



**new functions!**  
Merogram  
Spectrogram

# We changed the way measurements are made!

**HDTV**  
measurements

**SAT**  
DVB-S/S2

**TERRESTRIAL**  
DVB-T/H

**CABLE**  
DVB-C

## One model for every need

*Select yours*

|                                                | TV EXPLORER | TV EXPLORER II | TV EXPLORER II+ |
|------------------------------------------------|-------------|----------------|-----------------|
| LCD size                                       | 5.5         | 6.5            | 6.5             |
| LCD aspect ratio                               | 4:3         | 16:9           | 16:9            |
| Transflective LCD                              |             | ✓              | ✓               |
| DVB-T Terrestrial                              | ✓           | ✓              | ✓               |
| DVB-S Satellite                                | ✓           | ✓              | ✓               |
| DVB-S2 Satellite                               |             | ✓              | ✓               |
| DVB-C Cable                                    | ✓           | ✓              | ✓               |
| DVB-H mobile TV                                |             | ✓              | ✓               |
| FM radio demodulation                          |             | ✓              | ✓               |
| Analog TV                                      | ✓           | ✓              | ✓               |
| Spectrum analyser                              | 10 dB/DIV   | 10 / 5 dB/DIV  | 10 / 5 dB/DIV   |
| Constellation diagram                          |             | ✓              | ✓               |
| MER by carrier measurement                     |             |                | ✓               |
| Merogram                                       |             |                | ✓               |
| Spectrogram                                    |             |                | ✓               |
| Auto identification                            | ✓           | ✓              | ✓               |
| Explorer function                              | ✓           | ✓              | ✓               |
| Automatic measurements                         | ✓           | ✓              | ✓               |
| Automatic reference level                      |             | ✓              | ✓               |
| Reports & Automatic Internet updates           | ✓           | ✓              | ✓               |
| Echoes detection                               |             | ✓              | ✓               |
| Satellite IF test                              | ✓           | ✓              | ✓               |
| Cable TV: Return path (5 MHz)                  |             | ✓              | ✓               |
| Cable TV: 1 GHz                                |             |                | ✓               |
| Encrypted channels ( <i>common interface</i> ) |             |                | ✓               |
| Video stream recorder and player               |             |                | ✓               |
| Screen capture                                 |             |                | ✓               |
| Storage capacity                               | 768 KB      | 128 MB         | 1 GB            |
| PkTools software                               | optional    | included       | included        |
| Transport case                                 | optional    | included       | included        |



TV EXPLORER® is a registered trademark of PROMAX Electronica S.A.

## Digital TV:

*It is switch-over time!*



*"I waited for the right time to invest in a new analyser. I chose the **TV EXPLORER** because it is meant to be a meter for digital and analog.*

*But, I found out that it is much more than that. It has all the features I would have ever dreamt of to make my work faster and more reliable.*

*It is really **helping me** out to develop my **business**."*



## Transflective LCD

*From darkness to bright sunlight ★*

▶ The **TV EXPLORER II** and **TV EXPLORER II+** incorporate a transflective 6.5" colour LCD with a 16:9 aspect ratio. The new transflective technology combines the advantages of the transmissive and reflective displays.

The transmissive ones are those illuminated from behind the screen, with good vision in the darkness. The reflective ones use the reflection of the external light in the back of the display.

The result is an **stunning** vision in darkness and by the direct sunlight.

The big 6.5" panoramic colour screen allows to extend the area to display the measurements and make readings easier.

With the 16:9 aspect ratio the instrument can test any television signal independently of the receiver available.

The temperature range for the LCD is extended from 80° C to -40°C allowing its use in very **extreme conditions** away from the operating limits of other components.



★ according to model

## 6.5" panoramic colour 16:9 LCD

*Large display, compact size ★*



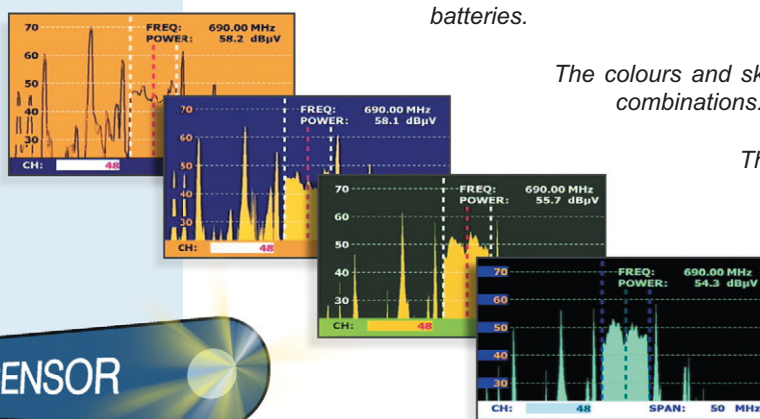
## Select colors and skins:

*Automatic adjustment*

▶ The **TV EXPLORER** includes a light **sensor** that selects the contrast and luminosity of the display according to the environmental conditions. This feature helps to save batteries.

The colours and skins are user-selectable and there are **several** combinations.

This feature can help to improve the LCD viewing experience in certain light conditions specially when working with spectrum graph.



★ according to model

## Easy to use

### *Setting a new standard*

➤ The **TV EXPLORER** is been designed for the installation, maintenance and surveillance of terrestrial, satellite and cable TV systems.

It provides complete information about the channels available in a network and their quality. This includes:

-  Measurements
-  Spectrum analyser
-  Signal decoding

The main difference with all instruments available until now is that it is easier to use. It can detect the type of signal, standard, modulation type, symbol rate... and just display the results. In other words, it does not require any preliminary information about the signals to be analysed.

The **TV EXPLORER** has set new standards in the way installers make and understand measurements. It includes an impressive new range of functions developed to easy measurements and to detect impairments in both digital and analog systems.

The **TV EXPLORER's** compact and rugged construction and its large colour LCD, makes it ideal for field use. With the **TV EXPLORER** it is possible to take measurements automatically, to store the results and print reports.

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



## Small and light: *In the palm of your hands*



➤ The **TV EXPLORER** has changed the concept for this type of product. It is **easier** to use, has **advanced** functions and... it is **small**.

It has an amazing shape factor, making compatible a very large display area with a really small size. It **fits** within the palm of your hands.

The **TV EXPLORER** is been designed for outside use. The classic PROMAX strong aluminium construction and an original **anti-shock** rubber cover, ensures highest protection to your investment. Depending on the model, it weights 2 - 2.2 kg (5 lbs).

The front panel is been designed with **flat keys** that avoid accidental water ingress.

The instrument comes with a **strap** to hang it to the neck or to fasten it around the waist. In this way, both hands are free to take the measurements, make adjustments, etc.

It can also be used within the **carrying bag** that protects the instrument from the weather conditions. A transparent **plastic cover** allows the operation of the keyboard even under the light rain.

The **TV EXPLORER II** and **TV EXPLORER II+** are delivered with a heavy duty **transport case**.

## Lithium-ion batteries: *The best solution available*



➤ The **TV EXPLORER** is fitted with Lithium-Ion batteries. These batteries provide a high operating time, with an estimated duration of **more than 4 ½ hours** (depends on the type of use).

This type of batteries can be **recharged** at any time and have an exponential charging cycle so that it can recover a large portion of the charge back in a very short time. It can be charged from the car through the lighter.

**Battery charge indicator** (  ) shows the status of the charge at any time.

## Auto-identification: *The magic key!*

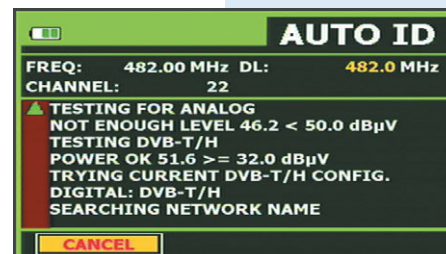
➤ The **TV EXPLORER** has been specially designed to satisfy the measurement needs in terrestrial, satellite and cable TV during the transition period to the analog switch off. For this reason it is equipped with functions to measure both analog and digital signals.

When pressing the “**explorer**” key briefly, it identifies the signal under test. First it recognises whether the channel is analog or digital.

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

When the signal is digital, it analyses the modulation type: **QAM / QPSK / 8PSK (\*) / COFDM** (European Zone models) and all the associated parameters such as the system, the symbol rate, the code rate, etc and it tries to lock the signal.

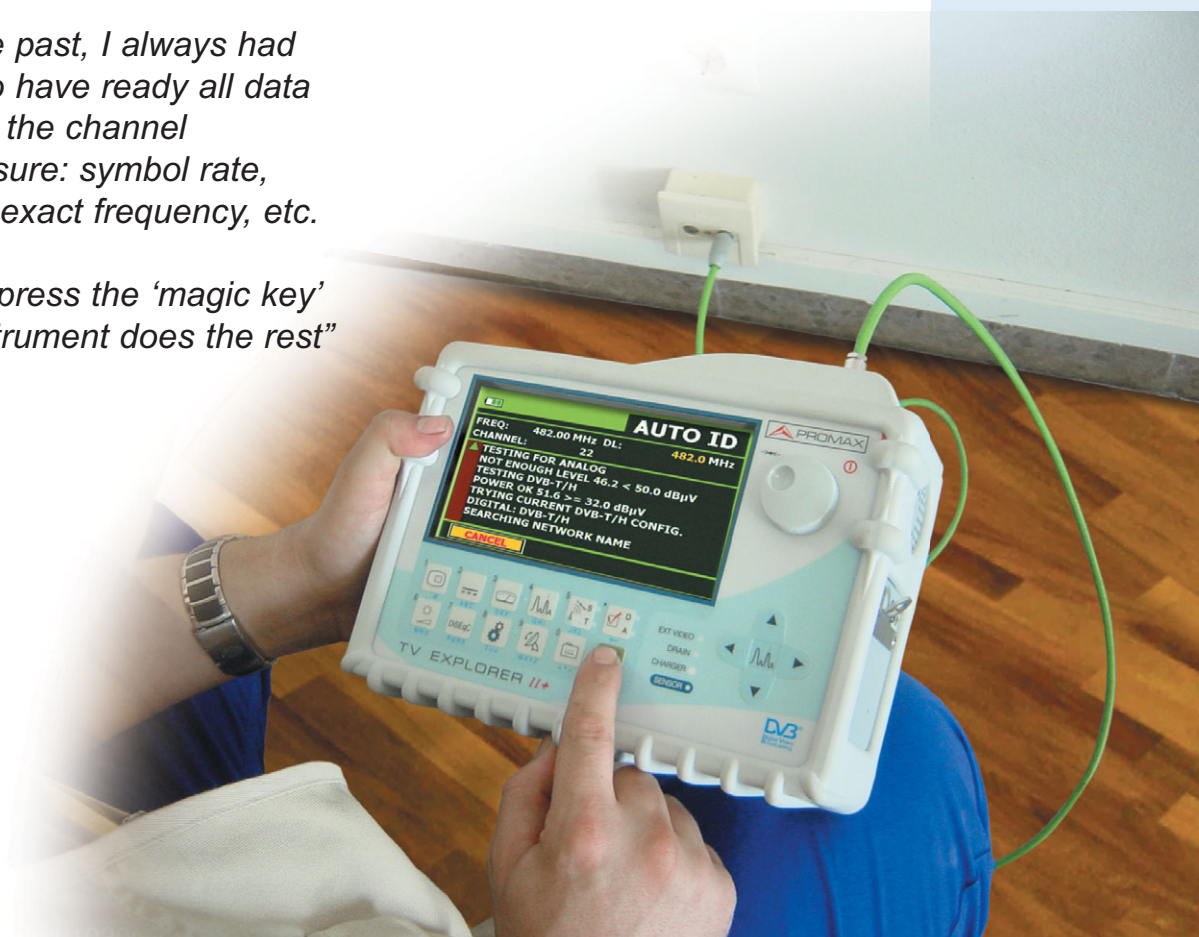
In this way, the **TV EXPLORER** becomes a **fully automatic** and agile instrument, able to detect and to identify all of the channels in a television system. When the conditions of the signal to be identified are too poor, the equipment allows to use the manual configuration.



Auto identification screen

➤ *“In the past, I always had to strive to have ready all data of the channel to measure: symbol rate, code rate, exact frequency, etc.*

*Now I just press the ‘magic key’ and the instrument does the rest”*



★ according to model

## Explorer: *One key and go!*



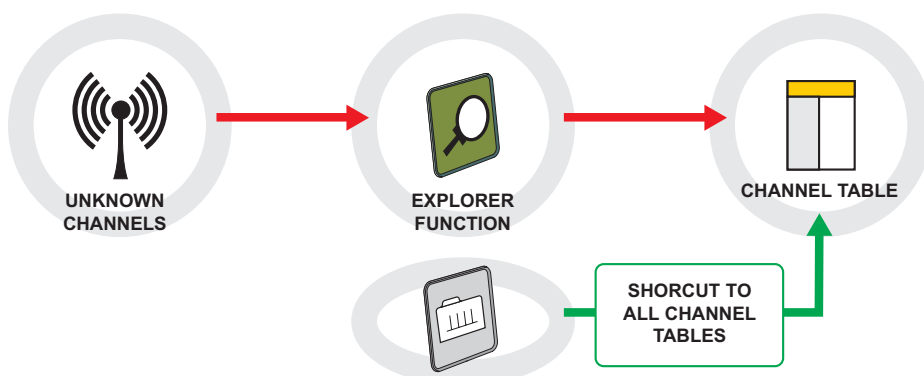
Explorer function screen

When the “**explorer**” key is pressed for a few seconds, a new spectrum exploration session begins. The **TV EXPLORER** makes a dynamic exploration of the spectrum, detecting all the channels in the swept band and identifying all its parameters to lock the signal.

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 measures the channels. It is the analyser on its own that begins by locating all the channels available in the band.

The **TV 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 **TV EXPLORER** is then able to determinate the nature of the signal -analog or digital- (patented function) and the channel bandwidth. It can also automatically identify channel shifts that the instrument will automatically detect.



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. This is specially useful in countries with MFN Digital Terrestrial Television networks where the design of channel plans can be complex.

This feature can help to reduce measuring times dramatically

## Fast channel plan selection



Selecting the active channel table

The **TV EXPLORER II / II+** allows to work with **multiple channel tables**. The use of channel tables facilitates the measurements. The selection of the active channel table is easily made by means of a direct access window.

The activation of this function is through a long push of .



## Measurements:

*Including DVB-S2 and DVB-H ★*

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

Digital terrestrial DVB-T COFDM (2k/8k):

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

Digital mobile DVB-H (only **TV EXPLORER II & II+**):

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

Digital satellite DVB-S QPSK:

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

Digital satellite DVB-S2 8PSK (only **TV EXPLORER II & II+**):

- Power
- C/N
- MER
- CBER
- LBER



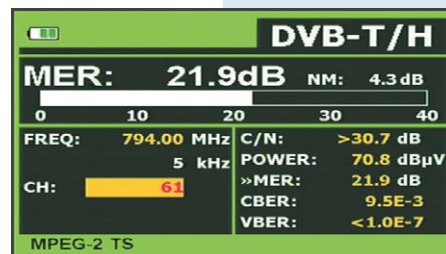
Digital cable DVB-C QAM (16/32/64/128/256):

- Power
- C/N
- MER
- BER
- Noise margin

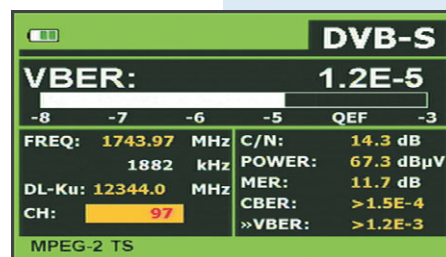
In case of an analog channel:

- Level
- V/A
- C/N

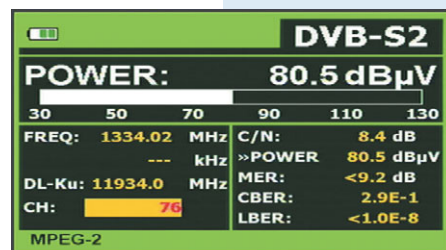
One of the measurements can be selected as a preferred and then it will be highlighted and a graphic bar for this particular measurement displayed in a preferential position. The analyser adapts to the user preferences.



Digital terrestrial / mobile (DVB-T/H) measurements



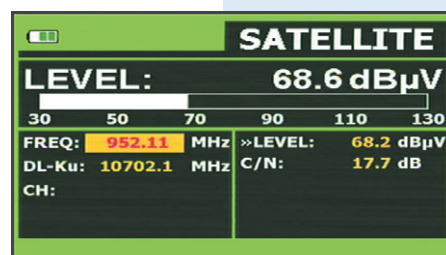
Digital satellite (DVB-S) measurements



HD Digital satellite (DVB-S2) measurements



Digital cable (DVB-C) measurements



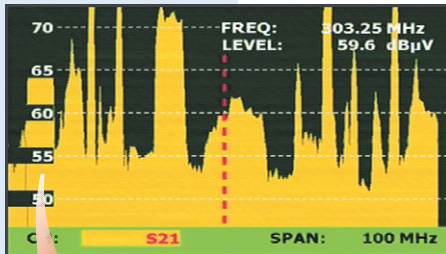
Analog satellite measurements

★ according to model



## Spectrum analyser:

*Direct keys, more intuitive*



Spectrum analyser

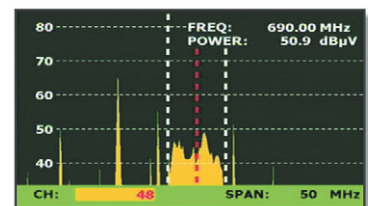
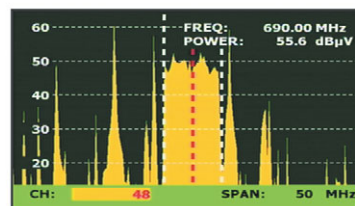
5 / 10 dB/DIV  
(TV EXPLORER II & II+)

➤ The **TV EXPLORER** presents an **innovative** spectrum analyser. **Four arrows** control completely the system making it very intuitive.

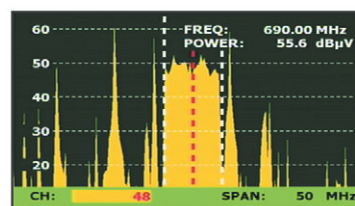
The **“UP-DOWN”** arrows set the reference level, so that when pressing the **“UP”** arrow reference level is increased by 5 or 10 dB. When pressing the **“DOWN”** arrow, the reference level is reduced by 5 or 10 dB allowing to check signals of lower level.

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.

On the **TV EXPLORER II & II+** the measuring filters are variable and selected automatically depending on the span used.



By pressing **UP** key twice, the instrument sets the reference level from 60 to 80 dBµV



By pressing **LEFT** key twice, the instrument sets the **SPAN** from 50 to 16 MHz

## Merogram

### *MER by carrier as a function of time*★

🔴 The **Merogram (patented function)** is a useful function designed to help in the detection of **DVB-T** or **DVB-H** channel reception problems.

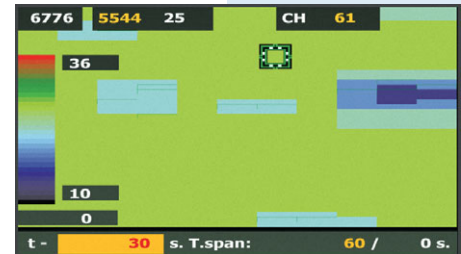
It has been developed to allow for an **early identification of intermittent and sporadic problems** that may happen in limited periods of time.

The **Merogram** function shows in a graphical form the values of **MER by carrier** as a function of time. MER values are represented in a colour scale. The vertical scale shows the different individual carriers that form the COFDM multiplex while the horizontal scale is the time.

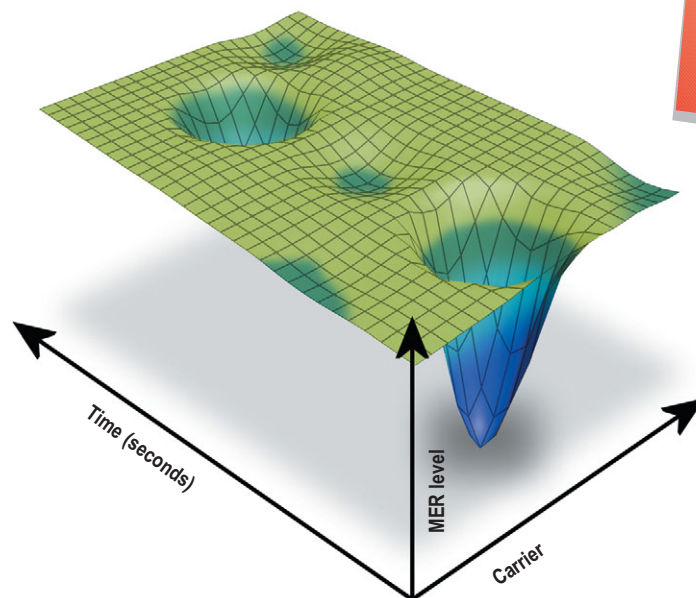
We therefore obtain a colour map like that shown on the picture. There is a cursor that can be moved around the graphic to display the actual MER values and time stamps of the selected area.

Colour spots on the graphic mean signal reception problems that may have affected only part of the multiplex or occurred during a fraction of time to disappear afterwards thus making them impossible to find using other classic functions.

This function is only available for **DVB-T** and **DVB-H** channels.

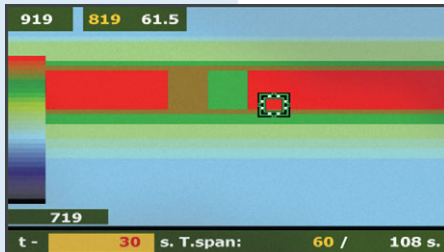


Example of Merogram



# Spectrogram

*Spectrum display as a function of time ★*



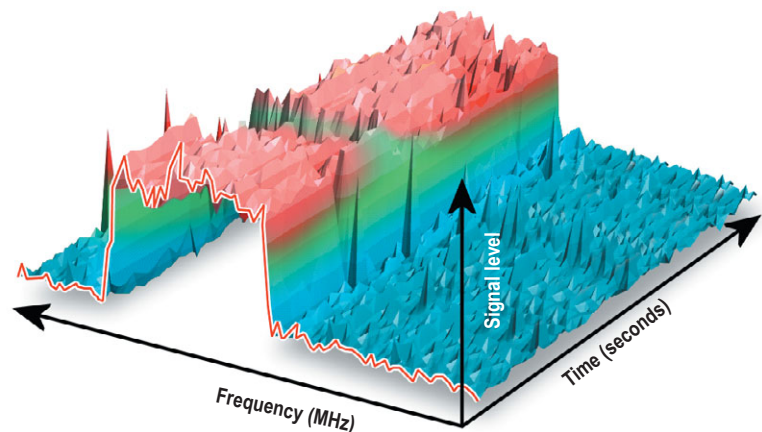
Example of Spectrogram

✎ The **Spectrogram** function (**patented function**), similarly to Merogram, has been designed to **detect problems that affect spectrum analyser** display only in the form of unpredictable random bursts.

The **Spectrogram** is a graphic that shows time in the horizontal scale and the measured frequency span on the vertical scale. Signal levels are then represented by colours.

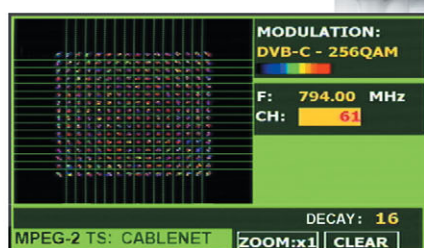
Colour spots on the graphic mean substantial signal reception variations that may be difficult to read otherwise.

The Spectrogram function, unlike Merogram, can be used for all sorts of signals within the frequency range of the **TV EXPLORER II+** not being limited by their modulation scheme.



## Constellation diagram:

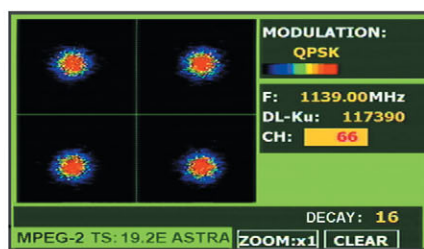
*Detecting impairments at a glance★*



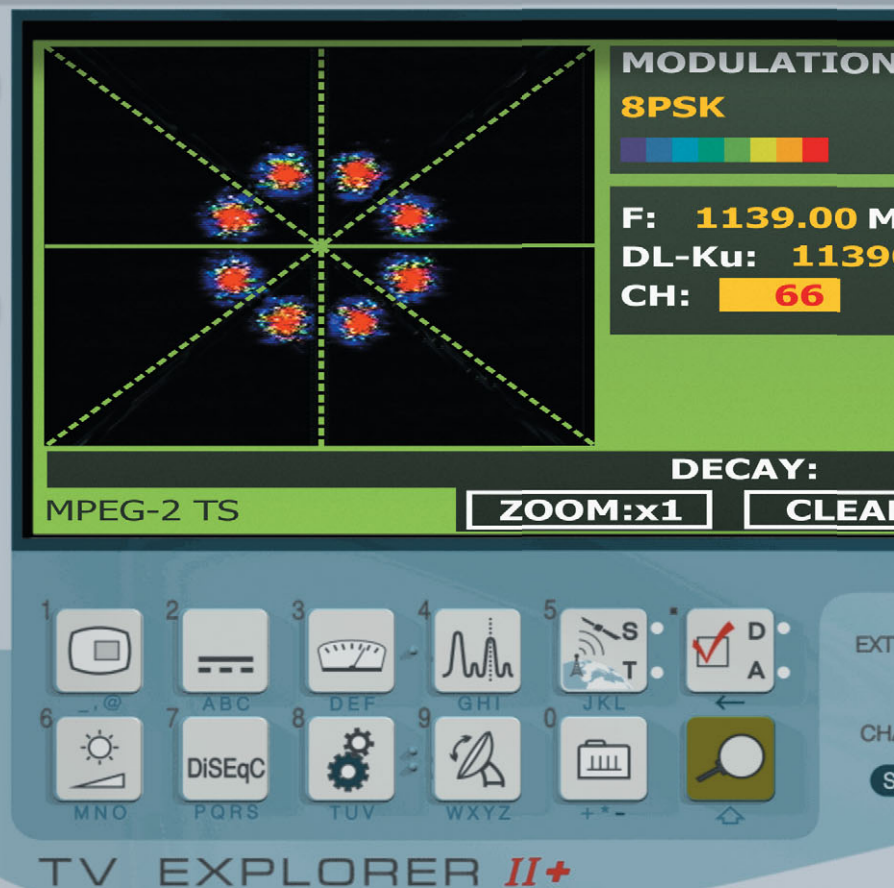
QAM 256 constellation



COFDM constellation



QPSK constellation



“This function is helping me a lot.”

By just looking at the shapes, I learned to read the quality of the systems.”



➤ The **constellation diagram** is a graphic representation (called I-Q) of the digital symbols received over a period of time.

There are different types of constellation diagrams for the different modulation modes. With the **TV EXPLORER II** & **TV EXPLORER II+** it is possible to display constellations for DVB-T/H, DVB-C, DVB-S and DVB-S2 signals.

In case of an ideal transmission channel, free of noise and interferences, all symbols are recognised by the demodulator without mistakes. In this case, they are represented in the constellation diagram as well defined points hitting in the same area and forming a clear dot.

Noise and impairments cause the demodulator to not always read the symbols correctly. In this case the hits disperse and create different shapes that at the end will allow to determine at a glance the **type of noise** in the signal.

Every modulation type is represented differently. A DVB-C 16QAM signal is represented on the screen by a total of 16 different zones, and a DVB-C 64QAM is represented on the screen by a total of 64 different zones and so on.

The constellation shows in different colours the **density** of hits and includes zooming and scrolling possibilities and also a clear button to clean the picture.





## Decoding:

### MPEG-2 picture and MPEG-4 detection

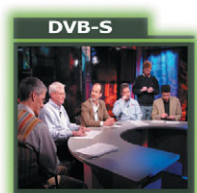
➤ In this mode the signal will be decoded according to its standard.

When decoding an analog channel (cable or terrestrial only), the **TV 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, it is possible to display the **SERVICE LIST** and it shows all the programs and services available within the tuned channel. Selecting one particular program or service becomes **very intuitive** using the encoder and/or the arrow keys to show all the data related to the program.



TV EXPLORER decoding a DVB-S program



Signal type and decoded MPEG-2 image.



Type (TV, radio, data), OSD (ON-OFF), encrypted or free, MHP

**ASTRA-VH CHANNEL: 100**  
**F: 1922.00 MHz DL: 125220**

Channel plan, frequency, channel and downlink frequency.

**VIDEO:**  
**MPEG-2 2797 kb/s**  
**MP@ML 720x576i 4:3**  
**VPID: 111 TSID: 97 25Hz**

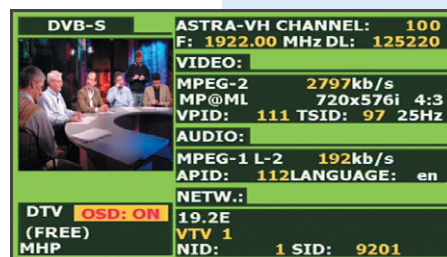
Video Stream type, bitrate, profile&level, frame size, aspect ratio, frequency, video PID, transmitter ID

**AUDIO:**  
**MPEG-2 L-2 192kb/s**  
**APID: 112 LANGUAGE: en**

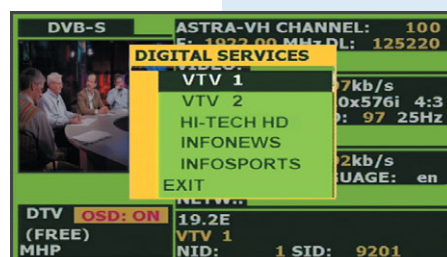
Audio stream type, bitrate, audio PID and coded language

**NETW.:**  
**12.9E**  
**VTV 1**  
**NID: 1 SID: 9201**

Network name, service name and network & service identifiers



Complete details on the channel



Other DVB-S services on the multiplex

If the program selected uses MPEG-2 compression, the picture and audio appear together with the program data for a few seconds and then using the whole screen. If it is MPEG-4, it will be possible to detect the program data such as name of the channel, bitrate, etc.

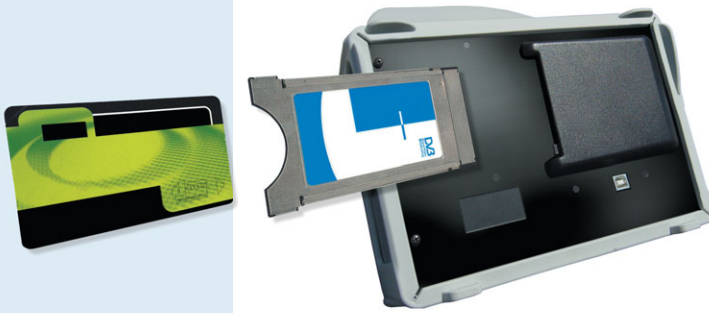
With the **TV EXPLORER II+** it is possible to use the CAM module interface to decode and display some types of MPEG-4 programs even if they are encrypted.



A MPEG-4 channel in this service

## Decoding encrypted channels:

*Using PROMAX patented technology ★*



➤ The **TV EXPLORER II+** includes a CAM slot that allows **decoding encrypted** channels.

The use of encryption systems is widely spread in digital pay TV. The operator encodes the signals and the subscriber can get a *Smart Card* giving access to those channels.

Today there are solutions to use MPEG-4 decoders implemented in the size of a CAM card. In these cases, using the suitable smart card, it is possible to decode MPEG-4 programs.

## SCART and USB interface

*... for signal and data ★*



➤ Through the SCART connector the **TV EXPLORER** can be connected to a television set so that measurements, spectrum, picture, etc can be displayed in a larger screen. This is very useful in applications such as monitoring or education.

In the same way, the SCART connector can be used to input signal from cameras, High Resolution receivers, etc.

The USB interface allows the connection of the instrument to a PC. With the software provided it is possible to always keep the **TV EXPLORER II / II+** updated with the latest firmware version. The USB also allows handling channel tables, dataloggers, downloading of information to print reports, etc.



★ according to model

# Automatic measurements

## Datalogger

### Run a datalogger

The process is simple, just run the application and the instrument takes all the measurements.

When running the datalogger, the **TV EXPLORER** starts a **sweep** of all the channels in the active channel plan and stores all the measurements: channel power, carrier/noise, BER, MER, etc.

| DATALOGGER                           |              |        |            |
|--------------------------------------|--------------|--------|------------|
| 9/38                                 | LYS HOTEL    |        |            |
| TEST POINT:                          | ROOM1        |        |            |
| CHANNEL SET:                         | MAIN HEADEND |        |            |
| FREQ:                                | 794.00 MHz   | C/N:   | 22.7 dB    |
|                                      | -1 kHz       | POWER: | <52.4 dBμV |
| CH:                                  | 61           | MER:   | 3.5 dB     |
|                                      |              | CBER:  | 4.7E-2     |
|                                      |              | VBER:  | 1.7E-5     |
| DVB-T/H. MPEG-2. MEASURING... 16 Sec |              |        |            |
| CANCEL                               |              |        |            |

Datalogger taking automatic measurements

### One Logger, several Test points

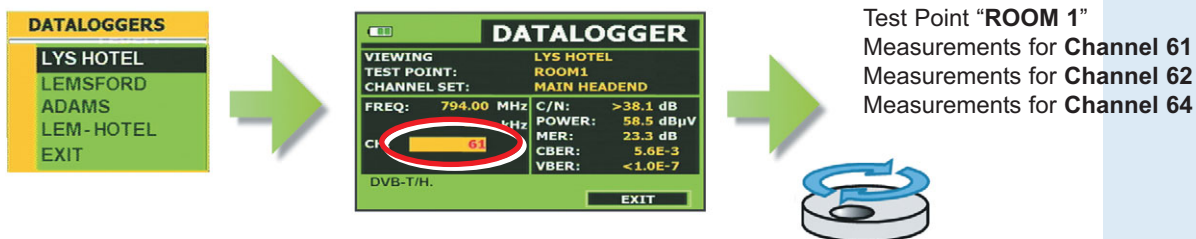
Every acquisition becomes in fact a **Test Point** inside a **Logger** and both the Logger and the Test Point can be personalised.

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 made, for instance bedroom, kitchen, etc.

### View all channels on a Test Point

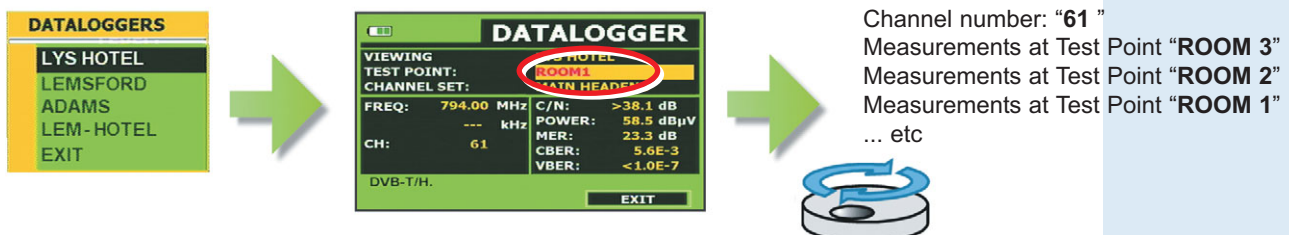
All the data previously acquired can be checked using the **view datalogger**. If the cursor is set over the channel, you can view the measurements of all channels on the present Test Point.

This function is very useful to **check** the channel equalisation.



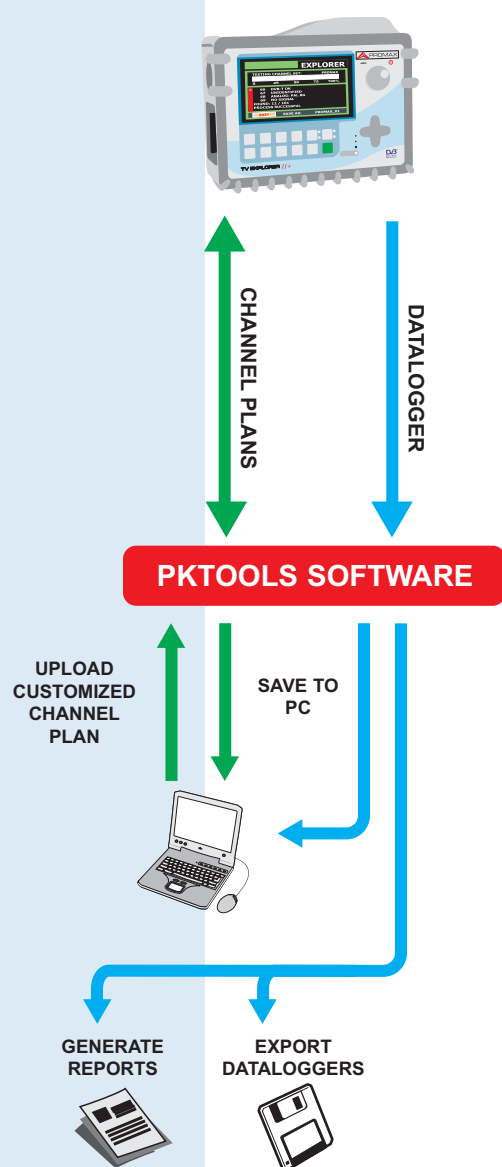
### View one channel in each Test Point

If the cursor is set over the Test Point when turning the encoder you can view the measurement of the present channel in all the test points. This function is specially useful to check the signal drop along the system.



## PkTools:

*Printing reports, channel table set up...*



➤ **PKTools** software (ordering reference: **RM-104**) was developed to work with all PROMAX analysers including the **TV EXPLORER** range.

The instrument connects directly to the USB or RS-232C interface in your PC, the **PKTools** software identifies it and automatically sets all configuration parameters required so that the user can easily access to the data stored in the **TV EXPLORER** memory.

### ➤ Working with channel plans

A **channel plan editor** allows to modify channel tables saved in the meter's memory which can be *STANDARD* or *MODIFIABLE* (generated automatically using the **EXPLORER** function). The **PKTools** software offers the following possibilities:

- Create or delete channel tables
- Add or remove delete-protection
- Add, delete or modify channels
- Edit advanced channel settings (channel spacing, digital parameters, LNB settings, offset,...)
- Save or retrieve channel tables from the PC
- Edit channel tables stored in the PC or in the meter's memory
- Upload channel tables to the **TV EXPLORER** memory

### ➤ Data acquisition: view, save and print reports

It is very easy to make measurements and data acquisition sessions with **TV EXPLORER**. In the same way **PKTools** helps you to process and print the information in different formats.

Using **PKTools** software you will be able to transmit to computer in an easy and fast way all measurements stored and required by the different authorities and legal applications, therefore you can **automatically generate the measurement tables** to be included on the installation certificate of compliance.



Data can also be **exported** to CSV files, a format compatible with most of the data bases, spreadsheets and many other software applications. In this way the user can create tailored data reports, generate graphs, etc.

## Cable test

### *Certify the installation*

➤ 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**, **RP-080** and also **RP-250** signal generators.

The main difference is the RP-050 covers **satellite IF** while the RP-080 covers also the **terrestrial** band. The RP-250 is an **agile signal generator** with selectable frequency and level across the 5-2500 MHz band.

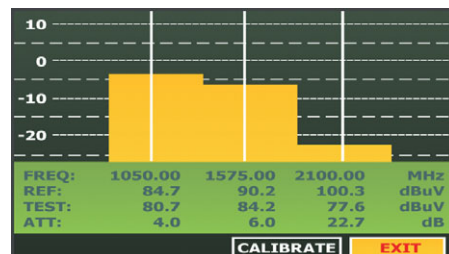
The procedure allows to evaluate the frequency response across the whole TV signals distribution network by means of two steps.

#### ➤ Step 1: Calibrating with TV EXPLORER

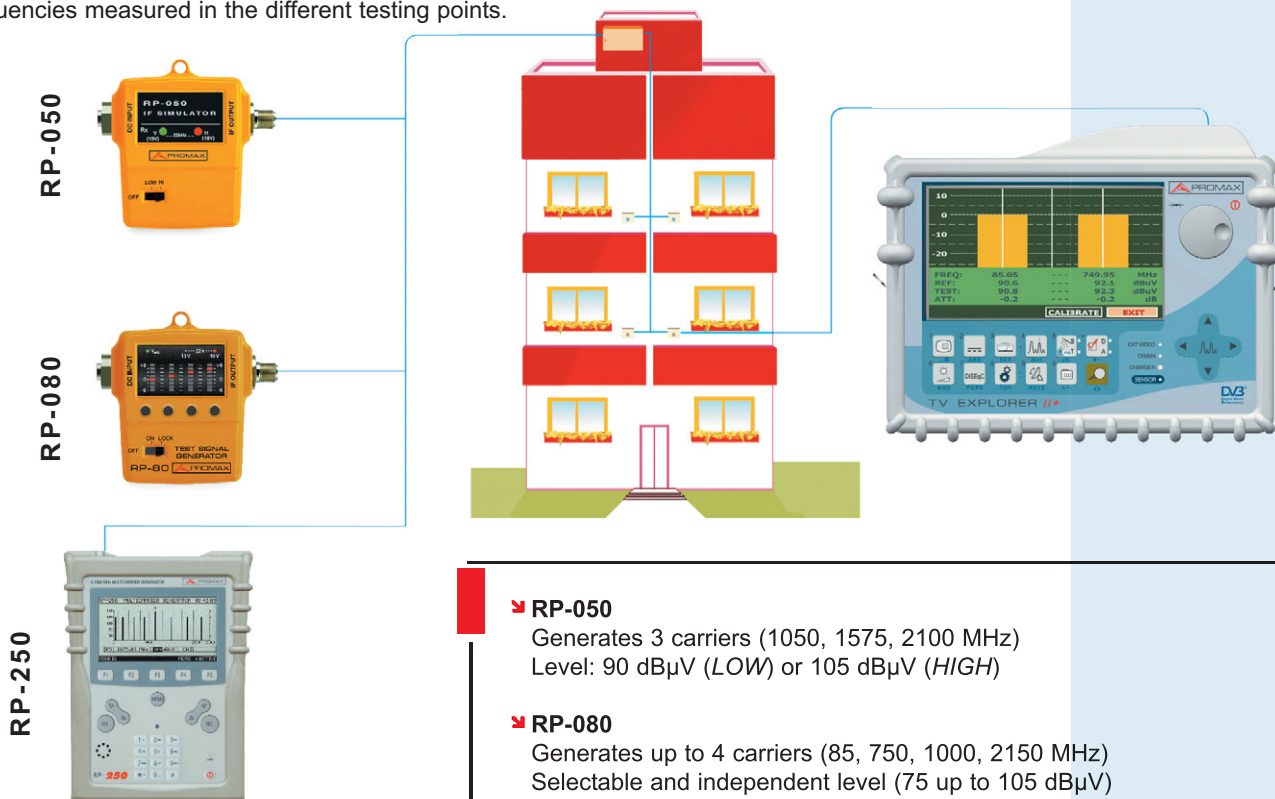
Connect the generator directly to the **TV EXPLORER** and calibrate. The instrument compensates all the cable and connector drops and sets signals at the detected frequencies as the **reference**.

#### ➤ 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 pilot frequencies measured in the different testing points.



IF test using RP-050



#### ➤ RP-050

Generates 3 carriers (1050, 1575, 2100 MHz)  
Level: 90 dBμV (LOW) or 105 dBμV (HIGH)

#### ➤ RP-080

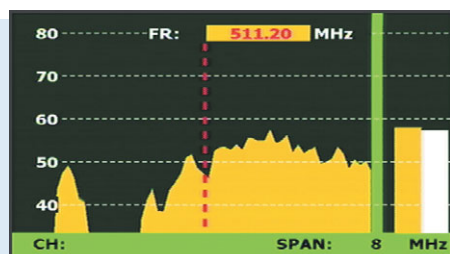
Generates up to 4 carriers (85, 750, 1000, 2150 MHz)  
Selectable and independent level (75 up to 105 dBμV)

#### ➤ RP-250

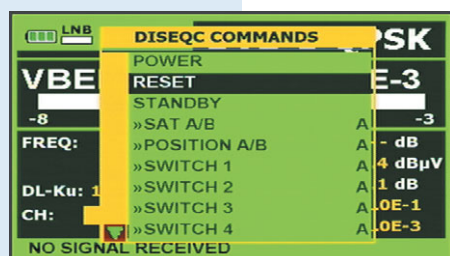
Generates up to 8 carriers (UHF, VHF, sub band, ISM, SAT)  
Selectable and independent level (90 up to 110 dBμV)

## Antenna installation:

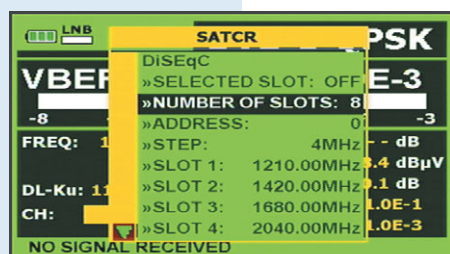
### *DiSEqC™ & SaTCR commands*



Antenna alignment screen



Some of the DiSEqC™ commands available



Some of the SaTCR commands available

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

A specific function has been developed to **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.

### ➤ Supply voltage

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

### ➤ DiSEqC™

DiSEqC™ is an open communications protocol created by Eutelsat. It consists of control commands overlapping the supply voltage that are recognised by receivers and other devices. They are used to switch polarities, bands, move motors, etc.

### ➤ SaTCR commands

The **TV EXPLORER** includes SaTCR commands as well.

## Automatic detection of saturation

### *Adjust easily maximum gain*



Adjusting the head-end

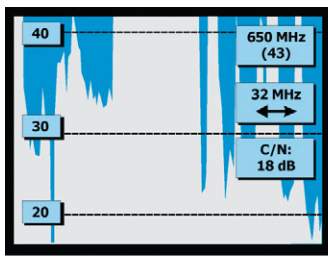
➤ This function is very useful to identify problems related to the distortion or excess of amplification of the analog channels, that can occur in the mast, system or distribution amplifiers.

When the gain in the head-end of a distribution system is too high, it can cause saturation. If the signal that arrives at the **TV EXPLORER** suffers saturation, the “detection of saturation” symbol appears on the screen. This function is very useful to find the **maximum gain** adjust of analog channel amplifiers.

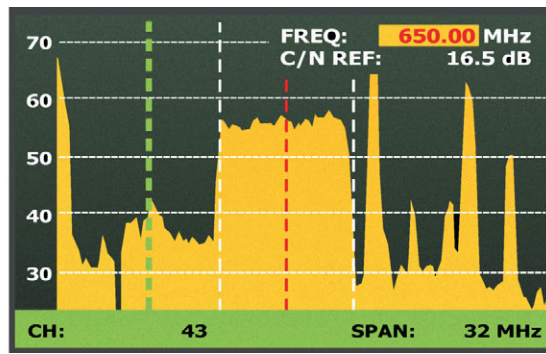
## Spectrum analyser automatic scale search: *One step ahead in automation*

TV EXPLORER users have considered that the control of the spectrum analyser based in the four arrow keys is a very valuable innovative function. The goal was to add as much automation as possible in the meter's user interface to make technicians job faster.

Continuing on with this philosophy PROMAX wanted to offer more in the TV EXPLORER II and TV EXPLORER II+. The **reference level** in the spectrum analyser function is initially set automatically to **the best value** based on the power of the signal shown.



With other meters



With a TV EXPLORER II / II+

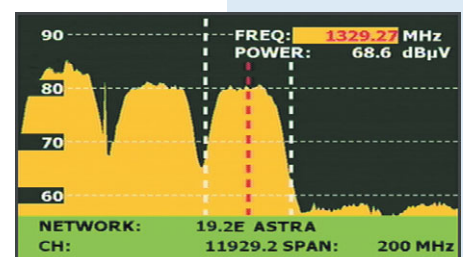
The reference level is instantly adjusted by the TV EXPLORER II / II+ as we enter the spectrum analyser function. The graphic shown is then ready to be analysed with all its ups and downs with no additional key strokes.

## What satellite is this?

*"... another world's exclusive on the TV EXPLORER"*

When using "AUTO-IDENTIFICATION" function from spectrum analyser or antenna alignment modes the TV EXPLORER provides information about the origin of the signal. If in Satellite mode, the information shown is the **orbital position** and the **satellite**.

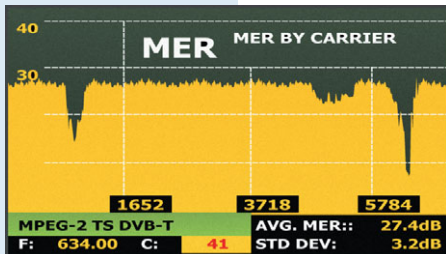
This is also valid for digital channels on DTT or Cable TV



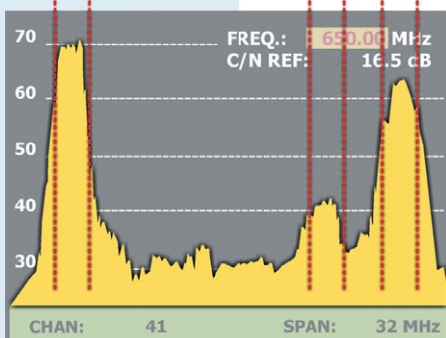
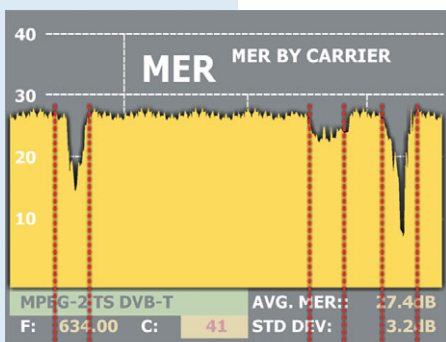
Spectrum showing signal identifier

## MER by Carrier measurement for COFDM

*Discover invisible signals*



"MER by carrier" function  
Measurement of MER for each one of the carriers



We can confirm that this is the source of the problem  
just by comparing the graphic with the spectrum analyser  
display of an analogue channel

➤ **MER** measurement of a COFDM multiplex has been considered until now as the **average of the individual MER** measurements for each of the carriers (about 8000 in a 8k system for instance) in the tuned channel. Sometimes reception quality is degraded by interfering signals that **can not be detected** unless we have very special analysis tools.

The **MER by Carrier** function uses a new extremely advanced algorithm that in a matter of seconds analyses the **MER for each of the carriers** forming the selected channel and displays it continuously in a graphic form.

It is a measurement exclusive to the **TV EXPLORER II+** that will turn out to be very useful during the transition to digital TV where we often find **cases that are difficult to troubleshoot** in which signals of different types and sources interfere among them.

An example where we use channel MER to analyse an 8K COFDM multiplex is shown on the left. We notice that there are 3 areas in the graphic where MER is degraded which tell us that an analogue channel may be present underneath.

If we compare this graphic with the spectrum analyser display of an analogue channel we realise that in effect the video, audio and colour carriers **affect** more intensively the MER of those digital multiplex carriers located at the same frequencies.

Fortunately the COFDM channel in this case is strong enough to be affected by this interference.

It is interesting to point out that **this interference could not be detected in any other way** for it can't be seen on the spectrum analyser and it is not strong enough to degrade the average MER, CBER or VBER readings substantially.

## Screen capture:

*Watch on the meter and download to PC*

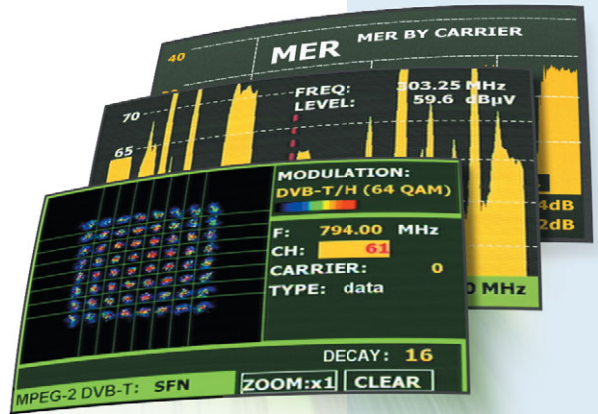
➤ The **TV EXPLORER II+** comes with 1 GB of internal memory that is exclusively available for user data.

The **TV EXPLORER II+** offers beside the video stream recording feature the possibility to take screen shots of the following functions:

- Spectrum analyser
- MER by carrier
- Constellation diagram

It is very easy to use. Users only need to select this option and the file with the screen capture will be saved in the **TV EXPLORER II+** internal memory.

The file can be retrieved and shown on the meter's display or can be saved to a PC to be included in measurement reports or to be processed using software applications, etc.



## Recording video streams

*Keep trace on the video impairments ★*

➤ The **TV EXPLORER II+** includes a function that allows to **record** video streams in the field and **play** them. This is a very interesting feature when it comes to analyse problems that can require some further study or interpretation.

**VIDEO  
STREAM**



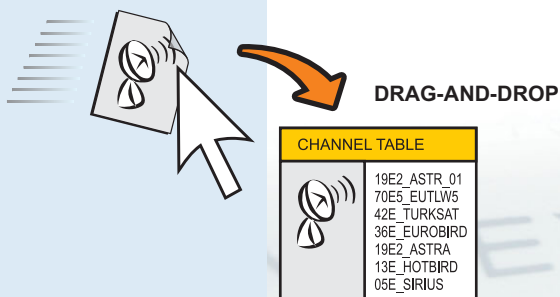
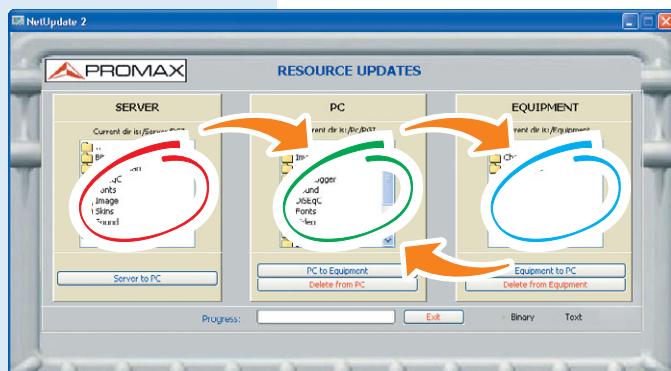
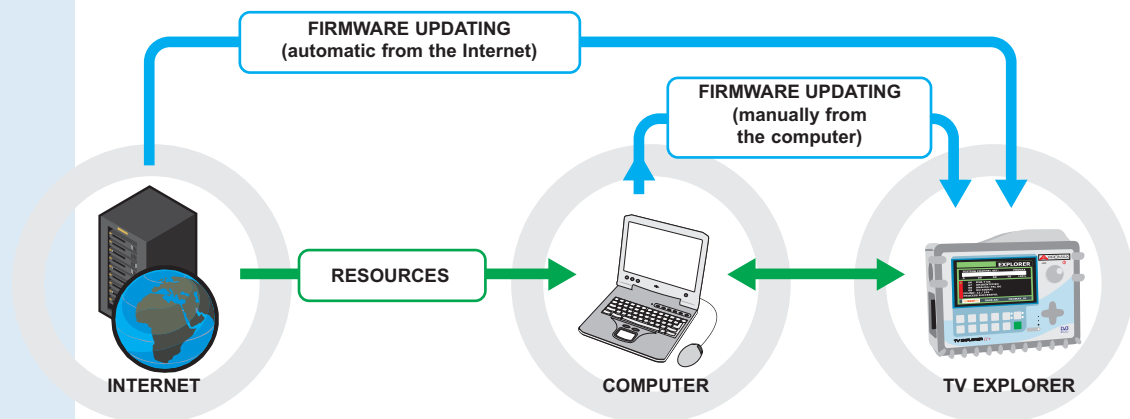
★ according to model

## NetUpdate:

*Much more than just updating firmware*

➤ **Updating the firmware** of your analyser had never been as simple as with the **NetUpdate**.

This software application detects any **TV EXPLORER** connected to the computer, it **connects to Internet** and it checks if a more recent version of firmware exists. If this is the case, it suggests the installation and it begins an **automatic update process**. This software is freeware and available at the PROMAX site.



### ➤ TV EXPLORER resource updates

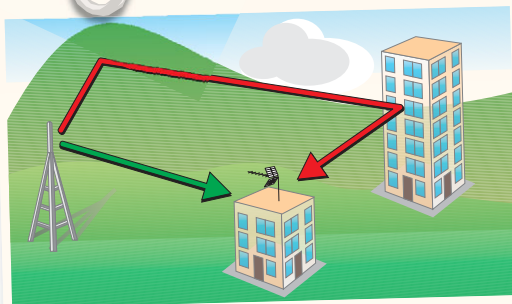
New **resources** for the **TV EXPLORER** are made available in the PROMAX server from time to time. The satellite channel tables for all satellites are included among these resources.

### ➤ Data transfer and backup

The NetUpdate can also be used to make to transfer dataloggers, captured screens, video etc and to **make backups** of the **TV EXPLORER** resources. The memory contents can be downloaded to the computer using the "drag-and-drop" technique:

- Dataloggers
- Screen captures
- Video streams
- Standard or tailor made channel plans
- Other resources

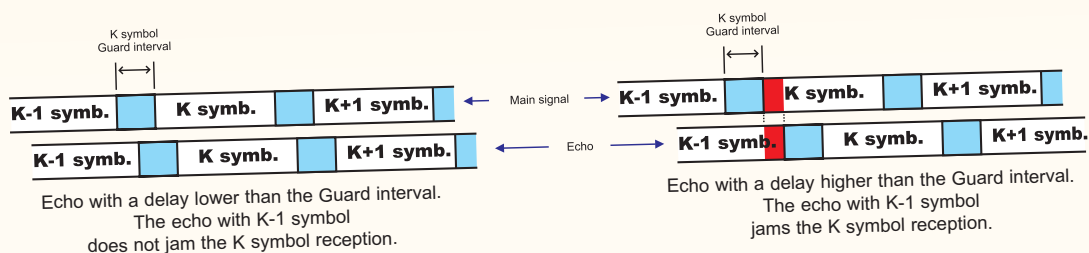
## The “ECHOES” on the DTT reception



During DTT broadcasting some echoes may appear due to the signal reflections on big objects such as buildings, mountains etc. Trying to overcome this inconvenience, the DVB-T standard defines the “Guard interval”, in this way the receptor does not take into account the replicated signal received during this period of time.

The user fixes the **Guard Interval** depending on the broadcasting characteristics and the geographical area where it takes place.

For that reason, those echoes that are predicted, when the delay is lower than the Guard interval, do not significantly affect the reception signal quality.

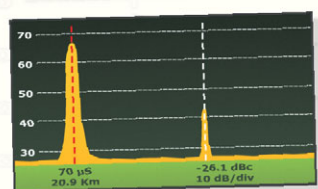


The echoes that are received out of the Guard interval affect the quality of the received signal and in a lot of cases the reception will be impossible. It depends on the delay and the amplitude of the echoes.

This situation may occur both in MFN (*Multiple Frequency Networks*) and SFN (*Single Frequency Networks*). The first case, MFN, the echoes come from the reflections of the original signal, whereas in SFN echoes can also appear that come from other broadcasts, maybe far away from the original but at the same frequency.

Trying to reduce as much as possible all the echoes effects, the installer should also try to reposition the receptor antenna according to the direction of the main emitter and try to reduce the others echoes received by the secondary lobes.

To make easy this task the range of TV EXPLORER II/II+ has a function specially designed to view the echoes.



## Intense echoes detection using the “MER by carrier” function of the TV EXPLORER II+

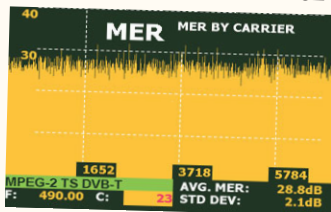
The “**MER by carrier**” function allows to detect in a visual way the intense echoes received by any reason. This function is exclusive for the **PROMAX TV EXPLORER II+** analyzer.

To sum up, the presence of echoes in the DTT channels reception produce a ripple. It is shown in the **MER by carrier** graph:

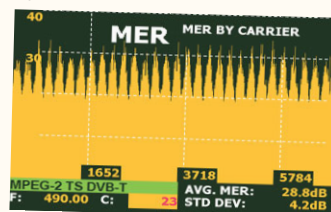
- ✓ The faster the ripple is, the longer the echo delay is (according to the main signal). 
- ✓ The higher the ripple amplitude is (see standard deviation in the graph), the higher the echo power is received. 

The next figure shows a real example of the echo effects in the **MER by carrier** graphic for a DTT signal with the following parameters:

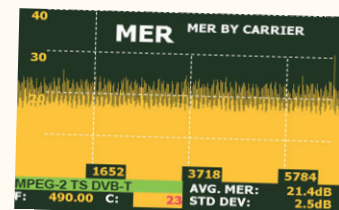
- ✓ COFDM modulation
- ✓ Number of carriers: 8K
- ✓ Channel Bandwidth: 8 MHz
- ✓ Guard interval: 1/32 (28  $\mu$ s)



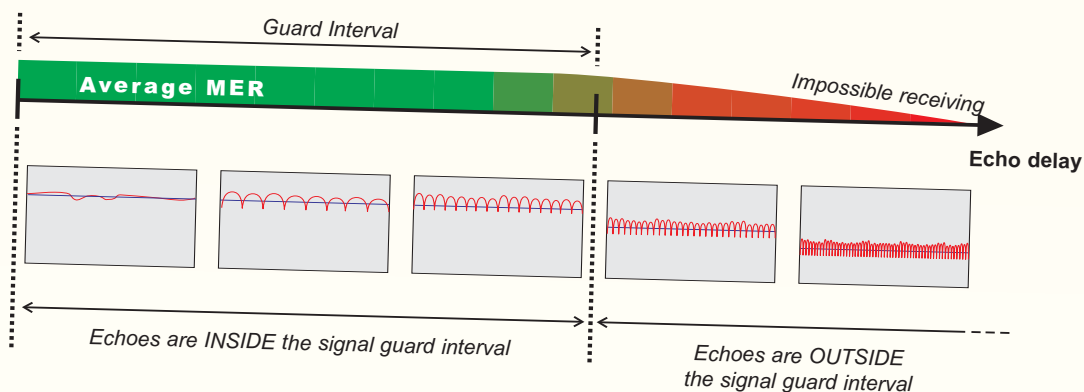
MER by carrier for a COFDM channel without echoes.



Echo effect inside the Guard Interval (4  $\mu$ s). The ripple is observed in the graph, but the average of MER is not practically affected.



Echo effect out of the Guard Interval (40  $\mu$ s). The ripple is observed in the graphic and the average of MER has significantly lessened.





## DC-229 Transport case

This heavy duty suitcase is included with **TV EXPLORER II** and **TV EXPLORER II+**. It is ideal for extra protection during transport.



## DC-267 Carrying bag

This soft carrying bag is adequate for external use. It is specially recommended for working under wet weather conditions.



## NG-281 / NG-282 Noise generators

- NG-281: from 5 to 1000 MHz Level 70 dB $\mu$ V, flatness  $\pm 2$  dB
- NG-282: from 20 to 2000 MHz Level 50 dB $\mu$ V, flatness  $\pm 3$  dB
- Power supply: batteries or external power adaptor



## RP-250 Multicarrier generator

- 5 to 2500 frequency range
- Generates up to 8 carriers (3x UHF / VHF, 3x SAT, 1x Sub Band, 1x ISM)
- Levels: 90 to 110 dB $\mu$ V



## RP-050 IF satellite generator

- Generates three pilots at 1050, 1575 and 2100 MHz for testing satellite TV networks prior to signal being available.
- RF levels: 90 & 105 dB $\mu$ V
- Power supply included



## RP-080 SAT & Terrestrial simulator

- Generates four pilots at 85, 750, 1000 and 2150 MHz with selectable level for testing TV and SAT networks prior to signal being available.
- Levels: 75 to 105 MHz



## CV-245 / CV-589 2.4 / 5.8 GHz band converter

- Converts signals from ISM 2.4 GHz or 5.9 GHz (depending on model) to IF satellite band
- Supply from the signal level meter



## AMC/1 Master aerial

- Connected to any field strength meter is able to find the intensity of the electric field in any location.

Please visit [www.promaxelectronics.eu](http://www.promaxelectronics.eu) to get more information or contact our distributor: