panel. The main generator is provided with a frequency indicator, to lessen reading errors.



## Radio Communications Analyser

**AC-725**

The Radiocommunications Analyser **AC-725** has been specially designed to perform tests of RF levels, AM and FM Modulation and Frequency simultaneously, being able to measure over a wide bandwidth between 20 MHz and 2.5 GHz.