PROMAX

Spectrum and TV Analyzers

TV, SATELLITE, CABLE and OPTICAL FIBRE
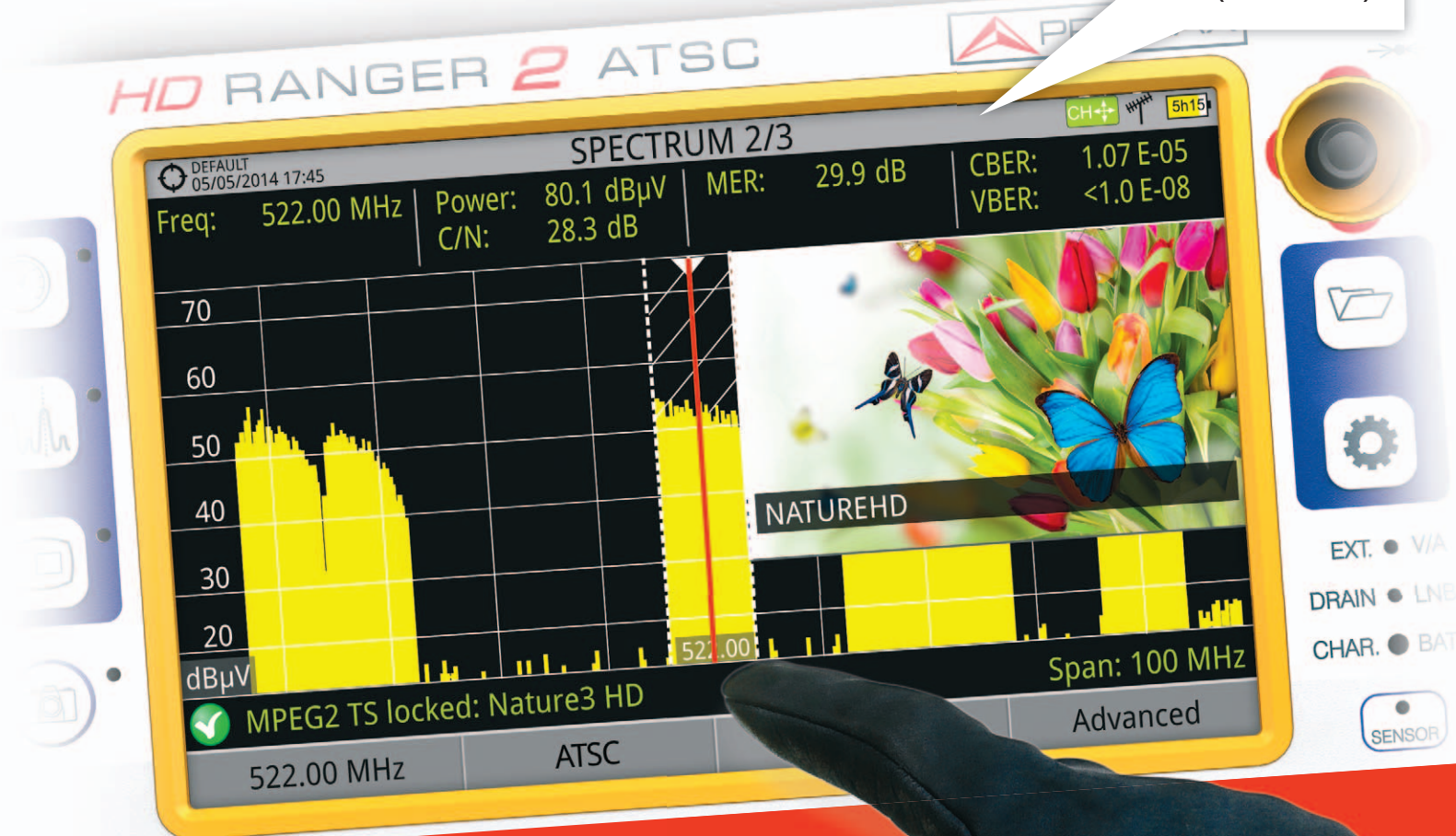
FULL FEATURED ANALYZER FOR
NORTH AMERICAN TELEVISION

HD RANGER 2 ATSC

SPECTRUM 2/3

DEFAULT
01/01/2012 00:00

| Freq: | 570.00 MHz | Power: | 75.0 dBµV | MER: | 29.4 dB | CBER: | 3.9E-04 |
| | | C/N: | >31.3 dB | | | VBER: | <1.0E-08 |

WorldNature HD

Span: 100 MHz

MPEG2 TS   TA1C   ATSC   Tools   Advanced
CH 33

EXT. ● V/A
DRAIN ● LNB
CHAR. ● BAT.

SENSOR

DOLBY DIGITAL PLUS   ip.tv   DVBC/S/S2   TRANSPORT STREAM ANALYZER · RECORDER · PLAYER   5 GHz RF INPUT   ASI-TS IN&OUT   HDMI   R·D·S

www.promaxelectronics.com

PROMAX

HD RANGER **2** ATSC

SPECTRUM 2/3

DEFAULT
05/05/2014 17:45

Freq: 522.00 MHz | Power: 80.1 dBµV | MER: 29.9 dB | CBER: 1.07 E-05
C/N: 28.3 dB | VBER: <1.0 E-08

NATUREHD

dBµV   522.00   Span: 100 MHz

✓ MPEG2 TS locked: Nature3 HD

522.00 MHz | ATSC | Advanced

EXT. ● V/A
DRAIN ● LNB
CHAR. ● BAT.
SENSOR

Touch to believe!

High resolution 7" touch screen
It helps you work easier and faster

The *HD* RANGER *2* features a new touch screen with excellent brightness and superior image sharpness. You will ~~see~~ **touch** the difference! It can also be used wearing gloves.

Improved mechanical design
Setting new standards for handheld field strength meters

Ergonomic handle, tripod coupling, specially formulated chassis composition and more... make the *HD* RANGER *2* robust, compact and ready for the hazards of the field work.

Hybrid operation
Touch or no touch. Your decision

The control software is designed in such a way that the meter can be fully operated using both the touch panel and the conventional keyboard.

Smart battery control
5 hours battery operating time

4:05'
0:15'

The *HD* RANGER *2* uses a high quality, long operating time Li+ battery and a special control system that shows the remaining battery time. This is also useful to know at any instant what the exact battery charge situation is.
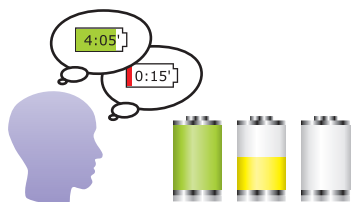
Triple split display

3 functions in a single screen

Fast & accurate spectrum analyzer
90 ms sweep time & amazing resolution

Variable span, 10, 5, 2 or 1 dB/DIV vertical scales, max and min hold, persistence control, etc... are some of the outstanding features of the *HD* RANGER *2* spectrum analyzer function.

Spectrogram
Identifying random interferences at a glance

This function has been developed to allow an early detection of intermittent impairments that may occur in very short periods of time and can not be monitored otherwise.

StealthID
Identifying the tuning parameters

The *HD* RANGER *2* StealthID function automatically identifies the required demodulation settings while tuning so that you don't need any previous information about the signal.
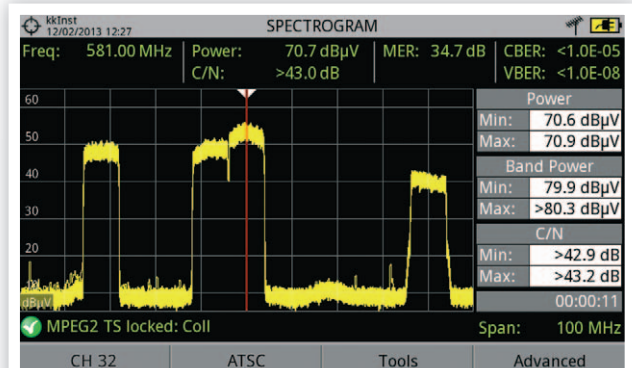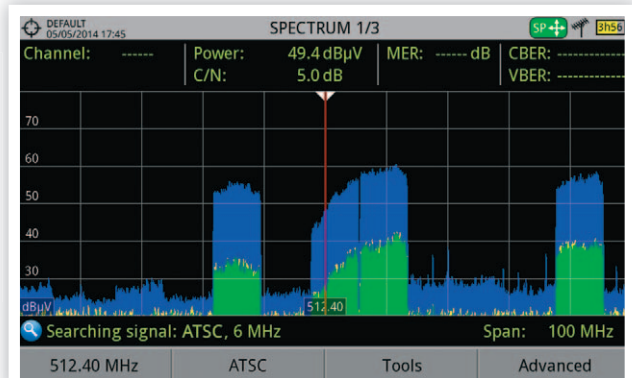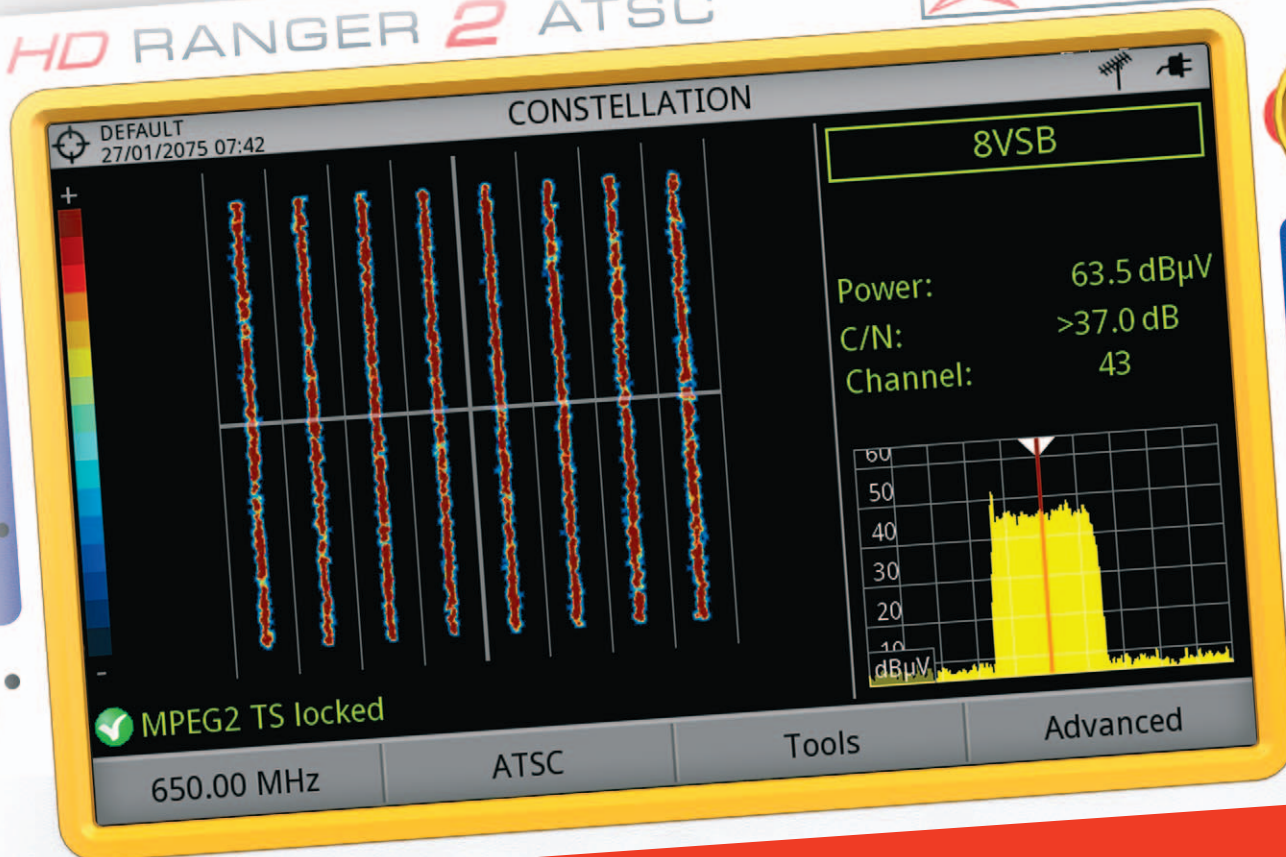
Constellation diagram

8 VSB constellation
### Detecting signal impairments at a glance

The constellation diagram is a graphic representation of the digital symbols received over a period of time. There are different types of constellation diagrams for the different modulation modes. Terrestrial, Cable and Satellite constellations are available on the *HD* RANGER *2*.

16/32 APSK, 8PSK and QPSK constellation

In the 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.
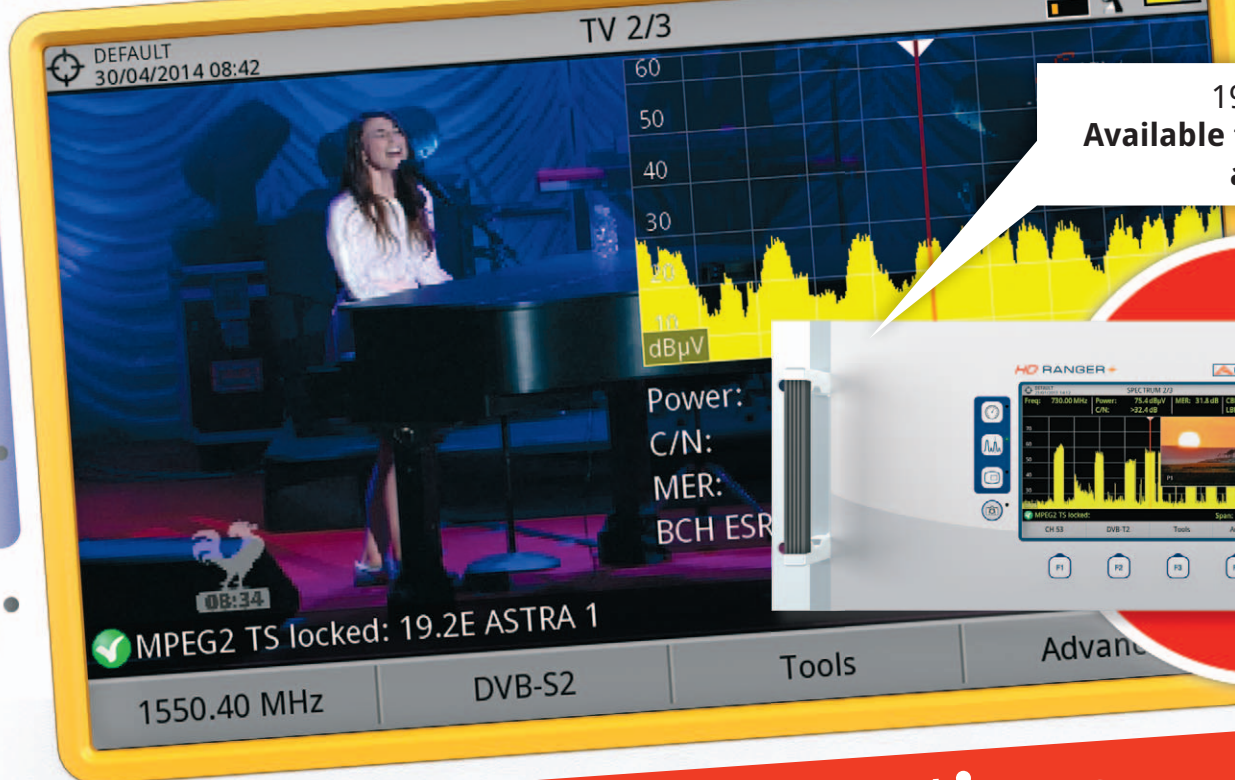
16, 32, 64, 128, 256 QAM

Every modulation type is represented differently. A ITU J.83 Annex B 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.
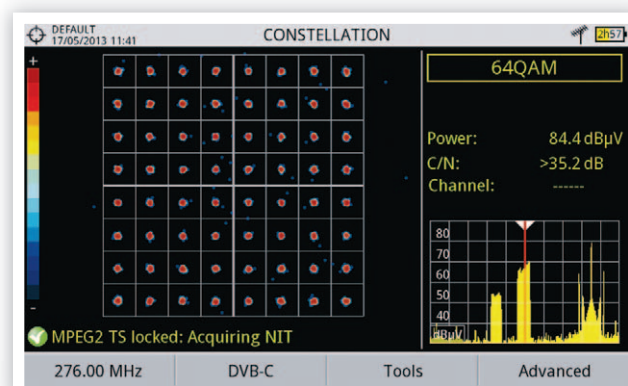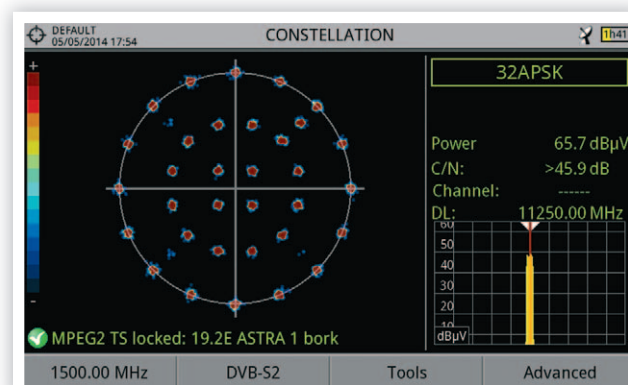
19" RACK VERSIONS
Available for *HD* **RANGER** **2**
and *HD* **RANGER** *+*

Advanced satellite functions

DVB-S2 multistream

Advanced modulation techniques combine several independent transport streams into one single RF carrier. Selecting a specific TS is easy with your *HD* RANGER *2* using the ISI Filtering function.

PLS - Physical Layer Scrambling

The PLS index is a number generated by the broadcaster that must be properly decoded by the customer so that demodulation is possible. *HD* RANGER *2* can also work with these type of signals.

Beacon - Flyaways, SNG and VSAT
Helping live broadcast in remote areas

The *HD* RANGER *2* spectrum analyzer function makes it easy for technicians working in VSAT applications to set up their satellite transmission-reception systems.
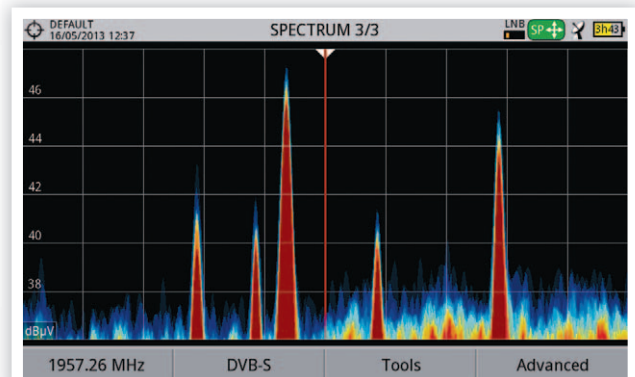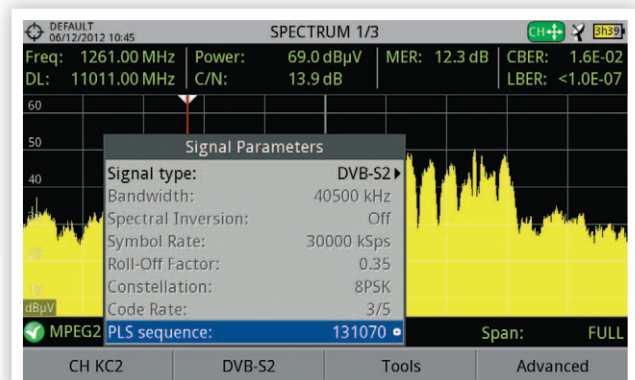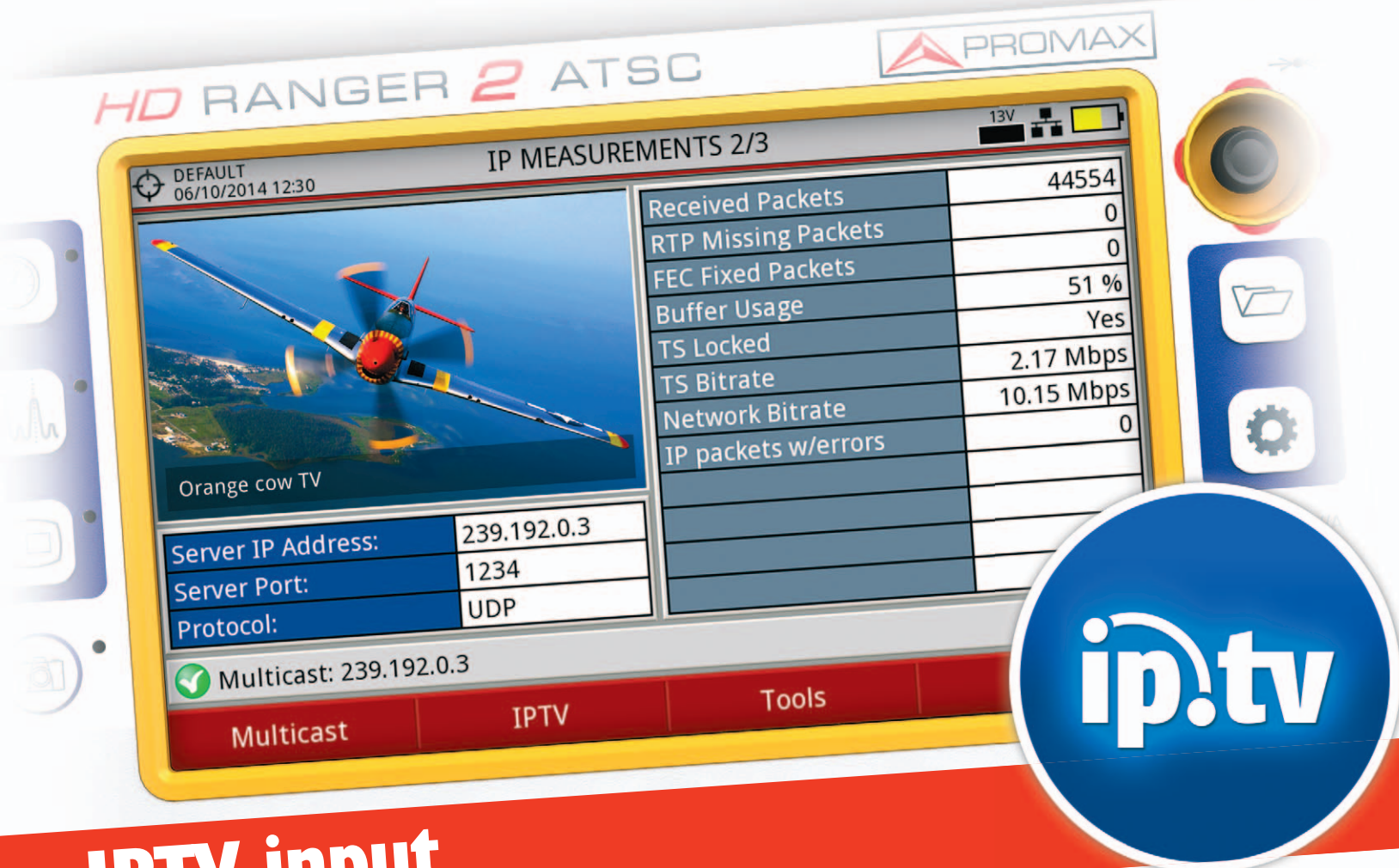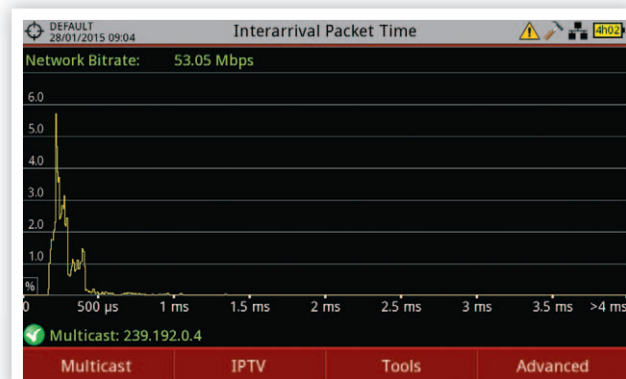
IPTV input

Measurements on IPTV signals

The *HD* RANGER *2* allows you to receive television programmes over IPTV networks. Those programes can be displayed on the screen together with other important service information.
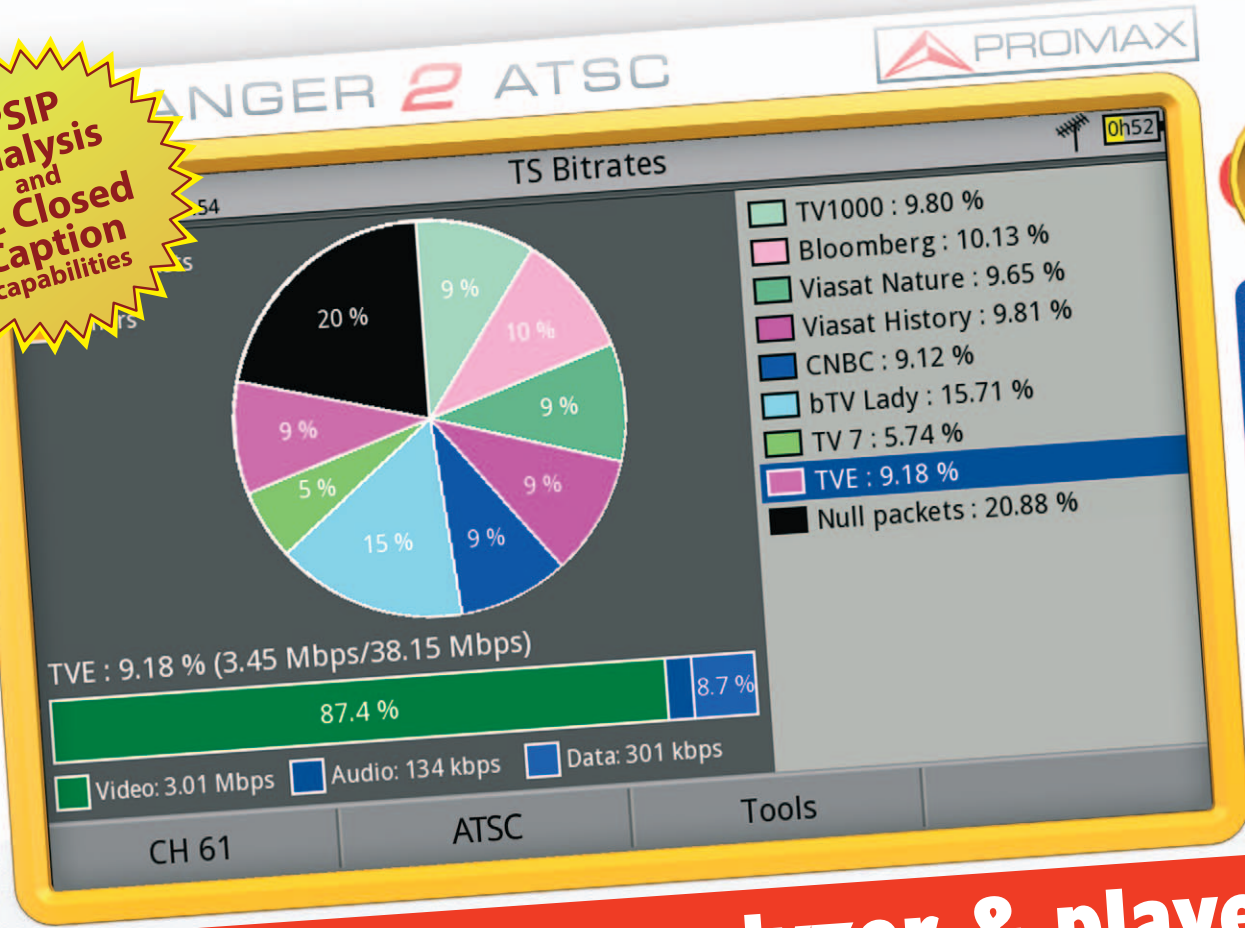
Although some concepts are similar, signal quality assessment metrics is not the same in IPTV as it is in digital TV over radio frequency. The *HD* RANGER *2* offers the measurements you need to understand, identify and correct the new problems that can be found in this new type of television distribution networks.

Interarrival Packet Time

This great feature allows to visualize the distribution of the IP Packets in function of their interarrival times. Its purpose is to check the packet reception continuity for the selected stream. In practice, the graph should show the arrival times concentrated around low time values. When the measurement result shows values that are spread over the time axis, this may point to a network problem.

PROMAX

PSIP analysis and CC Closed Caption capabilities

TS Bitrates

- TV1000 : 9.80 %
- Bloomberg : 10.13 %
- Viasat Nature : 9.65 %
- Viasat History : 9.81 %
- CNBC : 9.12 %
- bTV Lady : 15.71 %
- TV 7 : 5.74 %
- TVE : 9.18 %
- Null packets : 20.88 %

TVE : 9.18 % (3.45 Mbps/38.15 Mbps)
87.4 %   8.7 %

Video: 3.01 Mbps   Audio: 134 kbps   Data: 301 kbps

CH 61   ATSC   Tools

Transport stream analyzer & player

Table analysis

This function shows every detail of the transport stream tables in real time on a tree diagram. This is an outstanding function which is normally only available in more expensive equipment. It is possible to navigate through the tree branches using the joystick or the touch screen functionality.

Bitrate analysis

It shows the real time bitrate used by each one of the services in a transport stream on a pie chart. The graphic is dynamic and it is refreshed so that variations in the bitrate distribution among the services can be seen at a glance.

Full TS Recording capability

Record, analyze, decode and copy a Transport Stream

A function available for *HD* RANGER *2* that enables the instrument to capture the received TS in real time into its internal memory. The recorded TS can then be decoded, analyzed or even copied to a computer via USB. It also can be copied into a USB stick directly connected to the instrument.
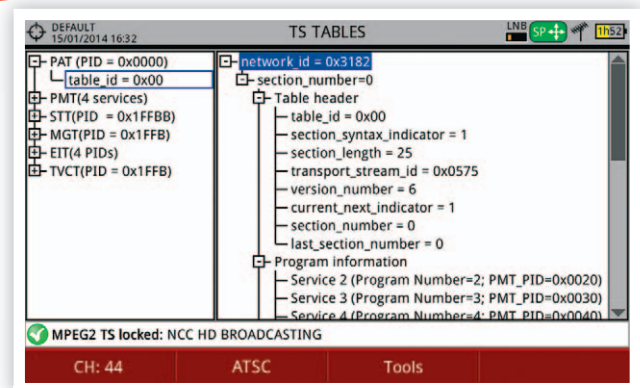
Drive test GPS option

## Coverage analysis and GPS
Taking georeferenced measurements

New "Coverage analysis /Signal Monitoring"viewer for any kind of signal in any equipment's band. While in **Signal Monitoring** or **Coverage Analysis** (when using Drive test GPS option) a new viewer allows to watch the final results (different types of measurement for a given time and GPS location), inspecting each point by zooming or panning through the captured data.
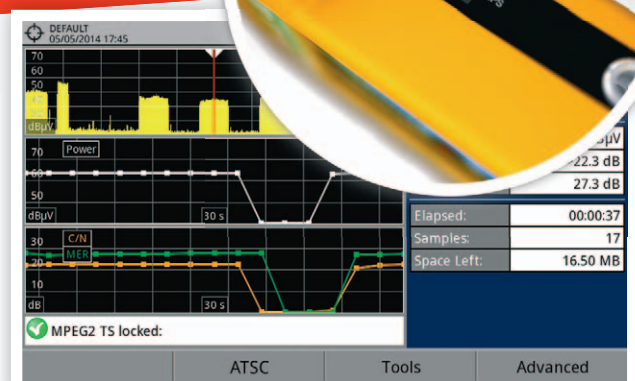
Creating reports

All this information is saved automatically to either the internal meter's memory or to an external USB memory and can be transferred to a PC computer using an universal XML format. Once on the PC the data can be processed and presented in different ways among which overlaying the values on a map is the most interesting.

Google earth compatible
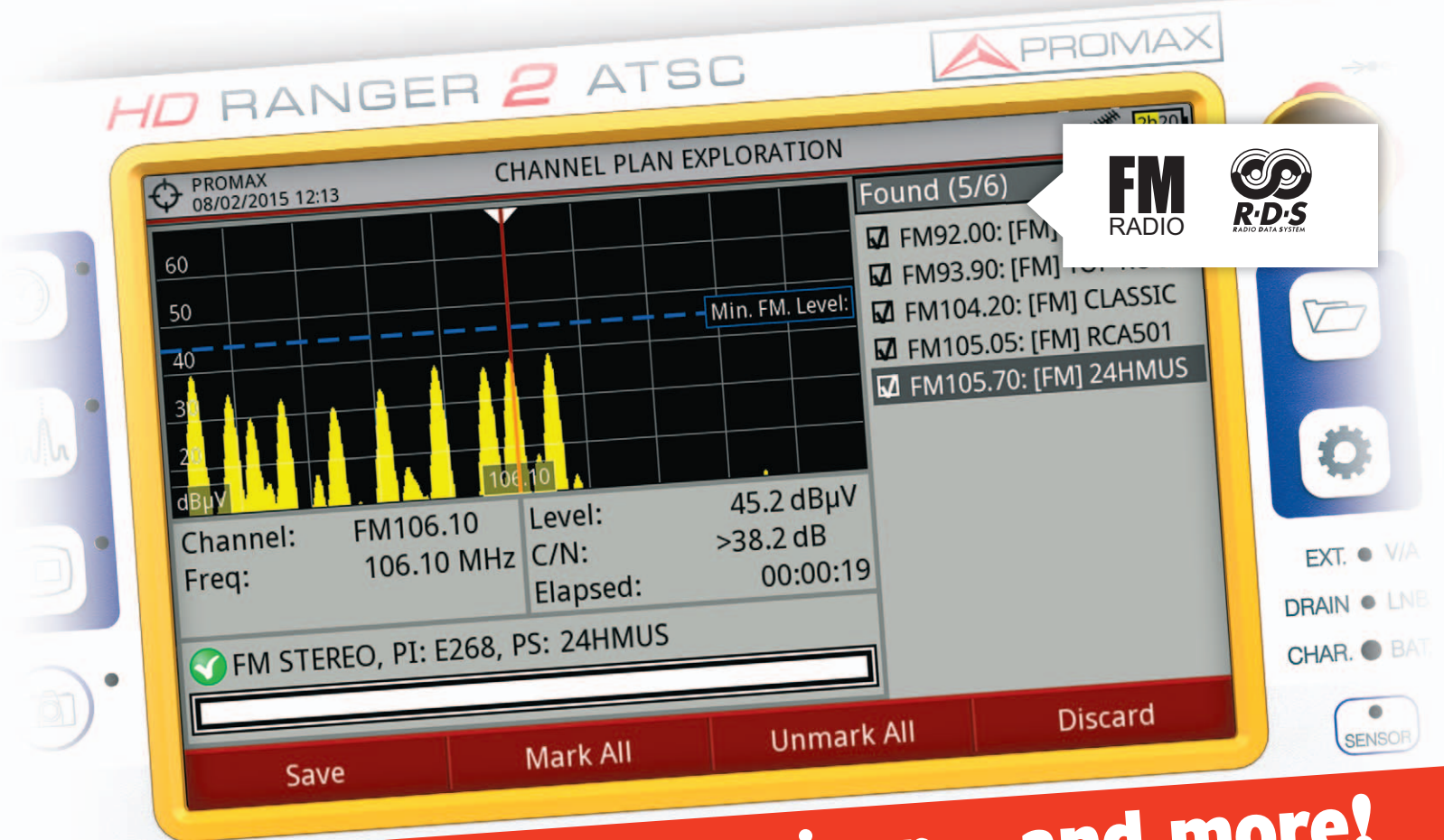
A complete radio receiver... and more!

FM radio receiver & analyzer

FM radio signals can be scanned, measured and demodulated, and any RDS data that is present can be decoded and shown in a dedicated results screen. The Drive test GPS option can also work in FM mode, and provide valuable field strength measurements for your radio station.

## 16/32 APSK constellations and VCM/ACM modulation schemes

Latest technology in radio links modulation schemes

IRG descriptor identification

For multi-camera live broadcasting events

The IRG descriptor is an embedded code that is added to video links containing contact info, GPS coordinates, etc from the source signal to allow a quick troubleshoot of interferences in scenarios such as live transmissions of sports events.
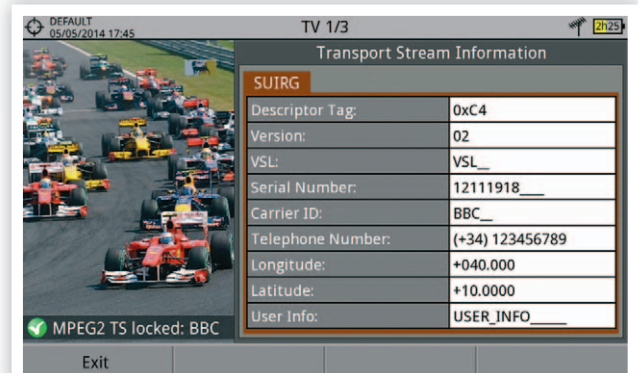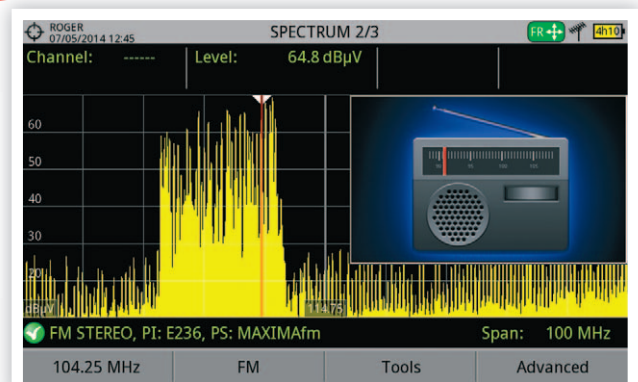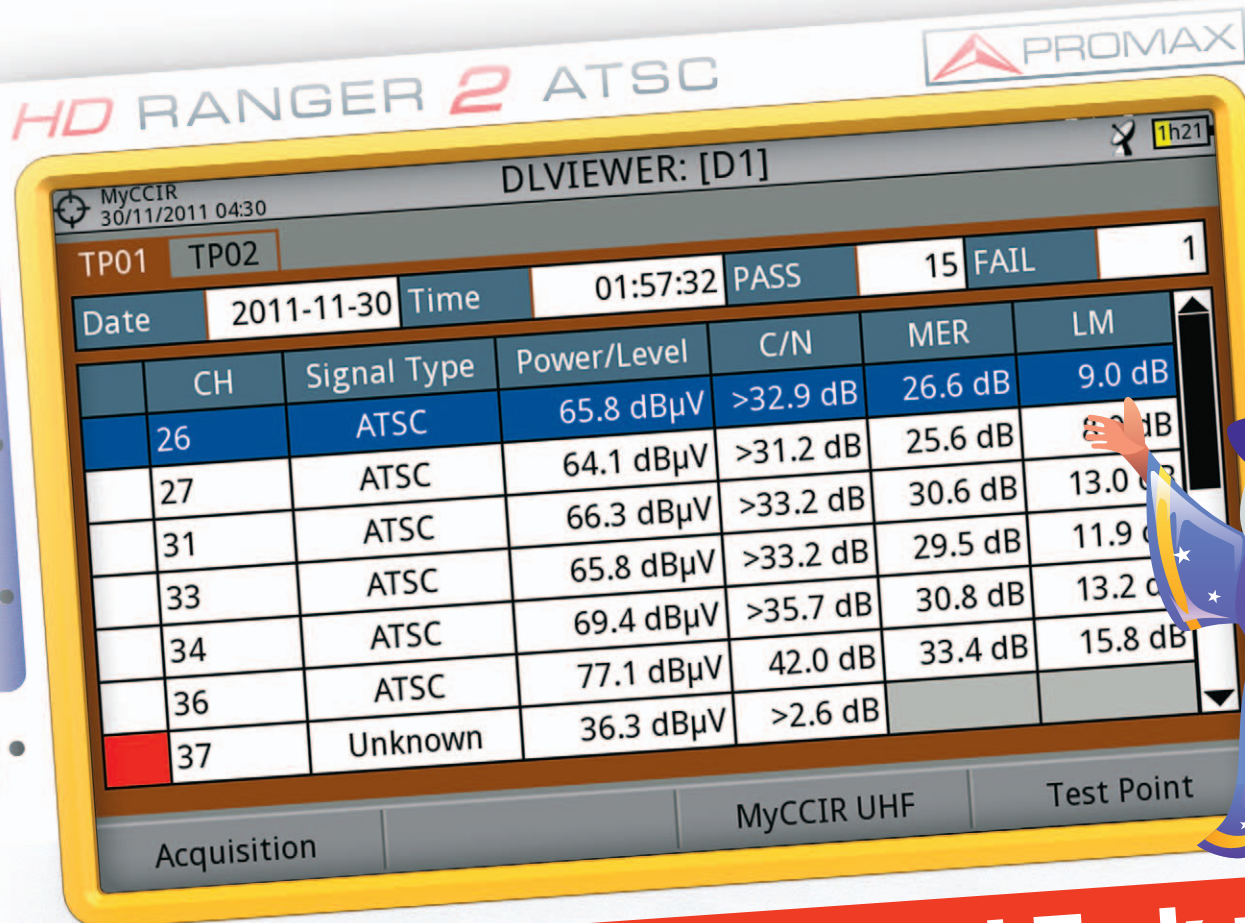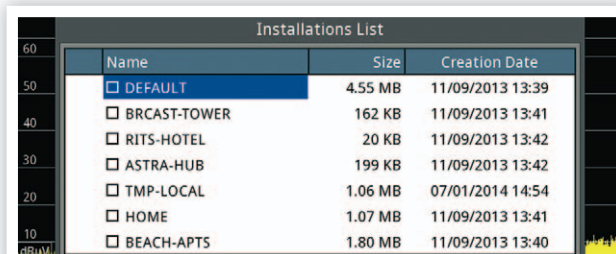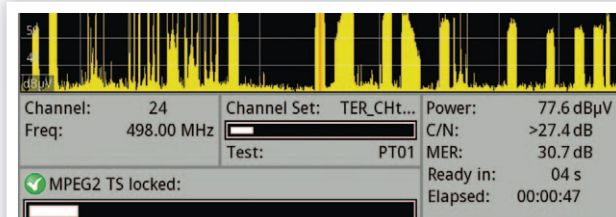
Powerful datalogger and Task planner

Automatic Datalogger
Data acquisition with a datalogger wizard

The datalogger can perform channel power, carrier/noise, BER, MER... measurements automatically. It can also save information from the NIT table such as the network name or even the SID and names of the services in the mux under test. All this information is saved inside the meter and it can be downloaded to a USB memory or to a PC for further processing later on.
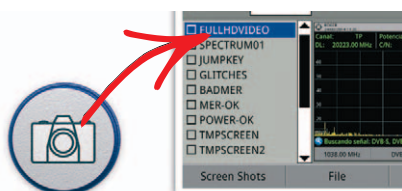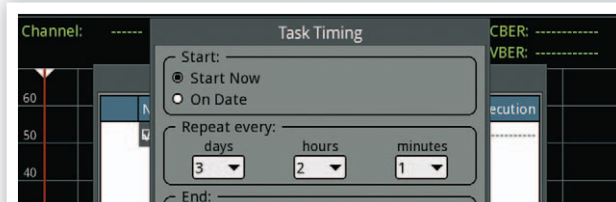
Task planner

This new function allows to set-up a task list, both for screen capture or Datalogger acquisition, selecting when to start, a repetition rate and the number of times the selected task must be performed. The equipment can be switched off after setting all parameters and will itself wake-up, at the required time, to perform the planned tasks.


Screenshot key

NetUpdate 4 – The perfect partner

PC software application

All RANGER products have a USB interface which can be used to connect it to a memory stick but also to a PC computer. NetUpdate 4 is a free PC software which can be downloaded from our website. This complete multi function application can be used to keep your meter updated, edit and taylor your channel tables or process datalogger information.
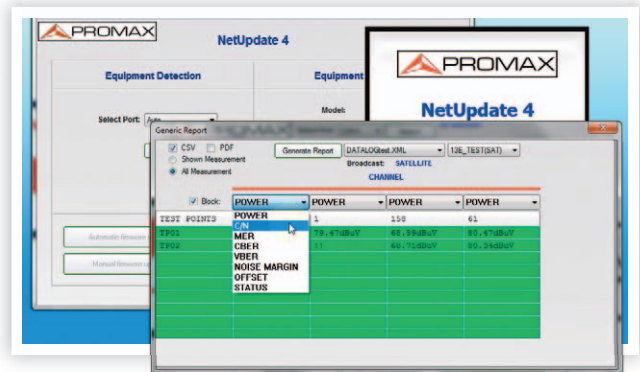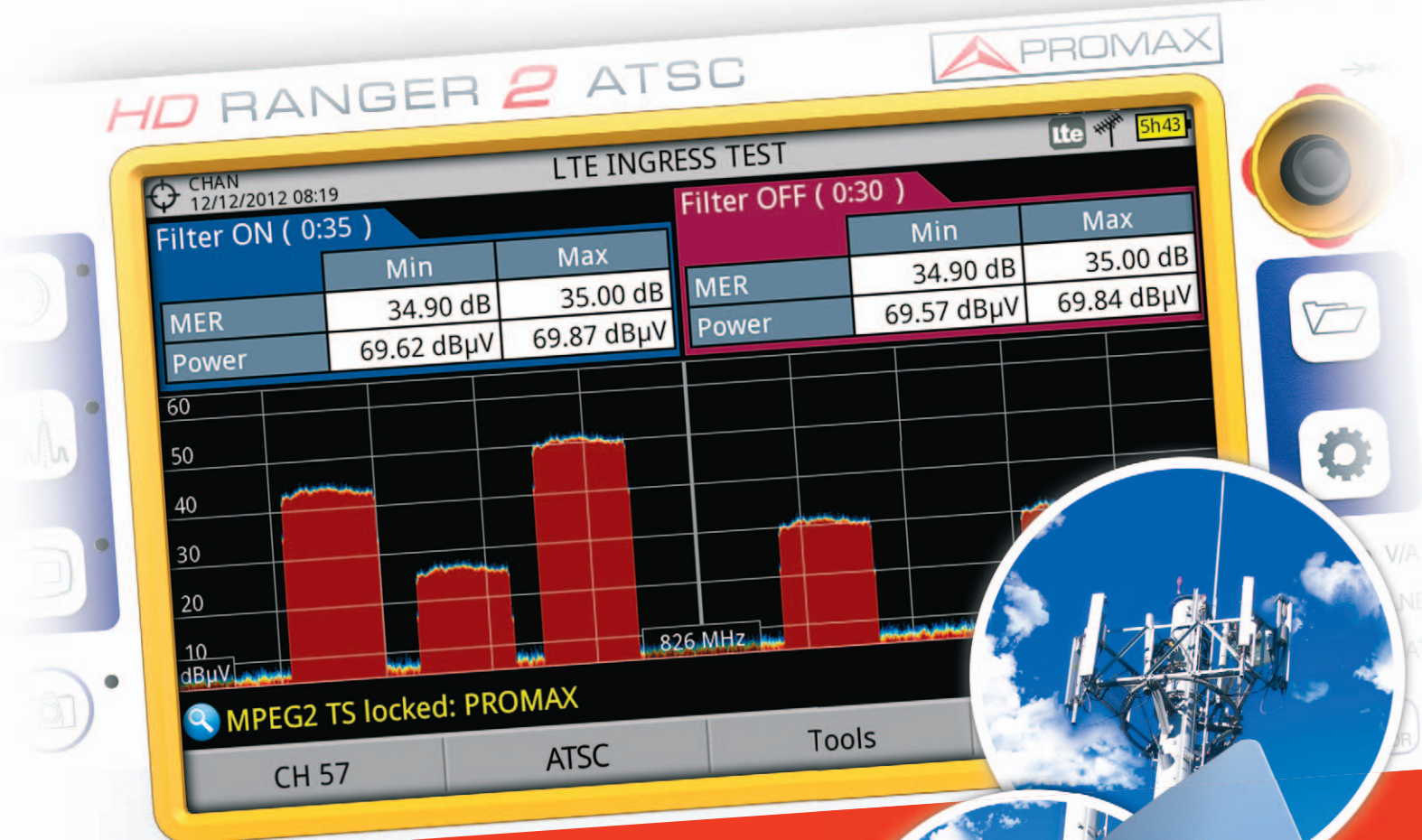
Update the analyzer's firmware
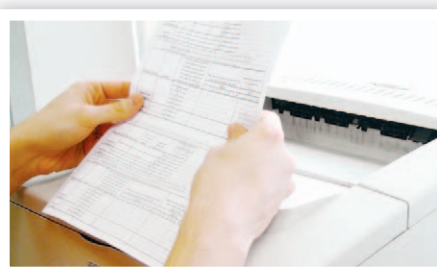
Receive, open, save and print Datalogger files
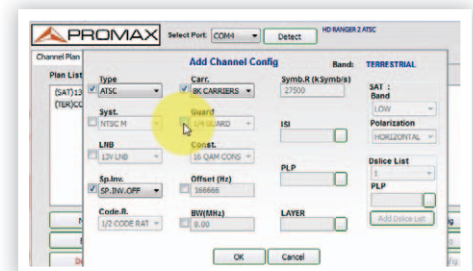
Create, edit, transmit, receive and save channel plans

LTE interference

LTE interference on SMATV systems
Minimizing LTE effect on your TV system

The *HD* RANGER *2* has a variety of tools to compare the signal reception quality measurements on digital TV channels with and without the LTE filter. This is very helpful to anticipate the performance improvement you should expect on your TV distribution system well before you physically make changes to the cabling to insert the LTE filter.

LTE interference on CATV networks – Locating interference sources to prevent service calls

Some of the bands allocated to LTE are near or inside former television bands. For example band 5 (uplink 824-849 MHz; downlink 869-894 MHz). The *HD* RANGER *2* has special functions to help installers determine the level of activity in those bands and therefore anticipate potential interference problems.

Downlink and Uplink interference – Visualising the two different scenarios

Downlink interference comes from the mobile phone base stations which are placed at fixed locations and are always on. This is not the case of Uplink interference which comes from the handheld devices and therefore it can be a lot more difficult to locate and mitigate.
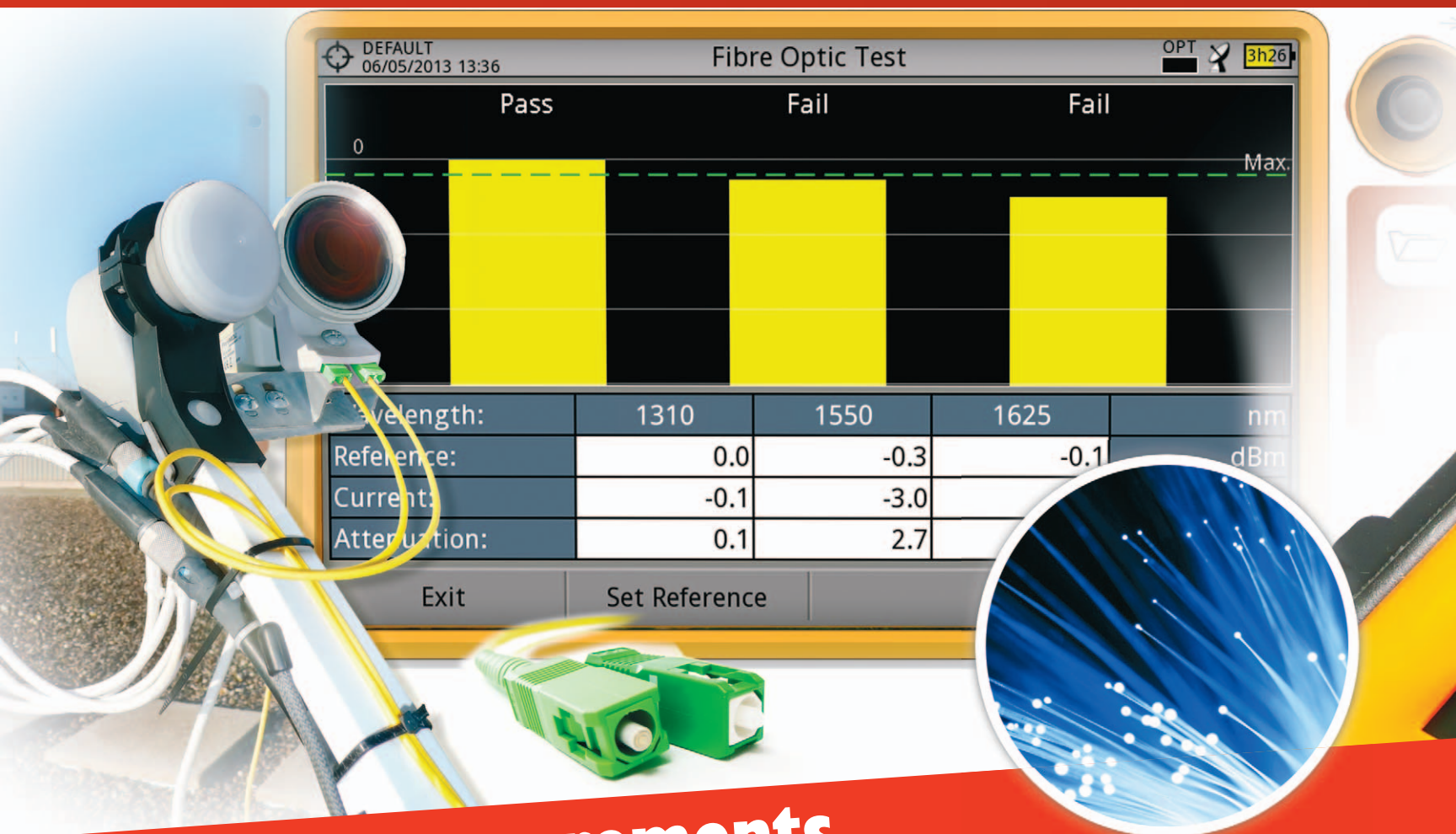
Optical measurements
... plus 5 GHz RF input!
**(optional)**

Selective Optical-to-RF converter

RFoG (Radiofrequency-over-Glass), as well as optical TV&SAT distribution, is used more and more by operators because it allows them to benefit from the advantages of fibre optics to compete with FTTH service providers. The RF signal at the converter output can be analyzed, measured and decoded by the meter as one would usually do with any signal over copper wires.

5 GHz RF Auxiliary input
Exclusive to HD RANGER 2

The HD RANGER 2 optical fibre option comes along with a 5 GHz RF auxiliary input which can be used among other applications for direct connection to optical LNBs with 5.4 GHz output. This RF input covers three bands:

Band I   From 2150 MHz to 3000 MHz
Band II   From 3400 MHz to 4400 MHz
Band III From 4400 MHz to 5400 MHz
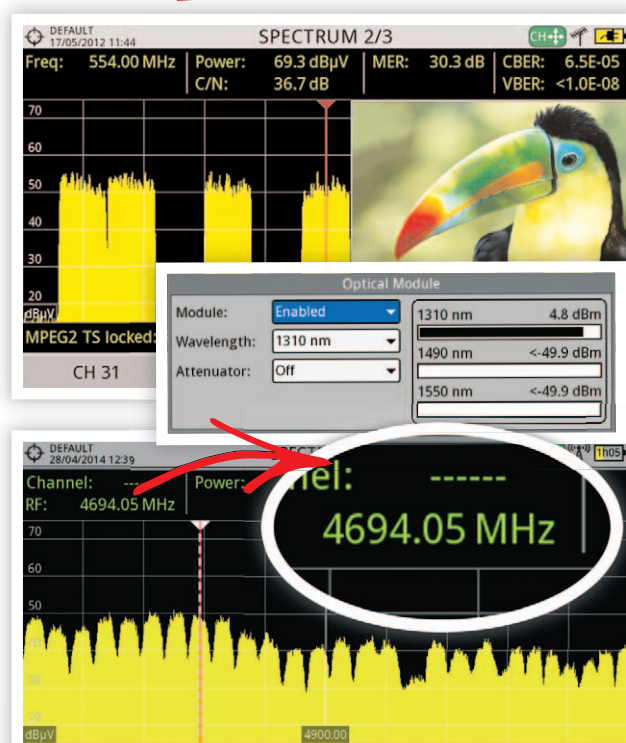
Extended connectivity features

Transport stream input and output
Interfacing with professional headend equipment

You can monitor and analyze streams coming out from satellite receivers, transport stream players, multiplexers, etc... The Transport Stream from the signals received in the *HD* RANGER *2* can also be output to other devices.

Common Interface
Decoding encrypted channels

The *HD* RANGER *2* includes a CI slot to interface with CAM modules available in the market and decode encrypted channels. The use of encryption is widely spread among television operators so this function is very useful indeed.

HDMI Interface

The *HD* RANGER *2* includes an HDMI output to interface with other High Definition equipment. It can also be very useful to check proper operation of the client's TV while on a service call. Everything that can be seen on the meter's screen is available through the HDMI.

PC Connection

The USB interface in the *HD* RANGER *2* can be used to connect it to a USB memory or to a PC computer. NetUpdate4, a free download PC software, allows updating the meter's firmware, editing channel tables, processing datalogger information, etc...

Quick selection table

		HD RANGER + ATSC	HD RANGER 2 ATSC
STANDARDS	**Digital television systems**	ATSC DVB S/S2 DSS, QAM Annex B J/83.B	ATSC DVB S/S2 DSS, QAM Annex B J/83.B
	Dolby Digital Plus (DOLBY DIGITAL PLUS)	✓	✓
	Analog TV and FM radio	✓ R·D·S	✓ R·D·S
TFT-LCD	**LCD screen features**	7" (16:9)	7" (16:9) touch screen
	Triple split display	✓	✓
CONNECTIVITY	**HDMI output** (HDMI)		✓
	IPTV input (ip.tv)		✓
	ASI-TS input and output (ASI-TS IN&OUT)		✓
	Encrypted channels (CAM modules)		✓
	Audio/Video input and output	✓	✓
	USB connection (USB)	✓	✓
	Optical fibre measurements	◉	◉
	GPS (GPS)	◉	◉
ADVANCED FUNCTIONS	**Transport Stream analyzer**		✓
	PSIP		✓
	CC analysis		✓
	Signal monitoring	✓	✓
	MER measurement	✓	✓
	Ultra fast spectrum analyzer	✓	✓
	Constellation diagram	✓	✓
	Internal LTE filters + LTE ingress test (lte)	✓	✓
OTHER	**Soft carrying bag**	✓	✓
	Hard transport case	✓	✓
	Battery	> 4 h	> 4 h
	19" rack mounting option	◉	◉

✓ Included   ◉ Optional

Cable and Satellite equipment

PROMAX-37: Cable TV & Data Analyzer for DOCSIS 3.0 and EuroDOCSIS 3.0 cable networks

PROMAX-37 allows the qualification of VoIP and IPTV services. It incorporates the most advanced functions which includes channel bonding technology.

▌ *Downstream: Σ Power, Channel power, Full band power, MER, BER, Pre/Post BER, Constellation diagram, Modulation type, Symbol rate, Spectrum / Scan.*

▌ *Upstream: Σ Power, Attenuation at CMTS, Frequency, Bandwidth, Modulation, Symbol rate, Communications test.*

▌ *Communications Test (in Registered mode): IPTV analyzer, VoIP analyzer, IP report, Ping test, Ratio of lost packets.*

▌ *Digital and analog channel TV measurements*

▌ *Loop-through mode*

PROMAX-12 Cable TV QAM analyzer

The PROMAX-12 incorporates the measurements for installation, verification and maintenance of reception and distribution systems for FM radio, MATV, CATV and MMDS, including the sub-band (return path). It is a multistantard instrument, so it can be used in any network in the world.

▌ *From 5 to 1000 MHz*

▌ *BER & MER on QAM digital signals*

▌ *16/32/64/256 QAM ANNEX A/B/C QPSK*

▌ *Analogue channels*

▌ *Digital channels*

▌ *Broadband power detection*

▌ *Scan*

▌ *C/N, CSO, CTB, VAC voltage, HUM*

▌ *Channel power by integration*

▌ *MAX and MIN hold*

▌ *Tilt*

▌ *Datalogger*

▌ *Printing*

▌ *Connection to PC*

SATHUNTER+: Digital DVB-S/S2 Satellite hunter

Fast antenna alingnment in a pocket size equipment

Designed for the installation of Direct To Home (DVB-S/S2 and DSS) satellite reception systems. It is fully automatic and very easy to use. Just turn the dish and the instrument will show up the identification of the selected satellite when it is detected. The instrument is actually reading the information transmitted by the satellite and displays its orbital position and the service list.

1 DETECT   2 IDENTIFY   3 ADJUST