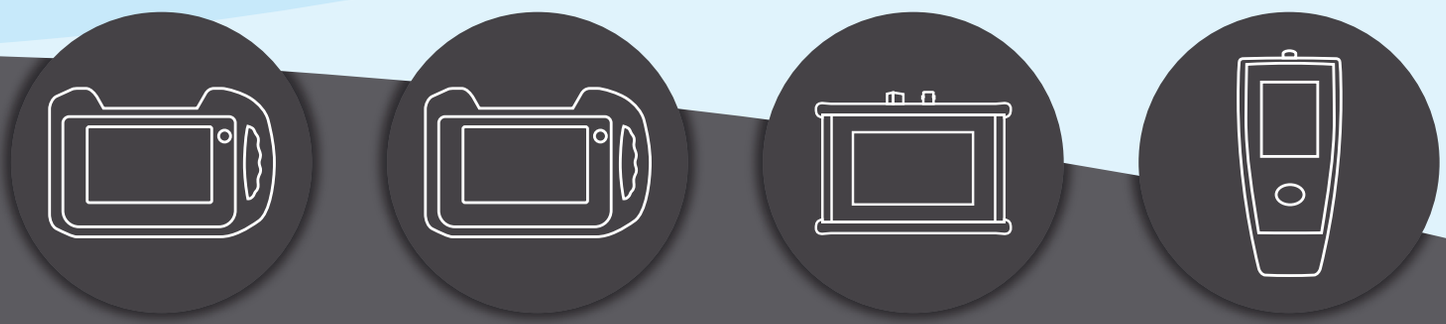
PROMAX

CATV / OPTICAL / DOCSIS ANALYZERS

CATV, OPTICAL & DOCSIS ANALYZERS



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

RANGER MICRO

From 5 to 2700 MHz

From 950 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

Bluetooth

2.2" TFT 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 Analogue has been replaced by digital QAM and DOCSIS came into play to provide the infrastructure needed to offer internet connectivity.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*

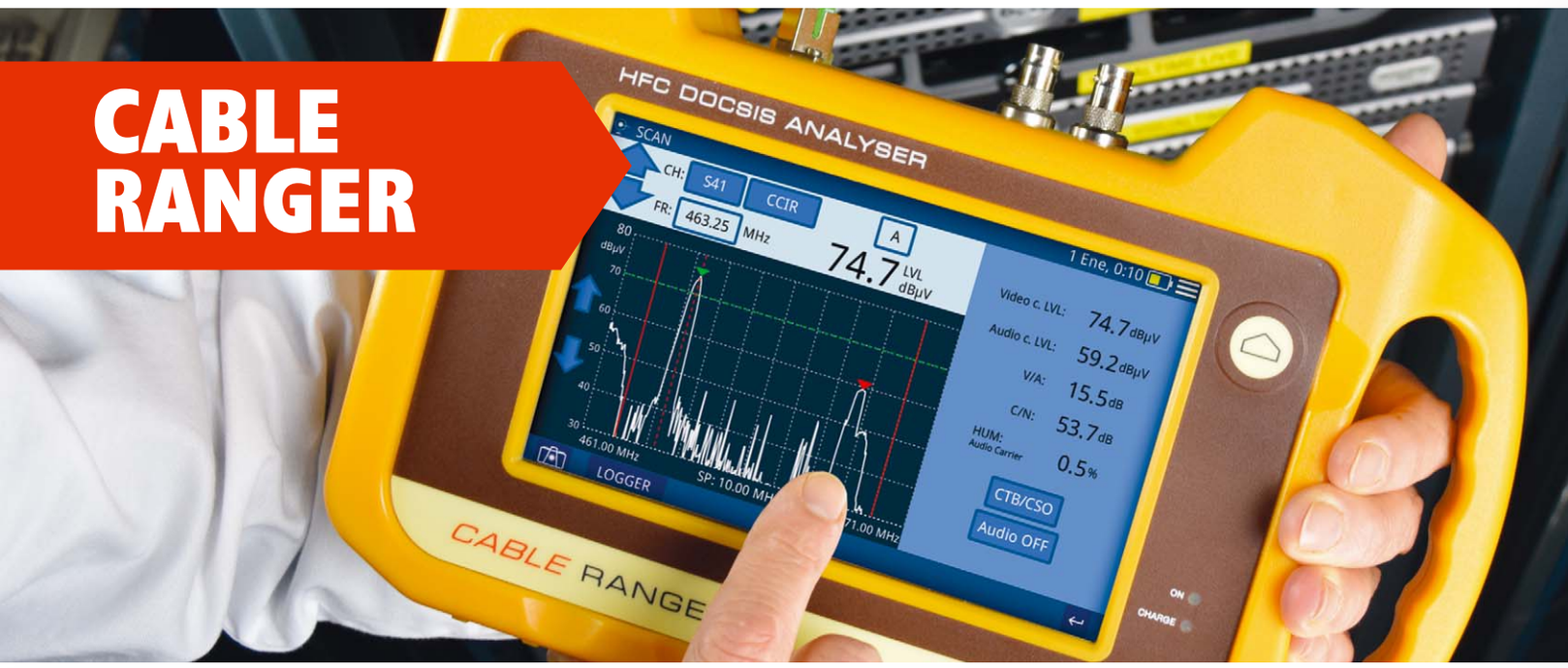
New generation pocket-size Signal Level Meter

PROWATCH *NEO*

Monitoring system

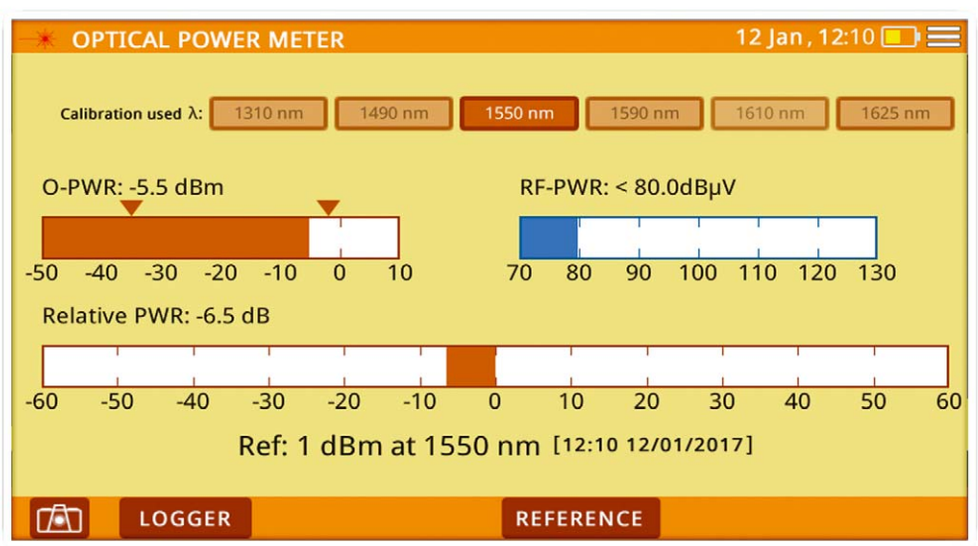
All products are designed to be very easy to use yet offering all measurements required working with today's complex hybrid fibre and coaxial networks.

CABLE RANGER

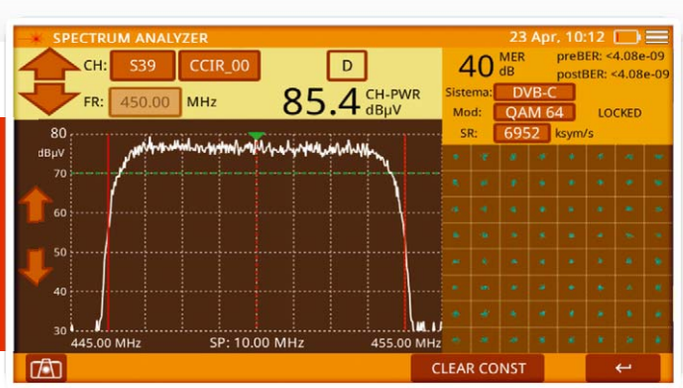


Optical measurements

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.

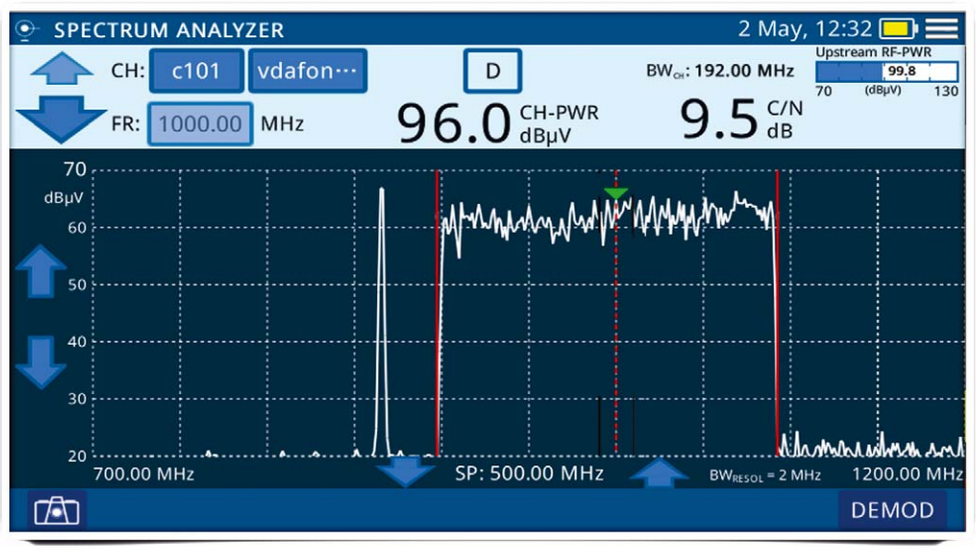


In this mode optical power measurement is shown together with the rest of the RF measurements. RFoG (RF-over-Glass) is used by CATV operators because it allows them to benefit from the advantages of fibre optics to compete with FTTH service providers.



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

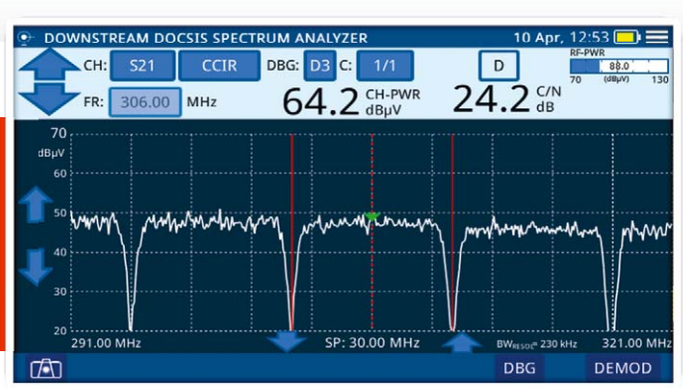
It is probably the fastest way to check if all signals in your network are present.

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

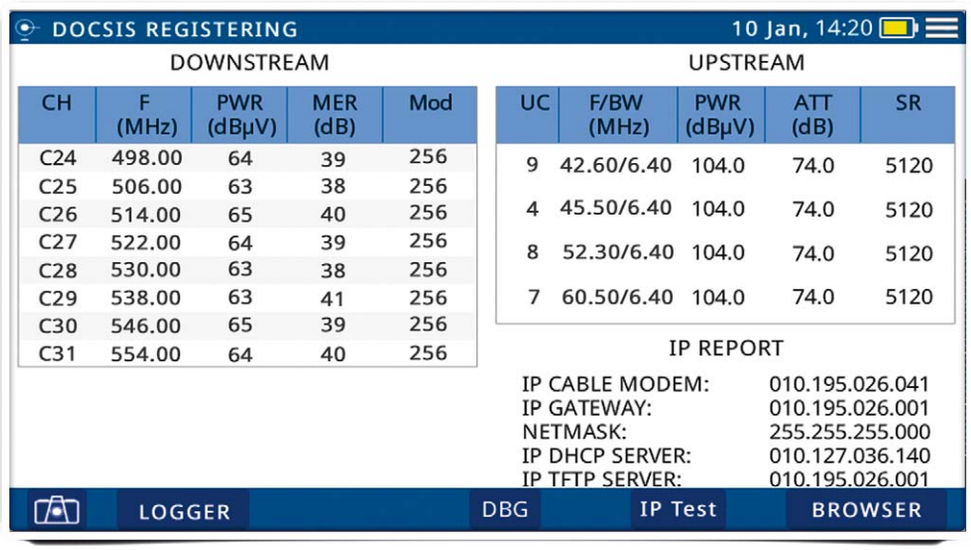
It is one of the essential functions in a field CATV analyzer. It allows you to have an overview of the RF content at the test point or to analyze a specific channel in detail and it is very helpful for interference and noise problem troubleshooting both in the forward and return bands. Signal level 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.

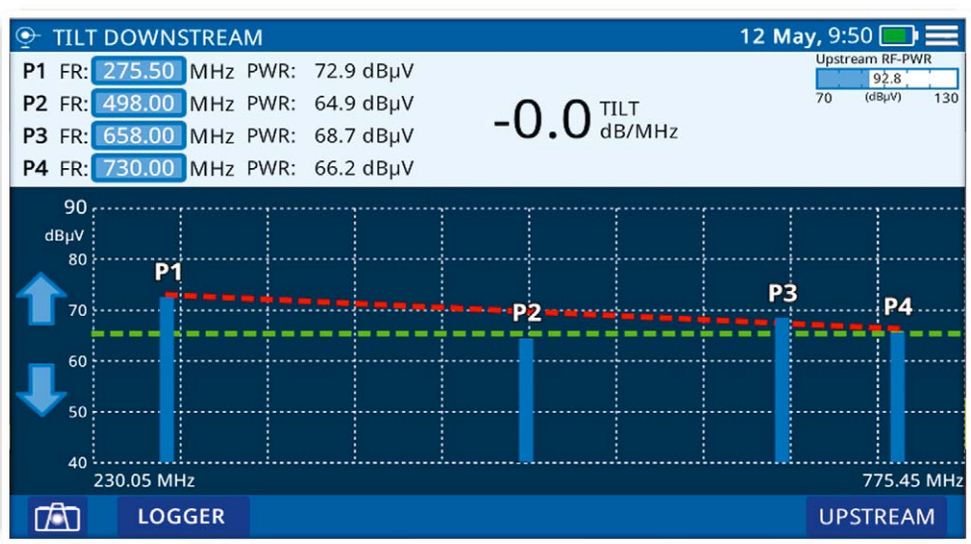


The CABLE RANGER incorporates the most advanced functions in accordance with the updates to the latest version of the DOCSIS 3.0 protocol (3.1 optional), including channel bonding technology, which are the latest technology implemented by operators in the cable data networks.

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.



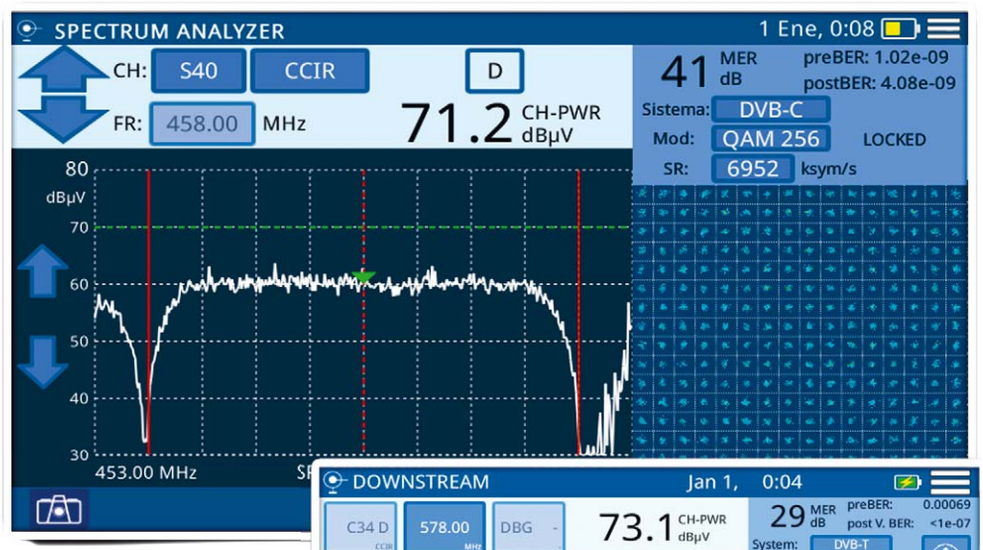
MER, BER Constellation

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

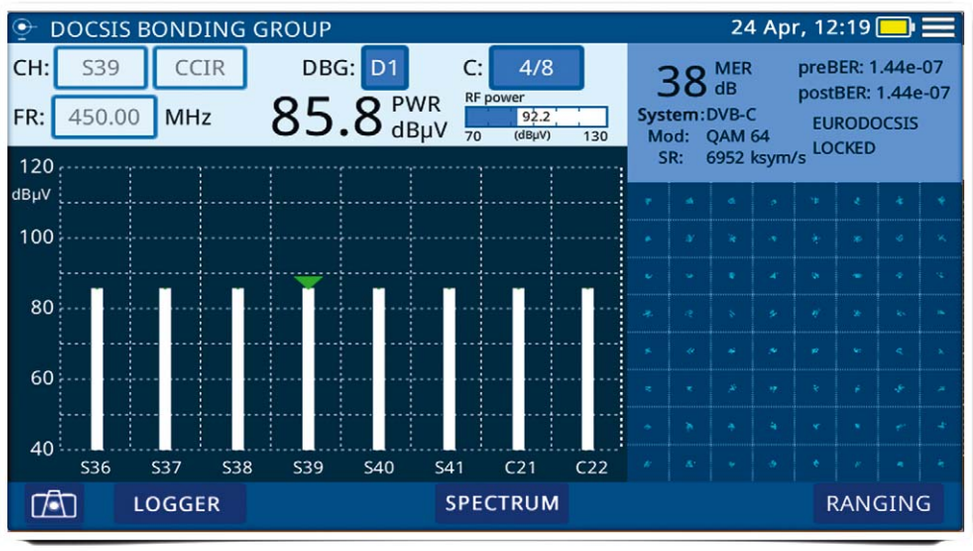
DVB-C/C2, DVB-T, QAM Annex A/B/C

CABLE RANGER 3.1 *includes a built-in DOCSIS 3.1 cable modem and a RF frequency range from 5 to 1800 MHz*

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.

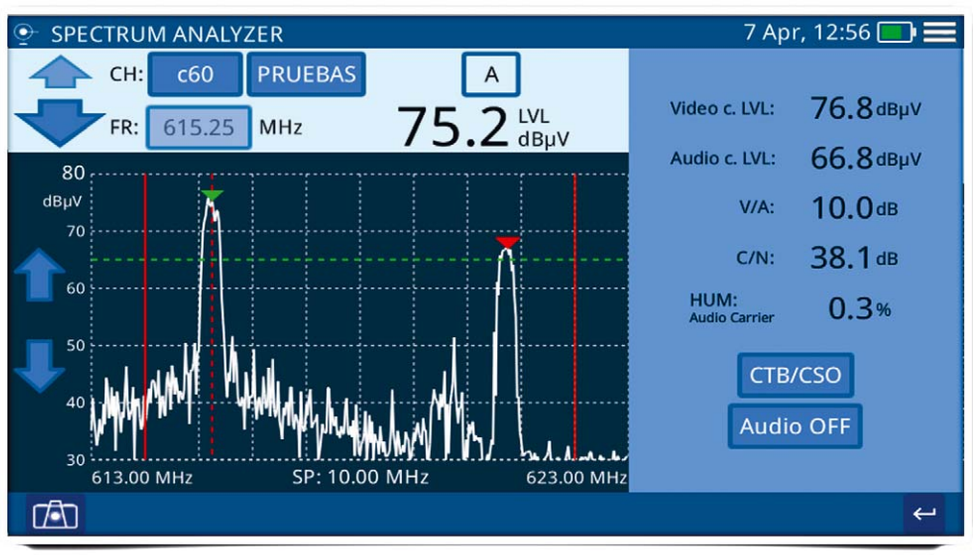
CABLE **RANGER** includes a comprehensive channel bonding screen where information about all of them is combined with other single channel measurements such as the constellation diagram.



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.

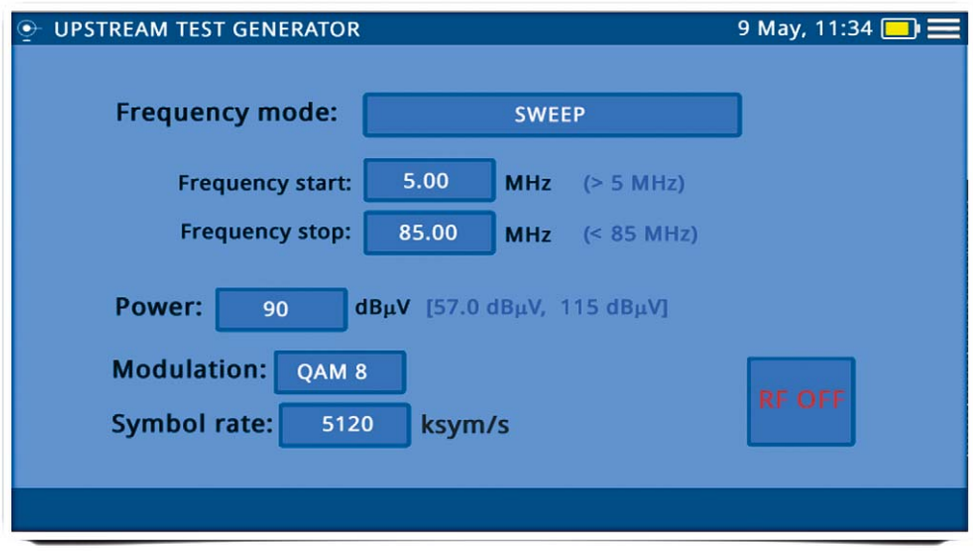


CABLE RANGER

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.

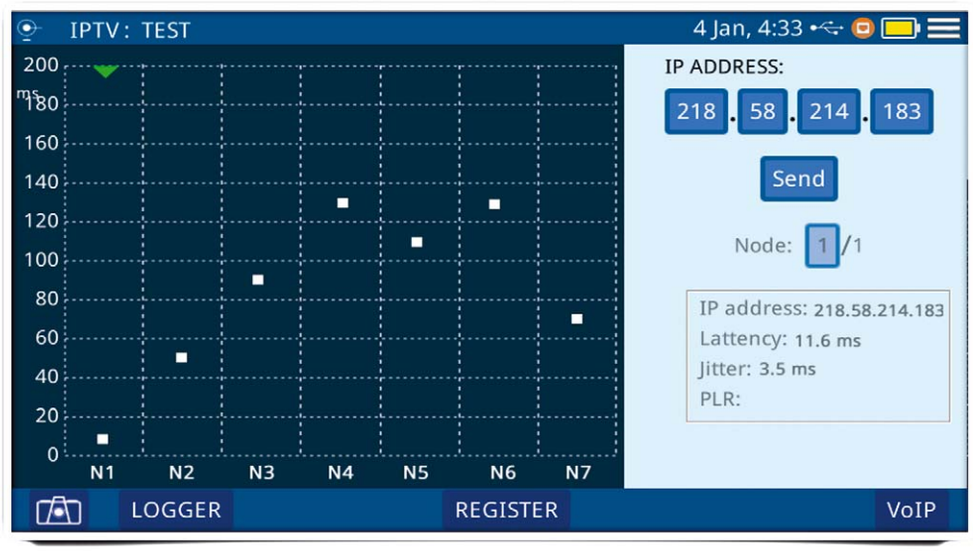
It can also be configured to sweep a specific frequency range within that band.

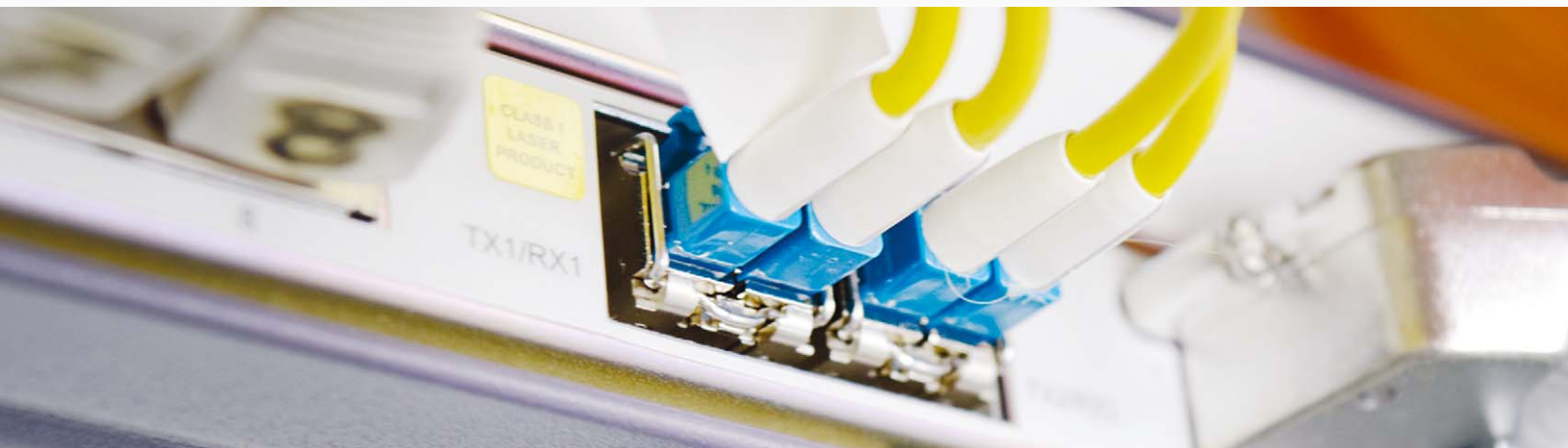


VoIP functionality test

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.

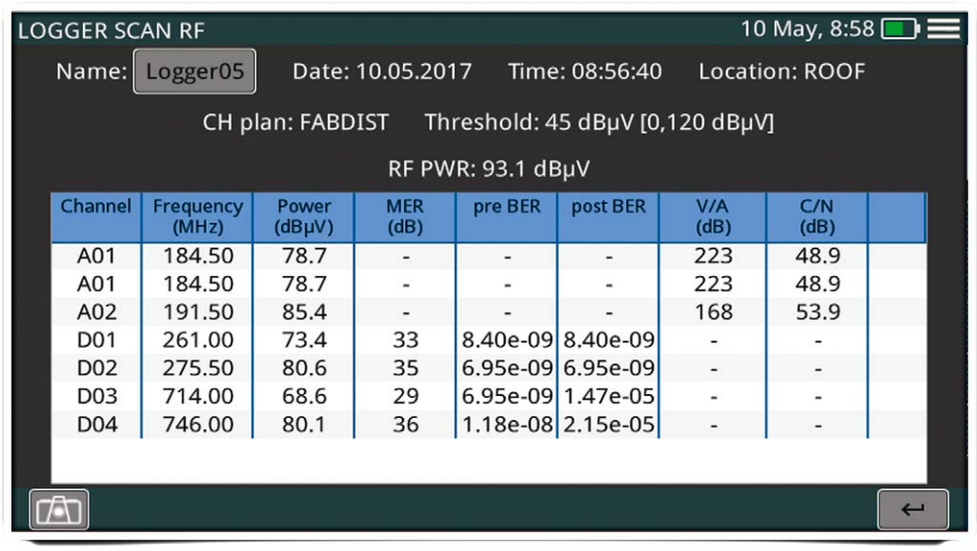




Datalogger

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.

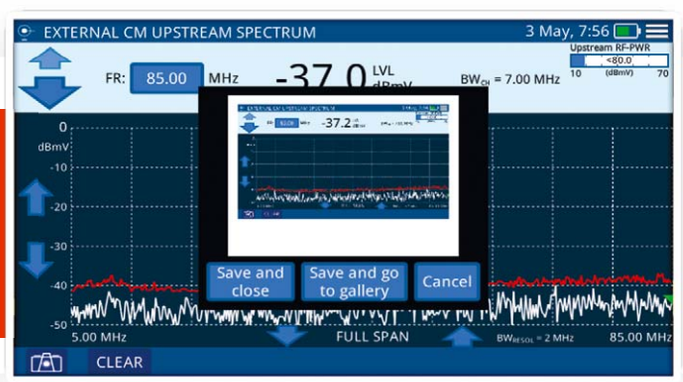
All this information is saved in the analyzer and it can be copied to a pendrive or to a PC for further processing at a later stage.

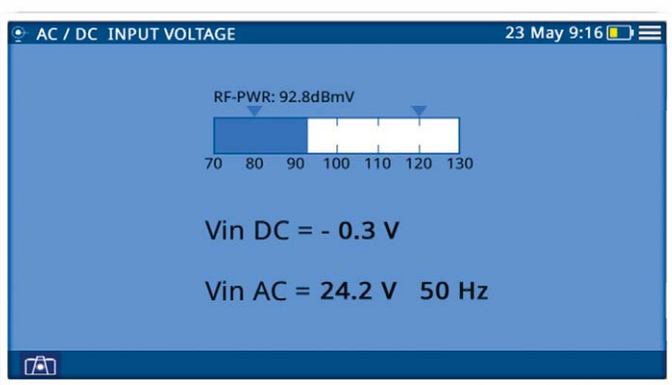


Channel	Frequency (MHz)	Power (dBµV)	MER (dB)	pre BER	post BER	V/A (dB)	C/N (dB)
A01	184.50	78.7	-	-	-	223	48.9
A01	184.50	78.7	-	-	-	223	48.9
A02	191.50	85.4	-	-	-	168	53.9
D01	261.00	73.4	33	8.40e-09	8.40e-09	-	-
D02	275.50	80.6	35	6.95e-09	6.95e-09	-	-
D03	714.00	68.6	29	6.95e-09	1.47e-05	-	-
D04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





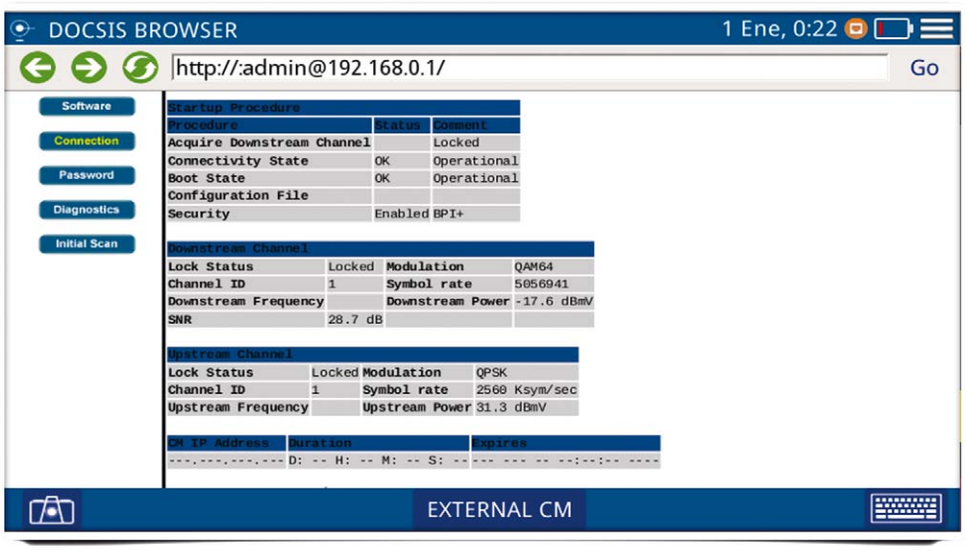
Input voltage measurement

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

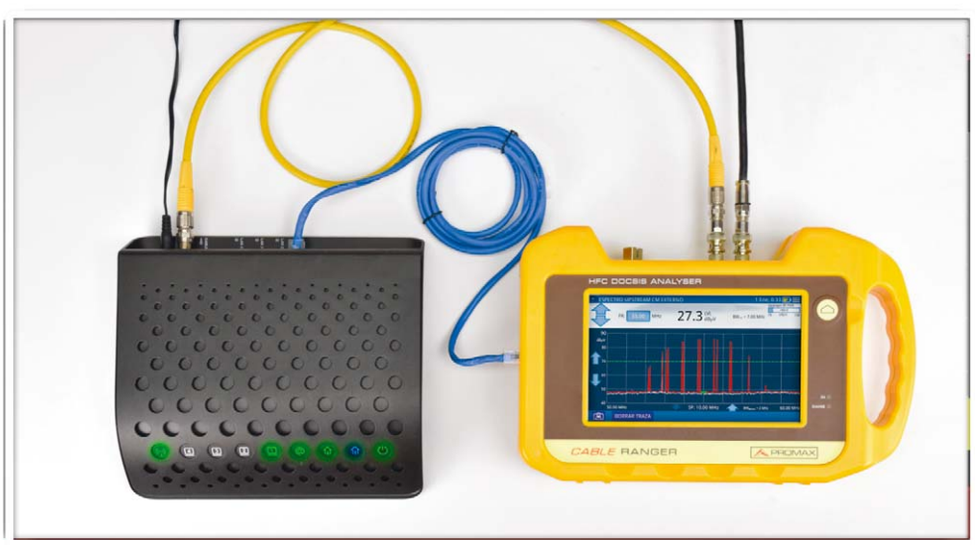
The built-in web browser can be used to register a maintenance action directly on the operator's website, rendering the use of other devices such as laptops unnecessary.

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*

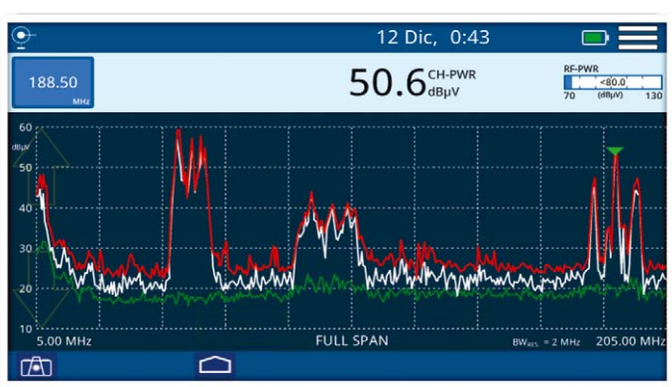
- ✓ RF BAND: 5-2700 MHz FOR DOCSIS 3.1
- ✓ TEST & GO
- ✓ DOWNSTREAM
- ✓ UPSTREAM ANALYZER
- ✓ SCAN / TILT
- ✓ OPTICAL FIBRE
- ✓ DATALOGGER
- ✓ PICTURE GALLERY AND DATA
- ✓ 5” COLOR TOUCH SCREEN TFT

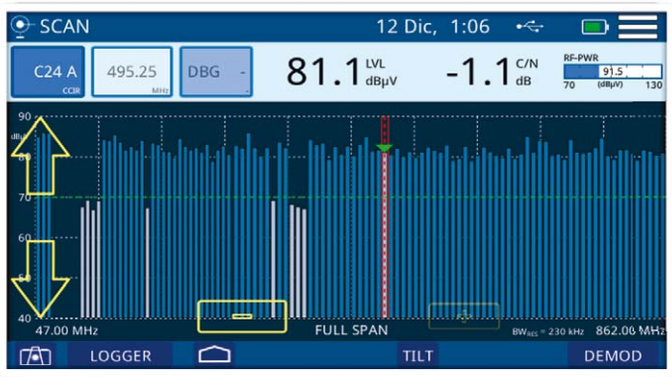
RANGER mini

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

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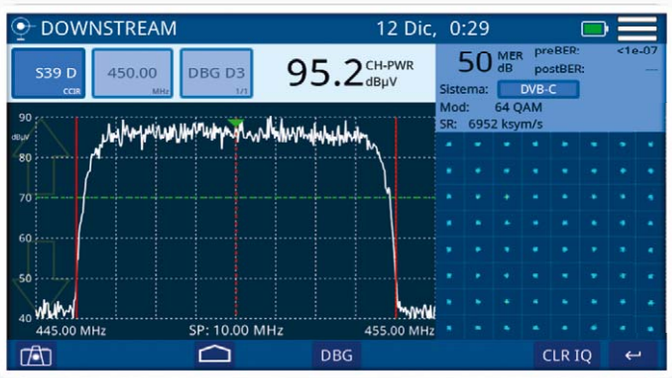

Constellation diagram

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DOCSIS bonding

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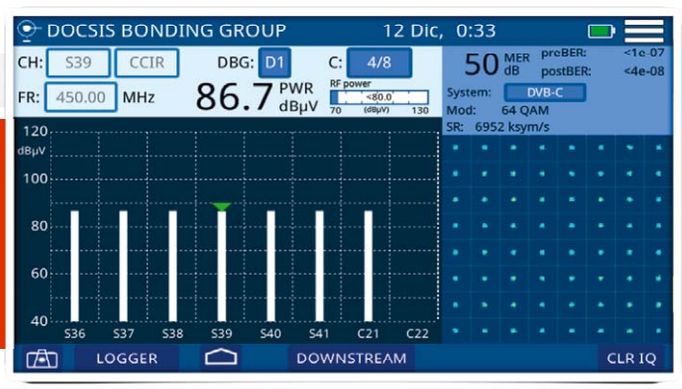

DOCSIS 3.1

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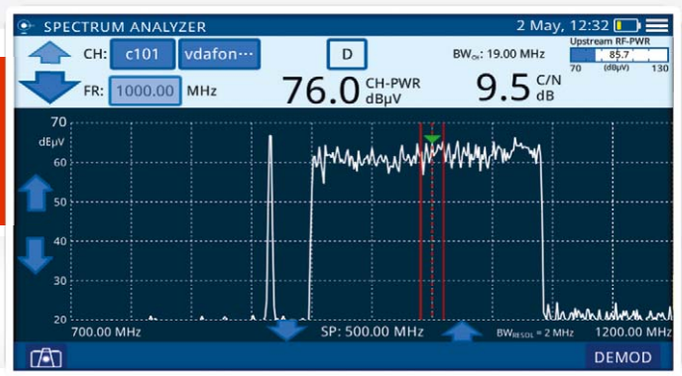

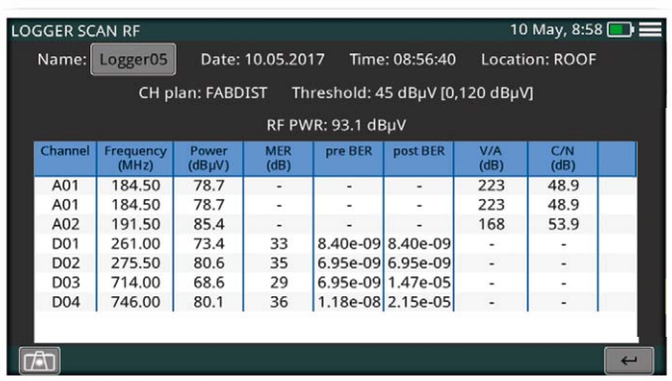

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Optical measurements (optional)

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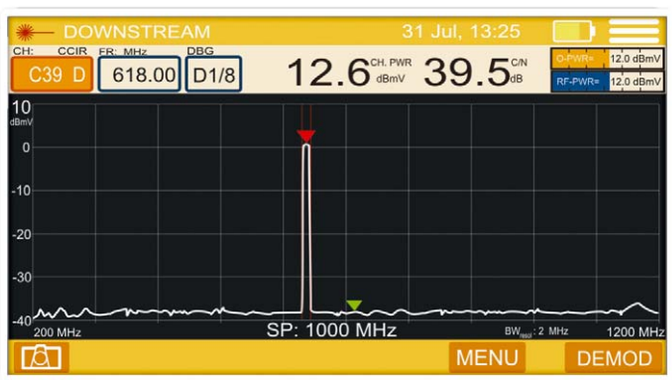
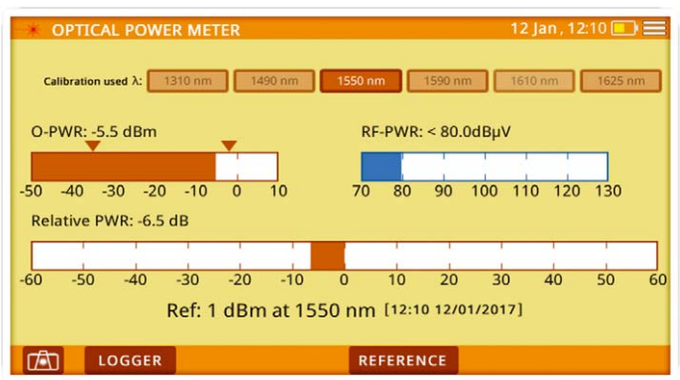


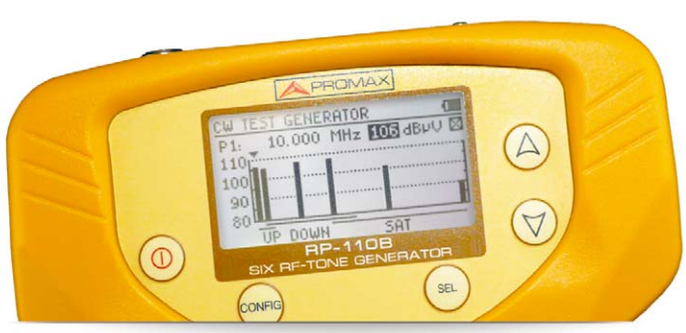


RP-110

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



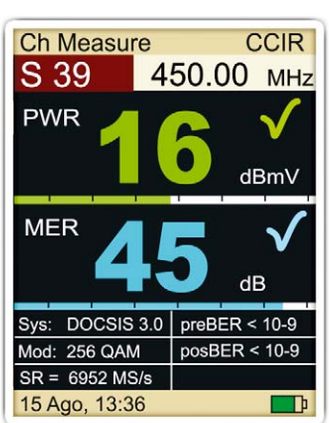
RANGER*micro*

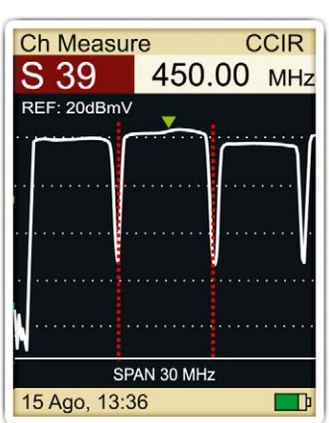
The **RANGER** ***micro*** is the modern version of a classic signal level meter. It is so compact that it will fit loosely in your pocket. It covers the frequency range from 5 to 2700 MHz so it is ideal for cable TV, off-air and satellite applications.

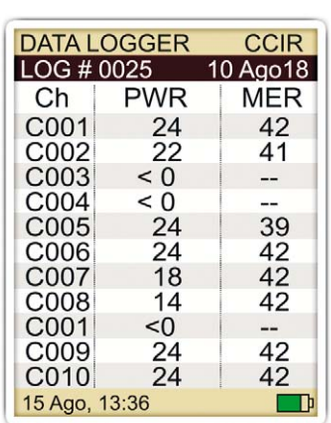
It provides channel power, MER and BER measurements for a variety of digital TV standards such as DVB-T, ISDBT, QAM, DVB-C, DVB-S/S2, all in one unit.

It also includes a spectrum analysis function that shows a portion of the frequency band around the carrier frequency being tuned.

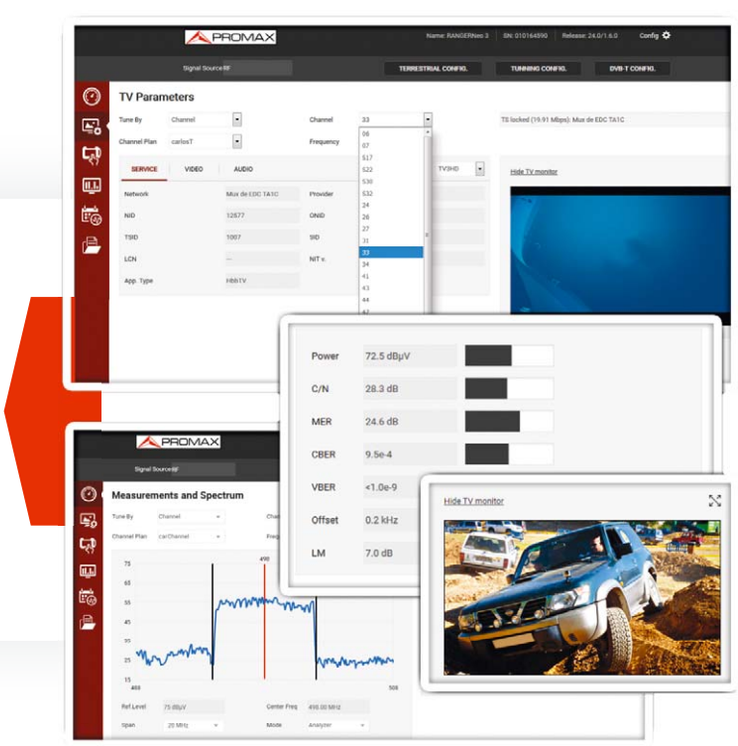
RANGER micro *connects via Bluetooth to your smartphone. At the push of a button it can perform a datalogger scan and it can send all data to your mobile device.*







webControl and Video streaming

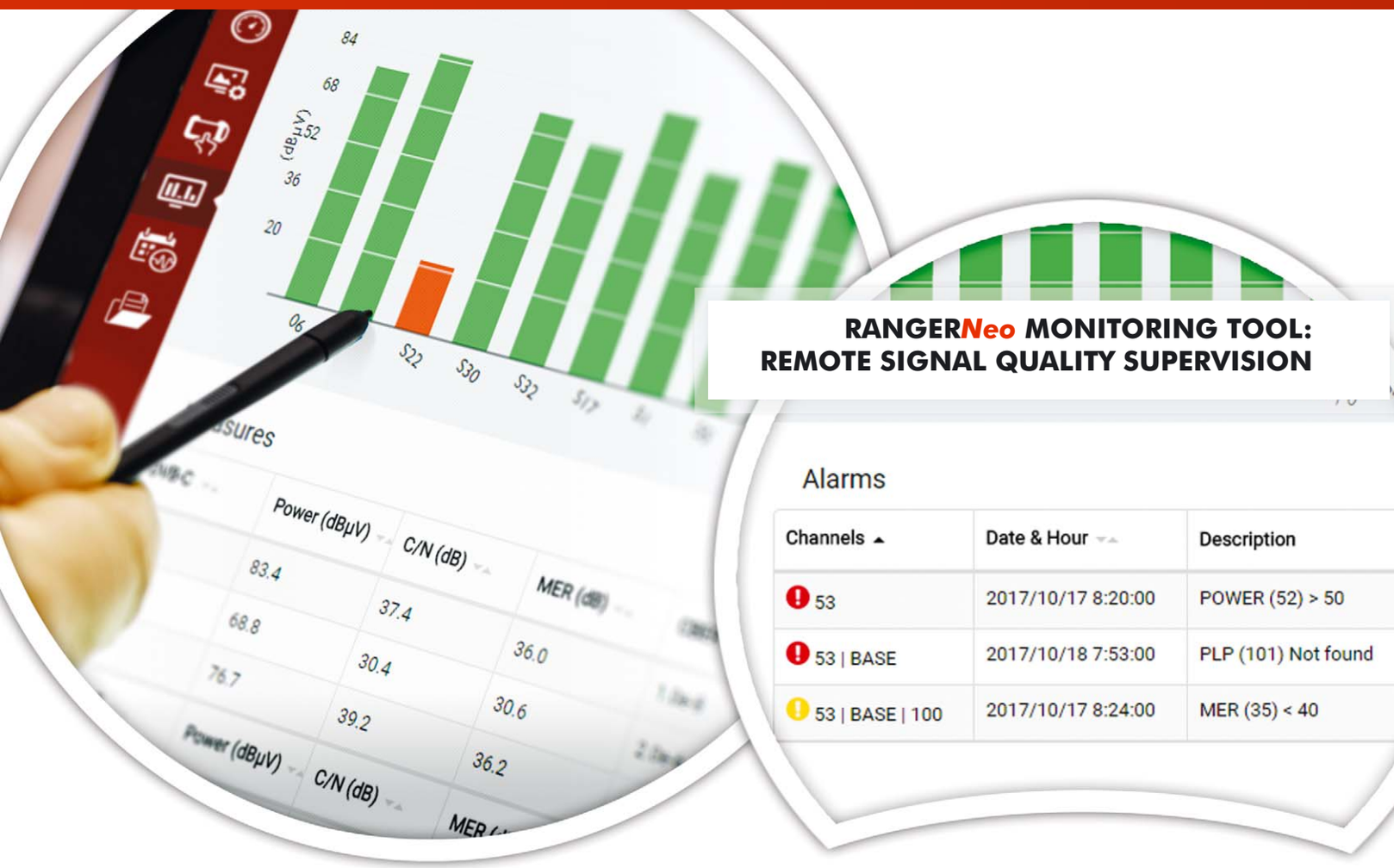


webControl

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

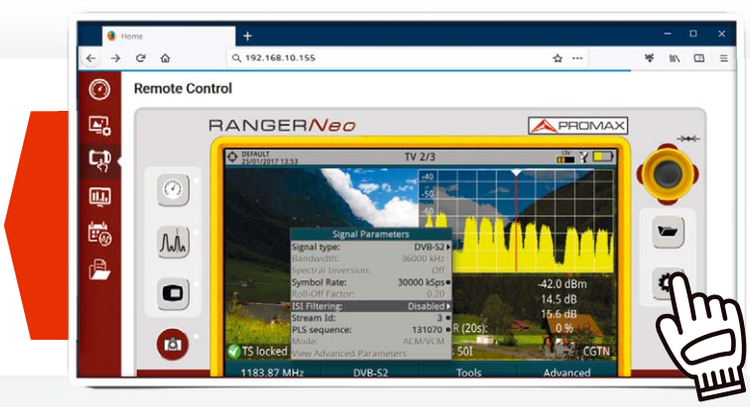
The Spectrum analyzer area shows us the spectrum trace, and all measurements for the RF channel being tuned, while we can modify reference level, span, channel/frequency and channel plan used.

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

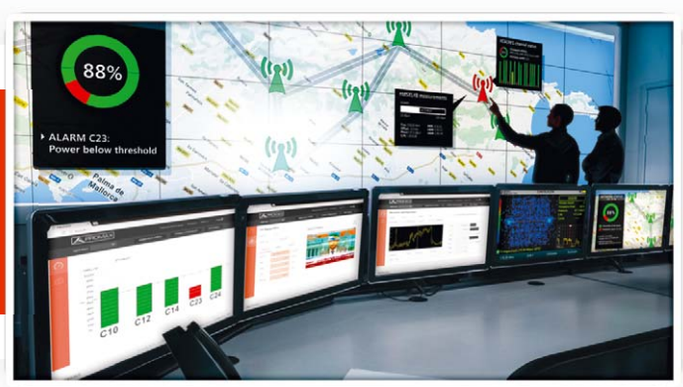
It is now possible to stream the Transport Stream after channel demodulation either over a private LAN or over the Internet, as a unicast (UDP) stream. The service as seen on the analyzer screen can be streamed as a SPTS over IP, or as a full TS containing all services for the channel being tuned.

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

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.

CATV / Optical / DOCSIS analyzers
Technical specifications

SPECIFICATIONS	*CABLE* RANGER 3.1	*CABLE* RANGER 3.0	RANGER *mini*	RANGER *micro*
SPECTRUM ANALYZER	Covers DOCSIS 3.0 and DOCSIS 3.1 RF requirements			
Frequency margin	From 5 to 2700 MHz	From 5 to 2700 MHz	From 5 to 2700 MHz	From 5 to 2700 MHz
Resolution	10 kHz	10 kHz	10 kHz	10 kHz
Resolution bandwidth	220 kHz / 2 MHz	220 kHz / 2 MHz	220 kHz / 2 MHz	220 kHz / 2 MHz
SPAN	From 10 MHz to Full band	From 10 MHz to Full band	From 10 MHz to Full band	From 10 to 300 MHz
LEVEL MEASUREMENT				
Dynamic range	-50 to -60 dBµV			-40 to -60 dBµV
Measuring range	50 dB			50 dB
Resolution	0.1 dB			1 dB
Accuracy	±2 dB			±2 dB
Input impedance	75 Ω			75 Ω
Units	dBmV, dBµV, dBm			dBmV, dBµV, dBm
DOCSIS				
Built-in cablemodem	DOCSIS 3.1	DOCSIS 3.0		
Downstream analyzer	DOCSIS 2.0 / DOCSIS 3.0 / DOCSIS 3.1			
Spectrum & power measurement				
MER and BER	DOCSIS 2.0 / 3.0 / 3.1	DOCSIS 2.0 / 3.0	DOCSIS 2.0 / 3.0. MER estimated: DOCSIS 3.1	
Constellation	DOCSIS 2.0 / 3.0 / 3.1	DOCSIS 2.0 / 3.0	DOCSIS 2.0 / 3.0	
DOCSIS bonding group				
Cable Modem Emulation	32 / 8 channels	8 / 4 channels		
Dowstream Tuning	32 channels	32 channels	32 channels	
Upstream spectrum analyzer	From 5 to 200 MHz	From 5 to 85 MHz	From 5 to 85 MHz	
DIGITAL CHANNEL ANALYZER				
Frequency band	From 10 to 2700 MHz			From 42 to 2700 MHz
BER, MER, Power	DVB-C/C2, DVB-T, QAM Annex A/B/C, ISDB-T, J.382			
Constellation	DVB-C/C2, DVB-T, QAM Annex A/B/C, ISDB-T, J.382			
SATELLITE CHANNEL ANALYZER				
Frequency band	From 950 to 2150 MHz			From 950 to 2150 MHz
BER, MER, Power	DVB-S, DVB-S2			DVB-S, DVB-S2
Constellation	DVB-S, DVB-S2			
LNB supply	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	-50 dBm to 4 dBm		-50 dBm to 4 dBm	
Calibrated wavelengths	1310, 1490 and 1550 nm		1310, 1490 and 1550 nm	
Optical to 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			From 42 to 2700 MHz
Measurements	Level, C/N, CTB-CSO, HUM			Level, C/N, CTB-CSO
Audio demodulation	FM			
INPUTS AND OUTPUTS				
RF input connector	F-type, replaceable		F-type, replaceable	F-type, replaceable
Voltmeter	AC/DC. From 5 to 1000 V			
Optical fibre	SC-APC		SC-APC (optional)	
Connectivity	Ethernet, USB, mini-USB		Ethernet, USB	MicroUSB, Bluetooth
MAIN FUNCTIONS	Spectrum analyzer		Spectrum analyzer	
	DOCSIS Analyzer			
	Test generator			
	External cable modem			
	Upstream and Return path analyzer		Return path analyzer	Channel analyzer
	SCAN / TILT		SCAN / TILT	
	Voltmeter, RF power meter		Voltmeter, RF power meter	
	TEST & GO		TEST & GO	TEST & GO
	Screenshots, Photo gallery		Screenshots, Photo gallery	
	Datalogger		Datalogger	
BATTERY	7.2 V / 6.6 Ah Li-Ion		7.2 V / 3 Ah Li-Po	3.7 V / 0.7 Ah Li-Po
Battery operation time	> 2 h continuous use		> 4 h continuous use	> 1 h continuous use
External supply	12 V		12 V	5 V (from USB)
INCLUDED ACCESSORIES	DC power adaptor + Power cord		DC power adaptor + cord	DC power adaptor
	Input adapter (“F”/f to “F”/f)		Input adapter (“F”/f to “F”/f)	Input adapter (“F”/f to “F”/f)
	Carrying bag, Transport case		Transport case, Touch screen	
	Quick reference guide		pen, Quick reference guide	Quick reference guide
MECHANICAL FEATURES				
Dimensions	290 (W) x 185 (H) x 65 (D) mm		177 (W) x 117 (H) x 30 (D) mm	62 (W) x 140 (H) x 30 (D) mm
Weight	1.6 kg		700 g	150 g

Fibre-Coaxial DOCSIS analyzers
CABLE Ranger


CABLE RANGER 3.1


CABLE RANGER 3.0


RANGER *mini*


RANGER *micro*

KEY FEATURES

	CABLE RANGER 3.1	*CABLE* RANGER 3.0	RANGER *mini*	RANGER *micro*
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	✓	✓	✓	✓
Spectrum analyzer	10 MHz to FULL SPAN	10 MHz to FULL SPAN	10 MHz to FULL SPAN	10 to 300 MHz 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	2.2” color screen
Dimensions (W. x H. x D.)	290 x 185 x 65 mm	290 x 185 x 65 mm	177 x 117 x 30 mm	62 x 140 x 30 mm
Weight	1.6 kg	1.6 kg	700 g	150 g

For more information please contact your distributor: