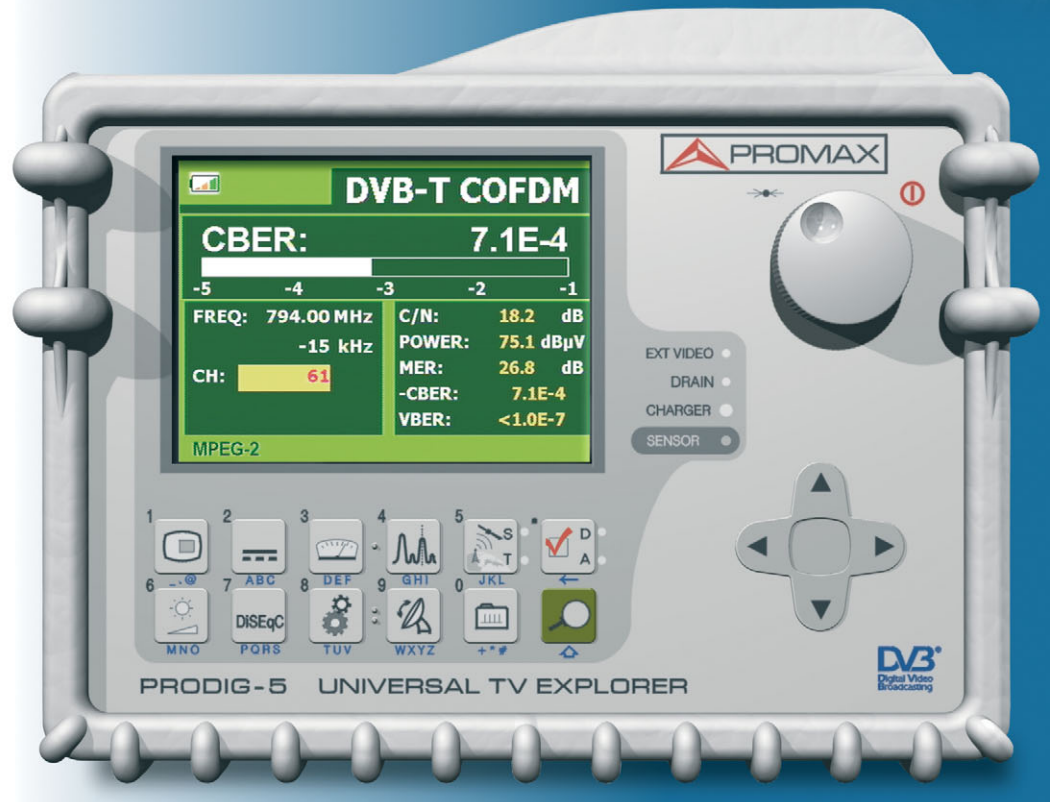




TV EXPLORER



Digital and analogue image demodulation

All measurements simultaneously

Professional spectrum

Full automatic operation

Autonomy of 4½ h.

Weight less than 2 kg.

the TV Explorer: *setting new standards*



- The **TV EXPLORER** is been designed for the installation, maintenance and surveillance of terrestrial, satellite and cable TV systems.
- The **TV EXPLORER** provides you automatically with all the information about the channels available in the network and their quality. It does not require any preliminary information about the signals to be measured, so that it can detect the type of signal, the standard, the modulation type, symbol rates, etc.

This instrument is setting new standards in the way installers make and understand measurements. The **TV EXPLORER** has an impressive new range of functions developed to easy measurements and detection of impairments in both digital and analogue systems.

The **EXPLORER's** compact and rugged construction makes it ideal for field use. A 5" colour LCD shows all the measurements and the picture of analogue and digital channels.

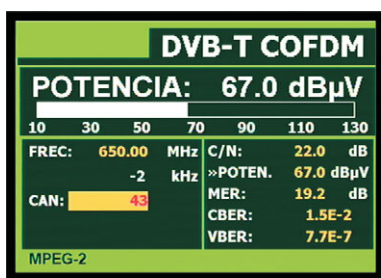
It includes a high resolution spectrum analyser function with a new intelligent way to directly control the display of signals on the screen.

It is ideal to be used in this transition period from analogue to digital, as it covers a wide range of standards, **PAL / SECAM / NTSC** in analogue and **COFDM / QPSK / QAM** in digital.

From now on, your analyser will be a much more intelligent and easy to use tool!



highlights

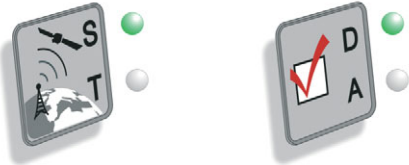


The highlights of the **EXPLORER** are its reduced dimensions and weight, its low cost and its incredible specifications:

- Coverage of satellite, cable and television.
- Tuning by channel and frequency (IF or direct in the case of satellite)
- Automatic channel search with the possibility to create channel plans for each new session.
- Automatic identification of the type of signal.
- Multistandard analogue measurements: Level, Video-Audio, C/N.
- Digital measurements: Power, C/N, Channel Identification.
 - COFDM 2k/8k: MER, VBER, CBER
 - QPSK: CBER, VBER, MER.
 - QAM 16/32/64/128/256: BER, MER.
- Simultaneous display of all the measurements and main associated parameters.
- MPEG decoding.
- List of services and PID's.
- TFT Monitor (320 candles/cm²).
- Li-ion batteries: 4 1/2 hours use and recharge to 80% in 1 hour.
- Dimensions: 230 x 161 x 76 (total volume: 2814 cm³).
- Weight: 1.9 kg (without protector).
- DiSEq 1.2.



Easy to use *engineered for you*





Just press **S/T** (satellite / terrestrial) key and **D/A** (digital / analog) key to change between modes



Pressing the key shortly will start the **AUTO ID** function or the **EXPLORER** function if the user keeps pressing

The **EXPLORER** is above all, **easy to use**. A *menu free* control system and a symbol-based keyboard allows direct access to most of the functions.




The instrument guides you through the functions and at all times the instrument indicates the type of measurement that is being made. I. e. **Terrestrial / Satellite** () and **Analogue / Digital** ().

The **TV EXPLORER** includes two new innovative functions designed to make operation easy.

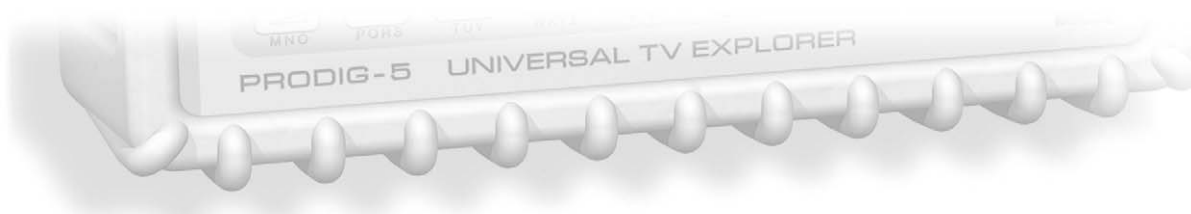
- **AUTO-IDENTIFICATION:** to analyse a channel.
- **EXPLORER:** sweeps the band and detects all channels.

The **TV EXPLORER** will become a friendly partner in the analysis of networks and its contents.

The basic functions to analyse any signal are:

-  Measurements
-  Spectrum analyser
-  Signal demodulation

Switching through these three functions will provide you with all of the information about the signal under test.



Auto-identification: *the magic key*



The **TV EXPLORER** has been specially designed to satisfy the measurement needs in terrestrial, satellite and cable TV during the transition period to the analogue switch off. For this reason it is equipped with functions to measure both analogue and digital signals.

When pressing the '**explorer**' key briefly, it searches and identifies the signal under test. First it recognises whether the signal is an analogue channel or a digital one.

If the channel is analogue, it determines the television standard of the signal (PAL/SECAM/NTSC).

When the signal is digital, it analyses the modulation type **QAM / QPSK / COFDM** and all the associated parameters such as the system, the symbol rate, the code rate, etc and it tries to lock to the signal.

In this way, the **EXPLORER** becomes a fully automatic and agile instrument, able to detect and to identify all of the channels in a television system. When the conditions of the signal to be identified are too poor, the equipment allows to use the manual configuration.

Explorer: *one key and go!*



When the '**explorer**' key is pressed for a few seconds, a new spectrum exploration session begins. Unlike any other meter currently on the market, the **EXPLORER** makes a dynamic exploration of the spectrum, detecting all the channels in the swept band. This applies to the terrestrial and satellite television bands.

This new measurement concept **sets a radical change in the way to understand and to use the meter**. The analyser is no longer a passive unit, that only measure the channels. It is the analyser on its own that begins by locating all the channels available in the band.

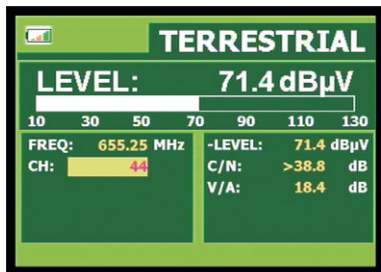
The **EXPLORER** detects all the channels in the band with no need for any previous details such as, the number of channels available, the type of signals transmitted or their characteristics. The **EXPLORER** is then able to determinate the nature of the signal (analogue or digital) and the channel bandwidths. It can also automatically identify digital channel shifts that the instrument will display.

With the data collected after each exploration, it creates a register that contains tables of channels that can be independent for each area or system. Each of these tables **can be saved** with a different name.

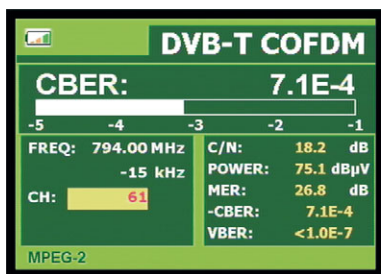
At any time, the stored sessions can be retrieved and the pattern used for a new sweep that will then be very fast. This feature can be very useful, for instance in countries with a MFN network.



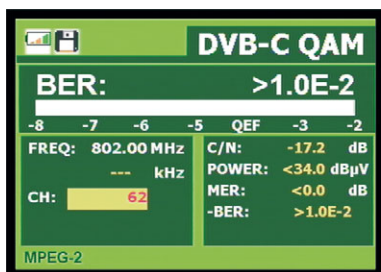
Measurements: *all in one screen*



Analog terrestrial TV measurements



Digital terrestrial TV (DVB-T) measurements



Digital cable TV (QAM) measurements

In the **EXPLORER** all the related measurements are displayed simultaneously on the same screen. Therefore, whenever the Measurement function is selected the instrument shows the different parameters that define the quality of the signal under test.

In case of an analogue channel:

- Level
- V/A
- C/N

For a digital terrestrial **COFDM** or a digital satellite **QPSK** channel:

- Power
- C/N
- MER
- CBER
- VBER

For a digital cable **QAM** channel:

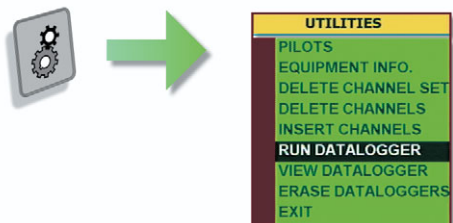
- Power
- C/N
- MER
- BER

One of the measurements can be selected as a preferred and then it will be highlighted and a graphic bar for this particular measurement displayed in a preferent position.

When pressing the measurement key, the highlighted measurement is switched to the next in the row. In this way the instrument adapts to the diverse preferences of the user.



Datalogger



Start a datalogger

The **TV EXPLORER** has become the **industry's standard instrument**. It combines very reduced dimensions with an **impressive data processing capacity**, making measurements in a way that are most transparent to the user. **PROMAX** pioneered and perfected the principal of providing an easy method of performing, collecting and collating literally thousands of signal measurements. The **Datalogger** function is been used in all the **PROLINK Premium** series instruments and now it is been made available to the **TV EXPLORER** as well.

Start a datalogger

With this new function, the **TV Explorer** not only becomes an instrument capable of automatically **EXPLORE** the band and **IDENTIFY** the signals (see *Explorer: one key and go!*), but it can also measure all the parameters that determines the signal quality such as **signal level, channel power, carrier/noise, BER, MER**, etc and store them. The datalogger is accessible from the utility menu and it mostly works on its on. You **press** the key, wait and **all the data will be collected**.

One Logger, several Test points

Every acquisition becomes in fact a **Test Point** inside a **LOGGER** and both the **LOGGER** and the **TEST POINT** can be personalised.

For instance, the **LOGGER** can be given the **name of the site, building or installation** and the **TEST POINT**, the **specific place** where test is make, for instance bedroom, Kitchen, etc.

View ALL CHANNELS on a Test Point or ONE CHANNEL in each Test Point?

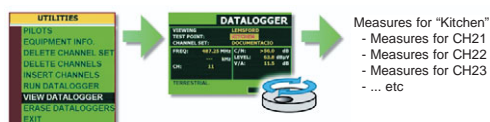
Data stored is all the data related to the signal either analogue or digital. Then data can be **viewed** and easily revised with the **VIEW DATALOGGER**.

If the cursor is set over the **CHANNEL**, when turning the encoder you can **VIEW** the **measurements of all channels** on the actual **TEST POINT**.

If the cursor is set over the **TEST POINT** when turning the encoder you can **VIEW** the measurements of the **actual channel** in all the **test points**. This function is specially useful to check the signal drop along the system.

Measurements reports

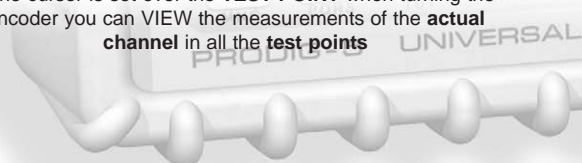
The **PKTools** software will allow the to download data to a **PC** to generate files and reports. This will be possible from now for the datalogger function can be incorporated to all instruments on the field.



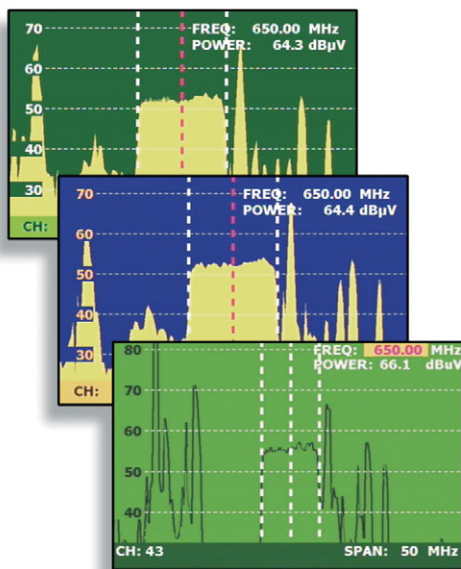
If the cursor is set over the **CHANNEL**, when turning the encoder you can **VIEW** the **measurements of all channels** on the actual **TEST POINT**.



If the cursor is set over the **TEST POINT** when turning the encoder you can **VIEW** the measurements of the **actual channel** in all the **test points**



Spectrum analyser: *direct keys* *new more intuitive control system*



One of the features that has been most carefully studied in the instrument design has been the **spectrum analyser**.

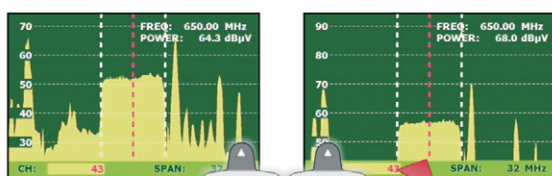
The spectrum function is been designed keeping on target the simplicity but, noting that specifications like accuracy, resolution, sensitivity and sweep time can make of the a spectrum analyser a very useful tool or a completely useless instrument. The **EXPLORER** is well designed to meet the diverse needs and applications a telecommunications installer has to undertake.

The **TV EXPLORER** comes with several user-selectable color models or "**skins**", so it becomes a customizable interface. There are a number of combinations of colors and lines. Skins can help to improve the LCD viewing experience in certain light conditions, specially when working with spectrum graph.

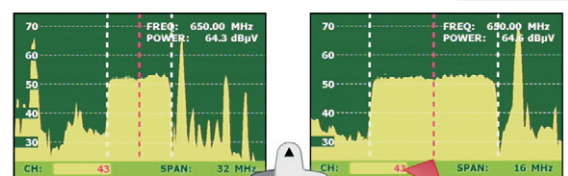
Back to the **spectrum analyser** function, the **TV EXPLORER** presents an innovative control system, based on four arrows, that makes the use of the spectrum analyser very intuitive.

The '**UP-DOWN**' arrows set the **reference level**, so that when pressing the 'UP' arrow reference level is increased by 10 dB. When pressing the "DOWN" arrow, the reference level is reduced by 10 dB allowing to check signals of lower level.

The "**LEFT-RIGHT**" arrows allow to select the **span** or **expansion**, so that when "right" is pressed the margin of frequencies in display can be increased up to full span and when "left" is pressed the zone around the cursor can be analysed with more detail.



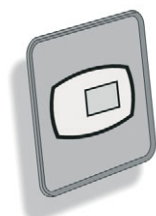
By pressing UP key *twice*
the instrument sets the reference level from 70 to 90 dBµV.



Starting from a SPAN of 32 MHz,
we press LEFT key and we reduce view to 16 MHz.



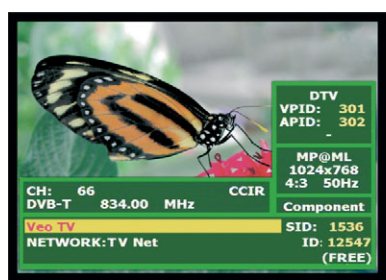
Signal demodulation: *analogue and MPEG-2 digital*



Switching to this mode will **demodulate** the signal according to the standard for both **analog** (except for satellite) and **digital** signals.

When demodulating an analog channel (cable or terrestrial), the **EXPLORER** shows with the video and audio, information about the channel on tune, the name of the channel plan and the TV system.

If the signal is digital (cable, satellite or terrestrial), the instrument shows for a few seconds, all the data related to the channel:



*PRODIG-5 while decoding a digital DVB-T channel.
Related information appears on the screen*

- Channel number and channel plan
- MPEG-2 detection flag
- Service
- Network Identification
- Video PID
- Audio PID
- Picture format
- SID
- ID
- Free or Encrypted
- Type of signal (DVB-T / C / S)



DVB services for a digital channel

At any time it is possible to display the **SERVICE LIST**, by pushing Encoder button, and show all the programs and services available within the tuned channel. Selecting one particular channel or service becomes **very intuitive** using the encoder and/or the arrow keys.



Small and light: *in the palm of your hands*



The **EXPLORER** has changed many concepts for this type of product: **easier** to use, many **functions** and... **small**. It has an ideal size to fit within the palm of your hands.

Weight is also optimised. The instrument **weights less than 2 kg** with batteries, this is less than half from any other similar model.



PROMAX's original **anti-shock** cover protects the instrument and makes it most suitable for outside use.

As usual with PROMAX equipment, the front panel is been designed with keys that avoid accidental water ingress.

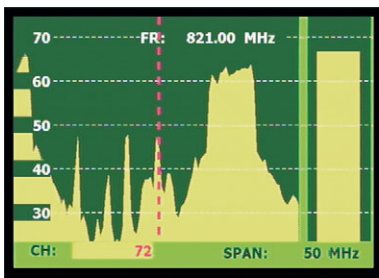


The instrument is delivered with a **carrying bag** that protects it from the weather conditions. A transparent plastic cover allows the operation of the keyboard even under the light rain.

The carrying bag has a strap to allow instrument to be used hanging from the neck or hold to the waist for even more comfort. Both hands are free to hold or adjust any device while reading the measurements in a large 5", high resolution, high brightness LCD display.



Antenna installation: *versatility*



Antenna alignment screen

The **EXPLORER** has been designed to make compatible different types of measurements that require of very different working configurations.

A **specific function** has been developed for an **easy antenna alignment**. In this mode, the instrument configures itself to offer a very fast sweep time in spectrum analyser mode. At same time, it shows a high sensitivity graphic bar that allows the fine adjustment of signal peaks, necessary to optimise antenna alignment.

The **EXPLORER** incorporates the **supply voltage** for amplifiers and LNB, including the 5 V for DVB-T indoor antennas.

It does also include commands to program **DiSEqC 1.2** devices.

Lithium batteries: *the best solution available*




The **EXPLORER** is fitted with Lithium batteries. These batteries provides a maximum operating time, with an estimated duration of **more than 4 ½ hours** for the **EXPLORER**.

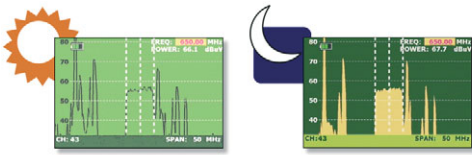
When PROMAX started to supply this type of batteries some years ago, they were made available as an option given the extremely high cost they had.

It is now proven that the advantage of using such batteries is not matched by any other technology. Not only they are smaller and lighter for the same capacity but also they can be recharged at any time.

Another advantage from this type of batteries is that they have an exponential charging cycle and a good portion of the battery can be recharged in very short time. From one job to another the instrument can be charged from the car lighter.

Battery time charge indicator () is displayed at any anytime in the top left corner.

Color LCD display: *large and light*



*Automatic LCD adjusting
for direct sunlight and bad illumination conditions*



The **EXPLORER** incorporates a high quality 5" TFT - LCD display.

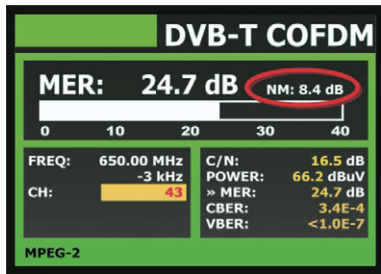
In the past, colour LCDs have not been recommended by us due to their low resolution, the low contrast & brightness that made it very difficult to use on sunlight conditions and the limited temperature range.

Nowadays, the technology is been improved and the characteristics of this particular LCD (320 candels per square centimeter) warrants **excellent resolution** and an **amazing contrast and brightness** that makes it now recommendable for outside use and more suitable than monochrome CRTs. The temperature range for this industrial model, is also been extended, allowing both the use at high and low temperatures. Though the instrument is protected with an automatic switch-off system, the internal fan allows to use the instrument even at high temperatures of 40° C/ 104 °F.

The instrument includes a **light sensor** that activates the contrast and luminosity of the display according to the environmental conditions. This feature helps to save batteries at the same time.



noise margin measurement function



Another function is been added to the TV Explorer.

Noise Margin value indicates how many dB's you could degrade the MER of a signal in order to reach VBER equal to QEF ($2 \cdot 10^{-4}$) or in other words how far we are from the QEF in terms of MER.

The MER of the signal in left picture, could still be degraded additional 8.4 dB to get to the VBER limit of acceptance $2 \cdot 10^{-4}$.

IF test



The IF TEST function allows to check buildings cabling system before the antennas and head-end systems are operative. For this application PROMAX has specially designed **RP-050** and **RP-080** signal generators.

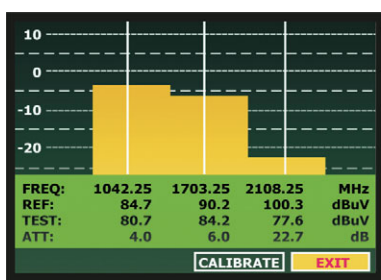
The procedure allows to evaluate the frequency response of a whole TV signals distribution network by means of two steps.

Step 1: Calibrating with TV Explorer

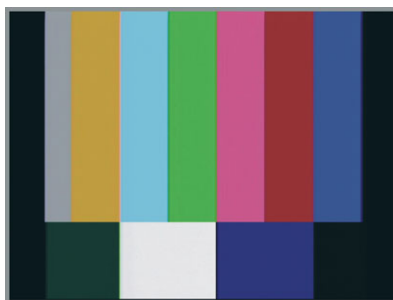
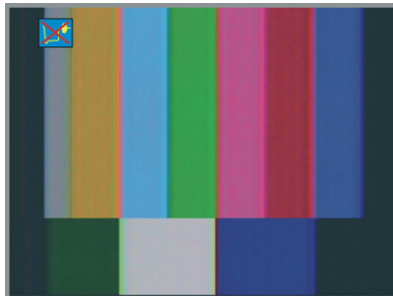
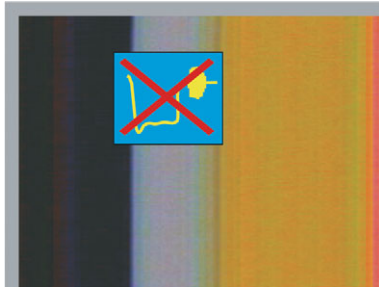
Connect the **RP-080** directly to the **TV Explorer** and power on the **RP-080** through the **Explorer's** RF output. Now access the **ATTENUATION TEST** in **CALIBRATE** mode. The system compensates all the cable and conector drops and sets all three frequencies to zero.

Step 2: Measure pilots throughout the network

Once calibrated, start to make level measurements in each outlet. On the screen will appear the attenuation values for the three pilot frequencies measured in the different testing points.



automatic detection of saturation



The objective of this function is to indicate by means of an icon if the signal that arrives at the TV EXPLORER is saturated. It is a very useful function to determine the correct adjustment of analogue channel amplifiers.

When the gain in the head-end of a SMATV system is too high, it can cause saturation. This function allows the adjustment of the maximum levels of the analogue signals coming from the amplifiers. When the level of a certain analogue channel is over the maximum level, the equipment detects its saturation and the symbol 'detection of saturation' appears in screen.

This icon also appears when the burst signal (transporting the information about the color) does not contain information and therefore the images are in black and white.

In summary, this function is very useful, to identify problems related to the distortion or excess of amplification, that can occur in the mast, system or distribution amplifiers.

Safety margin

While carrying out gain adjustments at the antenna amplifiers on analogue channels, the amplifier could be saturating the signal. When this happens, the icon will appear in the left top corner on the screen.

In this case, it is necessary to reduce the gain of the amplifier and to reduce it until the icon disappears completely. Then it is recommendable to take reading of the signal level and to readjust the amplifier 3 dB below the value previously read.

This procedure will provide a sufficient safety margin to guarantee the adjustment of each analogue amplifier to avoid saturation. Furthermore, it allows to determine the maximum gain to equalise the installation correctly. In this way, there will be a margin to avoid saturation conditions in case of an unexpected increase in the entrance signal level.



TV Explorer & *HDTV*



Spectrum for one ASTRA's HDTV channels

TECHNICAL REQUIREMENTS FOR HDTV

- Minimum vertical resolution of 720 lines in 16:9 format
- Inputs for HDTV signal via:
 - YPbPr (analogue components)
 - DVI or HDMI
- HDTV inputs must accept minimum following video formats:
 - 1280x720 @ 50 and 60Hz with progressive scan ("720p")
 - 1920x1080 @ 50 and 60Hz with interlaced scan ("1080i")

TRANSMISSION PROCESSES FOR HDTV

Digital compression.

Signal is converted into digital and compressed to reduce the amount of bandwidth required for transmission. Two techniques are used, MPEG-2 and MPEG-4. As a result we obtain a TS (Transport Stream)

Modulation.

The TS is prepared to be broadcasted over the transmission channel.

Terrestrial:
DVB-T COFDM

Cable:
DVB-C QAM

Satellite
DVB-S QPSK,
DVB-S2 QPSK or 8PSK

HDTV: A Short description

High Definition Television is a new TV format that intends to display video information with higher resolution than conventional TV.

After a long period of time with confusing technical information about HDTV, the industry has now agreed on the exact meaning of HDTV.

TV sets, based on CRT, TFT or plasma technologies, are compatible with HDTV and can consequently carry the label "HD READY" only if they are compliant with the certain technical requirements (see tables).

HDTV is broadcast using digital television techniques only. The HDTV video signal must be processed to prepare it for transmission.

HDTV Channels available now

Nowadays HDTV programmes can be received in the UK via satellite only. Astra 19E, Eutelsat 13E or Astra 23E offer a selection of transponders with HDTV content. With the World cup event coming up shortly BBC has announced that a DTT HDTV trial, limited to a few hundred households in London which have yet to be chosen, will take place. But other than this satellite is the only option.

If we take Hot bird Eutelsat 13E for example the following transponders offer HDTV content:

TXD 116	DVB-S	MPEG-4 / HD
TXD 2	DVB-S	MPEG-4 / HD
TXD 64	DVB-S2	MPEG-4 / HD

HDTV & the TV Explorer

The PRODIG-5 TV Explorer is compatible with DVB-S so **it can make measurements on HDTV channels** using this modulation scheme.

This is the case of TXD's 116 and 2 and is independent of whether the programmes are compressed in MPEG-2 or MPEG-4. The service list will indicate the presence of HDTV services.

Currently, power and C/N measurements can be carried out on TXD's using DVB-S2. No digital measurements such as MER, CBER, VBER can be made at present. However, because of the nature of satellite transmission, measurements taken at neighbouring channels can also be representative.

Following is a list of some satellite TXD's currently using DVB-S:

ASTRA 19.2 E
TXD 88
TXD 110

ASTRA 23.5 E
TXD 52

HOT BIRD 13.0 E
TXD 116
TXD 2

INTELSAT 1.0 W
TXD 12

ATLANTIC BIRD 5.0 W
TXD KC2



What satellite is this?

“... another world's first for your TV Explorer”



When using AUTO-IDENTIFICATION function from spectrum analyser or antenna alignment modes **the TV Explorer does what no other meter can do**. It tells information about the origin of the signal, what satellite or what transmitter is it coming from!!! This is obtained from network identification data contained in the transport stream.

This works for all digital channels, satellite, broadcast TV and Cable TV.

This is particularly useful to locate a satellite. Go to **antenna alignment** mode, move the dish until you receive some signals, press **AUTO-ID** and you know what satellite you are on.

