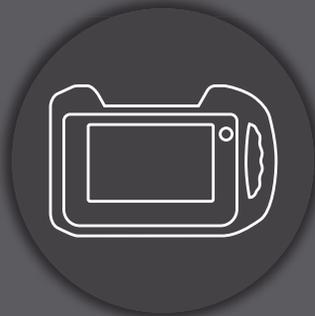




CATV / OPTICAL / DOCSIS ANALYZERS

CATV, OPTICAL & DOCSIS ANALYZERS





CABLE RANGER 3.1

Built-in DOCSIS 3.1 cable
modem

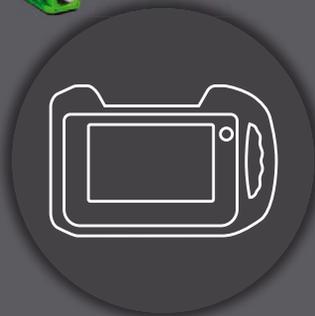
From 5 to 2700 MHz

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

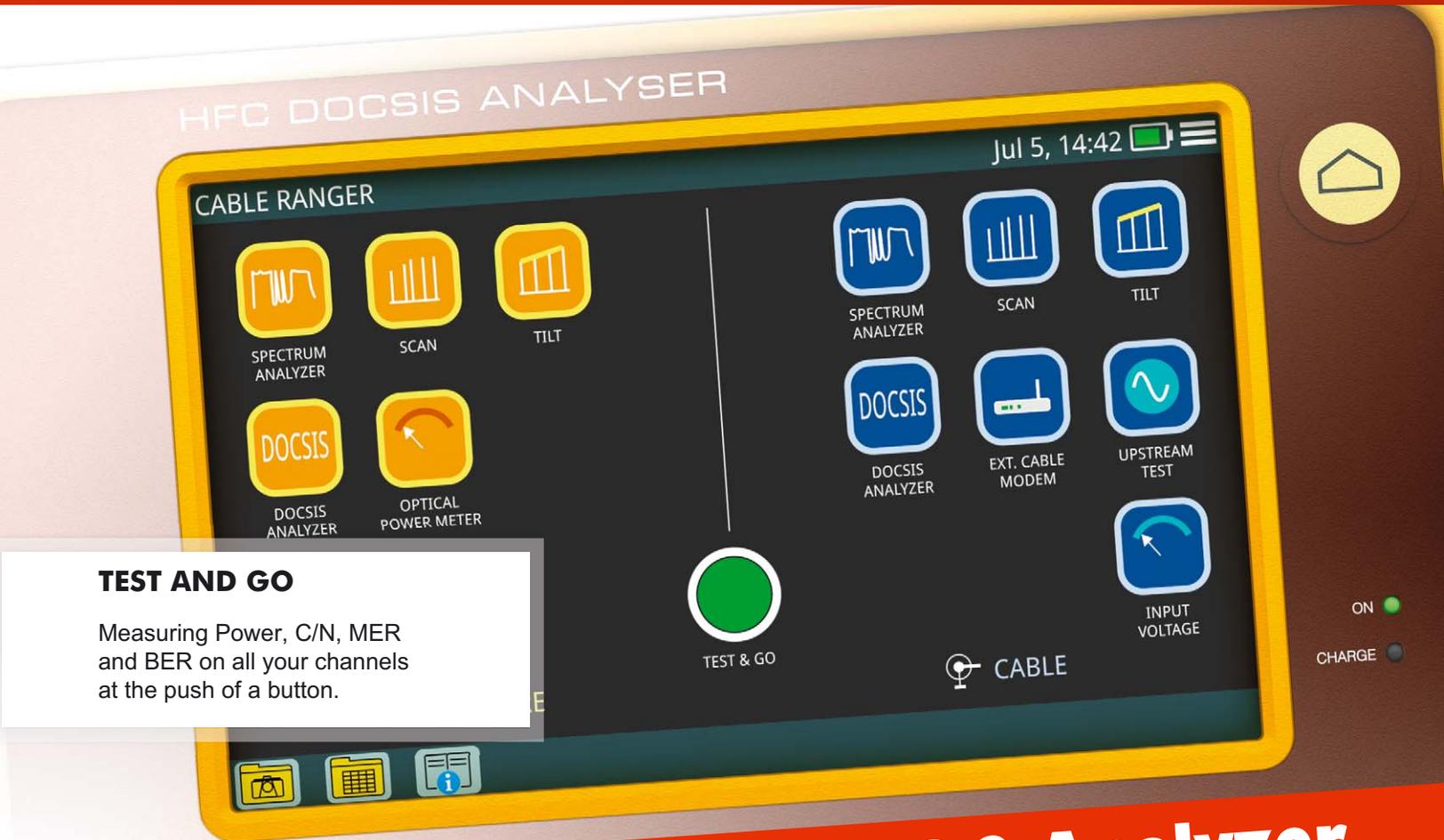
Up to 2150 MHz in satellite
mode

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



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 Analogue has been replaced by digital QAM and DOCSIS came into play to provide the infrastructure needed to offer internet connectivity.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

| | | | | |
|--|--|---|--|---|
|  |  |  |  |  |
| <p>CABLE RANGER 3.1 Touch screen hybrid HFC and DOCSIS analyzer with built-in DOCSIS 3.1 cablemodem</p> | <p>CABLE RANGER 3.0 Touch screen hybrid HFC and DOCSIS analyzer with built-in DOCSIS 3.0 cablemodem</p> | <p>RANGER MINI Touch screen hybrid HFC, DOCSIS, Satellite and Terrestrial analyzer</p> | <p>RANGER MICRO New generation pocket-size Signal Level Meter</p> | <p>PROWATCH NEO Monitoring system</p> |

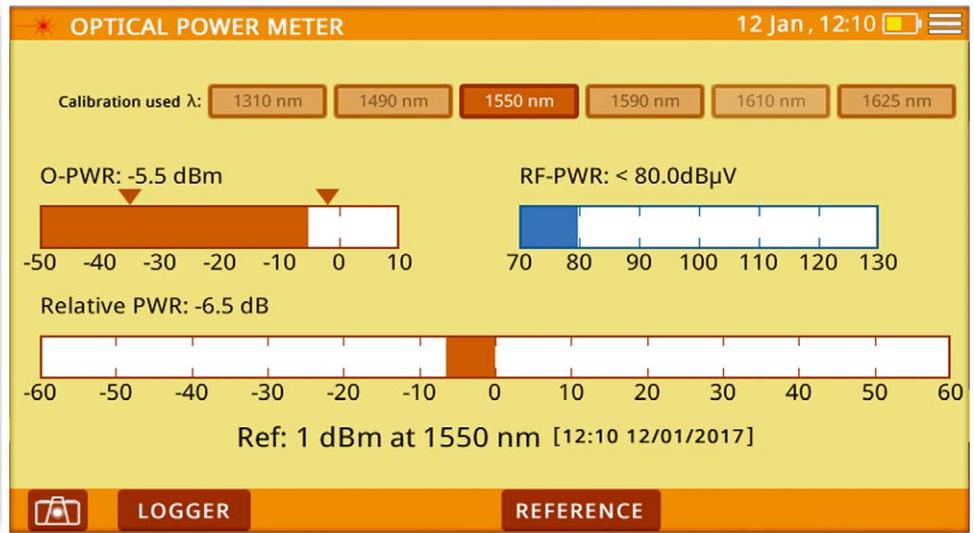
All products are designed to be very easy to use yet offering all measurements required working with today's complex hybrid fibre and coaxial networks.

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.

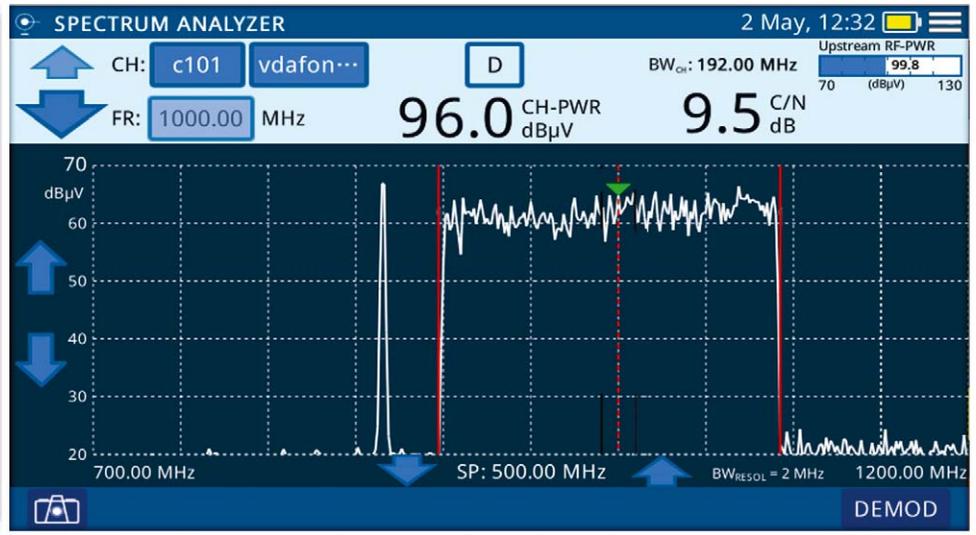


In this mode optical power measurement is shown together with the rest of the RF measurements. RFoG (RF-over-Glass) is used by CATV operators because it allows them to benefit from the advantages of fibre optics to compete with FTTH service providers.



DOCSIS 3.1 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.

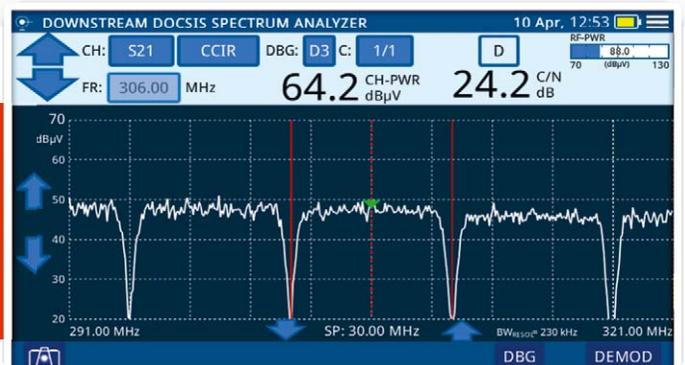
The SCAN function displays graphically all the analog and digital channels in a selected channel plan along with their signal levels.

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



Spectrum analyzer

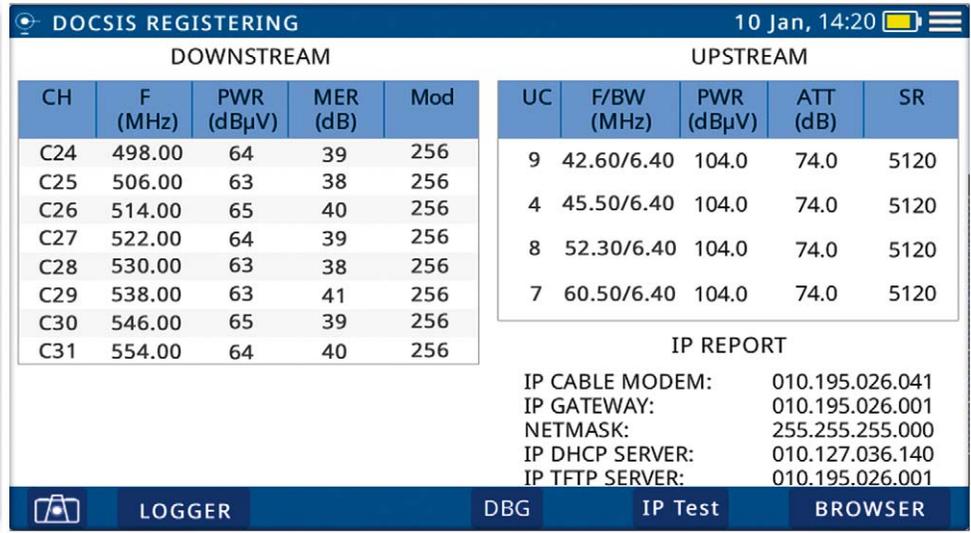
It is one of the essential functions in a field CATV analyzer. It allows you to have an overview of the RF content at the test point or to analyze a specific channel in detail and it is very helpful for interference and noise problem troubleshooting both in the forward and return bands. Signal level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



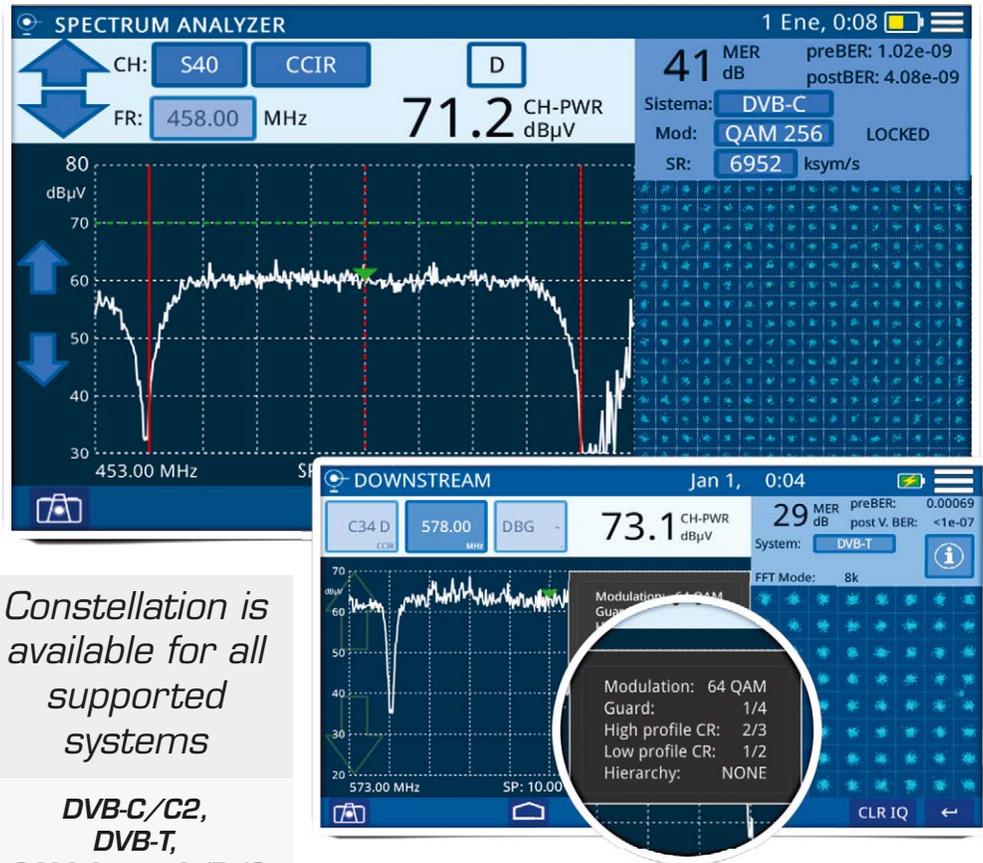
MER, BER Constellation

Constellation

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

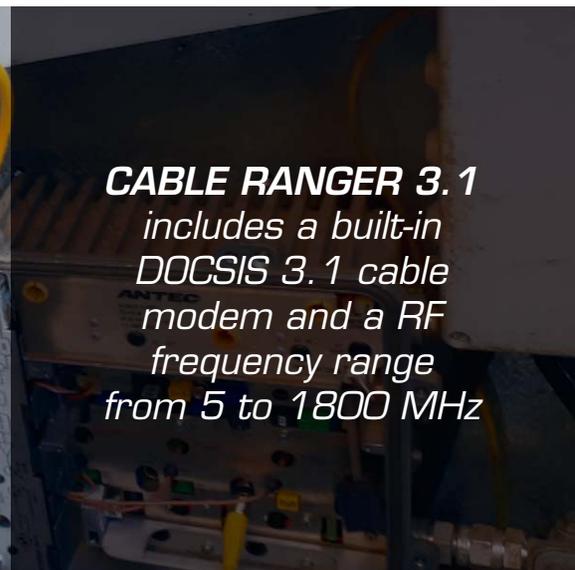
Constellation diagram is a simple and graphical way to identify signal impairments which impact MER and ultimately BER. An ideal QAM channel for example will be represented by a set (constellation) of very sharp dots.

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**

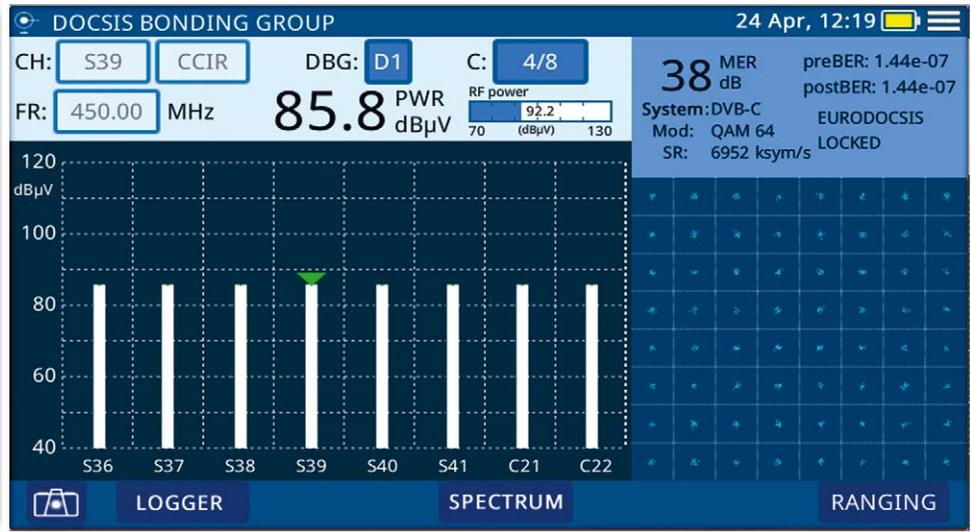


CABLE RANGER 3.1 includes a built-in DOCSIS 3.1 cable modem and a RF frequency range from 5 to 1800 MHz

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.

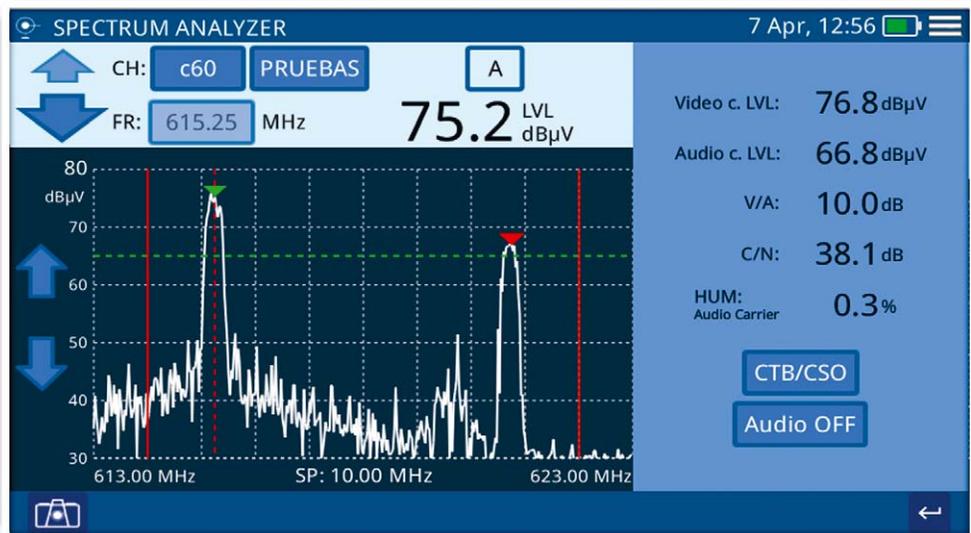
CABLE RANGER includes a comprehensive channel bonding screen where information about all of them is combined with other single channel measurements such as the constellation diagram.



Analog and HUM

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

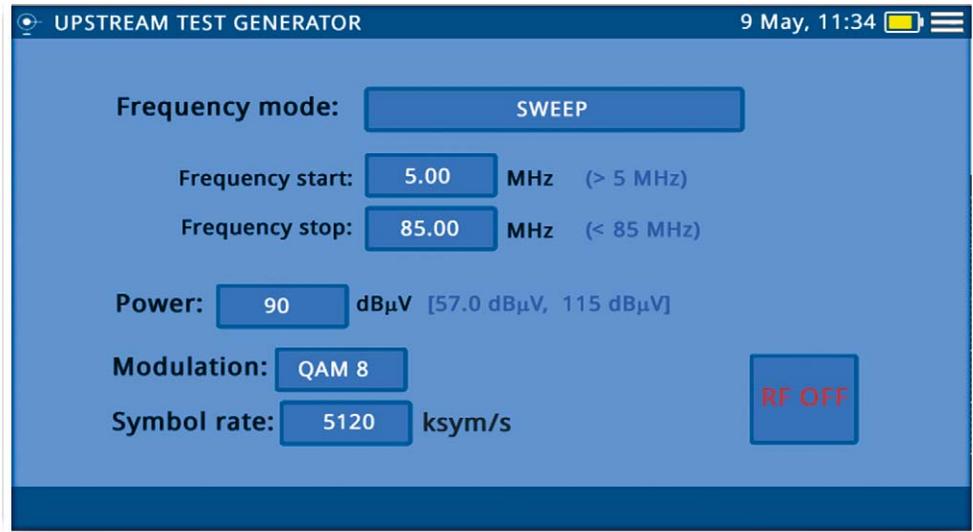
This is all shown alongside the screen together with the spectrum analyzer graphic.



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.

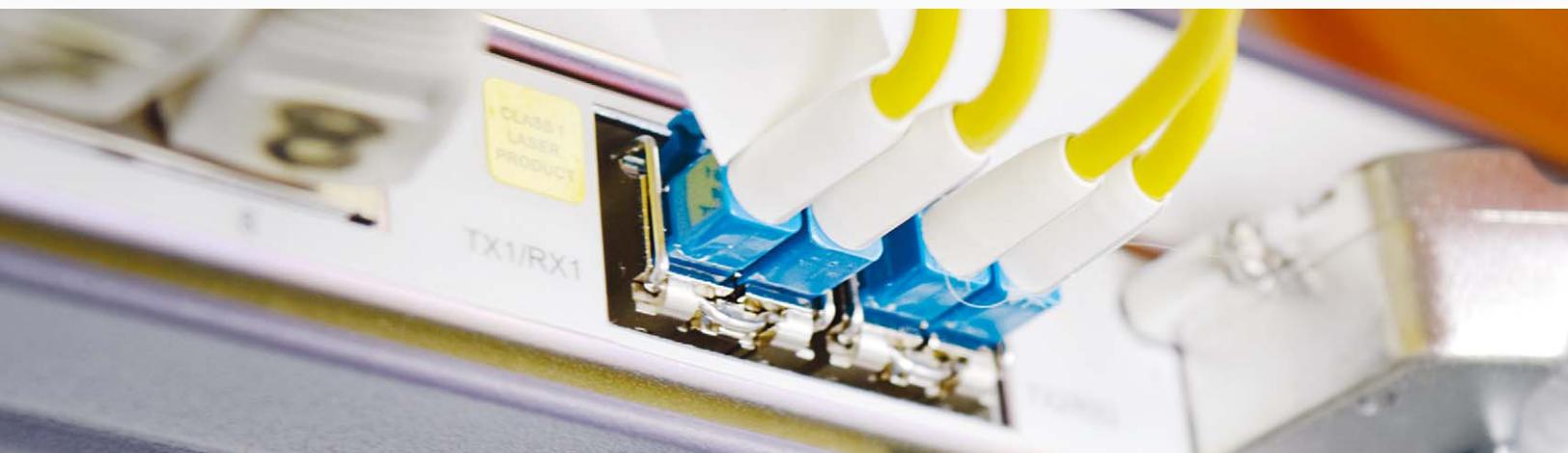
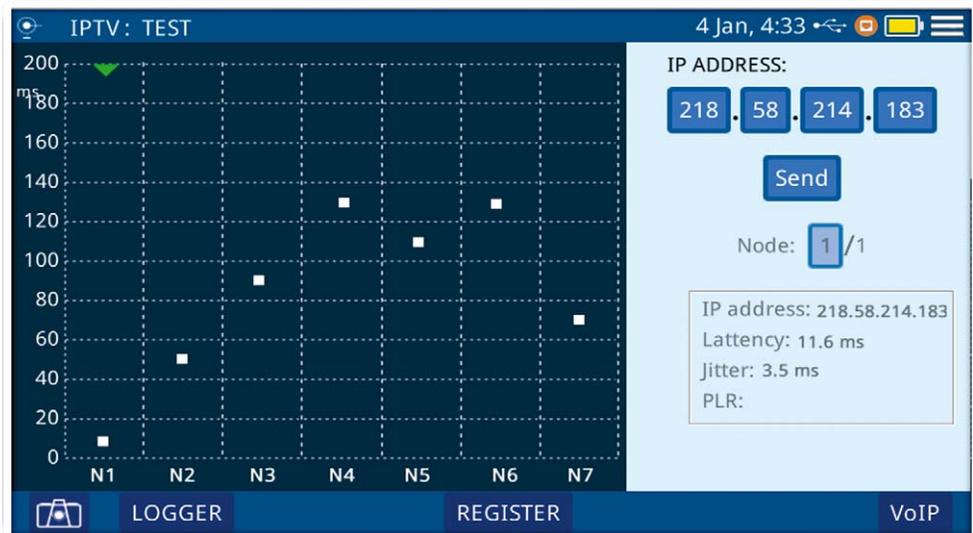
It can also be configured to sweep a specific frequency range within that band.



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.

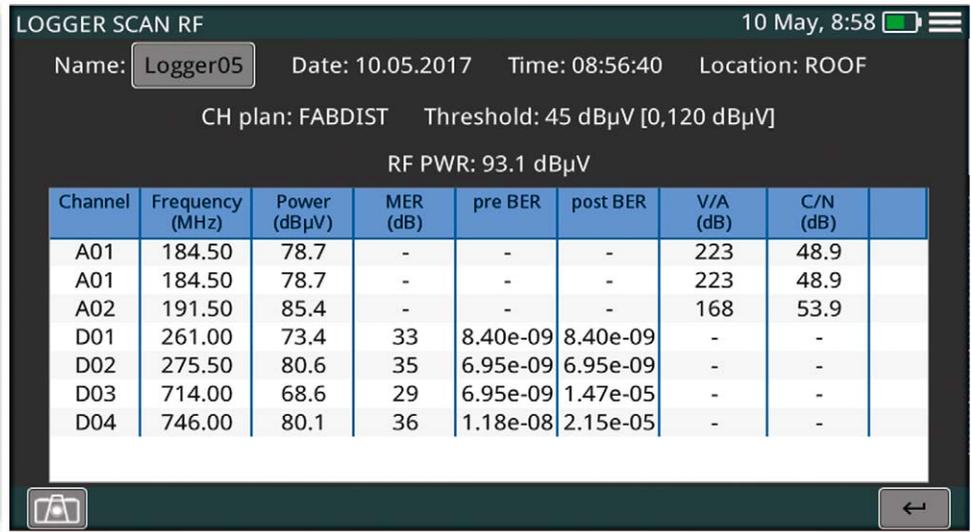
UGS stands for Unsolicited Grant Service. Most important measurements to assessing communication quality include latency, jitter, lost packets or MOS and R value.



Datalogger

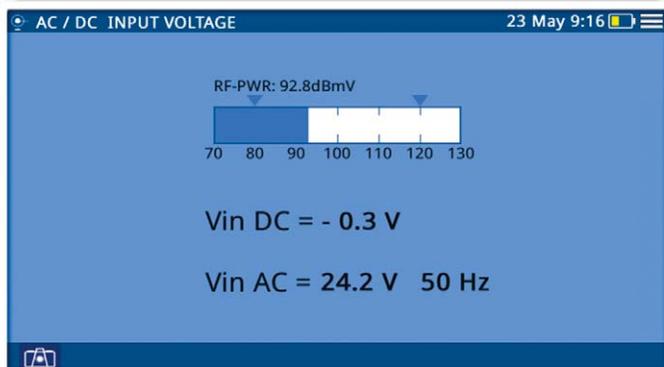
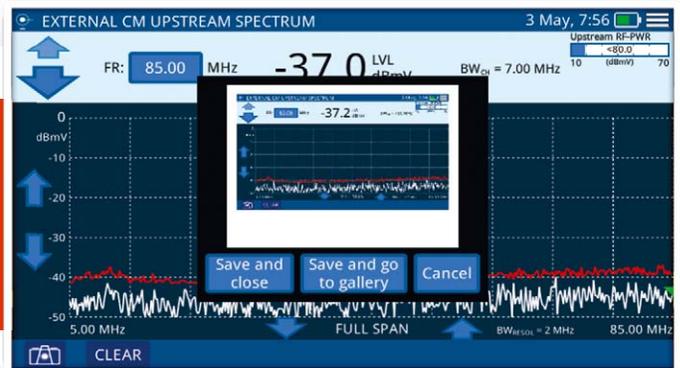
The datalogger function can perform various measurements including signal level and channel power, carrier/noise, BER and MER for all the channels listed in a given channel table automatically.

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.



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.



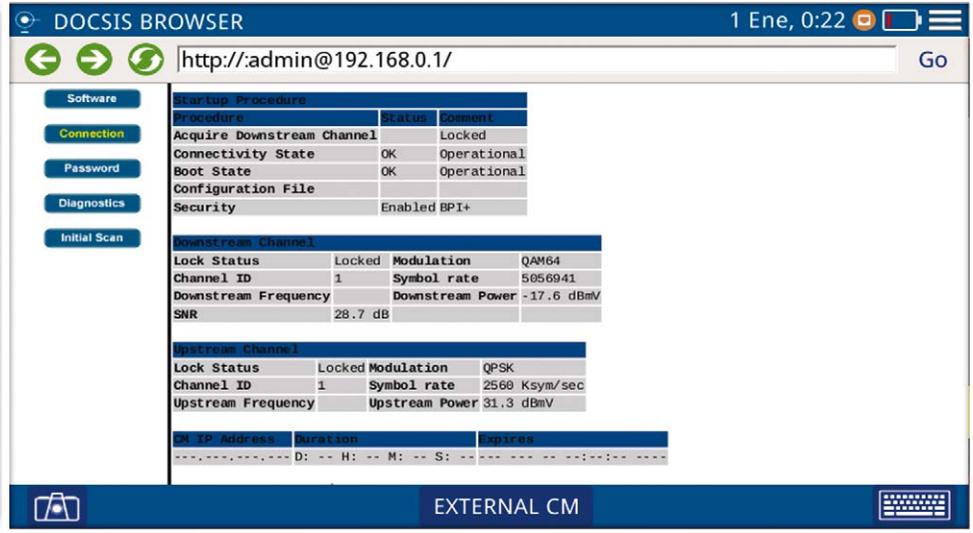
Input voltage measurement

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

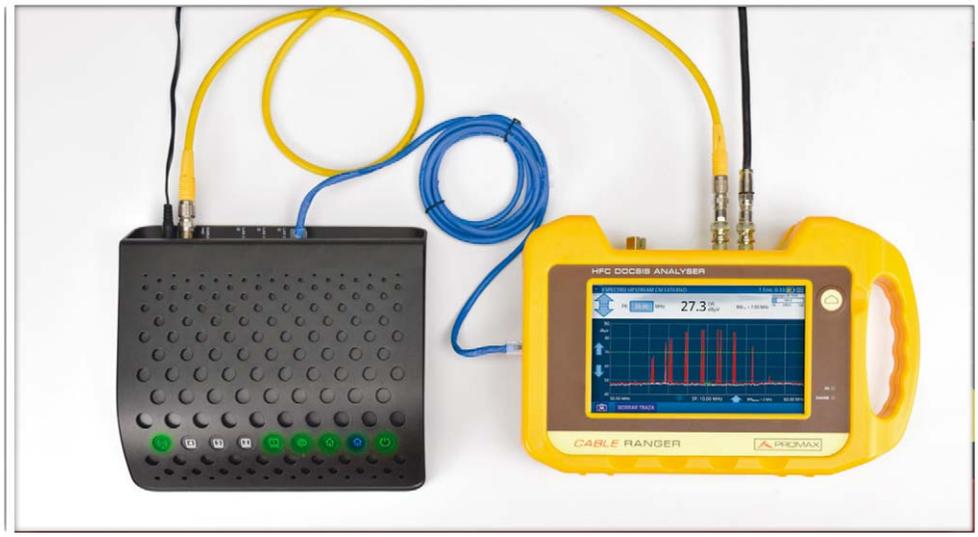
The built-in web browser can be used to register a maintenance action directly on the operator's website, rendering the use of other devices such as laptops unnecessary.

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.

- ✓ 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

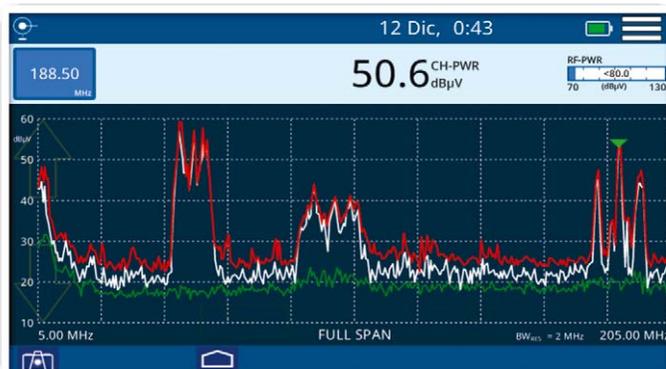


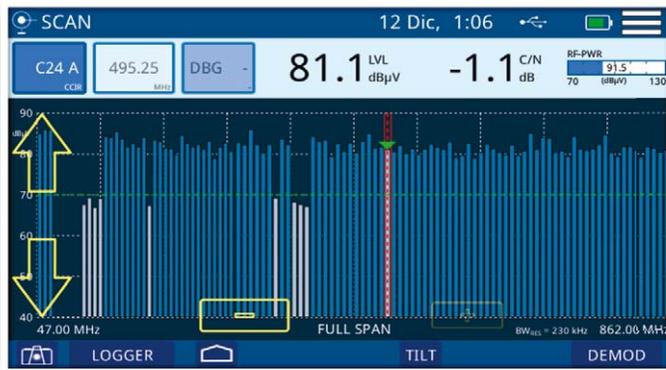
RANGER *mini*

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.

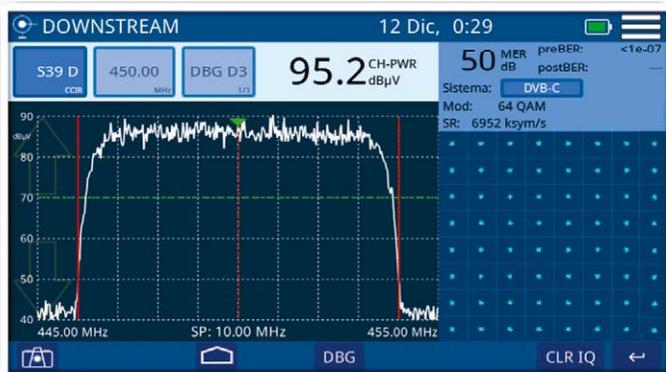




SCAN + TILT

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.

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

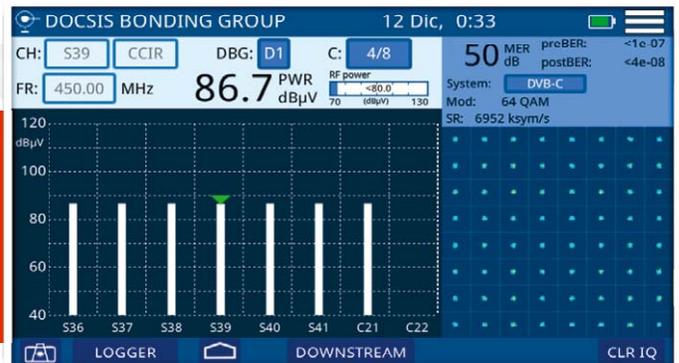


Constellation diagram

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.

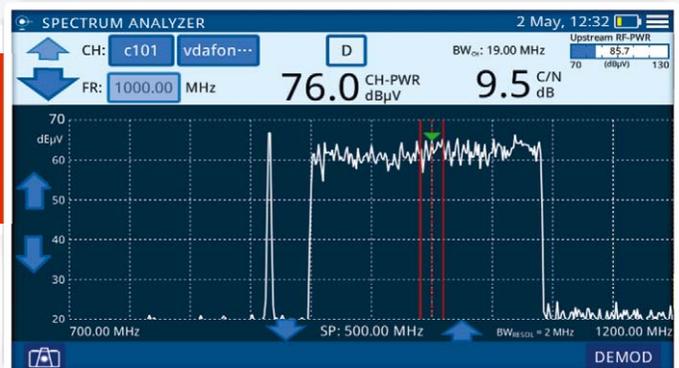
DOCSIS bonding

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.



LOGGER SCAN RF 10 May, 8:58

Name: Logger05 Date: 10.05.2017 Time: 08:56:40 Location: ROOF

CH plan: FABDIST Threshold: 45 dBμV [0,120 dBμV]

RF PWR: 93.1 dBμV

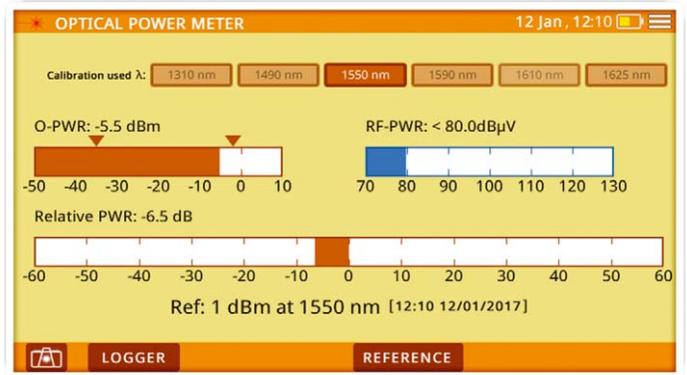
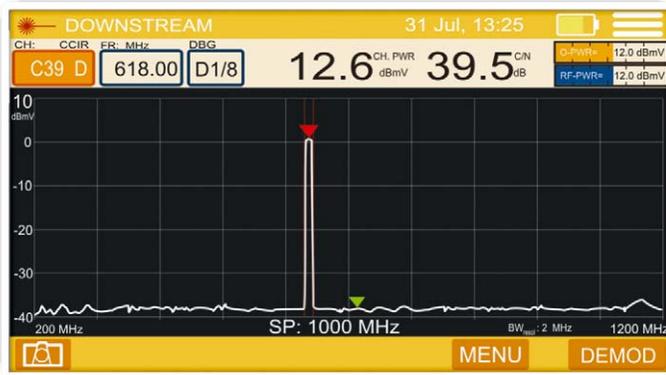
| Channel | Frequency (MHz) | Power (dBμV) | MER (dB) | pre BER | post BER | V/A (dB) | C/N (dB) |
|---------|-----------------|--------------|----------|----------|----------|----------|----------|
| A01 | 184.50 | 78.7 | - | - | - | 223 | 48.9 |
| A01 | 184.50 | 78.7 | - | - | - | 223 | 48.9 |
| A02 | 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 | - | - |

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

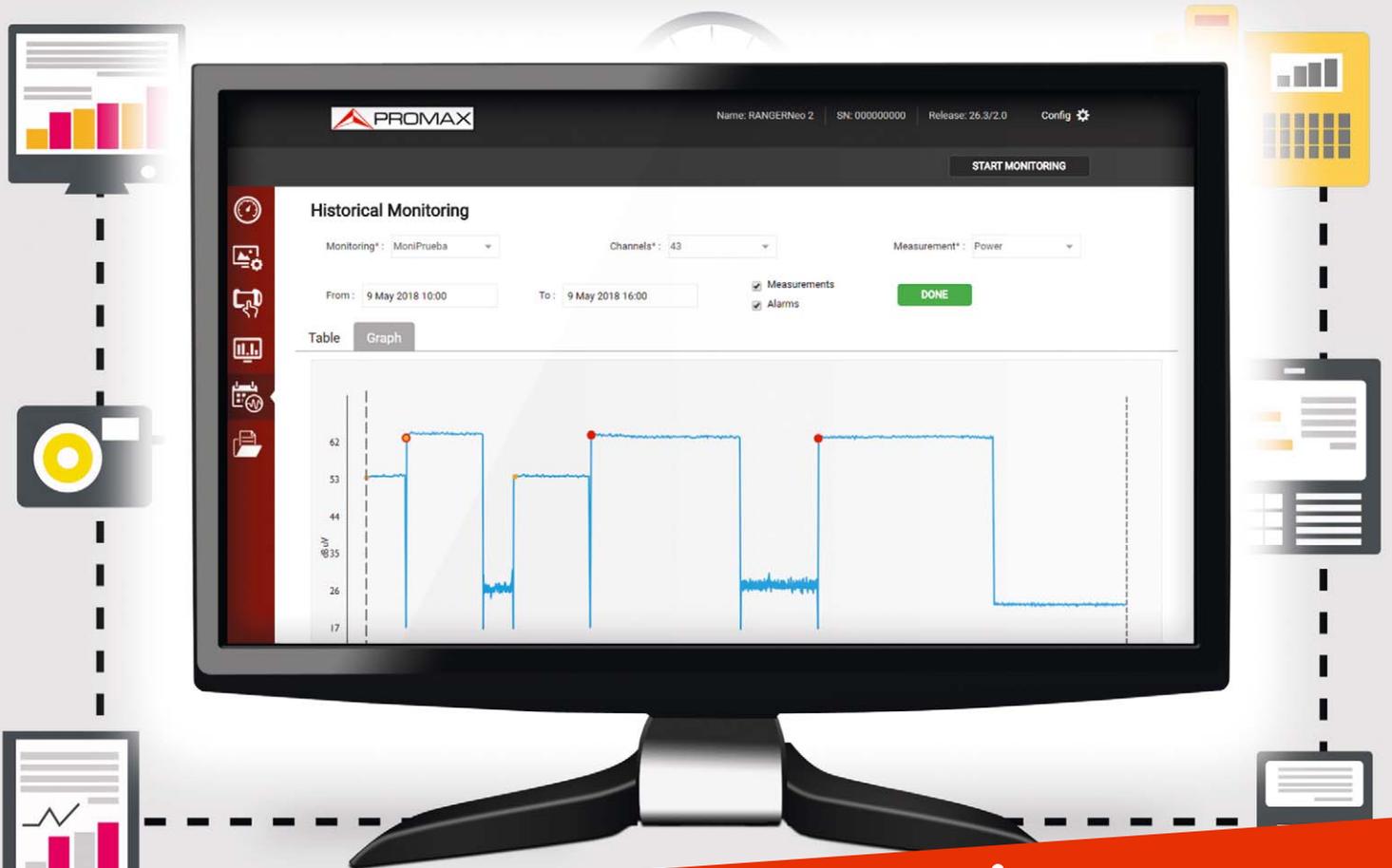
Test signal generator for coaxial cable

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

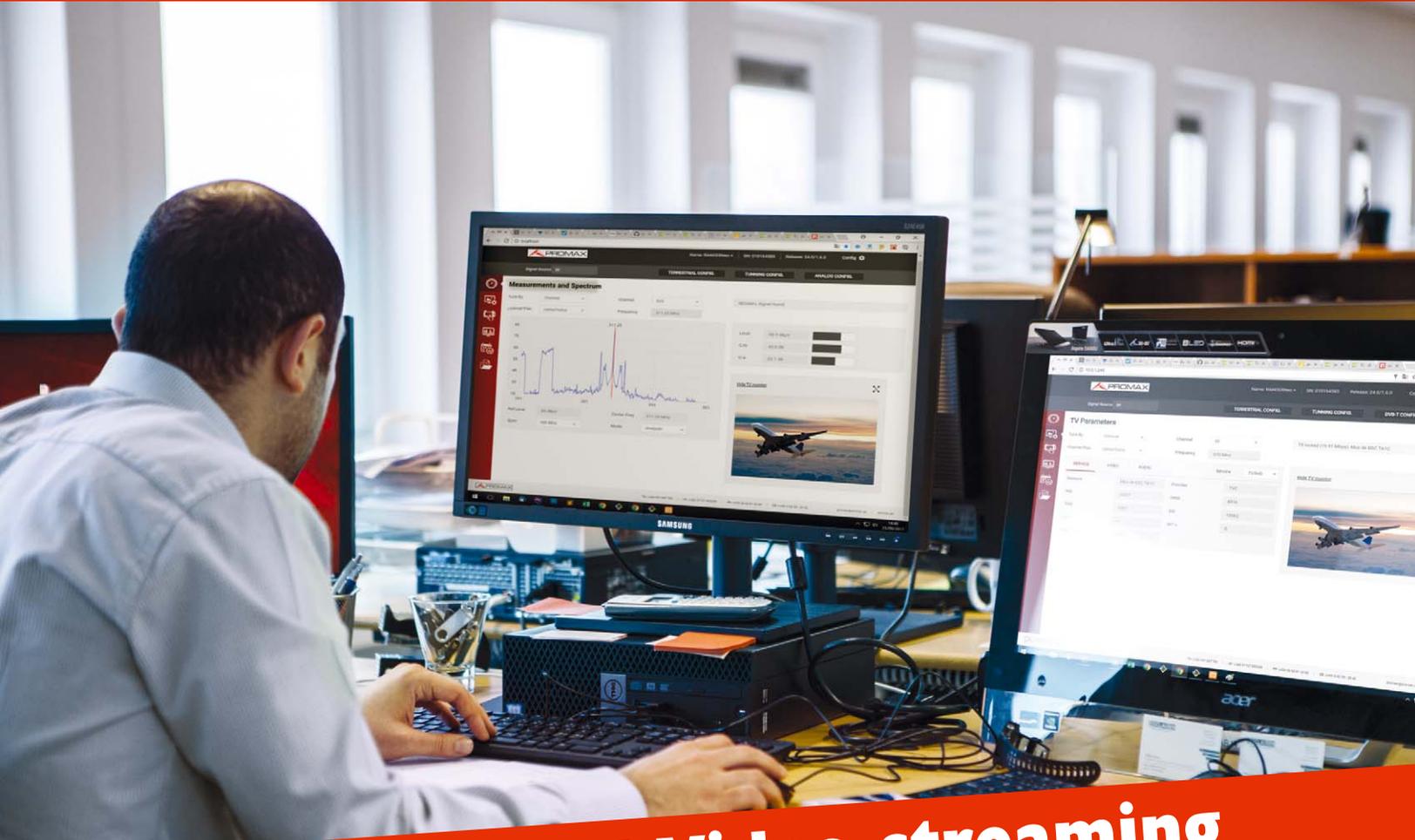
PROWATCH Neo is our response to the need for remote, permanent, 24/7 signal monitoring operations. It is embedded in a 19" 1U rack case and it allows you to do everything you can do with the portable analysers but remotely. It is also possible to connect it to a keyboard and monitor using USB and HDMI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



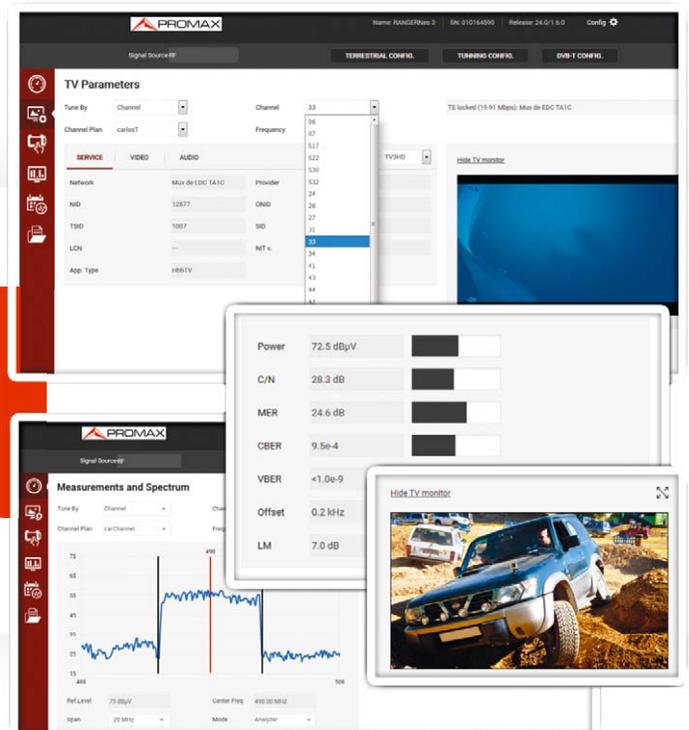
webControl and Video streaming

webControl

The **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. plus a continuous streaming of one of the services belonging to the channel selected.



| SERVICE | VIDEO | AUDIO |
|-----------|-----------------|----------|
| Network | Mux de EDC TATC | Provider |
| NID | 12877 | ONID |
| TSID | 1007 | SD |
| LCN | | NT v |
| App. Type | HBBTV | |

| | |
|--------|-----------|
| Power | 72.5 dBµV |
| C/N | 28.3 dB |
| MER | 24.6 dB |
| CBER | 9.5e-4 |
| VBER | <1.0e-9 |
| Offset | 0.2 kHz |
| LM | 7.0 dB |

PROWATCH Neo

RANGERNeo MONITORING TOOL: REMOTE SIGNAL QUALITY SUPERVISION

Alarms

| Channels | Date & Hour | Description |
|-----------------|--------------------|---------------------|
| 53 | 2017/10/17 8:20:00 | POWER (52) > 50 |
| 53 BASE | 2017/10/18 7:53:00 | PLP (101) Not found |
| 53 BASE 100 | 2017/10/17 8:24:00 | MER (35) < 40 |

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.

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 transferring | Universal RF input 75 Ω HDMI output IP input for remote control Analogue Video/Audio input 2 x USB (Type-A) for data transferring 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 Measurement range Span Resolution bandwidths | From 5 to 1000 MHz (Terrestrial) ; From 250 to 2500 MHz (Satellite) From 10 to 130 dBmV Full / 500 / 200 / 100 / 50 / 20 / 10 MHz 100, 200, 1000 kHz | 2 kHz (Terrestrial), 10, 20, 40, 100, 200, 1000 kHz |
| MEASUREMENT MODE (According to standards) Frequency Margin DVB-T COFDM DVB-T2 Base and Lite COFDM DVB-C QAM DVB-S2 COFDM PAL, SECAM and NTSC analogue TV FM radio DVB-S QPSK DVB-S2 QPSK, 8PSK, 16/32APSK DSS QPSK | From 5 to 1000 MHz (Terrestrial); From 250 to 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, Iterations LDP, Wrong packets Power (45 to 115 dBμV), BER, MER, C/N and Link margin Power (45 to 115 dBμV), CBER, MER, C/N, LBER, BCH ESR, Iterations LDP and Wrong packets M, N, B, G, I, D, K and L Level measurement Power (35 to 115 dBμV), CBER, MER, C/N and Link Margin Power (35 to 115 dBμV), CBER, LBER, MER, C/N, BCH ESR, Wrong packets and Link Margin 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

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 | | |
| Frequency margin | From 5 to 2700 MHz | | |
| Resolution | 10 kHz | | |
| SPAN | From 10 MHz to Full band | | |
| LEVEL MEASUREMENT | From -50 dBm to 60 dBm | | |
| Dynamic range | 50 dB | | |
| On screen measuring range | 0.1 dB | | |
| Resolution | ±2 dB | | |
| Accuracy | 75 Ω | | |
| Input impedance | dBmV, dBµV, dBm | | |
| Units | | | |
| 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 | | | |
| Mode | From 5 to 204 MHz | From 5 to 85 MHz | |
| Modulation | QAM (D3.0) / OFDM 4K (D3.1) | QAM (DOCSIS 3.0) | |
| Carrier level | QPSK, 16/32/64 QAM | QPSK, 16/32/64 QAM | |
| Symbol rate | From 50 to 120 dBµV (1 dB steps) | From 60 to 115 dBµV (1 dB steps) | |
| Resolution | From 160 ksym/s to 5120 ksym/s | From 160 ksym/s to 5120 ksym/s | |
| | 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 CHANNEL 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 | | | |
| Optical power meter | Included | | Optional |
| Wavelength band power range | From 1100 to 1700 nm | | From 1100 to 1700 nm |
| Calibrated wavelengths | From -50 dBm to 4 dBm | | From -50 dBm to 4 dBm |
| Optical to RF converter | 1310, 1490 and 1550 nm | | 1310, 1490 and 1550 nm |
| 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, Voltmeter, 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 | | | |
| Battery operation time | 7.2 V / 6.6 Ah Li-Ion | | 7.2 V / 3 Ah Li-Ion |
| Tensión externa | > 2 h continuous mode | | > 4 h continuous mode |
| | 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 |



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: