PROMAX

CATV / OPTICAL / DOCSIS ANALYZERS

CATV, OPTICAL & DOCSIS ANALYZERS

www.promaxelectronics.com

CABLE RANGER 3.1

Built-in DOCSIS 3.1 cable modem

From 5 to 2700 MHz

Tuning range covers DOCSIS 3.0 & DOCSIS 3.1 requirements

Includes DVB-C/C2, QAM Annex A/B/C and DVB-T

Up to 2 hours battery time

7" TFT touch screen

CABLE RANGER 3.0

Built-in DOCSIS 3.0 cable modem

From 5 to 2700 MHz

Tuning range covers DOCSIS 3.0 & DOCSIS 3.1 requirements

Includes DVB-C/C2, QAM Annex A/B/C and DVB-T

Up to 2 hours battery time

7" TFT touch screen

RANGER MINI

From 5 to 2700 MHz

Up to 2150 MHz in satellite mode

Tuning range covers DOCSIS 3.0 & DOCSIS 3.1 requirements

Includes DVB-C/C2, QAM Annex A/B/C and DVB-T, ISDB-T, DVB-S/S2

Up to 4 hours battery time

5 " TFT touch screen

CABLE RANGER

TEST AND GO

Measuring Power, C/N, MER and BER on all your channels at the push of a button.

Hybrid optical & DOCSIS 3 Analyzer

Hybrid Optical & DOCSIS 3 Analyzer

Doing your measurements right is not enough in today's challenging and competitive CATV world. Field crews are demanded to understand and fix problems at the first attempt when going out to a service call and there is no question technicians are therefore put under pressure. Moreover, problems are not always simple to understand or fix and having a proper CATV analyzer can make a big difference.

PROMAX first CATV analyzer was developed more than two decades ago and since then things have gone a long way. Modern CATV systems use as much fibre as coaxial cables if not more. Analogue has been replaced by digital QAM and DOCSIS came into play to provide the infrastructure needed to offer internet connectivity. While all this was happening **PROMAX** has been honoured with valuable customer feedback which we have incorporated in the different CATV analyzer families we have been offering to the market.

CABLE RANGER 3.1

Touch screen hybrid HFC and DOCSIS analyzer with built-in DOCSIS 3.1 cablemodem

CABLE RANGER 3.0

Touch screen hybrid HFC and DOCSIS analyzer with built-in DOCSIS 3.0 cablemodem

RANGER *MINI*

Touch screen hybrid HFC, DOCSIS, Satellite and Terrestrial analyzer

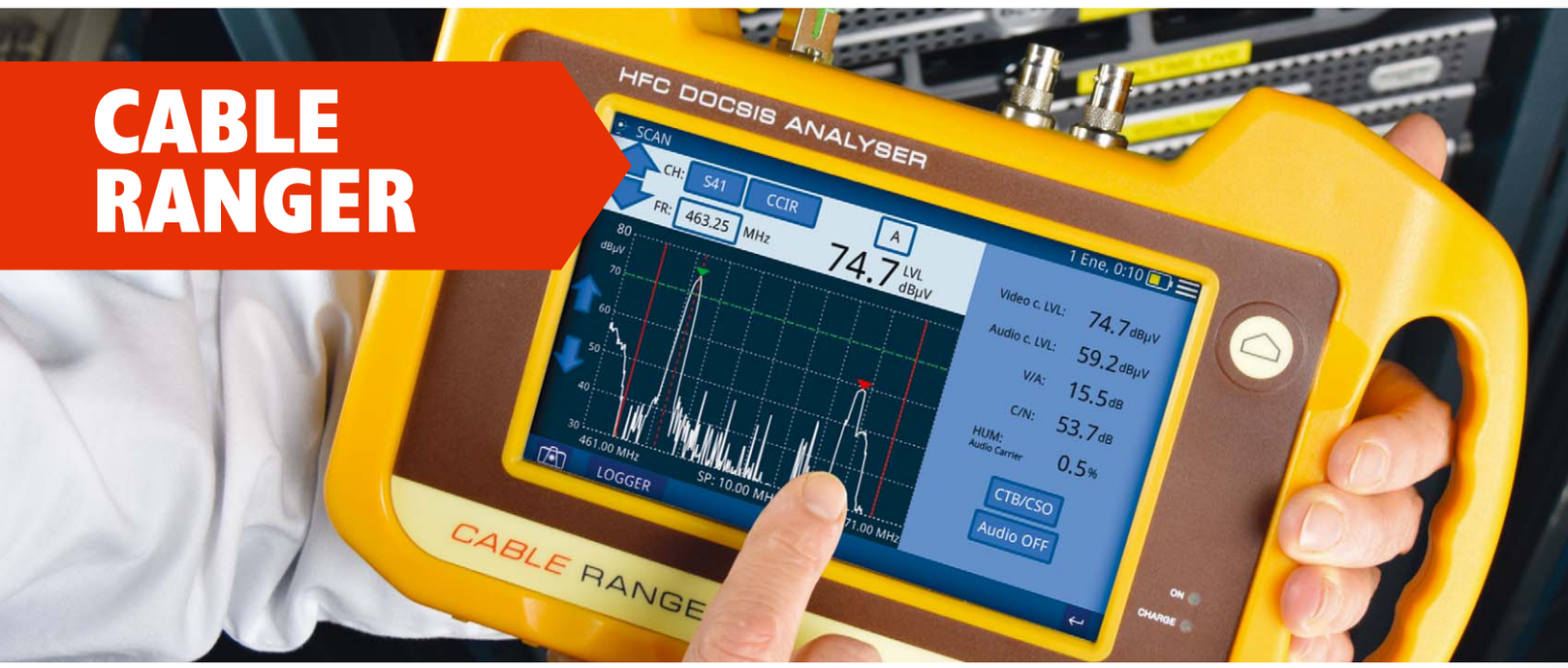
RANGER *MICRO*

New generation pocket-size Signal Level Meter

PROWATCH *NEO*

Monitoring system

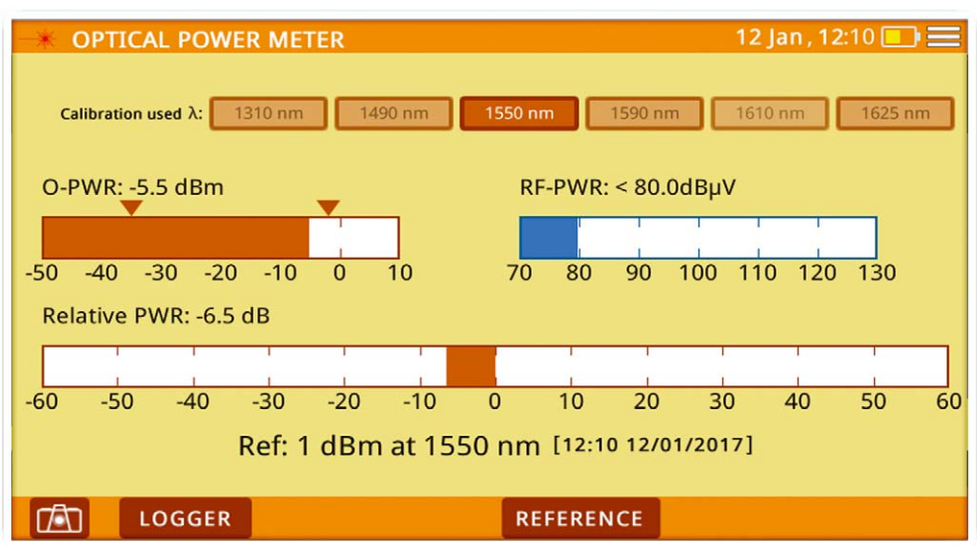
All products are designed to be very easy to use yet offering all measurements required working with today's complex hybrid fibre and coaxial networks.



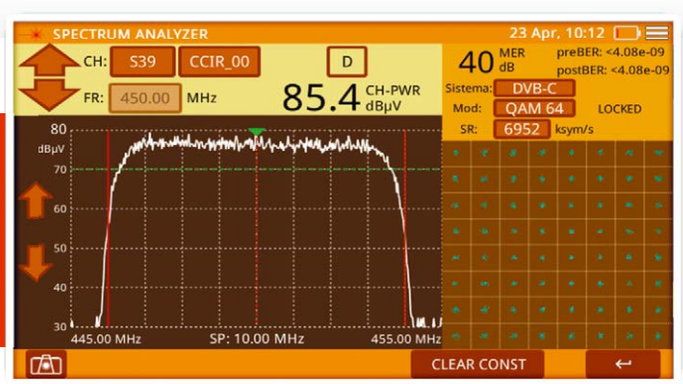
CABLE RANGER

Optical measurements

HFC networks use more and more fibre every time. ***CABLE*** **RANGER** includes an optical measurement input allowing field technicians not only to perform optical power measurements but also to do all the RFoG related RF measurements thanks to the built-in optical to RF converter.

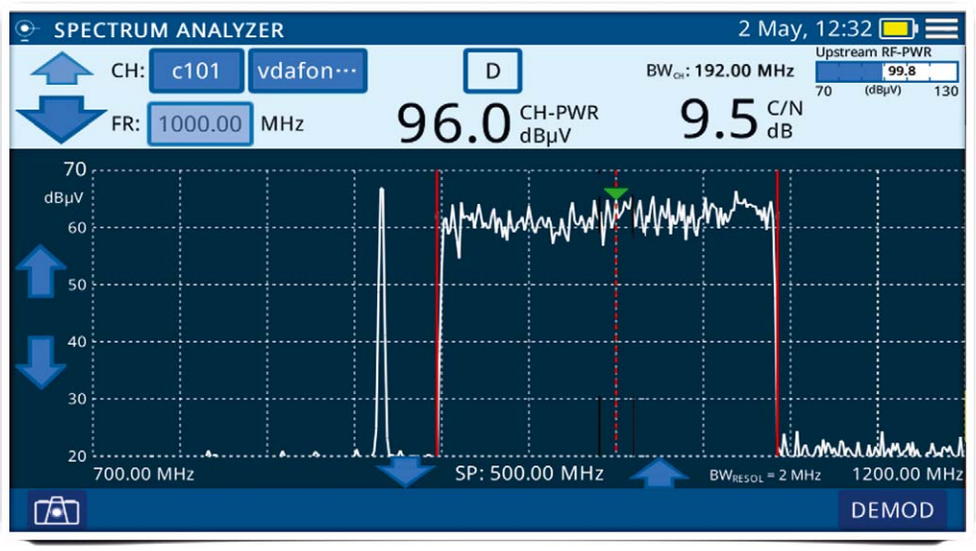


In this mode optical power measurement is shown together with the rest of the RF measurements. RFoG (RF-over-Glass) is used by CATV operators because it allows them to benefit from the advantages of fibre optics to compete with FTTH service providers.



DOCSIS 3.I RF compatible

DOCSIS 3.1 systems can use among other things an extended frequency range which goes up to 1500 MHz in the forward path with a return band up to 200 MHz. The ***CABLE*** **RANGER** RF input covers up to 1800 MHz.



SCAN

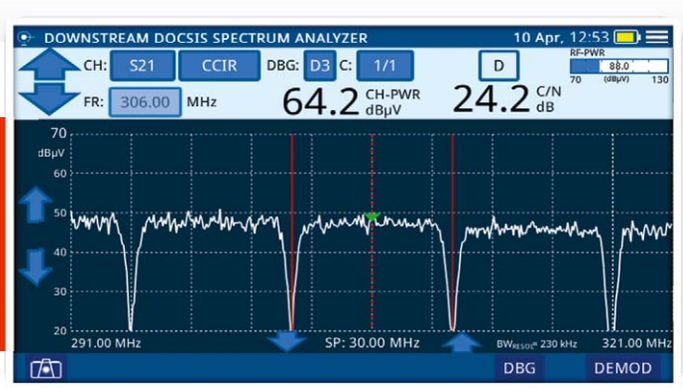
It is probably the fastest way to check if all signals in your network are present.

The SCAN function displays graphically all the analog and digital channels in a selected channel plan along with their signal levels.

Channel power, C/N, frequencies, channel numbers and total RF power are also shown on the screen.

Spectrum analyzer

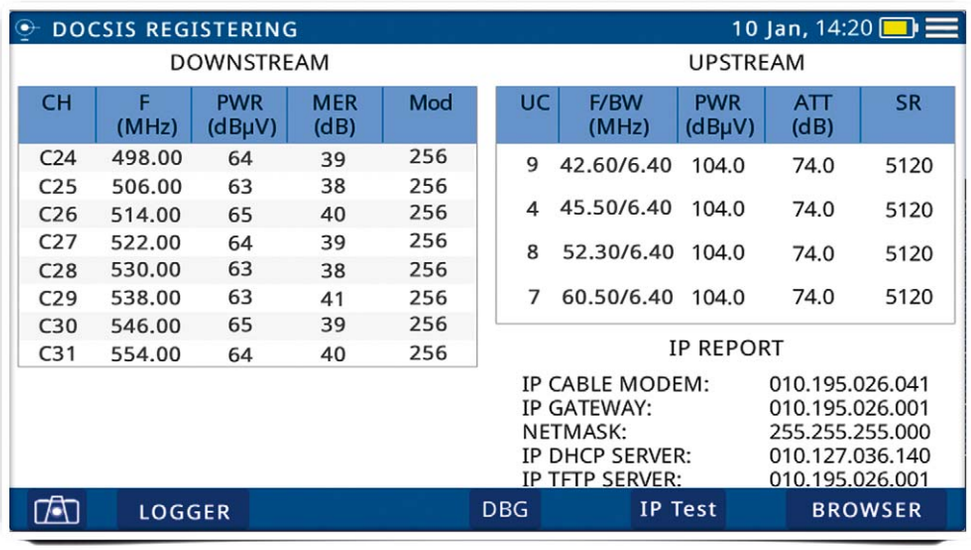
It is one of the essential functions in a field CATV analyzer. It allows you to have an overview of the RF content at the test point or to analyze a specific channel in detail and it is very helpful for interference and noise problem troubleshooting both in the forward and return bands. Signal level and C/N are displayed along with the spectrum trace. Also the total input power is displayed, a measurement of the power over the complete frequency band, which is very useful to detect saturation caused by fibre links.



Built-in Cable Modem

The ***CABLE*** **RANGER** built-in cable modem can be used to perform unregistered measurements such as the visualisation of the ranging process or the return path attenuation measurement.

It can also be used for registered measurements such as PLR, Delay and Jitter, for IPTV and VoIP system quality evaluation, sending RTPS and UGS packets. It monitors all the IP addresses involved in the communication process as well.

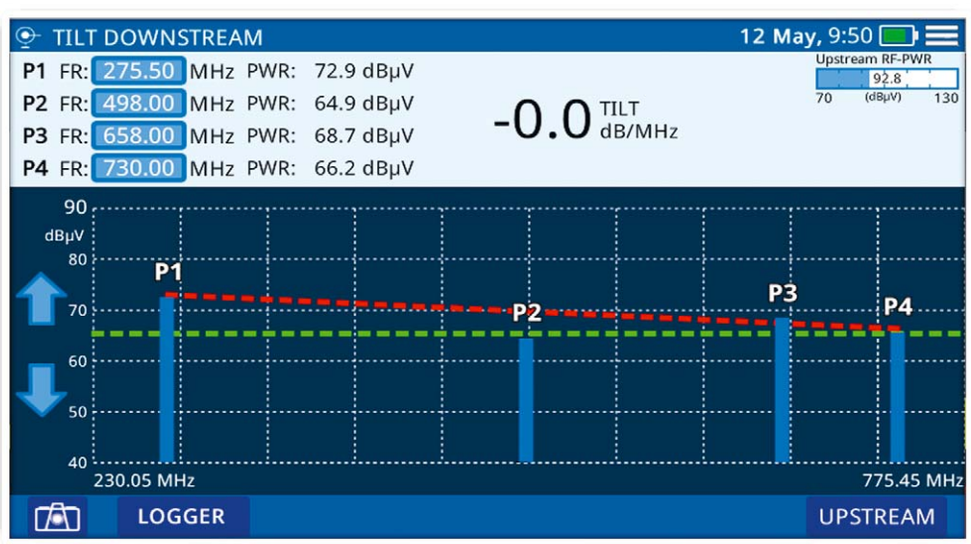


The CABLE RANGER incorporates the most advanced functions in accordance with the updates to the latest version of the DOCSIS 3.0 protocol (3.1 optional), including channel bonding technology, which are the latest technology implemented by operators in the cable data networks.

TILT

TILT measurements are used to identify system frequency unbalance which must be accurately compensated by field technicians.

Up to four pilot frequencies or analog/digital channels can be configured to be part of the TILT measurement which is displayed in both graphical and numerical formats.



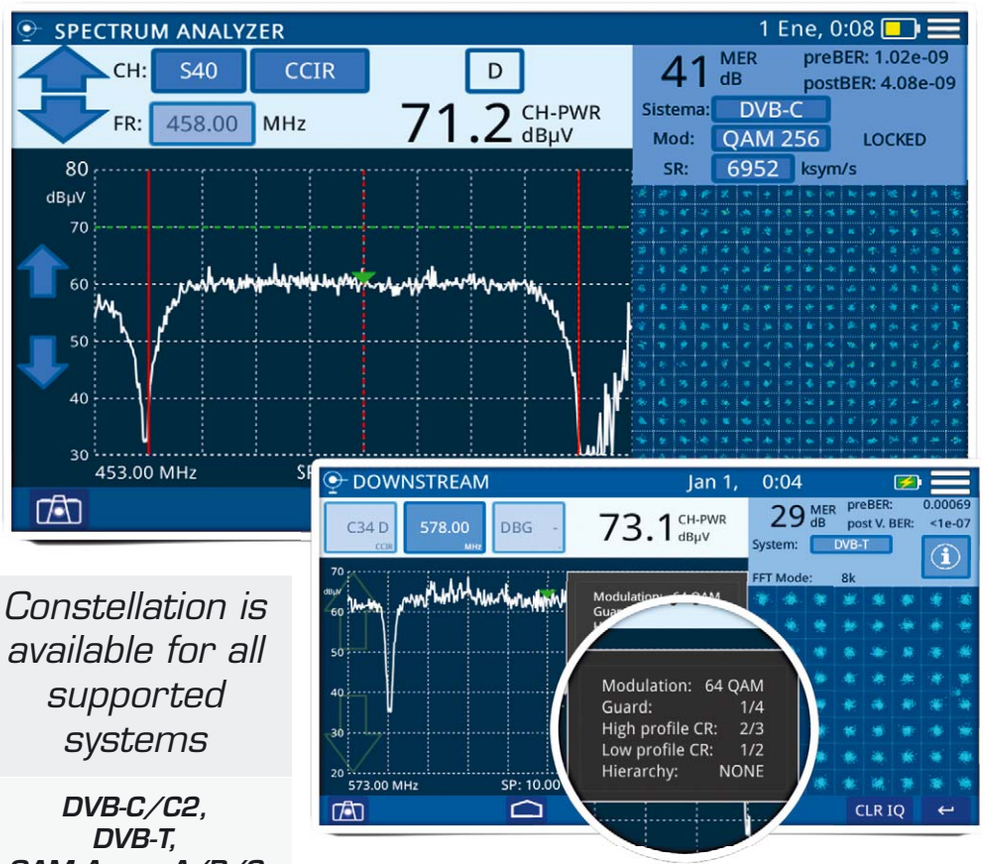
MER, BER Constellation

Constellation

These are probably the most important measurements technicians can do to assess digital QAM channel quality.

Constellation diagram is a simple and graphical way to identify signal impairments which impact MER and ultimately BER. An ideal QAM channel for example will be represented by a set (constellation) of very sharp dots.

These dots will become small dot clouds to indicate the presence of noise or other signal degradation sources. ***CABLE*** **RANGER** displays constellation diagram, MER, preBER and postBER simultaneously with the spectrum trace.



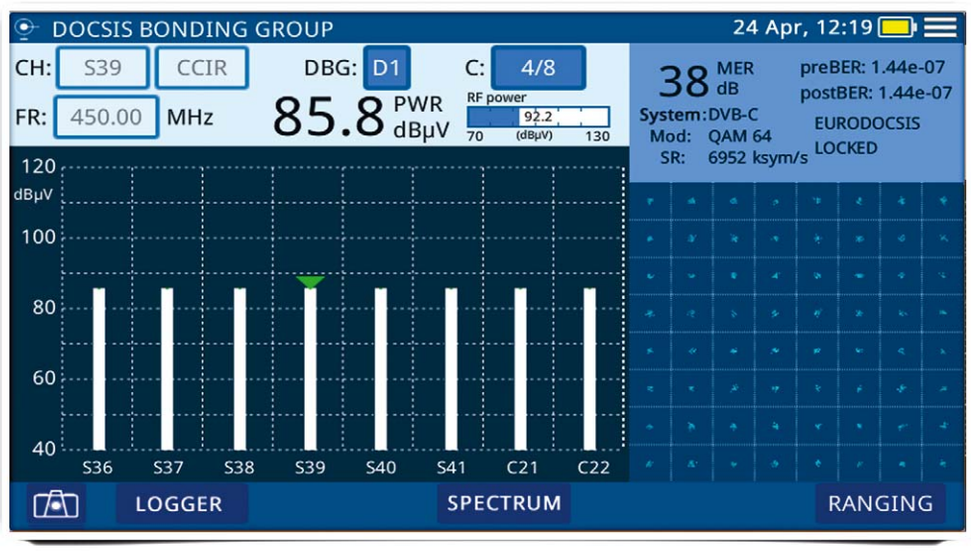
Constellation is available for all supported systems

DVB-C/C2,
DVB-T,
QAM Annex A/B/C

DOCSIS bonding group

As part of the DOCSIS 3.0 standard multiple upstream and downstream channels can be “bonded” to be used together as one.

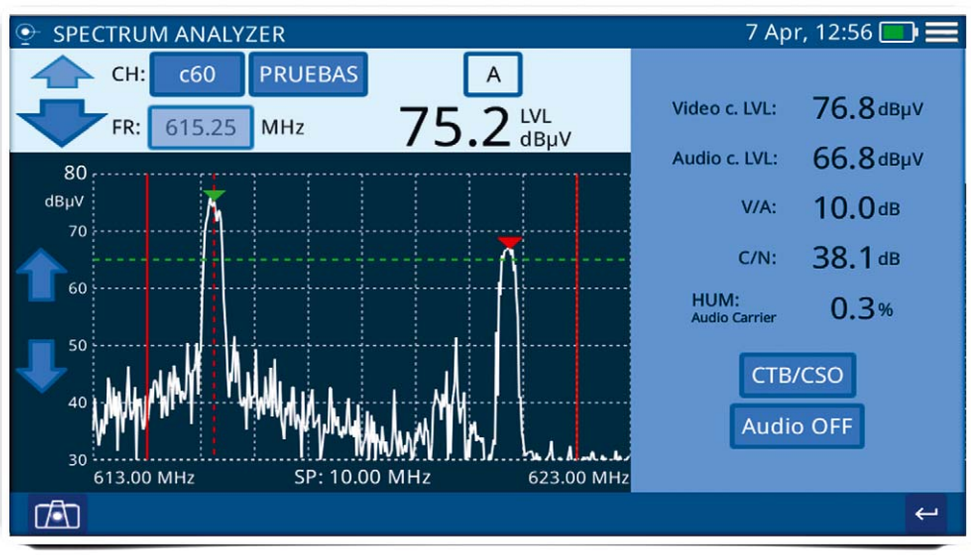
CABLE **RANGER** includes a comprehensive channel bonding screen where information about all of them is combined with other single channel measurements such as the constellation diagram.



Analog and HUM

The ***CABLE*** **RANGER** can measure video carrier signal level, Video/Audio and C/N ratio and HUM in analog mode.

This is all shown alongside the screen together with the spectrum analyzer graphic.

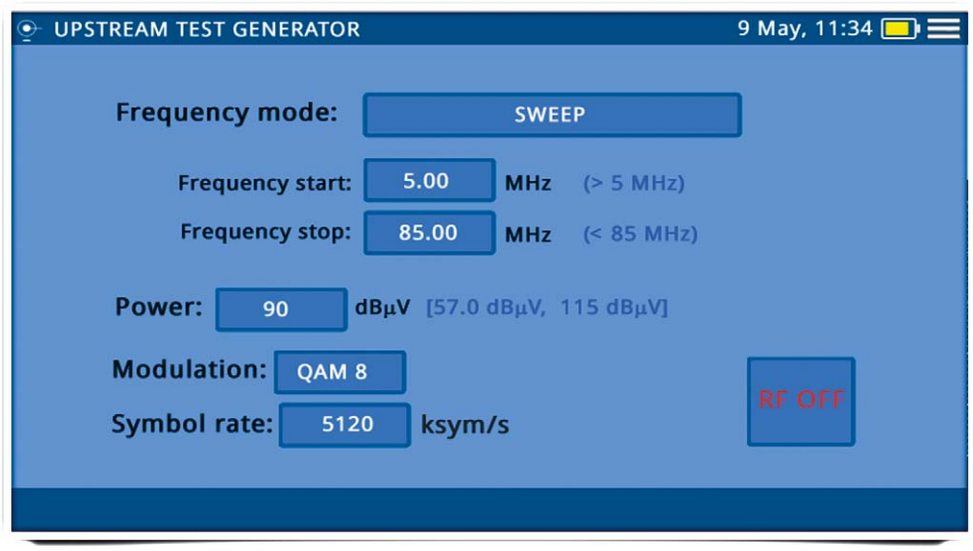


CABLE RANGER

Upstream test generator

A frequency and amplitude agile return path generator is also available in the ***CABLE*** **RANGER**. It allows generating a test signal which can be tuned from 5 to 85 MHz and it can be CW or modulated in QAM and QPSK.

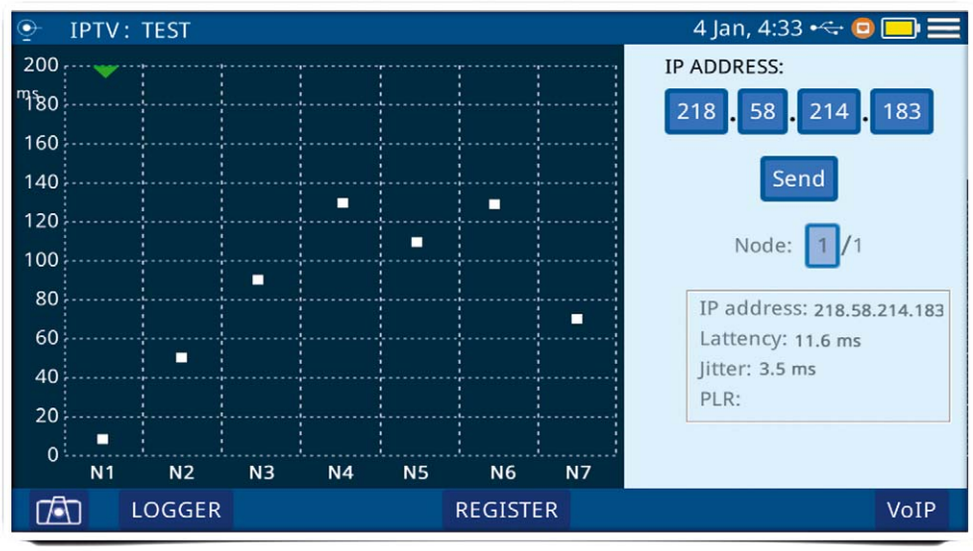
It can also be configured to sweep a specific frequency range within that band.

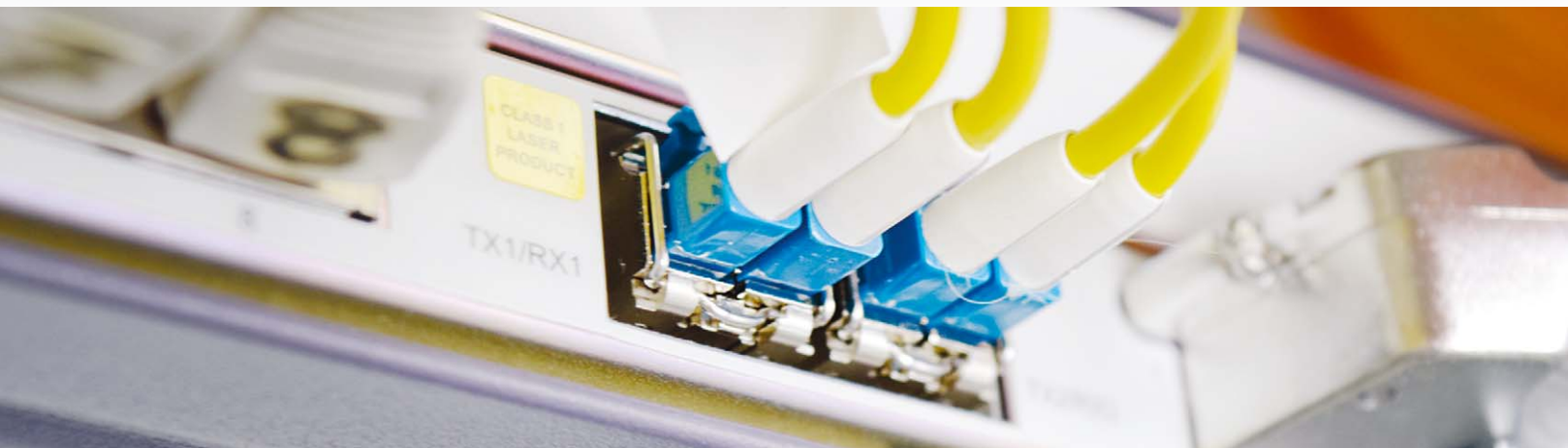


VoIP functionality test

The ***CABLE*** **RANGER** can be used to analyze network performance for VoIP applications using UGS QoS (Quality of Service) parameters in accordance to DOCSIS / EuroDOCSIS 3.0 and 3.1 standards.

UGS stands for Unsolicited Grant Service. Most important measurements to assessing communication quality include latency, jitter, lost packets or MOS and R value.

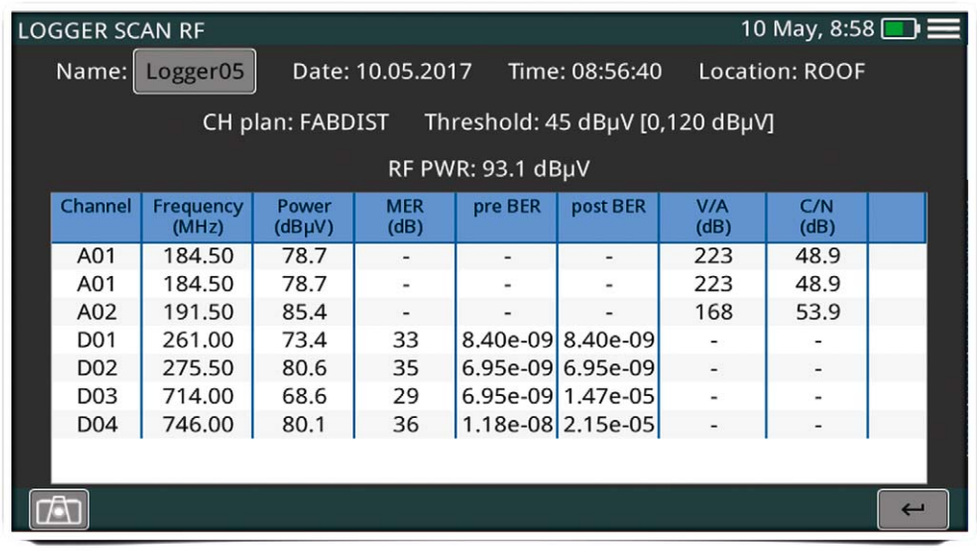




Datalogger

The datalogger function can perform various measurements including signal level and channel power, carrier/noise, BER and MER for all the channels listed in a given channel table automatically.

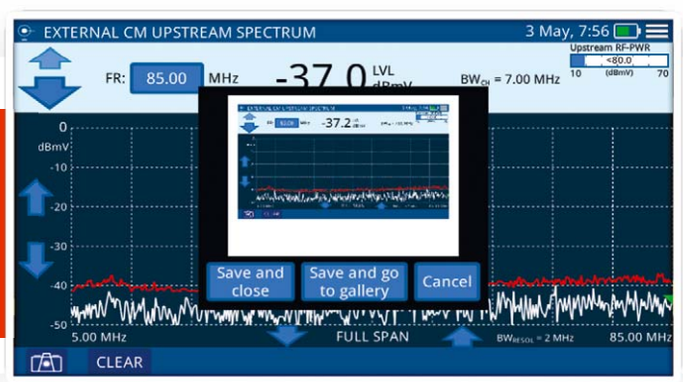
All this information is saved in the analyzer and it can be copied to a pendrive or to a PC for further processing at a later stage.

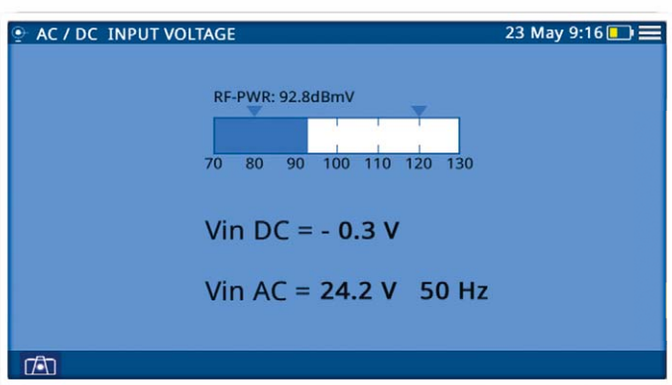


Channel	Frequency (MHz)	Power (dBµV)	MER (dB)	pre BER	post BER	V/A (dB)	C/N (dB)
A01	184.50	78.7	-	-	-	223	48.9
A01	184.50	78.7	-	-	-	223	48.9
A02	191.50	85.4	-	-	-	168	53.9
D01	261.00	73.4	33	8.40e-09	8.40e-09	-	-
D02	275.50	80.6	35	6.95e-09	6.95e-09	-	-
D03	714.00	68.6	29	6.95e-09	1.47e-05	-	-
D04	746.00	80.1	36	1.18e-08	2.15e-05	-	-

Screenshot

Taking screenshots is very easy with the ***CABLE*** **RANGER**. Whatever's on the screen of the analyzer can be saved to a graphic file which will become very handy when doing technical reports.





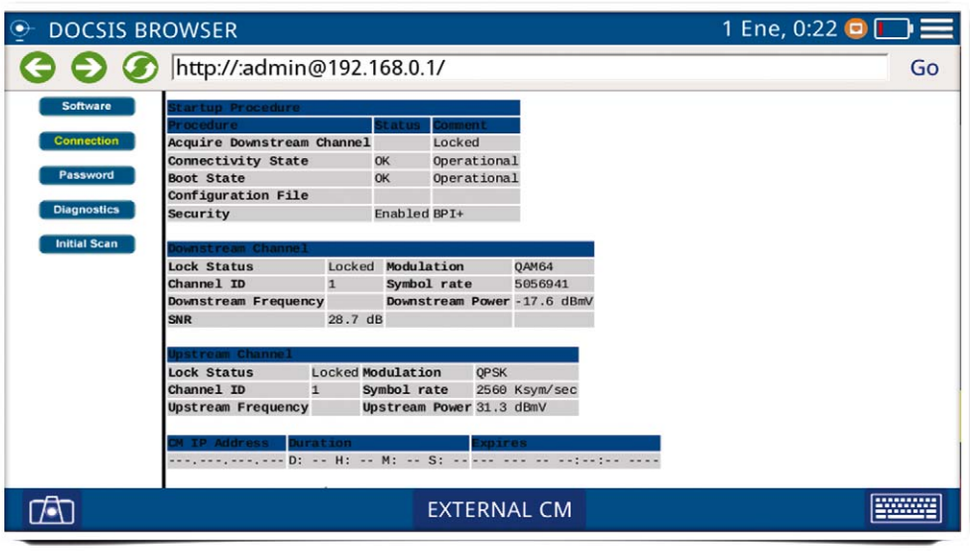
Input voltage measurement

The measurement of the DC and AC voltages present at the RF input is displayed together with the total RF power for convenience.

Web browser & service activation

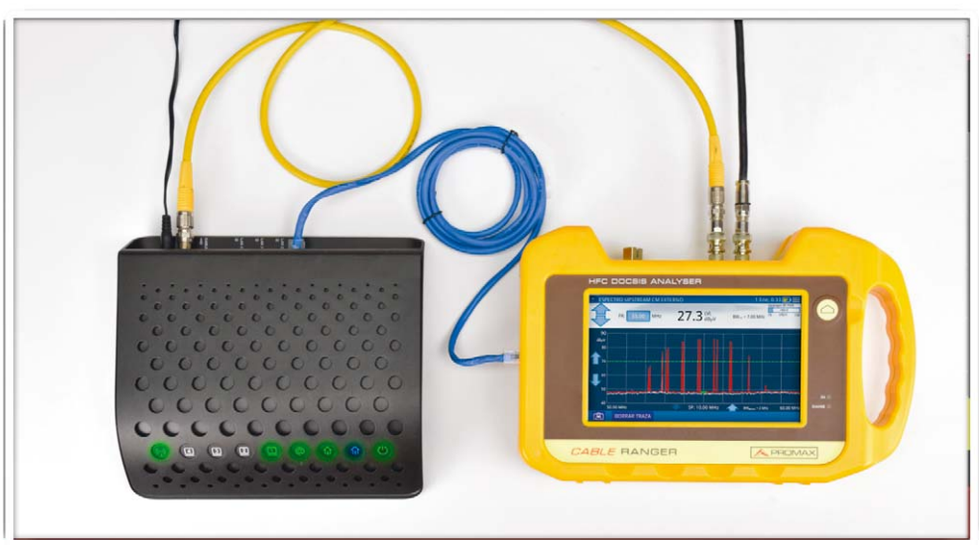
The built-in web browser can be used to register a maintenance action directly on the operator's website, rendering the use of other devices such as laptops unnecessary.

The ***CABLE*** **RANGER** can also be connected to the subscriber's cable modem to perform the service activation procedures.



External cable modem

The ***CABLE*** **RANGER** can also be connected to the RF of the subscriber's cable modem to verify it is working properly.



Carrying bag

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

RANGER *mini*

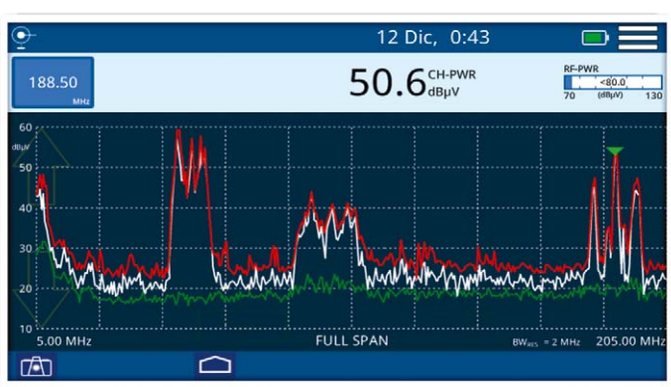
- ✓ RF BAND: 5-2700 MHz FOR DOCSIS 3.1
- ✓ TEST & GO
- ✓ DOWNSTREAM
- ✓ UPSTREAM ANALYZER
- ✓ SCAN / TILT
- ✓ OPTICAL FIBRE
- ✓ DATALOGGER
- ✓ PICTURE GALLERY AND DATA
- ✓ 5” COLOR TOUCH SCREEN TFT

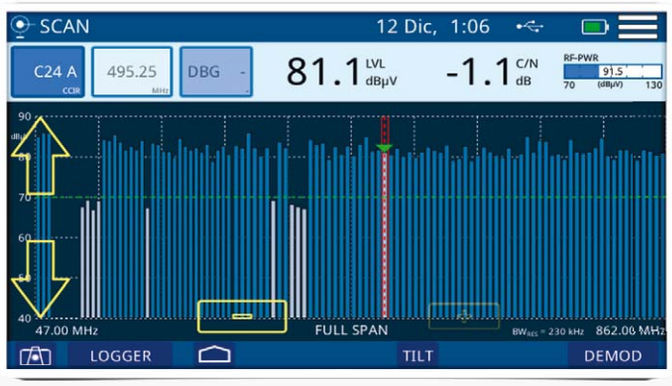
RANGER mini

The most compact field strength meter for RF + Optical + DOCSIS 3.1

The **RANGER *mini*** is PROMAX most compact and economical CATV analyzer. It features all the main required measurements to perform service activation in the modern DOCSIS 3.0 and DOCSIS 3.1 networks.

The **RANGER *mini*** is extremely easy to use and allow technicians to perform the measurements by pressing a single button for operation and to store measurements. It is based in a graphical menu based in all **RANGER *mini*** analyzers range and it is controlled via its touch screen.





SCAN + TILT

The SCAN function is probably the fastest way to check if all signals in your network are present. It displays graphically all the analog and digital channels in a selected channel plan along with their signal levels.

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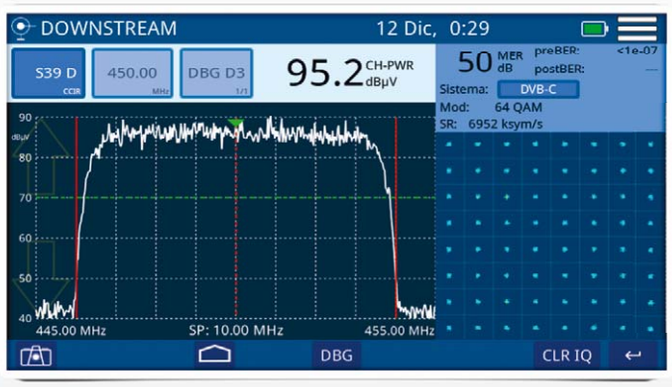
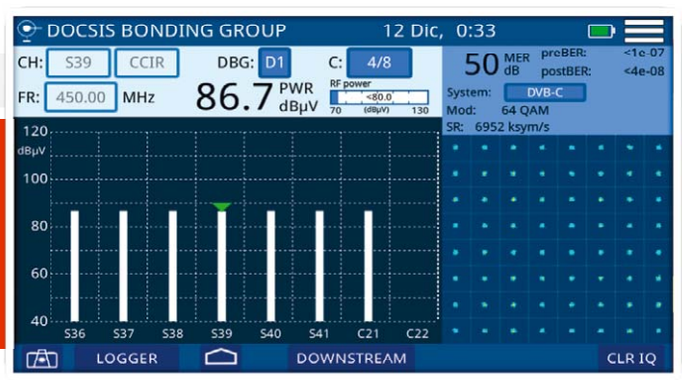


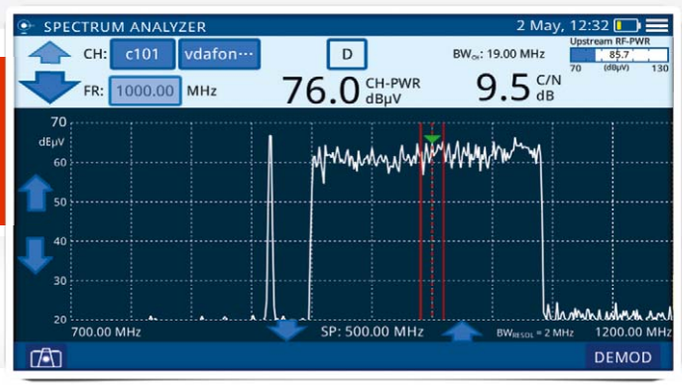
Constellation diagram

Constellation diagram is a simple and graphical way to identify signal impairments which impact MER and ultimately BER. These are probably the most important measurements technicians can do to assess digital QAM channel quality.



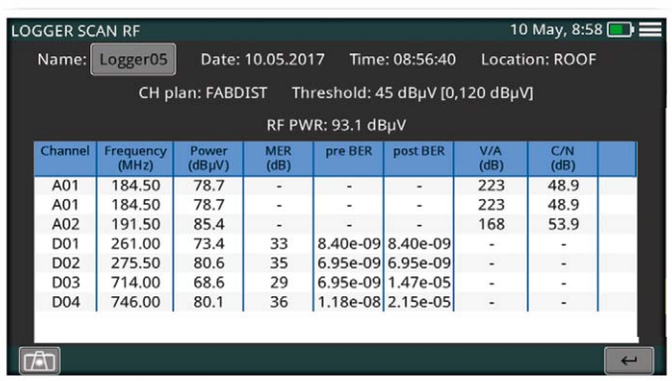
DOCSIS bonding

As part of the DOCSIS 3.0 standard multiple upstream and downstream channels can be “bonded” to be used together as one. **RANGER *mini*** includes a comprehensive channel bonding screen where information about all of them is combined with other single channel measurements such as the constellation diagram.



DOCSIS 3.1

DOCSIS 3.1 systems can use among other things an extended frequency range which goes up to 1500 MHz in the forward path with a return band up to 200 MHz. The **RANGER *mini*** RF input covers up to 2700 MHz.

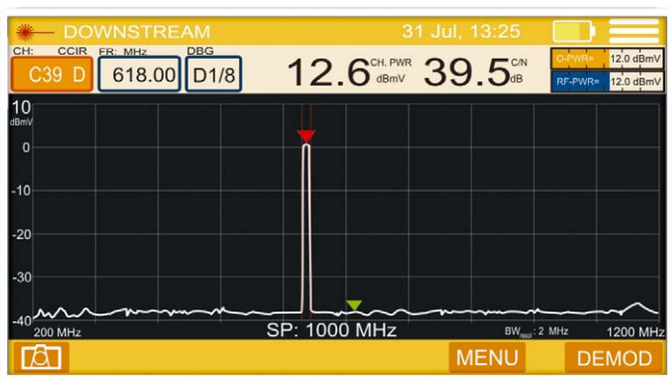


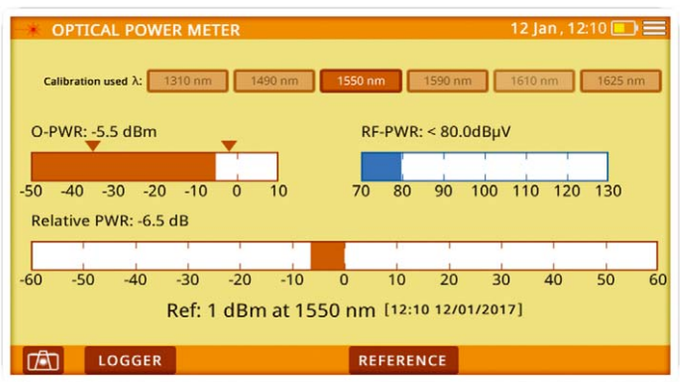
Datalogger

The datalogger function can perform various measurements including signal level and channel power, carrier/noise, BER and MER for all the channels listed in a given channel table automatically. All this information is saved in the analyzer and it can be copied to a pendrive or to a PC for further processing at a later stage.

Optical measurements (optional)

HFC networks use more and more fibre every time. **RANGER *mini*** includes an optical measurement input allowing field technicians not only to perform optical power measurements but also to do all the RFoG related RF measurements thanks to the built-in optical to RF converter. In this mode optical power measurement is shown together with the rest of the RF measurements. RFoG (Radiofrequency-over-Glass) is used by CATV operators because it allows them to benefit from the advantages of fibre optics to compete with FTTH service providers.





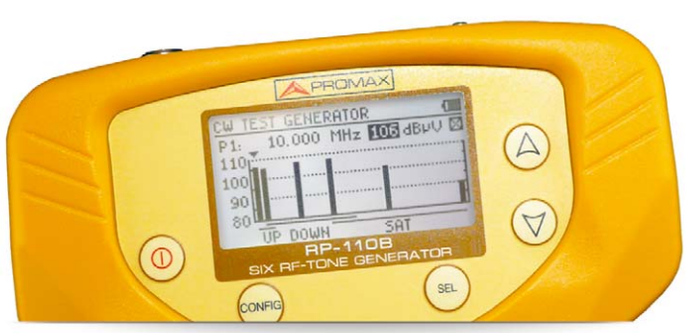
RP-110

Test signal generator for coaxial cable

Selectable frequency (From 5 to 2150 MHz) and level (From 80 to 110 dBµV)

Selectable frequencies

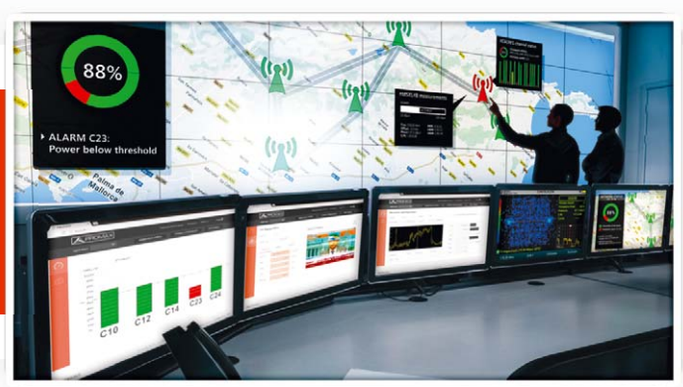
Pilot 1	From 5 MHz to 10 MHz
Pilot 2	From 55 MHz to 100 MHz
Pilot 3	From 460 MHz to 540 MHz
Pilot 4	From 800 MHz to 1000 MHz
Pilot 5	From 1450 MHz to 1750 MHz
Pilot 6	From 1850 MHz to 2150 MHz



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 analysers but remotely. It is also possible to connect it to a keyboard and monitor using USB and HDMI interfaces.

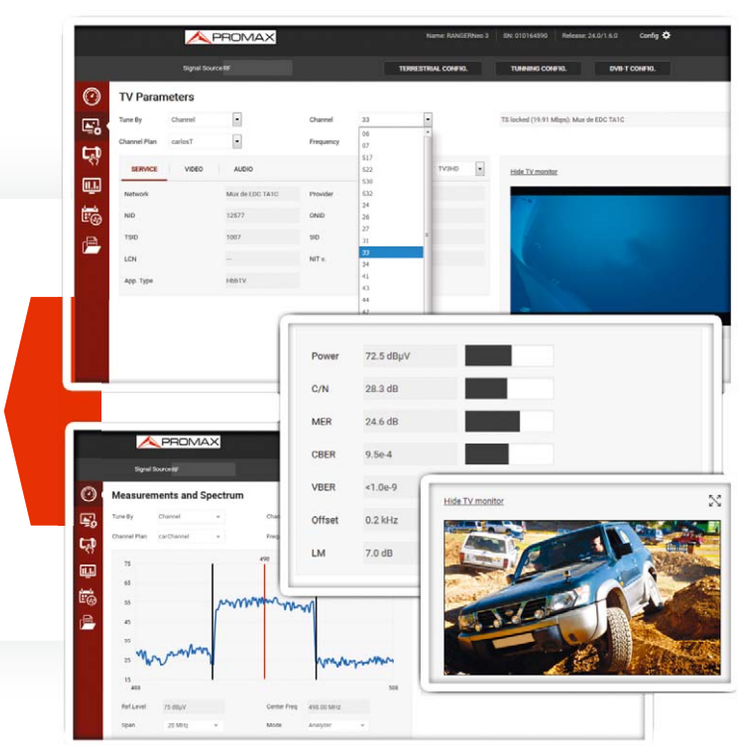


Professional monitoring system

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.

webControl and Video streaming

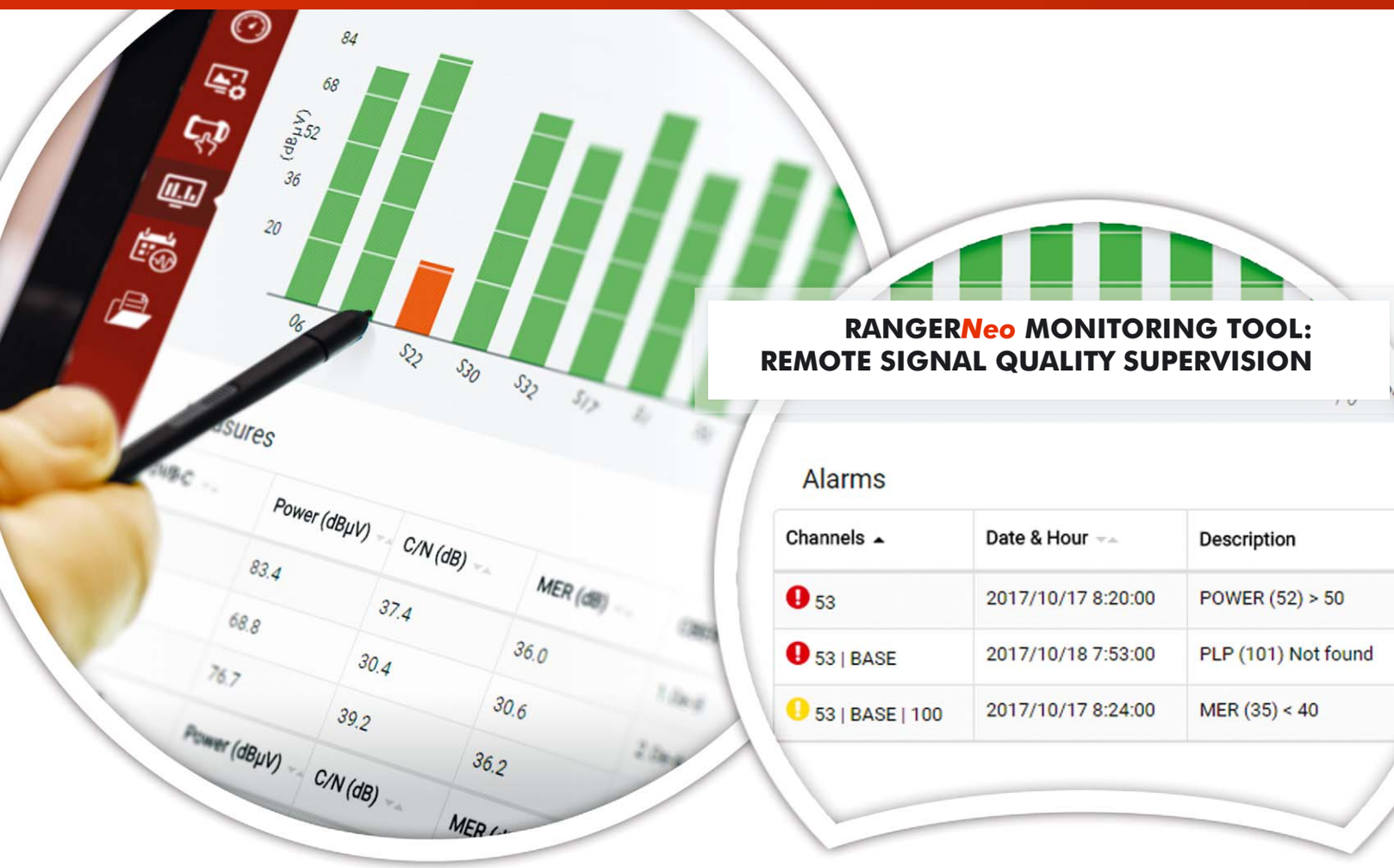


webControl

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

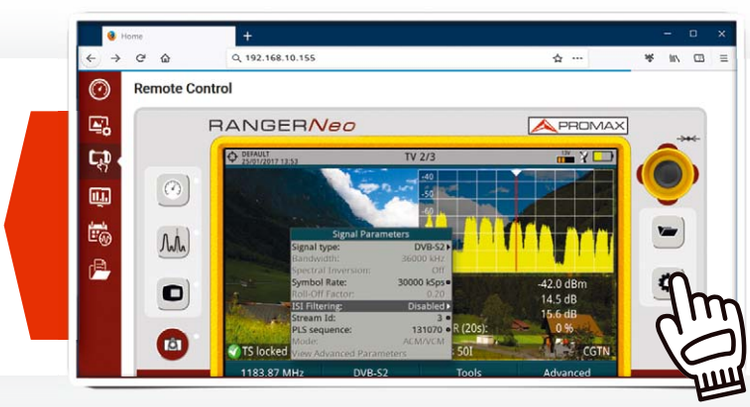
The Spectrum analyzer area shows us the spectrum trace, and all measurements for the RF channel being tuned, while we can modify reference level, span, channel/frequency and channel plan used.

The TV parameter area offers relevant metadata identifying the network (NID), (ONID), TS, Service, LCN, etc. plus a continuous streaming of one of the services belonging to the channel selected.



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.

Monitoring systems
Technical specifications

SPECIFICATIONS	PROWATCH*Neo* +	PROWATCH*Neo* 2
DIGITAL BROADCAST STANDARDS	DVB-T, DVB-T2, DVB-T2 lite, ATSC, ISDB-T/TB, J.83B DVB-C, DVB-C2 DVB-S, DVB-S2 DVB-S2 Multistream DSS, ACM / VCM / CCM DAB, DAB+ (optional)	DVB-T, DVB-T2, DVB-T2 lite, ATSC, ISDB-T/TB, J.83B DVB-C, DVB-C2 DVB-S, DVB-S2 DVB-S2 Multistream DSS, ACM / VCM / CCM DAB, DAB+ (optional) MPEG-TS
AUDIO CODECS	MPEG-1, MPEG-2, 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 input for remote control Analogue Video/Audio input 2 x USB (Type-A) for data transfering	Universal RF input 75 Ω HDMI output IP input for remote control Analogue Video/Audio input 2 x USB (Type-A) for data transfering ASI-TS input and output (BNC Female, 75 Ω) IPTV multicast input (UDP / RTP, RJ45) Common Interface slot
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) MAX and MIN hold FM RDS radio measurement and decoding Screenshots and Datalogger for measurement reports Beacon-Flyaways SNG and VSAT Wideband LNB WiFi 2.4 GHz LTE 1.8 GHz OTT Service Recording Field strength measurement Task planner Merogram Spectrogram Signal Monitoring Remote control (web server) MER by carrier GPS coverage analysis (optional) Channel Monitoring	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) MAX and MIN hold Descodificación y medida de radio FM RDS Screenshots and Datalogger for measurement reports Beacon-Flyaways SNG and VSAT Wideband LNB WiFi 2.4 GHz LTE 1.8 GHz OTT Service Recording Field strength measurement Task planner Merogram Spectrogram Signal Monitoring Remote control (web server) MER by carrier GPS coverage analysis (optional) TS recording TS Analysis IPTV multicast measurement and decoding Shoulder attenuation Channel Monitoring
SPECTRUM ANALYZER		
Frequency Margin	From 5 to 1000 MHz (Terrestrial) ; From 250 to 2500 MHz (Satellite)	
Measurement range	From 10 to 130 dBmV	
Span	Full / 500 / 200 / 100 / 50 / 20 / 10 MHz	
Resolution bandwidths	100, 200, 1000 kHz	2 kHz (Terrestrial), 10, 20, 40, 100, 200, 1000 kHz
MEASUREMENT MODE (According to standards)		
Frequency Margin	From 5 to 1000 MHz (Terrestrial); From 250 to 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, Iterations LDP, Wrong packets	
DVB-C QAM	Power (45 to 115 dBµV), BER, MER, C/N and Link margin	
DVB-C2 COFDM	Power (45 to 115 dBµV), CBER, MER, C/N, LBER, BCH ESR, Iterations LDP and Wrong packets	
PAL, SECAM and NTSC analogue TV	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 and Link Margin	
DVB-S2 QPSK, 8PSK, 16/32APSK	Power (35 to 115 dBµV), CBER, LBER, MER, C/N, BCH ESR, Wrong packets and Link Margin	
DSS QPSK	Power (35 to 115 dBµV), CBER, VBER, MER, C/N and Link margin	
INTERNAL STORAGE	7 GB for measurement protocols, screenshots and transport stream recordings	
PC CONNECTION (ethernet interface)	SNMP and WEB SERVER	
DIMENSIONS AND WEIGHT	482.6 (W.) x 44.4 (H.) x 381 (D.) mm.; 2.9 kg	482.6 (W.) x 44.4 (H.) x 381 (D.) mm.; 3.5 kg
OPTIONS	DAB, DAB+; GPS Coverage Analysis ; 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	

CATV / Optical / DOCSIS analyzers
Technical specifications

SPECIFICATIONS	*CABLE* RANGER 3.1	*CABLE* RANGER 3.0	RANGER *mini*
SPECTRUM ANALYZER	Covers DOCSIS 3.0 and DOCSIS 3.1 RF requirements		
Frecuency margin	From 5 to 2700 MHz		
Resolution	10 kHz		
SPAN	From 10 MHz to Full band		
LEVEL MEASUREMENT			
Dynamic range	From -50 dBm to 60 dBm		
On screen measuring range	50 dB		
Resolution	0.1 dB		
Accuracy	±2 dB		
Input impedance	75 Ω		
Units	dBmV, dBµV, dBm		
DOCSIS			
Built-in cablemodem	DOCSIS 3.1	DOCSIS 3.0	
Downstream analyzer			
Frequency margin	From 108 to 1219 MHz	From 108 to 1002 MHz	
MER and BER	DOCSIS 2.0 / 3.0 / 3.1	DOCSIS 2.0 / 3.0	DOCSIS 2.0 / 3.0 (MER estimated D3.1)
Constellation	DOCSIS 2.0 / 3.0 / 3.1	DOCSIS 2.0 / 3.0	DOCSIS 2.0 / 3.0
DOCSIS bonding group	32QAM + 2OFDM	8QAM + 2OFDM	
Upstream spectrum analyzer	From 5 to 200 MHz	From 5 to 85 MHz	From 5 to 85 MHz
UPSTREAM GENERATOR	From 5 to 204 MHz	From 5 to 85 MHz	
Mode	QAM (D3.0) / OFDM 4K (D3.1)	QAM (DOCSIS 3.0)	
Modulation	QPSK, 16/32/64 QAM	QPSK, 16/32/64 QAM	
Carrier level	From 50 to 120 dBµV (1 dB steps)	From 60 to 115 dBµV (1 dB steps)	
Symbol rate	From 160 ksym/s to 5120 ksym/s	From 160 ksym/s to 5120 ksym/s	
Resolution	100 kHz	100 kHz	
DIGITAL CHANNEL ANALYZER	From 10 to 2700 MHz		
BER, MER, Potencia	DVB-C/C2, DVB-T, QAM Annex A/B/C, ISDB-T, J.382		
Constelación	DVB-C/C2, DVB-T, QAM Annex A/B/C, ISDB-T, J.382		
SATELLITE CHANEL ANALYZER	From 950 to 2150 MHz		
BER, MER, Power	DVB-S, DVB-S2		
Constelación	DVB-S, DVB-S2		
Alimentación a LNB	13 V / 18 V		
OPTICAL FIBRE INPUT	Included		Optional
Optical power meter	From 1100 to 1700 nm		From 1100 to 1700 nm
Wavelength band power range	From -50 dBm to 4 dBm		From -50 dBm to 4 dBm
Calibrated wavelengths	1310, 1490 and 1550 nm		1310, 1490 and 1550 nm
Optical ro RF converter			
RF band	From 45 to 2700 MHz		From 45 to 2700 MHz
RF functions	Spectrum and Downstream analyzer		
ANALOG CHANNEL ANALYZER			
Frequency band	From 10 to 2700 MHz		
Measurements	Level, C/N, CTB-CSO, HUM		
Audio demodulation	FM		
INPUTS AND OUTPUTS			
RF input connector	F-type, replaceable		F-type, replaceable
Voltmeter	AC/DC. From 5 a 1000 V		
Optical fibre	SC-APC		SC-APC (optional)
Connectivity	Ethernet, USB, mini-USB		Ethernet, USB
MAIN FUNCTIONS	Spectrum analyzer, DOCSIS analyzer, Test generator, External cable modem, Upstream and Return path analyzer, SCAN/TILT, Volteter, RF power meter, TEST & GO, Screenshots, Photo gallery, Datalogger		Spectrum analyzer, Return path analyzer, SCAN/TILT, Voltmeter, RF power meter, TEST & GO, Screenshots, Photo gallery, Datalogger
BATTERY	7.2 V / 6.6 Ah Li-Ion		7.2 V / 3 Ah Li-Ion
Battery operation time	> 2 h continuous mode		> 4 h continuous mode
Tensión externa	12 V		12 V
INCLUDED ACCESSORIES	DV power adaptor + Power cord, Input adapter (“F”/f to “F”/f), Carrying bag, Transport case, Quick reference guide		DC power adaptor + cord, Input adapter (“F”/f to “F”/f), Carrying bag, Touch screen pen, Quick reference guide
DIMENSION AND WEIGHT	290 (W.) x 185 (H.) x 85 (D.) mm - 1.6 kg		117 (W.) x 117 (H.) x 30 (D.) mm - 700 g

Fibre-Coaxial DOCSIS analyzers
CABLE Ranger

CABLE RANGER 3.1

CABLE RANGER 3.0

RANGER *mini*

KEY FEATURES

Built-in Cable Modem	DOCSIS 3.1	DOCSIS 3.0	-
Upstream Test Generator	From 5 to 204 MHz	From 5 to 85 MHz	-
VoIP	DOCSIS 3.1	DOCSIS 3.0	-
Ping Test	DOCSIS 3.1	DOCSIS 3.0	-

RF FUNCTIONS

Power, Level, C/N	✓	✓	✓
MER, BER	✓	✓	✓
CTB-CSO	✓	✓	✓
HUM	✓	✓	✓
Constellation	✓	✓	✓
SCAN	✓	✓	✓
TILT	✓	✓	✓
TEST & GO	✓	✓	✓
Upstream generator	✓	✓	-
Spectrum analyzer	10 MHz to FULL SPAN	10 MHz to FULL SPAN	10 MHz to FULL SPAN
Return Path spectrum	5 to 200 MHz	5 to 200 MHz	5 to 200 MHz

DIGITAL TV STANDARDS

DVB-C/C2, QAM, DVB-T, ISDB-T	✓	✓	✓
DVB-S/S2	-	-	✓

OPTICAL FIBRE FUNCTION

Optical fibre	Included	Optional	Optional
Wavelengths	1100 to 1700 nm	1100 to 1700 nm	1100 to 1700 nm
Optical power meter	✓	✓	✓
Optical to RF converter (45 to 1700 MHz)	✓	✓	✓

OTHER FUNCTIONS

Screen shots	✓	✓	✓
Datalogger	✓	✓	✓
Web browser	✓	✓	-
Input DC/AC Voltmeter	✓	✓	-

CONNECTIVITY and MECHANICAL FEATURES

Ethernet	✓	✓	✓
USB	✓	✓	✓
Bluetooth	-	-	-
External Cable Modem connection	✓	✓	-
Screen type	7” color touch screen	7” color touch screen	5” color touch screen
Diensions (W. x H. x D.)	290 x 185 x 65 mm	290 x 185 x 65 mm	177 x 117 x 30 mm
Weight	1.6 kg	1.6 kg	700 g

For more information please contact your distributor: