For over 40 years PROMAX has been equipping installers with advanced instruments that are guaranteed to meet their needs.

In 1996 PROMAX launched the PROLINK series. Its innovative modular technology, enabled the user to make the leap to digital television with a very modest initial investment. Those who trusted PROMAX have been in the position to easily adapt their instrumentation to the continually changing requirements of these times.

Due to a ceaseless investment in R&D we are now in a position to present our new PROLINK Premium series, representing a new technological leap forward in instruments for installation, certification and the maintenance of telecommunications systems.

On new series for the 2005 year, we present the DAB for digital DAB radio and Wi-Fi for measurements, as well as coverage analysis on ISM band networks.

### Easily choose the instrument to fit your needs

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<td>Included</td>
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<td>MPEG Decoder (encrypted channels)</td>
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<td>Included*</td>
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<td>-</td>
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<td>Colour TFT Display</td>
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<td>-</td>
<td>5&quot;</td>
<td>5&quot;</td>
<td>5&quot;</td>
</tr>
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</table>

(*) Optional accessory required

### DAB MEASUREMENTS

PROMAX has developed a specific module for the PROLINK-4 Premium and PROLINK-4C Premium meters intended to measure the quality of the DAB Digital Radio signal reception.

### Wi-Fi MEASUREMENTS

The new equipment developed by PROMAX allows Wi-Fi technology-based broadcast verification by including specific functions for field analysis.
Sturdy, compact design with an eye for detail
Advanced measurements for new requirements of digital TV
High-performance spectrum analyser
Demodulation of free to air and encrypted digital channels
Automatic measurements, generation of reports, monitoring
Excellent world wide after-sales service
Unbeatable features/price ratio
- Large colour TFT display
- Portable
- Light weight and reduced size
- Back-pack type carrying case
- Transport case (optional)
- Very user friendly
- Menus in various languages
At PROMAX we have always believed that excellence can only be achieved through meticulous attention to detail. This is why, when designing the Premium series, we have given special attention to the small details that make all the difference.

The PROLINK-4C includes a 5" TFT display, striking the best possible balance between large dimensions and the portability of a field instrument.

The contrast (320 cd/m2) is much better than that usually found in this type of LCD's, allowing it to be used in sunlight. Its wide working temperature range (-30 to 85 ºC) makes it suitable for outdoor use, even in extreme weather conditions.

The PROLINK Premium hardly weighs 5 kg.

Advanced design techniques, such as the use of 4-layer printed circuits and mini-SMD mass assembly, have enabled to achieve a very reduce size for an instrument of such features.

The Premium series PROLINK’s are delivered with a carrying bag containing plenty of space for small working tools (*).

The carrying bag incorporates a viewing hood to improve screen contrast when working with direct exposure to sunlight (*).

For improved comfort, the carrying bag may also be used as a backpack, making it easier to climb ladders and moving over roofs (*).

The menus are available in various languages.

Optionally, PROMAX also offers a case (DC-233), ideal for extra protection of the instrument during transport.

(*) Optional for PROLINK-2 Premium

(**) Except PROLINK-2 Premium
Analogue TV measurements

Digital TV measurements QPSK/QAM/COFDM
- Channel Power
- Carrier/Noise
- Bit Error rate (BER)
- MER and CSI
- Constellation (QAM & COFDM)

MPEG transport stream analyser

Satellite IF test

Digital audio measurements
- NICAM sound
- RDS Radio
- DAB digital radio
Advanced measurements for new requirements of digital TV

- **Digital Satellite (QPSK DVB-S)**

  The PROLINK Premium range instruments that have this function, are measuring the Bit Error Rate (BER) before and after Viterbi. They include the DCI - Digital Channel Identifier (patented function), which helps to identify the selected channel almost instantaneously. (**)

  Measurement of the Bit Error Rate before the first correction (Viterbi) is more sensitive to small variations in reception quality. Measuring after Viterbi allows for comparison with the quality minimum requirements for DVB and defined by the QEF (Quasi Error Free) threshold.

- **MPEG transport stream analyser (**)**

  The ‘wrong packets’ function analyses in detail the MPEG-2 transport stream. The analysis consists on a continuous monitoring of the packages received during a period of time and then determining the cause of any reception problems. In Digital Terrestrial Televisión DVB-T, impairments are often due to impulsive noise caused by traffic and the ‘Wrong packets’ function will the way to determine or analy it.

  The instrument records all the errors or events detected in the MPEG-2 Transport Stream, according to standard ETSI TR 101290 ‘Measurement guidelines for DVB systems’ as defined by the ‘European Telecommunications Standards Institute’.

  It records the type of event along with the time and duration of each one. Also the total measuring time and the total number of events is registered.

- **Digital Cable (QAM DVB-C)**

  In digital cable, PROLINK Premium including this function measures both the BER and MER error rates in QAM digital signals. The BER is useful to confirm that system measurement meet with the DVB-C quality limits. The MER is proportional to signal quality and gives complementary information which enables the noise margin to be optimised. For example, quality of a signal with an excellent BER can be improved with adjustment of the MER. The DCI function is included within this display.

  In QAM signals, it is very valuable to analyse the constellation diagram which, with a simple glance, will show up any signals with noise-related errors, IQ imbalances, phase errors, etc.

- **Satellite IF Test for network test and equalisation**

  This function has been designed to test the satellite IF distribution network in buildings and to equalise the band before any signal is available. It is used in combination with the RP-050. This is a signal generator with 3 carriers in the satellite IF band.

  With this function it is possible to check at a glance the response of the system in the beginning, middle and end of the band at any outlet.

- **Terrestrial Digital (COFDM DVB-T)**

  PROLINK Premium instruments including this function measure the BER to contrast with DVB-T quality limits. They also measure the MER, to guarantee safety margins and good reception in the event of changing meteorological conditions, etc.

  The instrument also measures CSI ('Channel Status Information') which provides valuable additional information on the quality of the carriers making up a COFDM channel.

- **Digital audio measurements**

  The PROLINK Premium series allows various types of measurements to be taken on digital audio systems. This includes measuring the quality of NICAM digital sound.

  In FM radio it is possible to measure the quality of the RDS signal (Radio Data System) using the EBB (Error Block Balance) function. This function also allows to access information associated with this type of transmission.

(**) Except PROLINK-2 Premium
- High accuracy
- High-speed sweep
- High frequency resolution
- High sensitivity
- Flexible amplitude resolution
- Maximum and minimum hold
- Return channel coverage for Cable TV
- Measurement in ISM band
High-performance spectrum analyser

- **High accuracy, high-speed sweep**
  The PROLINK Premium series includes a batch of improvements in spectrum analyser mode that makes it a highly useful tool in a large number of applications in telecommunications.
  These instruments combine the advantages of high-accuracy systems, using the 'High Resolution' frequency sweep mode, with those of real time analysers, using the 'Aerial alignment' sweep mode.

- **High frequency resolution**
  The adjustment of the minimum frequency range or Span on screen has been reduced to 4 MHz in satellite band and 8 MHz in terrestrial band. Using a measurement resolution filter of 50 kHz it is possible to perfectly view signals that were not even possible to detect until now with this type of equipment.
  For example, in SNG applications for the transmission of data from mobile units, the satellite identification is through detection of 'Beacon' signals at certain frequencies. These very low power signals, may be clearly observed on the screen of PROLINK Premium series instruments.

- **Flexible amplitude resolution**
  The PROLINK Premium series combines a wide dynamic range of 50dB with a selectable reference level and a very flexible vertical resolution of 2/5/10 dB per division. In practice this allows to pick up signal variations on-screen that are not visible on other meters.
  The pictures below show a very low power signal as observed on the PROLINK Premium and on another device.
  As you can see, only the PROLINK Premium clearly shows the 'beacon' signal of a VSAT transmission.

- **Maximum and minimum hold**
  An application of maximum hold could be the measurement of non-continuous signals such as those in GSM band. Minimum detection could be useful, for instance, to identify interferences in an analogue TV signal.

- **Return channel coverage for Cable TV (**)**
  In cable television it is very important to cover the return band from 5 to 100 MHz, as these frequencies are used for the implementation of interactive services (internet, pay TV, etc.). Together with the RP-100, the PROLINK Premium becomes a very powerful test set to quickly confirm the operation and response of the cables, amplifiers, etc. in a cable TV network.

- **ISM band coverage (accessories not included)**
  There is a growing number of devices using the ISM band (Industrial Scientific and Medical) which operates at frequencies of 2.4GHz and 5.8GHz.
  Optional converters CV-245 and CV-589 allow to use PROLINK Premium instruments in spectrum analyser mode for aligning aerials, detecting interferences, etc.
- DVB Digital Channels identifier - DCI
  (Patented system)

- List of services

- MPEG transport stream input / output

- Free to air channels decoder

- Video and audio PID indication

- Encrypted channels decoder
  ‘Common Interface’ (Patented system)
Demodulation of free to air and encrypted digital channels

- DVB Digital Channels Identifier - DCI (**)
  The result of demodulating a QPSK, QAM or COFDM digital signal is a sequence of bits so called the 'Transport Stream'. These bits are structured into packets. Some of these packets transport compressed video, audio and data. Others contain the necessary information to access these contents. The NETWORK, PROVIDER and SERVICE identification tables may be constructed out of these later packets.
  The information contained in these 3 tables appears in a sequential way at the bottom line on the screen on measuring the Bit Error Rate or BER.

- Free to air channels decoder (**)
  Once one of the available services listed in 'DVB services' has been selected, it may be decoded and monitored.
  In addition to the image and audio, this screen shows information about the measurement of the digital signal along with the NETWORK, PROVIDER and SERVICE identifiers.

- Encrypted channels decoder (***)
  The use of encryption systems is widely spread in digital pay television. The operator encodes the signals and the subscriber holds a Smart Card giving access to those channels. The main limitation with this kind of solution is that each receiver specialises in a specific encryption system and can not be used for another system.
  There is one alternative known as 'Common Interface' which allows the use of standard receivers. In this case the receiver has a slot to insert various conditional access modules (CAM) and their corresponding Smart Cards. This lets the user access the digital television content of various providers, even if they use different encryption systems. PROMAX holds a patent over the use of 'common interface' in test equipment.

- List of Services (**)
  Selecting the 'List of services' function information on the services in each multiplex or channel is displayed on-the-screen.
  This is: service or programme name, the type of service (television, radio, data or mosaic) and whether the information is encrypted or free.

- Video and audio PID indication (**)
  Another information obtained on selecting a service is the video packet identification (PID).
  The PID is a personalised identifier for each network and each programme that is broadcasted. Its registration is regulated by the EBU (European Broadcasting Union).
  The instrument also provides information on the audio PIDs.

- MPEG Transport Stream input / output (***)
  The PROLINK-4/4C Premium have MPEG transport stream input / output connexion through LVDS DVB-PI, D-25 parallel interface.

Test Equipment Depot - 800.517.8431 - 99 Washington Street Melrose, MA 02176
FAX 781.665.0780 - TestEquipmentDepot.com

(**) Except PROLINK-2 Premium
(***) Only available in PROLINK-4 Premium and PROLINK-4C Premium
- Measurement configuration memories
- Automatic measurements
- Connection to computer
- Certified reports
- Configurable reports
- Control commands for monitoring
- Control and alarms software
- Flexible channel plans
Automatic measurements, reports and monitoring

- Measurement configuration memories

PROLINK Premium series instruments have 99 measurement configuration memories. Each configuration allows for the memorisation of detailed information on all the parameters related to the measurements: type of measurement (power, C/N, BER, MER, etc.), name, frequency or channel, measurement units, etc.

- Automatic measurements (**)

PROLINK Premium instruments may be used as data acquisition units. With a single command they can automatically analyse and memorise up to 99 channels in one outlet. This process may be repeated for up to 99 outlets or testing points.

It can also be used to perform continuous measurements in one point of the network.

Setting a time interval, from 1 second to 24 hours in between measurements, the instrument can be set in acquisition mode. This function is very useful to trace or monitor the network and to detect random-faults.

- Connection to computer (**)

The measurements on the Datalogger as well as the spectrum, can be downloaded to the CI-023 printer.

Using the PKTools (RM-104) software, measurements may be transferred to a personal computer, for a more detailed analysis. This software is optional.

- Certified and configurable reports (**)

The PKTools software allows to generate certified reports direct with the content in the data acquisition memory, and hindering the results from being altered in any way.

These reports may only be personalised to include the logo of the certifying company.

Alternatively, it is possible to make any other type of report, graphics or statistics using a standard spread sheet.

- Control and alarms software (**)

In some applications requiring prolonged or even permanent monitoring, the Datalogger included in the instrument might not be enough. The PKWatch software can prove especially useful in such cases.

PKWatch (RM-204) is an optional software that allows the user to select the channels and parameters to be traced using a very simple user-friendly menu. The program allows to establish PASS/FAIL measuring margins and to generate alarms when the measurements do not fall within these limits.

This may be an useful monitoring tool in transmission systems, repeater stations, satellite reception and distribution systems or headends in cable TV.

- Flexible channel set (**)

This feature is very useful to program the channel plans according to the specific requirements for each application.

For instance, the instruments may include the channel plans of various satellites in order to directly access each service.

(**) Except PROLINK-2 Premium
- Anti-shock protector
- Flat type sealed front panel
- Side-mounted connectors
- Replaceable adapters
- Long-life batteries (Li+)
- Quick battery charge from vehicle
- Battery status indicator
**PROLINK Premium**

**Designed to protect your investment**

PROMAX's PROLINK instruments have defined a before and an after in the industry for these type of instruments. The Premium series will continue to set trends given their innovative design.

**PROLINK Premium** are sturdy and very compact instruments.

A rubber band, made to protect the instrument from unexpected shocks from any angle, covers the instrument, giving it the necessary strength and protection to prevent damage during transport or field work. The instruments also have a special protection system to cushion the effects of any shock experienced by the screen (**).

The input connector is replaceable (**), so it may be easily changed depending on the application or in the event of breakdown. The instruments are delivered with BNC-TV-F connectors (**).

The Lithium-Ion batteries give an operational autonomy of over 4 hours (in analogue measuring mode).

Another advantage of this type of battery is that they can maintain its charge when the instrument is not being used. So that, even when the instrument has not been used for a long time, it is always ready to get back on operation whenever required.

Battery charging is quick and may be carried out in intervals. Using the included AA-103 adapter (**), battery charging may be performed from a vehicle's cigarette lighter.

In addition to the low-battery indicator, the instrument employs a screen where the user may consult the battery state, which also shows consumption by external units (amplifiers, LNBs, etc.) when they are powered from the instrument.

The front panel LEDs allow checking, at all times, the type of power source being used (mains or battery). The battery charging state shown by the flashing BATTERY OK indicator, can be checked at a glance.

(*) Optional for PROLINK-2 Premium

(**) Except PROLINK-2 Premium
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<th>PROLINK-4/4C <strong>Premium</strong></th>
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<td></td>
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</tr>
<tr>
<td>Range</td>
<td>45 to 862 MHz (± 1 dB accuracy*)</td>
<td>5 to 862 MHz (± 1 dB accuracy*)</td>
<td>5 to 862 MHz (± 1 dB accuracy*)</td>
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<tr>
<td></td>
<td>920 to 2150 MHz (± 1.5 dB accuracy*)</td>
<td>920 to 2150 MHz (± 1.5 dB accuracy*)</td>
<td>920 to 2150 MHz (± 1.5 dB accuracy*)</td>
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<td></td>
<td>(862 a 2150 MHz optional)</td>
<td>(862 a 2150 MHz optional)</td>
<td>(862 a 2150 MHz optional)</td>
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<tr>
<td>Mode</td>
<td>Frequency, Channel, Memory</td>
<td>Frequency, Channel, Memory</td>
<td>Frequency, Channel, Memory</td>
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<tr>
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<td>High frequency and amplitude resolution</td>
<td>High frequency and amplitude resolution</td>
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<td>-</td>
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<td>Up to 9801</td>
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<td></td>
<td></td>
<td>Unlimited using RM-104 / RM-204</td>
<td>Unlimited using RM-104 / RM-204</td>
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<td>COFDM Signals (DVB-T)</td>
<td>BER after Viterbi, CSI</td>
<td>BER after Viterbi, CSI, MER (optional)</td>
<td>BER after Viterbi, CSI, MER, Constellation</td>
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<tr>
<td>QPSK Signals (DVB-S)</td>
<td>BER before/after Viterbi</td>
<td>BER before/after Viterbi (optional)</td>
<td>BER before/after Viterbi</td>
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<tr>
<td>QAM Signals (DVB-C)</td>
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<td>Included</td>
<td>Included</td>
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<td><strong>DIGITAL AUDIO MEASUREMENTS</strong></td>
<td>Included</td>
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<td>Included</td>
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<tr>
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<td>-</td>
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<td>Included</td>
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<tr>
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<td>Name/Type/Codification</td>
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<td>Included (with digital option)</td>
<td>Included</td>
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<td><strong>FREE CHANNELS DEMODULATION</strong></td>
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<td>MPEG-2 / DVB (MP @ ML)</td>
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<tr>
<td><strong>ENCRIPTED CHANNELS DEMODULATION</strong></td>
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<td>Using module CAM ('Common Interface')</td>
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<tr>
<td><strong>ANALOGUE VIDEO</strong></td>
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<td>M/N/B/G/I/D/K/L</td>
<td>M/N/B/G/I/D/K/L</td>
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<td><strong>Li+ BATTERY</strong></td>
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<td>Included</td>
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<tr>
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<td>294 (W.) x 100 (H.) x 274 (D.) mm</td>
<td>294 (W.) x 106 (H.) x 274 (D.) mm</td>
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<td><strong>Weight</strong></td>
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(*) Typical specification at calibration points