PROMAX

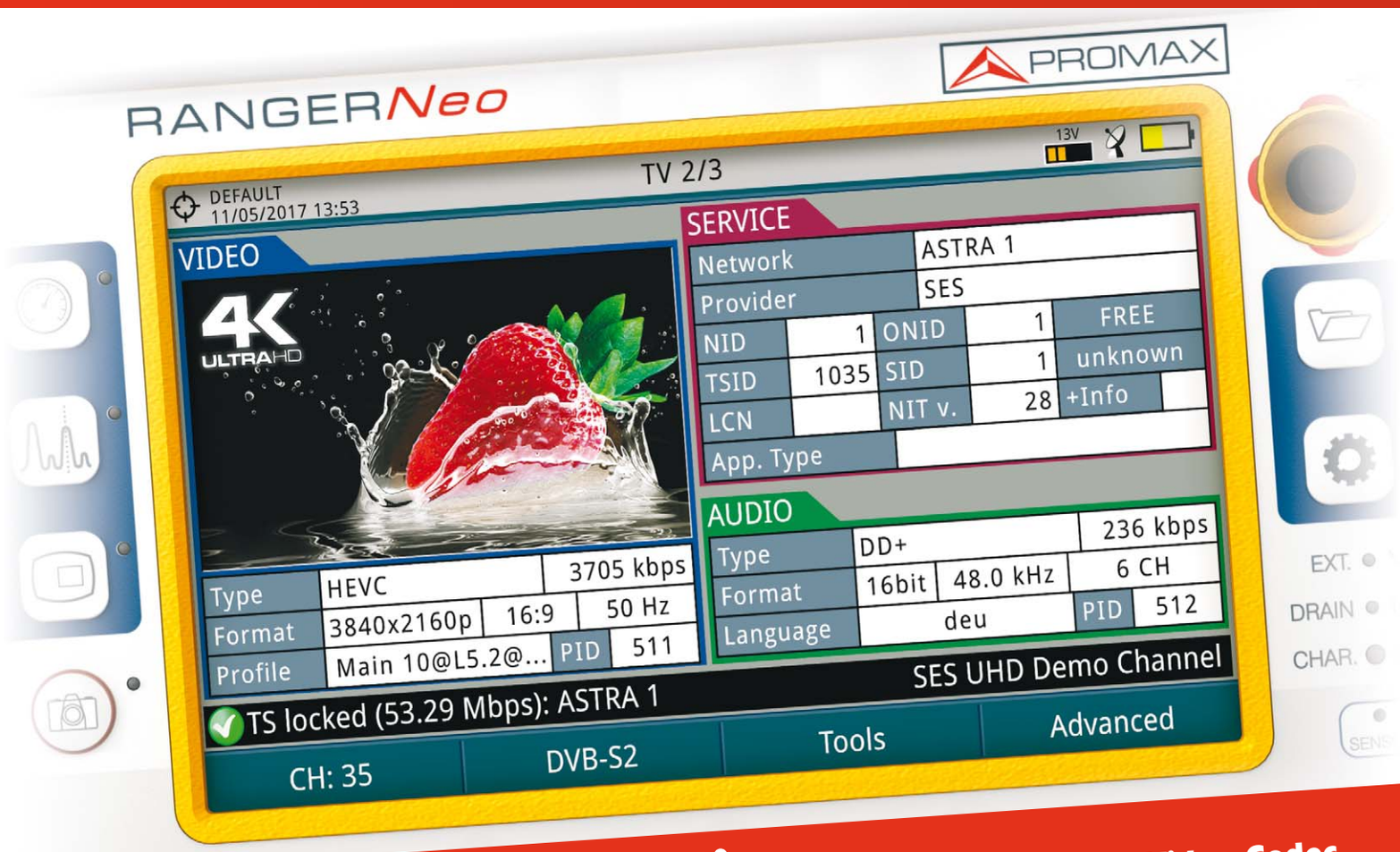
4K ULTRAHD

BROADCAST, CABLE, SATELITE,
IPTV, OPTICAL FIBRE AND WIFI

TV & SPECTRUM ANALYZERS

www.promaxelectronics.com

PROMAX



HEVC H.265 decoding

High efficiency Video Codec

RANGER*Neo* covers from 5 to 2500 MHz and includes HEVC decoding. On top of that, the **RANGER*Neo* 4** features a 4K decoder displaying UHD services. The rest of **RANGER*Neo*** models feature the “4K frame grabber” tool which decodes UHD video frames and displays them in a slideshow mode.

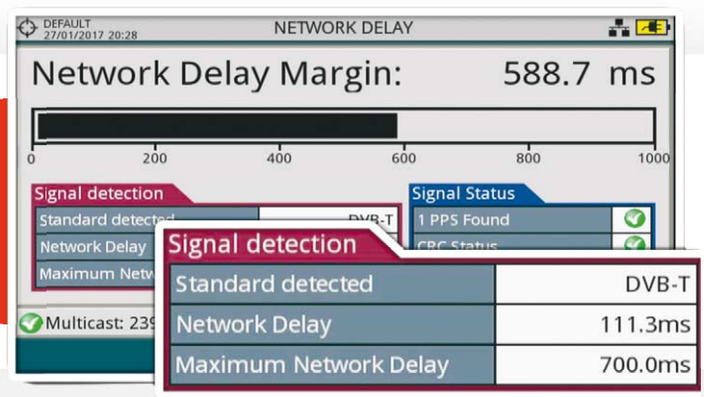
- **ULTRA FAST SPECTRUM**
- **TRIPLE SPLIT DISPLAY**
- **LIGHT WEIGHT (< 3 kg)**
- **SMART BATTERY CONTROL**

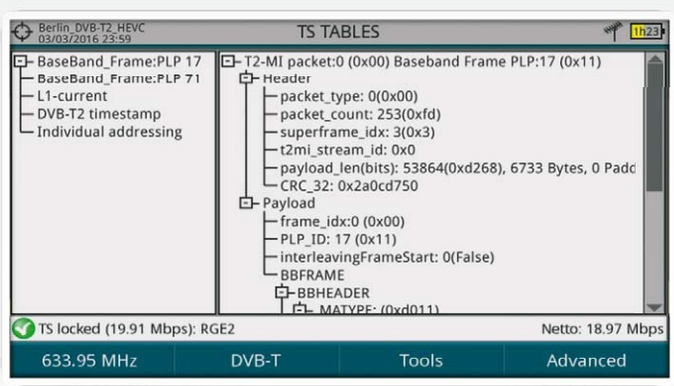
CHECK COMPARISON TABLE

For broadcasters

Network delay margin

Network planners determine what time instant transmitters should use to broadcast the transport stream bits. They all have to do it at a precise given time, e.g. 700 ms in the picture. The difference between the network delay and the required transmission time (700 ms in the example) is called the “network delay margin” and it will be different depending on the specific transmitter location. The lower the 'network delay margin' the higher the chances of that particular transmitter missing the assigned transmission time.





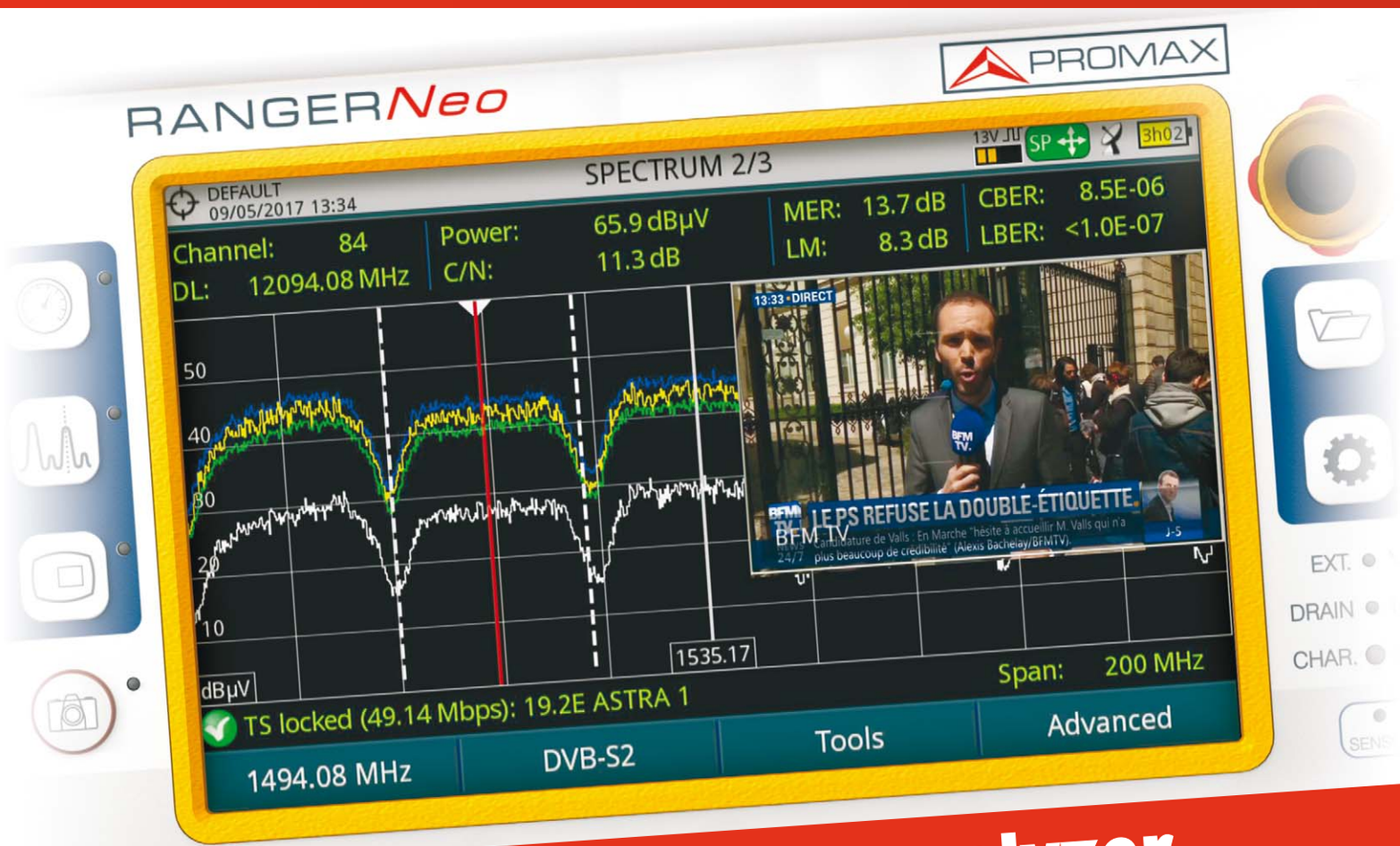
Receiving and analyzing T2-MI signals

T2-MI is the modulator interface signal used in the 2nd generation digital terrestrial television broadcasting system. It is physically transported to the TV towers using IP or RF and it is accessible via network devices in the form of ASI or IP signals.

RANGER*Neo* can receive a T2-MI signal via RF, ASI and IP, in which case it can perform transport quality measurements, T2-MI packet analysis and PSI extraction from each PLP.

CHECK COMPARISON TABLE

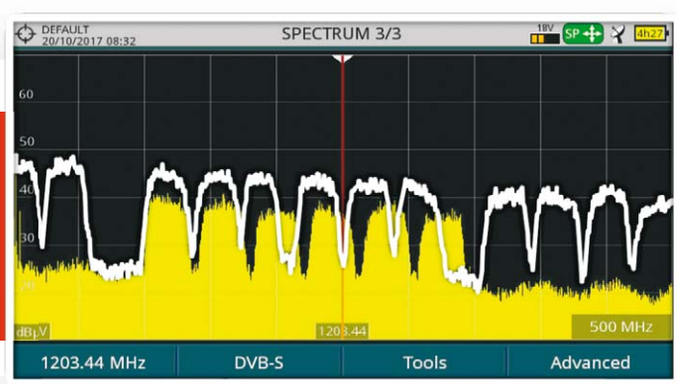
PROMAX

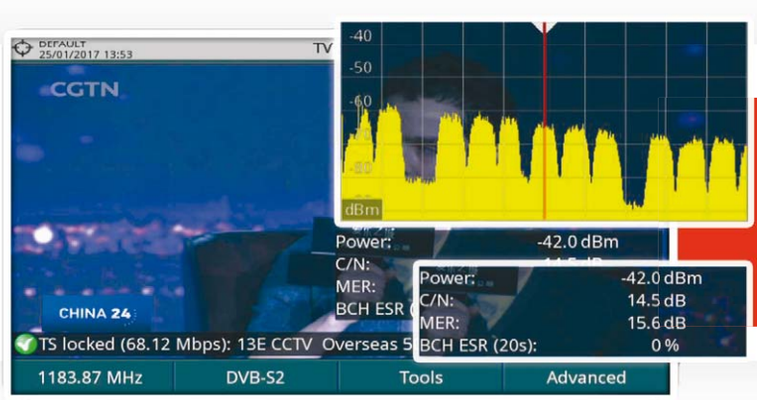


Professional spectrum analyzer

Reference traces

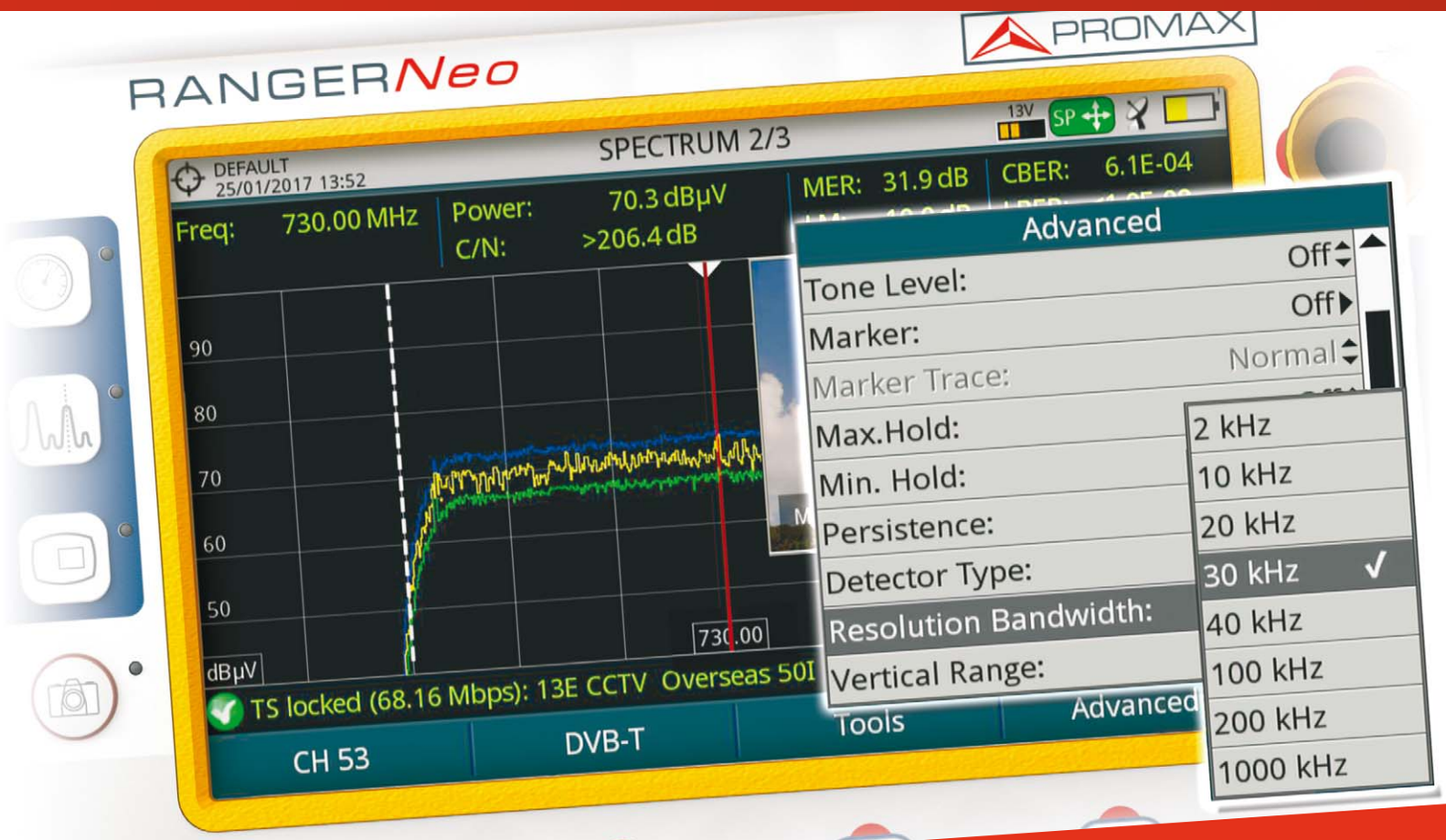
Freeze the spectrum graph and compare it with the running trace. Save that information and use it to identify satellites based on their spectrum footprint.





Triple split display

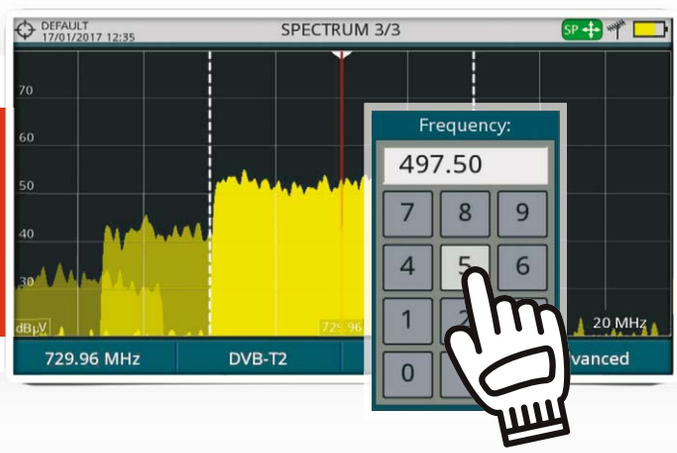
Up to 9 different ways to combine TV, measurement and spectrum modes.

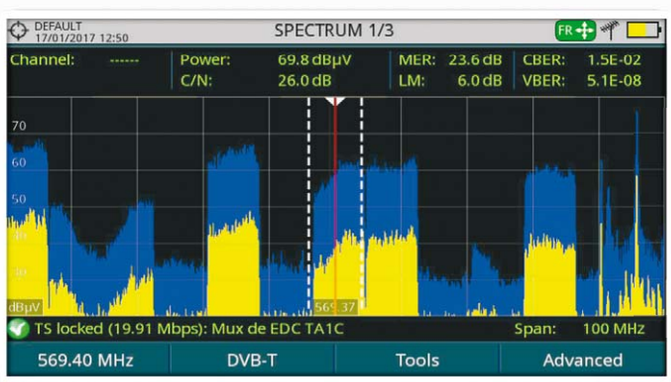


High resolution filters ★

Touch screen

Place the marker on any channel and move the trace using your finger. Enter frequencies or file names using the soft keypad.

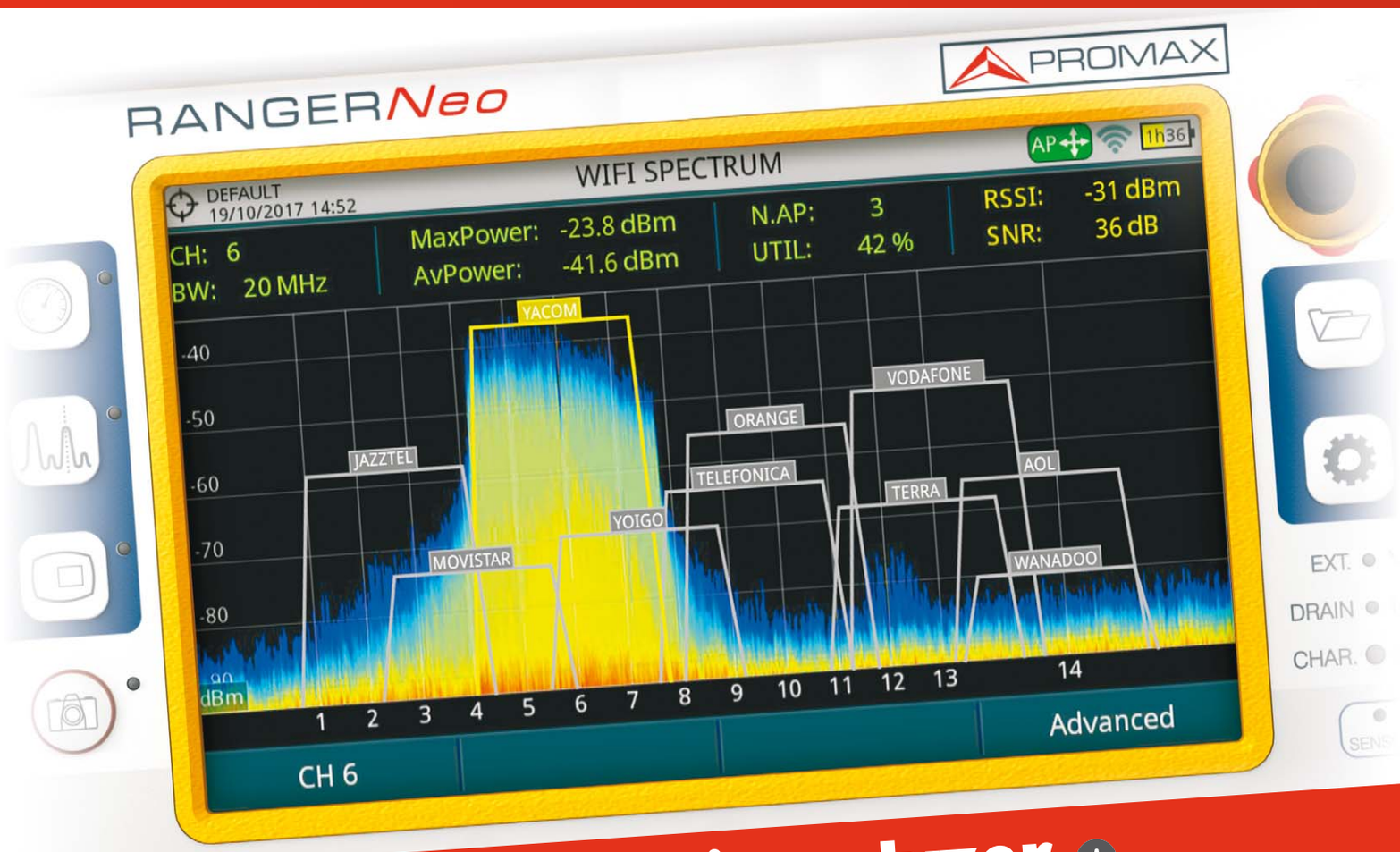




MIN and MAX hold

Display them separately or simultaneously along with the current spectrum trace.

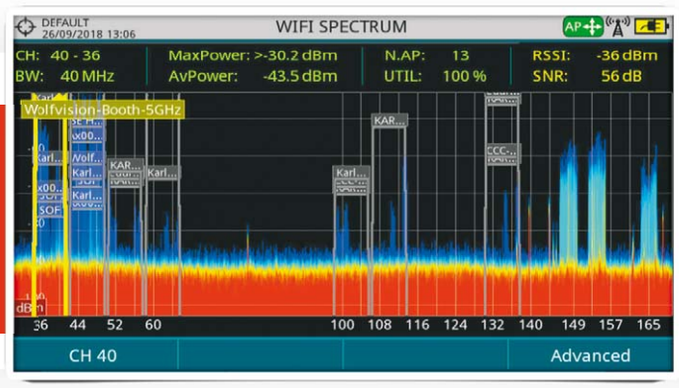
★ CHECK COMPARISON TABLE

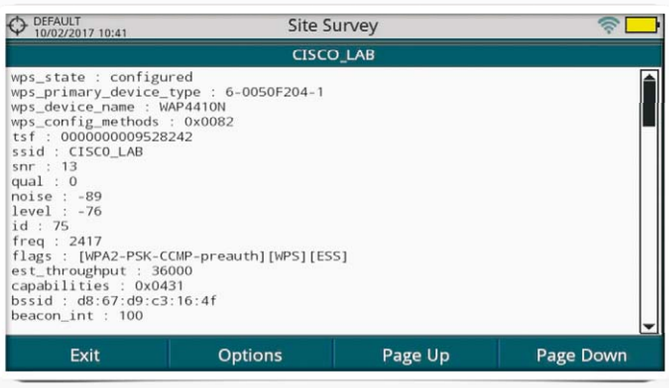


2.4 & 5.7 GHz WiFi analyzer ★

Simultaneous real spectrum analyzer information + WiFi access point data

WiFi signals can be disturbed by interference from other WiFi stations, for example other access points, but also from non-WiFi signals such as wireless CCTV cameras or a microwave oven. **RANGER*Neo*** can display real spectrum analyzer information and access point data simultaneously.

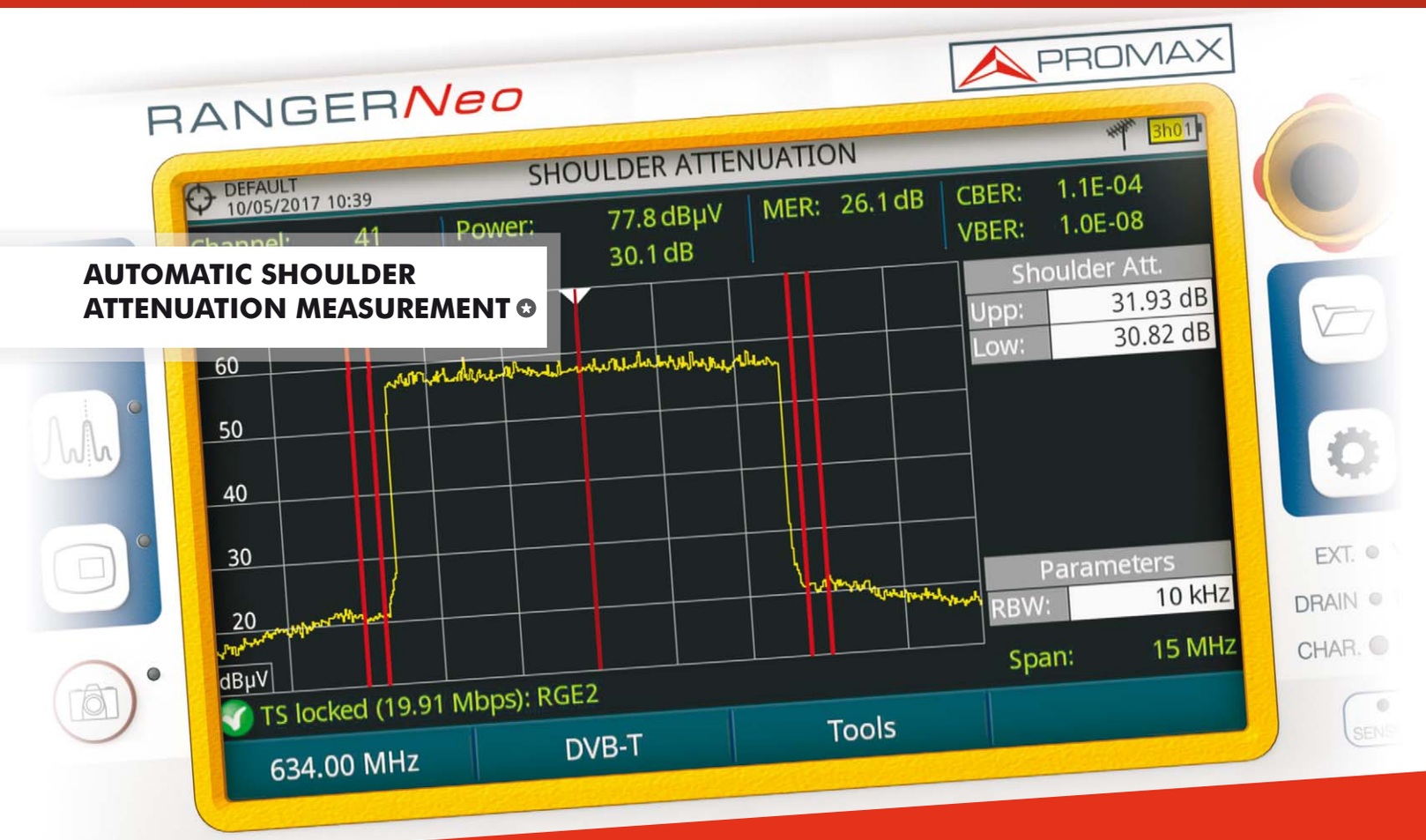




Access point information

RANGER*Neo* shows convenient information from the access points such as SSID, RSSI, SNR, security information, etc. It also indicates the number of access points per channel and offers you guidance regarding the level of occupancy of a specific channel.

★ CHECK COMPARISON TABLE

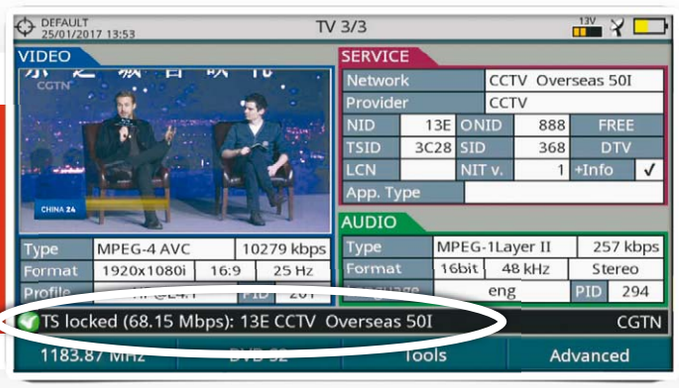


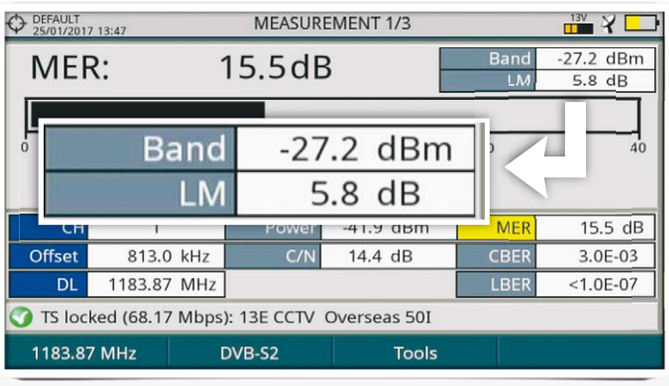
AUTOMATIC SHOULDER ATTENUATION MEASUREMENT

Productivity tools

StealthID

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



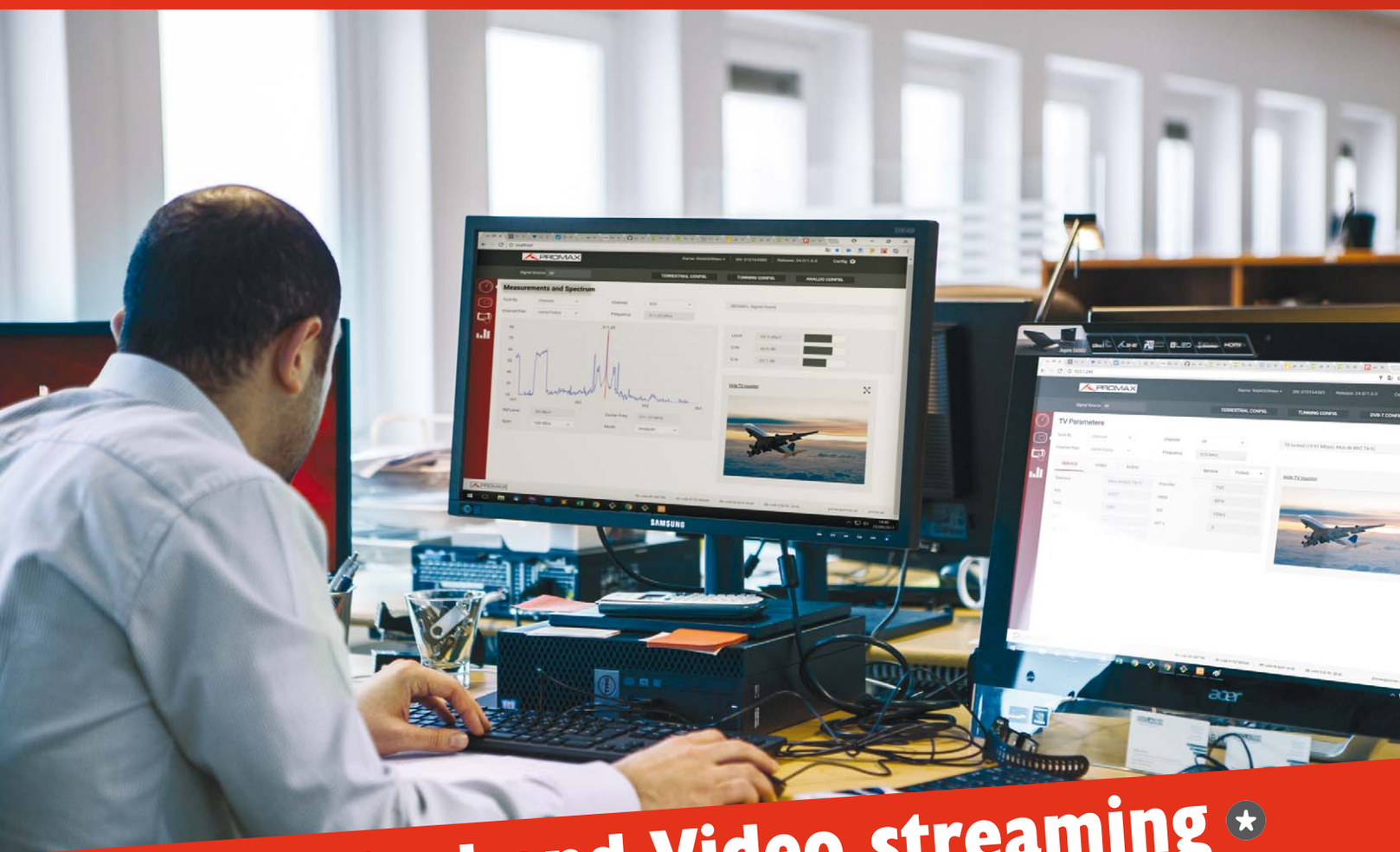


Full band power

The measurement of full band power is very useful to understand how much energy is available in total at the test point.

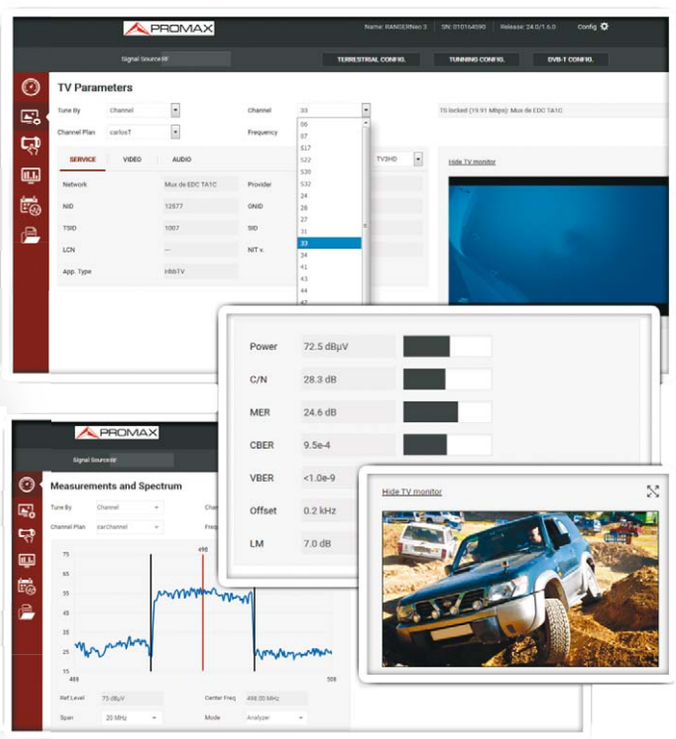
CHECK COMPARISON TABLE

PROMAX



webControl and Video streaming

The *webControl* is an operating mode of the **RANGER *Neo*** field strength meter that enables its remote control via a local area network (LAN) or the Internet. Thus, it is possible to log into the equipment from anywhere in the world at any time.



MEASUREMENTS AND SPECTRUM

Tuning parameters, real time navigation and adjustment of the spectrum, channel measurements....

TV PARAMETERS

Streaming of a TV/radio service, displaying information, recording the TS or the service...

MONITORING

Monitoring the quality parameters, setting alarms and pre-alarms, e-mail warnings...

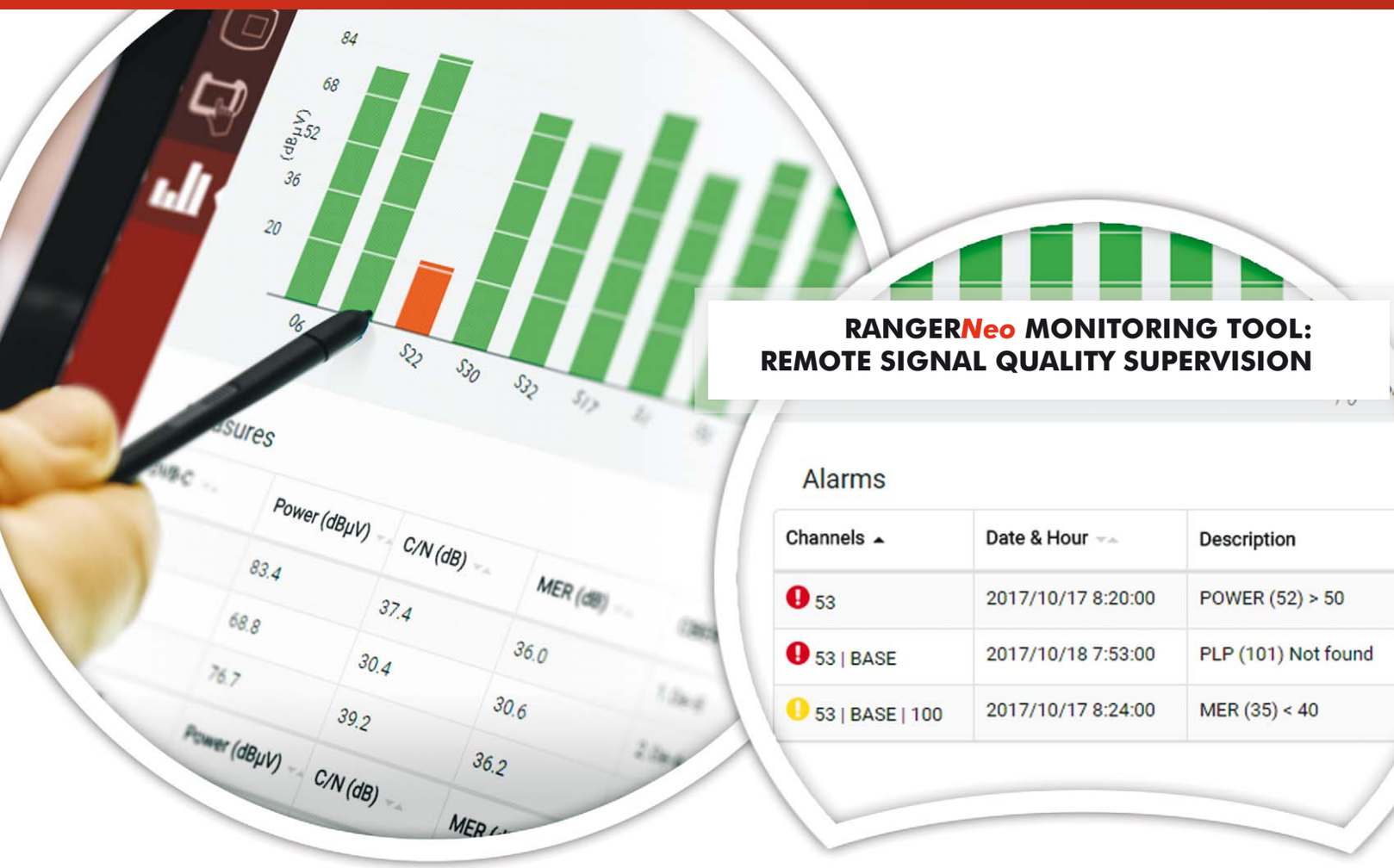
HISTORICAL MONITORING

Displaying a measurement graph, reviewing the measurements, exporting data to CSV...

INSTALLATIONS MANAGEMENT

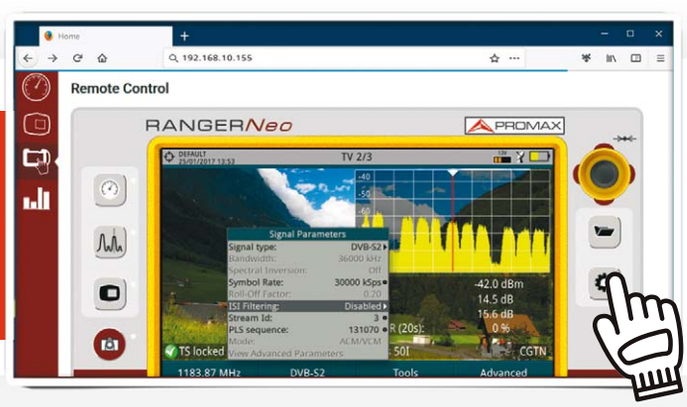
Uploading and downloading files from the internal memory of the equipment or the connected USB storage media.

CHECK COMPARISON TABLE



RANGER*Neo* Console

Complete control over your field strength meter from anywhere in the world and with no additional software installation required. A virtual platform that gives you access to all of the analyzer features.



Video / Audio Streaming

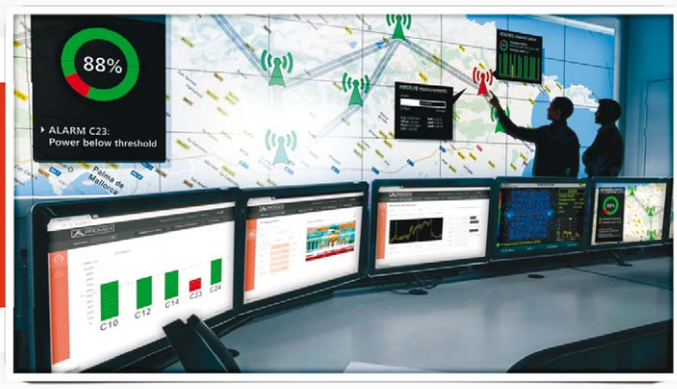
It is now possible to stream the Transport Stream after channel demodulation either over a private LAN or over the Internet, as a unicast (UDP) stream. The service as seen on the analyzer screen can be streamed as a SPTS over IP, or as a full TS containing all services for the channel being tuned.

The same feature can be used for other streams received over IP or previously recorded, instead of coming from an RF source.

Remote, 24/7 signal monitoring

PROWATCH *Neo*

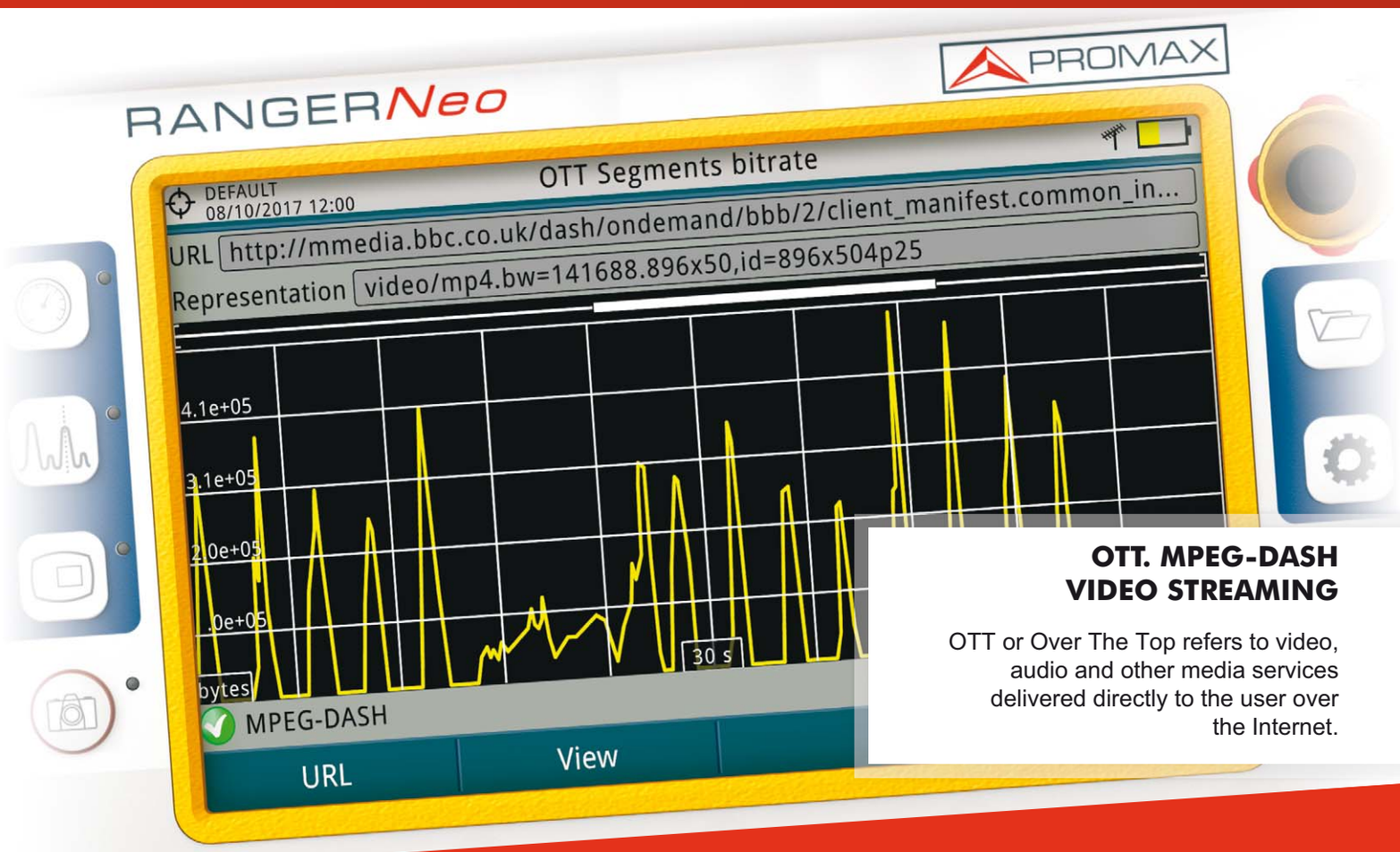
PROWATCH *Neo* is our response to the need for remote, permanent, 24/7 signal monitoring operations. It is embedded in a 19" 1U rack case and it allows you to do everything you can do with the portable analyzers but remotely. It is also possible to connect it to a keyboard and monitor using USB and HDMI™ interfaces.



Professional monitoring system

PROWATCH *Neo* is a professional monitoring system based in the **RANGER *Neo*** technology allowing users to perform:

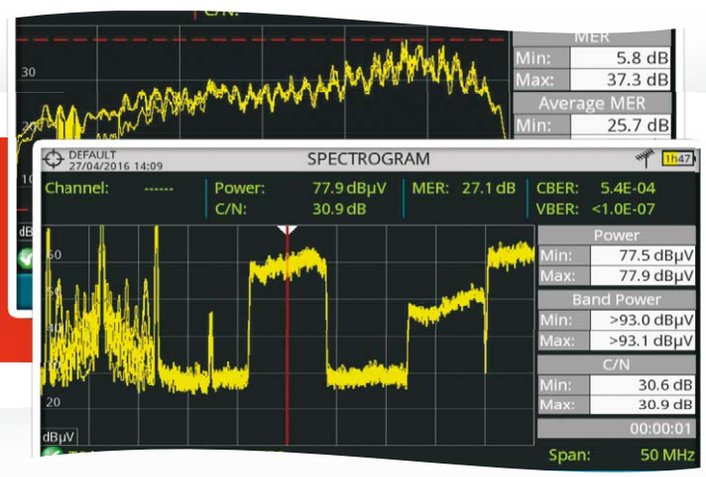
- Live transport stream and service recording.
- Service IP streaming.
- Alarm generation.
- Service quality and alarm statistics.



OTT. MPEG-DASH VIDEO STREAMING

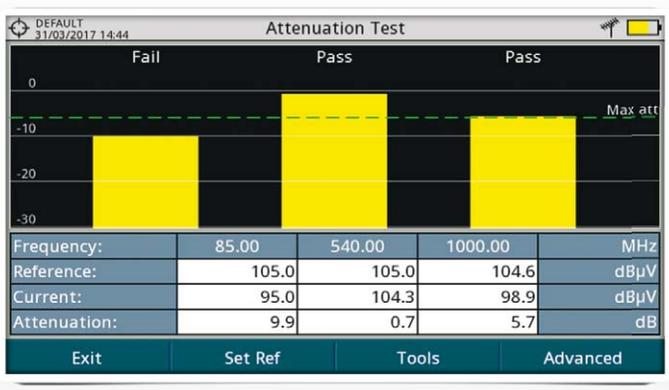
OTT or Over The Top refers to video, audio and other media services delivered directly to the user over the Internet.

Many useful functions



Merogram and Spectrogram

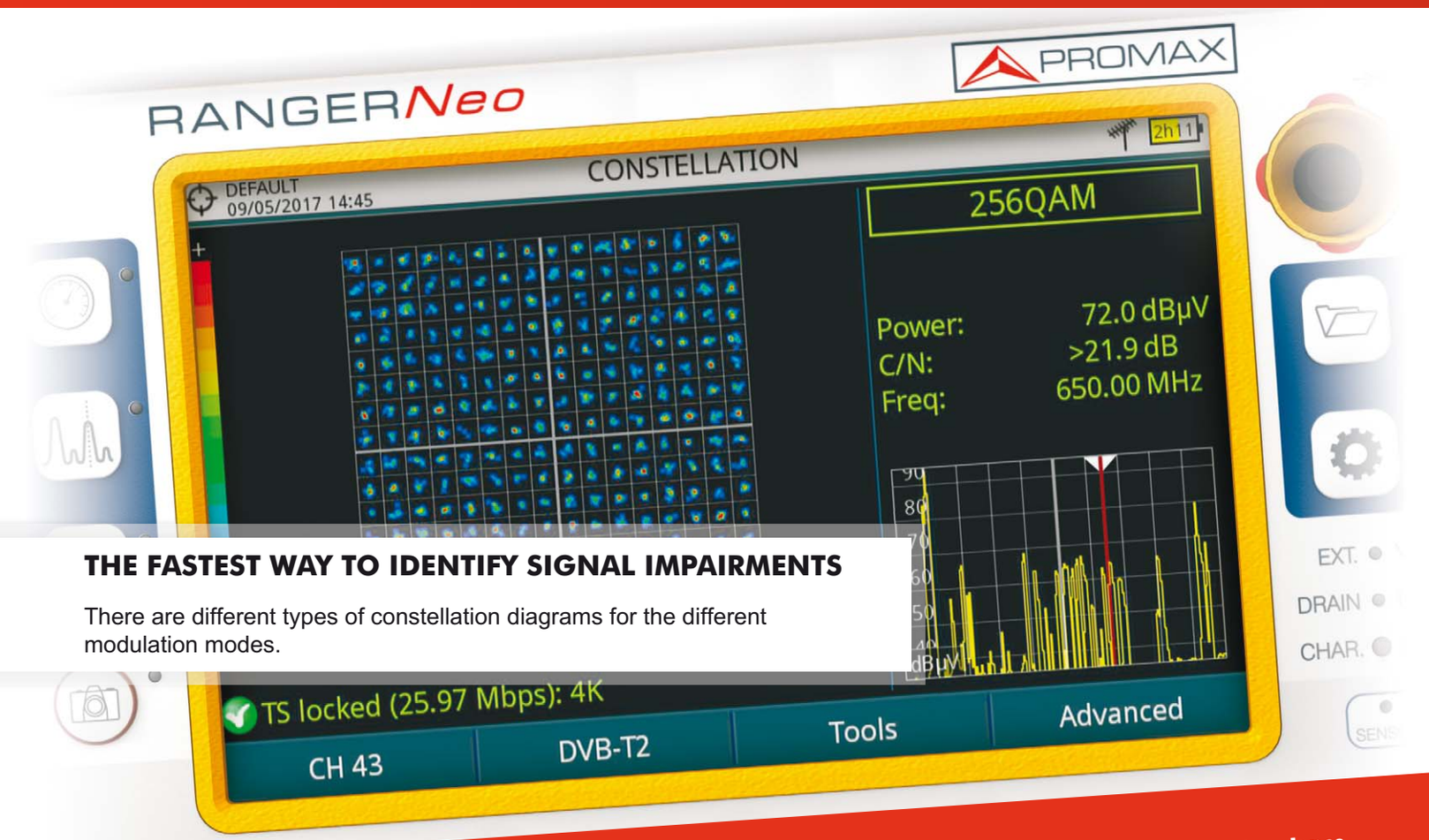
These functions have been developed to allow an early detection of intermittent impairments that may occur in very short periods of time and can not be monitored otherwise.



Attenuation test

Test the frequency response of your installation using RP-050, RP-080, RP-110B signal generators.

CHECK COMPARISON TABLE



THE FASTEST WAY TO IDENTIFY SIGNAL IMPAIRMENTS

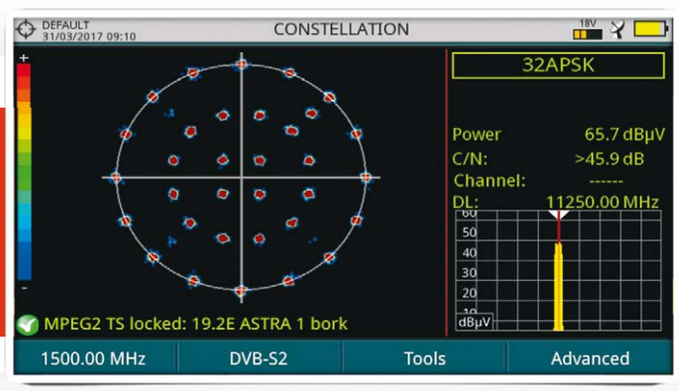
There are different types of constellation diagrams for the different modulation modes.

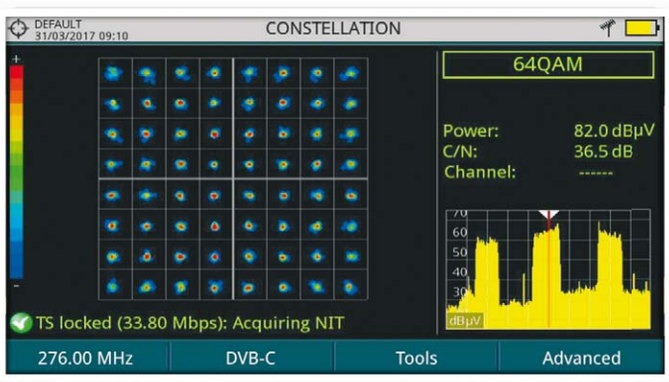
Constellation diagram

Detecting signal impairments at a glance

16/32 APSK, 8PSK and QPSK constellation

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



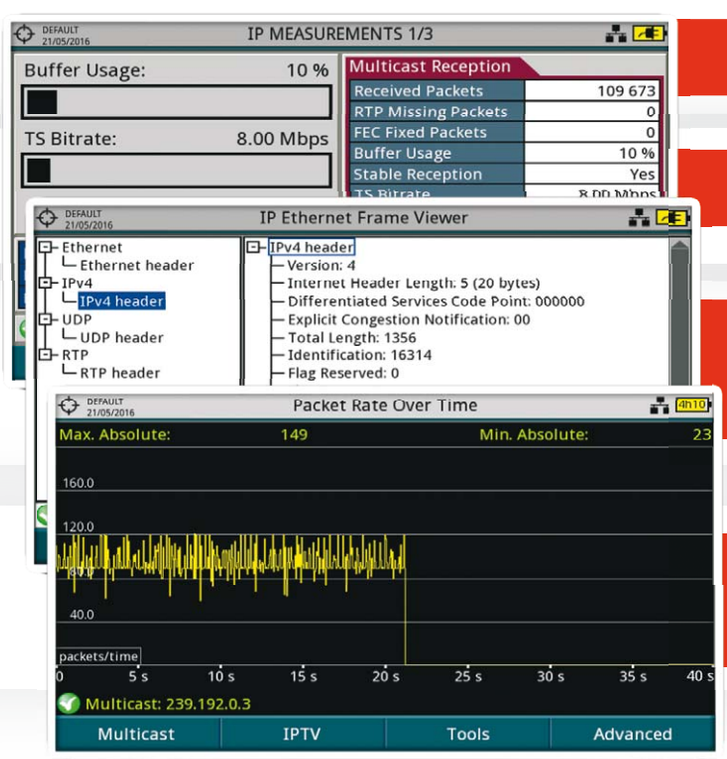


16, 32, 64, 128, 256 QAM

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.

CHECK COMPARISON TABLE

IPTV functions



Network bitrate

The network bitrate gives you an indication of the network load and possibility of overload.

Multicast Media Delivery Index and FEC

A key quality measurement formed by the Delay Factor and the Media Loss Rate. FEC measurements are also available.

IP Ethernet frame viewer

IP Ethernet frame viewer captures a multicast packet displaying all its frame details, for example Time-To-Live (TTL), all fields of RTP protocol, etc. It is very helpful to study IPTV signalisation problems.

PING, Trace, Average packet delay and IPDV

They are very useful to identify the reasons for communication problems, anything from complete service interruptions to uncontrolled delays which can be as important in terms of service performance.

CHECK COMPARISON TABLE

WIDEBAND LNB COMPATIBLE

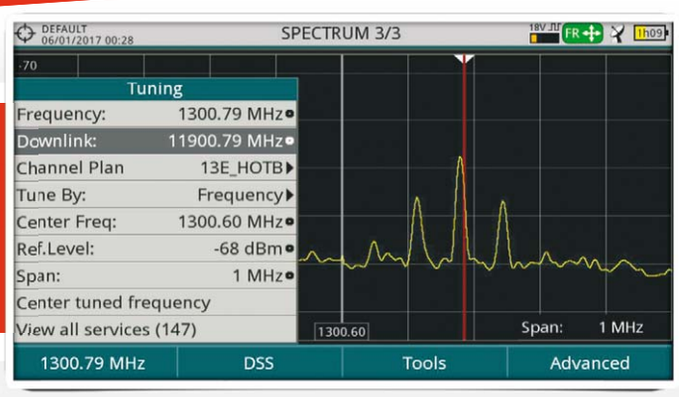
Wideband LNBs deliver the entire vertical and horizontal satellite polarities (low and high band together) using two separate RF cables and an extended IF frequency range from 290 to 2,340 MHz. **Is your analyzer ready?**

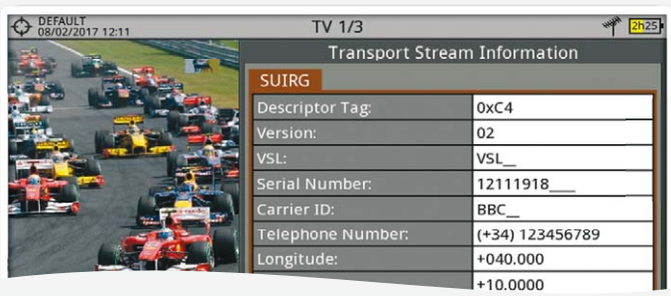
Advanced satellite technology

Beacon-flyaways, SNG and VSAT

Satellite BEACON signals can be clearly seen thanks to the 1 MHz SPAN and 10 kHz resolution filters.

Having the proper resolution filters is critical in some applications, **RANGER*Neo*** includes a very narrow 2 kHz filter available in terrestrial TV band.



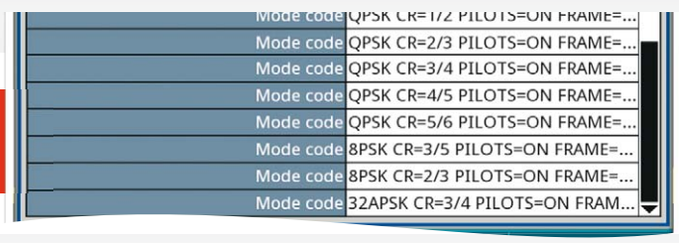


IRG descriptor identification

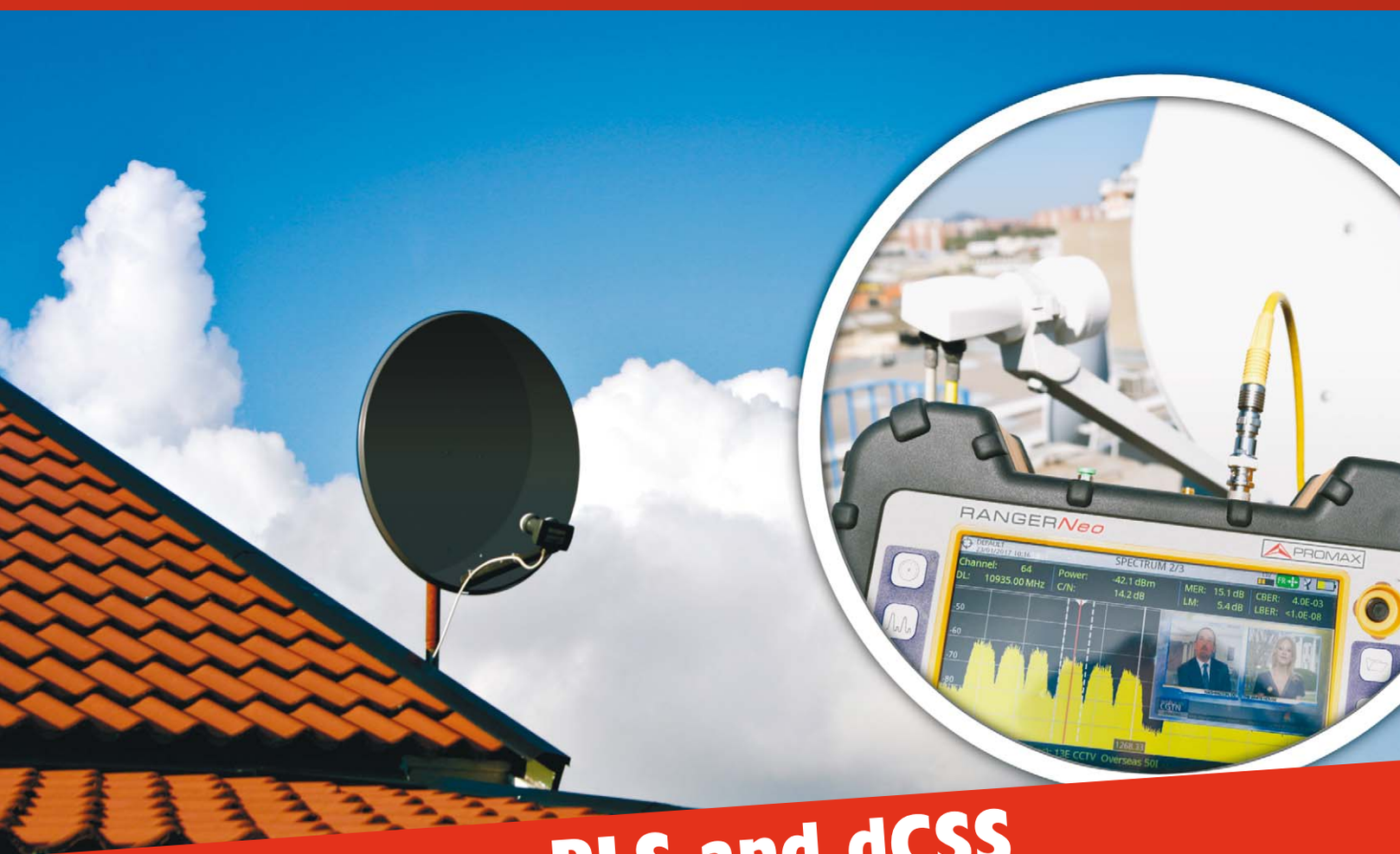
The IRG descriptor is an embedded code that is added to video links containing contact info, GPS coordinates, etc from the source signal to allow a quick troubleshoot of interferences in scenarios such as live transmissions of sports events.

VCM / ACM modulation schemes

VCM / ACM (Variable/Adaptative Coding and Modulation) allow changing the modulation parameters used in the same RF channel over time.



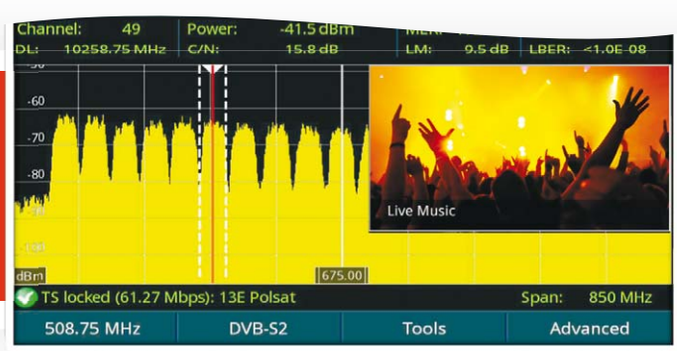
CHECK COMPARISON TABLE

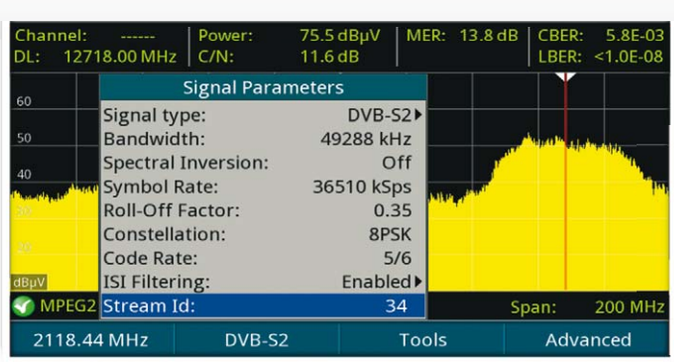


Multistream, PLS and dCSS

dCSS LNBs

Digital Channel Stacking Switch LNB can support several users on a single cable distribution system by allocating specific user bands for each of them. It is not possible to work with this type of LNB unless your field strength meter communicates using EN50494 (SATCR, UNICABLE) and EN50607 (dCSS, JESS, UNICABLE II) standard protocols.





PLS - Physical Layer Scrambling

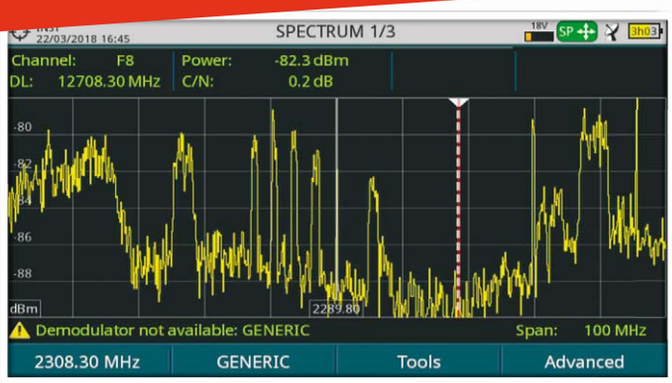
The PLS index is a number generated by the broadcaster that must be properly decoded by the customer so that demodulation is possible. **RANGER*Neo*** can also work with this type of signals.

DVB-S2 multistream

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

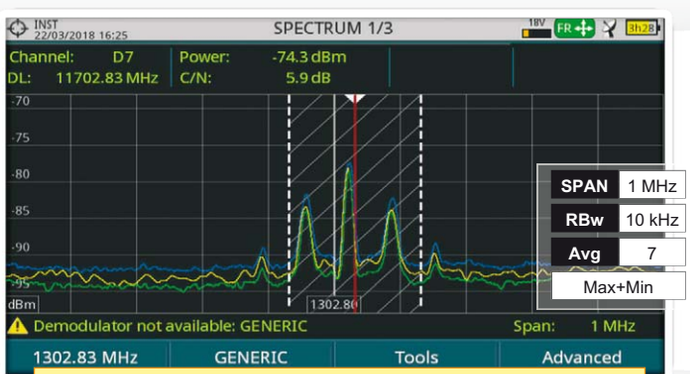
PROMAX

Advanced satellite technology

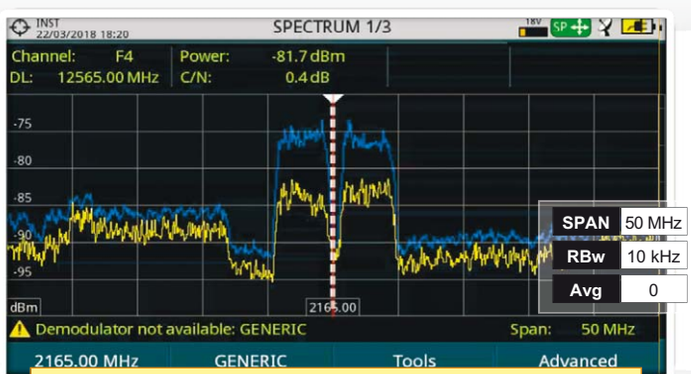


L-band spectrum analyzer

RANGER *Neo* are more than just spectrum analyzers. They are truly multifunctional including characteristics such as 10 kHz to 1 MHz resolution bandwidths, high frequency accuracy, screen capture functionality, datalogger and 24/7 signal monitoring, spectrogram, remote control via webserver and SNMP, all in one box.



Satellite beacon with Max and Min hold



2.1 GHz Terrestrial Interference from mobile phone base station

CHECK COMPARISON TABLE

LIGHTWEIGHT AND DURABLE

Teleport operators, as well as anyone involved in transmission quality assessment can rely upon the **RANGER *Neo*** to obtain the information they need to ensure proper system performance.

Weighing just 2.2 kg it is built to last in a sturdy double injection moulding weatherproof body.

Teleports, SNG, VSAT, SATCOM

If you need 24/7 monitoring...

The **RANGER *Neo*** spectrum analyzers will help you identify signal impairments locally or remotely. They will offer you remote control, webserver, SNMP compatibility, video streaming capabilities or the possibility to set up alarms for automatic monitoring applications.

Specifications

- **Frequency range**: 5 to 2,500 MHz
- **Input range**: -90 dBm to +20 dBm (approx. 20 dBµV - 130 dBµV)
- **Resolution filters**: 10 / 20 / 30 / 40 / 100 / 200 kHz, 1 MHz
- **Span range**: Full span, 1500, 1265, 850, 500, 250, 200, 100, 50, 20, 10, 2, 1 MHz
- **Fast sweep time**: 70 ms depending on span/RBW
- **Amplitude sensitivity**: 1, 2, 5, 10 dB/DIV
- **Advanced features**: Markers, Max/Min hold, Persistence, Trace averaging, RMS/PEAK, SAT IRG descriptor
- **LNA/LNB power**: 5/13/15/18 VDC, 22 kHz, DiSEqC, SATCR, dCSS
- **Remote control**: Ethernet port, webserver, SNMP
- **Display**: 7” touch screen colour TFT
- **Battery time**: More than 4 hours
- **Size & Weight**: 290 x 185 x 95 mm, 2.2 kgr (approx. 5 lbs)

Applications

- Teleport 24/7 monitoring
- SNG, VSAT, Flyaway antenna alignment
- SOTM Terminals (Satcom On-The-Move)
- Government and military SATCOM
- Oil rig & maritime satellite communications
- Beacon, TT&C (Telemetry, Tracking, and Command) signal location and monitoring
- Satellite, TV, CATV entertainment systems
- VSAT system on-site and remote commissioning
- OB van antenna alignment and signal monitoring

CHECK COMPARISON TABLE

RANGER*Neo* TV ANALYZERS

HD RANGER *Eco*

DVB-T2, DVB-C2, DVB-S2, DSS

Super spectrum analyzer

Triple split display

Dolby Digital Plus

Dynamic echoes analysis

DVB version

HD RANGER *UltraLite*

Tablet size

The lightest in the range

DVB version

RANGER *Neo* Lite

Touch screen

HEVC H.265 decoding

Wide band LNB Compatibility

Wi-Fi analyzer

DVB ISDB-T
DVB ISDB-T ATSC
Versions

RANGER *Neo* +

Web Server remote control

Merogram and Spectrogram

Fibre optics and GPS options

More than 4 hours battery time

DVB ISDB-T
DVB ISDB-T ATSC
Versions

Please note ***HD* RANGER *Eco*** and ***HD* RANGER *UltraLite*** do not belong to **RANGER*Neo*** series.

PROMAX

H.265 — H-265 HEVC analyzer and decoder

WiFi analyzer

T2-MI signal measurements

Transport stream recorder and analyzer

HbbTV

4K ULTRAHD

webControl via Ethernet port

Optional DAB and DAB+ digital radio

Optional optical power meter and RF converter

Common Interface slot for encrypted channels

Digital Channel Stacking Switch LNB (dCSS)

Optional GPS for signal coverage analysis

Extended IPTV functions

Optional 6 GHz RF input

RANGER *Neo* 2

IPTV analyzer

High resolution filters

TS-ASI input and output

Common Interface slot

Transport Stream recorder and player

Transport Stream analyzer

DVB ISDB-T

DVB ISDB-T ATSC

Versions

RANGER *Neo* 3

Network Delay Margin (DVB)

T2-MI analysis

GPS for drive test measurements

DVB ISDB-T version

RANGER *Neo* 4

4K decoder

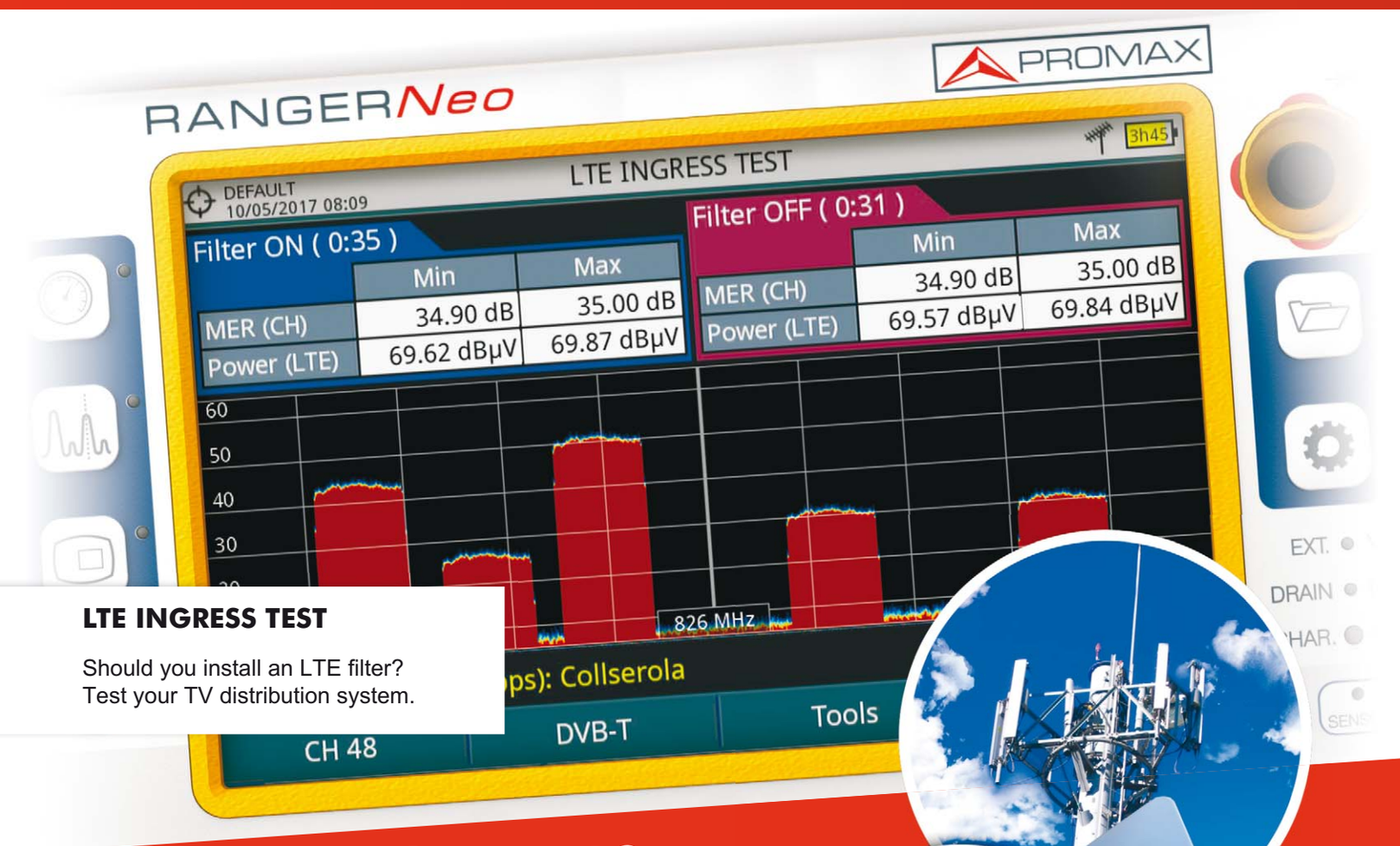
DVB ISDB-T version

ALL MODELS SUPPORT THE MOST RECENT BROADCASTING STANDARDS

UHD/4K DETECTION & MEASUREMENT

HbbTV INFORMATION

DAB+ CHANNEL PLAN



LTE INGRESS TEST

Should you install an LTE filter?
Test your TV distribution system.

LTE interference

LTE interference on SMATV systems

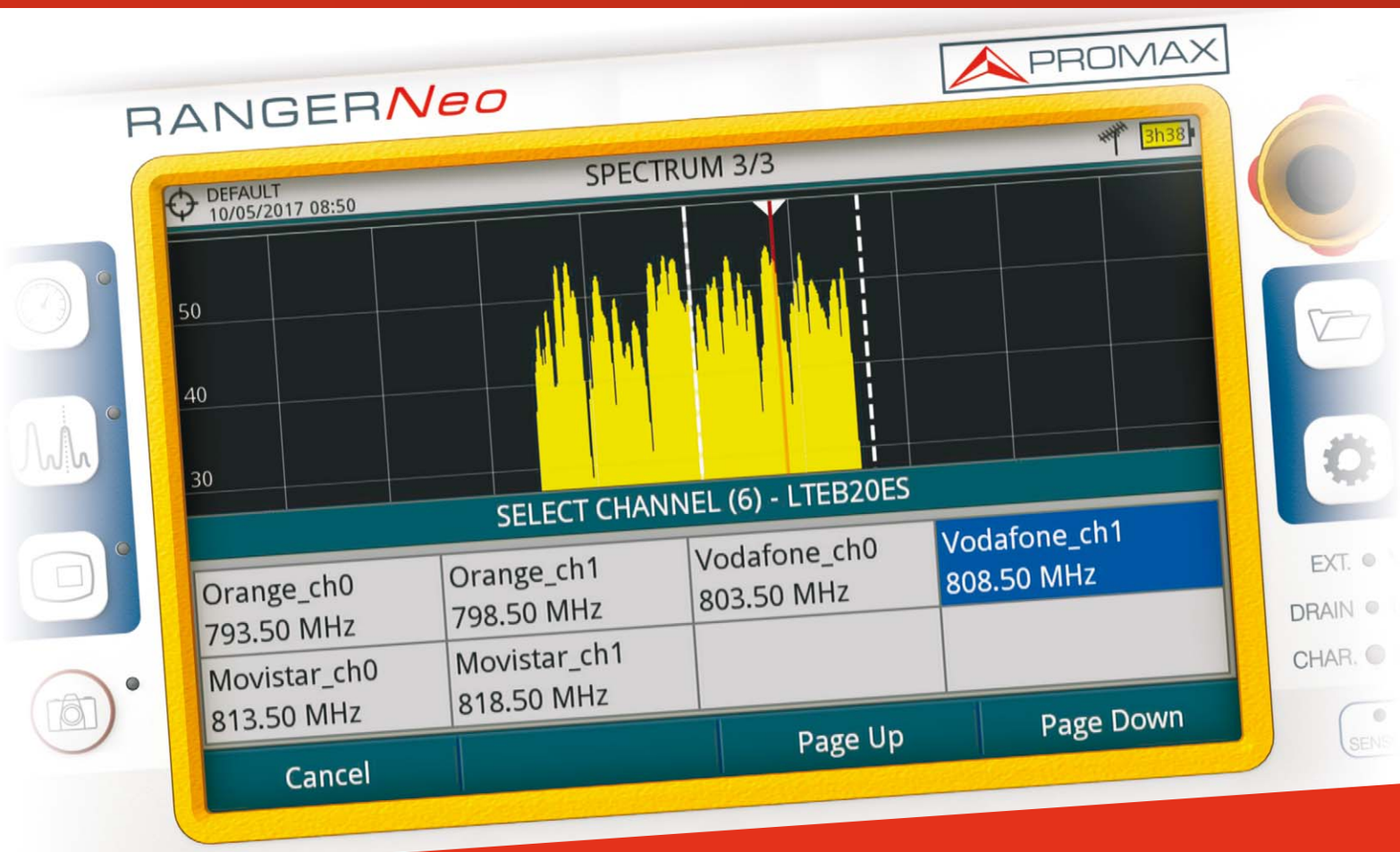
The **RANGER*Neo*** has a variery of tools to compare the signal reception quality measurements on digital TV channels with and without the LTE filter. This is very helpful to anticipate the performance improvement you should expect on your TV distribution system well before you physically make changes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

LTE interference on CATV networks

Some of the bands allocated to LTE are near or inside former television bands. For example band 20 (uplink 832-862 MHz; downlink 791-821 MHz). The **RANGER*Neo*** has special functions to help installers determine the level of activity in those bands and therefore anticipate potential interference problems

Downlink and Uplink interference

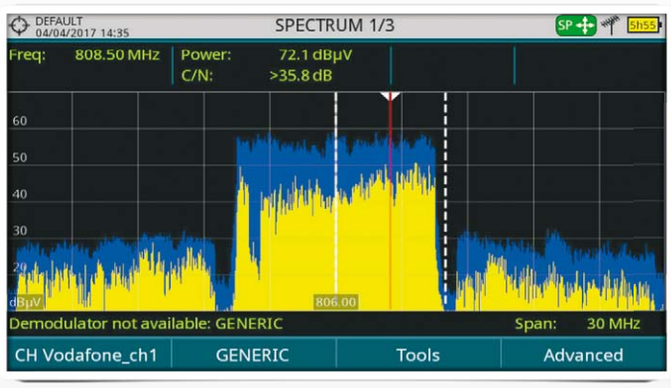
Downlink interference comes from the mobile phone base stations which are placed at fixed locations and are always on. This is not the case of Uplink interference which comes from the handheld devices and therefore it can be a lot more difficult to locate and mitigate.



LTE Signals

LTE signals and channel repack

The use of Smartphones is widely spread all over the world. In order to meet user demand for bandwidth, mobile phone operators need to expand their networks, use more efficient transmission standards (LTE) and use part of the bandwidth historically assigned to TV broadcast services (channel repack in the US or digital dividend in Europe).



M2M Machine to Machine applications

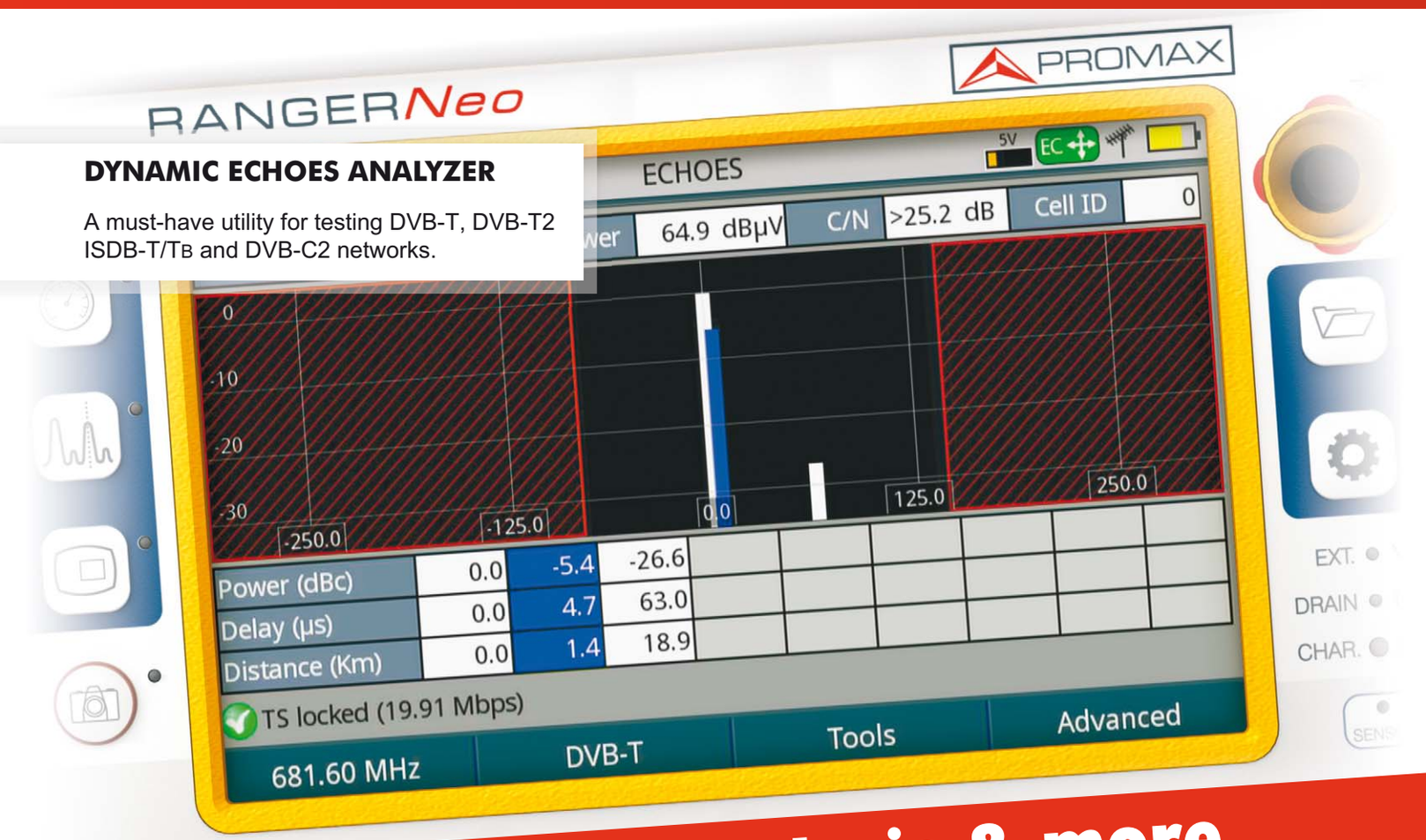
Besides LTE interference measurements there is also an increasing need to look at the LTE signals themselves. This function can also be useful for Machine to Machine applications (electric car charging station, vending machine, wireless credit card reader...). One of the first problems you encounter is to make sure there is good signal coverage from the operator the system is working with.

PROMAX

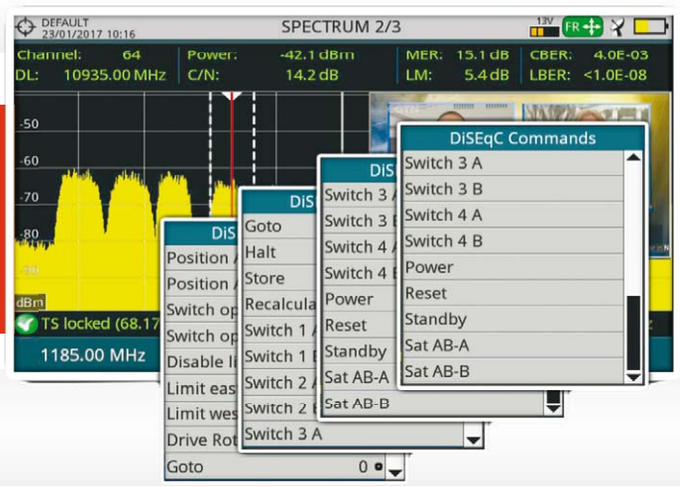
RANGERNeo

DYNAMIC ECHOES ANALYZER

A must-have utility for testing DVB-T, DVB-T2 ISDB-T/Tв and DVB-C2 networks.

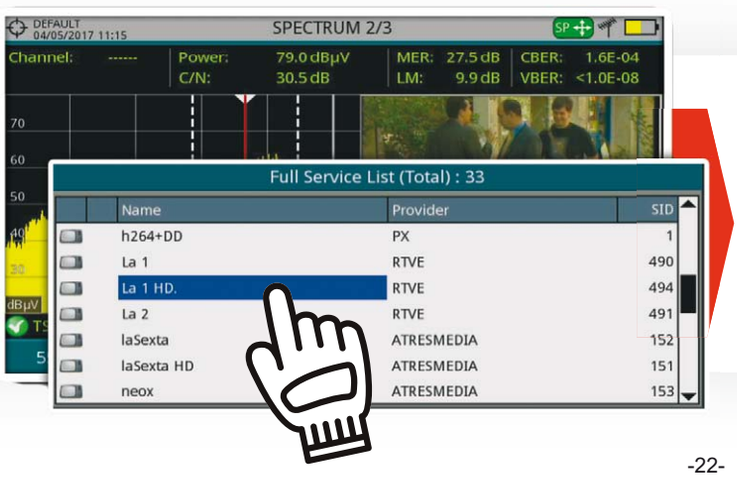


Dynamic echoes analysis & more



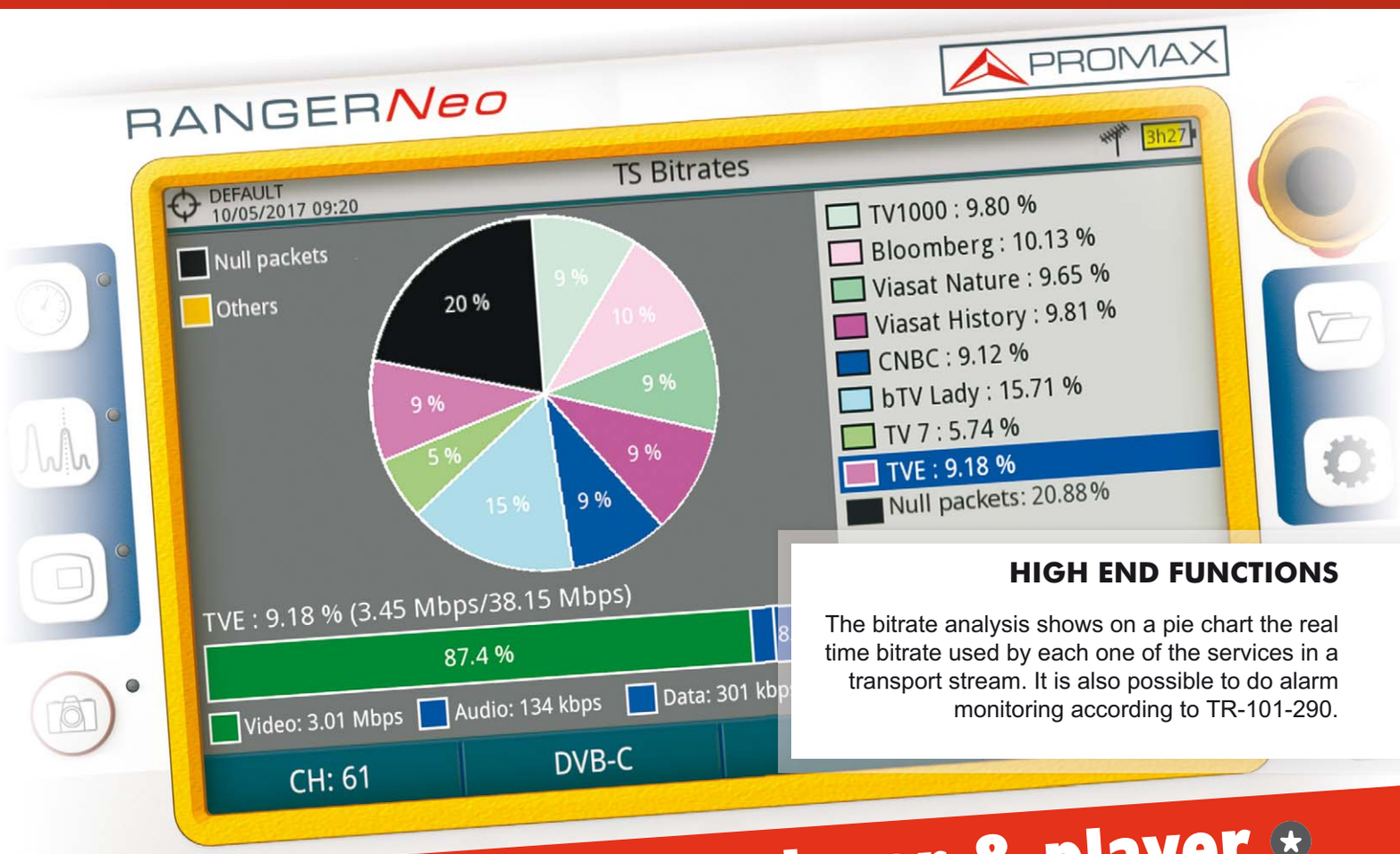
DiSEqC commands

Elementary DiSEqC commands are available from a drop-down list. They can be combined to form macros which can also be associated to a channel table.



Digital services database

RANGER*Neo* builds a list of the TV and RADIO services detected as it tunes the different digital channels. Besides tuning by frequency and channel It is then possible to select a specific service from the list.



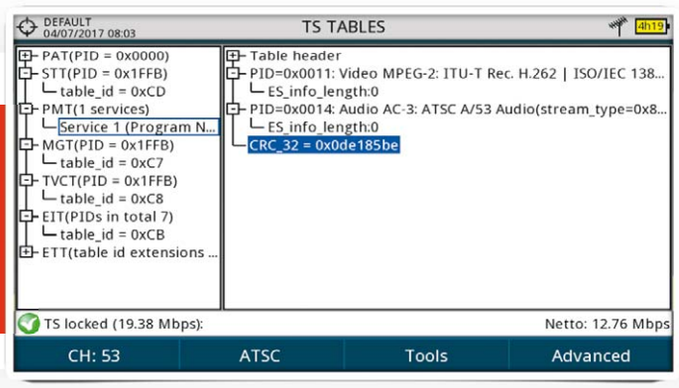
HIGH END FUNCTIONS

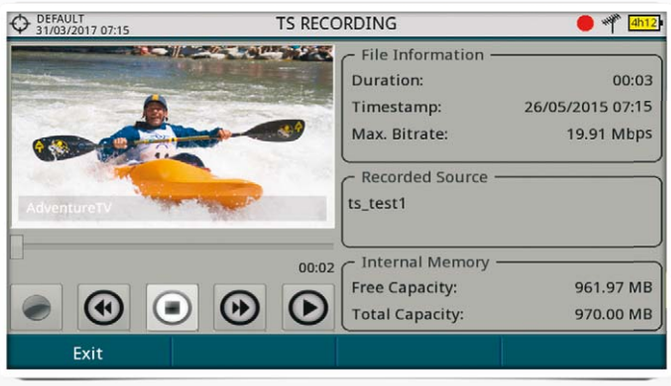
The bitrate analysis shows on a pie chart the real time bitrate used by each one of the services in a transport stream. It is also possible to do alarm monitoring according to TR-101-290.

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.

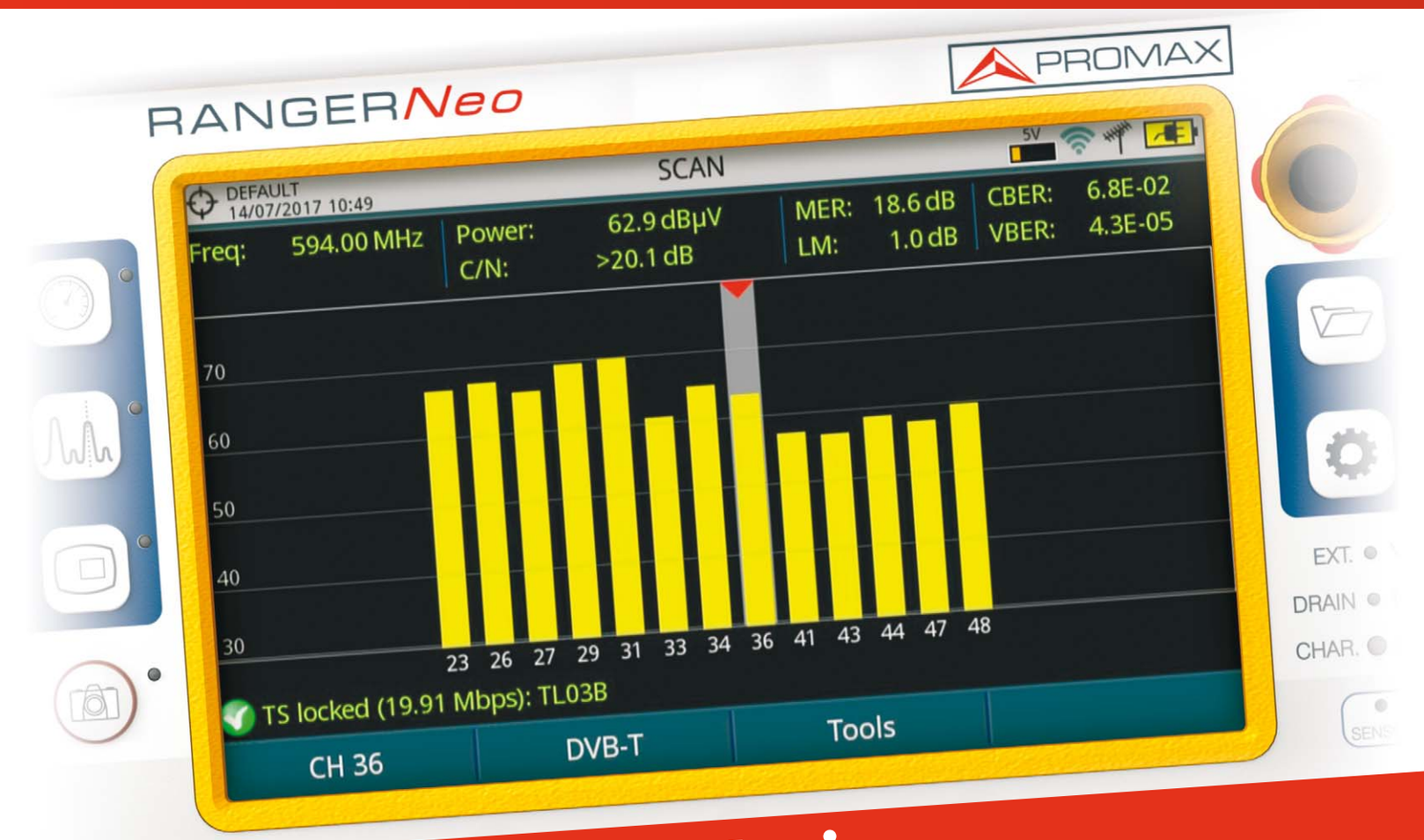




Record, analyze, decode and copy a Transport stream

A function available for **RANGER*Neo*** that enables the instrument to record the received TS in real time onto a a USB pendrive or on its internal memory. The recorded TS can also be decoded or analyzed.

CHECK COMPARISON TABLE



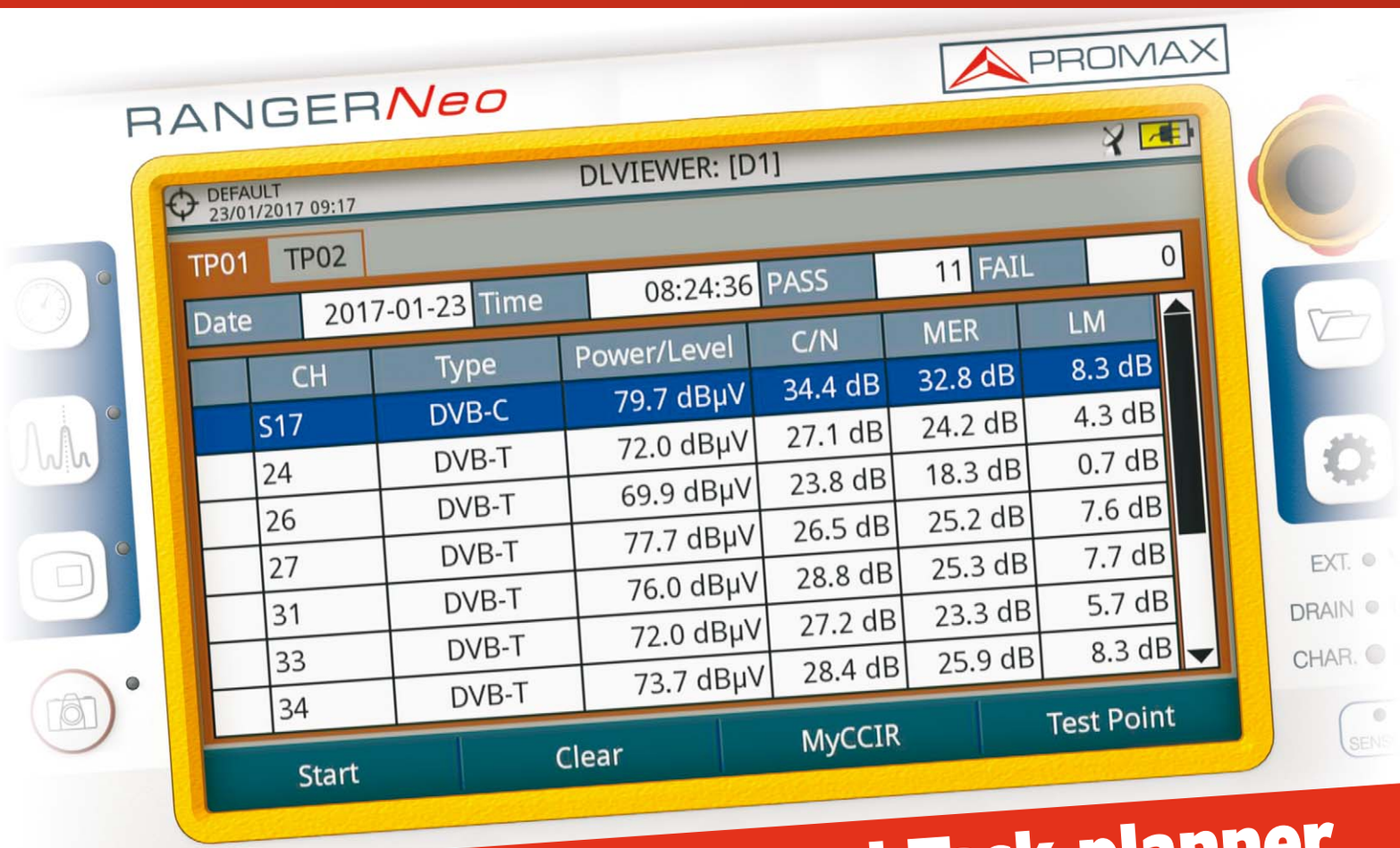
CATV network analysis

SCAN

CATV installers appreciate very much having a SCAN function on their analyzer for it allows them to check all the channel levels in a graphical way.

TILT

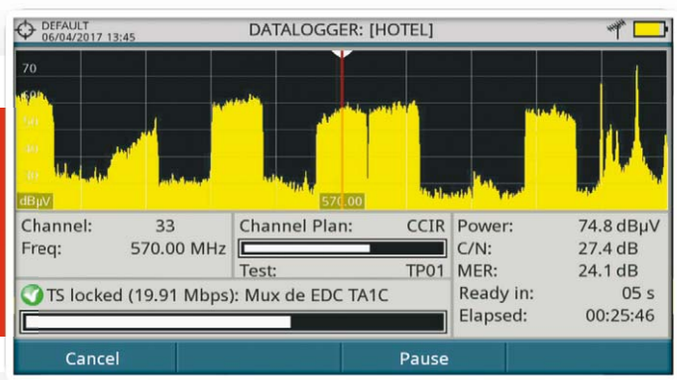
Using pilot generators as a reference, the TILT feature helps us to equalize the CATV network. We can detect as many as 4 pilots along the band from 6 – 999 MHz. The meter will calculate the level difference between the two most distant pilots and the tilt measurement (dB/MHz).

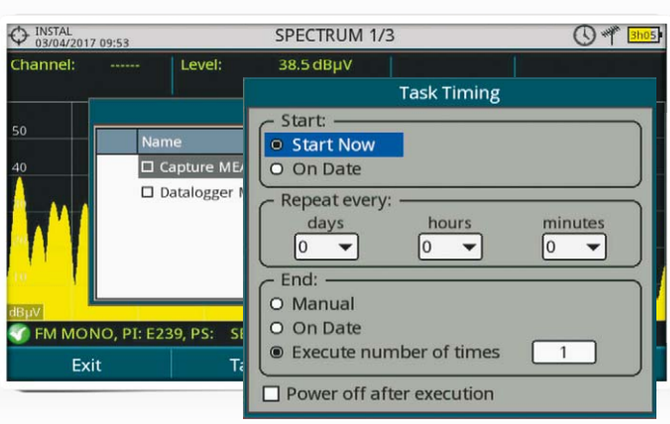


Powerful datalogger and Task planner

Datalogger and Test&Go

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 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.

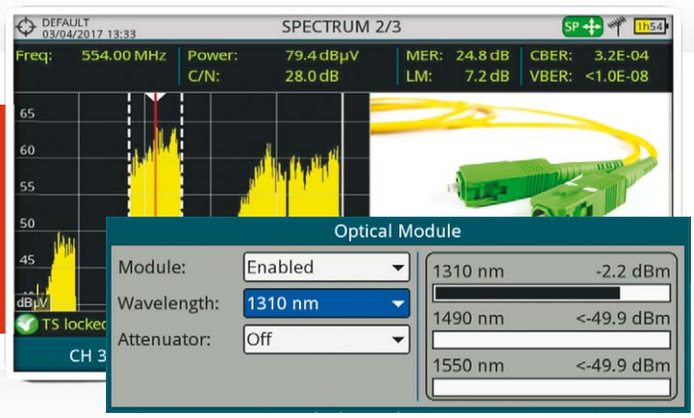
PROMAX

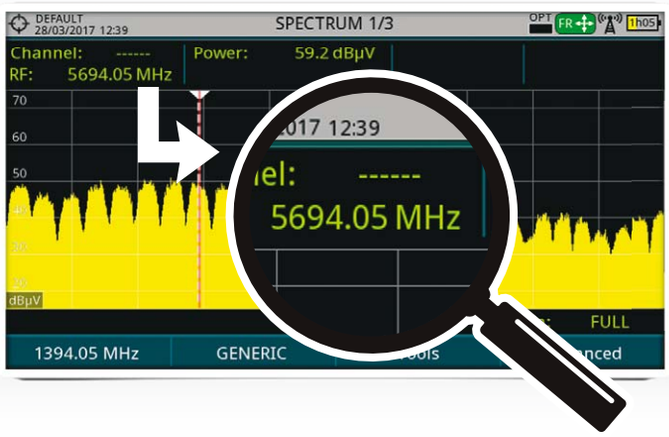
Optical measurements ★

... plus 6 GHz RF input

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.



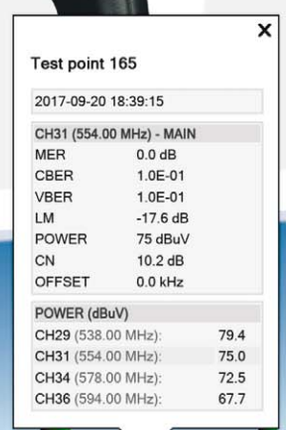


6 GHz RF auxiliary input

The **RANGER*Neo*** optical fibre option comes along with 6 GHz RF auxiliary input which can be used among other applications for direct connection to wholeband LNB's with 5.45 GHz RF output. This auxiliary 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 6000 MHz

★ CHECK COMPARISON TABLE



COVERAGE ANALYSIS AND GPS

This option turns the **RANGER*Neo*** into the perfect tool to perform signal coverage "drive test" analysis functions. It can capture different kind of measurements embedding time/date and geographic coordinates information.

Drive test GPS

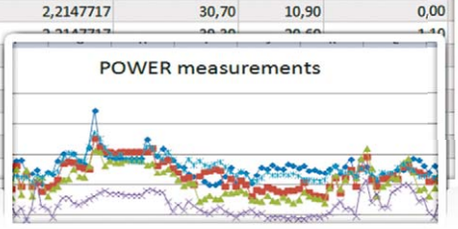
Create 3D maps with your measurements

Run your coverage analysis over one of multiple RF channels simultaneously

Once the drive test is completed, plot the coverage measurements overlayed in Google Earth (KML format), and generate the resulting reports in Exceland CSV formats.

KML EXCEL EXCEL CSV

TIME	LATITUDE	LONGITUDE	POWER (dBuV)	CN (dB)	OFFSET (kHz)
:45:33	41,4062683	2,2147717	32,70	16,50	-1,20
:45:36	41,4062683	2,2147717	35,40	19,30	-1,20
:45:39	41,4062683	2,2147717	35,40	19,40	-1,20
:45:42	41,4062683	2,2147717	31,70	15,10	-1,20
:45:45	41,4062683	2,2147717	33,00	14,40	-1,20
:45:48	41,4062683	2,2147717	32,70	14,30	-1,20
:45:51	41,4062683	2,2147717	30,70	10,90	0,00
:45:54	41,4062683				
:45:57	41,4062683				
:46:00	41,4062683				
:46:03	41,4062683				
:46:06	41,4062683				
:46:09	41,4062683				
:46:12	41,4062683				



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 a 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.

FREE ONLINE TOOL TO GENERATE KML FILES

Google Earth

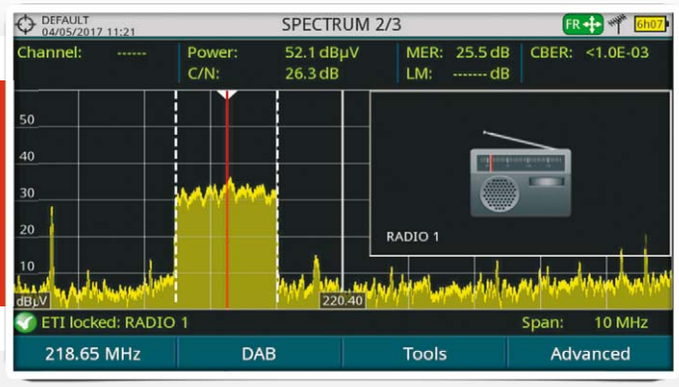
CHECK COMPARISON TABLE

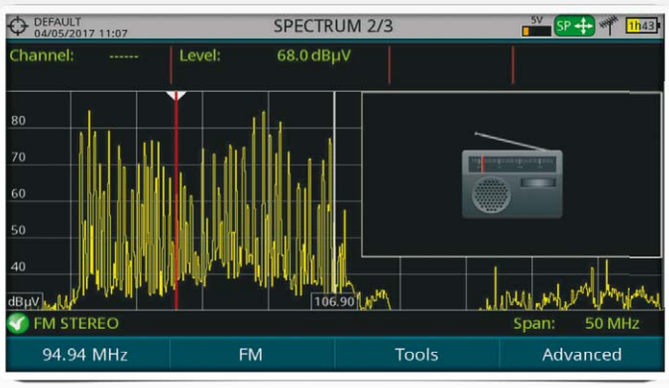
PROMAX

FM, RDS and DAB+ radio

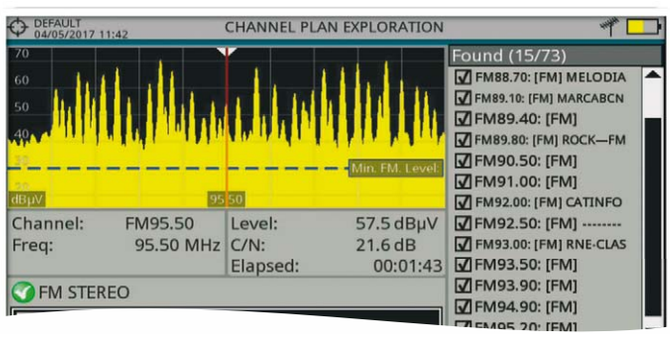
DAB+ digital radio

DAB+ is an evolution of DAB (*Digital Audio Broadcast*) that among other differences uses AAC+ audio codec. It also includes Reed-Solomon error correction algorithm which makes it more robust against transmission impairments. **RANGER*Neo*** DAB option is compatible with both standards.





FM radio receiver and analyzer



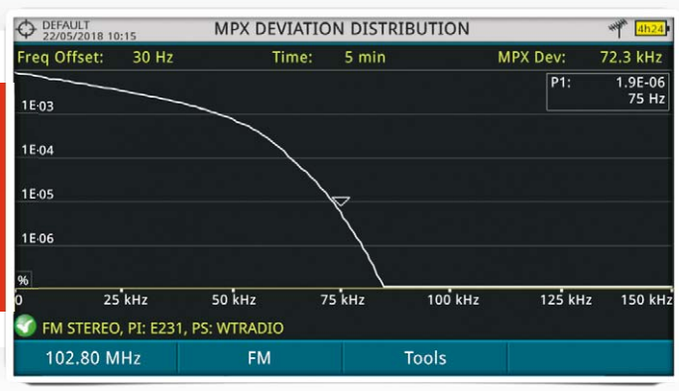
CHECK COMPARISON TABLE

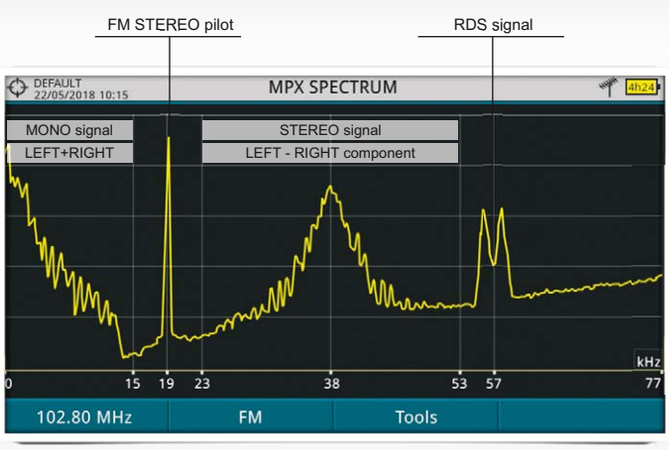
- Modulation Power
- Stereo Pilot Detection and frequency deviation
- MPX Frequency Deviation
- L+R, L-R, L, R Frequency Deviation
- RDS Frequency Deviation
- Tx-Rx Frequency Offset
- Pilot Frequency Offset
- Histograms
- % time frequency deviation > 75 kHz

Advanced FM option ★

MPX Histrogram

All parameters such as FM deviation sampling and refresh rates are set according to ITU-R SM.1268-2 and ITU-R SM.1268-4. Both normal and cumulative histograms are available.





MPX Spectrum display

Spectrum analysis of the MPX can have a variety of applications namely the detection of interferring signals which can not be seen otherwise.

★ CHECK COMPARISON TABLE

PROMAX

dab+

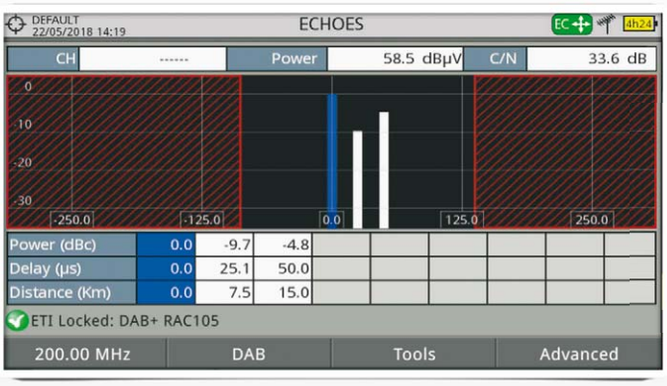
ADVANCED DAB OPTION FOR RANGER *Neo* 2, 3 & 4 ANALYZERS

The new advanced DAB option allows professional users to do DAB signal quality measurements and it includes many functions which are normally available in higher cost products only such as ETI recording, constellation diagram or echoes analysis.

Advanced DAB/DAB+ option ★

ETI recording

ETI stands for Ensemble Transport Interface and it may be described as the equivalent to the Transport Stream for DAB. It is possible to record ETI on the analyzer so that it can then be copied to an external device for further analysis.



Dynamic echoes analysis

DAB can also be operated in a Single Frequency Network (SFN) and therefore the dynamic echoes analysis becomes a handy function to have.

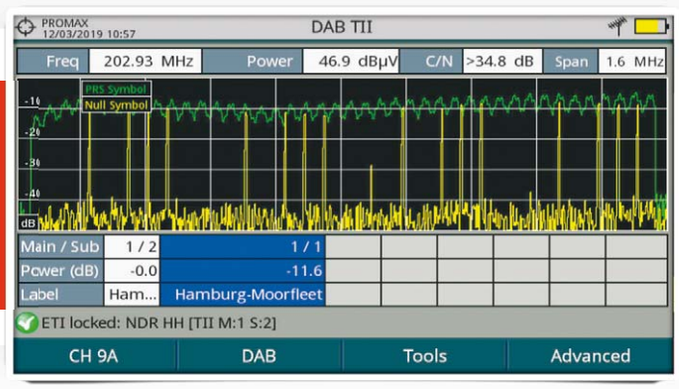
★ CHECK COMPARISON TABLE

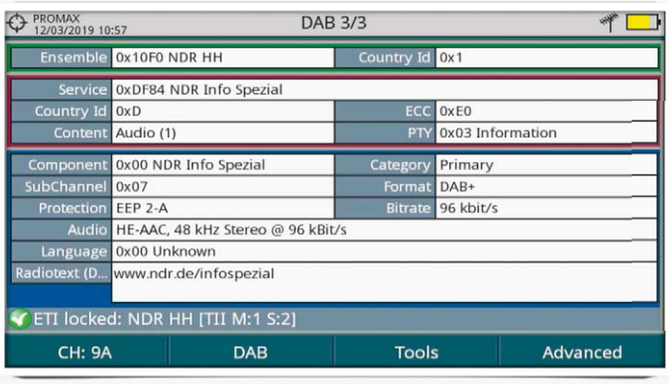
- ETI Recording and Playing
- IQ Recording
- Constellation
- Slideshow
- Full ensemble CBER
- Echoes
- Power, C/N, MER measurements
- NSC CBER
- FIC CBER
- TII
- Audio decoding

Advanced DAB/DAB+ option

Transmitter Identification Information TII

Each transmitter operating in the area is identified by its TII. All TII details are displayed along with the spectral representation of the mux showing the PRS and Null symbols which can be easily identified by colour. A label can be edited and assigned to each transmitter.





Down to the smallest detail

It is also possible to display plenty of useful information about the DAB mux and audio ensembles such as Ensemble and Country IDs, ECC, PTY, Component and SubChannel information or even the detail of the Radiotext.

CHECK COMPARISON TABLE

Create, save and transfer data

Ethernet connectivity

Ethernet and IP protocols are now the gold standards for remote control applications and **RANGER *Neo*** offers this functionality. Besides remote control the IP interface can be used to save or retrieve data from a PC, copy channel tables or installation information, dataloggers, screenshots, etc.

No running out of memory

There is a lot of information that **RANGER *Neo*** can store in its internal memory: Dataloggers, screenshots, signal monitoring files, etc. Its large storage capacity will make you think it's unlimited. However, files such as transport stream recordings can be very heavy. Storage capacity can also be extended to up to several Terabytes using a USB storage device.

HANDHELD: Compact, lightweight, durable, more than 4 hours of battery.

PROWATCH: For 24/7/365 monitoring of broadcasting signal.

19" RACK: Perfect for integration in OBvans.

Three formats, one soul

Perfect to be integrated into OB Vans

RANGER *Neo* rack and **PROWATCH *Neo*** systems are the solution needed by any professional involved in the reception and retransmission of satellite signals.

Including 24/7 permanent monitoring of satellite feeds, continuous evaluation of the transmission quality, system performance tracking… PROMAX systems feature remote control, webserver, SNMP compatibility, video streaming and alarms management.

Soft bag and hard case

A soft carrying bag and a heavy duty transport case are included as standard accessories.

CHECK COMPARISON TABLE

Extended connectivity features

Transport stream input and output

RANGER*Neo* can monitor and analyze streams coming out from satellite receivers, transport stream players, multiplexers, etc. Received transport stream signals can also be output to other devices.

Common Interface

The **RANGER*Neo*** 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.

HDMI™ interface

The **RANGER*Neo*** 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™.

Video input

A RCA to jack adapter is also included for SD composite video input in all **RANGER*Neo*** products.

USB and Ethernet connections

The **RANGER*Neo*** includes USB and Ethernet interfaces. The USB can be used to copy files to memory sticks for example. Remote control and web server functionality are available through the Ethernet port.

CHECK COMPARISON TABLE

SPECIFICATIONS	RANGER *Neo* Lite	RANGER *Neo* +	RANGER *Neo* 2	RANGER *Neo* 3	RANGER *Neo* 4
DIGITAL BROADCAST STANDARDS	DVB-T/T2, DVB-T2 lite DVB-C/C2 DVB-S/S2 DVB-S2 Multistream ISDB-T/Tb DSS, ACM / VCM / CCM		*... Also includes:* MPEG-TS	*... Also includes:* DVB-T2-MI	
AUDIO CODECS	MPEG-1, MPEG-2, AAC, HE-AAC, Dolby Digital, Dolby Digital Plus				
VIDEO CODECS	MPEG-2, MPEG-4 / H.264, HEVC / H.265				
INPUTS AND OUTPUTS	- Universal RF input 50/75 Ω - HDMI™ output - IP interface for remote control - Analogue Video/Audio input - 2xUSB (Type-A) for data transfering		*... Also includes:* - ASI-TS input and output (BNC Female, 75 Ω) - IPTV multicast input (UDP / RTP, RJ45) - Common Interface slot	*... Also includes:* - 1 pps input	
FUNCTIONS	- Constellation diagram - LTE ingress test - Dynamic echoes analysis - StealthID (instant identification of tuning parameters) - 4K detection - PLS (Physical Layer Scrambling) - Ultra fast spectrum analyzer (70 ms sweep time) - 4K Frame grabber - MAX and MIN hold - FM RDS radio measurement and decoding - Screenshots and Datalogger for measurement reports - Beacon-Flyaways for SNG & VSAT - Wideband LNB - WiFi 2.4 GHz - LTE 1.8 GHz - OTT - Service recording - Field strength measurement - Task planner - HbbTV information - DAB+ channel plan included				
ADDITIONAL FUNCTIONS		- Merogram - Spectrogram - Signal monitoring - Remote control (*webControl*) - MER by carrier - Video/Audio Streaming - SCAN + TILT - Shoulder attenuation	*... Also includes:* - TS recording - TS analysis - IPTV multicast measurement and decoding	*... Also includes:* - Network delay (DVB) - DVB-T2-MI analysis	*... Also includes:* - 4K decoder
SPECTRUM ANALYZER **Frequency Margin**	From 5 - 1000 MHz (Terrestrial) From 250 - 2500 MHz (Satellite)				
Measurement range	From 10 - 130 dBµV				
Span	Full / 500 / 200 / 100 / 50 / 20 / 10 MHz				
Resolution bandwidths	100 kHz	100, 200 kHz 1 MHz	2 kHz (terrestrial) 10, 20, 30, 40, 100, 200 kHz 1 MHz		
MEASUREMENT MODE (please refer to STANDARDS section) Frequency Margin	From 5 - 1000 MHz (Terrestrial) From 250 - 2350 MHz (Satellite)				
DVB-T COFDM	Power (35 to 115 dBµV), CBER, VBER, MER, C/N, Link margin				
DVB-T2 Base and Lite COFDM	Power (35 to 115 dBµV), CBER, C/N, LBER, MER, Link Margin, BCH ESR, LDP iterations, Wrong packets				
DVB-C QAM	Power (45 to 115 dBµV), BER, MER, C/N, Link margin				
DVB-C2 COFDM	Power (45 to 115 dBµV), CBER, MER, C/N, LBER, BCH ESR, LDP iterations, wrong packets				
PAL, SECAM and NTSC	M, N, B, G, I, D, K and L				
FM radio	Level measurement				
DVB-S QPSK	Power (35 to 115 dBµV), CBER, MER, C/N, Link Margin				
DVB-S2 QPSK, 8PSK, 16/32APSK	Power (35 to 115 dBµV), CBER, LBER, MER, C/N, BCH ESR, Wrong packets, Link Margin				
DSS QPSK	Power (35 to 115 dBµV), CBER, VBER, MER, C/N, Link margin				
INTERNAL STORAGE	6 GB for measurement protocols, screenshots and transport stream recordings				
PC CONNECTION (via ethernet interface)	NetUpdate 4 (free software) + Free and automatic firmware updates + User customised channel plans + Measurement reports and screenshots				
GENERAL	Hybrid operation: Touch screen (7") or conventional keyboard DiSEqC 2.x generator (DiSEqC 1.2 commands implemented) dCSS / SCD 2 (EN50607) and SATCR/SCD (EN50494)				
BATTERY	> 2h	> 4 h (smart battery)			
HARD CASE	Optional	Included			

OPTIONS	RANGER*Neo* +	RANGER*Neo* 2	RANGER*Neo* 3	RANGER*Neo* 4
GPS Coverage Analysis	Available	Available	**Included**	**Included**
Advanced DAB/DAB+ analyzer	Available	Available	Available	Available
Advanced FM radio analyzer	Available	Available	Available	Available
Rack assembly 19" 4U: 482 (W.) x 178 (H.) x 205 (D.) mm	Available	Available	Available	Available
OPM + Optical-to-RF converter + WiFi 5 GHz + LTE 2.6 GHz + 6 GHz RF input	Available	Available	Available	Available
WiFi 5 GHz + LTE 2.6 GHz + 6 GHz RF input	Available	Available	Available	Available

SPECIFICATIONS REFER TO EUROPEAN VERSION

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RANGERNeo TV analyzers

A new breed of analyzers for a new world

✓ Included
● Optional

	RANGER Neo								HD RANGER	
	4	3	2		+		Lite		Ultra Lite	Eco
	DVB ISDB-T	DVB ISDB-T	DVB ISDB-T	ATSC	DVB ISDB-T	ATSC	DVB ISDB-T	ATSC	DVB	DVB
4K detection	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4K decoder	✓									
HEVC H.265 decoder + 4K Frame Grabber	✓	✓	✓	✓	✓	✓	✓	✓		
MPEG-2 and MPEG-4 H.264 decoder	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HbbTV Information	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Touch screen	✓	✓	✓	✓	✓	✓	✓	✓		
Wide band LNB Compatibility (wbLNB)	✓	✓	✓	✓	✓	✓	✓	✓		
2.4 GHz Wi-Fi analyzer	✓	✓	✓	✓	✓	✓	✓	✓		
1.8 GHz LTE	✓	✓	✓	✓	✓	✓	✓	✓		
OTT	✓	✓	✓	✓	✓	✓	✓	✓		
Service recording	✓	✓	✓	✓	✓	✓	✓	✓	✓	
HDMI output	✓	✓	✓	✓	✓	✓	✓	✓		
Video/Audio input	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
USB interface	2x Type A	2x Type A	2x Type A	2x Type A	2x Type A	2x Type A	2x Type A	2x Type A	1x Mini USB	1x Mini USB
Battery time	> 4 h	> 4 h	> 4 h	> 4 h	> 4 h	> 4 h	> 2 h	> 2 h	> 2 h	> 2 h
Resolution filter 100 kHz	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Resolution filters 200 kHz, 1 MHz	✓	✓	✓	✓	✓	✓			✓	
Resolution filters 2, 10, 20, 30, 40 kHz	✓	✓	✓	✓						
Echoes analysis	✓	✓	✓		✓		✓		✓	✓
Constellation diagram	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
webControl and Video/Audio Streaming	✓	✓	✓	✓	✓	✓				
Spectrogram	✓	✓	✓	✓	✓	✓				
DVB-T/T2: Merogram and MER by carrier	✓	✓	✓		✓					
SCAN + TILT	✓	✓	✓	✓	✓	✓				
IPTV analyzer	✓	✓	✓	✓						
TS-ASI input and output	✓	✓	✓	✓						
TS analysis and recording	✓	✓	✓	✓						
Common Interface (encrypted channels)	✓	✓	✓	✓						
Shoulder attenuation measurement	✓	✓	✓	✓	✓	✓				
T2-MI	✓	✓								
Network delay Margin (DVB)	✓	✓								
GPS for drive test	✓	✓	●	●	●	●				
Signal monitoring	✓	✓	✓	✓	✓	✓				
DAB/DAB+ channel plan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Advanced DAB/DAB+ analyzer	●	●	●		●					
Advanced FM radio analyzer	●	●	●		●					
OPM + Optical-to-RF + WiFi 5G + LTE 2.6G + 6 G RF input	●	●	●	●	●	●				
WiFi 5 GHz + LTE 2.6 GHz + 6 GHz RF input	●	●	●	●	●	●				
ATSC standard				✓		✓		✓		
ISDB-T standard	✓	✓	✓	✓	✓	✓	✓	✓		
DVB-T/T2 standard	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DVB-S/S2, DSS and ACM/VCM standards	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DVB-C standard	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DVB-C2 standard	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
QAM annex B standard	✓	✓	✓	✓	✓	✓	✓	✓		
PSIP analysis				✓						
Closed Caption				✓						
Soft carrying bag	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Hard transport case	✓	✓	✓	✓	✓	✓				

DESIGN AND SPECIFICATIONS ARE SUBJECT TO CHANGES WITHOUT PRIOR NOTICE. 01/25