TV EXPLORER NG

UNIVERSAL TV ANALYZER

-0 MI2248-

PROMAX

NOTES ABOUT THE MANUAL

Read the user's manual before using the equipment, mainly **SAFETY RULES** paragraph.

The symbol ⚠ on the equipment means "**SEE USER'S MANUAL"**. In this manual may also appear as a Caution or Warning symbol.

WARNING AND CAUTION statements may appear in this manual to avoid injury hazard or damage to this product or other property.

ELECTRONIC MANUAL VERSION

You can access instantly to any chapter by clicking on the title of the chapter in the table of contents.

Click on the arrow ⬅ at the top right page to return to the table of contents.

At Index, click on a page number to access the related content.

Click on the **link** or scan the **QR code** inside de video boxes ▶ in order to play a tutorial video.

In some **video tutorials**, there may be differences between the interface shown in the video and the current equipment interface. We recommend you to follow the instructions in the manual and use the video only as supplementary reference material.

USER'S MANUAL VERSION

Manual Version	Web Publication Date	Firmware Version
F5.0	May 2026	4.1.0

■Please update your equipment to the latest firmware version available.

- Last firmware download: https://www.promax.es/go/tv-explorer-ng-firmware/
- Updating instructions: "Updating the meter" on page 21

WHAT'S NEW on manual F5.0

- New: Monitor TV mode ("Home Menu" on page 15).
- Update: Updating the meter ("Updating the meter" on page 21).
- Improvement: Video/audio display for analog channels ("► Analogue Signal" on page 104).
- Improvement: Loudness measurements (LUFS) added to Audio level ("Audio levels & loudness" on page 49).

NOTE: The details of changes in previous versions of the user manual can be found in the annex "PREVIOUS VERSIONS OF USER'S MANUAL" on page 134

SAFETY RULES

* The safety could not be assured if the instructions for use are not closely followed.

* Use this equipment connected only to systems with their negative of measurement connected to ground potential.

* The AL-103 external DC charger is a Class I equipment, for safety reasons plug it to a supply line with the corresponding ground terminal.

* This equipment can be used in Overvoltage Category I installations and Pollution Degree 2 environments.

* External DC charger can be used in Overvoltage Category II, installation and Pollution Degree 1 environments.

* When using some of the following accessories use only the specified ones to ensure safety:

  - Rechargeable battery
  - External DC charger
  - Car lighter charger cable
  - Power cord

* Observe all specified ratings both of supply and measurement.

* Remember that voltages higher than 70 V DC or 33 V AC rms are dangerous.

* Use this instrument under the specified environmental conditions.

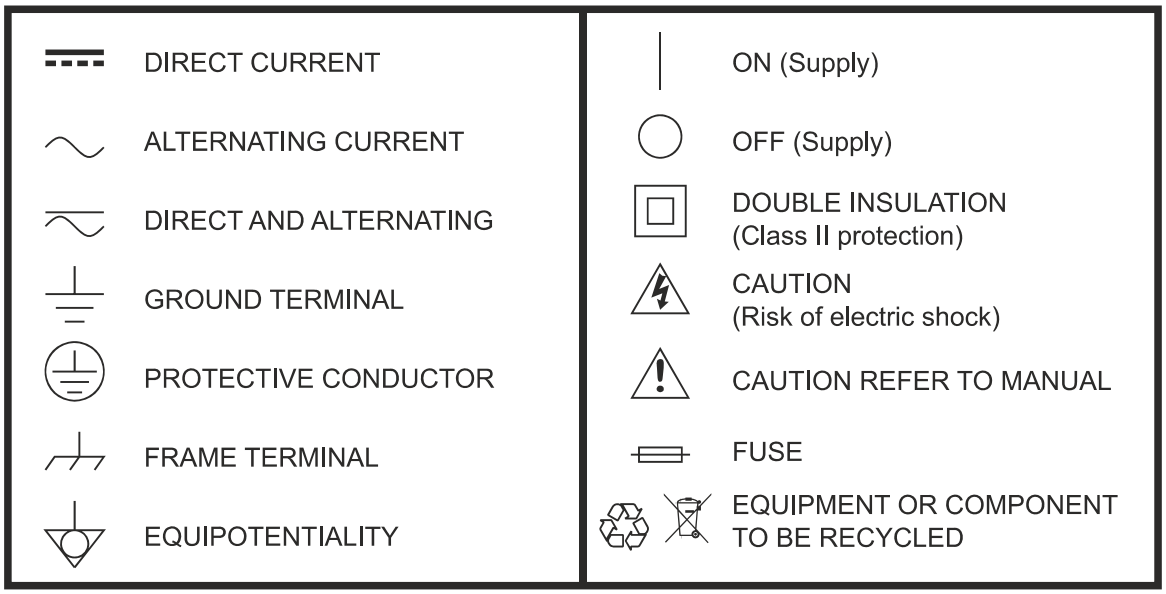
* When using the power adaptor, the negative of measurement is at ground potential.

* Do not obstruct the ventilation system of the instrument.

* Use for the signal inputs/outputs, specially when working with high levels, appropriate low radiation cables.

* Follow the cleaning instructions described in the Maintenance paragraph.

SAFETY SYMBOLS



DESCRIPTIVE EXAMPLES OF OVER-VOLTAGE CATEGORIES

* **Cat I**: Low voltage installations isolated from the mains.

* **Cat II**: Portable domestic installations.

* **Cat III**: Fixed domestic installations.

* **Cat IV**: Industrial installations.

CAUTION: The battery used can present danger of fire or chemical burn if it is severely mistreat. Do not disassembly, cremate or heat the battery above 100 °C under no circumstances.

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1 INTRODUCTION

1.1 TV EXPLORER NG: The Next Generation of Signal Analysis

The **TV EXPLORER NG** represents the natural evolution of the iconic TV EXPLORER, the field strength meter that played a key role in the digitalization of television broadcasting worldwide.

Designed and manufactured by PROMAX, drawing on decades of experience in the sector, this new device is perfectly suited to the present and future of the audiovisual industry, where high definition, hybrid television, and emerging transmission standards set the pace.

The **TV EXPLORER NG** has been conceived as a portable and rugged instrument, built to withstand the real conditions of everyday fieldwork. Its compact design, light weight, and long-lasting battery make it ideal for intensive field use, without compromising on modern connectivity. It features USB, Ethernet, and HDMI ports, remote access, and firmware update capabilities to ensure optimal performance at all times.

Figure 1.

►Redesigned Interface: Intuitive and Customizable

The **TV EXPLORER NG** features a new graphical interface based on dockable panels, allowing users to configure their workspace according to their specific needs. Its high-resolution multitouch screen and powerful multi-core processor ensure a fast, smooth, and modern user experience.

This ease of use does not compromise its analytical power: behind the user-friendly interface lies a high-precision professional instrument, designed for both field and lab work.

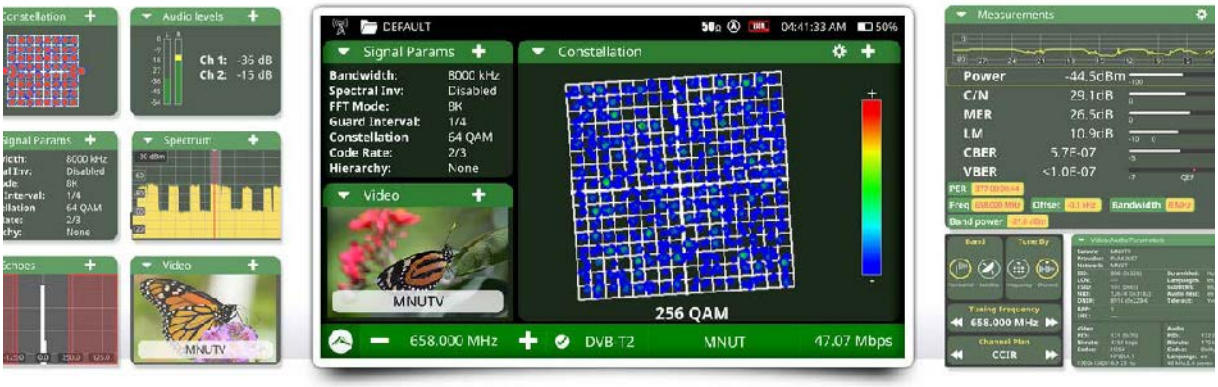


Figure 2.

▶	Main features (01:17s)	SCAN

Video 1.

1.2 Advanced Features

Designed to meet the needs of installers, maintenance technicians, and operators working in demanding environments, the **TV EXPLORER NG** offers a high-level set of analysis and diagnostic tools capable of delivering precise, fast, and real-time measurements, reliably adapting to any type of signal or standard.

- Real-time measurement of all key parameters: frequency, level, C/N, MER, BER, constellation, spectrum, and echo.
- Fast and detailed spectrum analysis with zoom, markers, and hold functions.
- Automatic signal identification with intelligent detection.
- Screen and video captures, subtitle display, service information, EPG, and much more.
- Automatic generation of measurement reports, exportable for documentation or certification.

► Compatible with the Latest Broadcasting Standards

In an ever-evolving digital ecosystem, the **TV EXPLORER NG** has been developed to offer full compatibility with most current digital television standards, whether terrestrial, cable, or satellite:

- DVB-T/T2, DVB-C/C2, DVB-S/S2, with optional support for DVB-S2x
- ISDB-T/Tb, widely used in Latin American and Asian countries
- Support for ATSC 1.0 and ATSC 3.0*
- Support for HbbTV, hybrid television
- Smooth decoding of HEVC H.265 signals, even in UHD 4K HDR 10-bit resolutions, without performance loss

This wide range of compatibility makes the **TV EXPLORER NG** an ideal tool for both traditional and advanced environments, fully prepared for the television of the future.

► International Regulatory Compliance

The **TV EXPLORER NG** is not only technically advanced but also designed to comply with the main technical regulations and national standards in various countries, including:

- ICT-2 (Spain)
- RITEL (Colombia)
- DUCTOS (Chile)

*. Only for **ATSC** version of **TV EXPLORER NG**

This makes it a trusted tool for professional installers, integration companies, network operators, and maintenance technicians who require reliable and up-to-date equipment.

1.3 Ready for the Future

The **TV EXPLORER NG** has been entirely designed and manufactured in the European Union under the guidance of a multidisciplinary team of highly qualified engineers, designers, and technicians committed to technological excellence and operational reliability.

Every stage of development has been meticulously handled—from the initial concept and electronic design to final assembly and functional validation. Component and material selection has followed the strictest quality criteria, with all parts subjected to rigorous quality controls to ensure durability, precision, and stability under any working conditions.

This approach reflects PROMAX commitment to the European industry, embracing a responsible and sustainable innovation model that ensures traceability, close technical support, and complete control over the production process.

► Commitment to Customer Support and Continuous Improvement

PROMAX extensive experience in the telecommunications sector, built over more than half a century, allows us to offer not only a high-end product but also a professional, agile, and personalized after-sales service, tailored to the needs of installers, field technicians, and network operators.

Introducing the TV EXPLORER NG (02:35s) SCAN

Video 2.

In addition, the **TV EXPLORER NG** benefits from a regular software update plan that not only addresses potential issues but also adds new features, performance improvements, and compatibility with future standards. This extends the equipment life-span and ensures its technological relevance in a constantly evolving environment.

2 SETTING UP

2.1 Package Content

Check that your package contains the following elements:

- **TV EXPLORER NG** Universal TV Analyzer.
- External DC charger.
- Mains cord for external DC charger.
- Car cable for external DC charger.
- F - BNC adapter (f/f).
- F - DIN adapter (f/f).
- F - F adapter (f/f).
- WiFi-USB dongle.
- Jack cable (4V) RCA.
- Transport belt.
- Carrying bag.
- Quick reference guide.

NOTE: Keep the original packaging, since it is specially designed to protect the equipment. You may need it in the future to send the analyzer to be calibrated.

2.2 Power

The **TV EXPLORER NG** is powered by a 7.4 V built-in rechargeable LiPo battery of high quality and long operation time. This equipment can operate on battery or connected to the mains using a DC adapter. An adapter is also supplied to use with the power connector car (cigarette lighter).

2.2.1 First Charge

The equipment comes with the battery half charged. Depending on the time elapsed from first charge and environmental conditions may have lost some of the charge. You should check the battery level. It is advisable a first full charge.

2.2.2 Charging the Battery

Connect the DC power adapter to the equipment through the power connector on the left side panel (see figure).

Figure 3.

Then connect the DC power adapter to the mains via the mains cord. Ensure that your mains voltage is compatible with the adapter voltage.

For a fast charging is necessary to switch off the equipment.

If the equipment is ON, the battery charge will be slower, depending on the type of work you are doing. When connecting the equipment to the mains the mains connected symbol appears inside the battery icon.

The charger led indicates the battery status:

- **Red**: Charging.
- **Green**: Charge finished.
- **Blinking:** Battery not detected.
- **Off**: Battery discharging.

When switching on the equipment, the battery voltage is checked. If the tension is too weak to start, the equipment does not start up. In this case please charge the battery immediately.

2.2.3 Charge / Discharge Times

Average charging time with the equipment off (fast charge):

- 6 h 15 min. to achieve a 100% charge.

Battery life:

- In TV Analyzer mode: 4 hours (mode: UHD TV with DVB-T2 demodulation).
- Basic WiFi: 4 hours (2.4 GHz band).

2.2.4 Energy Saving

These options are available in the menu **Settings ->** **Appearance**.

- **Automatic power off**: It allows the user to select the time to power off, which is the time after which the equipment shuts down automatically unless pressing any key. Time options are: off, 1, 5, 10, 15, 30 o 60 minutes.
- **Screen off**: User can select a time after which the TFT screen turns off, but the equipment is still running normally. The equipment can measure (for example, making a datalogger or channel exploration) and the battery will last longer, about 10% more. The screen turns on by pressing any key. Time options are: off, 1, 5, 10, 30 or 60 minutes.

2.2.5 Smart Control Battery

The built-in battery of the equipment is of the "**smart**" type, which means that reports its state of charge. This information can be shown on screen by enabling the **Show battery remaining time** option. It shows the average time available next to the battery icon. In this way the user knows at any time the remaining battery level.

The remaining time charge that appears is calculated according to the work that has been doing. If the external supply is working, the average time would be reduced according to the increase in consumption that occurs.

2.2.6 Usage Tips

The battery is losing storage capacity as you go through its life. Contact your **PROMAX** distributor when necessary to replace the battery.

To extend battery life the user should follow these tips:

- In case of providing a long inactivity period of the equipment it is advisable to make every 3 months a charge / discharge cycle and a subsequent partial charge (40% aprox.).
- It is advisable to keep it in a cool place and away from heat.
- You should avoid keeping the battery for a long period of time at full load or fully discharged.
- There is not necessary to wait to fully discharge before a charge because these batteries have no memory effect.

2.3 Equipment Details

Figure 4. Front view.

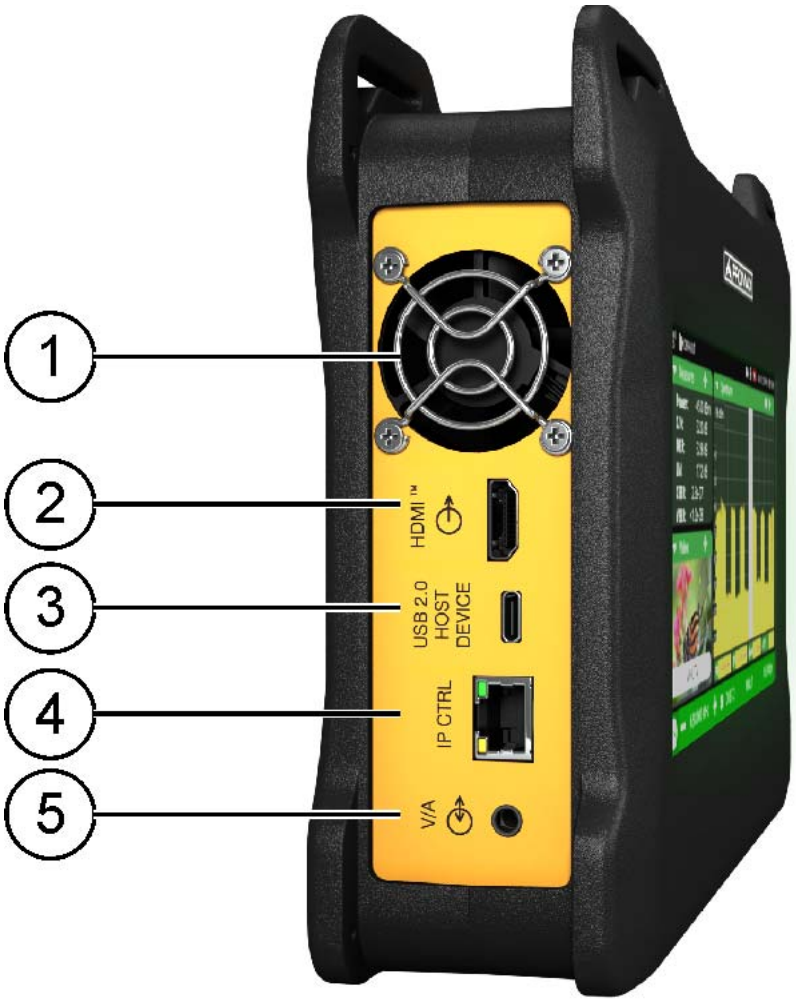


Figure 5. Left Side View.

1 Ventilation outlet.

2 Output with HDMI™ technology (supports HDMI 1.4b with 2.9 Gb/s and up to 3840x2160 @ 30 Hz).

3 USB-C Host/Device connector (selectable).

4 RJ45 connection for remote management.

5 Analogue Video/Audio input/output.

Figure 6. Right Side View.

1 Ventilation outlet.

2 LED indicator for battery charge level.

3 Power input connector.

Figure 7. Top View.

1 On/Off button + status LED indicator. Press and hold for 1 second to power on, or just press to power off.

2 USB 3.0. For WiFi dongle, GPS receiver or USB memory.

3 BNC (f) connector. For inserting a cable with RF signal.

4 FC-APC (f) connector. For inserting a cable with optical signal.

2.4 Switching On / Off

►Switching On:

1 Press the power on/off button located at the top of the device for a few moments. The status LED will light up to indicate that the device is powering on.

2 The boot screen appears and also a progress bar that indicates the system is loading.

3 After the system loads, it shows the same status before power off.

►Switching Off by software (recommended):

1 Press the switching off icon ⏻ at the **Home** screen.

2 Select **Power Off** or **Reboot**.

►Switching Off by button:

1 Press the **on / off** button placed on the top of the equipment.

►Switching Off by software (Energy save):

1 Press the Settings icon  from the **Home** screen.

2 Press the **Appearance** icon  .

3 The **Automatic power off** option allows the user to enable the automatic shutdown option. Select a waiting time (time without pressing any key and the meter not working) after which the equipment turns off automatically.

NOTE: The equipment keeps its last status (mode and screen) which is recovered when power on.

2.5 Reset

How to **RESET**: Hold down the ON/OFF key for 10 seconds until the equipment switches off.

When to **RESET**:

- **When it crashes and does not respond to any key**.
- **When it does not switch on.**
- **When it does not finish the boot process**.
- **When it does not complete the shutdown process**.

2.6 Icons

Icons on screen provide useful information about the equipment:

Icon	Description	Icon	Description
	Terrestrial band.		Satellite band.
	Enabled folder.		Recording.
	Attenuator: Optimum attenuation.		Signal Quality according to threshold: Correct quality.
	Attenuator: Over attenuation.		Signal Quality according to threshold: Quality close to threshold.
	Attenuator: Under attenuation.		Signal Quality according to threshold: Not acceptable quality.
	Battery charging.		External supply: Disabled.
	Battery in use.		Outdoor unit power supply: It shows selected voltage.
	Low battery. It will shut down shortly.		Outdoor unit power supply: It shows selected voltage and 22 kHz signal activated.
	RF Input Impedance: 50 Ohms.		Power supplied by an external source. It only measures the connector voltage.
	RF Input Impedance: 75 Ohms.		GPS enabled.

Icon	Description	Icon	Description
	Calibration warning.		Optical calibration warning.

2.7 Home Menu

To access the **Home** menu from any other screen press the **PROMAX** logo  at the left bottom corner.

From the **Home** menu you can access the work modes as described below.

-  TV Analyzer: Tool to analyze and demodulate terrestrial, satellite, and CATV (for more details refer to "TV ANALYZER" on page 38).
-  WiFi: Tool to analyze the WiFi band (for more details refer to "WIFI " on page 80).
-  TV Monitor: It allows viewing and listening to the video/audio received through the AV input (3.5 mm jack connector).
-  Manual: Access the complete user's manual.
-  Settings: Access the settings menu (for more details refer to "SETTINGS AND PREFERENCES" on page 23).

2.8 Top Menu

To access the **Top menu** from any screen, swipe down from the top of the screen.

From the Top menu, you can access various management options. Some options are only available in certain modes.

The available options are:

- **Workspace**: Management of work folders.
- **Task Planner**: Management of scheduled tasks.
- **USB**: Management of USB connection type.
- **GPS** (option): Management of GPS for the Drive Test.
- **WiFi: Management of WiFi network through the WiFi modem.**
- **HDMI™: Management of HDMI™ technology interface.**
- **Antenna**: Settings for terrestrial & sat antenna / Field strength meter.
- **Supply**: Management of power supply for external devices.
- **Optical power**: Measurement of power in the optical band.
- **Volume**: Management of audio volume.
- **Brightness**: Management of screen brightness.
- **Notifications area**: Latest notifications displayed on screen.

For more details refer to "Top Menu" on page 28.

2.9 Screenshot

The **Screenshot** function captures an image of what appears on the screen. The image is saved in PNG format.

There are 2 ways to capture an image:

- A) Press and hold the PROMAX icon located in the bottom-left corner for one second.
- B) Swipe 3 fingers horizontally from right to left across the screen.

When the capture is done, a virtual keyboard will appear to name the file of the captured image. Pressing **Enter** will save the image to the workspace folder, and a screenshot notification will appear.

NOTE: The PROMAX icon may not appear on all screens; in such cases, you can try the second method.

►How to access the screenshots

1. Access the **Top menu** by swiping down from the top of the screen.
2. Select the **Workspace** option and choose your workspace folder. If you haven't created one, click on **Default**.
3. In the dropdown menu, select the mode (Home, TV Analyzer, WiFi) in which the capture was done.
4. Next, click on the **Screenshots** icon to list the captured images.
5. Tap briefly on an image to display it on the screen.
6. Tap and hold an image to view the options menu, which allows you to rename, remove, preview or export to a USB.

2.10 Use Case: Terrestrial RF Signal Tuning

The next section is a general explanation of how to tune a terrestrial RF signal, step by step. For more details refer to "TV ANALYZER" on page 38.

1. Connect the RF input signal cable to the RF input connector.
2. From the **Home** Menu press on **TV Analyzer** .
3. On the main window, press ▼ and select the **Spectrum** tool. On the small windows, you can select other tools, like the **Video** tool to watch the demodulated signal or the **Measurements** tool to check power and MER.
4. Swipe right from the left side or press on the bottom bar to display the tuning menu.
5. Select the **terrestrial band** .
6. Select **type of tuning**: Tune by frequency or Tune by channel .
   - **Tune by frequency**: Select a frequency to be tuned.
   - **Tune by channel**: User selects a channel to be tuned. Previously the user have to select a channel plan on the **Channel Plan** option. A channel plan contains a list of channels with settings for each channel (frequency, type of signal, bandwidth, etc.). When tuning by channel it will apply the settings obtained from the channel plan in first place.
7. On **Signal Type** option select **Mode**:
   - **Auto mode**: It identifies and tries to demodulate the signal automatically using the StealthID function (for more details refer to "►StealthID" on page 27).
   - **Manual mode**: The user must enter the signal type and the parameters to identify and demodulate it.
8. Select **Span** (recommended value for terrestrial: 50 MHz).
9. Adjust the **reference level**.
10. Select channel or frequency to be tuned. You can select your frequency or channel by using the tuning menu or by dragging left or right on the screen and then tapping on the signal.
11. When on the signal, the tuning bar turns green if the signal is locked. If not locked, the tuning bar does not change and maintains the same colour.
12. If locked, it tries to demodulate it. At the video tool will show the image and at signal parameters tool will show all related parameters.

2.11 Use Case: Satellite RF Signal Tuning

The next section is a general explanation of how to tune a satellite RF signal, step by step. For more details refer to "TV ANALYZER" on page 38.

1 Connect the RF input signal cable to the RF input connector.

2 From the **Home** menu press on the **TV Analyzer** .

3 On the main panel, press ▼ and select the **Spectrum** tool on the main panel. On the small panels, you can select another tools, like the **Signal Parameters** tool or the **Measurements** tool to check power and MER.

4 Swipe right from the left side or press on the status bar to display the tuning menu.

5 Select the **satellite band** .

6 Select **type of tuning**: Tune by frequency or Tune by channel .

- **Tune by frequency**: The user selects a frequency to tune to (downlink or LNB). They must also select the signal tuning parameters: polarization (vertical, horizontal) and band (low, high).
- **Tune by channel**: The user selects a channel to be tuned. Previously the user have to select a channel plan on the **Channel Plan** option. A channel plan contains a list of channels with settings for each channel to be tuned (supply voltage, polarization and satellite band). When tuning a channel it will apply these settings in first place.

7 On **Signal Type** option select **Mode**:

- **Auto mode**: It identifies and tries to demodulate the signal automatically using the StealthID function (for more details refer to "►StealthID" on page 27).
- **Manual mode**: The user must enter the signal type and the parameters to identify and demodulate it.

8 Select **Span** (recommended value for satellite: 100 MHz).

9 Adjust the **reference level**.

10 Select channel or frequency to be tuned. You can select your frequency or channel by using the tuning menu or by dragging left or right on the screen and then tapping on the signal. In the case of frequency tuning, the user can select either the Downlink frequency or the LNB tuning frequency.

11 When the cursor is on the signal, the bottom tool bar will turn green and will show a check sign if the signal is locked. If not locked, the bottom bar does not change its colour and the check sign is not shown.

12 If locked, it tries to demodulate it. On **video** tool shows the image and on **signal parameters** shows all related parameters.

2.12 Channel Plan Editor

A channel plan is a structured allocation of frequencies within a specific band of the radio spectrum. It consists of a list of channels with predefined settings for each one (frequency, signal type, bandwidth, etc.).

The device can tune to a signal either by frequency or by channel. When tuning by channel, the settings from the channel plan will be applied first.

The device comes preloaded with the most common channel plans (CCIR, OIRT, STDL, FCC...) and includes options to load additional ones (for more details, refer to "WORKSPACES" on page 87). If none of the predefined plans meet the user needs, a new one can be created or existing ones can be edited.

There are different ways to create and edit a channel plan from an existing one:

- Using the advanced tool "Channel exploration" (for more details refer to "Channel Exploration" on page 70).
- Download and edit the channel plan file from a computer. This method is described below.

►How to edit a channel plan from a computer

1 Access the **Top menu** by swiping down from the top of the screen.

2 Select the **Workspace** option and then choose the workspace folder. If you have not created any workspace folder yet, click on **Default**.

3 In the dropdown menu, select the **TV Analyzer** mode.

4 Tap on the **Channel plans** icon to list all the channel plans.

5 Connect a USB memory to the USB port.

6 Press on the channel plan you want to edit until the options menu appears. Select the **Export to USB** option to copy the channel plan to the USB memory.

7 Safely disconnect the USB memory using the option to unmount the USB.

8 Now you can connect the USB memory with the channel plan to a computer to edit the file containing the channel plan. Use an XML editor such as XML Notepad (https://microsoft.github.io/XmlNotepad/).

9 Once edited, save the file in the root of the USB memory and connect it again to the USB port of the meter.

10 Access the **Top** menu and tap on **Workspace**. In the side menu that appears, select **USB**. The edited file of the channel plan will appear.

11 Tap on the channel plan until the options menu appears. Select the **Import to workspace** option to copy the channel plan to your workspace folder.

12 The edited channel plan is now available for use in the TV analyzer.

NOTE: Remember to follow the steps described in "Data Export to USB" on page 90 and disconnect the USB drive correctly to avoid data loss or damage to the device.

2.13 Updating the meter

In order to update your **TV EXPLORER NG** follow these steps:

1 Download the firmware from the TV EXPLORER NG datasheet at the PROMAX website in order to obtain the latest version of the update file.

2 The downloaded file has the extension **UDPATE**. Copy the file to the root of a USB memory.

3 Restart the **TV EXPLORER NG** and connect it to the mains to avoid draining the battery during the update process.

4 Go to the **Settings** menu.

5 Press **Update** to enter the update screen.

6 The update screen shows in the field **Current software version** the current release installed on the equipment.

7 At this time (not before), insert the USB drive into the USB 3.0 port or the USB Type-C port. The meter will detect the USB and analyze the file it contains.

8 After few moments (it can change according to the file size) if the update file is correct, the **Update** button is enabled and shows the release number.

9 Press the **Update** button and confirm to start the update process. A bar and a percentage indicates the update progress. Wait a few minutes.

10 Once finished, a pop-up window will appear informing that the software is up to date. **Disconnect the USB memory** and press OK. The meter will restart.

11 During the boot process, it shows the message "booting new update" in the upper left corner, indicating that the update has been successfully installed.

If, on the other hand, it displays the message "rolling back" it will indicate that there has been an issue during the update (corrupt file, damaged USB drive, etc.), and the previous version will be restored.

12 At the end of the update process, check that the new release has been installed correctly. Verify that the **Release** field (in **Settings -> Equipment Info**) reflects the newly installed software version.

3 SETTINGS AND PREFERENCES

3.1 Settings Menu

Press **Settings** on the **Home** menu to access the settings menu.

Settings are classified according to these categories:

- **General**: Equipment information and customizing options.
- **TV Analyzer**: TV analyzer settings.

3.1.1 General Settings

►Equipment Information

- Provider: Provider's name.
- Name: Equipment's name.
- Serial number: Unique identification number for this equipment.
- Release: Version of software installed on the equipment.
- Free memory: Free size of the flash memory installed on the equipment / Size of the flash memory installed for data (dataloggers, screenshots, service recording and so on...).
- Company: Name of the company which owns the equipment (set by user; protected by PIN code).
- User name: Name of the equipment's user (set by user; protected by PIN code).
- Change PIN: It allows user to change the pin code. The default PIN is 1234.
- Product Id: Identifier name of the equipment.
- Licenses: Information about the software licenses used.
- Generate report: It generates a report of the current status of the meter and it is exported to a pendrive that must be connected to the USB port.

►Appearance

- Automatic power off: It allows the user to select the time to power off,

which is the time after which the equipment shuts down automatically unless an user press any key. Time options are: off, 1, 5, 10, 30 o 60 minutes.

- Language: Language used on menus, messages and screens. Available languages are: English, Spanish, German, French, Polish, Portuguese and Catalan. Once the new language is selected, the equipment changes automatically to the new language.
- Screen off: User can select a time after which the TFT screen turns off, but the equipment is still running normally. The screen turns on by pressing any key. Time options are: off, 1, 5, 10, 30 o 60 minutes.
- Theme: It is the colour palette used on screen (dark or light).
- Accent color: It allows the user to select the secondary colour used to highlight certain interface elements such as bars, menus, etc. Available options: dark red, deep blue, and explorer green.
- Colorized icons: It enables colouring of the icons according to the selected Accent color.
- Show battery remaining time: It hides or shows the remaining battery time. Remaining battery time is displayed next to the battery level icon.
- Show hidden menu indicators: It activates the display of bars on the sides, indicating the presence of hidden menus. You need to drag from the bar toward the centre of the screen to display the menu.

►Date & Time 

- Time Format: It allows the user to change the time format (12 or 24).
- Continent/Ocean: It allows the user to select continent where the meter is in order to determine if it is necessary to apply DST (Daylight Saving Time).
- City/Region: It allows the user to select the capital of the country where the meter is.
- Network time: It allows you to enable or disable date and time synchronization with an internet time server.

►Network 

Network parameters identify the equipment into a data network. It is necessary to connect to a PC via ethernet.

- MAC: Physical address of the equipment. It is unique and cannot be edited.

- DHCP: Enable this option to get the proper IP address when the unit is first connected to a network. That feature contributes to make things easier to installers when debugging network access.
- IP: IP Address of the equipment into the local network.
- IP NetMask: Subnet mask of the equipment (by default 255.255.255.0).
- Gateway: IP address of the router into the local network (by default 10.8.8.1).
- DNS 1: Option 1 of DNS (by default 8.8.8.8). DNS stands for Domain Name System and translates domain names into IP addresses so that computers can communicate with each other over the Internet.
- DNS 2: Select DNS2 (by default 8.8.4.4).

►Options 

It shows all the options that have been installed and also allows installing new options. To install a new option press on "+" and enter the option code. Available options are:

- DAB/DAB+ option. It is made up of:
  - DAB Advanced.
  - DAB TII.
- Advanced FM option. It is made up of:
  - FM Advanced.
  - FM Histogram.
  - FM MPX Spectrum.
- Optical fibre option.

For more details about the **DAB/DAB+** option refer to "DAB/DAB+ OPTION" on page 114.

For more details about the **FM Advanced** option refer to "FM ADVANCED OPTION" on page 121.

For more details about the **Optical** option refer to "OPTICAL OPTION" on page 113.

If you are interested in any of these options please contact **PROMAX** (https://www.promaxelectronics.com/ing/contact-promax/).

►Wizard 

- Show wizard next at next start: It allows enabling or disabling the assistant that helps the user to set the meter. When enabled, the device will turn off, and when turned back on, it will display the assistant.
- Input name: User's name.
- Input e-mail: User's e-mail.
- Input phone number: User's phone.
- Subscription status: It allows the user to subscribe or unsubscribe from the updating service to keep the meter updated to the last software version available.

►Software Update 

- Last update version: It shows information about the current update installed on the meter.
- Update: It shows if there is an update available to install. Prior to do this, a memory device with the update file must be connected to the USB port.

For more details about the updating process refer to "Updating the meter" on page 21.

3.1.2 TV Analyzer Settings

►Measurements 

- Terrestrial Units: It allows the user to select the terrestrial measurement units for the signal level. Available options are: dBm dBmV and dBµV.
- Satellite Units: It allows the user to select the satellite measurement units for the signal level. Available options are: dBm, dBmV and dBµV.
- Attenuators linked to reference level: If enabled, when the user changes the reference level, the attenuation value is adjusted according to the selected reference level, and vice versa. If disabled, both values are independent, allowing the user to change the reference level without affecting the attenuation value, and vice versa.
- Power offset: It adds this value to the power/level measurement. When this value is different to 0 dB, next to power/level measurement an asterisk (*) is shown as a warning that offset is been applied.

- Terrestrial Downlink: If this option is enabled it allows you to set a local oscillator in terrestrial band and displays intermediate and downlink (DL) frequencies calculated from local oscillator. For example, it allows you to work with terrestrial radio-links or frequency converters.
- Terrestrial downlink frequency: It allows you to enter an offset frequency for the terrestrial band when terrestrial downlink is enabled.

►StealthID

Enables the user to select the signal types the meter will use during automatic signal identification in the terrestrial band.

To enable the **StealthID** automatic detection tool, the user must select **Auto** mode under the **Signal Type** option within the **Tuning** menu of the **TV Analyzer** mode.

When **StealthID** mode is activated in the terrestrial band, all selected signals are included in the automatic detection process.

When **StealthID** mode is activated in the satellite band, all satellite signals are included by default in the automatic detection process.

When trying to tune a signal with the **StealthID** tool active, a magnifying glass icon appears in the status bar next to the signal type currently being identified. If the signal is not identified, the tool moves to the next signal type, repeating this process cyclically with all remaining signal types.

►Exploration configuration

Allows the user to select the levels and attempts to identify a channel during channel exploration (for more details refer to "Channel Exploration" on page 70).

- Minimum level for terrestrial signal (analog TV): It sets the minimum level for a terrestrial analogue signal to be identified when channel exploring.
- Minimum power for terrestrial signal (digital TV and DAB): It sets the minimum reference level for a terrestrial digital signal to be identified when channel exploring.
- Minimum level for FM signal: It sets the minimum power for a FM signal to be identified when channel exploring or datalogging.

- Number of attempts to lock terrestrial signal: This is the number of times the meter attempts to lock the signal of a terrestrial channel before moving on to the next channel.
- Number of attempts to lock satellite signal: This is the number of times the meter attempts to lock the signal of a satellite channel before moving on to the next channel.

►Datalogger configuration 

Allows the user to select the attempts and time when performing datalogging.

- Number of attempts to lock terrestrial signal: This is the number of times the meter attempts to lock the signal of a terrestrial channel before moving on to the next channel.
- Number of attempts to lock satellite signal: This is the number of times the meter attempts to lock the signal of a satellite channel before moving on to the next channel.
- Maximum time to make a terrestrial measurement (s): This is the maximum time the meter has to perform the measurement of a terrestrial signal.
- Maximum time to make a satellite measurement (s): This is the maximum time the meter has to perform the measurement of a satellite signal.
- Maximum time to make a FM measurement (s): This is the maximum time the meter has to perform the measurement of a FM signal.
- Maximum time to make an Analog / Generic measurement (s): This is the maximum time the meter has to perform the measurement of an analog / generic signal.
- Use Link Margin to optimize acquisition time: If this option is enabled, it uses the Link Margin measurement to improve the measurement time.

3.2 Top Menu

To access the **Top menu** from any screen, swipe down from the top of the screen.

From the **Top menu**, you can access various management options. Some options are only available in certain modes.

- Workspace
- Task planner
- USB

- GPS
- WiFi
- HDMI
- Optical power
- Antenna
- Supply
- Volumen
- Brightness
- Notifications

The options are described below.

3.2.1 Top Menu Options

►Workspace Settings 

It allows you to manage the workspace folders where data and resources are stored.

For more information refer to "WORKSPACES" on page 87.

►Task Planner 

It allows scheduling certain tasks to run at a specific date and time. It is currently available for screenshots.

Selecting this option opens a window with the available scheduled tasks. Pressing **Add Task** opens a window that allows scheduling a task with the following settings:

- Type: Select the type of task to schedule.
- Run every (min): If the task is repetitive, select the interval between tasks.
- Start date: Start date and time of the task.
- Expiration date: End date and time of the task.

When a task is scheduled, a calendar icon appears in the top information bar, indicating that there are pending tasks to be executed.

►USB Settings 

It allows managing the devices connected to the **USB 3.0** port and the **USB 2.0 Type-C** port.

The USB 2.0 Type-C port supports two types of connections: **host or slave**. The appropriate option must be selected based on the connected device and its interaction with the meter.

It also allows safely unmounting the memory connected to the USB 3.0 port by pressing SDA in order to prevent damage to the memory and its data.

►GPS Settings 

It allows managing the GPS connected to the USB 3.0 port or the USB-C port.

If the antenna is connected to the meter, it displays a screen showing the detected satellites, status (synchronized or not), coordinates, and other data.

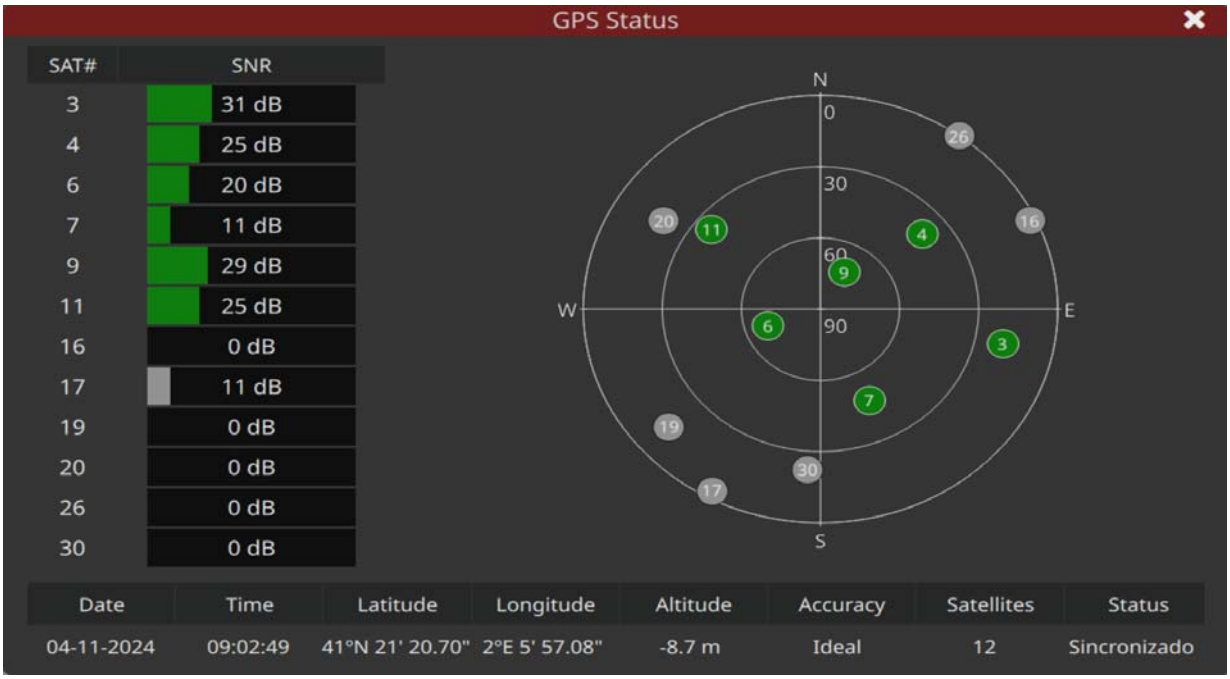


Figure 8.

►WiFi Settings

It manages the WiFi connection through the USB-WiFi adapter connected to the USB port.

1. Connect the USB-WiFi dongle (provided with the device) to the USB connector located at the top of the device. The dongle detects available WiFi networks.

2. Access the **Top menu** by swiping down from the top of any screen and tapping on the WiFi option to open the WiFi settings window with access parameters.

3. The WiFi configuration window displays the WiFi networks detected by the USB-WiFi dongle. It also allows enabling/disabling the DHCP protocol, which automatically assigns an IP to the device. If not using this protocol, the IP, mask, and gateway must be entered manually.

►HDMI Settings

It allows you to view the resolution and other details of the interface with HDMI™ technology.

► Supply Settings

It allows you to enable or disable external power to supply voltage to external devices (Terrestrial: 5, 12 or 24 V; Satellite: 5, 13, 13V+22 kHz, 15, 18, 18 + 22 kHz). If the **External** Voltage option is selected, it will measure the voltage present in the connector but will not apply any voltage.

A window next to the option displays the voltage and current measured at the LNB.

►Volume Settings

It allows you to increase or decrease the audio volume using a sliding bar.

Clicking on the icon on the left side of the slider mutes the audio output. Clicking on the icon on the right restores the volume to the level before it was muted.

►Brightness Settings

It allows you to increase or decrease the screen brightness using a sliding bar.

Clicking on the icon to the left of the slider lowers the brightness to the minimum, while clicking on the icon to the right increases the brightness to the maximum.

►Notification Area

It allows you to view the most recent notifications that have appeared on the screen.

►Antenna Settings  (only for TV Analyzer mode)

■Settings for Terrestrial/Satellite Antenna:

- **Impedance correction**: Allows configuring the impedance correction on the RF input (BNC connector) of the device. The input is designed to present 75 Ω. If the input is 50 Ω, a 50/75 Ω adapter must be connected to the device input, and then the 50 Ω option must be selected. When 50 Ω is selected, the software applies a correction for the impedance adapter.
- **Field Strength**: It allows the equipment to operate as a field strength meter using the measurements provided by the antenna connected to the RF input. When enabled, it displays the field strength value based on the following calculation:

Level + K factor + Cable loss = Field Strength measurement (dBµV/m)

For the measurement to be accurate, the antenna correction factor (K factor) and the cable loss values must be entered; these will be applied during the field strength measurement. The K factor can be entered in **Manual** mode or via a previously loaded **XML** file (more information in the next section). If the **Manual** option is selected, the following data must be entered:

-**K factor**: Antenna correction factor for the measurement frequency.
-**Cable loss (dB)**: Estimated loss of the cable connecting the antenna to the equipment.

■Settings for Satellite Antenna:

- **Band**: Allows selecting between the KuKa band and the C band.
- **Low oscillator (MHz)**: Defines the local oscillator frequency of the LNB for the low band. If, for a specific channel plan, the selected oscillator values are not suitable, the system will display a warning message.
- **High oscillator (MHz)**: Defines the local oscillator frequency of the LNB for the high band. If, for a specific channel plan, the selected oscillator values are not suitable, the system will display a warning message.
- **DiSEqC commands**: Allows enabling or disabling DiSEqC commands. DiSEqC (from Digital Satellite Equipment Control) is a communication protocol between the satellite receiver and the satellite installation accessories. DiSEqC commands are individual low-level instructions. Once enabled, they can be accessed in the tuning menu.
- **DiSEqC programs**: Allows enabling or disabling DiSEqC programs. DiSEqC programs are sequences of individual commands predefined by the user that automate antenna-related actions. The DiSEqC programs must be previously loaded into the device before they can be activated. Once enabled, they can be accessed in the tuning menu.
- **SCR/EN50494 (SCD)**: Allows enabling or disabling the SCR/EN50494 function to control devices in a satellite TV installation compatible with this

technology (more information in the following section "SCR/EN50494 (SatCR/SCD)" on page 35.

- **dCSS/EN50607 (SCD2)**: Allows enabling or disabling the dCSS/EN50607 function to control devices in a satellite TV installation compatible with this technology (more information in the following section "dCSS/EN50607 (JESS/SCD2)" on page 36.

3.2.2 Creation of an Antenna file to measure Field Strength

1. Access the **Top menu** by swiping down from the top of the screen.
2. Select the **Workspace** option and then choose the workspace folder. If you have not created any workspace folder yet, click on **Default**.
3. In the dropdown menu, select the **TV Analyzer** mode.
4. Tap on the **Tools** icon to list all the antenna files.
5. Connect a USB memory to the USB port.
6. Press on the antenna file (XML) you want to edit until the options menu appears. Select the **Export to USB** option to copy to the USB memory.
7. Safely disconnect the USB memory using the option to unmount the USB.
8. Now you can connect the USB memory to a computer to edit the file. Use an XML editor such as XML Notepad (https://microsoft.github.io/XmlNotepad/).
9. The value of the **FREQUENCY** field must be edited to set the frequency, and the **AF** field to set the correction factor. The remaining fields, such as **MODEL**, **DESCRIPTION**, **IMPEDANCE**, or **HEIGHT**, can be modified for informational purposes but will not be used in the field strength calculation.
10. Once edited, save the file with a new name in the root of the USB memory and connect it again to the USB port of the meter.
11. Access the **Top** menu and tap on **Workspace**. In the side menu that appears, select **USB**. The edited file will appear.
12. Tap on the channel plan until the options menu appears. Select the **Import to workspace** option to copy the file to your workspace folder.
13. The edited file is now available for use in the Field Strength dropdown menu.

NOTE: Remember to follow the steps described in "Data Export to USB" on page 90 and disconnect the USB drive correctly to avoid data loss or damage to the device.

3.2.3 SCR/EN50494 (SatCR/SCD)

Using the SCR/EN50494 function (international standard also known as SatCR or SCD), it is possible to control devices in a satellite TV installation that are compatible with this standard, which allows multiple downlink frequencies (slots) to be carried over a single cable. In this way, each user, using a slot, can tune and decode any signal present on the satellite.

1. Connect the RF cable to the RF connector input.
2. From the **Home** menu**,** tap on the icon **TV Analyzer** to access the TV analizer mode.
3. To display the **Tuning** settings, swipe to the right from the left side of the screen or tap on any field related to tuning (frequency, span, etc.), and in the **Band** option select the satellite frequency band.
4. Select polarization (horizontal/vertical) and satellite band (high/low).
5. To access the **Top menu** from any screen, swipe down from the top of the screen.
6. If necessary, tap on **Supply** LNB and select the supply voltage for the LNB.
7. Tap on the **Antenna** option .
8. On the option **SCR/EN50494**, select **On** to enable it.
9. After activation, a gear icon appears next to the **SCR/EN50494** option. Pressing the icon will open a window that allows access to the configuration parameters.

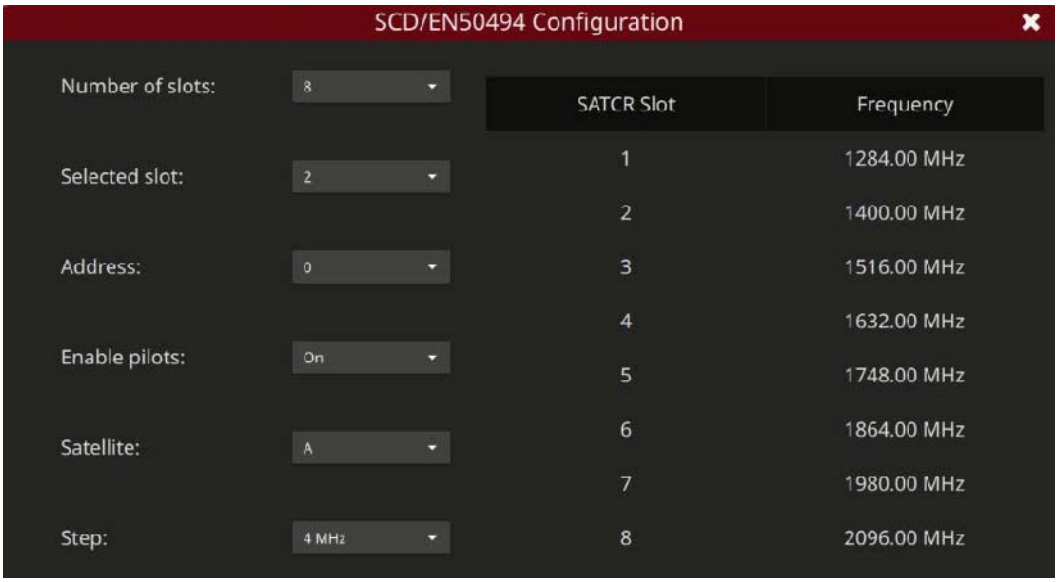


Figure 9.

The configuration window shows the options that the user can modify:

- Number of slots (2, 4, 8): For each type of slot number unit there is a list of independent frequencies to select. The user may have separate frequencies for 2, 4 or 8 slots units and these values are not lost when switching from one type to another.
- Selected slot (1, 2).
- Address (0, 2, 3).
- Enable pilots (on, off): When activating, the device located in the headend emits a pilot signal with constant level for each downlink frequency to identify available channels.
- Satellite (A, B).
- Step (1 - 8 MHz).

10 Once SCR/EN50494 is set, the user can select the slot through the **Slots SCD** option in the **Tuning Settings**.

11 While **SCR/EN50494** is enabled, the **SatCR** icon will appear in the information bar

3.2.4 dCSS/EN50607 (JESS/SCD2)

Through the SCD2/EN50607 (internation standard, also known as JESS) function is possible to control the devices of a TV satellite installation that are compatible with this standard. This technology has two main functionalities: one for configuring headends, and another for configuring sockets. This technology requires bidirectional DiSEqC capabilities.

Thanks to its bidirectional DiSEqC capabilities, the meter can automatically read the configuration from any SCD2/EN50607 compatible unit connected to it. In case that no compatible device is detected, the meter allows the user to make a blind configuration of the unit without any confirmation other than spectrum reference.

1 Connect the RF cable to the RF connector input.

2 From the **Home** menu**,** tap on the icon **TV Analyzer**  to access the TV analizer mode.

3 To display the **Tuning** settings, swipe to the right from the left side of the screen or tap on any field related to tuning (frequency, span, etc.), and in the **Band** option select the satellite frequency band.

4 Select polarization (horizontal/vertical) and satellite band (high/low).

5 To access the **Top menu** from any screen, swipe down from the top of the screen.

6 If necessary, tap on **Supply** LNB and select the supply voltage for the LNB.

7 Tap on the **Antenna** option .

8 On the option **dCSS/EN50607**, select **On** to enable it.

9 After activation, a gear icon appears next to the **SCR/EN50494** option. Pressing the icon will open a window that allows access to the configuration parameters.

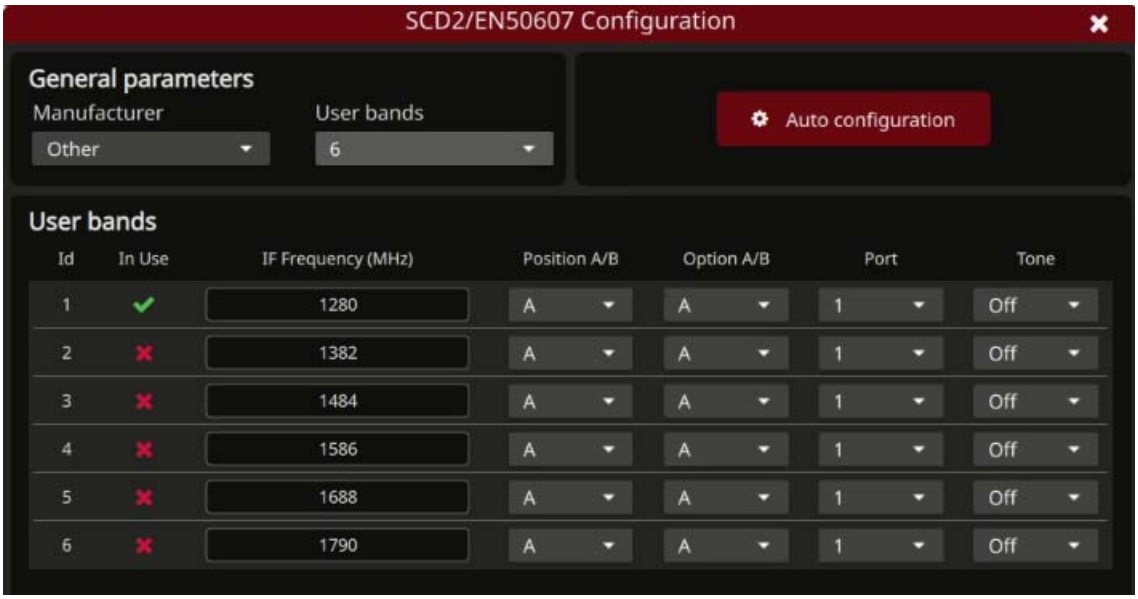


Figure 10.

10 The user must select the number of user bands (UB) and the LNB manufacturer. Available manufacturers include Jultec, Sky UK, Sky Italy BW, Inverto, or others. Depending on the manufacturer, the configuration parameters may vary.

11 By tapping on the corresponding field, the parameter values for each user band can be modified. These include frequency, A/B position, A/B option, port, and tone.

12 The **Auto Configuration** option connects to the LNB and performs an automatic setup.

13 Once dCSS/EN50607 is set, the user band (UB) can be selected via the **User Band** option in the **TV Analyzer Tuning Settings**.

14 While dCSS/EN50607 is enabled, the **dCSS** icon will appear in the information bar.

4 TV ANALYZER

4.1 Introduction

The **TV Analyzer** mode allows you to analyze RF signals: terrestrial, satellite, CATV or FM. It can demodulate and display services for terrestrial/CATV from 45 to 1000 MHz and satellite from 250 to 3000 MHz.

	TV Analyzer Introduction (02:58s)	SCAN

Video 3.

To enter the **TV Analyzer** mode, tap the icon  from the **Home** screen.

The TV Analyzer screen is divided into 3 windows:

- main window
- left top window
- left bottom window

Each one of these windows can show a tool selected by the user. Some utilities are available only for certain types of signals.

Press on the triangle ▼ on any window to display the tools menu. Select one tool to be shown on the window.

There are also a menu with advanced tools that the user can deploy by swiping from the right side of the screen to the left.

4.2 TV Analyzer Screen

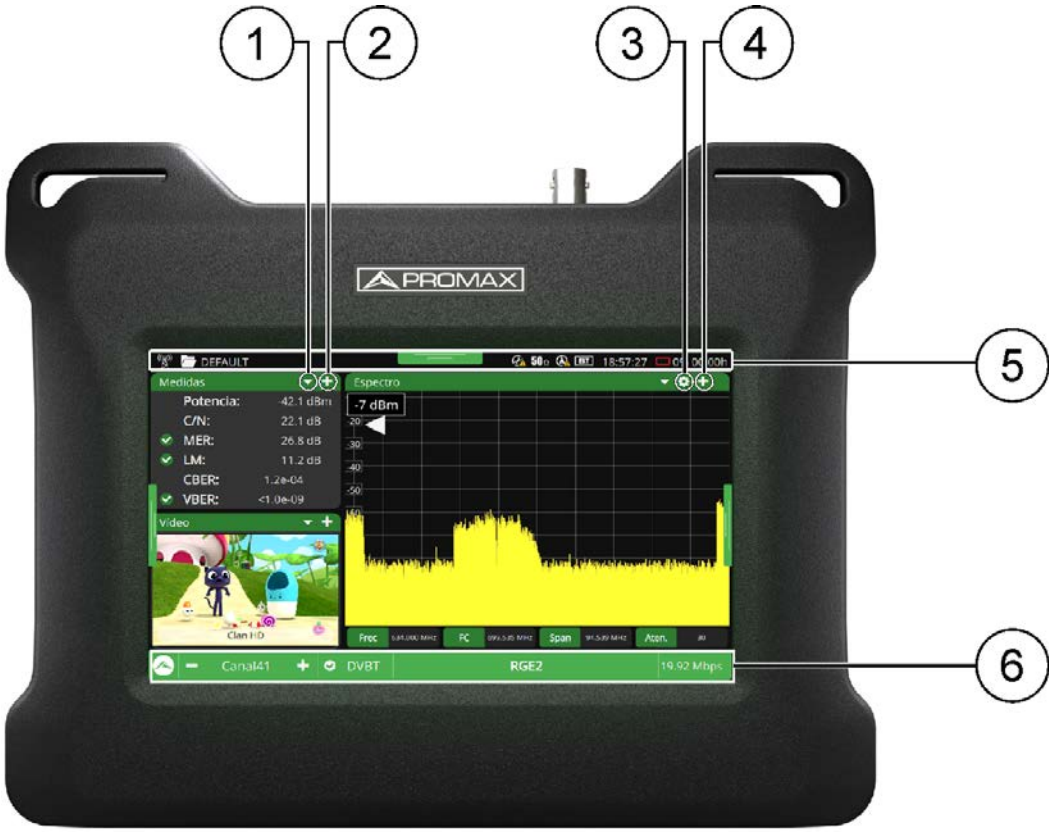


Figure 11.

1 Triangle ▼ (all windows): It displays a menu with all available tools. Select one tool to be displayed. The same tool cannot be in more than one window (for more details about tools refer to "Tools" on page 42).

2 Plus (+) sign (small windows): It maximizes the window, switching to the main window position.

3 Gear ⚙ (main window): It displays a settings menu for the tool. It is available for some tools and only on the main window.

4 + / - sign (main window): It shows the panel in full-screen mode. To return to the previous view press on the minus sign.

5 Information Bar: It is the bar located at the top of the screen that displays additional information about the meter. Different icons may appear depending on the function in use (see "Icons" on page 14).

6 Status bar: It shows tuning parameters like frequency/channel selected, signal info (standard, bandwidth...), network name and Transport Stream total bitrate. Also it gives access to Tuning Settings (for more details refer to

"Tuning Settings" on page 40). The **PROMAX** logo returns to the Home screen.

4.3 Tuning Settings

To display the Tuning Settings swipe right from the left side of the screen or press any field related to tuning (frequency, span...). Tuning Settings change according to the type of signal to tune.

- Band: It allows selecting between terrestrial or satellite frequency band.
- Tune by: It allows selecting between **tuning by channel** or **tuning by frequency**. If you select a channel or a channel plan it changes automatically to tuning by channel.
- Tuning Frequency: It allows selecting the frequency to tune. Select frequency value and frequency units (MHz, kHz, Hz) on the keypad. **Tune by Frequency** must be selected before enter the frequency.
- Channel Plan: It allows selecting a channel plan. A channel plan is a structured allocation of frequencies within a specific band of the spectrum. It consists of a list of channels with predefined settings for each one (frequency, signal type, bandwidth, etc.). Press on the **Channel plan** option to show a list of available channel plans.
- Channel: It allows selecting a channel from the channel plan. Press on the "Channel" option to show a list of available channels.
- Signal type: It displays the current standard and allows selecting another standard in the same band (terrestrial or satellite). Press on the "Signal type" option to show a list of available standards and to select the signal type working mode.
- Signal type mode: Press on the **Signal type** option to select **Manual mode or Auto mode**. The **Auto** mode enables the **StealthID** in order to identify automatically the signal. In the **Manual** mode the user must select the standard of the signal type to be demodulated.
- Downlink frequency (satellite): It displays downlink (DL) frequency calculated from local oscillator value.
- Polarization (satellite): It allows the user to select the signal polarization between Vertical or Horizontal. In tuning by channel mode this option can not be changed because is defined by the channel.
- Sat band (satellite): It allows the user to select the **High** or **Low** band frequency for satellite channel tuning. In tuning by channel mode this option can not be changed because is defined by the channel.
- Symbol rate (DVB-S/DVB-S2/DVB-S2x): Symbol Rate determines the rate at which symbols occur. A symbol may consist of one or more bits as determined by the modulation format.
- Center frequency: It allows the user to edit the center frequency. The center frequency is the frequency at which the screen is centered.

- Span: It allows to edit the span, which is the frequency range displayed on screen on the horizontal axis. The current span value appears at the bottom.
- Reference level: It allows the user to edit the reference level. The reference level is the power range represented on the vertical axis. The Reference Level can be changed directly swiping up or down.
- Attenuation: It can work in Manual mode or Automatic mode. In manual mode the user must select a value of attenuation between 0 and 70. In automatic mode the system applies attenuation according to the signal.

WARNING! In some models, for safety reasons, when the device starts up, the attenuation is set to **35 dB by default**. When entering the **TV Analyzer** mode, if the attenuation is in **Manual** mode, it will remain at 35 dB until the user changes it. If it is in **Automatic** mode, it will adjust according to the input power.

- Capture mode: It allows specifying whether the content of the demodulated signal is TS or T2MI.
- Maximum trace hold: It records the outline of the spectrum when reaches the maximum level.
  - Enable: It enables the maximum trace hold.
  - Hide: It shows/hides the last maximum trace recorded.
  - Freeze: It holds and keeps on screen the last maximum trace.
- Minimum trace hold: It records the outline of the spectrum when reaches the minimum level.
  - Enable: It enables the minimum trace hold.
  - Hide: It shows/hides the last minimum trace recorded.
  - Freeze: It holds and keeps on screen the last minimum trace.
- PLP (DVB-T2/ATSC-3*).
- Profile (DVB-T2).
- Slice (DVB-C2).
- Layer (ISDBT).
- PLS (DVB-S2/DVB-S2x).
- DiSEqC commands (DVB-S/DVB-S2/DSS).

*. Only for **ATSC** version of **TV EXPLORER NG**

4.4 Tools

In the following sections, a description of each tool associated with the TV Analyzer is provided.

The tools are available in the dropdown menu located on the top bar of each panel of the TV Analyzer.

Some tools are only available for certain types of signals. Tools that are not available for the selected signal type will appear grayed out. When clicking on these option, a pop-up message will appear explaining why it is not available.

The tools available for the TV Analyzer are:

- Spectrum ("Spectrum" on page 43)
- Measurement ("Measurement" on page 45)
- Signal Parameters ("Signal Parameters" on page 47)
- Video ("Video" on page 48)
- Audio levels ("Audio levels & loudness" on page 49)
- Video/Audio parameters ("Video/Audio Parameters" on page 50)
- Streaming ("Streaming" on page 51)
- Constellation ("Constellation" on page 53)
- Echoes ("Echoes" on page 55)
- MER by Carrier ("MER by Carrier" on page 56)
- Spectrogram ("Spectrogram (Spectrum + Waterfall)" on page 57)
- Merogram ("Merogram (MER by carrier + Waterfall)" on page 59)
- Recording ("Recording" on page 60)
- Optical Power Meter ("Optical Power Measurement" on page 62)

4.5 Spectrum

The **Spectrum** tool shows the spectrum of the signal received from the RF input.

	Spectrum (02:26s)	SCAN

Video 4.

►Touch gestures


Tap: It places the cursor on the point.


Zoom out: It amplifies signal, reducing the span.


Zoom in: It reduces signal, amplifying the span.


Horizontal drag (spectrum): It moves along the frequency band.


Horizontal drag (tuned signal): It moves the signal over the frequency.


Vertical drag: It changes reference level.

►Screen

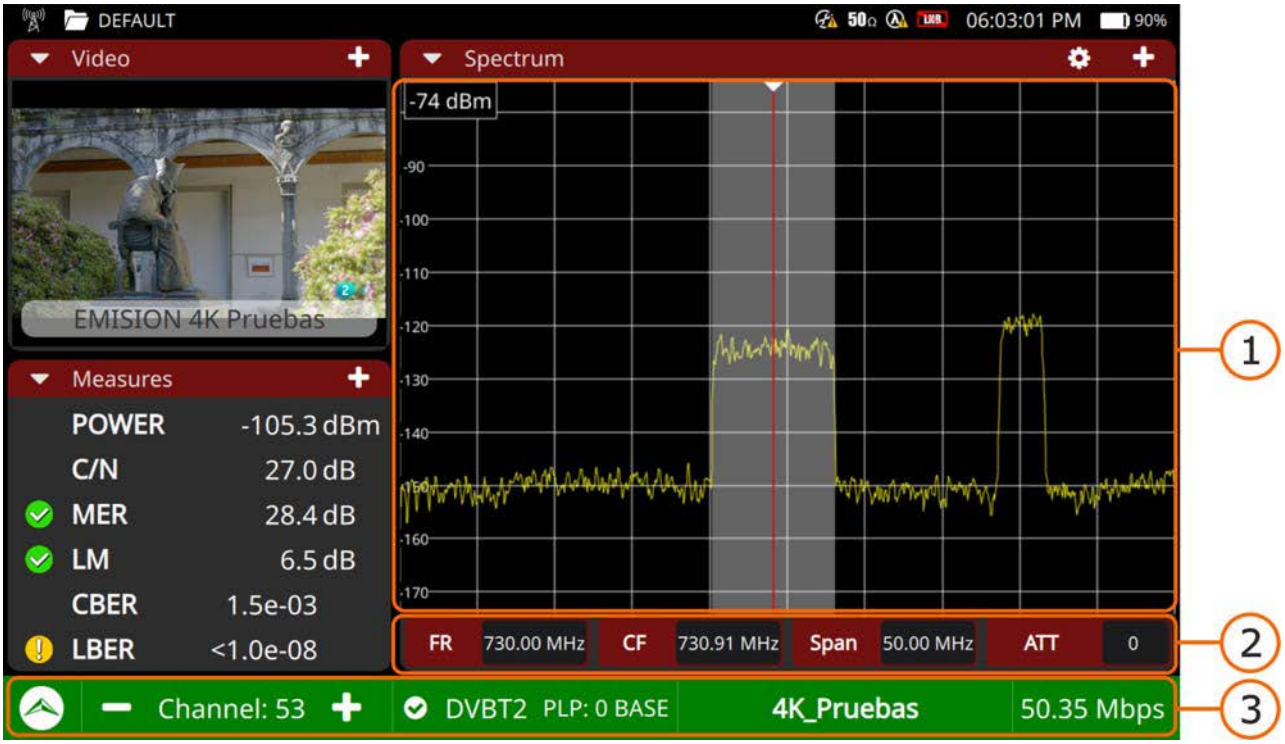


Figure 12.

1 Spectrum: The red vertical line shows the frequency been tuned. At either side there are two dotted white lines that define the signal bandwidth over which the meter is trying to identify the tuned signal. When the signal is tuned, the meter auto identifies it. The dotted lines change to a full white band falling over the tuned signal.

2 Spectrum bar: There are four fields that give quick information about the tuned frequency in this order: frequency tuned, the center frequency in the spectrum window, the span and the attenuator selected. Pressing on any of this buttons opens that field in the tuning menu.

3 Status Bar: When it turns green, it indicates that TS or ALP* is being received. In red, it indicates that the data stream is not being received. It also displays several fields, such as the network name and the total bitrate of the transport stream.

►Settings

Press on the gear to display the settings menu:

- View: It defines the spectrum trace mode: outline, solid or gradient. Outline shows only the spectrum outline. Solid shows the spectrum with a yellow background. Gradient shows the spectrum with a gradient of yellow background.

*. Only for **ATSC** version of **TV EXPLORER NG**.

- dB/div: It allows modifying the number of dB per division on the vertical axis of the graph that displays the power. The available values are: x10, x5, x3, x2, x1.
- Marker type: It defines how to display the marker: outline, arrowhead or horizontal.
- Resolution filter: It defines the resolution bandwidth filter value. The resolution filter available is 100 kHz.
- Shaded BW: It disables or enables the display of the tuned channel bandwidth.
- To center marker: It centers the selected frequency on the screen.

4.6 Measurement

The **Measurement** tool displays all relevant measurements for the tuned signal.

Video 5.

►Touch gestures

Tap: Select a measurement to monitor it on the graph.

►Settings

Press on the gear ⚙ to display the settings menu:

- Reset PER: It resets the PER value (Packet Error Ratio).

► **Screen**

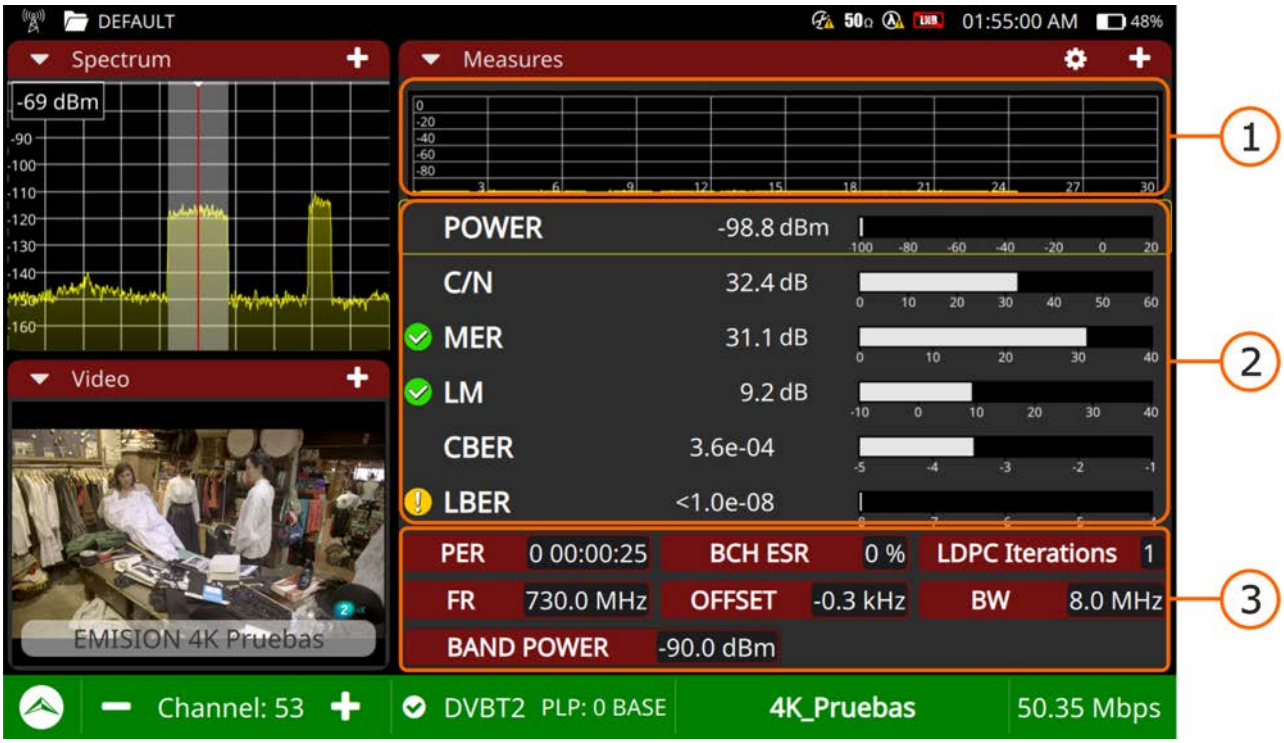


Figure 13.

1 Monitoring graph: It shows the selected measurement being plotted on a graph over time. The user can select any of the measurements available on the panel below. The selected measurement is inside a frame.

2 Relevant Measurements: It shows the most relevant measurements for the tuned signal. Measurements are in numerical value and also plotted on a graph bar. The sign on the left indicates its quality.

3 Extra Measurements: It shows some extra measurements according to the signal (PER, frequency, offset, bandwidth, band power, etc.).

4.7 Signal Parameters

The **Signal parameters** tool displays the modulation parameters of the signal being tuned and demodulated.

	Signal Parameters (00:32s)	SCAN

Video 6.

►Screen

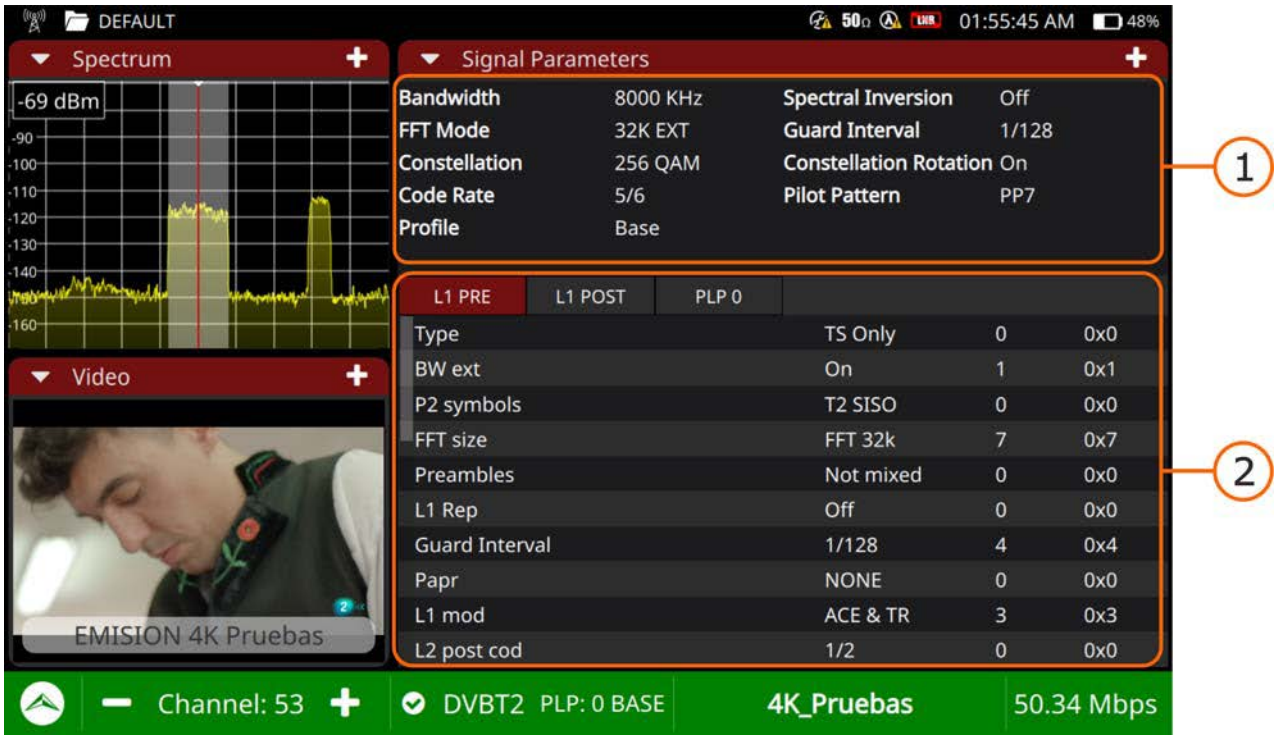


Figure 14.

1 General Panel: It displays the most relevant information.

2 Detail panel: It shows detailed data.

4.8 Video

The **Video** tool displays one of the services carried by the signal being demodulated.

	Video (01:15s)	SCAN

Video 7.

►Screen

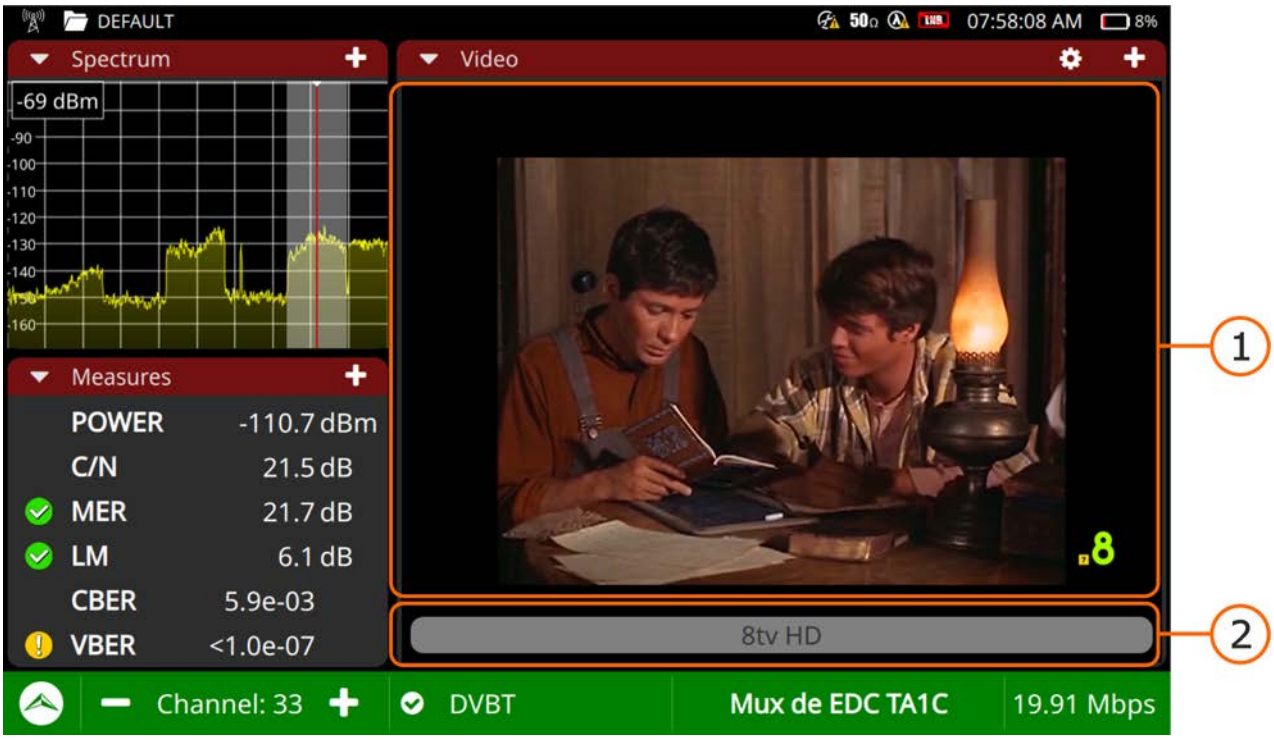


Figure 15.

1 Video Panel: It displays the demodulated service.

2 Service bar: It shows the name of the service and quality. If pressing, it opens a new window that shows all services available for the transport stream. Select one service to be displayed on screen. Each service is identified by its ID, LCN (if available) and name. It also shows if it is video, audio or data. In case of video it also shows resolution (SD, HD or UHD).

►Settings

Press on the gear to display the settings menu:

- Audio: It allows the user to change language of the service in case there is more than one available.

4.9 Audio levels & loudness

The **Audio levels & loudness** tool allows the user to measure and visualize audio levels and loudness.

The **audio level** of each channel is measured in dBs and displayed in a bar graph. If the TS carries multiple audio channels (stereo left and right, 5.1, 7.1), up to 8 channels can be displayed on screen simultaneously..

Audio loudness is measured according to LUFS (Loudness Units relative to Full Scale), a measurement standard used to quantify perceived loudness, mimicking the way the human ear naturally perceives volume.

Audio levels (01:33s) SCAN

Video 8.

►Screen

Figure 16.

1 Audio loudness:

- *Momentary* (LUFS; *Loudness Units relative to Full Scale*): SPerceived loudness over a very short time interval (400 ms) for measuring volume peaks and transients..
- *Short-term* (LUFS): Perceived loudness over a short time interval (3 s) for measuring the loudness of sections..
- *Integrated* (LUFS): Perceived loudness over a long time interval for measuring the loudness of a complete audio file (song, program, podcast, etc.).
- *Loudness Range* (LU; *loudness units*): Variation in perceived loudness throughout an entire audio file.

2 The bars display the real-time audio level of each channel. The red horizontal markers indicate the maximum peak reached. The colour of the bar indicates the audio level as follows:

- Red: High volume (0 dB <-> -9 dB).
- Yellow: Medium volume (-9 dB <-> -18 dB).
- Green: Appropriate volume (-18 dB <-> -54 dB).

►Settings

Press on the gear to display the settings menu:

- Audio: It allows the user to change the audio track in case there is more than one available.

4.10 Video / Audio Parameters

The **Video / Audio parameters** tool shows details about the service selected and its video and audio layers.

Video Values (01:43s) SCAN

Video 9.

►**Screen**

Figure 17.

1 General Panel: It provides service information: name, provider and network name. Also Service ID, Logical Channel Number, transport stream ID, Network ID, original network ID, app (HbbTV), URL, scrambled service, audio language, subtitles language, audio and teletext.

2 Video/audio panel: On the left side shows video layer details: PID, bitrate, codec, resolution, aspect ratio and scanning rate. On the right side shows audio layer details: PID, bitrate, codec, language, sampling rate and format.

NOTE: If this tool is expanded to full screen by tapping the Plus (+) sign, a new area will appear on the left side with more details about the service layers (video, audio, and data).

It will detect the MPD* file if it exists. If the file contains errors, the error can be viewed along with a description and its cause.

*. Only for the **ATSC** version of the **TV EXPLORER NG**

4.11 Streaming

The **Streaming** function allows generating a point-to-point unicast stream of the transport stream being received.

►Screen

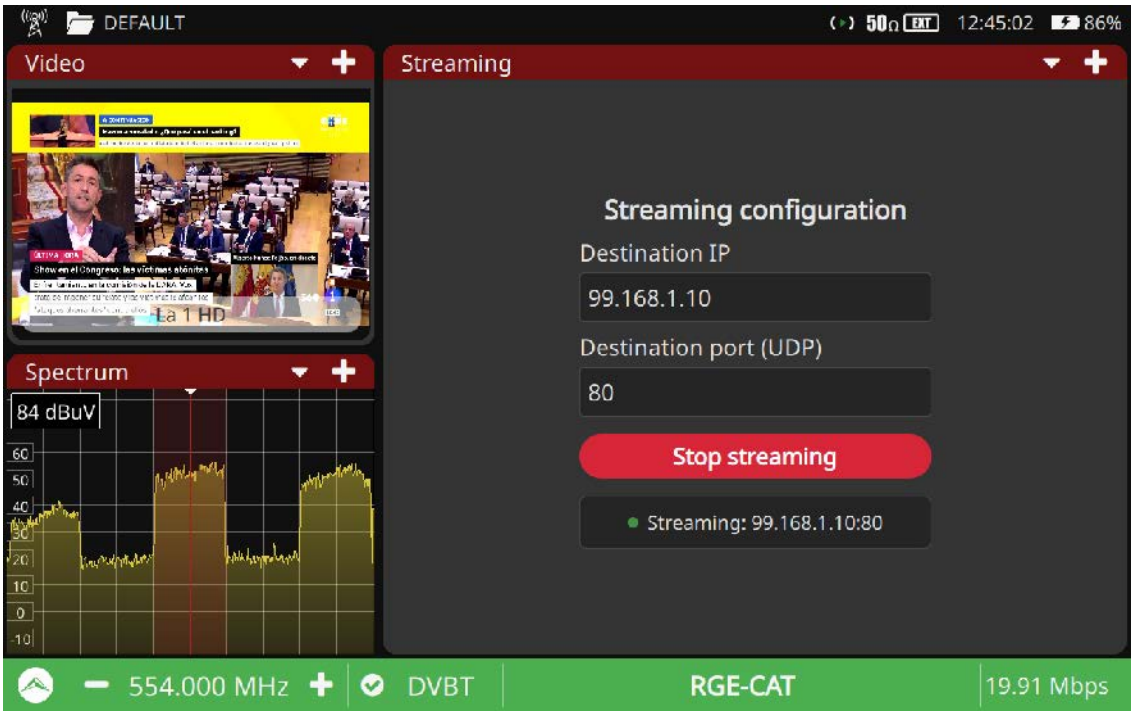


Figure 18.

►Operation

1 First, the channel to be streamed must be tuned.

2 Next, enter the destination IP and the port where the stream will be sent (unicast).

3 Tap **Start Streaming** to launch the streaming service. An identifying icon will appear in the upper information bar.

4 While the Streaming function is active, you cannot exit the TV Analyzer mode or change the channel.

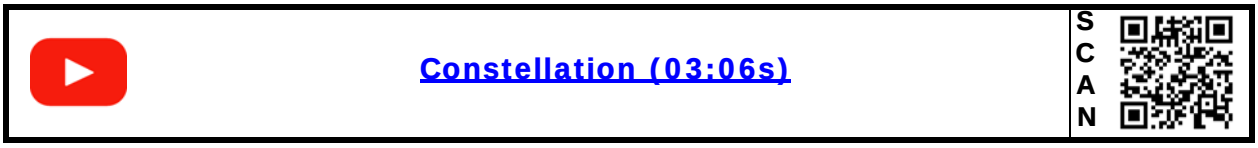
5 To stop streaming, tap **Stop Streaming.**

►Touch gestures

Tap: Starts / stop the streaming service.

4.12 Constellation

The **Constellation** tool is used to analyze terrestrial, satellite and CATV digital signals.



Video 10.

►Settings

Press on the gear ⚙ to display the settings menu:

- Grid: Full grid or cross grid.
- Zoom: All, Q1, Q2, Q3, Q4.
- Point size: Large, medium, small, pixel.
- Clear: It clear current constellation to start plotting from scratch.
- Start Carrier: Select the start carrier of the constellation.
- Stop Carrier: Select the stop carrier of the constellation.
- Default carrier: It takes all carriers.

NOTE: In the case of a DVB-T2 signal, it allows selecting between a PLP-DATA or L1-POST constellation, although it is not possible to select the carrier range.

►Screen

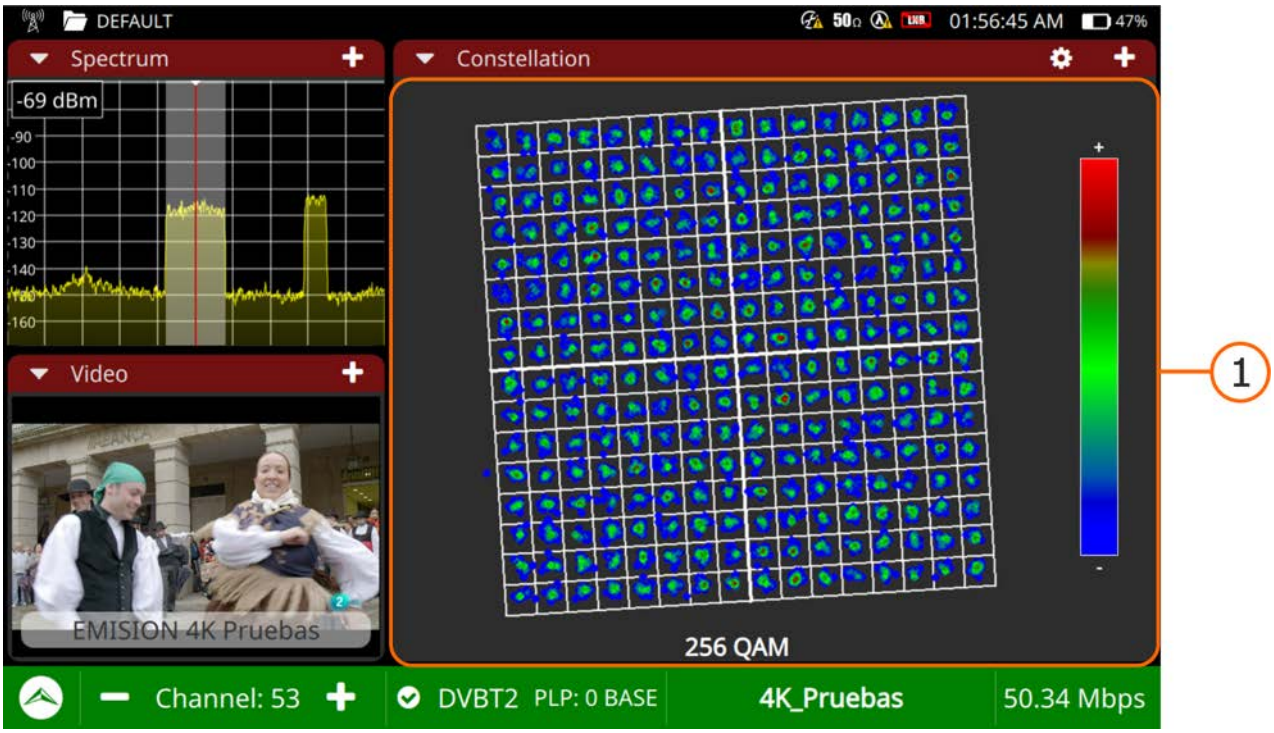


Figure 19.

1 General Panel: It displays the signal demodulated. The constellation is a pattern that shows the symbols received by the demodulator. Symbols are colour coded according to the density of points falling the same area across time. The greater amount of impacts in an area, the warmer the colour of symbols. Well defined points implies a transmission and reception system with low noise and interferences. Scattered symbols denote a higher degree of noise and interferences.

►Touch gestures

Drag: It moves around the constellation.

Zoom out: It amplifies constellation.

Zoom in: It reduces constellation.

4.13 Echoes

The **Echoes** tool detects and displays the echoes that can occur due to multiple reception of the same digital terrestrial channel with different delays.

Echoes (04:22s)

SCAN

Video 11.

► **Screen**

Figure 20.

1 Graph Panel: It shows the echoes. The horizontal axis shows time (µs) and the vertical axis shows level (dB carriers). It can display up to 10 echoes. Everything falling in between the red areas is received within the guard interval, everything falling in the read areas are outside the guard interval and therefore very damaging.

2 Measurement panel: For each echo, comparing to the main signal, shows level (dB carrier), delay (µs) and distance (km).

►Touch gestures

Tap: Tap on a table column in the measurement panel and its corresponding echo will be highlighted in blue color.

►Settings

Press on the gear to display the settings menu:

- Zoom: To zoom out echoes graph (x1, x2, x4, x8).

4.14 MER by Carrier

The **MER by carrier** tool measures the MER for each carrier in the channel and shows it graphically. This tool is useful to analyse systems where signals of different type interfere between them.

MER by Carrier (01:37s)

SCAN

Video 12.

►Screen

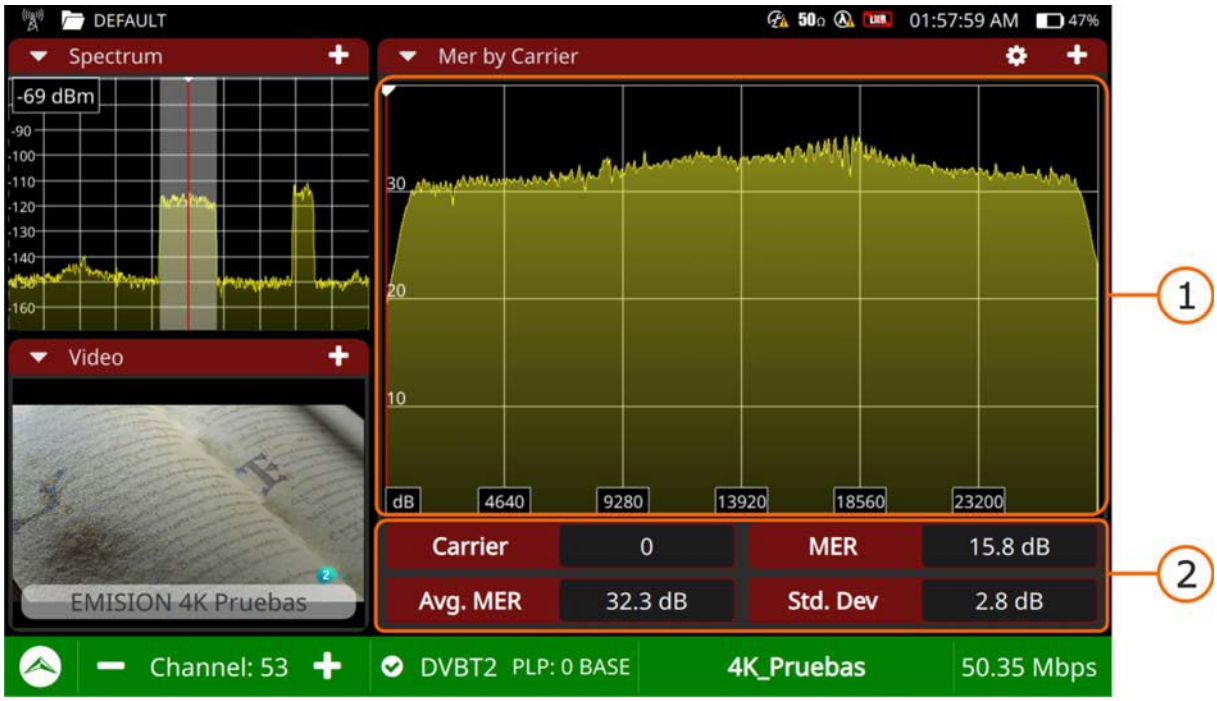


Figure 21.

1 Graphic Panel: The horizontal axis shows the number of carriers and the vertical axis shows the MER value. The marker points the selected carrier.

2 Measurement panel: It shows the average MER for all carriers and its standard deviation. If there is an interference signal, a drop in the MER of the affected carriers will occur. The fields Carrier and MER shows these values for a single carrier selected by the user.

►Touch gestures

Tap: Select a carrier.

►Settings

Press on the gear ⚙ to display the settings menu:

- View: It defines the spectrum trace mode: outline, solid or transparent. **Outline** shows only the spectrum outline. **Solid** shows the spectrum with a yellow background. **Transparent** shows the spectrum with a gradient of yellow background.
- Carrier: It allows the user to select one specific carrier.

4.15 Spectrogram (Spectrum + Waterfall)

The **Spectrogram** tool is a graph that displays the real-time evolution of the spectrum power level.

Spectrogram (01:55s) SCAN

Video 13.

When changing any of the real-time chart configuration parameters such as span, center frequency, reference level, etc., the chart will reset and regenerate.

►Screen

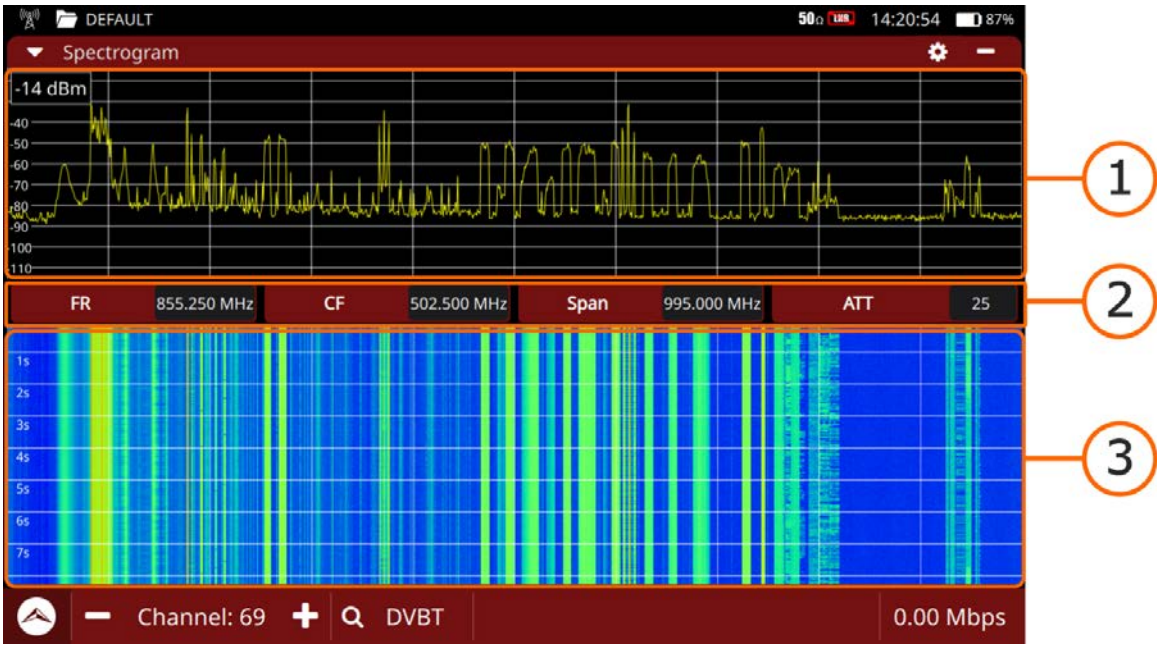


Figure 22.

1 Top window: the graph shows the spectrum received by the RF input, with the horizontal axis representing the selected frequency span and the vertical axis representing power.

2 Settings window: It shows tuned frequency (FR), central frequency (CR), span and attenuation (ATT).

3 Bottom window (waterfall): Graph where the horizontal axis represents the same frequency span as in the top window, and the vertical axis represents time. To represent the power level, a range of colours is used, going from 0 dB (cool colour) to 40 dB (warm colour).

►Touch gestures

Tap: When tapping on the waterfall area, a legend will appear indicating the color corresponding to each level of power.

►Settings

Press on the gear to display the settings menu:

- View: It defines the spectrum trace mode: outline, solid or gradient. **Outline** shows only the spectrum outline. **Solid** shows the spectrum with a yellow background. **Gradient** shows the spectrum with a gradient of yellow background.

- dB/div: It allows modifying the number of dB per division on the vertical axis of the graph that displays the power. The available values are: x10, x5, x3, x2, x1.
- Duration: It defines the time window of the vertical axis that can be adjusted within a range from 1 to 60 minutes
- Clear: It clears the waterfall and starts to plot it again.

4.16 Merogram (MER by carrier + Waterfall)

The **Merogram** tool is a graph that shows the real-time evolution of the MER power level by carrier..

Merogram (01:58s) SCAN

Video 14.

When changing any of the real-time chart configuration parameters such as span, centre frequency, reference level, etc., the chart will reset and regenerate.

►Screen

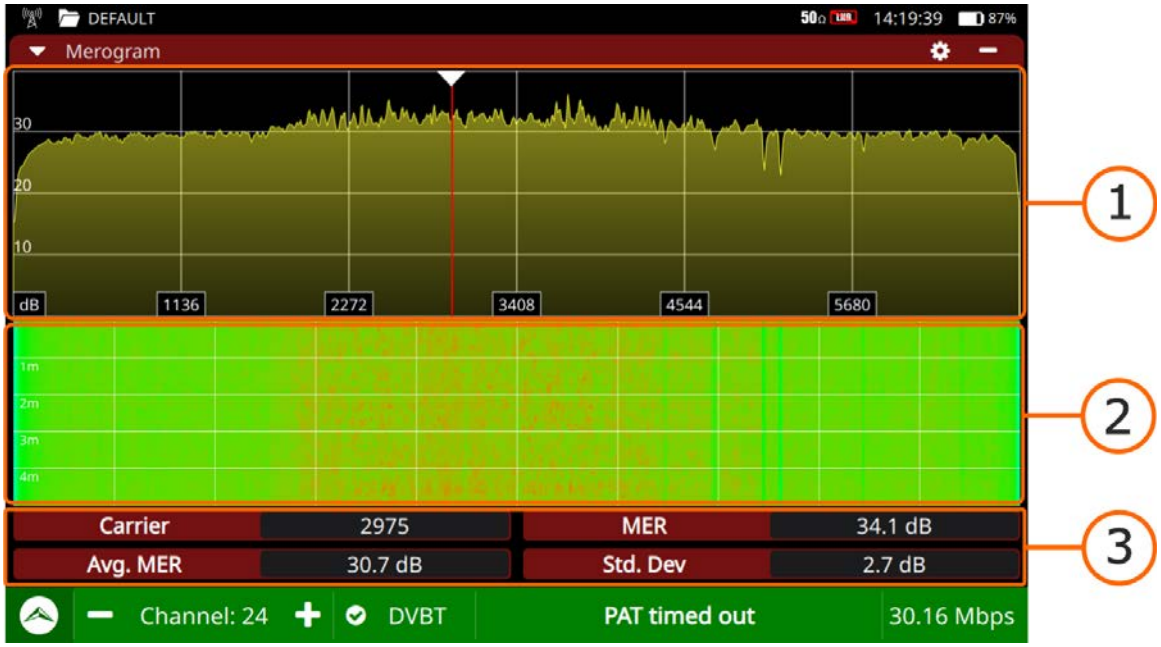


Figure 23.

1 Top window: a graph displays the horizontal axis representing the number of carriers and the vertical axis showing the MER level (dB). The selected marker is placed on a carrier.

2 Intermediate window (waterfall): Graph where the horizontal axis represents the same number of carriers as in the top window, and the vertical axis represents time. A range of colours is used to represent the MER level, going from 0 dB (cool colour) to 40 dB (warm colour). When tapping on the waterfall area, a legend will appear indicating the colour corresponding to each level of power.

3 Bottom window: It shows the average MER (Avg. MER) for all carriers and its standard deviation (Std. Dev). The fields Carrier and MER shows these values for the single carrier selected by the user.

►Touch gestures

Tap: When tapping on the waterfall area, a legend will appear indicating the colour corresponding to each level of power. When tapping on the spectrum area you will select a carrier.

►Settings

Press on the gear to display the settings menu:

- View: It defines the spectrum trace mode: outline, solid or transparent. **Outline** shows only the spectrum outline. **Solid** shows the spectrum with a yellow background. **Transparent** shows the spectrum with a gradient of yellow background.
- Carrier: Select a carrier.
- Duration: It defines the time window of the vertical axis that can be adjusted within a range from 5 to 60 minutes.

4.17 Recording

The **Recording** tool allows recording the full transport stream from the demodulated signal being tuned.

It also has the option to record raw signal in order to be analysed in case there was any problem locking the signal.

Recording (01:09s)

SCAN

Video 15.

►Screen

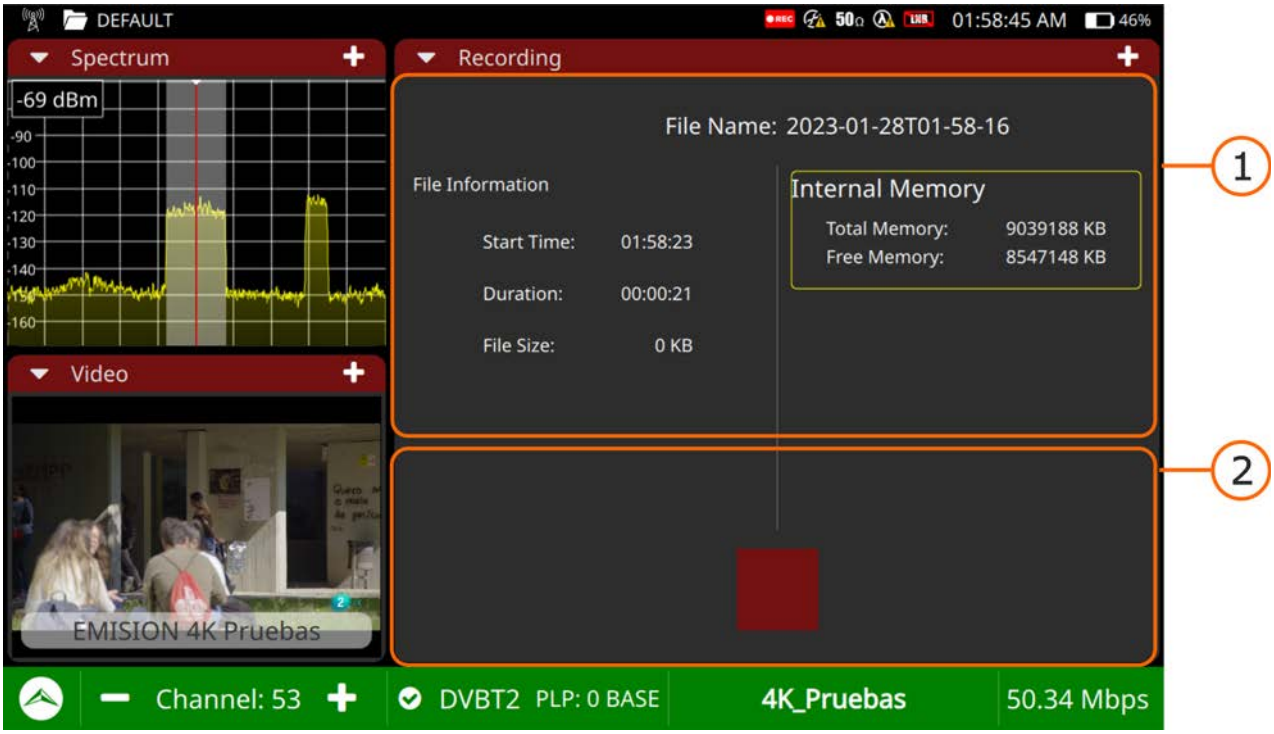


Figure 24.

1 File information Panel: On the left you can see start time, duration and file size. On the right side there is the total memory and free memory available.

2 On/Off button: It shows a red button to start/stop recording. If pressing when the button is a circle it starts recording and when it is square it stops recording. Records are saved in the current workspace from where it can be exported to a pendrive (for more details refer to "WORKSPACES" on page 87). Check the **Raw Recording** checkbox and follow the instructions below to record a raw signal.

►Raw Recording Procedure

Raw recording is useful to analyze the signal in order to find any problems in the data stream that are not allowing to lock or demodulate the signal. It is very important to follow these steps to generate a proper raw record:

1. Disconnect the signal.
2. Check the **Raw recording** option.
3. Start recording.
4. Connect the signal.
5. After a while, stop recording.
6. Access the **Workspace** (for more details refer to "WORKSPACES" on page 87) to get the recording. To access, deploy the **Top menu** and select **Workspace**. Then select the current workspace and in **Mode** select **TV Analyzer**. Now press on **Recordings**.
7. Press on the file to access the options menu and copy it to an USB.
8. Now the file can be analysed or send in order to find any problems that are not allowing to tune / demodulate the signal.

►Touch gestures

Tap: Tap the on/off button to start/stop recording or to check the raw recording checkbox.

4.18 Optical Power Measurement

The meter has an FP-APC input that allows connecting fiber optics to take different measurements.

Optical Power Measurement (01:00s)

SCAN

Video 16.

To measure power in the whole optical band you must follow these steps:

1 Connect the optical signal to the meter's optical input (FC-APC connector).

2 From the **TV Analyzer** mode, access the **Top menu** swiping down.

3 Select the **Optical Power** icon.

4 In the **Status** field, select **On** to start the measurement.

5 If everything is correct, a bar will appear on the screen indicating the total power for the optical band, ranging from 800 to 1700 nm.

►Screen

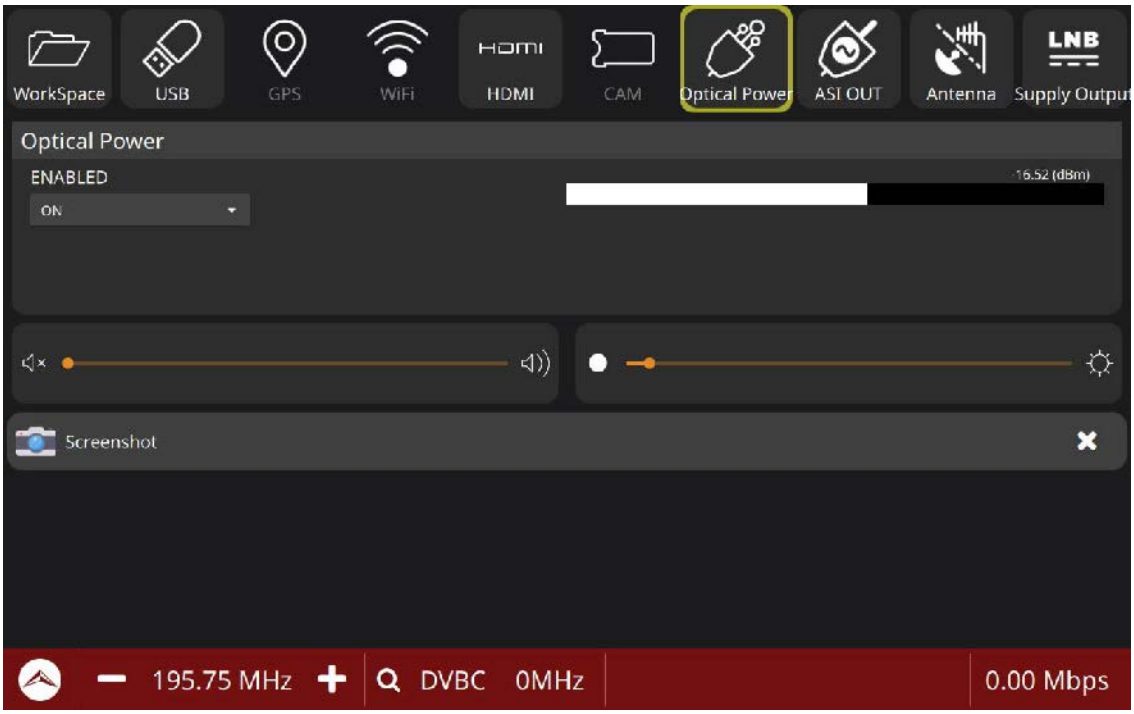


Figure 25.

1 The first bar shows the optical power in the full optical bandwidth.

To take measurements by optical band it is necessary to install the optical fiber option (for more details refer to "OPTICAL OPTION" on page 113).

4.19 Advanced Tools

In the next sections each advanced tool for the TV Analyzer is explained. The advanced tools available for the TV Analyzer are:

- Channel Exploration ("Channel Exploration" on page 70)
- Drive Test / Signal Monitoring ("Drive Test / Signal Monitoring" on page 64)
- Datalogger ("Datalogger" on page 71)
- Blind Scan ("Blind Scan" on page 74)
- Attenuation test

NOTE 1: Advanced tools make use of a large amount of the meter's resources, so some functions may not be available while the advanced tool is running. Make sure to exit or finish the advanced tool in order to use the meter in the usual manner.

NOTE 2: The user should select the tools to be displayed in the secondary panels, as they cannot be modified once the advanced tool has been started.

4.20 Drive Test / Signal Monitoring

The **Drive Test / Signal Monitoring** tool allows monitoring different signal parameters over time.

If the **Drive Test** option is available ("DRIVE TEST OPTION" on page 130), it enables adding geo-positioning (GPS) to the signal measurements in order to map the coverage of a specific transmitter.

Drive Test (07:06s) SCAN

Video 17.

To perform a **Drive Test / Signal Monitoring** the user must follow these stages:

- Create a task
- Set the GPS receiver (only for Drive Test option)
- Run the task
- Export the task
- Exit

Next it is explained each one of these stages:

► Creating a task

1 From the **TV Analyzer** mode, access the **Advanced Tools** menu by swiping from the right side of the screen to the left and tap on **Drive Test**.

2 The **Drive Test / Signal Monitoring** screen allows you to create a new task or select one already created.

3 Previously to create a task, tune a channel to use it as a reference (for more details refer to "Use Case: Terrestrial RF Signal Tuning" on page 18).

4 To create a new task tap on the "+" sign and fill in all the fields:

- Name: Name that identifies the task.
- Description: Description of the task.
- Audio (Off/On): When enabled it sounds an alarm in case the analyzer gets unlocked from the channel.
- GPS alarm (Off/On): When enabled it generates an alarm if the GPS receiver gets unlocked from the satellite.
- Select mode (Auto/Manual): It allows the user to choose among two modes of operation. The **Auto** mode takes measurements automatically, according to the sampling time. The **Manual** mode takes measurements every time the user press the **Measurement** button.
- Time chart (s): Defines the length of the time axis in the plot that is displayed when the Drive Test starts.
- Sample Time (s): Time between samples when working in **Auto** mode.
- Signal type: Select the type of signal to be monitored and other parameters related to it.
- Discard FM frequencies: Check this box to skip monitoring FM frequencies.

5 When finish tap on **Save** to save the task.

6 Now you can select the task just done and start it or exit the tool and run the task later.

7 To exit the **Drive Test** tool, access the **Advanced Tools** menu by swiping from the right side of the screen to the left and pressing on the cross next to **Drive Test**.

► **Screen**

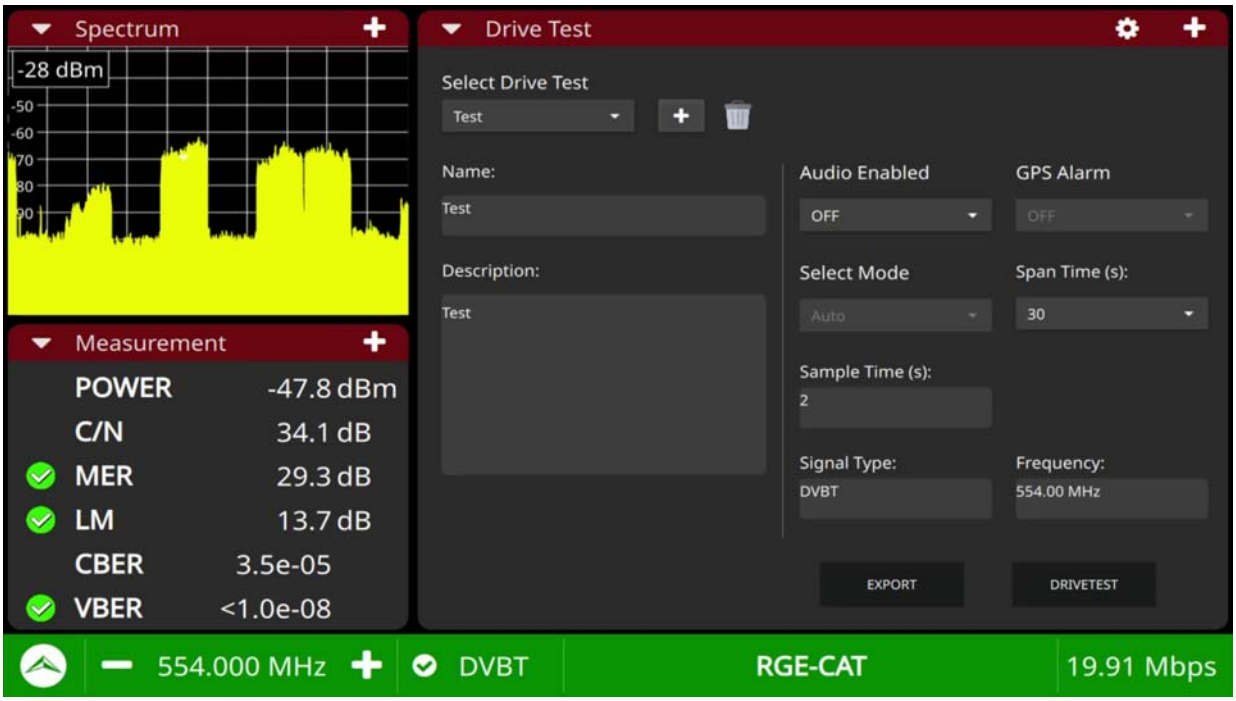


Figure 26. Task screen

► **Setting the GPS receiver (only for Drive Test option)**

1 Swipe down from the top of any screen to access the **Top menu**.

2 Connect your GPS receiver to the USB port. It should appear a notification **GPS inserted**.

3 Tap on the **GPS** option to access the GPS status screen.

4 The GPS status screen shows all the satellites detected by the GPS receiver and which ones are locked to (in green).

5 It also shows SNR measurements and geo-position data.

6 If all is correct the user can follow to the next stage.

► **Screen**

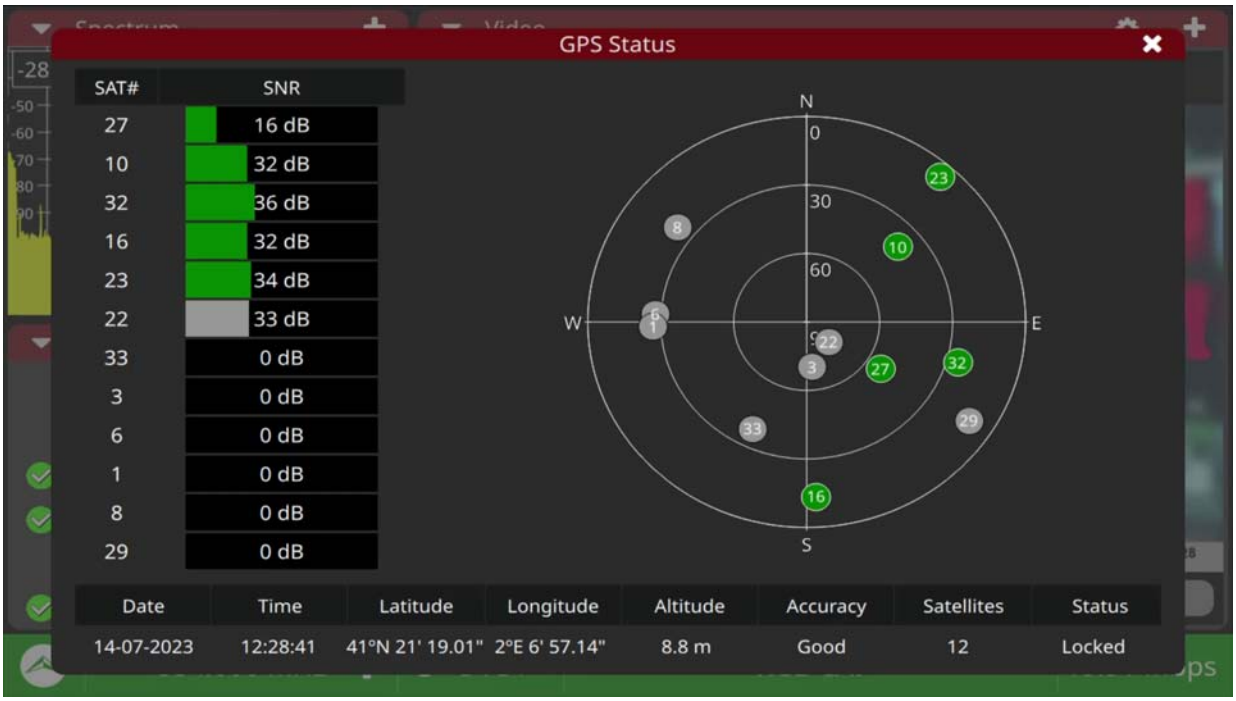


Figure 27. GPS status screen (only for Drive Test option)

► **Running a task**

1 From the **TV Analyzer** mode, access the **Advanced Tools** menu by swiping from the right side of the screen to the left and tap on **Drive Test**.

2 On the **Select Drive test** select one of the tasks previously created and tap on **Drive Test**.

3 Now press on the **Drive test** button to go to the Drive Test screen.

4 The screen shows data plotted on the main panel. The left top panel will show the spectrum and the left bottom panel will show measurements. These panels cannot be changed.

5 To launch the drive test press on **Start**. Warning messages will appear before the test, indicating that the data from the previous Drive Test with the same name will be overwritten. A warning message will also appear if the GPS is not connected or has not locked. Press **OK** to proceed if you agree.

6 When starting, it first tunes the channel saved in the task and then starts plotting measurements over time. All data measurement (and geolocation if you have the Drive Test option) is saved in a file that can be recovered after the drive test task finishes.

7 During the drive test task, if it is needed, the user can pause it pressing on **Pause** and resume it pressing on **Resume**.

8 Press on **Finish** to end the task. It shows a confirmation message to exit the task, followed by another to exit the tool. If you agree, press **OK**.

►Screen

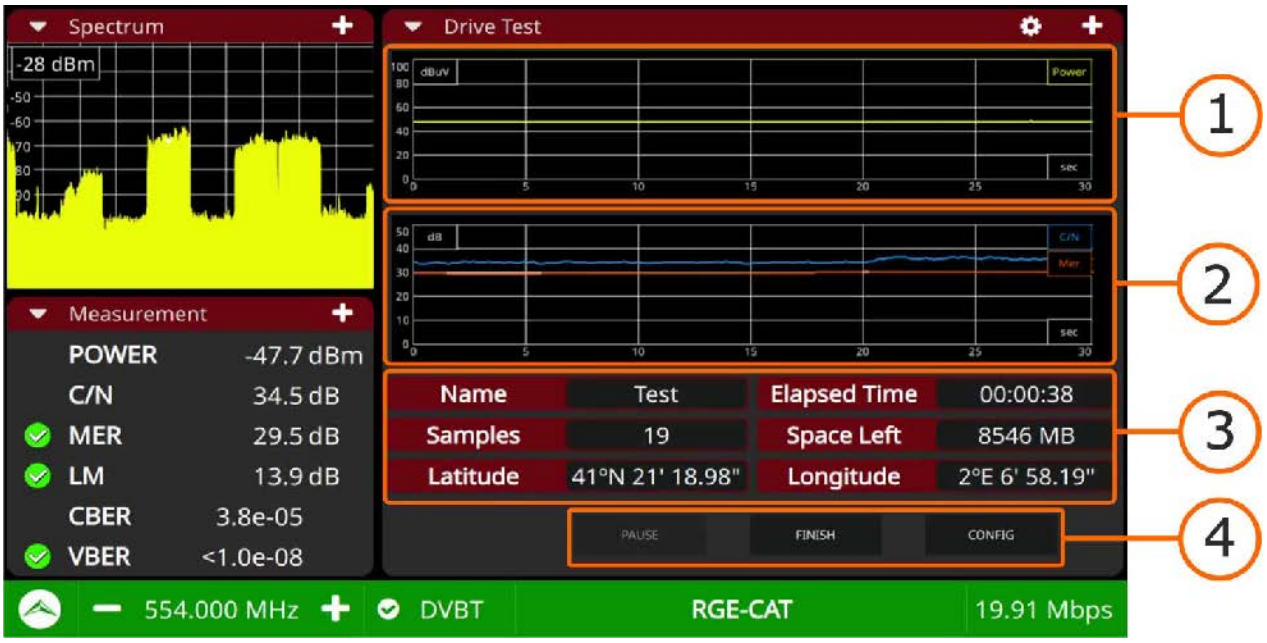


Figure 28.

1 Plot showing power level measurement over time.

2 Plot showing C/N and MER measurement over time.

3 Drive Test data: task name, samples taken, elapsed time, space left, latitude & longitude (only for Drive Test option).

4 Options:

- Back: It accesses de task settings.
- Pause/Resume: It pauses or resumes the task.
- Finish: It ends the task.
- Measurement (only in Manual mode): It takes a measurement.

5 Spectrum.

6 Measurement.

► Exporting data

1 Once the task is done we can recover the measurements taken. From the **TV Analyzer** mode, access the **Advanced Tools** menu by swiping from the right side of the screen to the left and tap on **Drive Test**.

2 In the dropdown menu, select the task done to export its data.

3 Tap the **Export** button. It opens a windows that allows selecting where to download the data, between internal memory or an external USB memory. It also allows selecting the file format among KML, CSV or XLSX.

4 KML format can be used in Google Earth or other programs to overlay measurements on a map.

►Screen

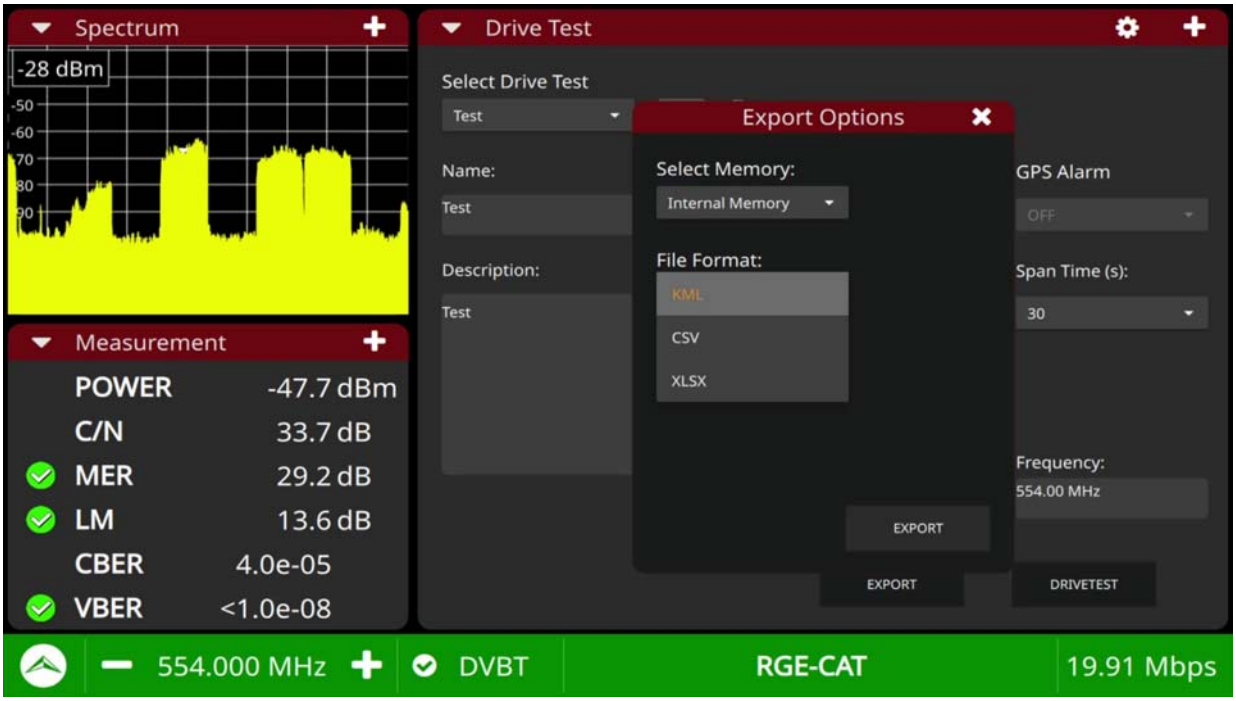


Figure 29.

► Exit the Drive Test task

1 The **Drive Test / Signal Monitoring** tool is a high level function and it needs all the resources of the meter. For this reason some other tools cannot be working simultaneously with. You must exit in order to work as usual.

2 To exit the Drive Test / Signal Monitoring tool there are two options:

- Press the **Finish** button at the **Drive test / Signal Monitoring** screen and click twice on **OK**.
- Swipe from the right side of the screen to the left and tap on the cross next to **Drive Test**.

4.21 Channel Exploration

The **Channel Exploration** function performs a scan of the RF spectrum (terrestrial or satellite) using another previously selected channel plan as a template. It detects where there are active signals within that channel plan and on which channels a signal is being received. With this information, it scans those channels, looking for emissions and identifying them.

Video 18.

► Operation

1 From the **Home** menu press on **Settings**.

2 From the **TV Analyzer** area on Settings, press on **Exploration Config**.

3 From this section, the user can adjust the minimum levels for the system to try to identify the signal and the number of attempts to lock it (for more details, refer to "►Exploration configuration" on page 27).

4 Return to the **Home** screen and press **TV Analyzer**.

5 Slide to the right from the left side of the screen to display the tuning settings or press any field related to tuning (frequency, span...).

6 Select the channel plan that will serve as a reference for scanning channels.

7 Now access the **Advanced Utilities** menu by sliding from the right side of the screen to the left and press **Channel Exploration** to start the scan.

8 When the scan starts, all the channels from the reference channel plan will appear on the screen. The screen will show how the system goes through channel by channel trying to detect and demodulate the signal on each one.

9 At the bottom there is a progress bar with the number of channels scanned and detected.

10 During the scan, to skip channels press on **Skip**. If for any reason you want to abort the full scan and exit the tool, open the **Advanced Utilities** menu again and press the cross on **Channel Exploration**.

11 When finished, each channel can present one of the following states, identified by these icons:

- Ok (channel identified): The channel power exceeds the threshold defined in the settings. It has been demodulated and identified.

- Unknown (low signal): The channel does not reach the power threshold defined in the settings.

- Error (channel not identified): The demodulator discards the channel, as it may exceed the power threshold but could not be demodulated or identified.

12 The identified channels are selected by default and will be saved in the channel plan when clicking the **Save** button. By clicking on a channel, the meter will display the channel spectrum in the **Spectrum** tool and attempt to lock onto it.

13 The remaining channels (unknown or incorrect) are discarded unless the user manually adds them. To manually add a channel, press and hold the channel for two seconds. Do the same to deselect it.

14 After selecting channels, press **Save** to save the new channel plan with a user-assigned name.

15 The newly created channel plan will become the active channel plan and will be available in the channel plan list.

4.22 Datalogger

The **Datalogger** function allows the user to create a datalogger (data file) that records and stores measurements performed at one or more test points. A test point represents each physical location (an antenna socket, for example) where measurements are taken.

For example, a datalogger could be created for a specific home. Within that datalogger, different test points can be defined, where each point represents an individual antenna socket within the home.

The datalogger results can be viewed directly on the equipment, or they can be exported to a file for viewing on a PC.

Datalogger (03:14) SCAN

Video 19.

► **Settings**

1 From Home, access the **Settings** option and then click on **Datalogger Config**.

2 This screen displays all the parameters to configure the datalogger (for more details, please refer to "►Datalogger configuration" on page 25).

- Number of attempts to lock terrestrial signal.
- Number of attempts to lock satellite signal.
- Maximum time to make a terrestrial measurement (s).
- Maximum time to make a satellite measurement (s).
- Maximum time to make a FM measurement (s).
- Maximum time to make an Analog / Generic measurement (s).
- Use Link Margin to optimise acquisition time.

► **Operation**

1 From **Home**, access the **TV Analizer** option.

2 Access the **Advanced Tools** menu by swiping from the right side of the screen toward the left, and tap **Datalogger**.

3 The **Datalogger** screen is displayed.

4 Select one of the three options:

- **Test & Go**: Uses the current tuning configuration (determined by the selected channel plan) to perform the datalogger. The system automatically creates and assigns a name to both the datalogger and the test point.
- **Datalogger**: Opens the datalogger configuration window, where the user can customize it. Once configured, the datalogger is saved and remains available to be run later.
- **Select datalogger**: The user selects a datalogger from the available ones to run, delete or export.

5 Depending on the selected option, the system will perform specific actions described below.

► **Configuration**

1 rom the **Datalogger** screen, tap the **Datalogger** box to access the datalogger advanced configuration screen.

2 Fill in the **Name** and **Description** fields to identify the datalogger.

3 In **Type**, select either **Generic** (for most use cases) or **ICT Spain** (to create a datalogger and a report in accordance with Spanish telecommunications regulations).

4 Set the pause in **Pause before changing channel plan**. This option pauses the process and waits for the user to resume it manually. The available options are **Never** (the datalogger runs completely without pauses), **Always** (a pause occurs at each channel plan change), or **Band change** (a pause occurs only when switching between terrestrial and satellite bands).

5 In the **Terrestrial** or **Satellite** option, select the channel plan(s) to be used in each band during the datalogger run.

NOTE: If the user selects a channel plan that does not define the signal type for all the channels included in it, a message will be displayed indicating that the advanced tool **Channel Exploration** must first be run to define all signal types for that channel plan.

6 In the **Attenuation Test** option, select whether to perform an attenuation test on the **terrestrial** or **satellite** channel plans (for more details, refer to "Attenuation Test" on page 75).

7 Once all fields have been completed, tap **Save** to store the datalogger. It will then be available in the datalogger list.

8 After saving, if everything is correct, the screen to run the datalogger will open.

► Selecting and Running the Datalogger

1 In **Select Datalogger**, a list of all available dataloggers is displayed. Select a datalogger. The screen to run the datalogger will then open.

2 The top window displays some configuration parameters that can be edited: **name, description, type, and pause**.

3 The lower window displays the channel plans and the attenuation test associated with the datalogger. These parameters cannot be modified.

4 The **Test points** window displays the measurement points. If measurements have already been performed with the datalogger, the existing measurement points will be shown. If no measurements have been taken, the window will be empty.

5 Tap **Add test point** to open the window where a **Name** can be assigned to the test point, then tap **Acquire** to start measurements.

6 The measurement process will start for the selected test point. Upon completion, a window will display all measurements for each channel plan and attenuation test.

► **Results Table and Data Export**

1 Once completed, a table will be displayed with the measurement results from the datalogger.

2 The results table displays the name of the test point, date and time, and the results for each channel: **channel, type, power, C/N, MER, LM, CBER, LBER/VBER, and status**. For the attenuation test, the associated data are displayed (for more details, refer to "Attenuation Test" on page 75).

3 At the bottom, there are three options: **Remove**, which deletes the test point and its results, the **Reacquire** option that overlays new results onto the current ones, or **Back,** which returns to the datalogger screen.

4 The newly created test point will now be available in the **Test point** window of the datalogger screen. Tapping on its name will open the results table.

5 The **Export** button allows the entire datalogger to be exported to a file. The export options let you select the report **Type** (generic or ICT Spain), the drive (**internal memory** or **external memory**), and the **File format** (PDF, CSV, or XLSX).

6 If exported to the internal memory, it can be accessed through the **Workspace** option (for more details, refer to "WORKSPACES" on page 87).

4.23 Blind Scan

The **Blind Scan** function uses an ML algorithm to automatically search for and detect available satellite channels within a specific frequency range, without any prior knowledge or configuration. This is typically done to identify all channels being broadcasted in a particular area.

Blind Scan (03:12s) SCAN

Video 20.

Although the **Blind Scan** function can find channels, it may also detect unwanted signals or those causing interference. Therefore, it is often necessary to manually filter or exclude certain channels based on their quality or content.

► **Operation**

1 From the **Home** menu press **TV Analyzer**.

2 Slide to the right from the left side of the screen to display the tuning settings or press any field related to tuning (frequency, span...).

3 Select the satellite band.

4 Now access the **Advanced Utilities** menu by sliding from the right side of the screen to the left and press **Blind Scan** to access the tool.

5 Before starting, select the polarization (low vertical, low horizontal, high vertical, high horizontal) and the band (wide band or universal LNB).

6 Press the play button to start the **Blind Scan**.

7 Once started, all detected transponders appear on the screen first. The system will go through them one by one, attempting to detect and demodulate the signal for each.

8 At the bottom there is a progress bar with the number of channels scanned and detected.

9 When finished, each channel can present one of the following states, identified by these icons:

- Ok: Transponder identified.
- Error: Transponder not identified.

10 By tapping on a channel, the channel spectrum is displayed in the **Spectrum** tool and it tries to lock it.

11 The identified channels are selected by default (highlighted channels) unless the user manually deselects them.

12 Not identified channels are discarded by default (shaded channels) unless the user manually selects them.

13 To manually select or deselect a channel, press and hold the channel for two seconds.

14 After selecting channels, press **Save** to save the new channel plan with a user-assigned name.

15 The newly created channel plan will become the active channel plan and will be available in the channel plan list.

4.24 Attenuation Test

The **Attenuation test** function allows the user to easily check the response of the telecommunications installations before antennas and headers are working. It allows the user to evaluate the response along the complete range of frequencies by measuring the losses (attenuation) in the distribution of TV

signals, comparing reference levels at headend output and at each house antenna plugs.

	Attenuation test (soon available)	SCAN

Video 21.

► **Operation**

1 From the **Home** menu press **TV Analyzer**.

2 Access the **Advanced Utilities** menu by sliding from the right side of the screen to the left and press **Attenuation test** to access the tool.

3 The **Attenuation test** function is displayed.

4 First, tap on the gear icon to display the **Settings** menu.

5 Set the parameters to perform the test:

- Pilots (MHz) (1, 2 and 3).
- Maximum attenuation (dB).
- Threshold (dB).

6 Then it is necessary to set references. This requires a signal generator. We recommend to use of one of the PROMAX signal generators: RP-050, RP-080 or RP-110 (depending on the frequency band).

7 Connect the generator and the meter where the origin of the signal distribution is in the installation (antenna, headend, etc.) or connect the generator directly to the RF input of the meter. If necessary, the meter can feed the generator using the **Supply** option from **Top menu**.

8 Active the signal generator and in the meter, press the **Set Reference** key in the **Settings** menu.

9 Once are set the references for the pilot signals, let the signal generator connected to the source point of the distribution system and take measurements in each user access point with the meter.

10 In each measurement a message over each pilot signal indicates whether the measure **Pass** or **Fail** according to the parameters set.

11 The measurement data from the **Attenuation Test** can be saved through the **Datalogger** tool. To do this, when creating a new **datalogger**, check the Attenuation test box (terrestrial and/or satellite). Then, the user must perform a datalogger from the test point where is performing the attenuation test.

12 Another quick option it is to select the **Test & Go** function in the **Datalogger** tool. This option creates automatically a channel plan from the channel plan currently selected and starts measuring.

► **Screen**

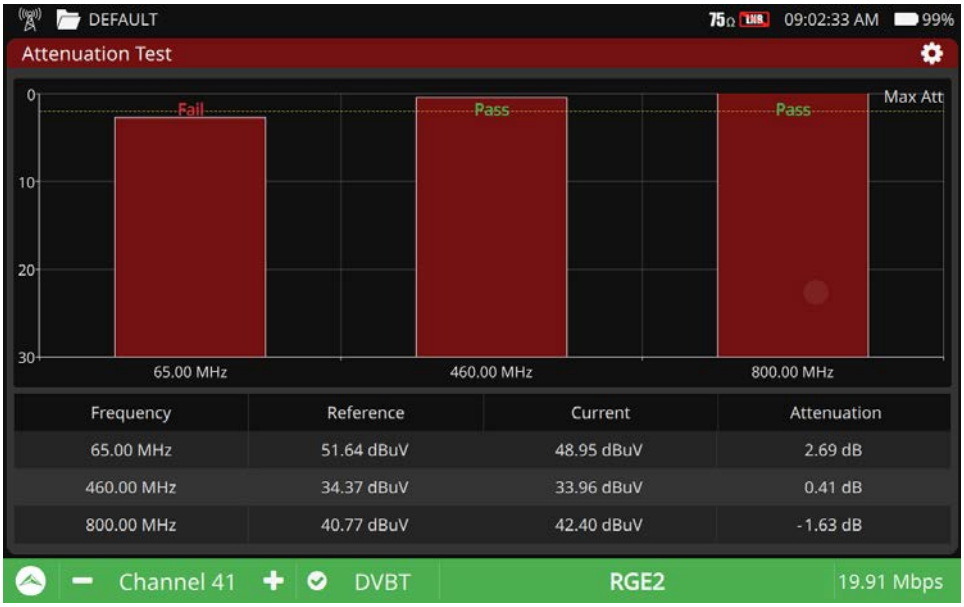


Figure 30.

► **Settings**

Press on the gear to display the settings menu:

- Threshold (dB): It defines the maximum difference that may exist between the pilot signal of higher level and the pilot signal of lower level. All pilot signals out of this range will be removed and not used as a pilot signal during the measurement process.
- Maximum Attenuation (dB): It sets the attenuation level used by the equipment to show on screen if the signal passes or fails. When the attenuation level is below this value the message on screen is **Pass** and when it is above this value is **Fail**.
- Pilot 0: It defines the frequency of the pilot signal 1 (MHz).
- Pilot 1: It defines the frequency of the pilot signal 2 (MHz).
- Pilot 2: It defines the frequency of the pilot signal 3 (MHz).

4.25 Discover FM (optional)

The **Discover FM** function scans the terrestrial RF spectrum dedicated to FM (frequency modulation). It detects where active signals are present within that frequency range and identifies which channels are receiving signals. With this

information, it explores those channels with signals, searching for and identifying broadcasts.

For more information refer to "FM ADVANCED OPTION" on page 121.

► Operation

1 From the **Home** screen, tap on **Settings**.

2 From the **TV Analyzer** section in **Settings**, tap on **Exploration configuration**.

3 From this section, the user can adjust the minimum FM level for the system to attempt to identify the signal and the number of attempts to lock it (for more details, refer to "►Exploration configuration" on page 27).

4 Return to the **Home** screen and tap on **TV Analyzer.**

5 Now, access the **Advanced Utilities** menu by swiping from the right side of the screen to the left, and tap on **Discover FM** to start the scan.

6 When the scan begins, all the channels in the reference channel plan will appear on the screen. The screen will show the system processing channel by channel, attempting to detect and demodulate the signal in each one.

7 At the bottom, a progress bar appears, showing the number of channels scanned and detected.

8 During the scan, you can skip a channel by pressing **Skip**. If, for any reason, you wish to abort the entire scan and exit the tool, reopen the **Advanced Utilities** menu and tap the cross on **Discover FM**.

9 At the end of the scan, each channel can display one of the following statuses, identified by these icons:

- Ok (Channel identified): The channel power exceeds the threshold set in the settings. It has been demodulated and identified.
- Unknown (Insufficient signal): The demodulator discards the channel since it does not reach the power threshold defined in the settings.
- Error (Channel not identified): The demodulator discards the channel because, although it may exceed the power threshold, it could not be demodulated or identified.

10 The identified channels are selected by default and will be saved in the channel plan when clicking the **Save** button.

11 By clicking on a channel, the device will display the channel spectrum in the **Spectrum** tool and attempt to lock onto it.

12 The remaining channels (unknown or erroneous) are discarded unless the user manually adds them. To manually add a channel, press and hold the channel for two seconds. Do the same to deselect it.

13 At the end of channel selection, press **Save** to store the new channel plan with a name assigned by the user.

14 The newly created channel plan will become the active channel plan and will be available in the list of channel plans.

5 WIFI

5.1 Introduction

WiFi technology allows wireless connectivity and communication between devices in the 2.4 and 5 GHz frequency bands. These bands are also used by other technologies such as Bluetooth, wireless USB, home automation, cordless phones, security cameras, microwave ovens, etc., which can interfere with the device's signal.

	WiFi (04:52s)	SCAN

Video 22.

For this reason, and due to the growing number of devices using wireless technology, a tool that deeply analyzes these types of signals is essential to detect problems and ensure quality in WiFi communication.

5.2 Operation

1 Connect the USB WiFi adapter (supplied with the equipment) to the USB 3.0 port located at the top of the device. The adapter will detect WiFi networks.

2 From the **Home** menu press on the **WiFi** option to enter the WiFi working mode.

3 The WiFi Analyzer screen is divided into 3 windows:

- main window
- left top window
- left bottom window

Each one of these windows can show a tool selected by the user. Press on the triangle ▼ on any window to display the tools menu. Select one tool to be shown on the window.

4 The tools available for the WiFi Analyzer are:

- WiFi Scanner
- WiFi Parameters
- WiFi Bands
- Measurements

5 Select a tool for each window.

6 In the next sections each WiFi tool is explained in detail.

5.3 WiFi Analyzer Screen

Figure 31.

1 Triangle ▼ (all windows): It displays a menu with all available tools. Select one tool to be displayed. The same tool cannot be in more than one window (for more details about tools refer to "Tools" on page 82).

2 Plus (+) sign (small windows): It maximizes the window, switching to the main window position.

3 Info bar: It is the bar at the top of the screen. From left to right, it displays: the name of the workspace, time, and battery level.

4 Gear ⚙ (only for some tools in the main window): It displays a settings menu for the tool. It is available for some tools and only on the main window.

5 + / - sign (main window): It shows the panel in full-screen mode. To return to the previous view press on the minus sign.

6 Status bar: Displays settings parameters such as band, access point name, and MAC address. It also provides access to WiFi settings (for more details, see the next section). The **PROMAX** logo returns to the Home screen.

5.4 WiFi Settings

To display the WiFi settings, swipe right from the left side of the screen or tap on the band in the status bar.

- WiFi Band: It allows you to select the 2.4 GHz WiFi band, the 5 GHz band, or both.

5.5 Tools

In the following sections, each tool of the WiFi Analyzer is explained. They are the following:

- WiFi Scanner.
- WiFi Parameters.
- WiFi Bands.
- Measurements.

5.6 WiFi Scanner

The **WiFi Scanner** tool displays all detected access points along with their main parameters.

►Touch gestures

Tap: Selection of Access Point.

Vertical dragging: Vertical scrolling through the access points.

►**Screen**

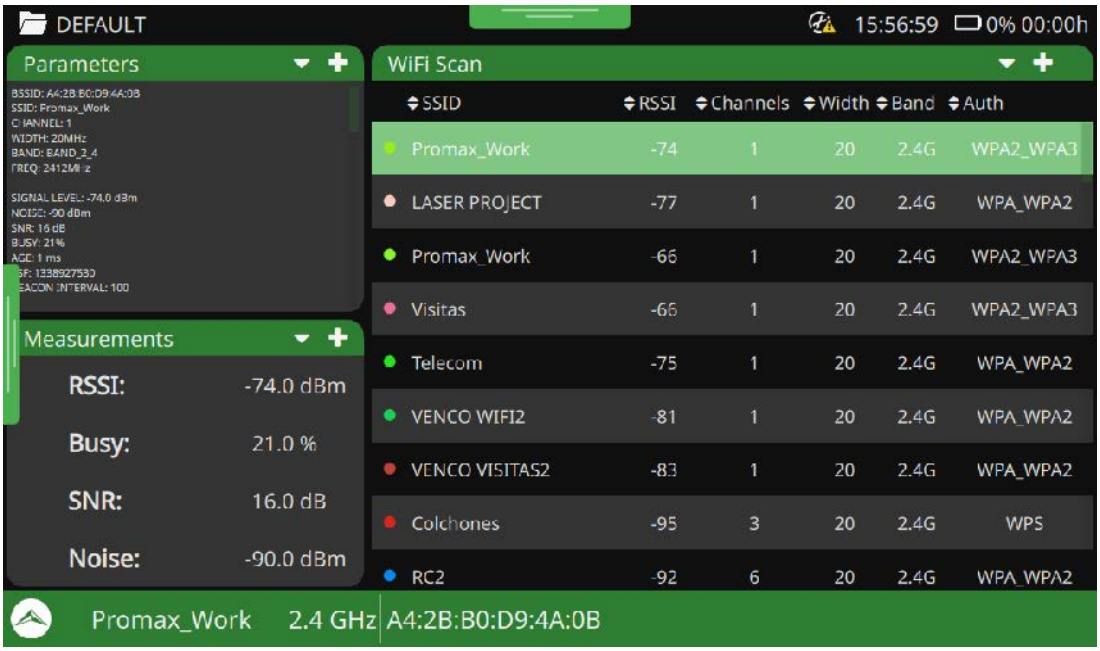


Figure 32.

Each column shows a paratemer of the WiFi signal. Press on '+' to see all parameters:

- SSID (Service Set ID): Name of the access point (AP).
- RSSI: Power at which the AP is being received. This power is measured by the WiFi dongle.
- Channels: Central channel of the Access Point.
- Width: Width of the Access Point.
- Band: Band to which the access point belongs.
- Auth: Type of security used to access the Access Point.
- BSSID (full screen): Basic Service Set ID or MAC of the Access Point.
- Device (full screen): Name of the manufacturer of the device that provides the infrastructure. It is not always available.

5.7 WiFi Parameters

The **WiFi Parameters** tool displays a detailed report of the selected Access Point.

►Touch gestures

Vertical dragging: Vertical scrolling through the parameters.

►Screen

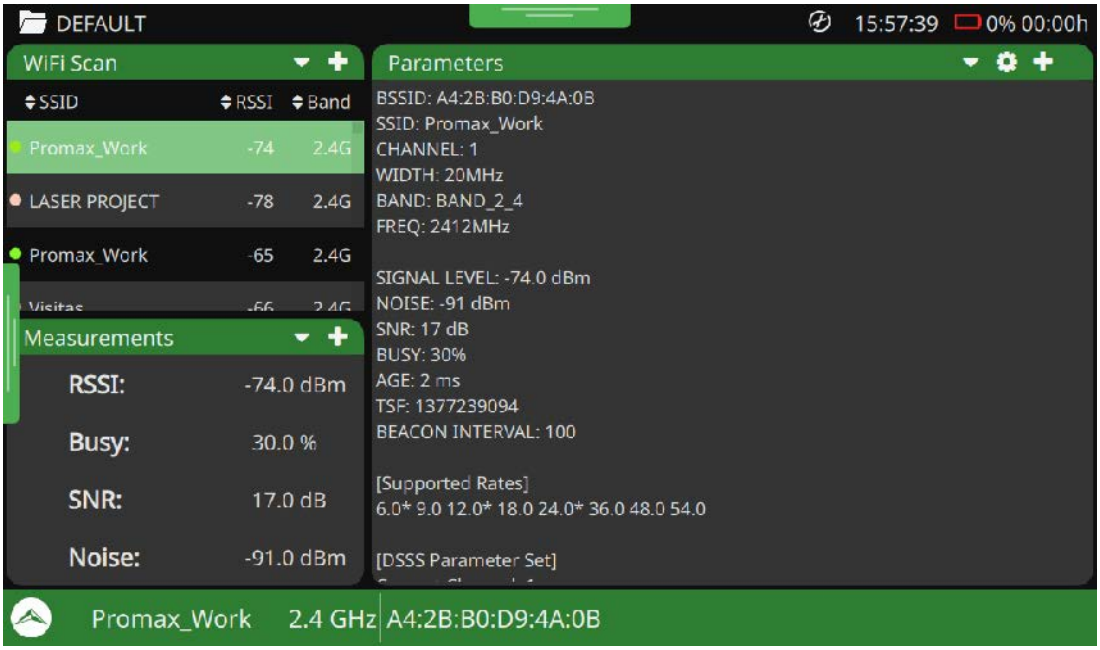


Figure 33.

1 Details of the selected access point.

►Settings

Press on the gear to display a settings menu for this tool:

- Export: It allows exporting the information displayed on the screen to the internal memory.

5.8 WiFi Measurements

The WiFi Measurements tool displays information about the most relevant measurements of the selected access point and shows them on the screen.

►Touch gestures

Tap: Selection of measurement to display in the graph.

►Screen

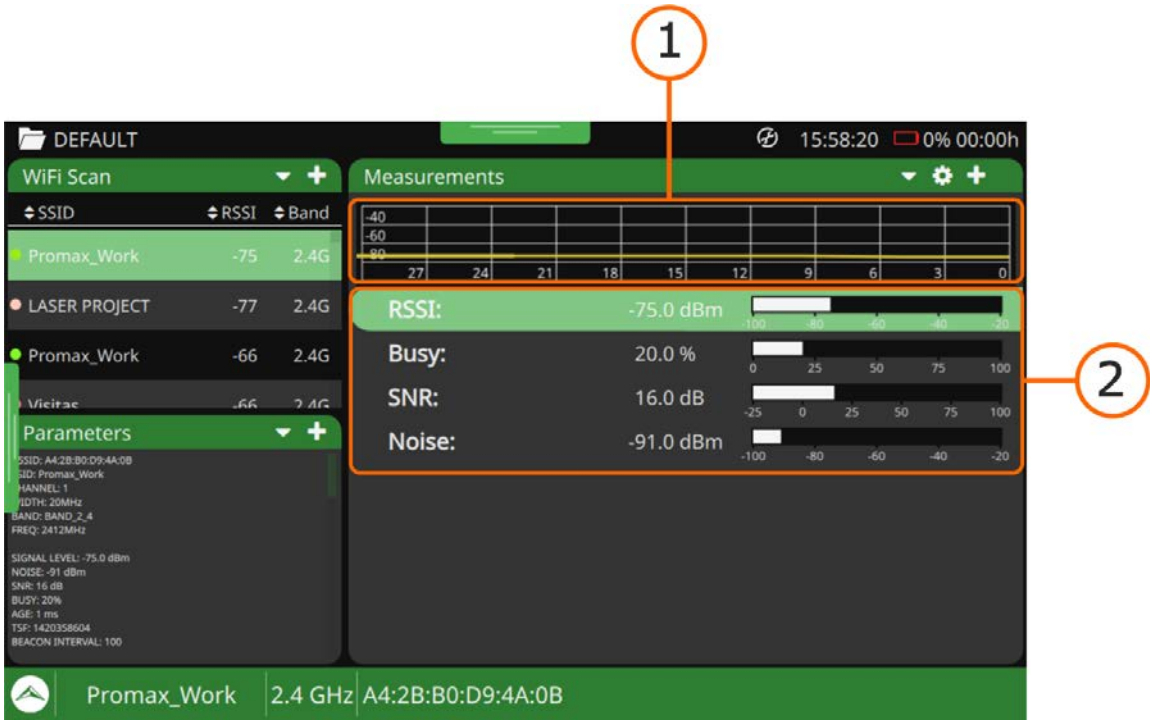


Figure 34.

1 Graph of the selected measurement.

2 Available measurements:

- RSSI (Received Signal Strength Indicator): Power of the selected Access Point measured by the USB WiFi adapter (also called "dongle"). The dongle measures the power of a single AP, while the meter measures the power of an area of the spectrum where multiple APs may exist. For this reason, and due to the different types of antennas used by both devices, the power measured by the dongle and by the spectrum may not match.

- Busy: Percentage of channel usage. This measurement is based on the time the channel is used. This measurement can help decide whether the channel can accommodate another AP.
- SNR (Signal to Noise Ratio): SNR measurement provided by the USB WiFi adapter for the selected channel / Access Point.
- Noise: Noise level of the selected Access Point.

►Settings

Press on the gear to display the settings menu:

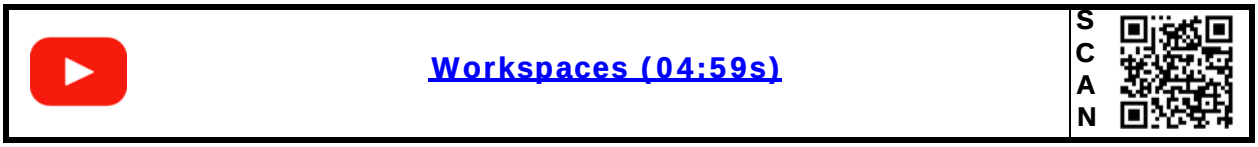
- Reset PER: It resets the PER value (Packet Error Ratio).

6 WORKSPACES

6.1 Description

The tool Workspaces is a function that allows the user to easily create a folder to store and manage data independently from other folders. Measurements, channel plans, screenshots and any other data associated will be stored in its folder. These data can later be exported a visualized to a PC.

Each workspace contains a subfolder for each operation mode. The files generated during the use of each mode are saved in the corresponding subfolder. For example, if a screenshot is taken in WiFi mode, the file with the captured screen image will be in the SDI subfolder, whereas if the capture is done in Spectrum Analyzer mode, it will be in that other subfolder..



Video 23.

If the user does not create any workspace, data will be stored in the default folder (named "DEFAULT").

6.2 Workspace Management

Next, we describe how to manage the workspaces in order to create a new one, remove, load, etc.:

1. The active workspace appears in the upper left corner of the screen. This is the folder where all files generated during the use of the equipment are stored.

2. Swipe down from the top of any screen to access the **Top menu**.

3. From the **Top menu** select **Workspaces** to access the workspaces and resources management screen.

4. A screen will appear showing all available workspaces. The current workspace appears outlined by a box.

5. The side menu allows you to switch between **Workspaces** and **Resources**. Select **Workspaces**.

6 To access the options menu, press and hold on one workspace. A pop-up menu will appear with the following options:

- **Open**: it opens the selected workspace for viewing and managing data.
- **Load**: it loads the workspace. From this moment on, all data will be saved in this workspace and the workspace name will appear in the upper left corner of each screen. **It is only possible to change the workspace by accessing the option from the Top menu at the Home screen.**
- **New Workspace**: it creates a new workspace (same function as the button **Add**).
- **Rename**: it renames the selected workspace.
- **Remove**: it removes the selected workspace (except for the "default" workspace that cannot be removed).
- **Export to USB**: it copies the workspace to a memory connected to the USB port. The progress of the action will appear in the notification window until it is finished.

7 Select one of these options.

WARNING! To load a workspace into memory and make it the active workspace where all data is stored, you must **access the Top menu from the Home screen** and then enter **Workspace**, select the workspace and load it.

6.3 Data File Management

Next, it is described how to access and manage the files inside the workspace:

1 Swipe down from the top of any screen to access the **Top menu**.

2 From the Top menu, tap on the **Workspace** option to access the Workspace management screen.

3 A screen displaying all available workspaces will appear.

4 The side menu allows you to switch between **Workspaces** and **Resources**. Tap on **Workspaces**.

5 Tap on a workspace to access the data stored.

6 Select the working mode from the dropdown menu. The working mode is the mode in which the data was generated. The available working modes are:

- Home.
- TV Analyzer.
- WiFi.

7 Now you can find all the data available for the selected working mode. Depending on the selected working mode different data can appear. They are:

- Tools.
- Channel plans.
- Dataloggers.
- Drive Test.
- Recordings.
- Screenshots.
- Quality.

8 When you tap on one of these data types, it will show a list with all the related files.

9 Files can be selected one by one by clicking on the box next to the file, or a multiple selection can be made by clicking on the box in the header.

10 When you long-press on a file, a menu pops up, providing the following actions:

- **Rename**: It allows you to change the name using the virtual keyboard.
- **Remove**: It deletes the file after confirmation.
- **Export to USB**: It copies the file to a memory connected to the USB port. The progress of the action will appear in the notification window until it is finished.
- Preview Screenshot: The screenshot is displayed on the screen (it will also be previewed by clicking directly on the file).

11 Select the desired option from the menu.

WARNING! When exporting data, **do not disconnect the USB drive directly from the equipment**, as the information contained could be lost.

Follow the process described in the next section to ensure that the data is properly preserved.

►**Screen**

Figura 35.

1 Left Sidebar: choose between wokspaces or resources.

2 Dropdown menu: select the Working Mode.

3 Toolbar: select the type of data.

4 File list: select a file to export, rename or remove. These files can be sorted by name, size, or date by clicking on the corresponding column.

6.4 Data Export to USB

The following describes how to export data from the equipment to a USB flash drive. It is important to follow these steps to ensure that the data is exported correctly:

1 Access the files to export as described in the previous section.

2 Connect a memory drive to the USB port.

3 When the USB drive is connected, the system scans it for compatible files. During this process, a spinning wheel will appear above the USB icon. Until this scanning process is complete, operations involving the USB drive cannot be performed.

4 If the USB drive is detected, a notification will appear, and the option **USB (name)** will show up in the left sidebar along with the icons for update and eject.

5 Open the workspace and select the file or files to export.

6 Press and hold the file or files to export until the option menu appears.

7 Select the **Export to USB** option.

8 The files will be copied to the USB drive. The progress of the action will appear in the notification window until it is finished.

9 Once copied, click on **USB (name)** in the left sidebar and then press the **Update** icon. The screen should refresh and display the files that were just copied.

10 If everything is correct, click on the **Eject** icon to disconnect the USB drive.

11 Remove the USB drive from the equipment.

12 Connect the USB drive to a PC to access data.

6.5 Resources Management

The **Resources** folder is a repository of common data for all the workspaces. This folder stores a large number of files that can be exported to the enabled workspace at any given time.

For example, in the case of channel plans, we can keep in our workspace only the channel plans that we regularly use. If we ever need a different channel plan, we can simply export it from the resources folder.

To use the Resources folder:

1 Swipe down from the top of any screen to access the **Top** menu.

2 From the Top menu select **Workspace** to access the workspaces and **Resources** management screen.

3 The side menu allows you to switch between **Workspaces** and **Resources**. Select **Resources**.

4 Select the operation mode from the dropdown menu. The available working modes are:

- TV Analyzer.
- WiFi

5 Now, at the toolbar, you can find all the tools with available resources. Depending on the operation mode selected different resources can appear. They are:

- Tools
- CH Plans
- Quality

6 When you tap on one of these resources, it will show a list with all the related files.

7 Files can be selected one by one by clicking on the box next to the file, or a multiple selection can be made by clicking on the box in the header.

8 When you long-press on a file, a menu pops up, providing the following actions:

- **Rename**: It allows you to change the name using the virtual keyboard.
- **Remove**: It deletes the file after confirmation.
- **Export to USB**: It copies the selected files to the memory drive plugged into the USB port. The progress of the action will appear in the notification window until it is finished.
- **Import to workspace**: It copies the selected files to the enabled workspace. The progress of the action will appear in the notification window until it is finished.

9 Select the desired option from the menu.

6.6 Case of use: Accessing saved data

I have captured the spectrum in TV Analyzer mode and saved it with the name "test". Now I want to view it on my PC. How do I do it?

1 Access the **Top** menu by swiping down from the top of the screen.

2 Tap on the **Workspaces** option. The Workspaces screen will appear.

3 Tap on the workspace folder that was selected at the time of the screenshot (if no workspace was created, select the "default" option).

4 Connect a memory drive to the USB port.

5 In the **Working Mode** menu, select the **TV Analyzer** mode.

6 On the toolbar, click on **Screenshots**.

7 The list of captured files should appear, and one of them should be a file named "test". Long-press on the file name and from the popup menu, select **Export to USB** to copy the file to the USB memory.

8 Safely eject the USB memory from your meter and connect it to your PC in order to view the image.

6.7 Case of use: Loading a Workspace

I want to load a workspace called "test" where I have saved all the measurements taken at an installation. How do I do it?.

1 Go to the Home menu by clicking on the Promax icon located in the bottom-left corner. **It is only possible to load a workspace by accessing the option from the Top menu of the Home screen.**

2 Access the **Top** menu by swiping down from the top of the screen.

3 Tap on the **Workspace** option. The **Workspace** screen will appear.

4 Press and hold the workspace you want to load until a pop-up menu appears.

5 In the pop-up menu, select the **Load** option.

6 A message will appear indicating that the workspace has been loaded.

7 From this moment, the workspace loaded is the active folder where all screenshots, measurements, and data generated is stored.

8 The name of the active workspace will appear at the top-left corner of all screens.

7 WEBCONTROL

7.1 Introduction

The webControl function allows you to connect remotely to the meter in order to visualize measurements and operate on it. The meter must be connected to a data network. To connect to meter from a remote access device use just a standard web browser.

webControl tools are:

- Remote Console: It emulates and allows you to interact with the equipment in first person.

The next section explains how to configure the meter to be able to connect remotely.

7.2 Settings and Remote Access

► Meter Settings

1 The meter can be connected to a data network via an Ethernet cable or via WiFi. To access the configuration parameters:

- Ethernet network: From the main **Home** screen, access the network settings by pressing the **Settings** option. Go to the **Network** settings, where you will find the configuration parameters to register on the network (for more details refer to "►Network" on page 24).
- WiFi network: Connect the USB-WiFi dongle to the USB port. Access the **Top** menu by swiping your finger from top to bottom of the screen. Select the **WiFi** option to access the WiFi network configuration settings (for more details refer to "►WiFi Settings" on page 31).

2 Select **DHCP enabled**, if you connect the equipment to a network with a router or server with DHCP protocol. Then the network will set automatically the parameters in the meter. If not, follow the next steps to set the meter.

3 On **IP Address** enter the equipment IP. Use an IP in the same range used by your PC in the local network (if you do not know these data see "find out local network data" section). For instance, if the IP for your PC is 10.0.1.18, the equipment must have a free IP in the same range, like 10.0.1.50.

4 In the **Mask** box, enter the mask value, which should be the same as the one used by the local network (usually 255.255.255.0; if you do not know these data see "find out local network data" section).

5 To connect the equipment from an external network, fill in the **Gateway** with the info obtained from the local network. In the DNS fields, you can either leave the default values or assign others.

6 Connect the equipment to a data network with Internet access. You can use an Ethernet cable connected to the IP CTRL port or in case of WiFi network, connect the USB WiFi adapter to the USB port, select the network and enter the password.

► Find out Local Area Network Data (LAN)

1 To obtain data from the Ethernet network where your meter is connected, you should use a PC connected to this same network.

2 From the PC click on **Start** menu in Windows. On the Search box write **CMD** and press **Enter**.

3 In opens a command line window. Write **IPCONFIG** and press enter.

4 It displays a window with some lines with info. On line "Local Network Ethernet Adapter" see line "IPv4 Address". This is the local IP for your PC. Write down this IP. Also write down "Subnet Mask" and "Default Gateway". This data is needed to configure the meter by hand.

► Remote Access

1 From a remote access device (PC, mobile device) run a standard web browser (Chrome recommended).

2 On the address bar write the address to remotely access the meter. To view or edit this IP address, from **Home** go to **Settings -> Network**.

3 If the connection is successful, it should appear on screen the webControl access screen.

Figure 36.

4 Enter user and password and press "Login" to access the webControl.

5 User and password by default are:

- **Role: administrator**
  - User: admin
  - Password: admin
- **Role: guest (only for watching)**
  - User: guest
  - Password: guest

6 The AD user (administrator) can interact freely with the device as if physically present. The GU user (guest) can only observe the device without being able to interact with it.

NOTE: The webControl uses ports 80.

In the browser, JavaScript must be enabled in order to use the webControl.

There are many ways to connect to the meter from an external network. If you have follow these instructions and you fail to connect the webControl, please contact PROMAX technical assistance and we will help you (promax@promax.es).

7.3 Remote Console

► Description

Remote Console allows you to interact remotely with the meter like you were in front of it. To interact with the meter you can use the mouse pointer as a touch on screen.

The meter can be used simultaneously both remotely and locally.

► **Screen**

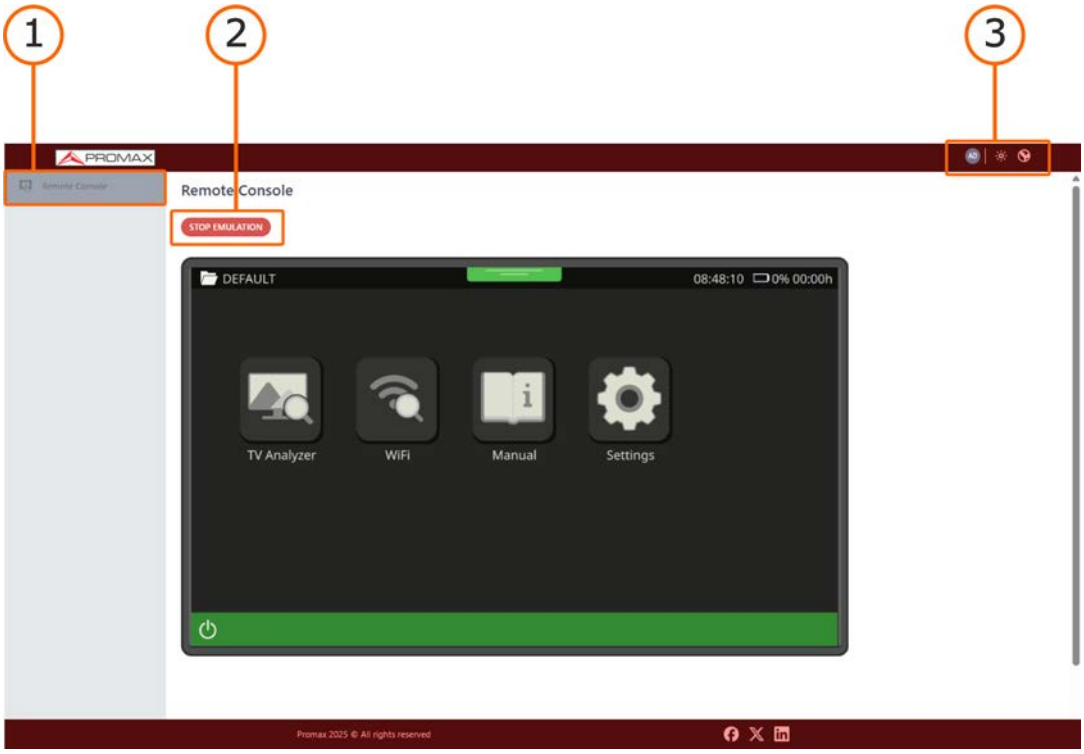


Figure 37.

1 Selected function (Remote Console).

2 Start / Stop console emulation button. To start emulation press on **Start emulation**. To end the emulation press on **Stop emulation**.

3 Setting options:

- User (AD/GU): reboot equipment / about / logout. AD means that the session has been started as an administrator. GU means that the session has been started as a guest.
- Theme (light / dark).
- Language (English / Spanish).

8 SPECIFICATIONS TV EXPLORER NG

8.1 General

► Inputs and Outputs

Parameter	Value	Additional Data
RF Input		
Connector	BNC 75 Ω	
Maximum Input Power	15 dBm	5 MHz - 20 MHz
	23 dBm	20 MHz - 6 GHz
Maximum Input Voltage	50 Vrms	DC - 100 Hz (with AL-103)
	30 Vrms	DC - 100 Hz
Optical Input		
Connector	FC-APC	female
Optical Power Measurement Range	800 - 1700 nm	
Analogue Video Input		
Input Connector	Multipole Jack	Zin=75 Ω
Sensibility	1 Vpp	75 Ω; positive video
Analogue Audio Input		
Input Connector	Multipole Jack	Zin=3 kΩ; same input as video
Digital Video / Audio Output		
Output Connector	Supports HDMI 1.4b with 2.9 Gb/s	Resolution up to 3840x2160 @30 Hz
Audio Output		
Output Connector	Multipole Jack 32 Ω	Stereo; to connect headphones or external speakers
Speakers	1 speaker (mono)	
USB Interface 3.0		
Connector	USB type A	
File systems supported	FAT32, exFAT, NTFS, ext3, ext4	
Features	Mass Storage Host	Can read and write on a pendrive USB
	USB CDC	CDC: Communication device class (GPS, probes)
USB Interface 2.0		
Connector	USB type C	
File systems supported	FAT32, exFAT, NTFS, ext3, ext4	
Features	Two modes: master or device	
	Master: mass storage host, USB CDC	For GPS, probes
	Device: Virtual COM	Remote control of the equipment through remote commands

Parameter	Value	Additional Data
IP Interface (control IP)		
Connector	RJ45	Labeled IP CTRL
Type	Ethernet 10 / 100 Mbps / 1 Gbps	
Communication Software	webControl	
	Remote commands	
	SNMP protocol	
	SFTP protocol	
WiFi Interface		
Type	Wireless standard 802.11 abgn	Dongle-Wifi connected to USB port
		Dongle must be validated by PROMAX
Remote control Interfaces		
Interfaces	RJ45 Ethernet; USB virtual COM; WiFi	
Remote control	JSON: sending and receiving remote commands with JSON files	All interfaces
	webControl: web technology using a standard browser	RJ45, WiFi interfaces (open port: 80; allow javascript in the web browser)
	SNMP protocol	Interfaces: RJ45, WiFi
	SFTP protocol	user: atlas; password: password
Monitor Display		
Monitor	7" TFT touch panel	
Aspect Ratio	4:3	
Format	1024 x 600 dots	(RGB); (W) x (H)
Brightness	380 cd/m^2	
External Unit Power (through the RF input connector)		
Terrestrial Supply	External	
	5 V	Up to 500 mA
	12 V	Up to 500 mA
	24 V	Up to 250 mA
Satellite Supply	External	
	5 V	Up to 500 mA
	13 V	Up to 500 mA
	15 V	Up to 500 mA
	18 V	Up to 500 mA
22 kHz Signal Voltage	0.65 V ± 0.25 V	Selectable in Satellite band
22 kHz Signal Frequency	22 kHz ± 4 kHz	Selectable in Satellite band
DiSEqC Generator	DiSEqC 2.x (DiSEqC 1.2 commands implemented)	DiSEqC is a trademark of EUTELSAT
SATCR / SCD (EN50494)	Available	DiSEqC 1.2 available
dCSS / SCD2 (EN50607)	Available	Compatible with LNB SKY UK According DiSEqC 2.x
LNB Band	Ku / Ka / C	
Polarity	Horizontal / Vertical, Right / Left	

►Operation Modes

Parameter	Value	Additional Data
TV Analyzer	Available	
WiFi	Available	

►Channel Plans

Parameter	Value	Additional Data
CCIR	Available	
OIRT	Available	
STDL	Available	
FCC	Available	
EIA	Available	

►Datalogger

Parameter	Value	Additional Data
Stored Data	Signal type, all measures available for the detected signal type, and time stamp, PSI info for each measured channel	If GPS is connected to USB port, the equipment stamps GPS coordinates in each measurement made. For DVB-T2, DVB-C2 or ATSC 3.0* signals it saves information from all PLPs. In case of Satellite signal it also saves polarization.
Timestamp	Date and time at each measured channel	

*. Only for **ATSC** version of **TV EXPLORER NG**

►Mechanical Features

Parameter	Value	Additional Data
Dimensions	23.4 x 18.38 x 7.3 (cm)	(W) x (H) x (D)
Weight	1890 (g)	Without installed options
Volume	TBD	

►Power Supply

Parameter	Value	Additional Data
Internal Battery	7.4 V; 12.2 Ah	LiPo Smart battery
Battery Operation Time	between 3 and 4 hours	With smart power management
TV Analyzer mode	4 hours aprox.	con UHD TV y demodulación DVB-T2
WiFi mode	4 hours aprox.	at 2,4 GHz band
Charging time	6 h 15 min (100%)	5 h (80%)
External Voltage	12 ± 2 V DC	
Consumption	30 W	
Energy saving	Auto power off TFT Off	Configured by user

►Operating Environmental Conditions

Parameter	Value	Additional Data
Altitude	Up to 2000 m	
Temperature Range	From 5 °C to 45 °C	Automatic disconnection by excess of temperature
Max. Relative Humidity	80%	Up to 31°C; decreasing lineally up to 50% at 40 °C.

NOTE: Equipment specifications are set in these environmental operating conditions. Operation outside these specifications is also possible. Please check with us if you have specific requirements.

►Included Accessories

Parameter	Value	Additional Data
1x AL-103	External DC charger	
1x CA-005	Mains cord for external DC charger	
1x AA-103	Car cable for external DC charger	
1x CB-097	Rechargeable Li-Po battery	built-in
1x AD-055	F - BNC (f/f) adapter	(m: male; f: female)
1x AD-056	F - DIN (f/f) adapter	
1x AD-057	F -F (f/f) adapter	
1X AW010	WiFi-USB dongle	
1x CC-046	Jack cable (4V) RCA	
1x DC-309	Transport belt	
1x DC-310	Carrying bag	
1x DG0453	Quick reference guide	

►Optional accessories

Parameter	Value	Additional Data
1x DC- 229	Transport suitcase	

NOTE: It is recommended to keep all the packing material in order to return the equipment, if necessary, to the Technical Service.

8.2 TV Analyzer Mode

8.2.1 Supported Standards

► **DVB-T**

Parameter	Value	Additional Data
Modulation	COFDM	
Margin of power Measurement	-85 dBm to +23 dBm	+20 dBµV to +130 dBµV
Power measurement accuracy	± 1,5 dB	
Sensibility	< -86,7 dBm	@1000 MHz QPSK 5/6 8K 8 MHz
Frequency resolution	1 kHz	
Measurement	Power, CBER, VBER, MER, PER, C/N and Link Margin	
Tuning Range	45 - 1000 MHz	
C/N	TBD	
MER	TBD	
Standard compliant	European Standard for DVB-T	ETSI EN 300-744 v.1.6.1
	All European Standards for static and portable equipment and targeting upcoming Digital Europe e-book requirements	NorDig-Unified Test Specs ver2.5.0 DTG D-Book 8.0 IEC 62216

► **DVB-T2**

Parameter	Value	Additional Data
Profiles	T2-Base, T2-Lite	
Modulation	COFDM	
Margin of power Measurement	TBD	
Power measurement accuracy	± 1,5 dB	
C/N	TBD	
MER	TBD	
Sensibility	TBD	
Frequency resolution	1 kHz	
Measurement	Power, CBER, C/N, LBER, MER, Link Margin, BCH ESR, LDP Iterations and PER	Measurement of LBER below 1E-10
Tuning Range	45 - 1000 MHz	
Standard compliant	European Standard for DVB-T2	ETSI EN 302-755 v1.3.1
	All European Standards for static and portable equipment and targeting upcoming Digital Europe e-book requirements	NorDig-Unified Test Specs ver2.5.0 DTG D-Book 8.0 IEC 62216

► **ISDB-T**

Parameter	Value	Additional Data
Modulation	COFDM	
Margin of power Measurement	-87 dBm to +23 dBm	+20 dBµV to +130 dBµV
Power measurement accuracy	± 1,5 dB	

Parameter	Value	Additional Data
C/N	TBD	
MER	TBD	
Sensibility	TBD	
Frequency resolution	1 kHz	
Measurement	Power, CBER, VBER, MER, PER, C/N, PER and Link Margin	
Tuning Range	45 - 1000 MHz	
Standard compliant	ARIB Transmission System for DTT Broadcasting	ARIB STD-B31 v2.2

► DVB-C

Parameter	Value	Additional Data
Modulation	QAM	
Margin of Power Measurement	-87 dBm to +23 dBm	+20 dBµV to +130 dBµV
C/N	TBD	
MER	TBD	
Power measurement accuracy	± 1,5 dB	
Sensibility	-67dBm	995 MHz/256QAM/SR=6,95MS/s
Frequency resolution	1 kHz	
Measurements	Power, BER, MER, PER, C/N, PER and Link Margin	
Tuning Range	45 – 1000 MHz	
Standard compliant	Digital Video Broadcating for cable systems	ETSI EN 300-429 v1.2.1
	NorDig-Unified Test Specification	ver 2.5
Symbol Rate	1700 - 7200 kbauds	

► DVB-C2

Parameter	Value	Additional Data
Modulation	QAM	
Margin of Power Measurement	-87 dBm to +23 dBm	+20 dBµV to +130 dBµV
C/N	TBD	
MER	TBD	
Power measurement accuracy	± 1,5 dB	
Sensibility	TBD	
Frequency resolution	1 kHz	
Measurements	Power, CBER, MER, PER, C/N, LBER, BCH ESR, LDP Iterations, PER	
Tuning Range	45 - 1000 MHz	
Standard compliant	Digital Video Broadcating for cable systems	ETSI EN 300-769 v1.2.1

► J83 Annex B

Parameter	Value	Additional Data
Modulation	QAM	
Margin of Power Measurement		
Power measurement accuracy	± 1,5 dB	

Parameter	Value	Additional Data
C/N	TBD	
MER	TBD	
Sensibility	TBD	
Frequency resolution	1 kHz	
Measurement	Power, BER, MER, PER, C/N and Link Margin	
Tuning Range	45 - 1000 MHz	
Standard compliant	International Telecommunication Union standard	ITU-T J.83 v3.0

► Analogue Signal

Parameter	Value	Additional Data
Tuning range	45 - 1000 MHz	
Frequency resolution	1 kHz	
Power measurement accuracy	± 1,5 dB	
Colour System	PAL, SECAM and NTSC	Identification and measurement, video and audio
Standard Supported	M, N, B, G, I, D, K and L	Identification and measurement, video and audio
Measurements	Level, C/N, A/V	

► DVB-S

Parameter	Value	Additional Data
Modulation	QPSK	
Margin of Power Measurement		
Power measurement accuracy	± 1,5 dB	
C/N		
MER		
Sensibility		
Frequency resolution	1 kHz	
Measurements	Power, CBER, VBER, MER, C/N and Link Margin	
Symbol Rate	1,1 - 80 Msym/s	
Tuning Range	950 – 2150 MHz	

► DVB-S2

Parameter	Value	Additional Data
Modulation	QPSK, 8PSK, 16APSK, 32APSK	Long frames and short frames
Margin of Power Measurement		
Power measurement accuracy	± 1,5 dB	
C/N	>= 50 dB	
MER		
Sensibility		
Frequency resolution	1 kHz	
Measurements	Power, CBER, LBER, MER, PER, C/N, BCH ESR and Link Margin	

Parameter	Value	Additional Data
Symbol Rate	500 ksym/s - 80 Msym/s	The TS provided by the demodulator will only be processed if the bitrate is below 200 Mbit/s.
Supporting	TS, GPS and GCS MODCODs CCM, ACM and VCM	
Tuning Range	950 – 2150 MHz	

► DSS

Parameter	Value	Additional Data
Modulation	QPSK	
Margin of Power Measurement		
Power measurement accuracy	± 1,5 dB	
C/N		
Sensibility	TBD	
Frequency resolution	1 kHz	
Measurements	Power, CBER, VBER, MER, PER, C/N and Noise Margin	
Tuning Range	950 - 2150 MHz	

► DVB-S2x

Parameter	Value	Additional Data
Modulation	QPSK, 8PSK, 8APSK-L, 16APSK, 16APSK-L, 32APSK, 32APSK-L, 64APSK, 64APSK-L, 128APSK, 256APSK, 256APSK-L	Long frames and short frames
Power measurement accuracy	± 1,5 dB	
MER	Max: 30 dB; Min: 0 dB	Freq: 1500 MHz; SR= 27,5 MS/s; CR=1/2
Sensibility	TBD	
Frequency resolution	1 kHz	
Measurements	Power, CBER, LBER, MER, C/N, BCH ESR, PER and Link Margin	
Symbol Rate	200 ksym/s - 80 Msym/s	The TS provided by the demodulator will only be processed if the bitrate is below 200 Mbit/s.
Supporting	TS, GPS and GCS CCM, VCM y ACM MODCODs	
Tuning Range	950 - 2150 MHz	

► ATSC 1.0*

Parameter	Value	Additional Data
Modulation	8VSB	
Margin of Power Measurement	-87 dBm to +23 dBm	+20 dBµV to +130 dBµV
Power measurement accuracy	± 1,5 dB	
C/N	>= 50 dB	
MER	Max: 42 dB; Min: 14 dB	Freq: 698 MHz
Sensibility	TBD	
Frequency resolution	1 kHz	
Measurement	Power, SER, VBER, MER, PER, C/N and Link Margin	
Tuning Range	45 - 1000 MHz	
Standard compliant	ATSC Digital Television Standard	ATSC A/53-part 2 (2011)

► ATSC 3.0**

Parameter	Value	Additional Data
Modulation	COFDM	
Margin of Power Measurement	-87 dBm to +23 dBm	+20 dBµV to +130 dBµV
Power measurement accuracy	± 1,5 dB	
C/N	>= 50 dB	
MER	Max: 40 dB; Min: -4 dB	Freq: 698 MHz; BW=6 MHz; mode=8K
Sensibility	TBD	
Frequency resolution	1 kHz	
Measurement	Power, CBER, MER, PER, C/, LBER, BCH ES	
Tools	ALP Recording	
Tuning Range	45 - 1000 MHz	
Standard compliant	ATSC Digital Television Standard	ATSC A/321 (2016) ATSC A/322 (2017) ATSC A/330 (2016)

8.2.2 TV Analyzer Tools

► Spectrum

Parameter	Value	Additional Data
Tuning range	5 MHz - 2150 MHz	
Markers	1	It shows frequency, level, frequency difference and level difference
Reference Level	Selectable	linked or not to attenuators
Attenuator	5 dB steps	Automatic / manual mode
Digital channels measurement	Power, C/N	Units: dBuV, dBmV, dBm

*. Only for **ATSC** version of **TV EXPLORER NG**

. Only for **ATSC version of **TV EXPLORER NG**

Parameter	Value	Additional Data
Advanced functions	Trace max hold	
	Trace min hold	
	dB / div: 10, 5, 2, 1 dB	
Measurement resolution	0,1 dB	
Measurement accuracy	± 1.5 dB	
Frequency resolution		
Accuracy of frequency reference		
Terrestrial sweep		
Satellite sweep		
Indicators	Saturation	
Markers	Absolute and referenced	
Scan rate	8 GHz/s	
Displayed Average Noise Level (DANL)		
Dynamic		
Display Range		
Return lost (RL)		
Terrestrial Band		
Tuning range	5 - 1000 MHz	
Tuning mode	Channel or frequency	
Frequency Accuracy		
Resolution Bandwidth (RBW)	100 kHz	
Span		
Span settings	numeric value or predefined	
Span predefined values	10, 20, 50, 100, 200, 500, 995 MHz	
Minimum Span	10 kHz	
Maximum Span	995 MHz	
Amplitude		
Max input voltage		
Max level input		
Satellite Band		
Tuning range	950 - 2150 MHz	
Tuning mode	Channel or frequency	
Frequency Accuracy		
Resolution Bandwidth (RBW)	100 kHz	
Span		
Span settings	numeric value or predefined	
Span predefined values	10, 20, 50, 100, 200, 500, 1000 MHz, full	
Minimum Span	10 kHz	
Maximum Span	2750 MHz	
LNB		

Parameter	Value	Additional Data
Band	Ku / Ka / C	
Polarity	Horizontal / Vertical, Left / Right	

► Video

Parameter	Value	Additional Data
Codecs		
	MPEG-2	HD, MP, HL up to 1080p6
	H.264	CBP, MP, High Profile Level 5.2 up to 1080p240 / 4Kp60
	H.265 4K UHD	MMP L5.1 8b/10b up to 4Kp60

► Audio

Parameter	Value	Additional Data
Codecs	MPEG-1	
	MPEG-2	
	AAC HE-AAC	
	Dolby Digital (DD) Dolby Digital + (DD+)	
	Dolby AC-4 Dolby AC-4 ATMOS	

► Transport Stream

Parameter	Value	Additional Data
Communication Protocol	MPEG-2	
Packets	188 or 204 bytes	Automatic detection
Max. Bitrate	150 Mbit/s	
Max. Recording Bitrate	200 Mbit/s	
Recording	Internal memory or external USB	
Recording Internal Memory	8 GB	
TS Analyser		
Standards supported	DVB, ATSC*, ISDB-T SCTE	
PSI Tables	PAT, PMT, NIT, CAT	Hierarchical table tree
SI Tables	NIT, BAT, SDT, EIT, TDT, TOT, MIP	Hierarchical table tree

*. Only for **ATSC** version of **TV EXPLORER NG**

► Other Tools

Parameter	Valor	Additional Data
Echoes	Available for DVB-T, DVB-T2, DVB-C2, ISDB-T, ATSC 3.0*	
Constellation	Available for DVB-T, DVB-T2, DVB-C, DVB-C2, DSS, DVB-S, DVB-S2, ISDB-T, J83 Annex B, ATSC 3.0**	
MER by Carrier	Available	
Optical power measurement	Available	

Parameter	Valor	Additional Data
TS Recording	Available	
Spectrogram	Available	
Merogram	Available	

*. Only for **ATSC** version of **TV EXPLORER NG**

. Only for **ATSC version of **TV EXPLORER NG**

► Advanced Tools

Parameter	Value	Additional Data
Channel exploration	Available	
Datalogger	Available	
Task Planner	Available	
Blind Scan (Discover SAT)	Available	Discovers transport packet streams from satellite spectrum and creates a channel plan.

8.3 WiFi Mode

Parameter	Value	Additional Data
Interface	Dongle-Wifi connected to USB port	Dongle must be validated by PROMAX
Standards	Wireless standard 802.11 ac/a/b/g/n	802.11ac 2x2 compliant with MU-MIMO
Max. data rates	54 Mbps for 802.11g 300 Mbps for 802.11n 866,7 Mbps for 802.11ac	
ISM bands	2.412 - 2.484 GHz 5.150 - 5.850 GHz	
Measurements		
RSSI (dBm)	Range: -100 dBm to -20 dBm	Received Signal Strength Indicator
Occupied AP (%)	0 - 100%	
SNR (dB)	Available	Signal to noise ratio
Noise (dBm)	Available	

8.4 Options

► Fibre Optics

Parameter	Value	Additional Data
Descriptive Code	OP-002-PS	
Selective Optical Power Meter		
Connector	FC-APC	female
Optical Measure bands	1310 nm ± 50 nm; 1490 nm ± 10 nm; 1550 nm ± 15 nm	
Optical Power Measurement Dynamic Range	- 49,9 dBm to +5 dBm	Accuracy ± 0,5 dB

► DAB / DAB+

Parameter	Value	Additional Data
Descriptive Code	OP-002-DAB	
Tuning range	45 - 1000 MHz	
Frequency resolution	1 kHz	
Margin of Power measurement	-95 dBm - +20 dBm	Accuracy ± 1,5 dB
Sensitivity	-95 dBm	
Tools	TII, Echoes, Constellation, MERxCARRIER	
Measurement	Power, C/N, MER, CBER	Max. measurement MER = 40 dB
	MSC CBER, FIC CBER	
	Frequency offset, bandwidth	
	FIB Ratio	

► Advanced FM

Parameter	Value	Additional Data
Descriptive Code	OP-002-FM	
Tuning range	45 - 1000 MHz	
Frequency resolution	1 kHz	
Accuracy of level measurement	± 1,5 dB	
MPX deviation	Up to 100 kHz	Accuracy < ± 2 kHz
MPX power	Up to 100 kHz	Accuracy < ± 0.2 dB
Sensitivity	8 dBµV / -99 dBm	S+N/N = 12 dB
Tools	Histogram	ITU-R SM. 1268-4 all samples and accumulated. ITU-R SM. 1268-2 all samples and accumulated.
	MUX spectrum	
Measurement	Level, C/N, MPX power	
	Frequency offset, bandwidth	
	Frequency deviation: left (L), right (R), L+R, L-R, MPX, RDS, Pilot	
	Level: left (L), right (R), L+R, L-R, MPX	
RDS information	Available	

9 MAINTENANCE

9.1 Shipping Instructions

Instruments returned for repair or calibration, either within or out of the warranty period, should be sent with the following information: Name of the Company, name of the contact person, address, telephone number, receipt (in the case of coverage under warranty) and a description of the problem or the service required.

9.2 Considerations about the Screen

This paragraph offers key considerations regarding the use of the color screen, taken from the specifications of the manufacturer.

In the TFT display, the user may find pixels that do not light up or pixels that are permanently lit. This should not be regarded as a defect in the TFT. In accordance with the manufacturer quality standard, 9 pixels with these characteristics are considered admissible.

Pixels which are not detected when the distance from the surface of the TFT screen to the human eye is greater than 35 cm, with a viewing angle of 90° between the eye and the screen should not be considered manufacturing defects either.

It is advisable a viewing angle of 15° in the 6.00 o'clock direction in order to obtain the optimum visualization of the screen.

9.3 Cleaning Recommendations

The equipment consists of a plastic case and a TFT screen. Each element has its specific cleaning treatment.

►Cleaning the Screen

The TFT screen surface is DELICATE. It has to be cleaned with a soft fabric cloth (cotton or silk), always making the same move from left to right and from top to bottom, without putting pressure on the screen.

The TFT screen has to be dry-cleaned or with a product specifically designed for TFT screens, by slightly dampening the cloth. NEVER use tap or mineral water, alcohol or conventional cleaning products, because they contain components that can damage the screen.

Turn off the equipment to locate dirt on the screen. After cleaning, wait a few seconds before turning on.

►Cleaning the Plastic Case

The equipment has to be disconnected before cleaning the case.

The case must be cleaned with a solution of neutral soap and water, using a soft cloth dampened with this solution.

Before use, the equipment has to be completely dry.

Never clean with abrasive soaps, chlorinated solvents or aromatic hydrocarbons. These products may degrade the case.

i OPTICAL OPTION

This annex contains operating instructions for the next option:

- OP-002-PS: Selective measurement of Optical Power.

The optical input measures the total power transmitted through the fiber optic cable. With this option the equipment can measure each of the three wavelengths (lambdas) that are transmitted through the fiber optic cable.

i.1 Optical option Installation

1 From **Home** press on **Settings** .

2 Press on **Options** on the **General** settings row.

3 The **Options** screen shows a list of all tools already installed from different options.

4 The **Optical** option is made up of different tools that are explained next. These tools should appear in the list. If they do not appear, then the option is not installed.

5 To install this option press on "+" and enter the option code.

6 The option code is unique. Contact PROMAX if you are interested in this option (https://www.promaxelectronics.com/ing/contact-promax/).

i.2 Selective measurement of Optical Power

1 Connect the fiber optic cable to the FC-APC input connector.

2 From **Home** press on **TV Analyzer** .

3 Swipe down from the top of the screen to display the **Top menu**.

4 Select the **Optical Power** option from the Top menu. Select **On** in the field **Status**.

5 In the **Select lambda (nm)** field, choose one of the three available wavelengths (lambda) (1310, 1490, and 1550 nm).

6 On the right side, a power meter for each lambda appears. It should display the power for the selected lambda.

ii DAB/DAB+ OPTION

ii.1 Description

This annex contains operating instructions for the next option:

- OP-002-DAB: Measurement for DAB and DAB+ digital radio.

The DAB (Digital Audio Broadcasting) is a digital radio standard, designed for both home and portable receivers to broadcast terrestrial and satellite audio and also data. It works with Band III and frequencies.

The DAB+ is an evolution of DAB using the AAC + audio codec. It also includes Reed-Solomon error correction, which makes it more robust. DAB receivers are not compatible with DAB+ receivers.

ETI (Ensemble Transport Interface) is the output stream for a DAB/DAB+ multiplexer. The ETI is divided in several layers with information about the radio signal. It is similar to the transport stream obtained when multiplexing a TV signal.

The DAB+ option has some exclusive tools. It is also able to decode and show images (slideshow) that some broadcasters sent to complement audio services.

DAB and DAB+ Analysis (11:06s) SCAN

Video 24.

The DAB+ option has some exclusive tools. It is also able to decode and show images (slideshow) that some broadcasters sent to complement audio services.

Also some standard tools such as Echoes, Constellation and MER by carrier are also available on DAB/DAB+.

ii.2 DAB/DAB+ option Install

1 From the **Home** menu press on **Settings** .

2 Press on **Options** at **General** settings section.

3 The **Options** screen shows a list of all tools already installed from different options.

4 The **DAB/DAB+** option is made up of different tools that are explained next. These tools should appear in the list. If they do not appear, then the option is not installed.

5 To install this option press on "+" and enter the option code.

6 The option code is unique. Contact PROMAX if you are interested in this option (https://www.promaxelectronics.com/ing/contact-promax/).

ii.3 DAB/DAB+ Tuning

1 Connect the RF input signal cable to the RF input connector.

2 From the **Home** Menu press on **TV Analyzer** .

3 On the main window, press ▼ and select the **Spectrum** tool. On the small windows, you can select other tools, like the video tool to watch the demodulated signal or the measurements tool to check power and MER.

4 Swipe right from the left side or press on the tuning bar to display the tuning menu.

5 Select the **terrestrial band** .

6 Select **type of tuning**: Tune by frequency or Tune by channel .

- **Tune by frequency**: User selects a frequency to be tuned.
- **Tune by channel**: User selects a channel to be tuned. Previously the user have to select a channel plan on the Channel Plan option. A channel plan contains a list of channels with settings for each channel (frequency, type of signal, bandwidth, etc.). When tuning by channel it will apply the settings obtained from the channel plan in first place.

7 On **Signal Type** option select **Mode**:

- **Auto mode**: It identifies and tries to demodulate the signal automatically using the StealthID function (for more details refer to "►StealthID" on page 27).
- **Manual mode**: The user must enter the signal type and the parameters to identify and demodulate it.

8 Select **Span** (recommended value for terrestrial: 50 MHz).

9 Adjust the **reference level**.

10 Select channel or frequency to be tuned. You can select a frequency or channel by using the tuning menu or by dragging left or right on the screen and then tapping on the signal.

11 When on the signal, the tuning bar turns green if the signal is locked. If not locked, the tuning bar does not change its colour.

12 If locked, it tries to demodulate it. At the video tool will show the image and at signal parameters tool will show all related parameters.

ii.4 DAB Advanced Measurements

1 From the **Home** Menu press on **TV Analyzer** .

2 On the main panel, press ▼ and select the **Measurement** tool.

3 The **DAB Advanced** tool shows extra measurements for the DAB/DAB+ signal.

►Screen with DAB advanced measurements

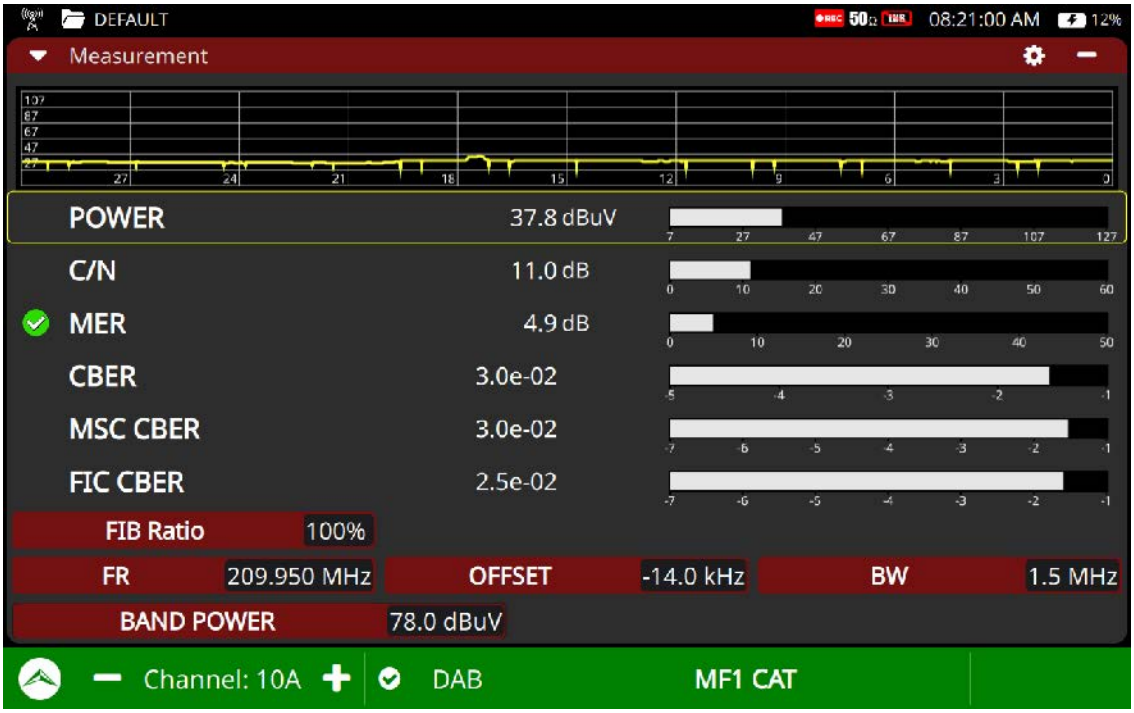


Figure 38.

► DAB/DAB+ advanced measurements

- **MSC CBER**: CBER for MSC (*Main System Channel*). It is part of ETI containing audio and images.
- **FIC CBER**: CBER for FIC (*Fast Information Channel*). It is part of ETI containing information about the configuration of the ETI itself, such as number and type of services.
- **CBER**: Bit error ratio for DAB/DAB+ channel (it includes all the ETI content).

- **FIB Ratio**: FIC quality ratio. It is calculated from wrong packets detected by CRC. 100% is the top quality level.

►Touch gestures

Tap: Select a measurement to monitor it on the graph.

►Settings

Press on the gear to display settings:

- Reset PER: It resets the PER value (Packet Error Ratio).

ii.5 DAB TII

The **DAB TII** tool shows information that identifies transmitters (TII) from the ETI locked. The graph on screen shows PRS and null symbols.

►Touch gestures

Tap: Select a transmitter.

►Screen

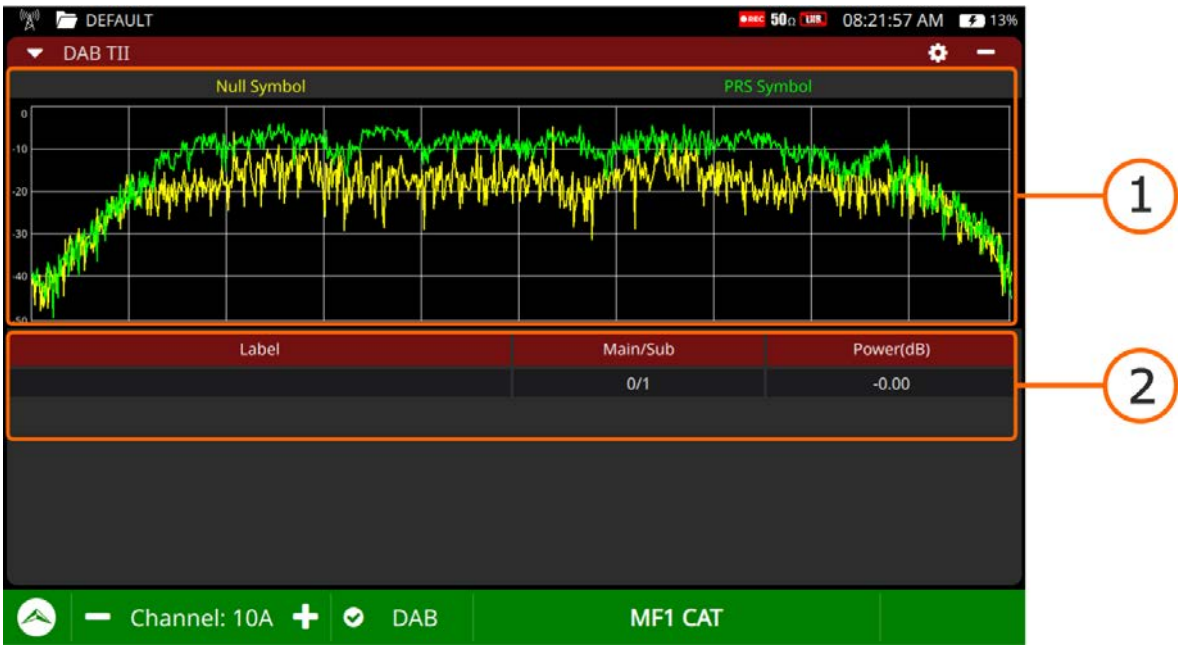


Figure 39.

1 PRS symbol spectrum (green) and null (yellow). Using the **Settings** menu you can display each one separately. It also allows you to select the display of the null symbol with or without transmitter information.

2 Transmitters data. Transmitters are ordered from highest to lowest power. It also allows you to select one of the transmitters by tapping on it. Data shown are as follows:

- Transmitter Identification label.
- Main identifier (Main) and sub-identifier (Sub) of the transmitter.
- Power of transmitter in relation to most powerful transmitter.

► Settings

Press on the gear to display settings:

- Show: It allows displaying on screen the PRS symbol, the Null symbol or both.
- Null Symbol: It allows showing the Null symbol with or without TII.

ii.6 ETI Analyzer

The **ETI Analyzer** tool displays FIC tables and service tables of ETI. All table components and contents can be viewed by expanding the node tree. This allows analysis of the tables and detailed inspection of what is being transmitted, as well as verification that the information is correctly encapsulated.

►Touch gestures

Tap: Tap on the table name to expand it and view subfields.

►**Screen**

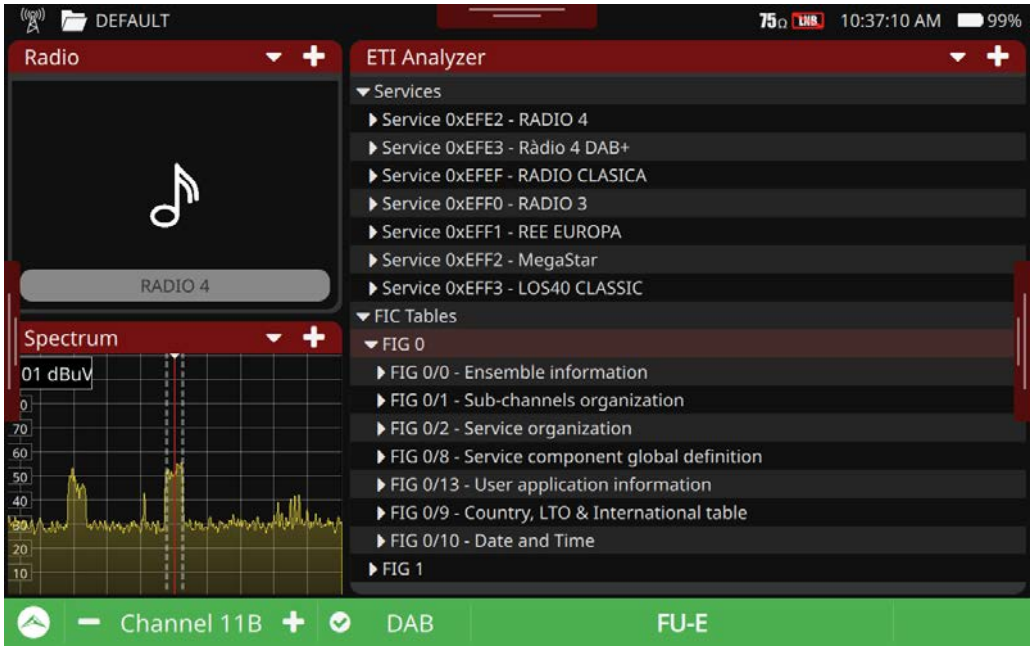


Figure 40.

- General panel: Displays all metadata extracted from the ETI. Specifically, this includes service data and the FIC (Fast Information Channel) tables and FIG (Fast Information Group) subtables. These can be expanded to view their subfields.

ii.7 IQ Recording

The **IQ Recording** tool records the RF signal in I/Q format. This recording can later be downloaded to a USB drive and played back in signal analysis software. It is not necessary to lock onto the signal to perform the DAB IQ recording.

This function is particularly valuable, as it allows RF signals to be captured at problematic measurement points for later analysis in the laboratory. The I/Q recording format enables signal playback in the laboratory using an RF signal generator.

►Screen

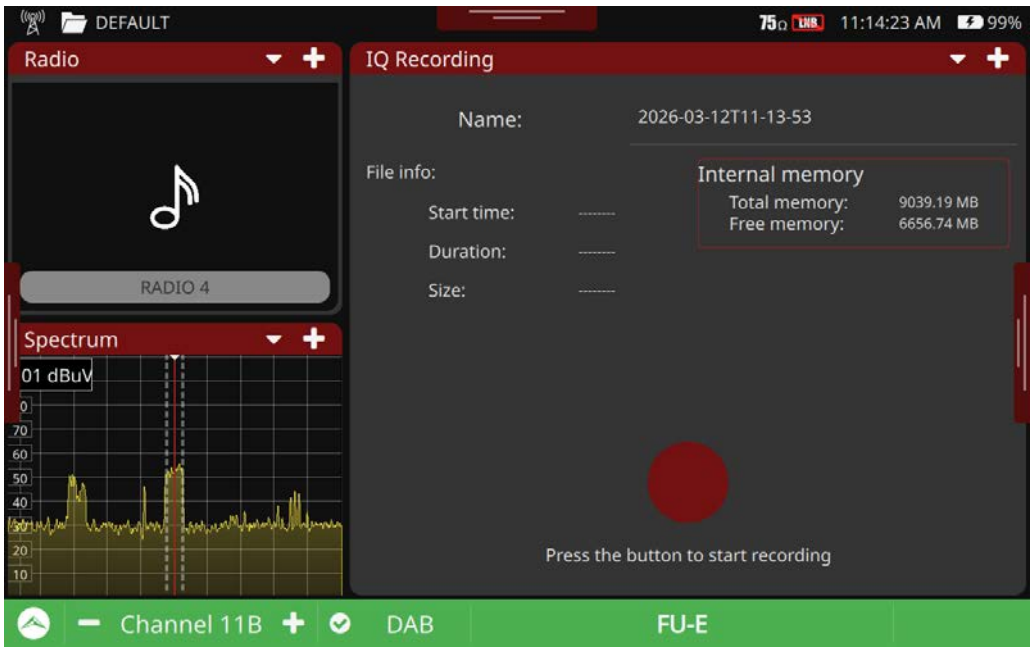


Figure 41.

1 File Information panel: On the left side, the start time, duration, and file size are displayed. On the right side, the total memory and available free memory are shown.

2 On/Off button: This button starts/stops the recording. Press the button (circle) to start recording. Press it again (square) to stop. The recording is saved in the active work folder with an IQ extension, from where it can be exported to external storage (for more details refer to "WORKSPACES" on page 87).

iii FM ADVANCED OPTION

iii.1 Description

This annex contains operating instructions for the next option:

- OP-002-FM: Advanced measurements for FM analogue radio.

The Advanced FM demodulates and uses advanced features and tools for FM measurement.

Advanced FM (03:38s) SCAN

Video 25.

Some of the included measurements are the signal level for the demodulated multiplex and the deviations of the subcarriers that form the multiplex. The added utilities display the FM multiplex spectrum and the FM histogram deviation.

iii.2 Advanced FM option Installation

1. From **Home** press on **Settings** .
2. Press on **Options** on the **General** settings row.
3. The **Options** screen shows a list of all tools already installed from different options.
4. The **FM Advanced** option is made up of different tools that are explained next. These tools should appear in the list. If they do not appear, then the option is not installed.
5. To install this option press on "+" and enter the option code.
6. The option code is a unique code for the meter. Contact PROMAX if you are interested in this option (https://www.promaxelectronics.com/ing/contact-promax/).

iii.3 FM Tuning

1 Connect the cable with the input signal to the RF input connector.

2 From the **Home** menu, press on **TV Analyzer** .

3 On the main window, press ▼ and select the **Spectrum** tool. On the small windows, you can select other tools, like the video tool to watch the demodulated signal or the measurements tool to check power and MER.

4 Swipe right from the left side or press on the bottom bar to display the tuning menu.

5 Select the **terrestrial band** .

6 Select **type of tuning**: Tune by frequency or Tune by channel .

- **Tune by frequency**: Select a frequency to be tuned.
- **Tune by channel**: User selects a channel to be tuned. Previously the user have to select a channel plan on the **Channel Plan** option. A channel plan contains a list of channels with settings for each channel (frequency, type of signal, bandwidth, etc.). When tuning by channel it will apply the settings obtained from the channel plan in first place.

7 On **Signal Type** option select **Mode**:

- **Auto mode**: It identifies and tries to demodulate the signal automatically using the StealthID function (for more details refer to "►StealthID" on page 27).
- **Manual mode**: The user must enter the signal type and the parameters to identify and demodulate it.

8 Select **Span** (recommended value for terrestrial: 50 MHz).

9 Adjust the **reference level**.

10 Select channel or frequency to be tuned. You can select a frequency or channel by using the tuning menu or by dragging left or right on the screen and then tapping on the signal.

11 When on the signal, the status bar turns green if the signal is locked. If not locked, the tuning bar does not change its colour.

12 If locked, it tries to demodulate it. **Signal parameters** tool will show all related parameters.

iii.4 FM Advanced measurements

1 From the **Home** Menu press on **TV Analyzer** .

2 On the main window, press ▼ and select the **Measurement** tool.

3 The **FM Advanced** tool shows advanced measurements for the FM signal.

►Screen

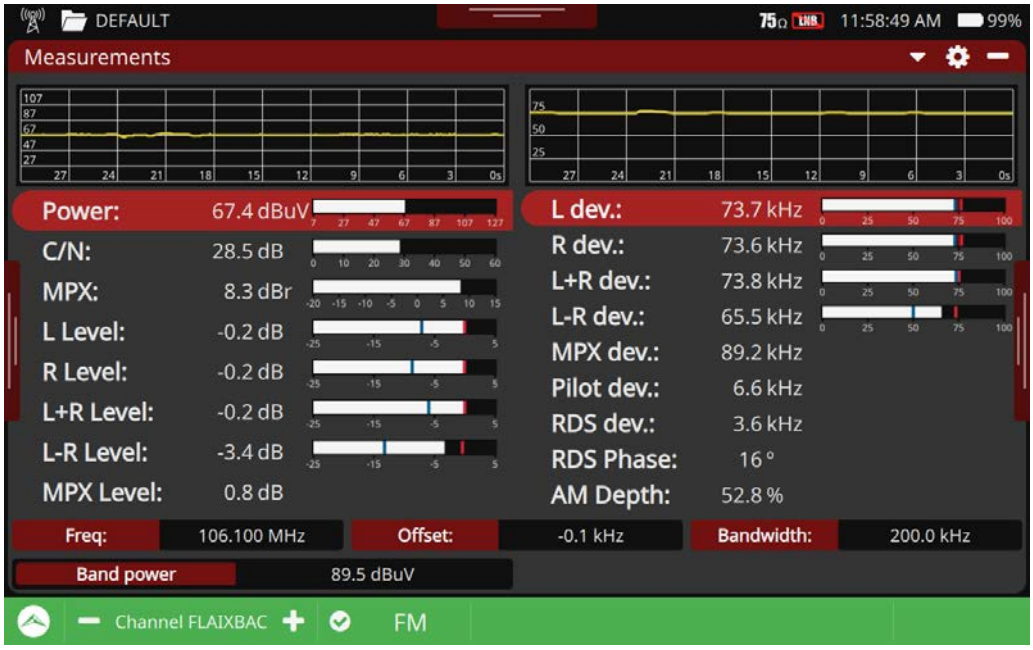


Figure 42.

► FM Advanced Measurements

- **MPX**: FM Multiplex level (dBr = dB relative to reference level).
- **Level L**: Left channel level.
- **Level R**: Right channel level.
- **L+R Level**: L+R component level (left + right), also known as mono, for MPX.
- **L-R Level**: L-R component level (left + right), also known as stereo, for MPX.
- **MPX Level**: FM Multiplex level (dBr = dB relative to reference level).
- **L Dev**: Frequency deviation caused only by L channel (once decoded).
- **R Dev**: Frequency deviation caused only by R channel (once decoded).
- **L+R Dev**: Frequency deviation caused only by L+R (or mono) component of MPX.
- **L-R Dev**: Frequency deviation caused only by L-R (or stereo) component of MPX.
- **MPX Dev**: Deviation of whole band pass filtered MPX.

- **Pilot Dev**: Frequency deviation caused only by stereo pilot (19 kHz tone) component of MPX.
- **RDS Dev**: Frequency deviation caused only by RDS subcarrier.
- **RDS Phase**: Angular phase between the pilot signal and the RDS subcarrier.
- **AM Depth**: Measurement of how much the FM signal power level fluctuates as the frequency changes (%).
- **Offset**: Frequency offset between the transmitter and the received tuned frequency.

►Touch gestures

Tap: Select the measurement to be monitored on screen.

►Settings

Press on the gear to display settings:

- Reset: It restarts measurements.
- View: It shows level or power measurement on the main window.

iii.5 Tools

In the following sections, each specific tool for Advanced FM is explained. They are as follows:

- RDS FM Parameters
- FM Histogram
- FM MPX Spectrum
- IQ Recording

iii.6 RDS FM Parameters

RDS (Radio Data System) is a system that allows FM radio stations to transmit additional digital data alongside the conventional audio signal. This data can be received by compatible devices, such as car radios or home audio equipment, which display additional information on the receiver's screen.

►Screen

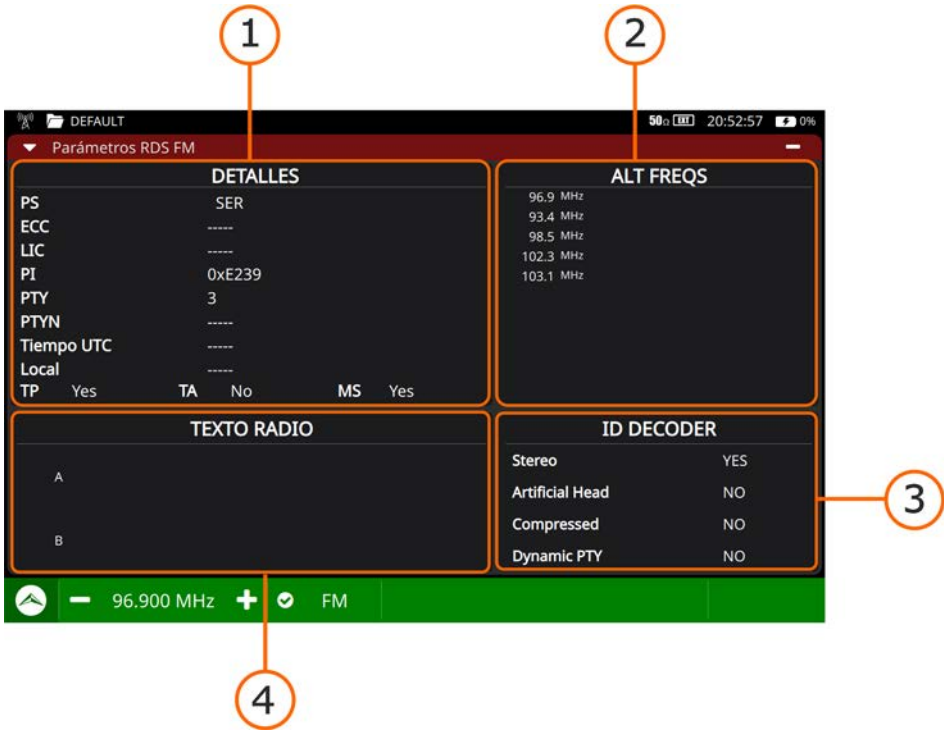


Figure 43.

1 Detailed information.

- PS: Program Service Name. The name of the radio station.
- ECC: Extended country code.
- LIC: Language Identification Code.
- PI: Programme Identification.
- PTY: Program Type.
- UTC Time: Universal time.
- Local: Local time.
- TP: Traffic program.
- TA: Traffic announcement.
- MS: Music/Spoken switcher.

2 Alternative frequencies.

3 Radio text.

4 Decoder identification.

iii.7 FM Histogram

The FM histogram shows a graph with the distribution of measurements of deviations in FM multiplexing.

►Screen

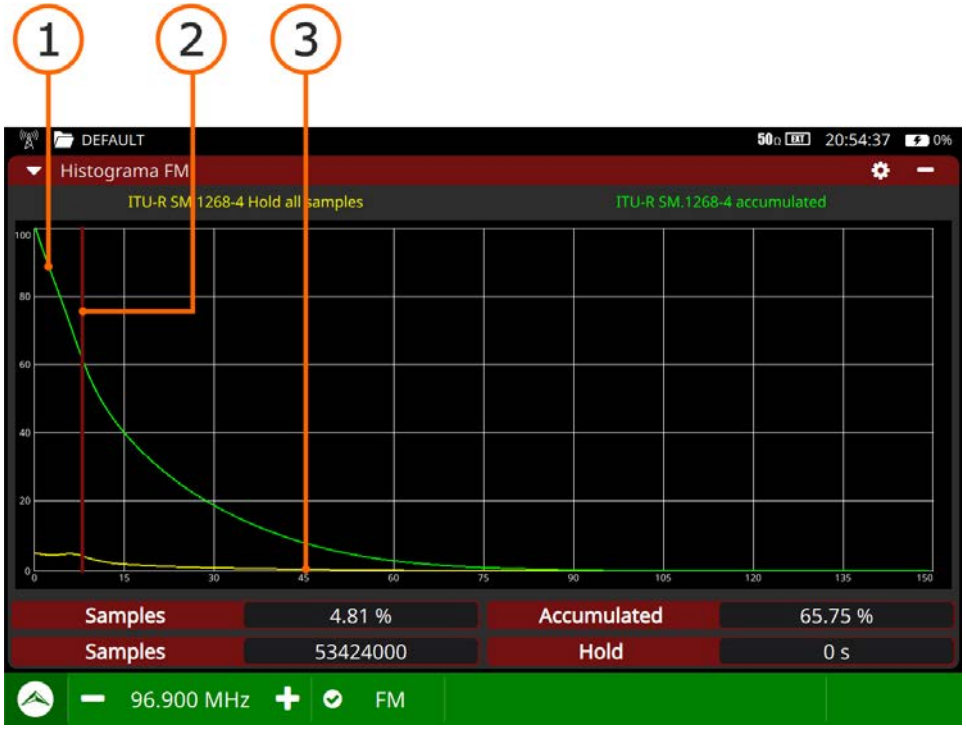


Figure 44.

1 Green line: Cumulative percentage of sample values for FM MPX deviation (measured according to the selected standard).

2 Red vertical line: Selected threshold for FM MPX deviation (typical value: 75 kHz). Press left-right to adjust the threshold.

3 Yellow line: Percentage of FM MPX deviation values (measured according to the selected standard).

4 Measurements:

- Samples: Percentage and total number of FM MPX deviation samples equal to the threshold (yellow graph).
- Cumulative: Percentage of FM MPX deviation samples that are equal to or above the threshold (green graph).
- Hold: Sample retention time.

►Touch gestures

 Tap: Threshold selection.

►Settings

Press on the gear to display settings:

- Retain samples
  - All: Take samples continuously.
  - Time: Take samples for a limited period of time.
- Time: Selection of the time period for taking samples.
- Standard
  - All samples: Histogram calculated according to the ITU-R SM 1268-4 standard. It accumulates all frequency deviation values in the histogram.
  - Max 50 ms: Histogram calculated according to the ITU-R SM 1268-2 standard. It measures the maximum frequency deviation value over 50 ms and accumulates it in the histogram.
- Reset: It clears and resets the histogram.

iii.8 FM MPX Spectrum

The FM MPX Spectrum utility displays the FM multiplex spectrum over a frequency range of 100 kHz. It shows all the subcarriers that make up the FM multiplex. It provides an overview of the FM multiplex that can help identify issues.

►**Screen**

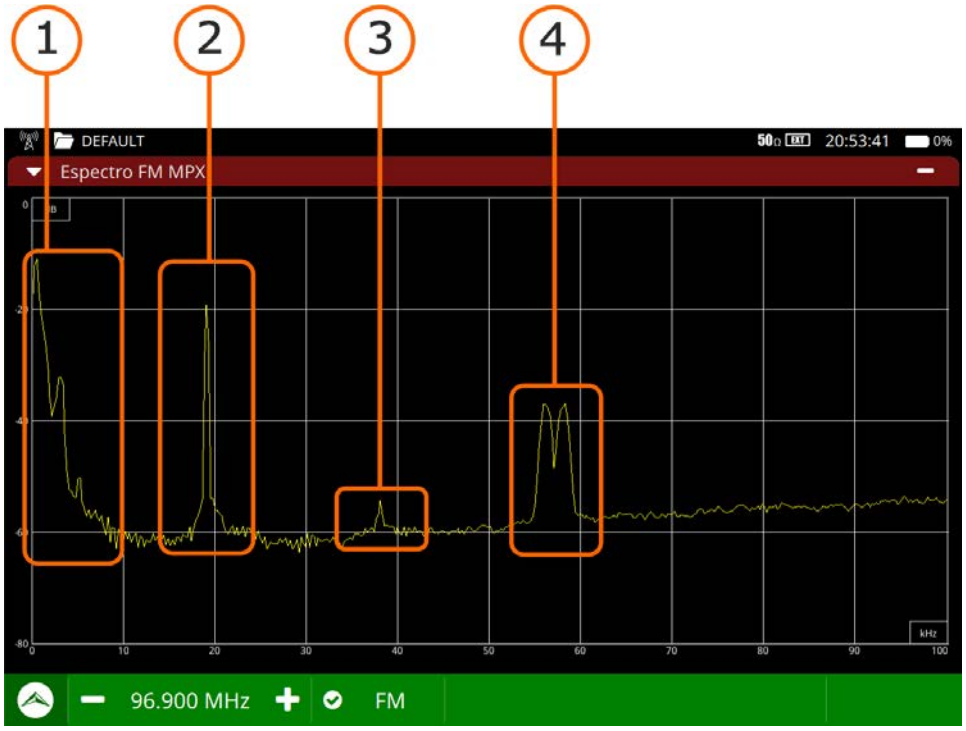


Figure 45.

1 Sub-carrier L+R.

2 Stereo pilot.

3 Sub-carrier L+R.

4 Sub-carrier RDS.

iii.9 IQ Recording

The **IQ Recording** tool records the RF signal in I/Q format. This recording can later be downloaded to a USB drive and played back in signal analysis software. It is not necessary to lock onto the signal to perform the DAB IQ recording.

This function is particularly valuable, as it allows RF signals to be captured at problematic measurement points for later analysis in the laboratory. The I/Q recording format enables signal playback in the laboratory using an RF signal generator.

► **Screen**

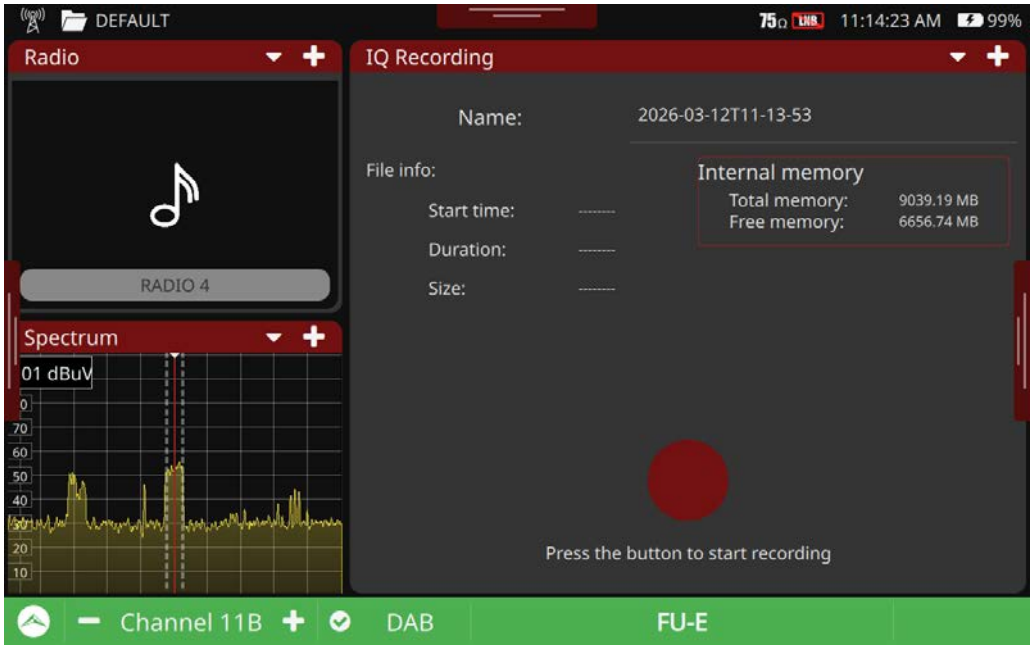


Figure 46.

1 File Information panel: On the left side, the start time, duration, and file size are displayed. On the right side, the total memory and available free memory are shown.

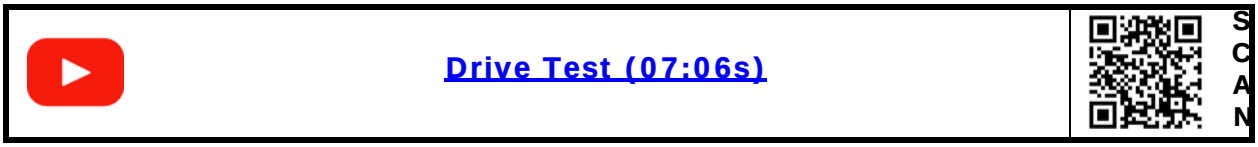
2 On/Off button: This button starts/stops the recording. Press the button (circle) to start recording. Press it again (square) to stop. The recording is saved in the active work folder with an IQ extension, from where it can be exported to external storage (for more details refer to "WORKSPACES" on page 87).

iv DRIVE TEST OPTION

iv.1 Description

This annex contains operating instructions for the next option:

- OP-002-GPS: GPS for Drive Test.



Video 26.

The **Drive Test** option allows monitoring different signal parameters over time, geo-positioned using GPS coordinates, in order to map the coverage of a specific transmitter.

iv.2 Drive Test option Installation

1. Connect the GPS antenna to the USB port of the device. No additional software installation is required.
2. From the **TV Analyzer** mode, access the **Advanced Tools** menu by swiping left from the right side of the screen.
3. Select the **Drive Test** option.
4. For more details on how this tool works, refer to "Drive Test / Signal Monitoring" on page 64.

v ADDITIONAL INFORMATION

v.1 Additional Documents

On the PROMAX website you can find additional information to go deeper in some aspects related to the field strength meter.

Name	Description	Link	
TV EXPLORER NG	Product page	https://www.promaxelectronics.com/ing/products/tv-cable-satellite-signal-and-spectrum-analyzers/tv-explorer-ng/universal-tv-and-spectrum-analyzer/	
TV EXPLORER NG	Download documentation	https://www.promaxelectronics.com/ing/products/tv-cable-satellite-signal-and-spectrum-analyzers/tv-explorer-ng/universal-tv-and-spectrum-analyzer/#tab_default_5	
DiSEqC Commands	Description of DiSEqC commands for remote control of antennas	https://www.promax.es/downloads/manuals/English/diseqc-commands.pdf	
Firmware	Last firmware release	https://www.promax.es/go/tv-explorer-ng-firmware/	

v.2 Social Networks

Name	Link	
Twitter	@PROMAX_news	
Linkedin	https://www.linkedin.com/company/promax-electronica/	
Facebook	https://www.facebook.com/promaxelectronics/	
YouTube	https://www.youtube.com/user/PROMAXElectronics	

vi MULTIMEDIA CONTENT

The following table shows all the links to video tutorials included in this manual.

NOTE: In some **video tutorials**, there may be differences between the interface shown in the video and the current equipment interface. We recommend you to follow the instructions in the manual and use the video only as supplementary reference material.

Chapter	num	Title	Link	QR Code	
1. Introduction	**1**	Main features of the TV EXPLORER NG	https://youtu.be/t4HxIrKdGuc		
1. Introduction	**2**	Explorer NG: My loyal go-to tool	https://youtu.be/IBLJdUTDkOU		
4. TV Analyzer	**3**	TV Analyzer Introduction	https://youtu.be/x9cYqCwDpOo		
4. TV Analyzer	**4**	Spectrum	https://youtu.be/c6_NIUXoeuc		
4. TV Analyzer	**5**	Measurements	https://youtu.be/ZAvGjzLSqjk		
4. TV Analyzer	**6**	Signal Parameters	https://youtu.be/ZAvGjzLSqjk?t=54		
4. TV Analyzer	**7**	Video	https://youtu.be/c4fA5oXJ7Go		
4. TV Analyzer	**8**	Recording	https://youtu.be/aE4h9lktrgE		
4. TV Analyzer	**9**	Constellation	https://youtu.be/PIVX95fCgQE		
4. TV Analyzer	**10**	Video Values	https://youtu.be/Ww84wTu9wwk		
4. TV Analyzer	**11**	MER by Carrier	https://youtu.be/bdgpY1_M2JQ		
4. TV Analyzer	**12**	Spectrogram	https://youtu.be/mbNizyQL1-0		
4. TV Analyzer	**13**	Merogram	https://youtu.be/fjHxDvTLrCQ		
4. TV Analyzer	**14**	Echoes	https://youtu.be/4Q1uxtyyn70		

Chapter	num	Title	Link	QR Code	
4. TV Analyzer	**15**	Audio levels	https://youtu.be/38x7ozsjxjw		
4. TV Analyzer	**16**	Optical Power Measurement	https://youtu.be/d9H9NAMvPxc		
4. TV Analyzer	**17**	Drive Test	https://youtu.be/Fa2WQocZU-s		
4. TV Analyzer	**18**	Channel Exploration	https://youtu.be/0WnmD922znk		
4. TV Analyzer	**19**	Datalogger	https://youtu.be/vlje1yKCygk		
4. TV Analyzer	**20**	Blind Scan	https://youtu.be/c0IbmIlHFe0		
4. TV Analyzer	**21**	Attenuation test	(soon available)		
5. WiFi	**22**	WiFi	https://youtu.be/_zu52kl8UWU		
6. Workspaces	**23**	Workspaces	https://youtu.be/GalvHQw5w9Y		
ii. DAB/DAB+	**24**	DAB and DAB+ Analysis	https://youtu.be/UUa25AFdDWM		
iii. FM Advanced	**25**	Advanced FM	https://youtu.be/ZKGHtfFsbqY		
iv. Drive test	**26**	Drive Test	https://youtu.be/Fa2WQocZU-s		

vii PREVIOUS VERSIONS OF USER'S MANUAL

Manual Version	Web Publication Date	Firmware Version
F4.0	april 2026	4.0.3
F3.2	march 2026	3.4.3
F3.1	january 2026	3.4.3
F3.0	january 2026	3.4.3
F2.0	december 2025	3.3.8

WHAT'S NEW on manual F4.0

- Improvement: Audio level can show up to 8 channels ("Audio levels & loudness" on page 49)
- Improvement: MIP packets added to TS PID table ("► Transport Stream" on page 108).
- Update: Attenuation by default (35 dB) only applies for some models ("Tuning Settings" on page 40).
- Improvement: LCN on service list ("Video" on page 48).
- New: AM Depth and RDS phase on FM advanced ("► FM Advanced Measurements" on page 123).
- New: IQ Recording ("IQ Recording" on page 119).
- New: ETI analyzer ("ETI Analyzer" on page 118).
- Update: Datalogger ("Datalogger" on page 71).
- Improvement: Blind scan step by step explanation ("Blind Scan" on page 74).
- New: Attenuation test advanced function ("Attenuation Test" on page 75).
- New: New languages available for the interface ("►Appearance" on page 23).
- New: Display of current and voltage at LNB ("► Supply Settings" on page 32).
- New: Compatibility with SCR/EN50494 protocol ("SCR/EN50494 (SatCR/SCD)" on page 35).
- New: Compatibility with protocol dCSS/EN50607 ("dCSS/EN50607 (JESS/SCD2)" on page 36).
- New: Numbered video ("MULTIMEDIA CONTENT" on page 132).
-)Other minor updates and improvements

WHAT'S NEW on manual F3.2

-)Update: DAB/DAB+ option ("DAB/DAB+ OPTION" on page 114).

WHAT'S NEW on manual F3.1

-)Small corrections.

WHAT'S NEW on manual F3.0

- New: Field Strength Meter measurement ("►Antenna Settings (only for TV Analyzer mode)" on page 33).
- Update: UPDATE file instead of ZIP ("Updating the meter" on page 21).
-)Other minor updates and improvements.

WHAT'S NEW on manual F2.0

- New: Support for analogue signal ("► Analogue Signal" on page 104).
- Update: Available resolution filter 100 kHz ("Spectrum" on page 43).
- Improvement: Captures and shows HbbTV info ("Video/Audio Parameters" on page 50).
- Improvement: Frequency offset option ("TV Analyzer Settings" on page 26).
- New: Streaming tool at TV Analyzer ("Streaming" on page 51).
- Improvement: 35 dB attenuation by default when starting up ("Tuning Settings" on page 40).
- Update: Top and bottom windows locked ("Advanced Tools" on page 63).
- Improvement: Warning message in Datalogger if the channel plan is not defined ("Datalogger" on page 71).
- New: Select between two constellation types in DVB-T2 ("Constellation" on page 53).
- New: MPD file view for ATSC 3.0 ("Video/Audio Parameters" on page 50).
-)Other minor updates and improvements.

viii INDEX

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