



FIELD STRENGTH METERS & SPECTRUM ANALYZERS

BROADCAST, CABLE, SATELLITE, IPTV, OPTICAL AND WIFI

RANGER *Neo*



EASY OPERATION

Hybrid user interface
(touch + keyboard)



HEVC H.265

High Efficiency Video
Codec



WIFI ANALYZER

Dual display:
SPECTRUM and DATA



WIDEBAND LNB

Extended SAT band on
a single SPAN

RANGERNeo



HEVC H.265 decoding

High efficiency Video Codec

RANGERNeo covers from 5 to 2500 MHz and includes HEVC decoding. On top of that, the **RANGERNeo 4** features a 4K decoder displaying UHD services. The rest of **RANGERNeo** 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

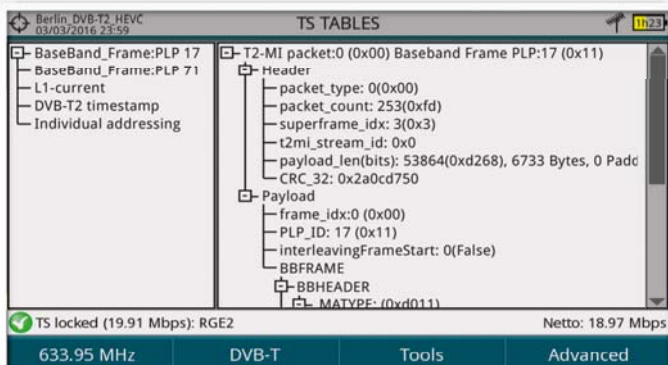
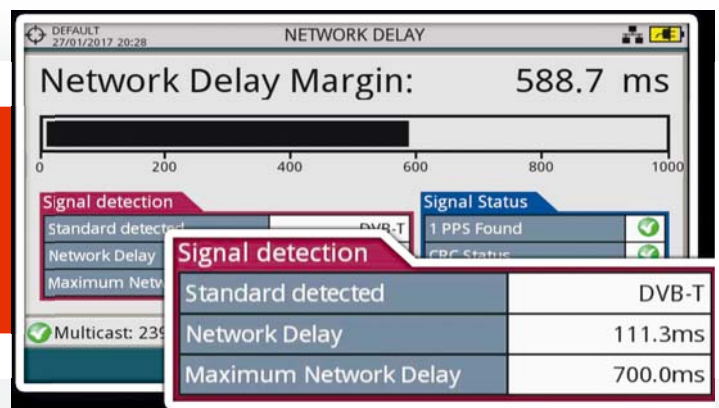




For broadcasters

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.

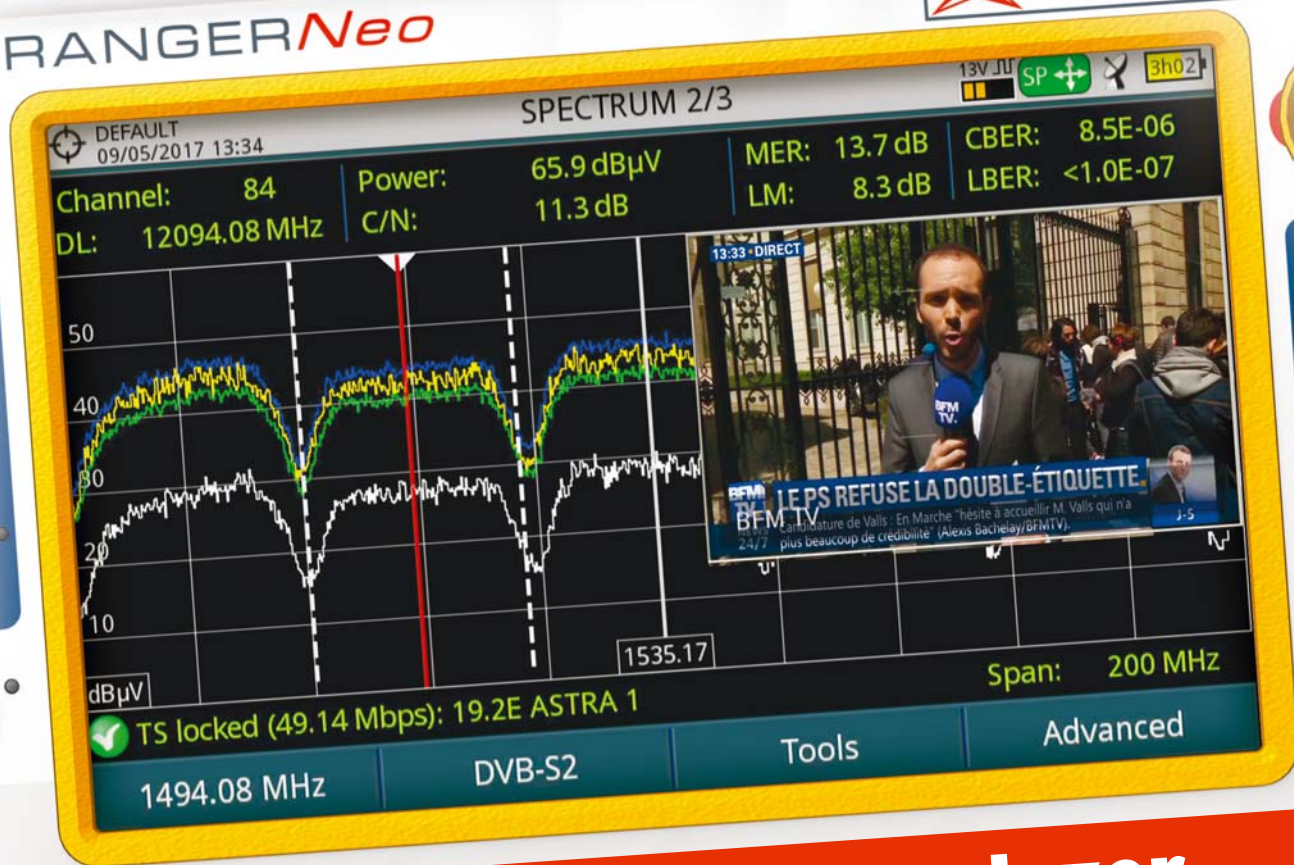


Receiving and analyzing T2-MI signals ⭐

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.

RANGERNeo 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.

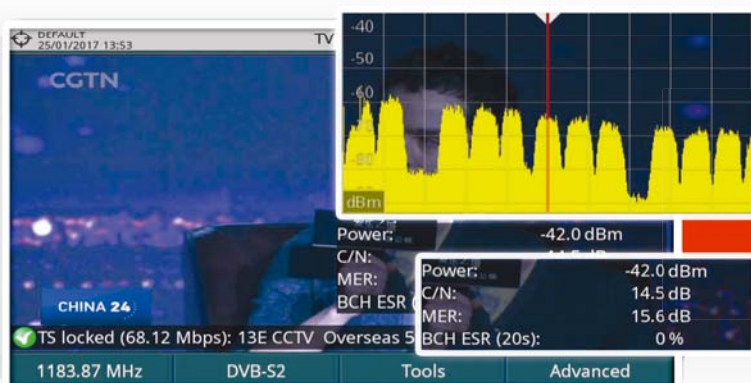
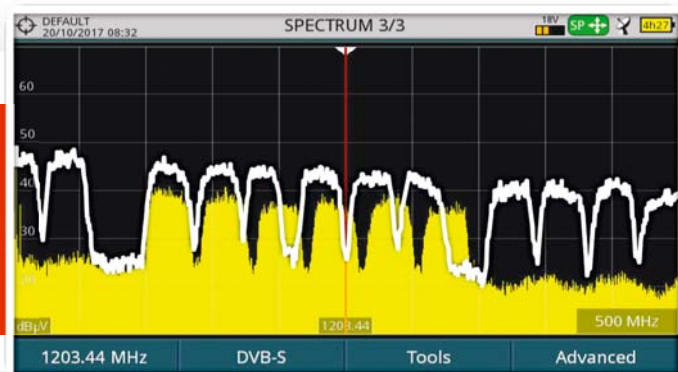
RANGER^{Neo}



Professional spectrum analyzer

Reference traces

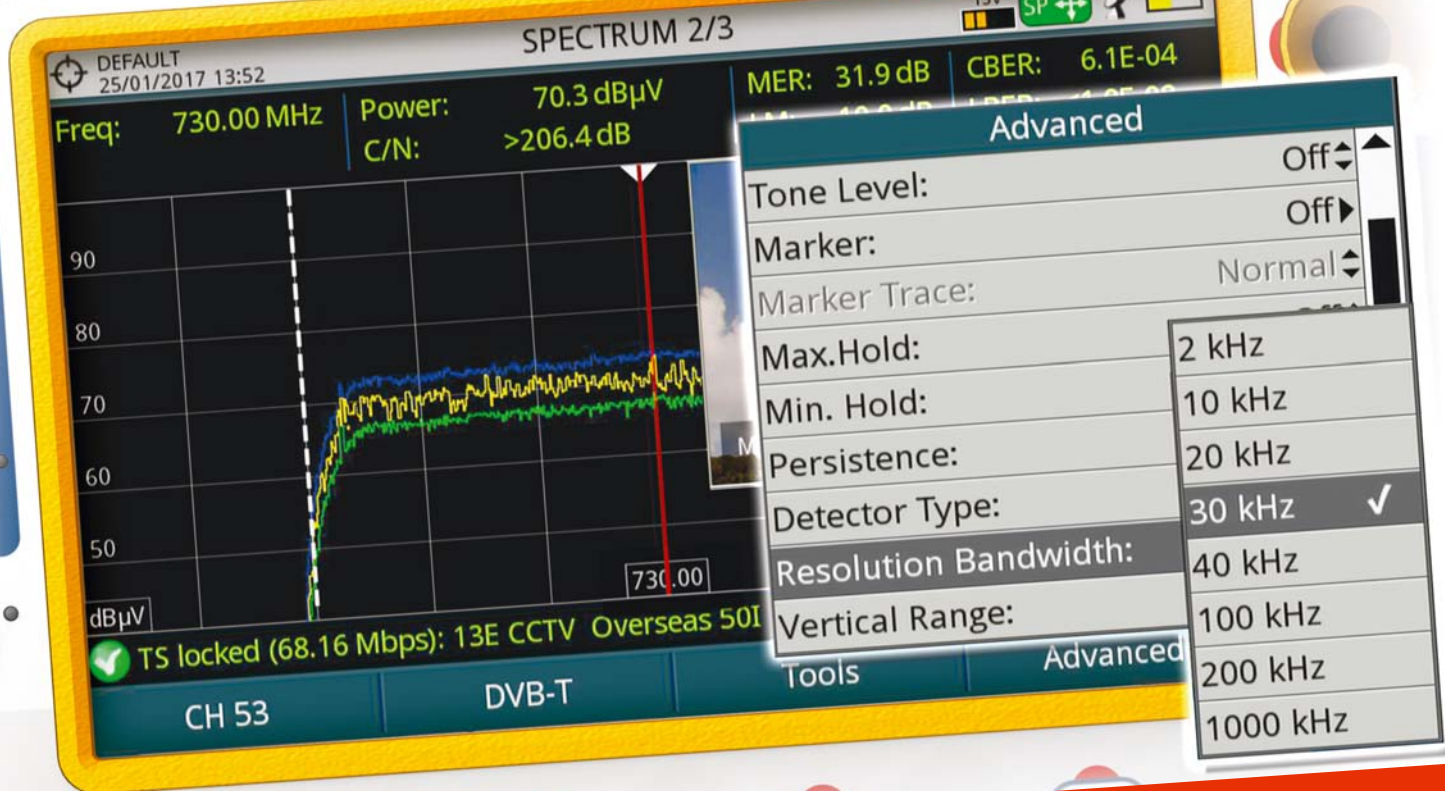
Freeze the spectrum graph and compare it with the running trace. Save that information and use it to identify satellites based on their spectrum footprint.



Triple split display

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

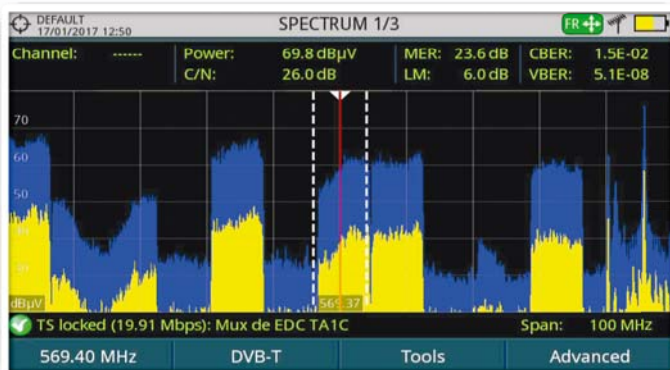
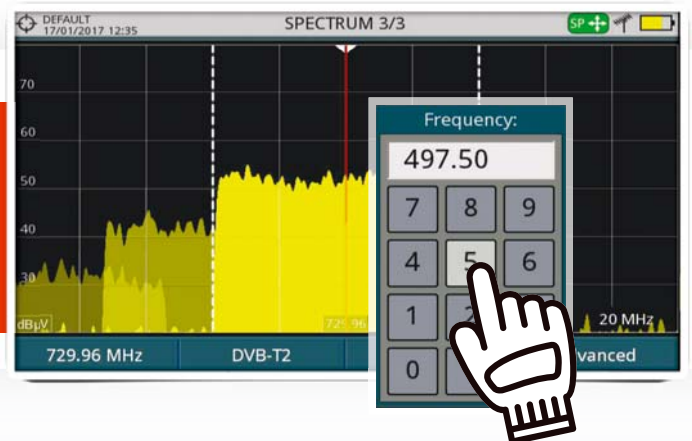
RANGERNeo



High resolution filters ★

Touch screen

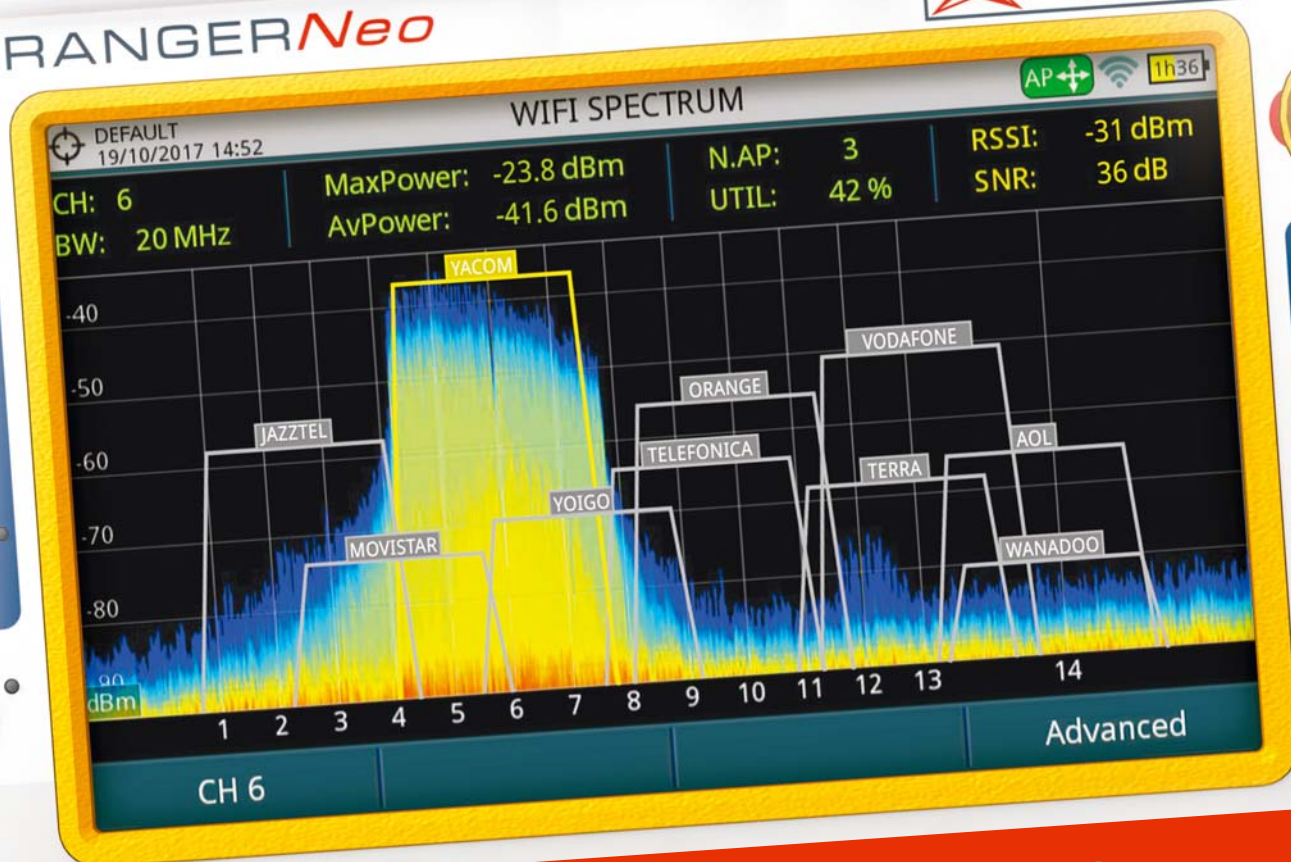
Place the marker on any channel and move the trace using your finger. Enter frequencies or file names using the soft keypad.



MIN and MAX hold

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

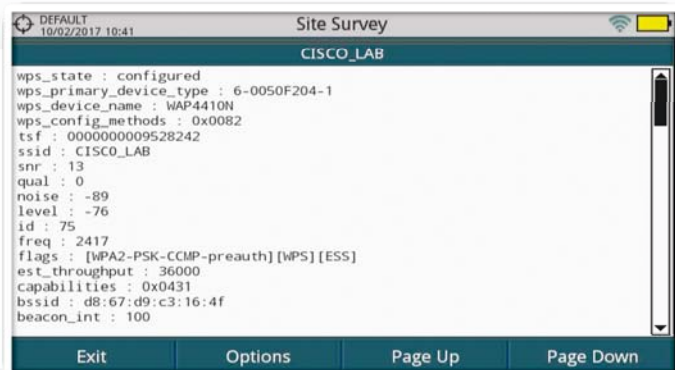
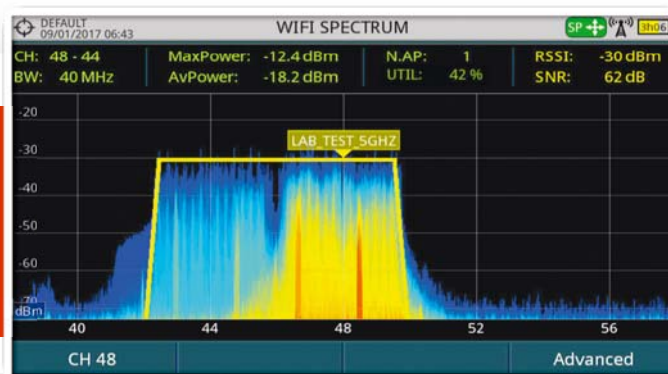
RANGER*Neo*



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. **RANGERNeo** can display real spectrum analyzer information and access point data simultaneously.



Access point information

RANGERNeo 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.





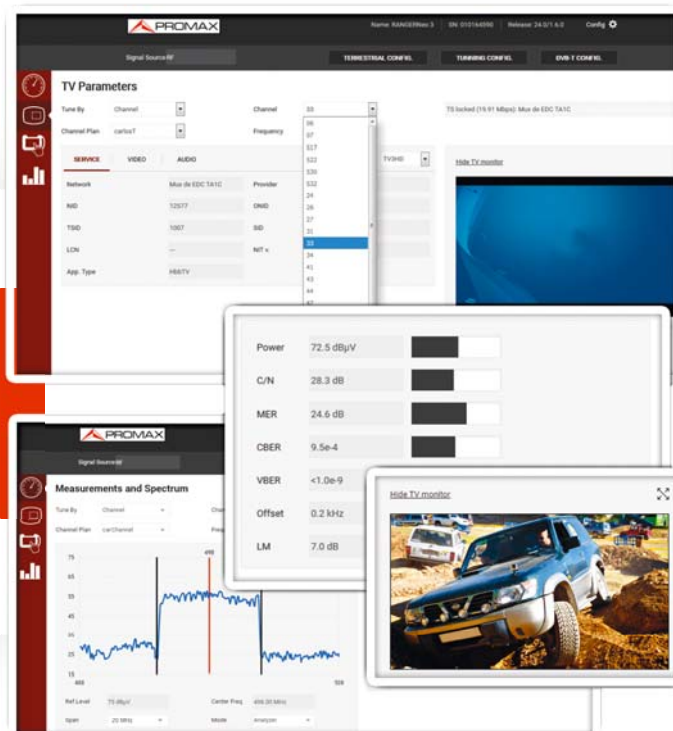
webControl and Video streaming ★

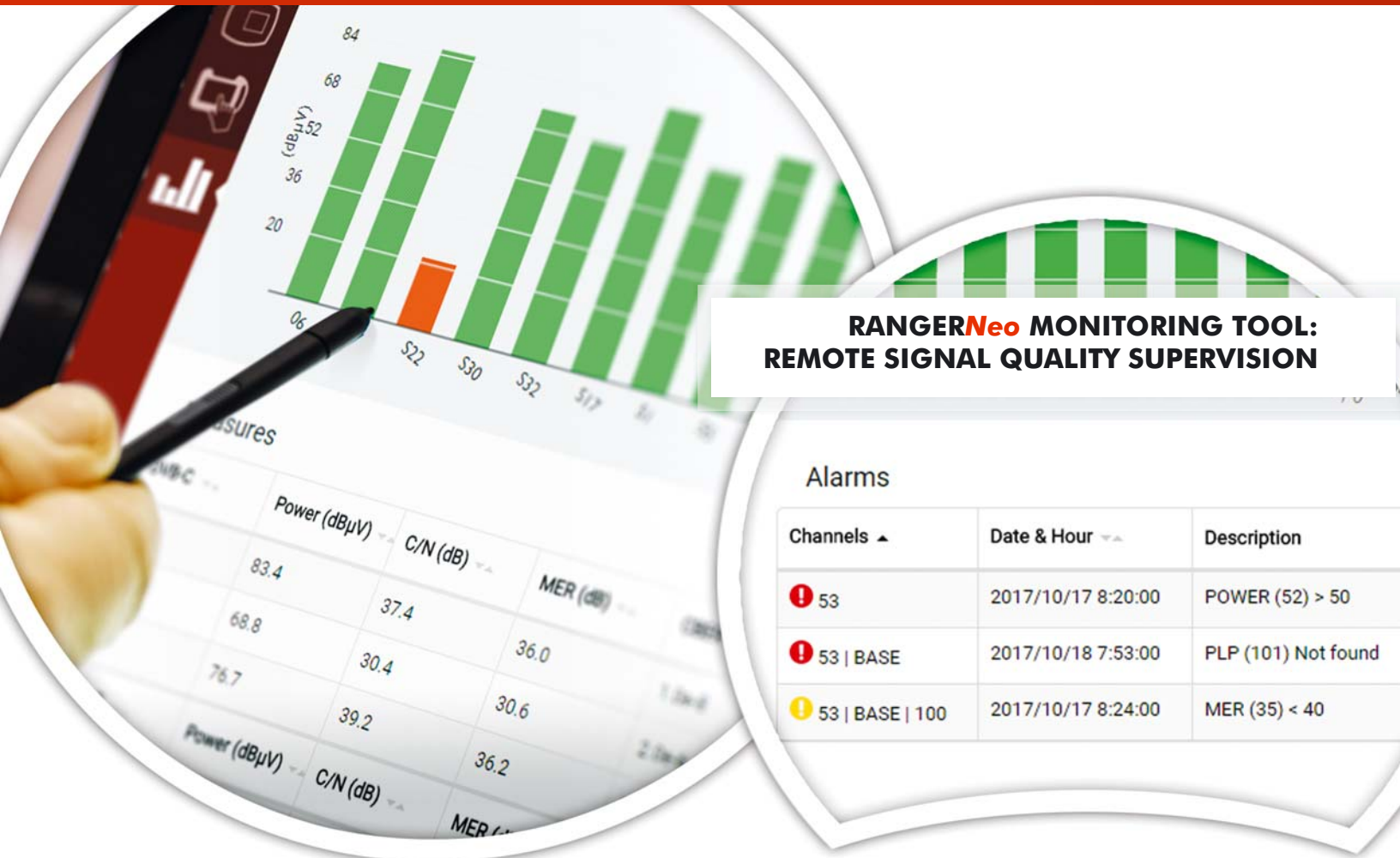
webControl

The **RANGERNeo** internal *webControl* offers four main areas: Spectrum analyzer, TV Parameters, Remote console and Monitoring mode.

The Spectrum analyzer area shows us the spectrum trace, and all measurements for the RF channel being tuned, while we can modify reference level, span, channel/frequency and channel plan used.

The TV parameter area offers relevant metadata identifying the network (NID), (ONID), TS, Service, LCN, etc. along with the video slideshow of one of the services in the selected channel.





RANGERNeo 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.

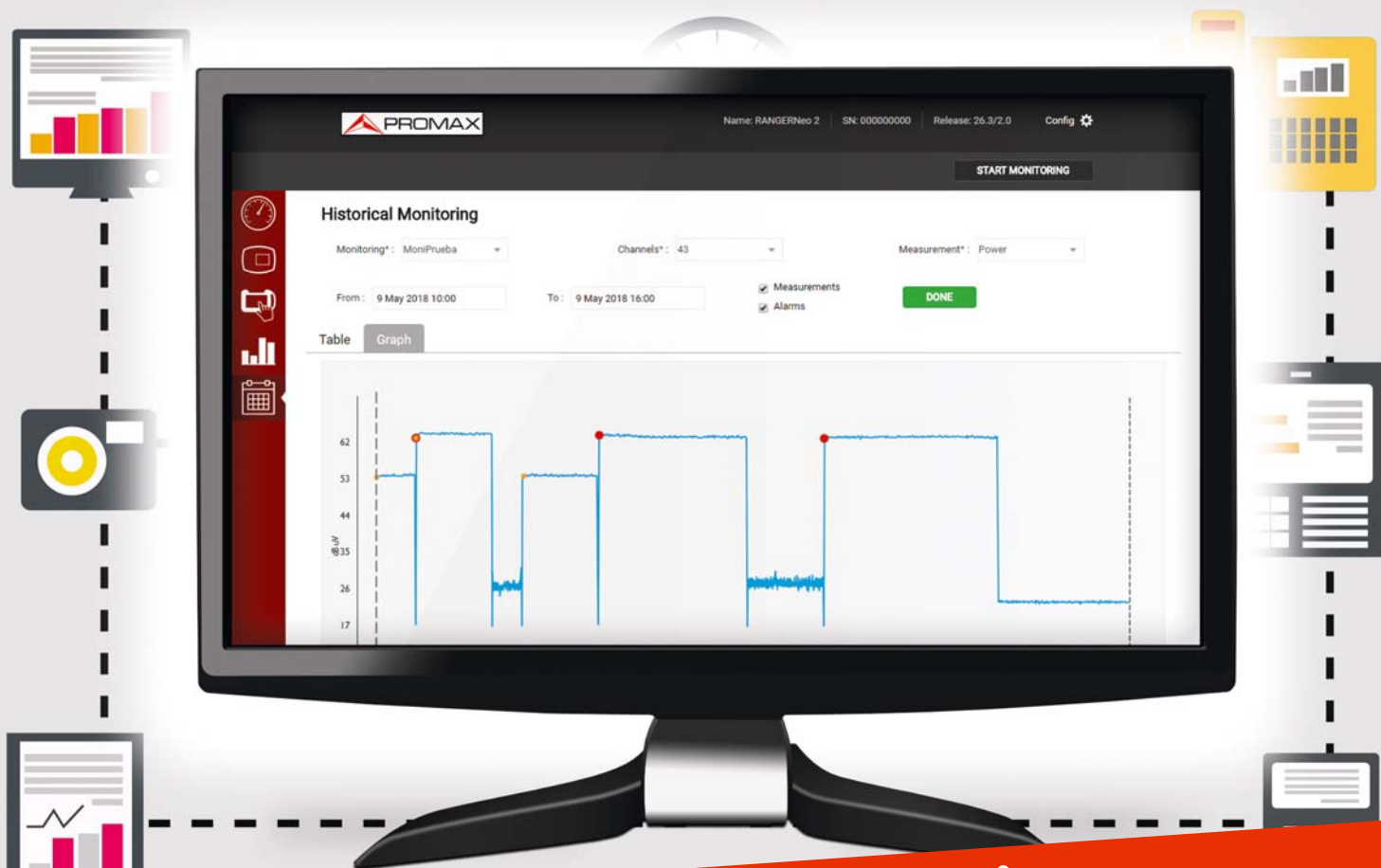


Video / Audio Streaming

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.

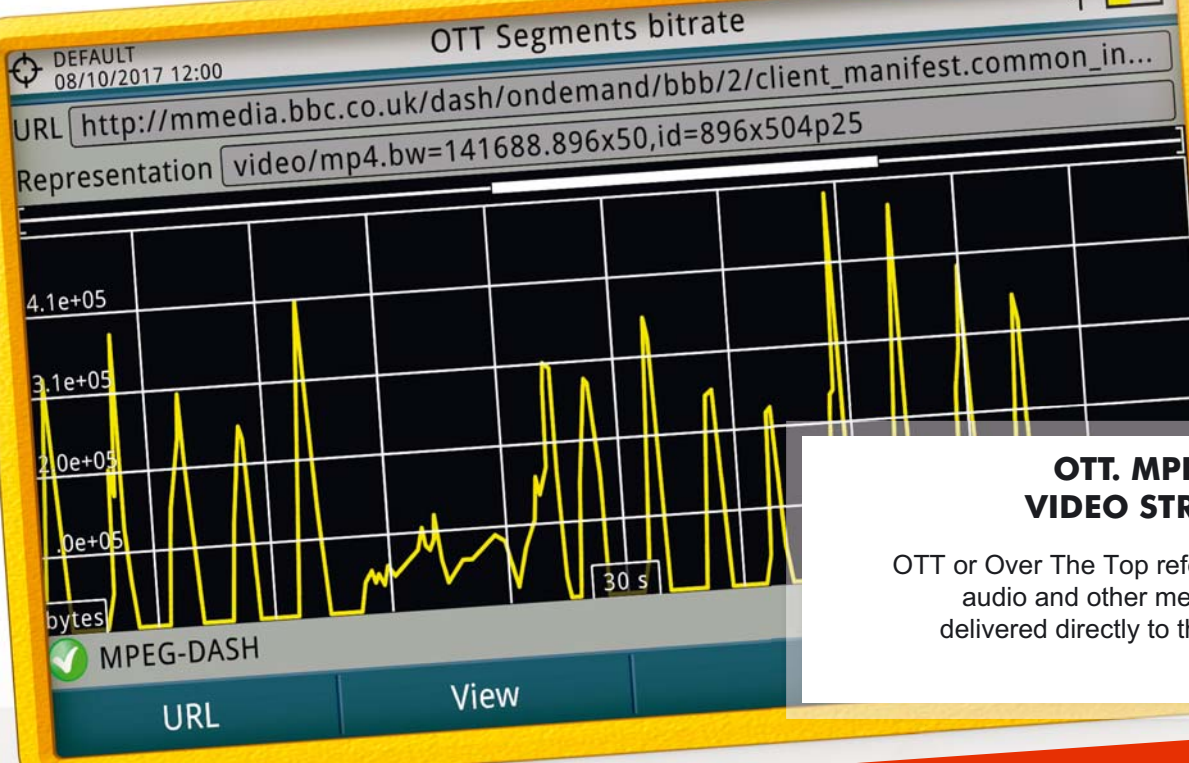


Professional monitoring system

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.

RANGER^{Neo}



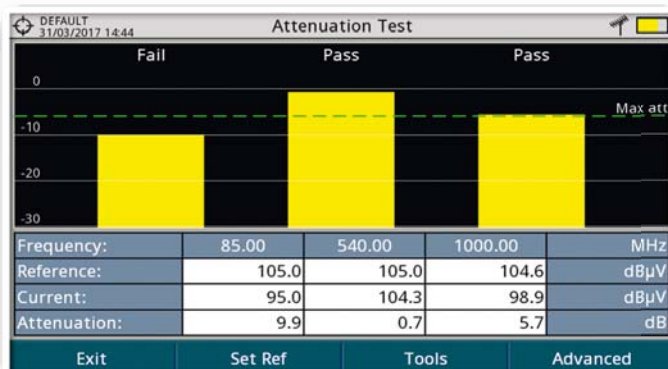
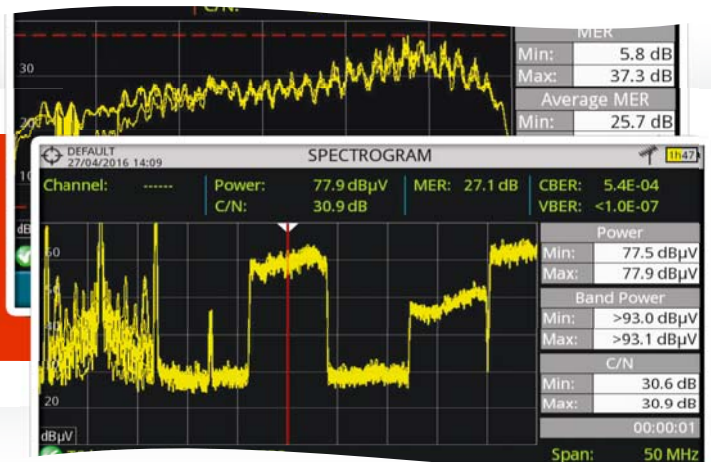
OTT. MPEG-DASH VIDEO STREAMING

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

Many useful functions

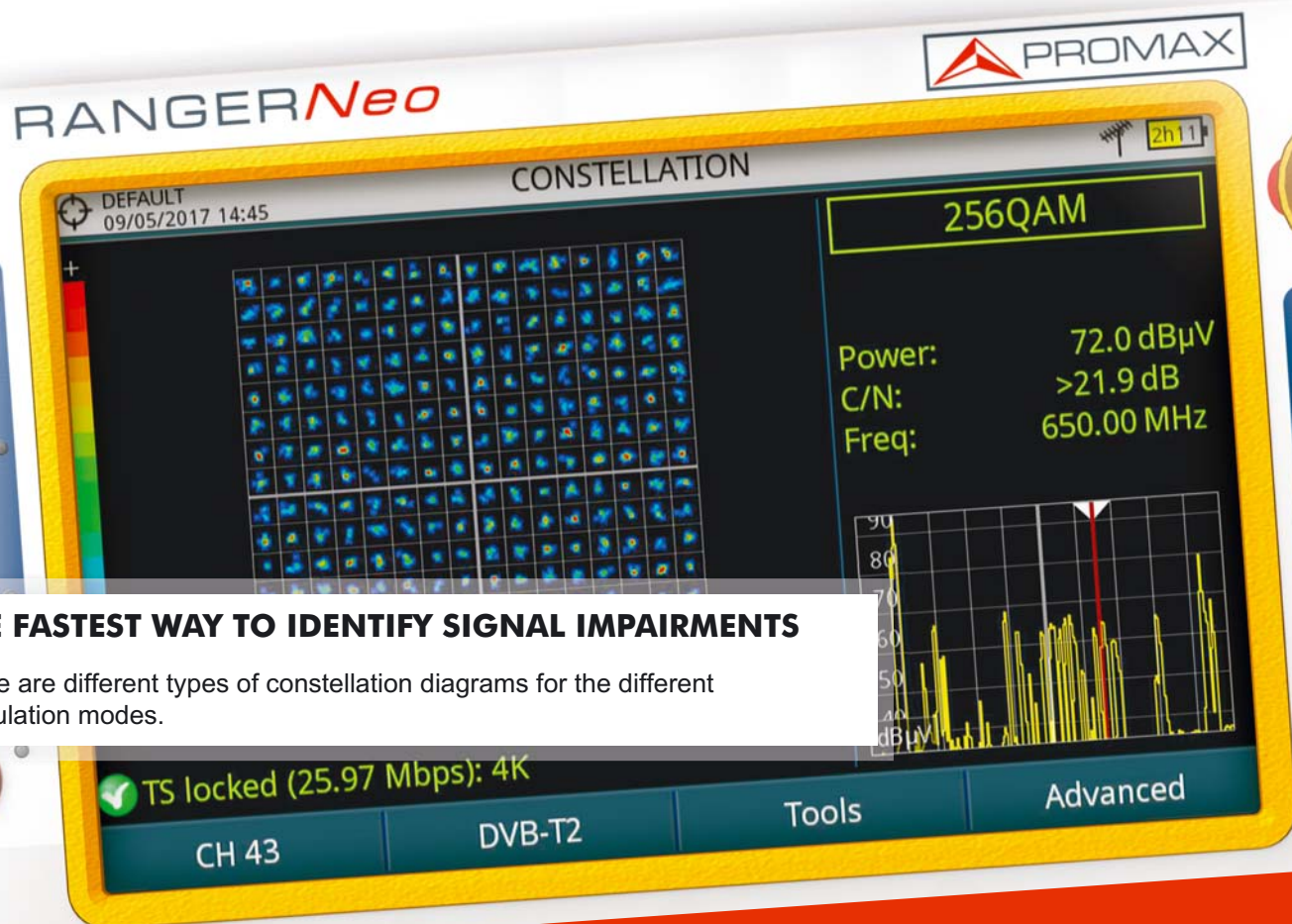
Merogram and Spectrogram *

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.



THE FASTEST WAY TO IDENTIFY SIGNAL IMPAIRMENTS

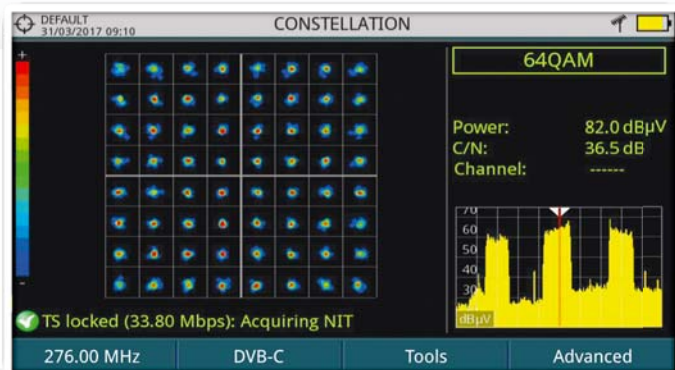
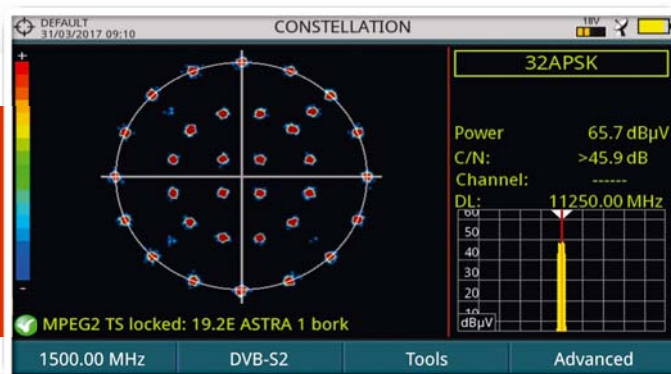
There are different types of constellation diagrams for the different modulation modes.

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.

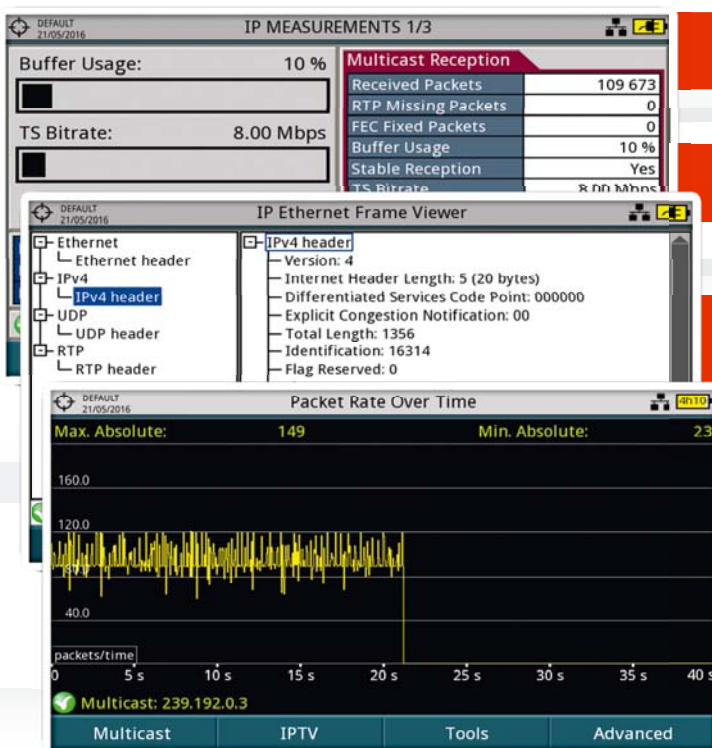


16, 32, 64, 128, 256 QAM *

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.

IPTV MEASUREMENTS

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.

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?**

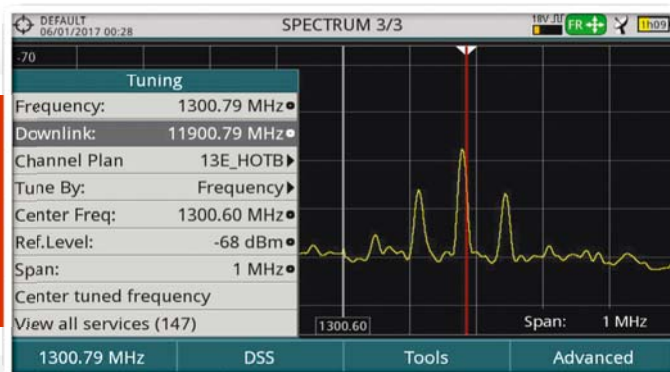


Advanced satellite technology

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, **RANGERNeo** 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.

Mode code	QPSK CR=1/2 PILOTS=ON FRAME=...
Mode code	QPSK CR=2/3 PILOTS=ON FRAME=...
Mode code	QPSK CR=3/4 PILOTS=ON FRAME=...
Mode code	QPSK CR=4/5 PILOTS=ON FRAME=...
Mode code	QPSK CR=5/6 PILOTS=ON FRAME=...
Mode code	8PSK CR=3/5 PILOTS=ON FRAME=...
Mode code	8PSK CR=2/3 PILOTS=ON FRAME=...
Mode code	32APSK CR=3/4 PILOTS=ON FRAM...

VCM / ACM modulation schemes

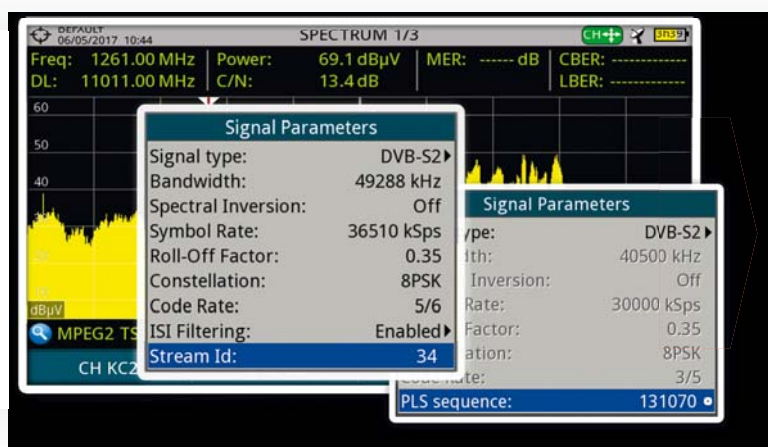
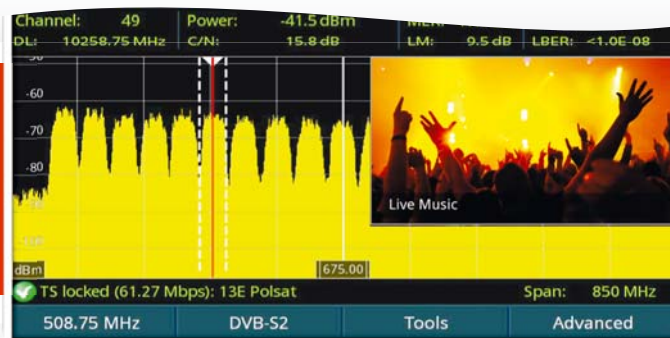
VCM / ACM (Variable/Adaptative Coding and Modulation) allow changing the modulation parameters used in the same RF channel over time.



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

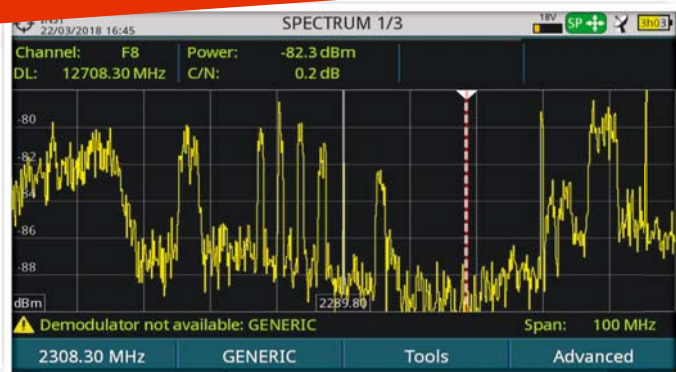
The PLS index is a number generated by the broadcaster that must be properly decoded by the customer so that demodulation is possible. **RANGERNeo** can also work with this type of signals.

DVB-S2 multistream

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

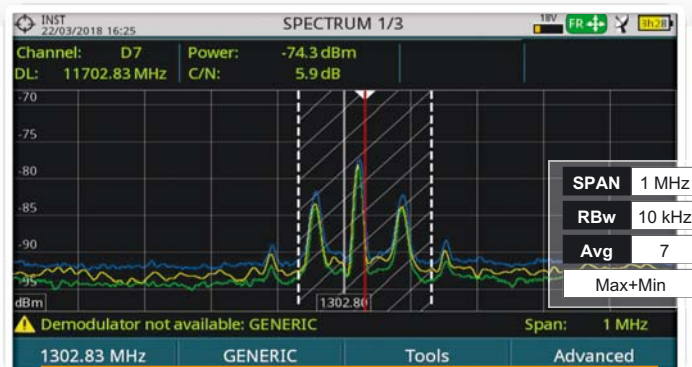


Advanced satellite technology

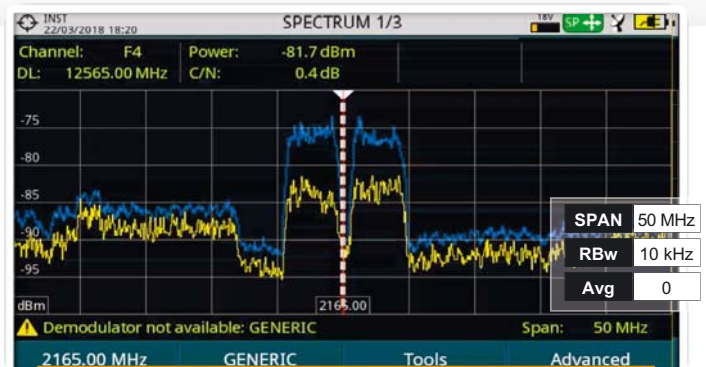


L-band spectrum analyzer

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

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

RANGERNeo TV ANALYZERS



			
HD RANGER Eco	HD RANGER UltraLite	RANGERNeo Lite	RANGERNeo +
			
DVB-T2, DVB-C2, DVB-S2, DSS	Tablet size	Touch screen	Web Server remote control
Super spectrum analyzer	The lightest in the range	HEVC H.265 decoding	Merogram and Spectrogram
Triple split display	DVB version	Wide band LNB Compatibility	Fibre optics and GPS options
Dolby Digital Plus		Wi-Fi analyzer	More than 4 hours battery time
Dynamic echoes analysis		DVB ISDB-T ATSC	DVB ISDB-T ATSC
DVB version		Versions	Versions



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

H.265

H-265 HEVC analyzer and decoder

4K
ULTRAHD

WiFi

WiFi analyzer



T2-MI signal measurements



Transport stream recorder and analyzer



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** **ATSC** versions



RANGER Neo 3



Network Delay Margin

T2-MI analysis

GPS for drive test measurements

DAB/DAB+ digital radio

DVB **ISDB-T** version



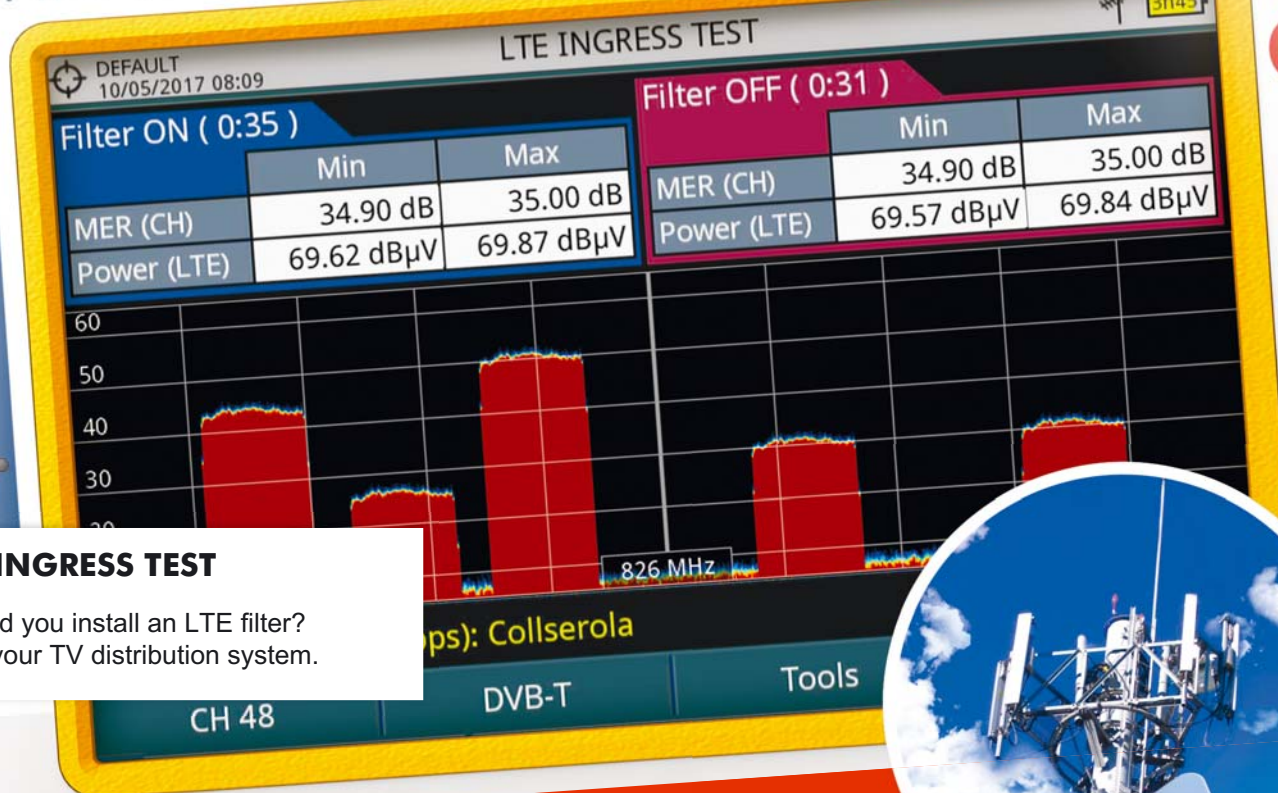
RANGER Neo 4



4K decoder

DVB **ISDB-T** version

RANGERNeo



LTE INGRESS TEST

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

LTE interference

LTE interference on SMATV systems

The **RANGERNeo** 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.

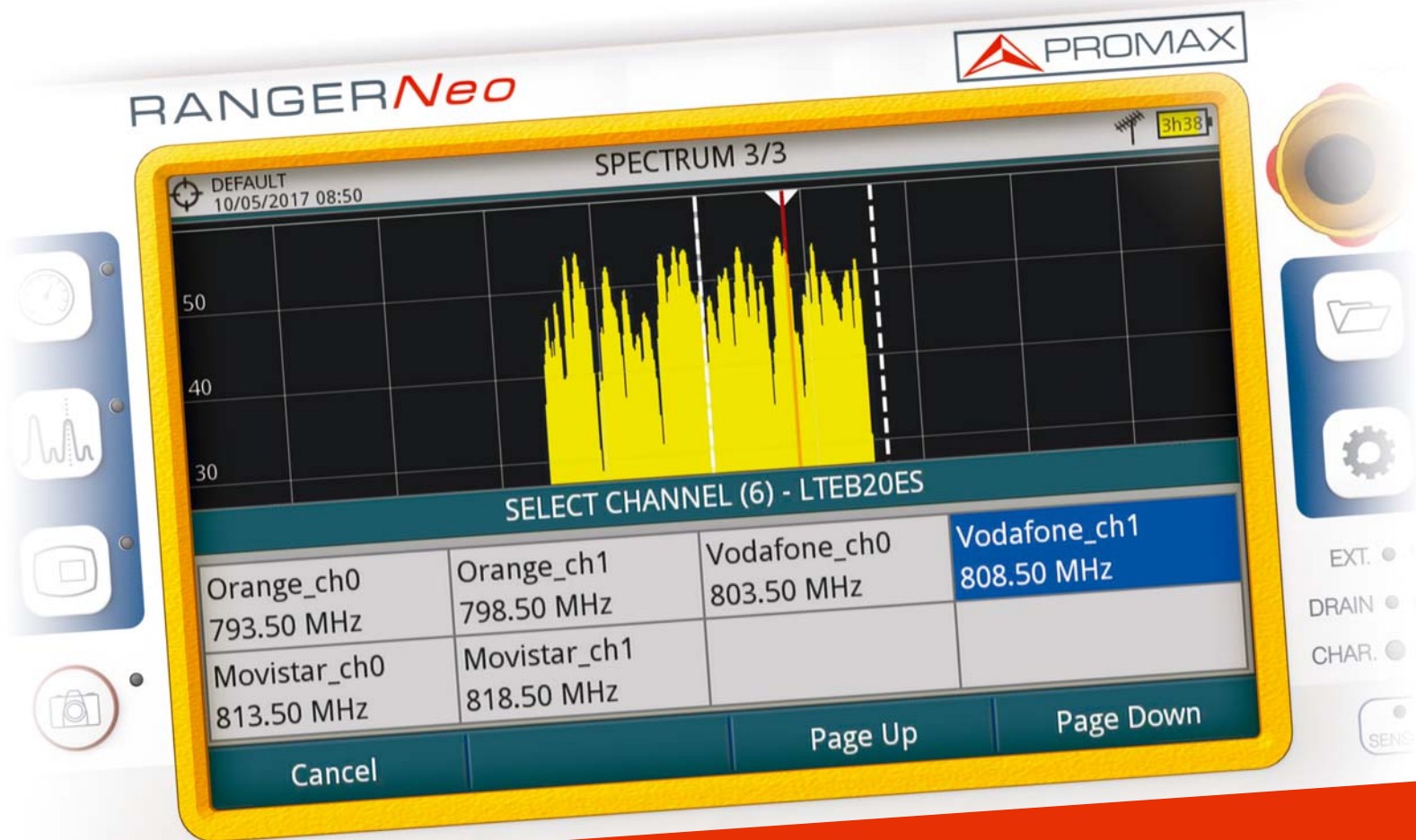
LTE interference on CATV networks

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 **RANGERNeo** 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.

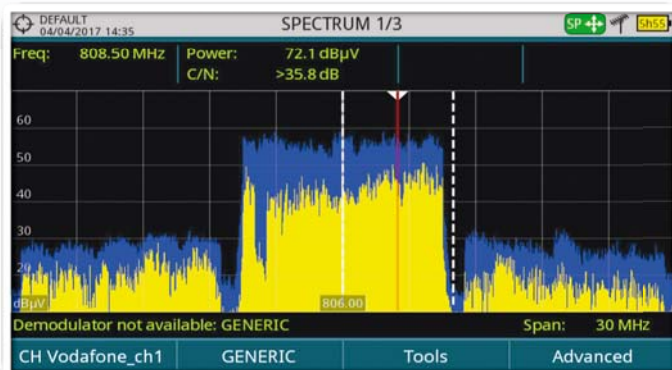
This is not the case of Uplink interference which comes from the handheld devices and therefore it can be a lot more difficult to locate and mitigate.



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).



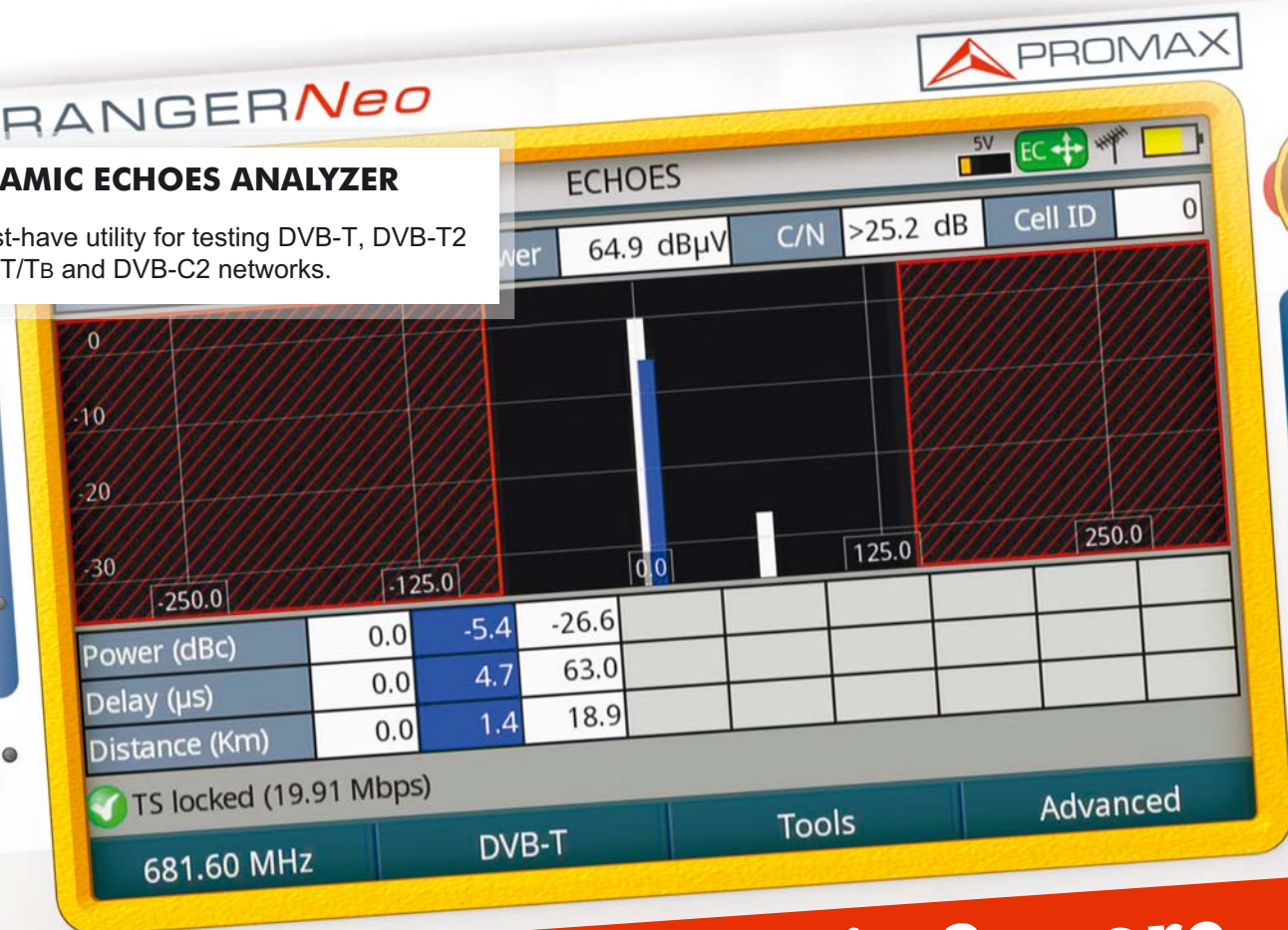
M2M Machine to Machine applications

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.

RANGERNeo

DYNAMIC ECHOES ANALYZER

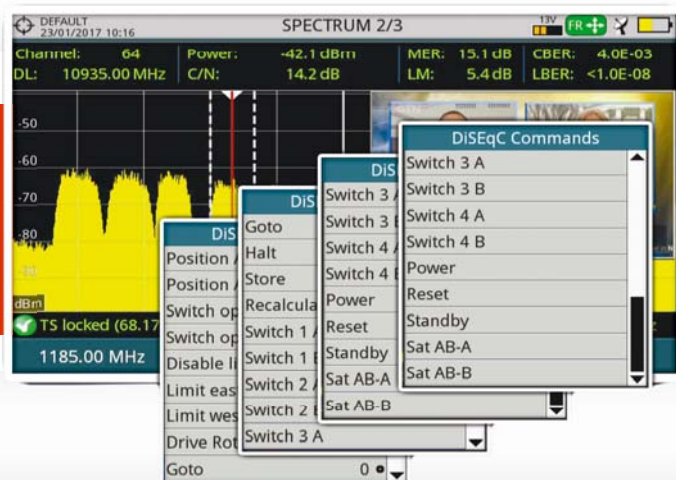
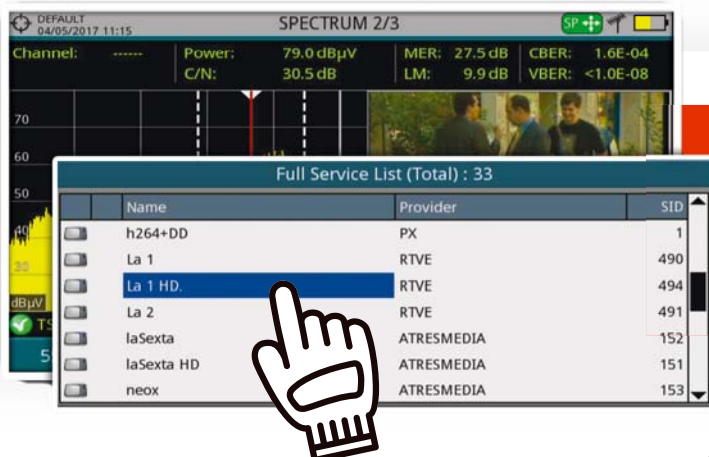
A must-have utility for testing DVB-T, DVB-T2 ISDB-T/Tb and DVB-C2 networks.



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.

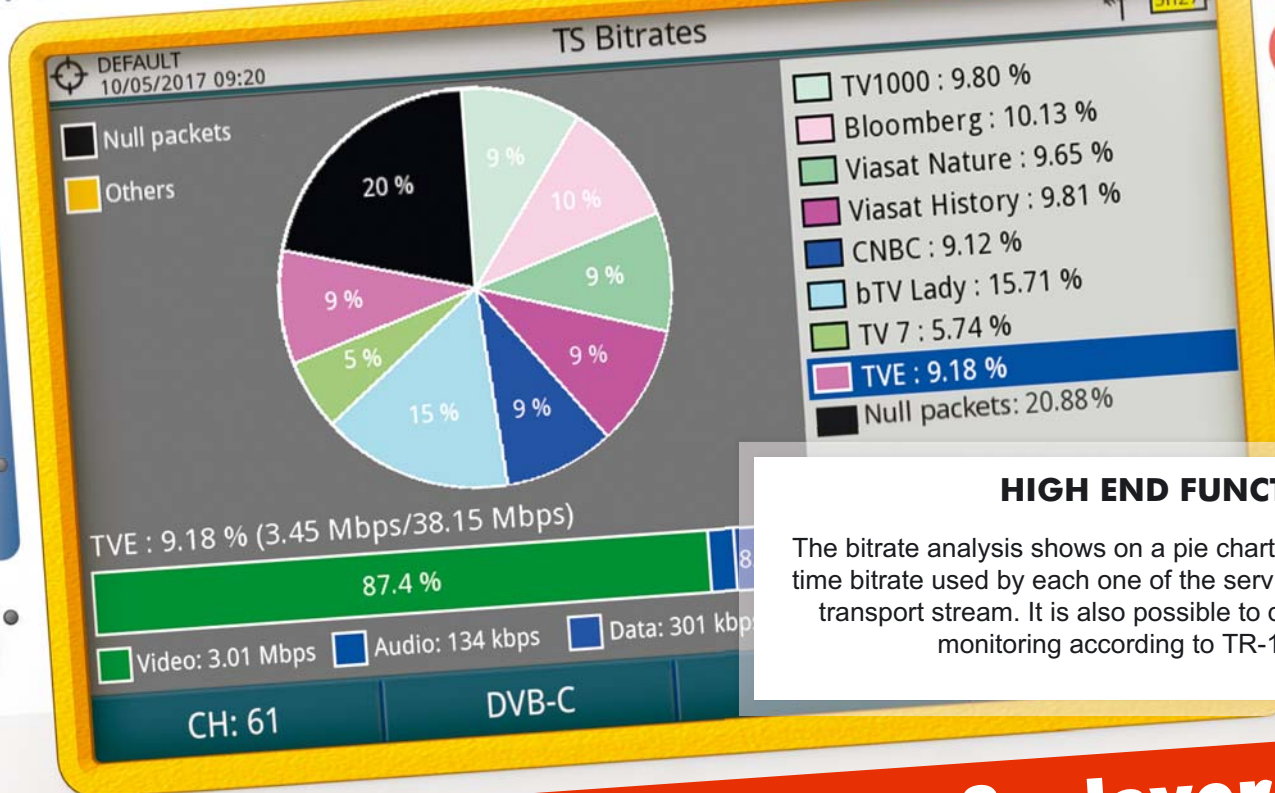



Name	Provider	SID
h264+DD	PX	1
La 1	RTVE	490
La 1 HD	RTVE	494
La 2	RTVE	491
laSexta	ATRESMEDIA	152
laSexta HD	ATRESMEDIA	151
neox	ATRESMEDIA	153

Digital services database

RANGERNeo 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.

RANGERNeo

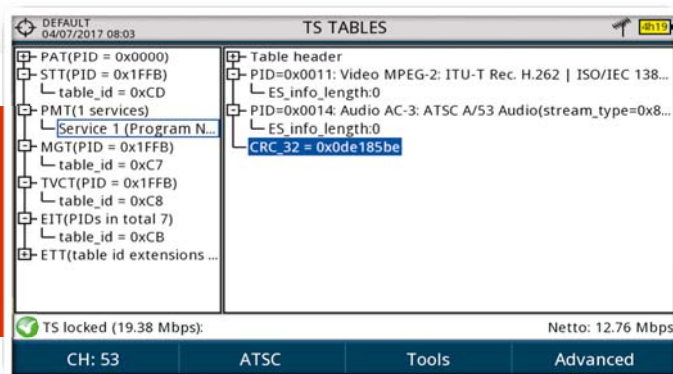
HIGH END FUNCTIONS

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 ★

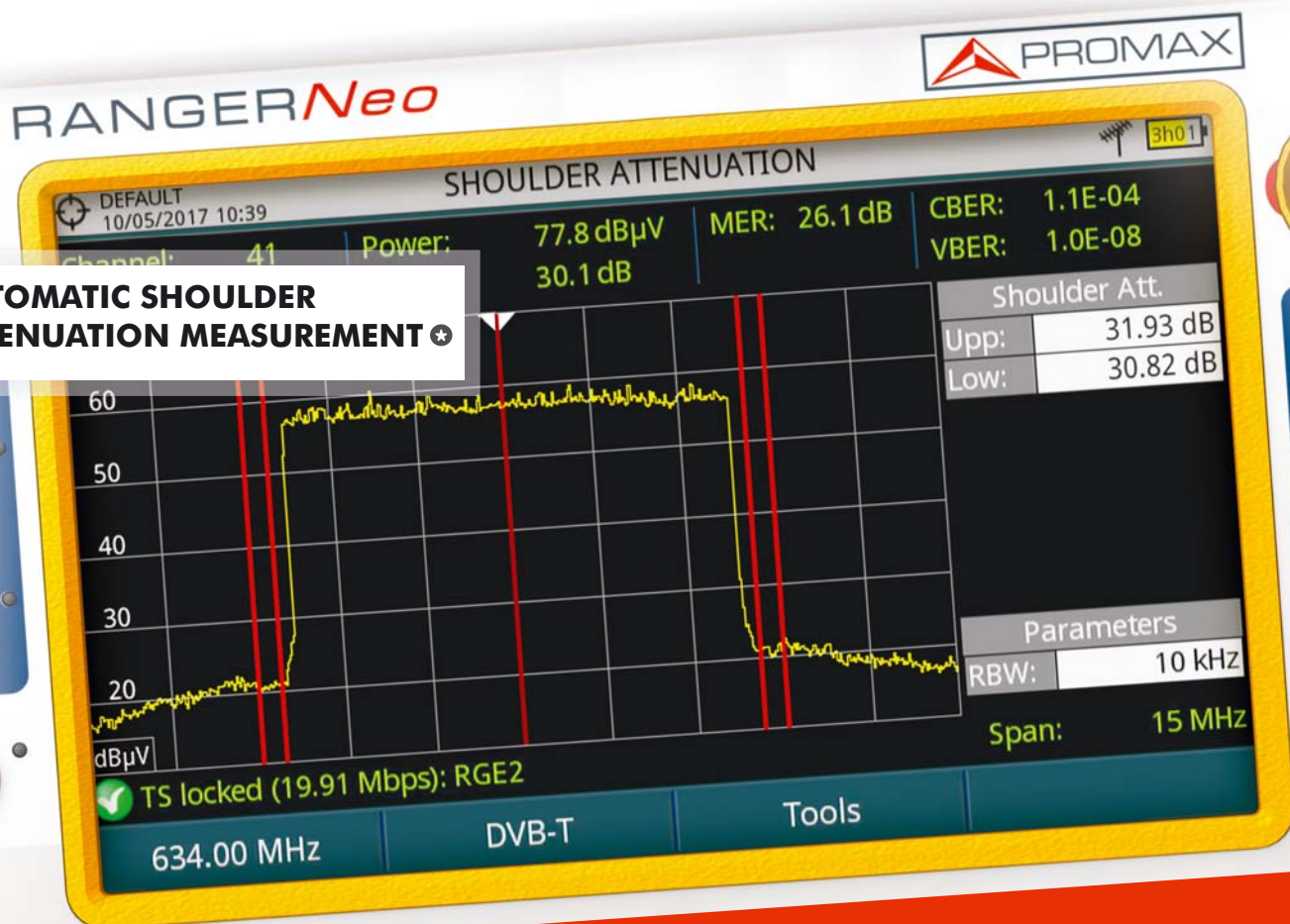
This function shows every detail of the transport stream tables in real time on a tree diagram. This is an outstanding function which is normally only available in more expensive equipment. It is possible to navigate through the tree branches using the joystick or the touch screen functionality.



Record, analyze, decode and copy a Transport stream ★

A function available for **RANGERNeo** 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.

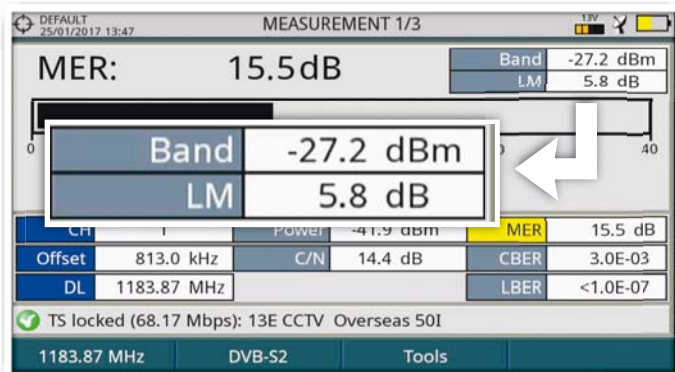
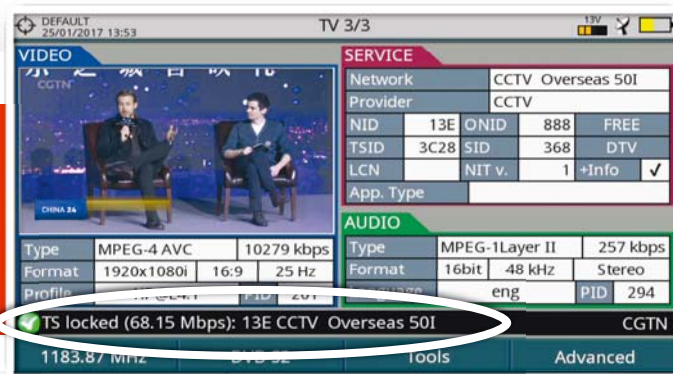
AUTOMATIC SHOULDER ATTENUATION MEASUREMENT



Productivity tools

StealthID

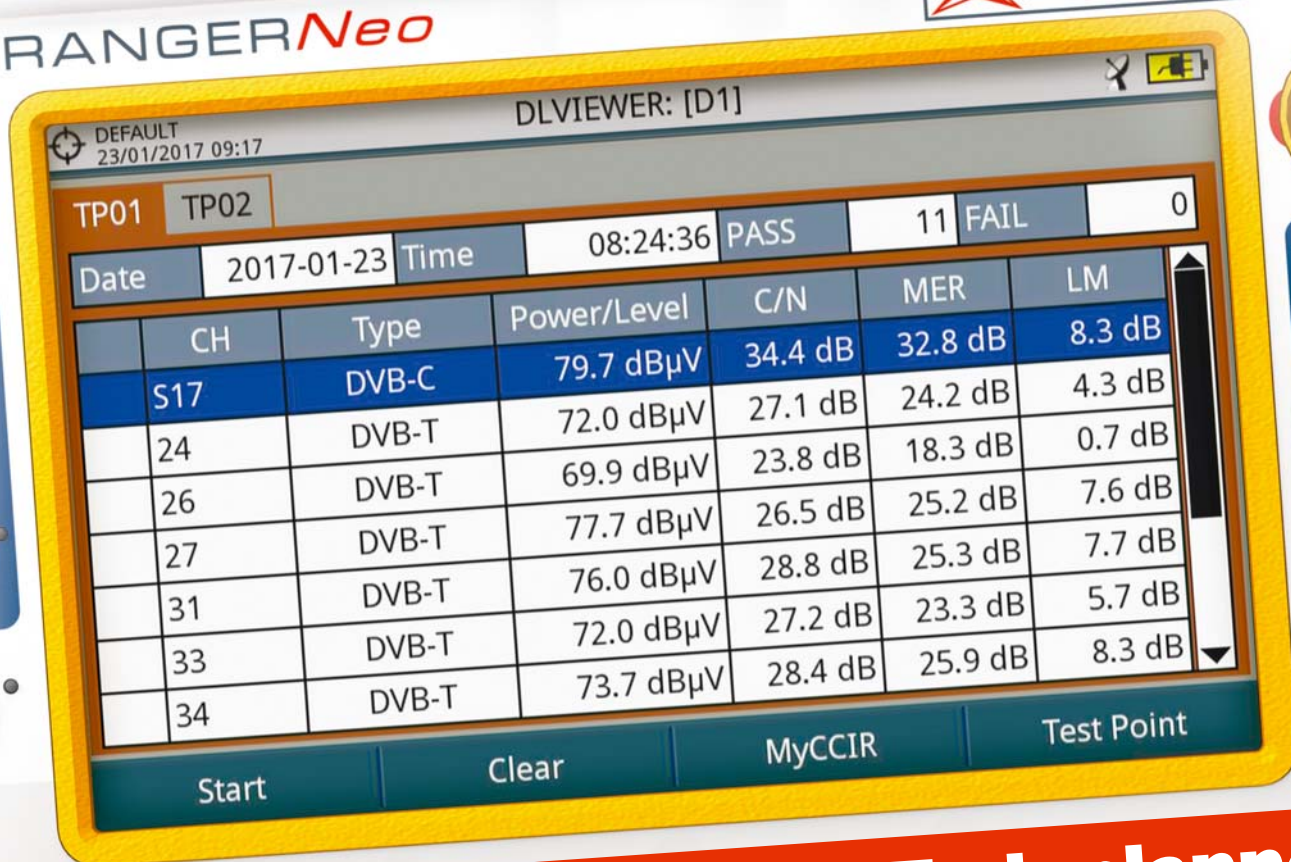
The **RANGERNeo** StealthID function automatically identifies the required demodulation settings while tuning so that you don't need any previous information about the signal.



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.

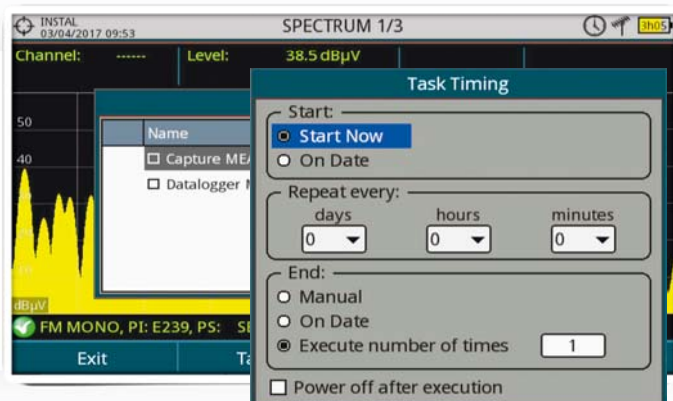
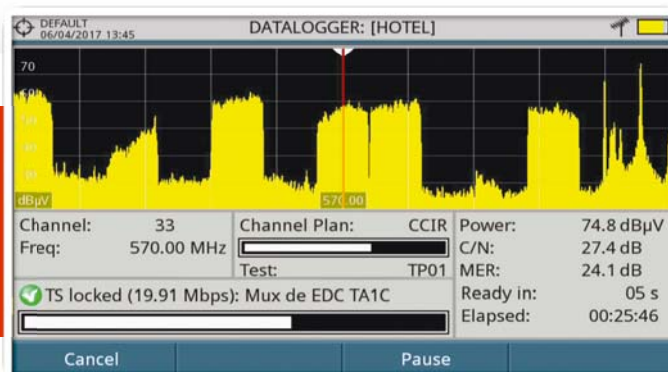
RANGER^{Neo}

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.



Test point 165

2017-09-20 18:39:15

CH31 (554.00 MHz) - MAIN

MER 0.0 dB

CBER 1.0E-01

VBER 1.0E-01

LM -17.6 dB

POWER 75 dBuV

CN 10.2 dB

OFFSET 0.0 kHz

POWER (dBuV)

CH29 (538.00 MHz): 79.4

CH31 (554.00 MHz): 75.0

CH34 (578.00 MHz): 72.5

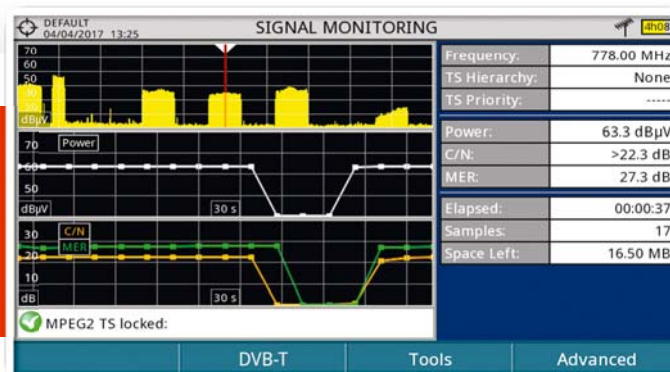
CH36 (594.00 MHz): 67.7

Drive test GPS ★

Create 3D maps with your measurements

Coverage analysis and GPS

This option turns the **RANGERNeo** 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.



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



RUN YOUR COVERAGE ANALYSIS OVER ONE OR 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 Excel and CSV formats.



TIME	LATITUDE	LONGITUDE	POWER (dBuV)	CN (dB)	OFFSET (kHz)
19:45:33	41,4062683	2,2147717	32,70	16,50	
19:45:36	41,4062683	2,2147717	35,40	19,30	
19:45:39	41,4062683	2,2147717	35,40	19,40	
19:45:42	41,4062683	2,2147717	31,70	15,10	
19:45:45	41,4062683	2,2147717	33,00	14,40	
19:45:48	41,4062683	2,2147717	32,70	14,30	
19:45:51	41,4062683	2,2147717	30,70	10,90	
19:45:54	41,4062683	2,2147717	39,30	20,60	
19:45:57	41,4062683	2,2147717	34,50	16,60	
	41,4062683	2,2147717	34,10	15,50	
	41,4062683	2,2147717	35,30	18,30	
	41,4062683	2,2147717	33,40	16,60	
	41,4062683	2,2147717	35,00	17,10	
	41,4062683	2,2147717	34,80	16,90	
	2,2147717		32,20	14,40	
	2,2147717			15,70	



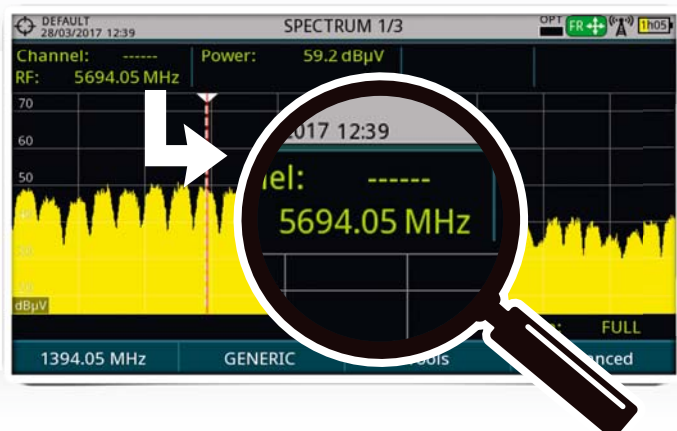
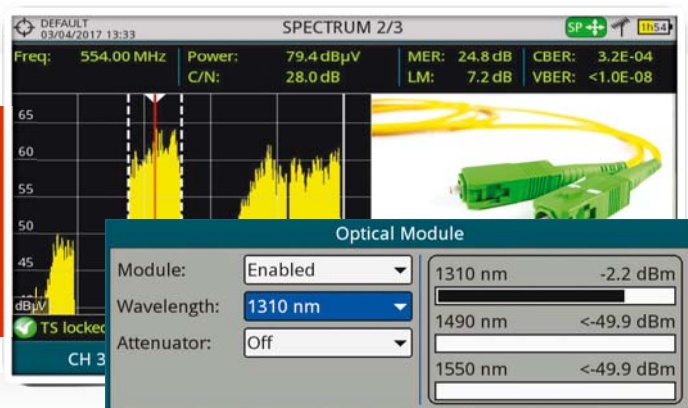


Optical measurements ★

... plus 6 GHz RF input

Selective optical-to-RF converter

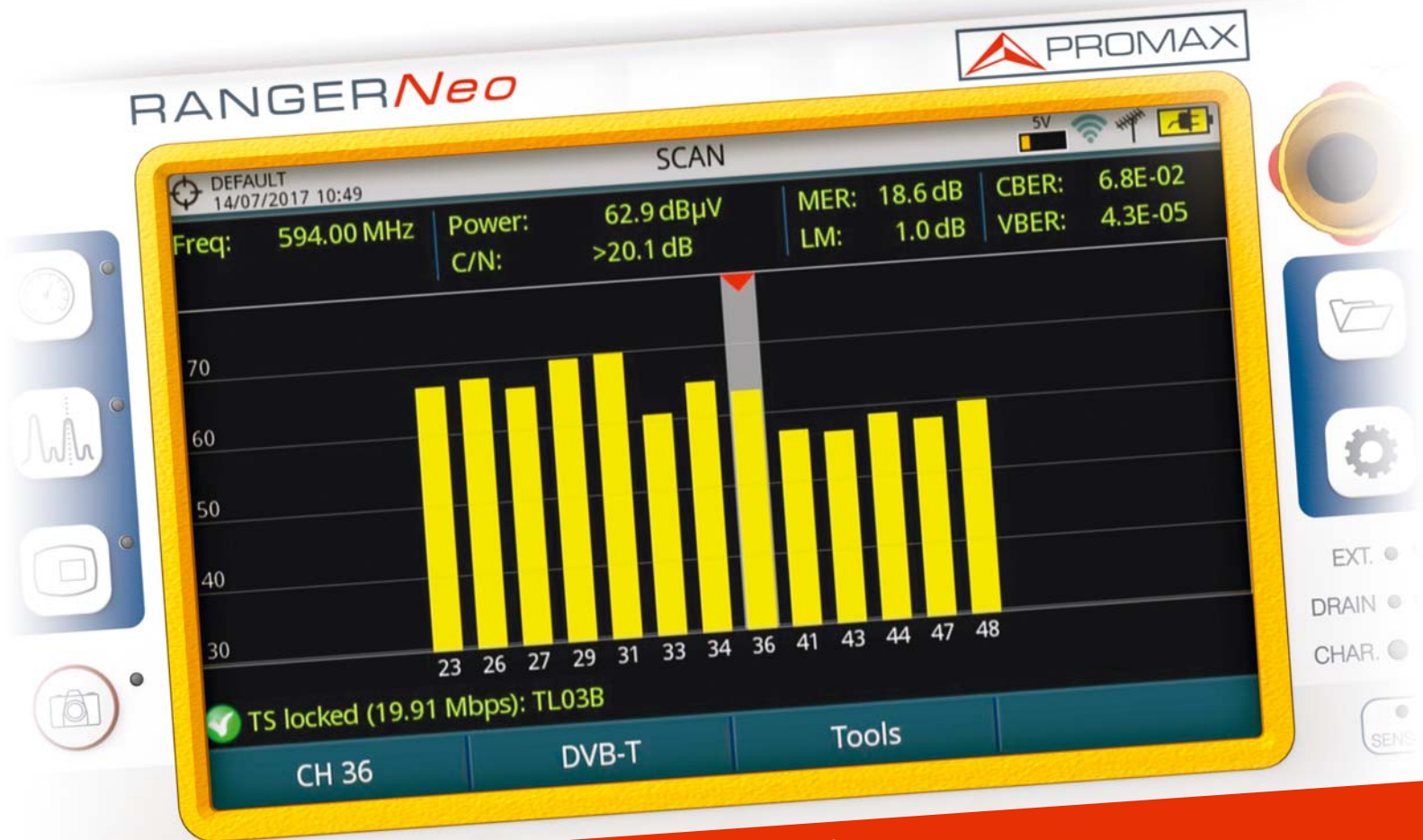
RFoG (Radiofrequency-over-Glass), as well as optical TV&SAT distribution, is used more and more by operators because it allows them to benefit from the advantages of fibre optics to compete with FTTH service providers. The RF signal at the converter output can be analyzed, measured and decoded by the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



6 GHz RF auxiliary input

The **RANGERNeo** 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



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

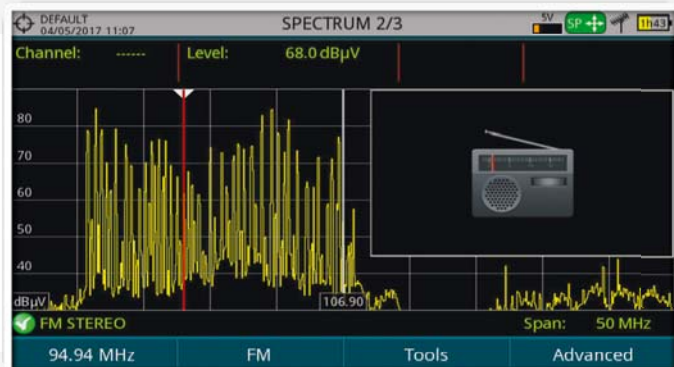
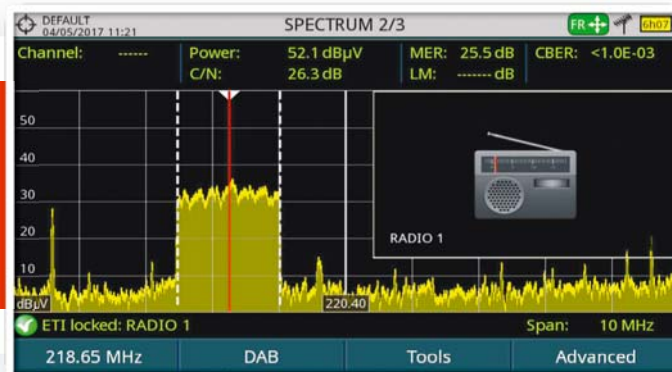
Using pilot generators as a reference, the TILT feature helps us to equalize the CATV network. We can detect as many as 4 pilots along the band from 6 – 999 MHz. The meter will calculate the level difference between the two most distant pilots and the tilt measurement (dB/MHz).



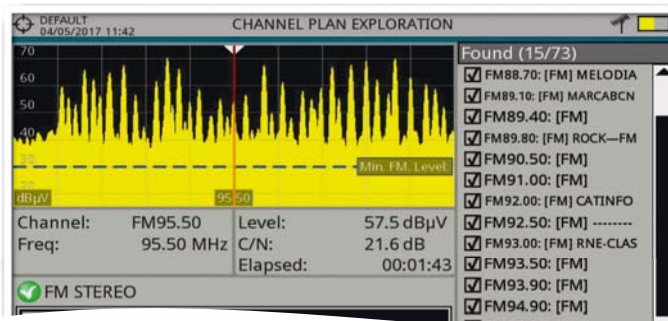
FM, RDS and DAB+ radio ★

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. **RANGERNeo** DAB option is compatible with both standards.



FM radio receiver and analyzer



DAB+

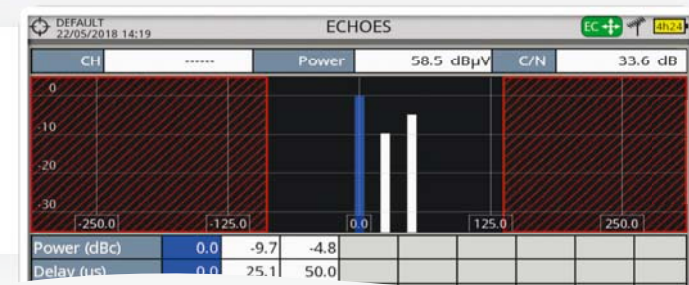
ADVANCED DAB OPTION FOR RANGER Neo 2, 3 & 4 ANALYZERS

The new DAB2 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 ★

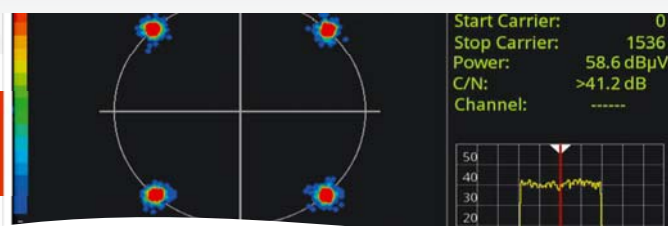
ETI recording

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.



DAB constellation diagram

DAB uses DQPSK modulation and so its constellation diagram shows a cloud of dots clustered around four points.

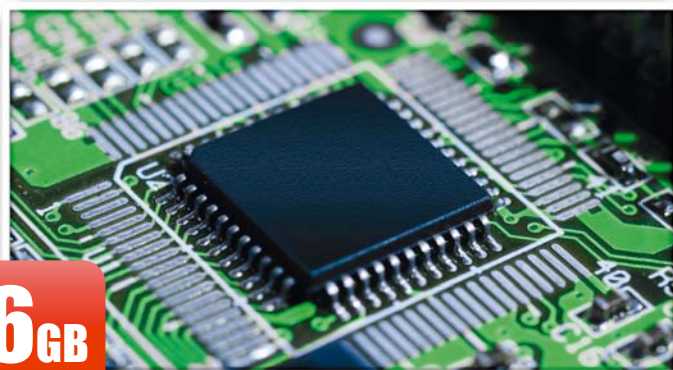




Create, save and transfer data

Ethernet connectivity

Ethernet and IP protocols are now the gold standards for remote control applications and **RANGERNeo** 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.



6GB

More internal memory: Up to 6 GB

There is more data a **RANGERNeo** can store in the internal memory, dataloggers, screen shots, signal monitoring files, etc. However, it is the transport stream recording what uses up memory faster. Even though the information can be downloaded to a PC or even copied to a *pendrive* in the field, the 6 GB of internal memory in the **RANGERNeo** are far from negligible.



Field strength measurements

The **RANGERNeo** can do FSM Field Strength Measurements. The antenna K factor can be entered manually or in the form of a file.



Soft bag and hard case

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



Extended connectivity features

Transport stream input and output

RANGERNeo 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 **RANGERNeo** 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.

SPECIFICATIONS	RANGER <i>Neo</i> Lite	RANGER <i>Neo</i> +	RANGER <i>Neo</i> 2	RANGER <i>Neo</i> 3	RANGER <i>Neo</i> 4
DIGITAL BROADCAST STANDARDS	DVB-T/T2, DVB-T2 lite DVB-C/C2 DVB-S/S2 DVB-S2 Multistream DSS, ACM / VCM / CCM	... Also includes: DAB, DAB+ (optional)	... Also includes: MPEG-TS	... Also includes: DVB-T2-MI DAB, DAB+	
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 75 Ω - HDMI output - IP interface for remote control - Analogue Video/Audio input - 2xUSB (Type-A) for data transferring		... 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) - 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 meas.reports - Beacon-Flyaways SND and VSAT - Wideband LNB - WiFi 2.4 GHz - LTE 1.8 GHz - OTT - Service Recording - Field strength measurement - Task planner	... Also includes: - Merogram - Spectrogram - Signal monitoring - Remote control (<i>webControl</i>) - MER by carrier - GPS coverage analysis (optional) - Video/Audio Streaming - SCAN + TILT - Shoulder attenuation	... Also includes: - TS recording - TS analysis - IPTV multicast measurement and decoding - Advanced DAB/DAB+ analyzer (optional)	... Also includes: - Network delay - DVB-T2-MI analysis	... Also includes: - 4K decoder
SPECTRUM ANALYZER Frequency Margin Measurement range Span Resolution bandwidths	From 5 - 1000 MHz (Terrestrial) From 250 - 2500 MHz (Satellite) From 10 - 130 dBμV Full / 500 / 200 / 100 / 50 / 20 / 10 MHz				
	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 DVB-T COFDM DVB-T2 Base and Lite COFDM DVB-C QAM DVB-C2 COFDM PAL, SECAM and NTSC FM radio DVB-S QPSK DVB-S2 QPSK, 8PSK, 16/32APSK DSS QPSK	From 5 - 1000 MHz (Terrestrial) From 250 - 2350 MHz (Satellite) Power (35 to 115 dBμV), CBER, VBER, MER, C/N, Link margin Power (35 to 115 dBμV), CBER, C/N, LBER, MER, Link Margin, BCH ESR, LDP iterations, Wrong packets Power (45 to 115 dBμV), BER, MER, C/N, Link margin Power (45 to 115 dBμV), CBER, MER, C/N, LBER, BCH ESR, LDP iterations, wrong packets M, N, B, G, I, D, K and L Level measurement Power (35 to 115 dBμV), CBER, MER, C/N, Link Margin Power (35 to 115 dBμV), CBER, LBER, MER, C/N, BCH ESR, Wrong packets, Link Margin 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	RANGERNeo +	RANGERNeo 2	RANGERNeo 3	RANGERNeo 4
DAB, DAB+ Advanced DAB/DAB+ analyzer GPS Coverage Analysis Rack assembly OPM + Optical-to-RF converter + WiFi 5 GHz + LTE 2.6 GHz + 6 GHz RF input WiFi 5 GHz + LTE 2.6 GHz + 6 GHz RF input	Available - Available Available Available Available	Available Available Available Available Available Available	Included Available Included Available Available Available	Included Available Included Available Available Available

SPECIFICATIONS REFER TO EUROPEAN VERSION

A new breed of analyzers for a new world



- ✓ Included
● Optional

Optional	RANGER <i>Neo</i>								HD RANGER	
	4 DVB ISDB-T	3 DVB ISDB-T	2 DVB ISDB-T	ATSC	+	ATSC	Lite DVB ISDB-T	ATSC	Ultra Lite DVB	Eco DVB
4K decoder	✓									
HEVC H.265 decoder + 4K Frame Grabber	✓	✓	✓	✓	✓	✓	✓	✓		
MPEG-2 and MPEG-4 H.264 decoder	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
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	✓	✓								
GPS for drive test	✓	✓	○	○	○	○				
DAB/DAB+ digital radio	✓	✓	○	○	○	○				
Advanced DAB/DAB+ analyzer	○	○	○	○	○	○				
5 GHz WiFi + 2.6 GHz LTE + 6 GHz RF input	○	○	○	○	○	○				
Optical measurements and optical to RF converter	○	○	○	○	○	○				
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	✓	✓	✓	✓	✓	✓				