PROMAX

PROMAX-37

CABLE TV & DATA ANALYSER

DOCSIS / EURODOCSIS 3.0

PROMAX-37 *is an analyser for the installation, configuration and maintenance of video and high speed data interactive services over TV networks based on the* ***EuroDOCSIS*** *and* ***DOCSIS 3.0*** *standard. It allows the qualification of VoIP and IPTV services.*

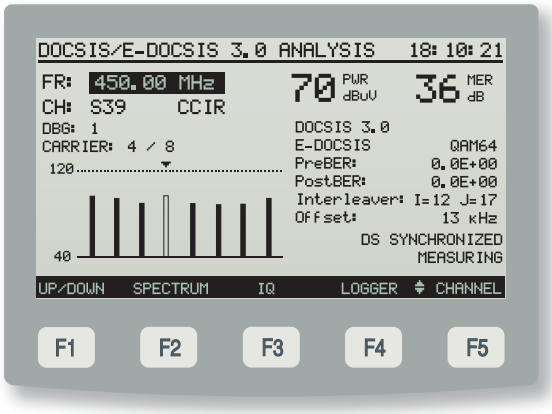
The ***PROMAX-37*** *incorporates the most advanced functions in accordance to updates made on the latest version of the DOCSIS 3.0 protocol, which includes channel bonding technology, allowing the instrument to be adapted to the latest technologies implemented by data over cable network operators.*

Channel Bonding

Channel bonding technology divides the data stream packets in order to sent them simultaneously through multiple independent channels. At destination they are again sequentially reordered. The result is a bandwidth equal to the sum of all used channels. By this way, the whole bandwidth increases by using the existing infrastructure of the data network. The channel bonding allows both the data traffic sent to a cable modem travels through several downstream channels (Downstream channel bonding) as the traffic generated by each user returns through several upstream channels (Upstream channel bonding). The channel bonding function of the **PROLITE-37** can measure and check cable networks that use this technology in both directions.

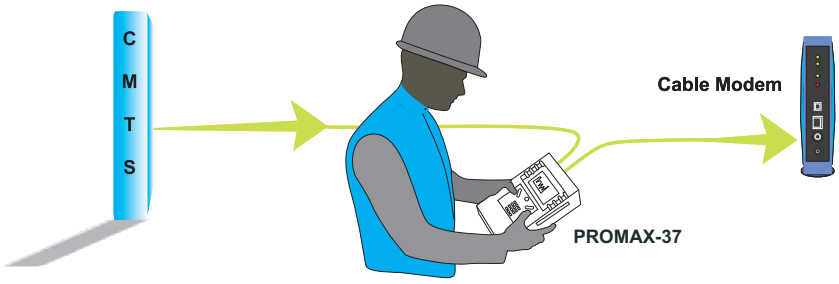
DS Analyser

The **PROMAX-37** analyses the Downstream measurement by allowing to visualize simultaneously the power of all 8 channels.



Through loop with an external cable modem

It allows the user to monitor the signal transmitted by an external CM that has been previously registered in the network.



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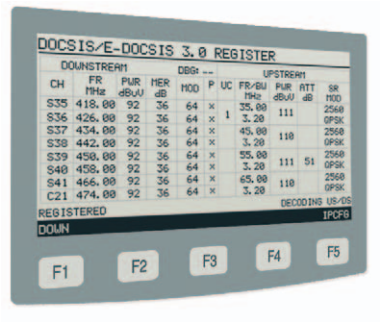
Logger Mode

This function obtains a detailed record of all the measures taken for each channel, both for the upstream and downstream channel. These measures are stored in the memory of the instrument, up to 100 measurements.



IPTV service analysis

Internet Protocol Television (IPTV) has become the most common denomination for the distribution systems of television and / or video signals using IP on a network infrastructure

PROMAX-37 analyses parameters than can affect quality signal, like latency, jitter, lost packets and **trace route**, which trace the route of sent packets on a graph.

This function may be useful to detect possible bottlenecks.

MER and Constellation

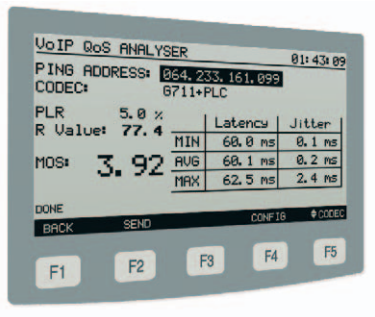
These measurements are decisive for the early detection of excessive noise in the system or intermodulation problems in the downstream. In general, a lower MER can mean system operating problems, as well as a slow speed due to the packets loss and interruptions.

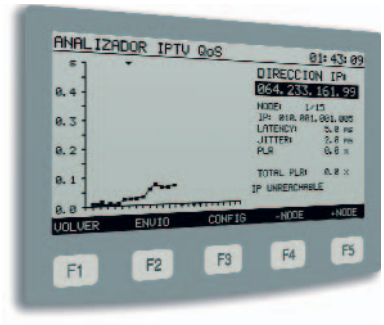
The display of the constellation diagram and the bit error rate (BER) are other key measurements to evaluate the performance of the downstream.

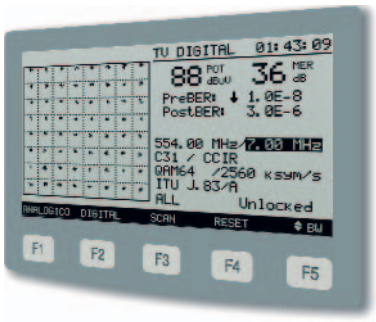
VoIP

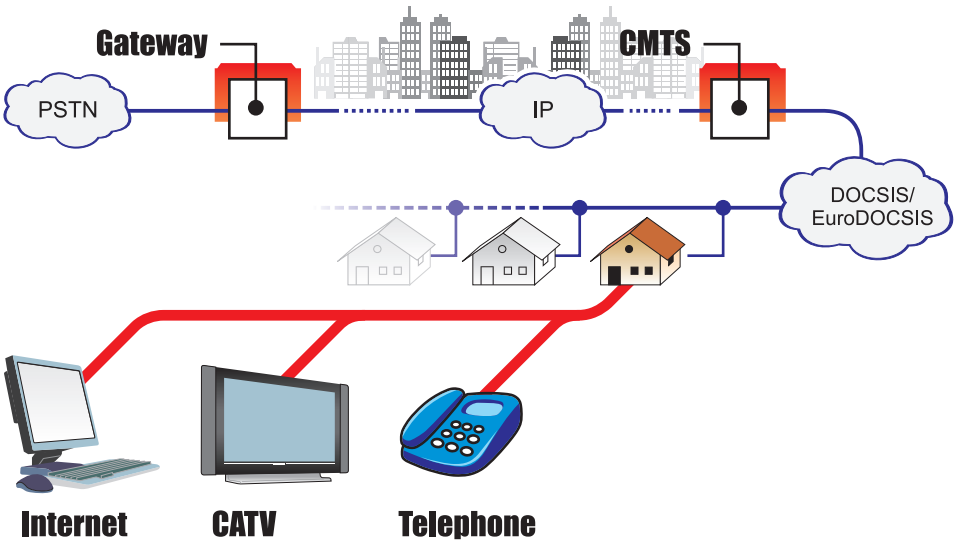
VoIP (voice over IP) or IP Telephony, is a group of resources that make it possible for the voice signal to travel over the Internet using IP (Internet Protocol). The **PROMAX-37 VoIP** function performs an analysis of the network based on the quality of service parameters, named UGS, according to the standards **DOCSIS / EuroDOCSIS 3.0**.

The **PROMAX-37** analyses the most important factors that may affect the quality of communication, including latency, jitter, lost packets, MOS and R value. This comprehensive analysis will ensure the achievement of an excellent quality of call.









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The **PROMAX-37** is capable of the following measurements:

Downstream:

- Σ Power measurement
- Channel power measurement
- Quality test: MER, BER, Pre BER and Post BER
- Constellation diagram
- Full band power
- Frequency, channel and active channel plan
- Modulation type and symbol rate
- Spectrum / Scan measures

Upstream:

- Σ Power measurement
- Power measurement
- Attenuation at CMTS
- Frequency and bandwidth
- Modulation and symbol rate
- Communications test
- Spectrum / Scan measures

Digital and analog channel TV measurements

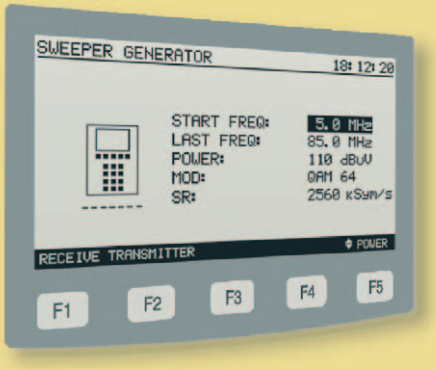
Communications Test (in Registered mode):

- IPTV analyser (television over IP)
- VoIP analyser (voice over IP)
- IP report
- Ping test
- Ratio of lost packets

Serial interface to External Cable Modem (loop-through mode)

Sweeper function

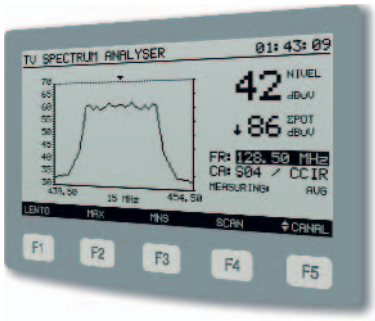
The **PROMAX-37** also incorporates the Sweeper function, which can test and adjust tilt and gain of the upstream distribution amplifiers and detect any failure in the system caused by the imbalance of any of these parameters.



Spectrum Analysis

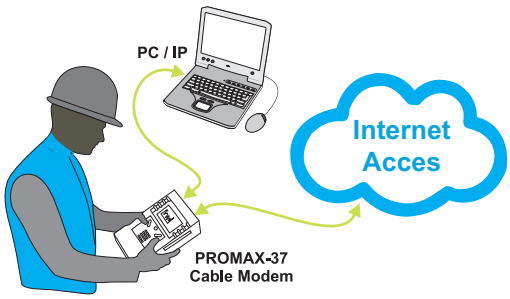
When in Scan mode all the carriers or a portion of them are displayed in the screen.

When the tuned channel is zoomed, it shows in one screen the channel under test, both adjacent channels and the level measurement. It is extremely useful to view interference's at a glance.



Internet access

The Ethernet connection to a PC allows browsing by means of the internal cable modem of the instrument, once it is registered on the network.



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SPECIFICATIONS	PROMAX-37
TUNING Tuning range Resolution	 From 5 to 1000 MHz 10 kHz
GENERATOR (*Upstream*) Carriers frequency range Resolution Carrier level Modulation Symbol Rate	 5 – 85 MHz 100 kHz 60 to 115 dBµV (selectable in 1 dB steps) QPSK, 8 QAM, 16 QAM, 32 QAM, 64 QAM From 160 to 5120 ksym/s
BROADBAND POWER LEVEL MEASUREMENT Measuring range Bandwidth Resolution	 From 70 to 120 dBµV (From 10 dBmV a 60 dBmV) From 5 to 1000 MHz 1 dB
LEVEL MEASUREMENT Measurement Analogue channels Digital channels Measuring range Readout IF bandwidth	 Video carrier signal level measurement Power measurement in the channel bandwidth by integration method From 25 to 120 dBµV. (from – 35 dBmV to 60 dBmV) Digital in dBµV, dBmV or dBm and analogue through a graphic bar. 1 dB resolution. 230 kHz ± 50 kHz
DIGITAL SIGNALS MEASUREMENT MER (Modulation error ratio) BER (measured before RS decoding) Constellation Diagram Symbol rate Data logger Modulation type Channel bandwidth	 From 22 dB to 42 dB for QAM 64 / 256 From 10 E-2 to 10 E-10 ITU-J83 (Annex A/B/C) and DOCSIS/EuroDOCSIS compliant signals From 1000 to 7000 Msym/s for QAM 16/64/256 Power lever, BER and MER for each digital channel, to send to PC or printer QAM 16/32/64/128/256 ITU J 83 annex A/B/C and QPSK Selectable
C/N MEASUREMENT Analogue channels Digital channels	 40-50 dB for input level between 60 and 70 dBµV > 50 dB for input level > 70 dBµV > 30 dB for input level > 60 dBµV
CABLE MODEM	DOCSIS / EuroDOCSIS 2.0, 3.0
TV/MODEM DATA LOGGER FUNCTION Max. number of loggers Measurements TV analogue channels TV digital channels Data digital channels	 140 Level, C/N and V/A Power, BER and MER Upstream and Downstream parameters (Power level, attenuation, frequency, bandwidth, modulation, symbol rate, BER and MER)
SCAN Span Dynamic margin	 Variable: 10, 30, 100, 300 MHz and full band Variable from 20 to 120 dBmV in 10 dB steps
SPECTRUM ANALYSER Span Reference level Analysed band Detector Bandwidth	 From 1 to 100 MHz (1, 5, 15, 30, 50, 100 MHz) Variable from 20 to 120 dBµV in 10 dB steps From 5 to 862 MHz Peak or average 200 kHz
POWER SUPPLY Li-Ion battery Low battery indication Automatic power-off Battery charge Equipment consumption Mains to charger adapter	 7.4 V – 4.8 Ah (battery life: approximately 3 hours) Graphic indication on the display Power-off after approximately 10 minutes of non-use By fast internal charger 22 W AL-103: 100 to 240 V AC / 50-60 Hz / 12 V DC
MECHANICAL FEATURES Dimensions Weight	 160 W x 230 H x 50 D mm 1.4 kg. (including battery and protective bag)