USER MANUAL
Series EXA7 – EXA9

Congratulations on your new purchase!

Dear Customer,
We would like to congratulate you on the purchase of your new **ROVER**

We are delighted that you have chosen ROVER – VEMA, and we are confident that this product will bring great value and satisfaction to your business activities.

Every day, our team works with passion to offer high-quality and high-tech solutions; knowing that you have decided to place your trust in us fills us with pride. If you have any questions, concerns, or simply wish to share your experience, we are always at your disposal.

Thank you again for choosing us, and welcome to our community!

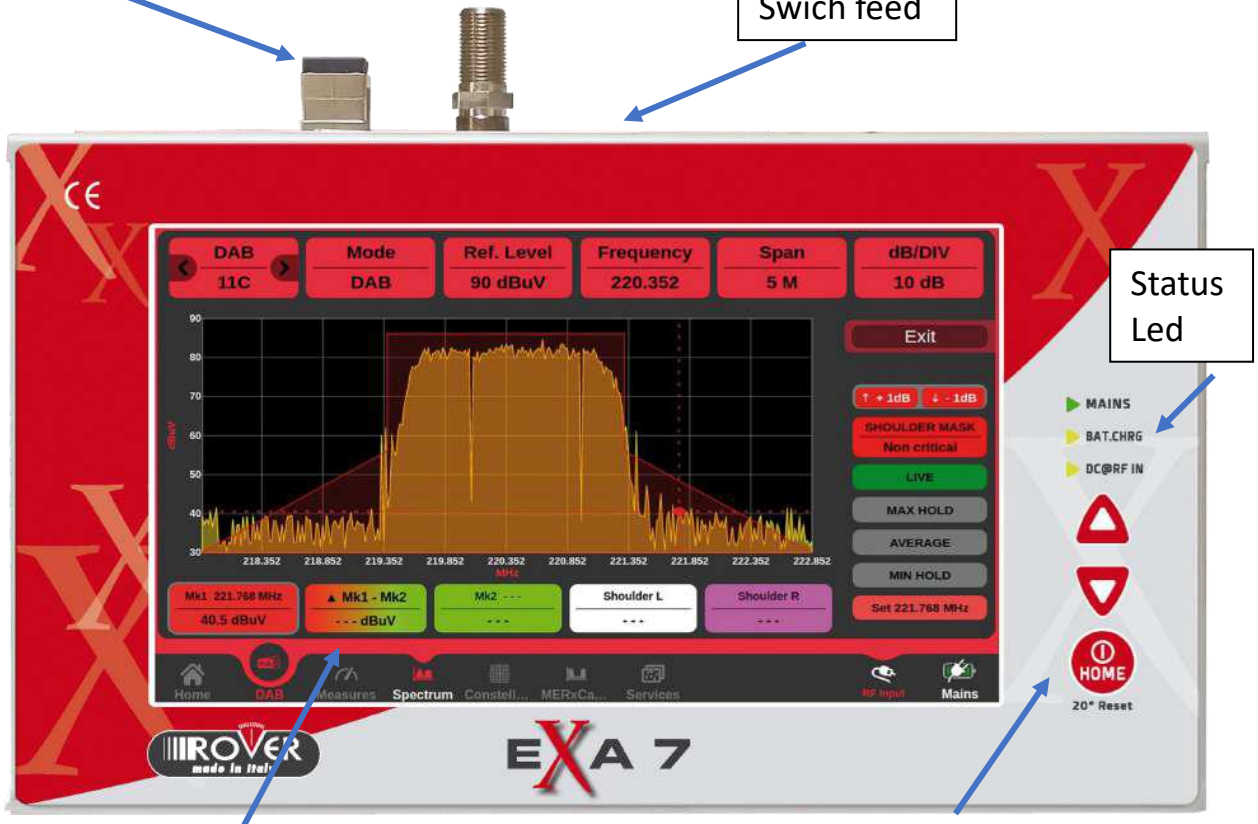
ROVER Instruments

ROVER Instruments

Summary

GET TO KNOW YOUR EXA

Front view



To switch on and off, press **HOME**

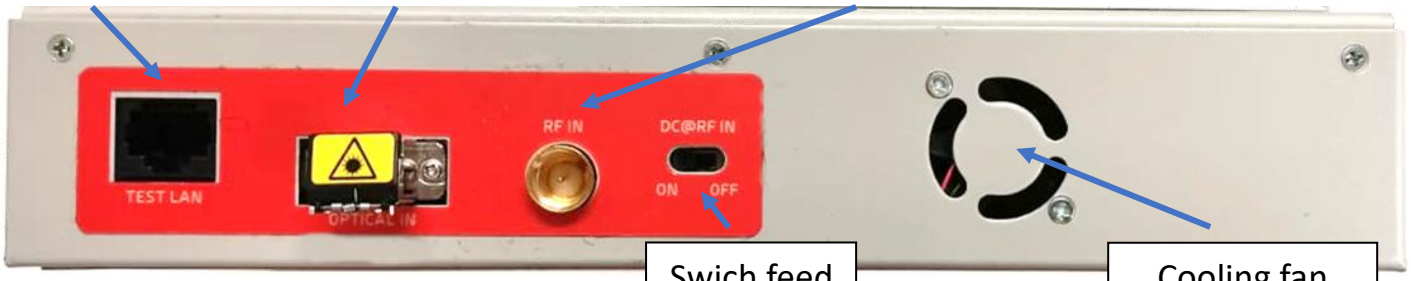
Instrument **RESET**: with the instrument turned on **press and hold the button for at least 15 seconds**, then turn the instrument back on.

Physical description and connectors

Input RJ45 to LAN testing

Input SC optical connector (for Lite opt.)

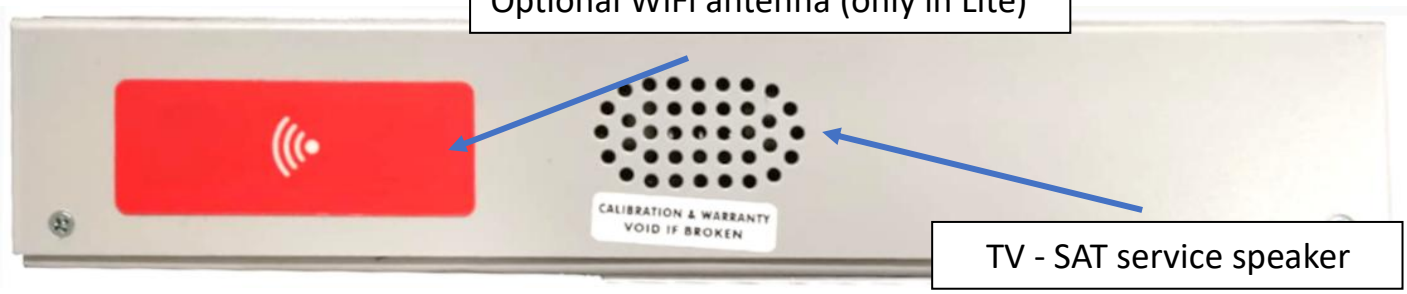
Input RF connector



Swich feed

Cooling fan

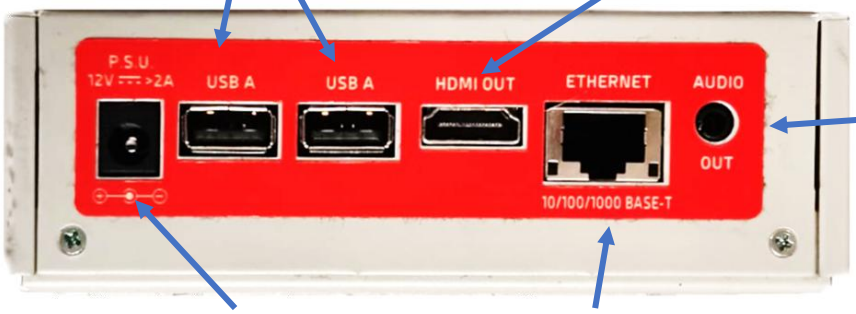
Optional WiFi antenna (only in Lite)



TV - SAT service speaker

USB-A external memory

HDMI (not available)



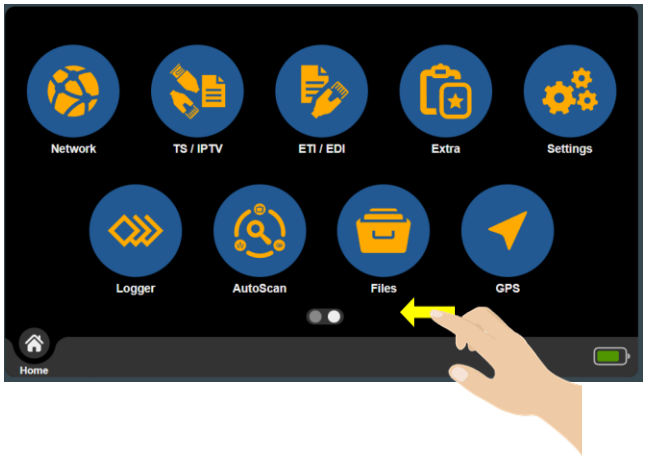
Stereo audio output

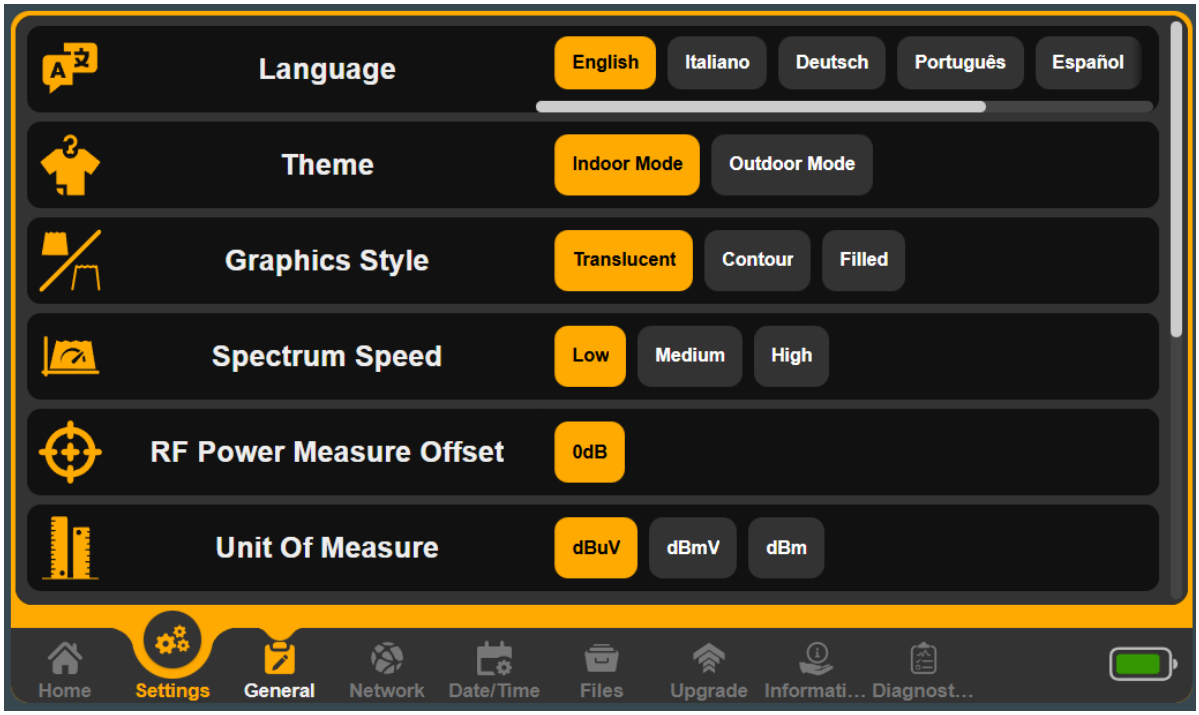
12Vdc power supply

RJ45 Ethernet LAN

CONFIGURATION

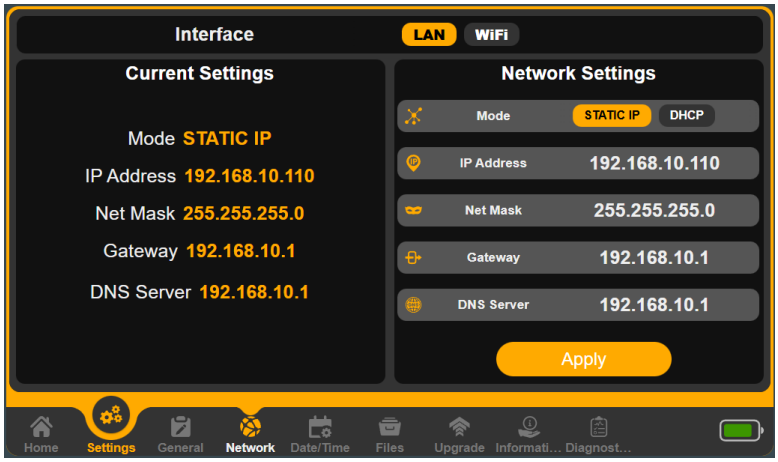
Using the instrument starts from the HOME screen, which uses the new SMARTPHONE-style navigation menu! The user interface has been completely redesigned, making it easier and more immediate to use. The most frequently used main functions are now at your fingertips, with faster access to measurements.





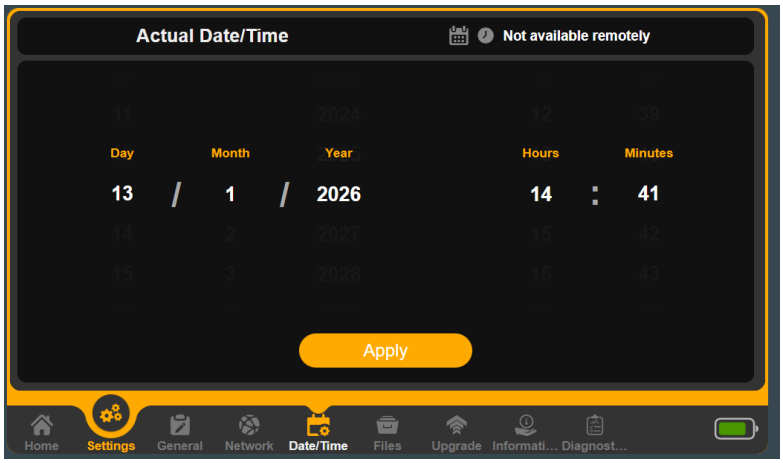
Before using the device, proceed with the initial configuration, tap the “Settings” icon to access the settings menu.

In this menu you can configure all the parameters needed for measurements, language, LAN connection, FW updates and everything needed to operate.



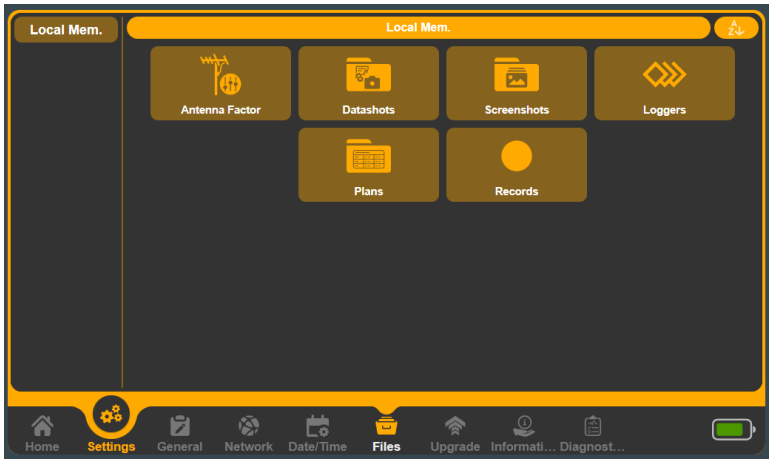
NETWORK Configuration
To configure the network, tap the "Network" icon at the bottom and enter the parameters to connect the device to the PC via LAN cable or via WiFi. After entering the data, tap the "Apply" icon to save it in the device.

DATE and TIME configuration



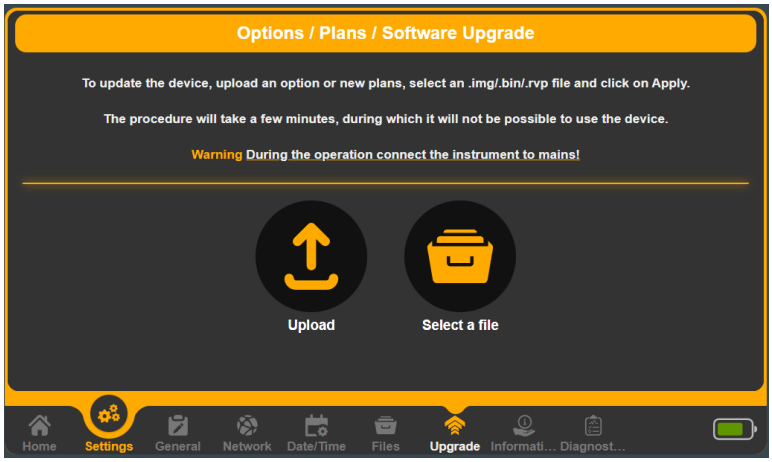
Configure the time and date by tapping the “Date/Time” icon. After entering the data, tap the “Apply” icon to save it in the tool.

FILES Configuration



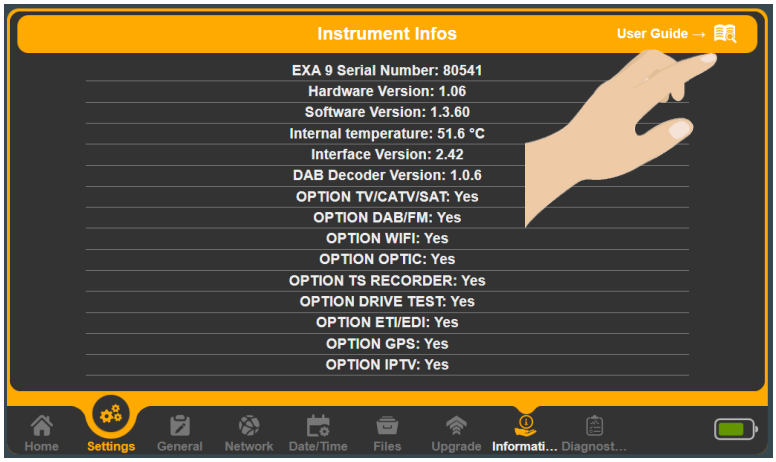
To access the memory plans or files stored on the instrument, tap the "Files" icon, and select the desired item. If a USB memory stick is inserted into one of the instrument's two side ports, the word "usb0" will appear under the "Local Memory" icon in the upper left part of the screen.

Instrument UPDATE



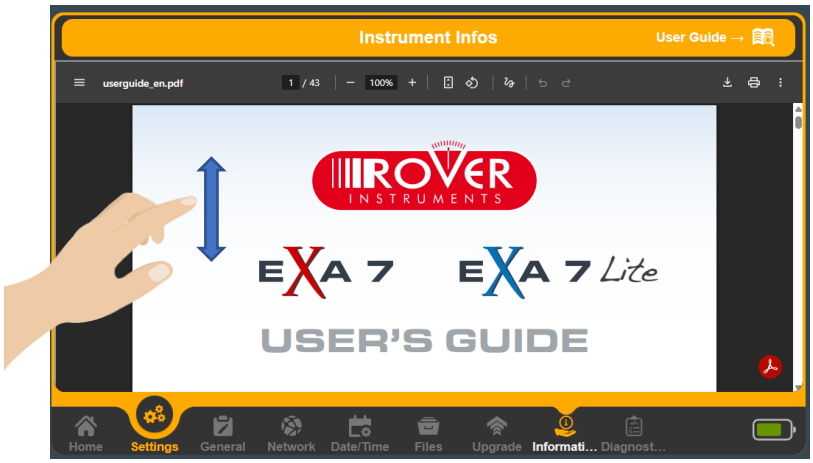
Tapping the "Update" icon accesses the FW or Memory Plan update mode.
If the instrument is connected to the PC via LAN cable, a second "Load" icon will also appear.
The easiest and quickest way is to download the upgrade file from *www.roverinstruments.com* and save it to a USB stick. Then**, with the instrument OFF**, insert the USB stick **and turn it on**. After a few seconds, a screen will appear asking whether you want to proceed with the update. Follow the instructions on the display.

Instrument INFORMATION

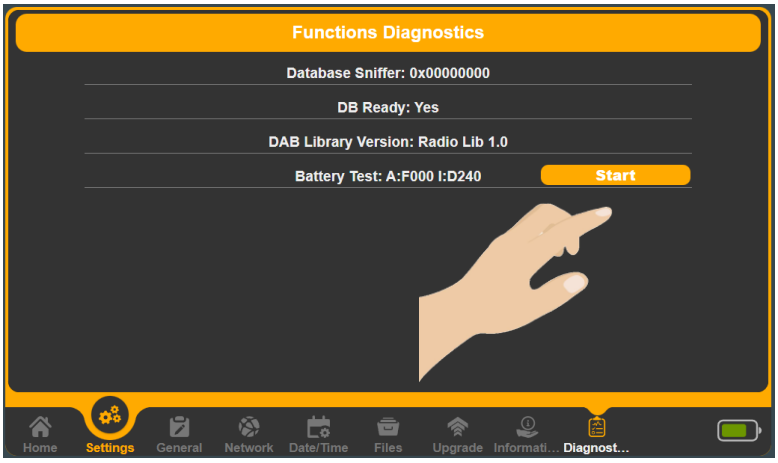


Selecting "Information" takes you to the summary page of the instrument's features and firmware.

IMPORTANT:
Please provide this information in the event of technical assistance.
By tapping the book icon, you can view and read the instrument's complete manual.

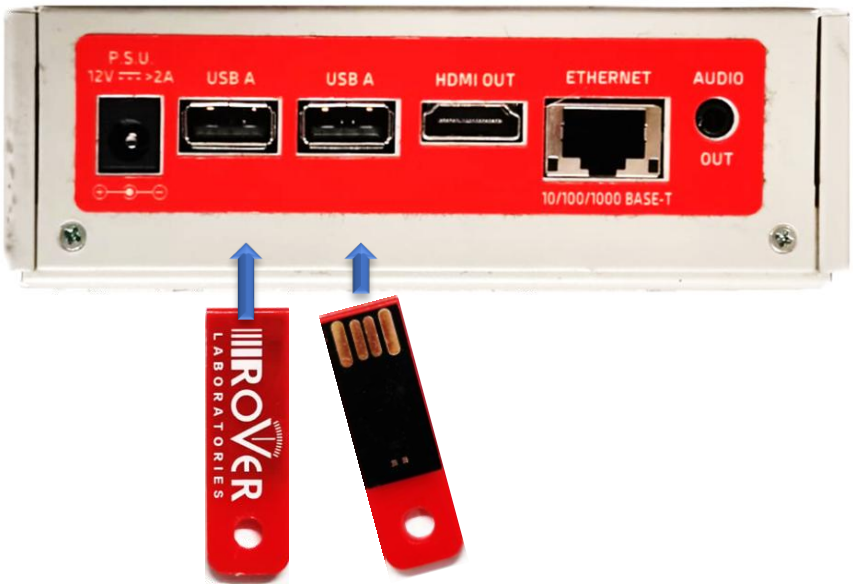


DIAGNOSTICS and BATTERY TEST



Among the various information available, there is a battery test function, which allows you to regenerate the battery and realign the actual charge with the icon visible at the bottom right of the display.
It is recommended to perform this test every 3–4 months, especially during seasonal changes, since temperature—particularly the cold winter—significantly affects battery life.
The test takes several hours, so it should be started when you do not plan to use the device. If it is forcibly interrupted, there are no problems: the device will function normally the next time it is turned on. In this case, it is simply advisable to repeat the test.

Screen shot



The "SCREEN SHOT" function allows you to save the screen image to an external USB memory stick. If you want to quickly save and export the screen, insert an external memory stick (not included) into the USB A 3.0 or 2.0 port, making the USB icon appear on the display. To set the screen tool you want to save, e.g., Spectrum, Measurements, Constellation, etc., follow these steps:
Place your finger at the top of the screen you want to save and drag it downwards. A menu will appear offering to save to "LOCAL MEM" or to USB (if the memory stick is inserted into the instrument's USB port).

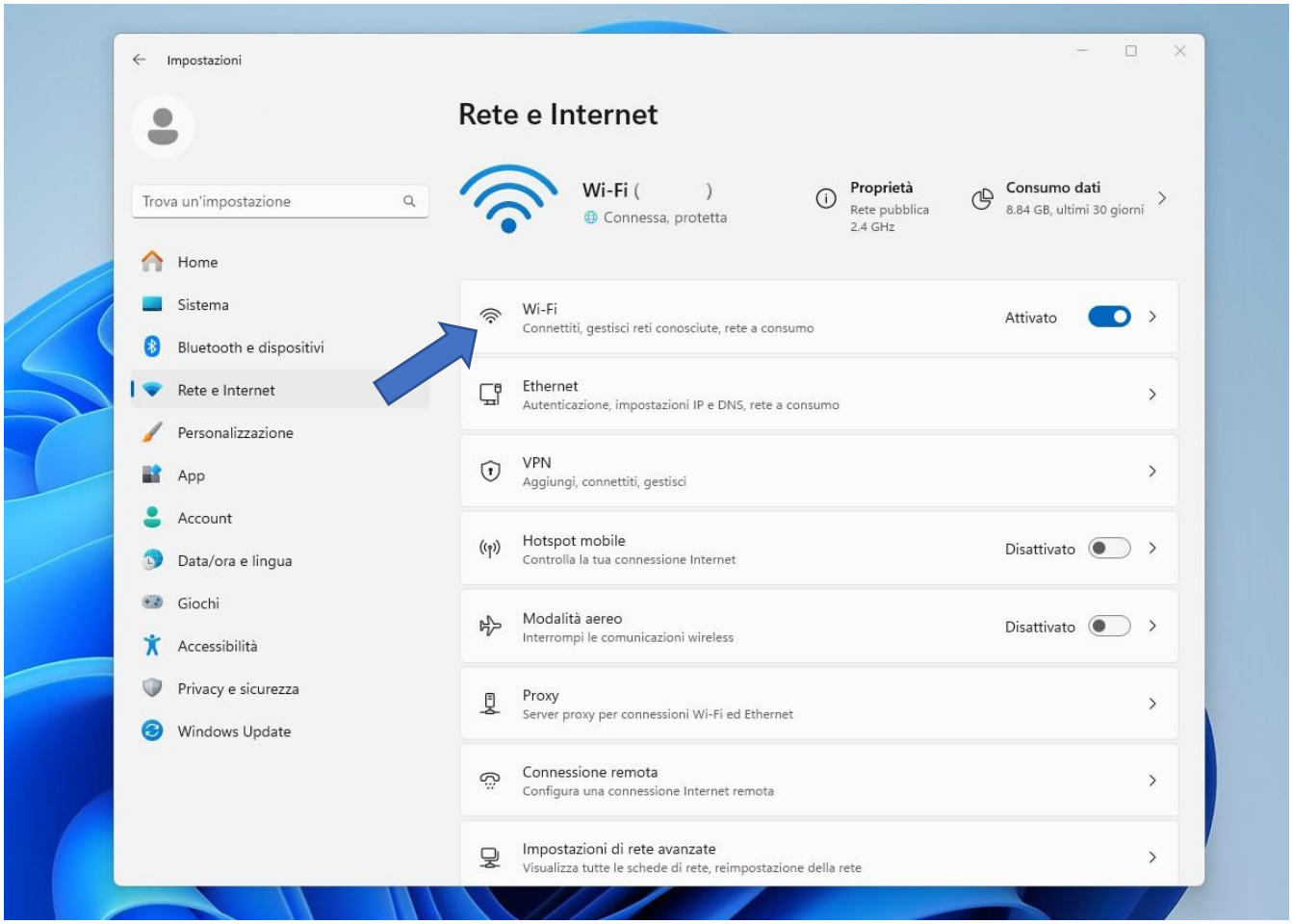
Connecting to the computer

Preliminary information

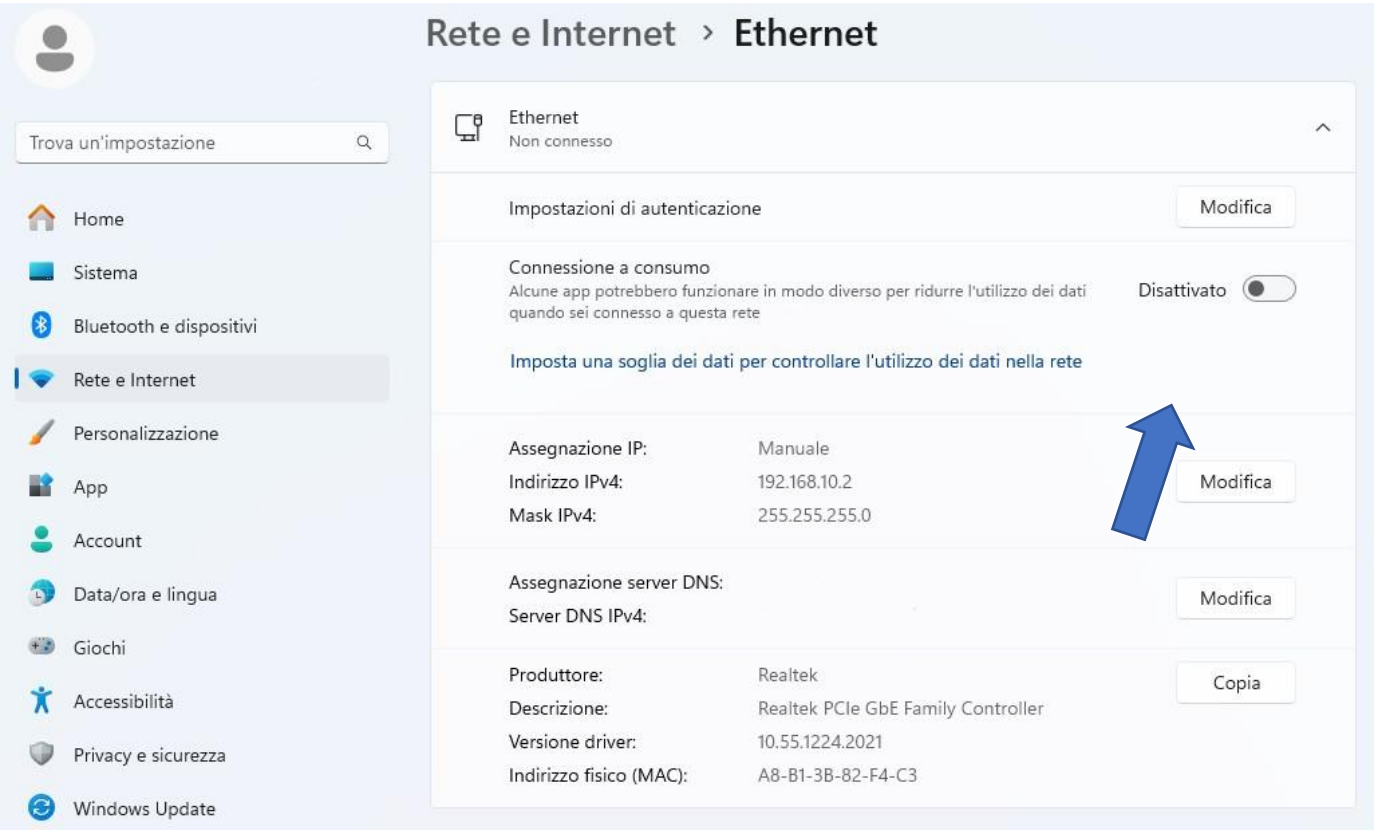
This section describes the standard connection procedure between a PC and ROVER EXA instruments using a standard LAN cable. This involves configuring the PC's Ethernet card and the instrument's Ethernet card to initiate the connection using a web browser (e.g., Google Chrome, Mozilla Firefox, Microsoft Edge, etc.).

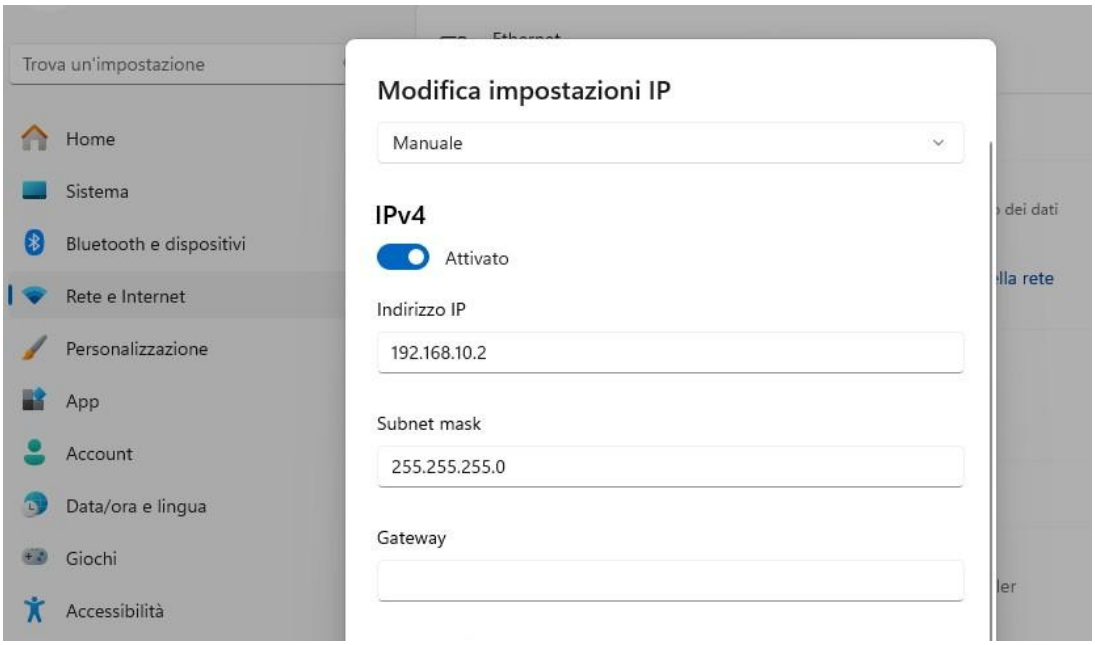
PC Card Setup

If necessary, configure the PC's Ethernet card according to the example below, by entering the section dedicated to the PC's Ethernet settings (see arrow)

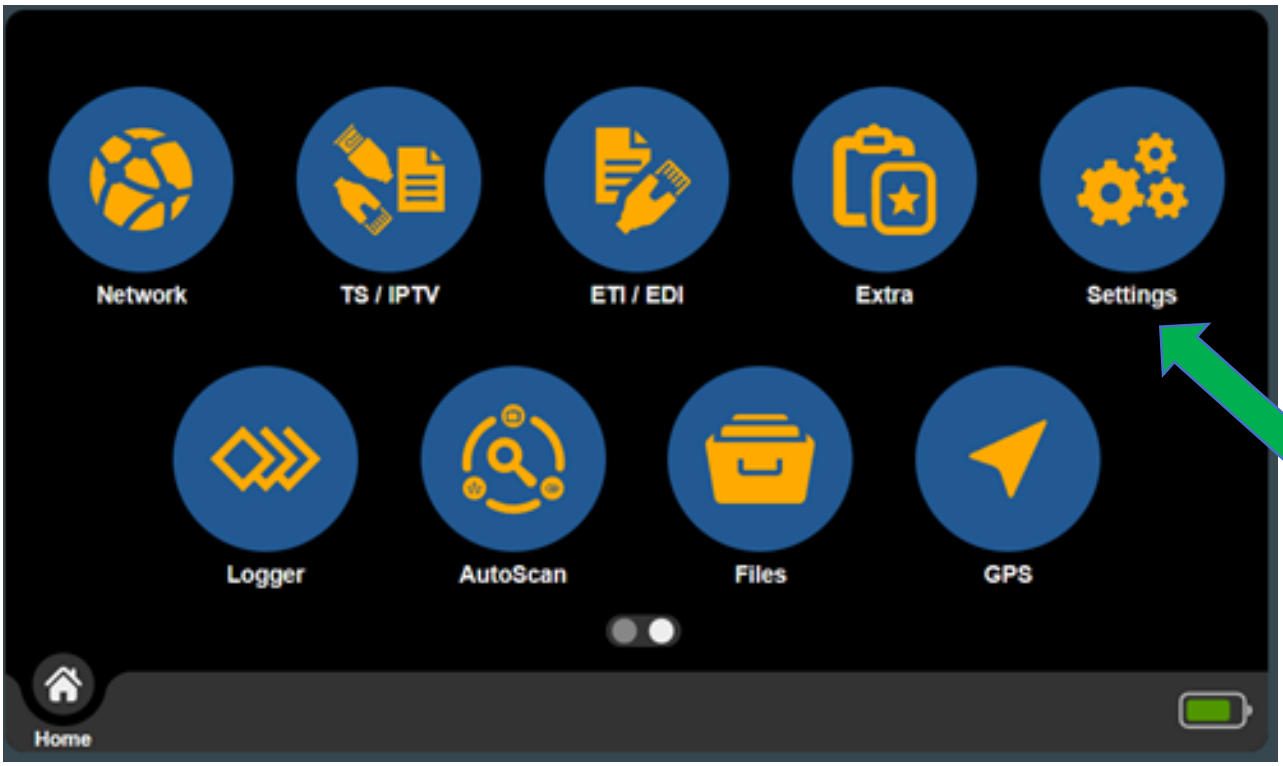


Assign the IP address by placing the box in "manual" and entering the data as shown in the figure.

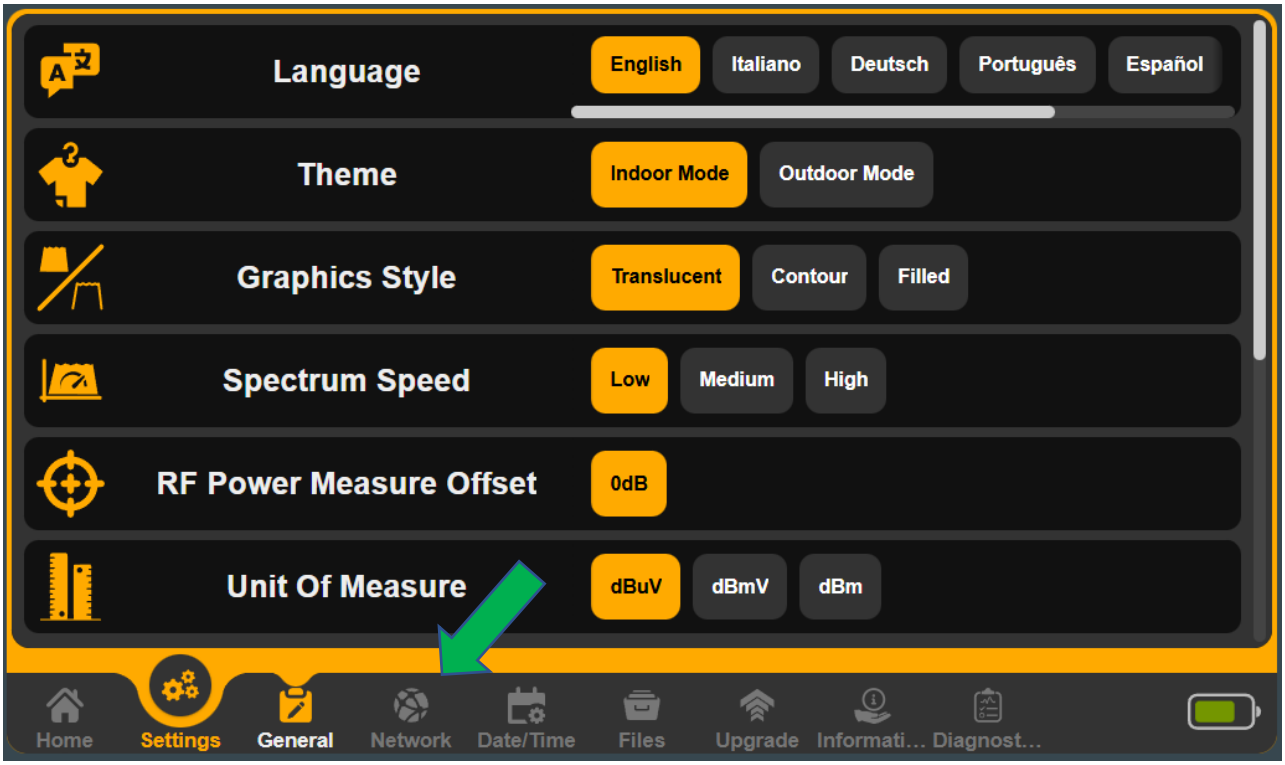




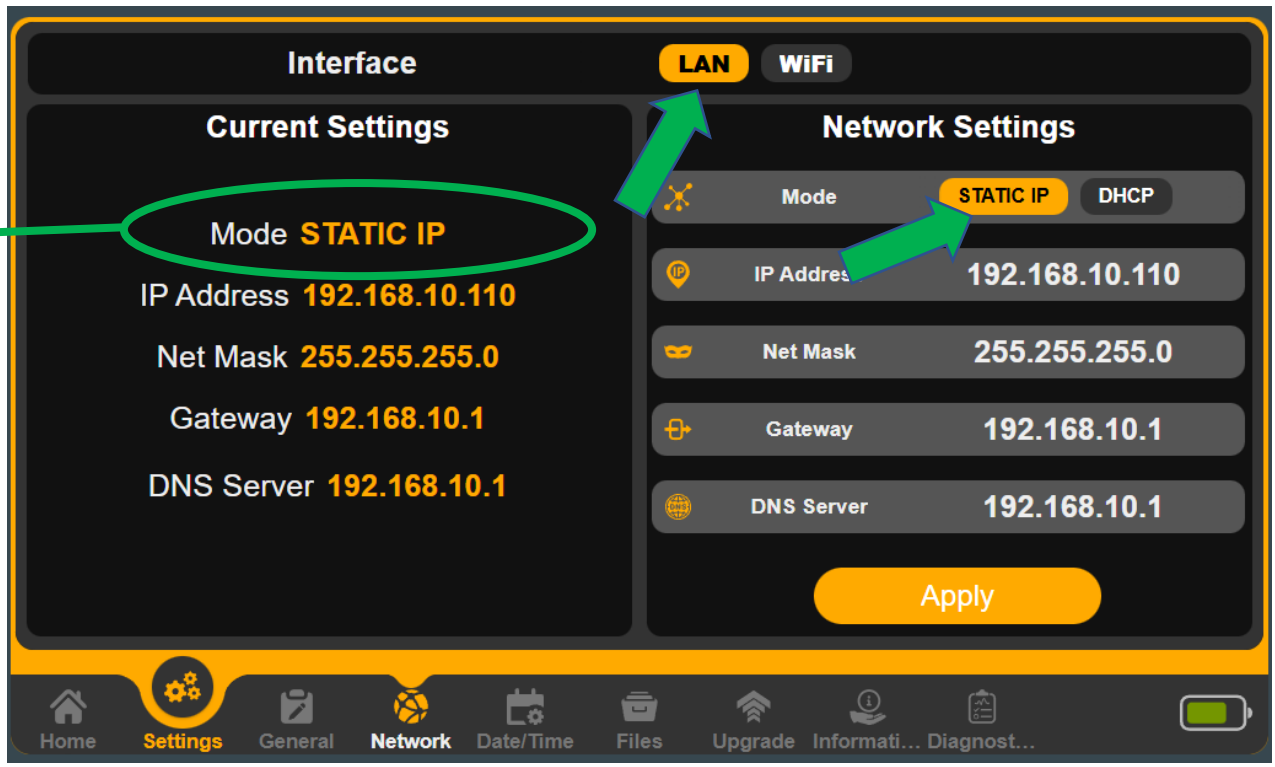
Turn on the device and access the "Settings" menu.



Access the "Network" menu.



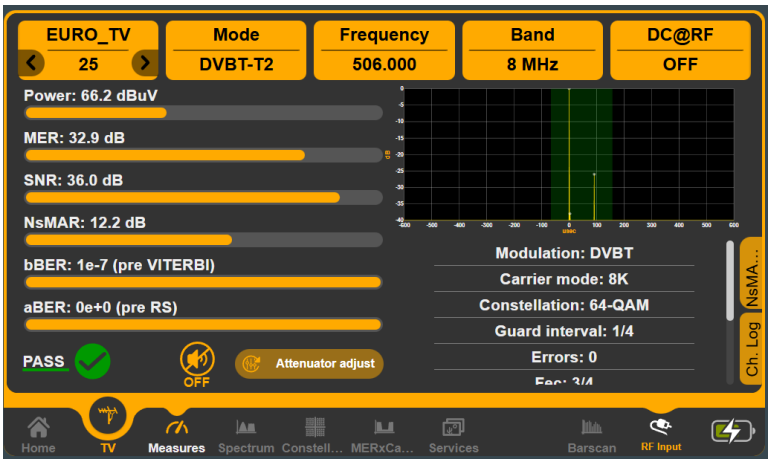
Switch to LAN and STATIC IP mode.



Enter the IP address, network mask, and gateway information and select the "APPLY" button. Open your browser and type the network address entered in the device settings into the command bar (see green arrow).

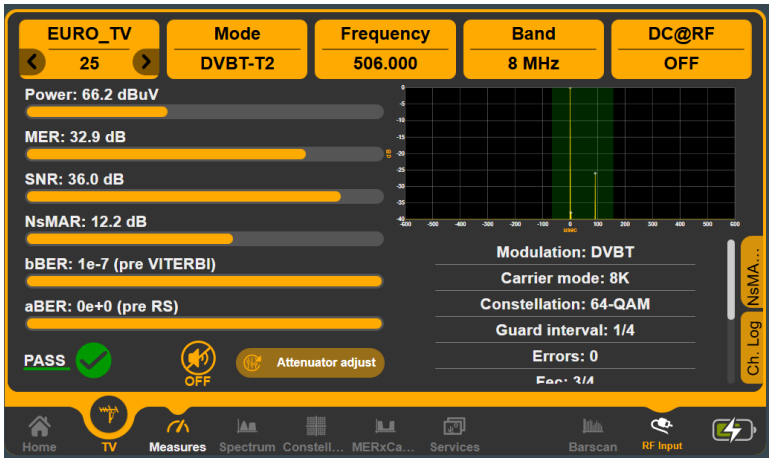
DVB-T/T2 TV ANALYSIS

To switch to digital terrestrial signal measurement mode, tap the TV icon from the main menu (Home).

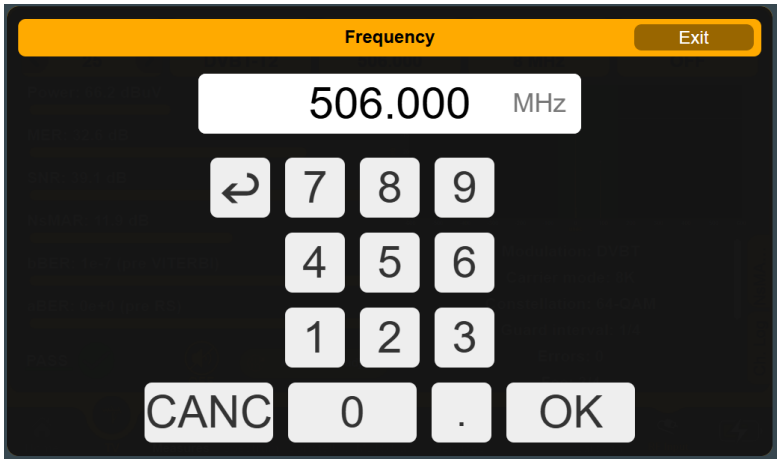


Go to the measurement screen: power, MER, bBER, aBER, the signal quality icon, and, if necessary, the attenuator adjustment icon. The echoes are displayed at the top right and can be enlarged by tapping the relevant section. The information about the locked signal is displayed at the bottom.

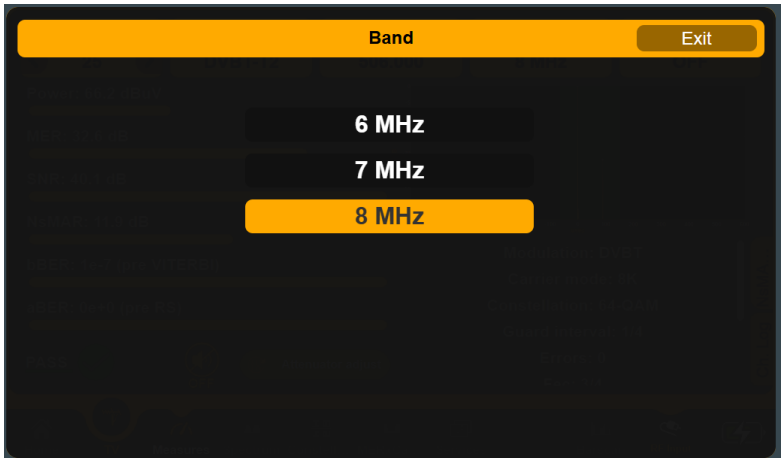
By tapping the top left of the screen, you can access the channel plan you want to use (preset or AUTO plans). On the right of the screen is the list of reference channels.



By touching the “Mode” icon you can quickly access the measurements relating to the modulation you want to receive and measure.

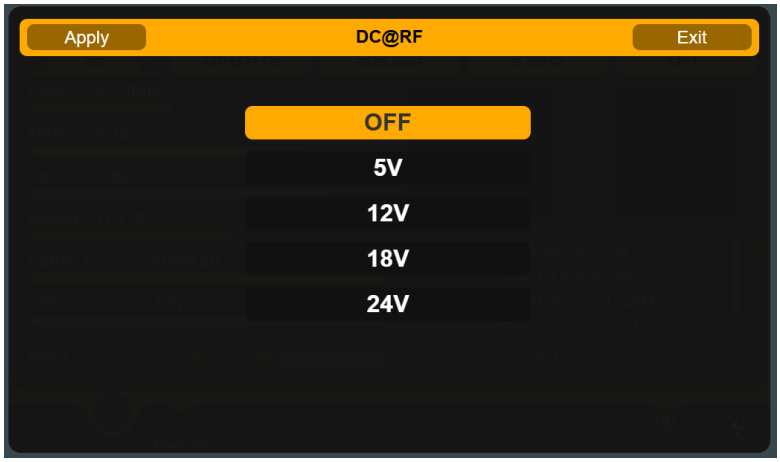


The “Frequency” icon is used to manually enter the frequency of the signal you want to measure.



By tapping the "Bandwidth" icon, you can change the bandwidth of the signal being measured.

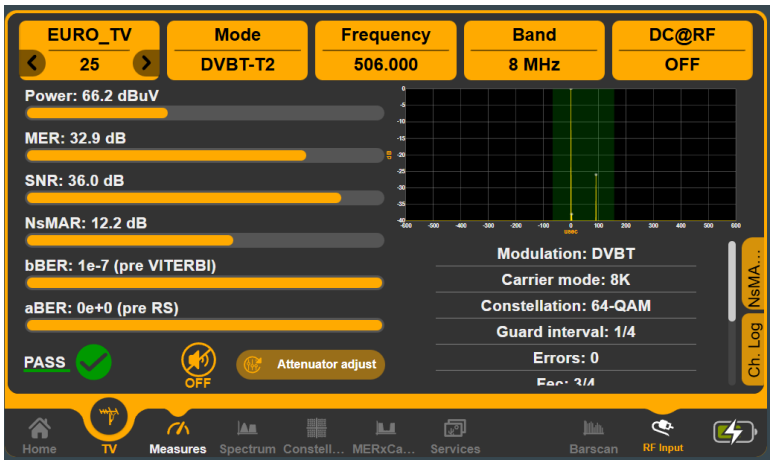
NB: It is recommended to leave the instrument's default value to avoid missing the signal.



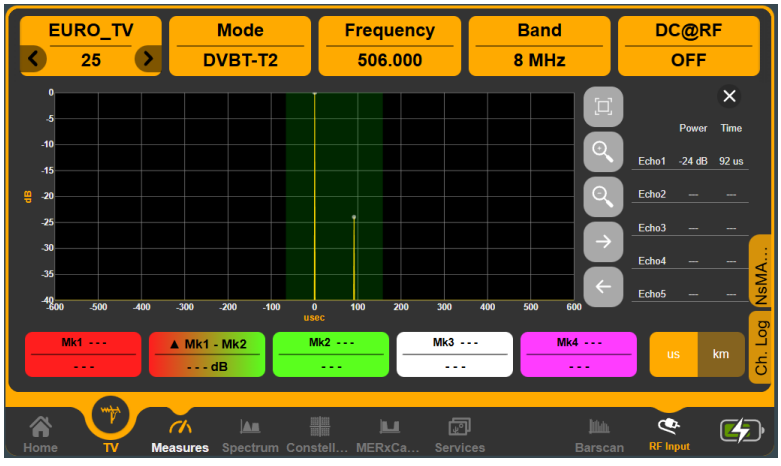
The “DC@RF” icon is used to access the remote power supply menu, which is automatic in the case of SAT measurements (preset in the transponders of the various satellites) or absent in the case of TV – DAB – FM – DVBC measurements.

NB: Be careful when choosing to send voltage to preamplifiers or other active system elements through the remote power supply. As soon as the voltage is selected, it is immediately supplied to the RF connector. The output current is limited to a typical 600mA or interrupted in the event of a short circuit.

Echo display and marker selection

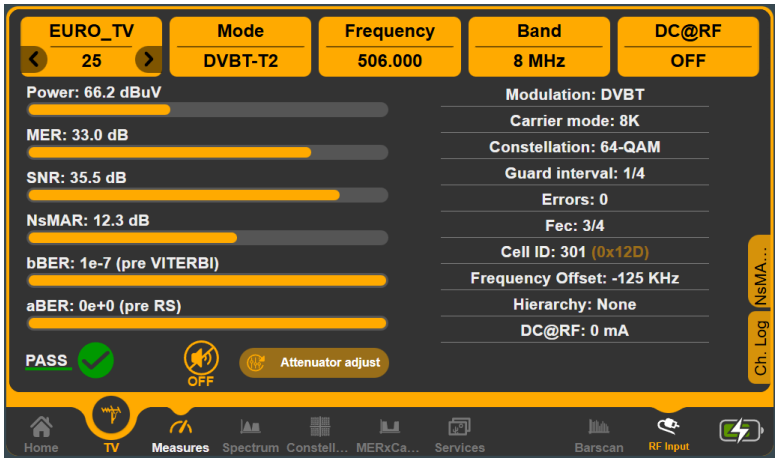


By touching the portion of the window at the top right relating to the echoes, you enter the corresponding menu



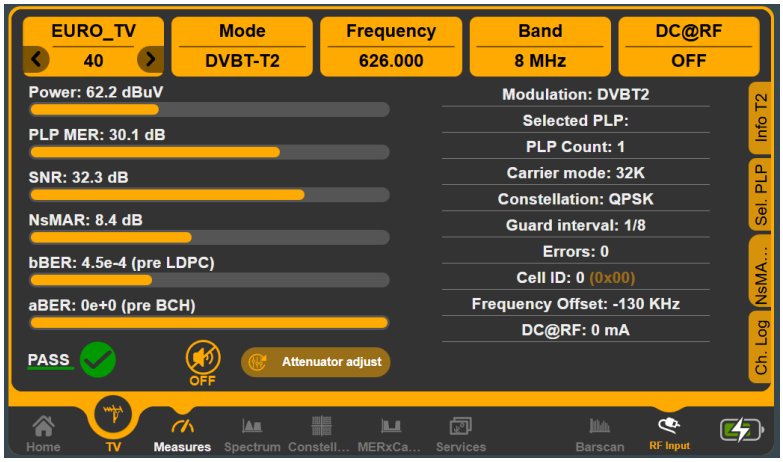
In this submenu you can view the echoes (if present in the received signal) in greater detail and select the markers to measure their main values: intensity and/or distance of the signal under examination.

DVB-T transmission parameters

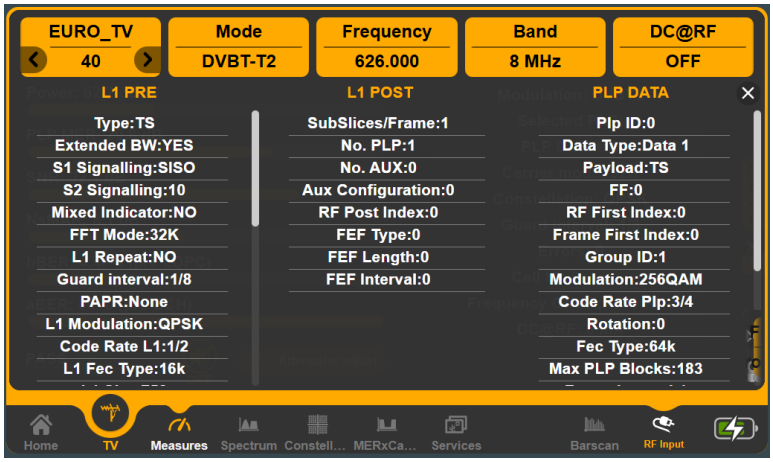


By tapping the area below the echoes icon, the list of parameters constituting the digital signal under examination is enlarged. Some of these values are useful for understanding from which transmission site we are receiving the channel being measured, e.g., "Cell ID" or the "robustness" of the signal, i.e., the "Fec" value."

DVB-T2 transmission parameters

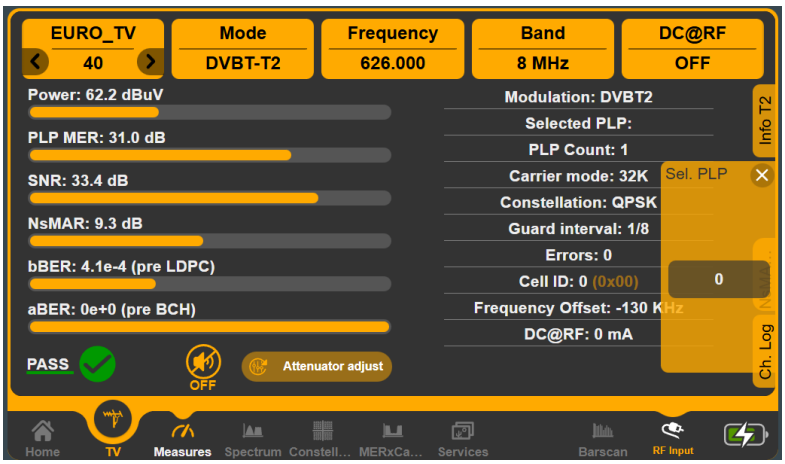


If you are in the presence of a TVB-T2 signal, in addition to all the signal strength and quality measurements, some additional parameters will appear on the right side of the screen: “info t2” “sel. PLP” NoMar...”



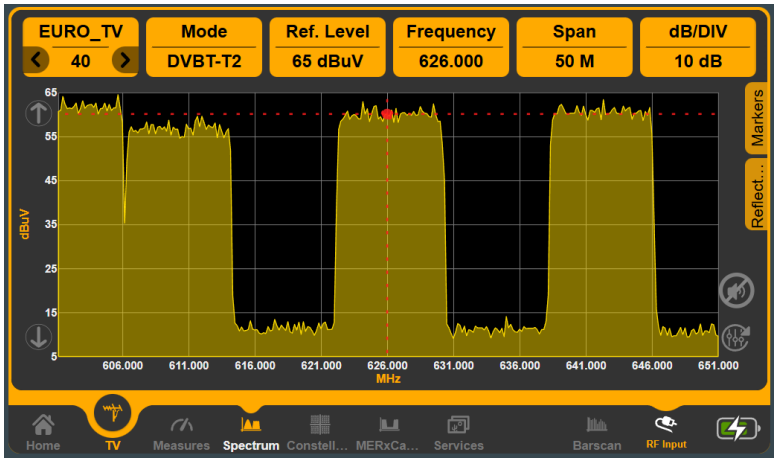
By touching the “info t2” text, the screen with the parameters relating to the DVB-T2 digital signal transmission mode appears.

PLP SELECTION

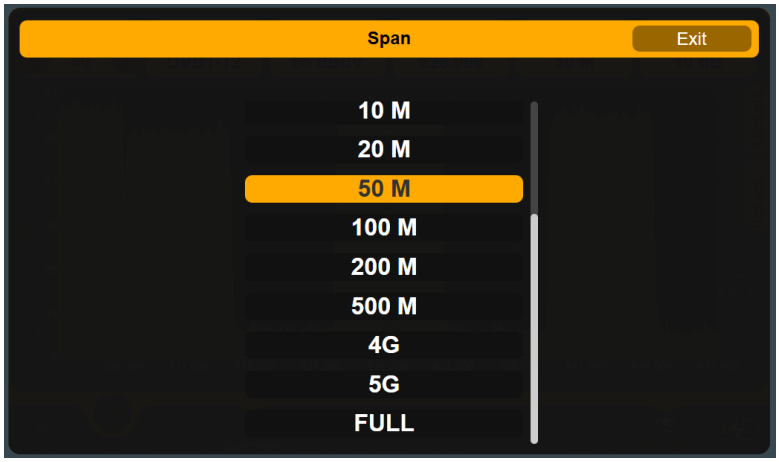


By touching the icon on the right side of the screen, you can access the possible selection of PLPs transmitted by the operator

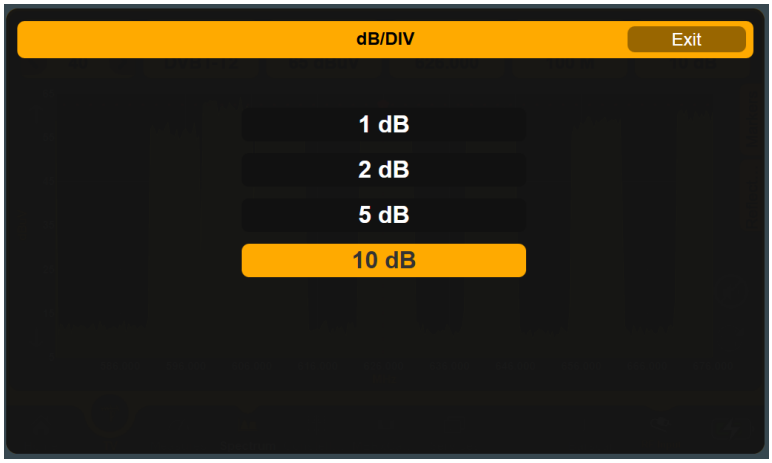
SWITCH to SPECTRUM mode



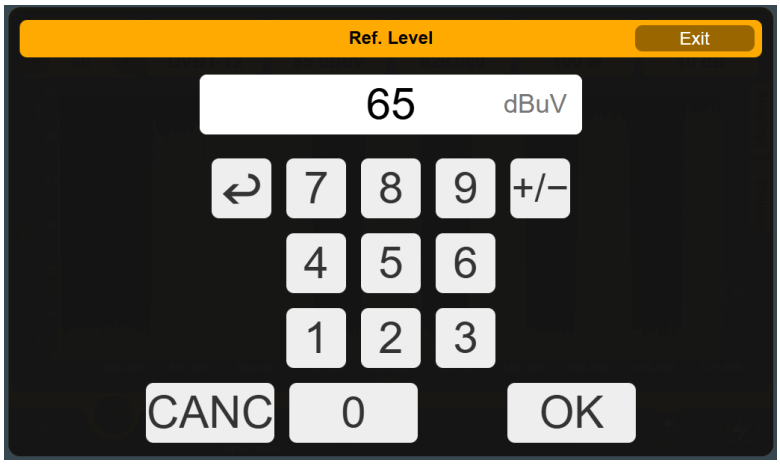
To switch to spectrum view, tap the "Spectrum" icon at the bottom. On the left you can see a typical example of a digital TV signal spectrum with the marker (red dotted line in the center of the screen) positioned on ch40.



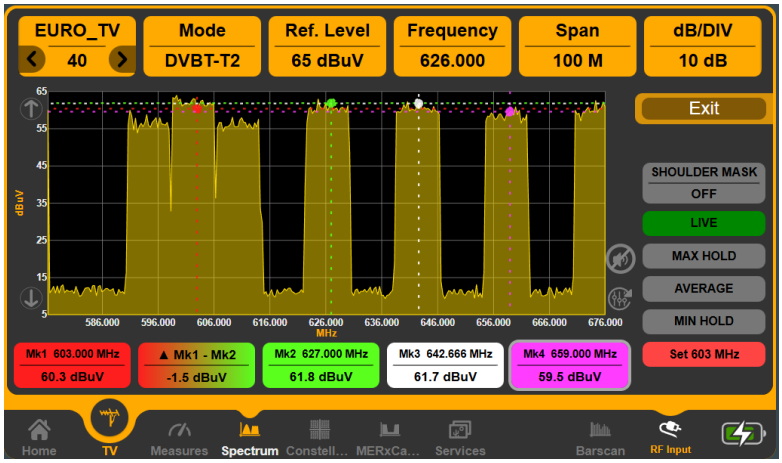
By tapping the "Spam" icon, you can change the display of channels. The higher the value selected, the more channels are displayed.



Selecting the "dB/WHERE" option sets the vertical resolution of the measurement graph. Typically, for TV signals, this is 10dB.



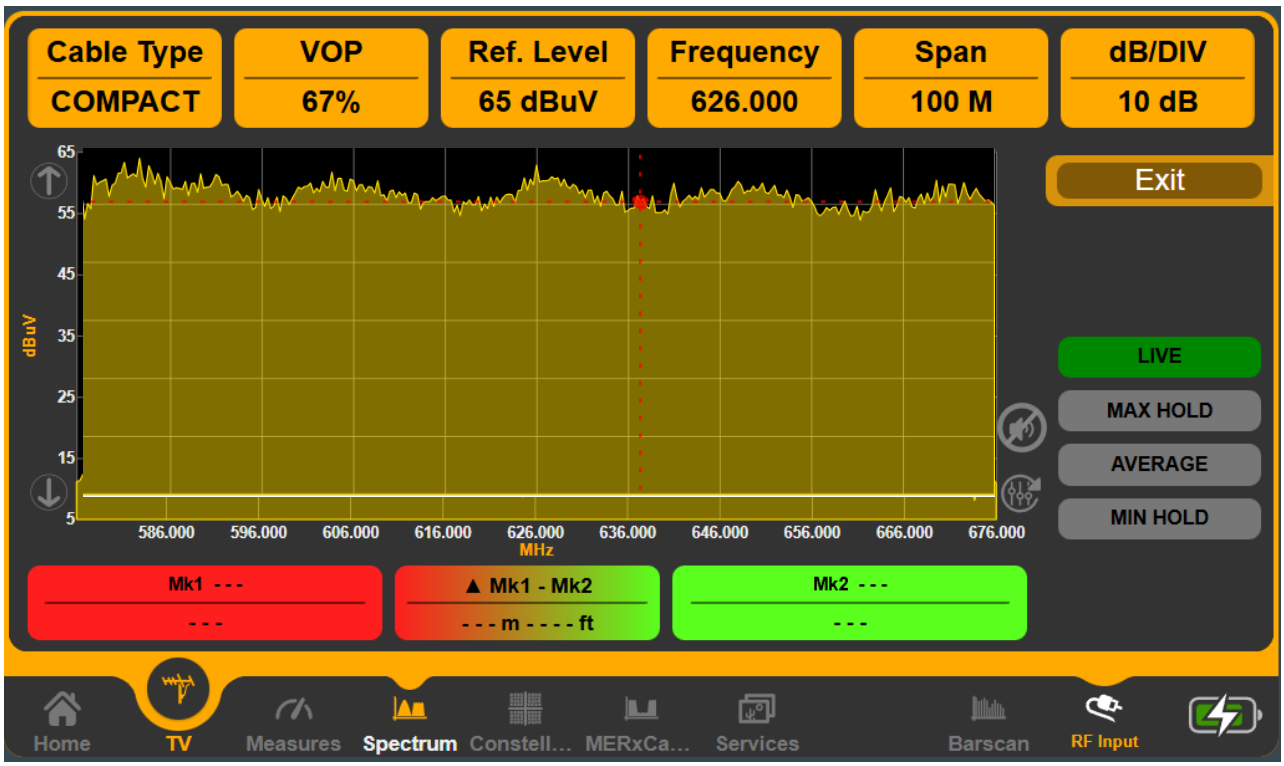
The “Ref. Level” icon is used to manually change the measurement level. It is recommended to leave the setting automatically set by the instrument.



From the spectrum screen, tap the “Markers” item to access the marker functions and the management of peak, average and minimum measurements.

REFLECTOMETRIC EASUREMENTS

To access reflectometric measurements, tap the "Reflect..." icon on the spectrum screen to enter reflectometric measurement mode. To use these functions, you need the CNG70USB constant noise generator.



Noise generator mod. CNG 70 USB

CNG70USB TECHNICAL SPECIFICATIONS

An indispensable accessory that should always be present in the antenna technician's laboratory is the Noise Generator. It is a device capable of providing a signal with constant and evenly distributed energy across all television bands, from 4 MHz to over 2.5 GHz.
It is obvious that this instrument can be used to perform a wide range of tests, from checking filters, cables, amplifiers, shunts, etc. to verifying an antenna's tuning frequency.
In practice, the noise generator is a device capable of simultaneously producing all frequencies within its operating range, with a nearly constant level of approximately 70 dBµV. By connecting this generator to a field strength meter, a horizontal white band with a constant width of 70 dBµV* will be visible in the spectrum from 5 to 2500 MHz.

It is now clear that, for example, by placing a channel-pass filter between the generator and the analyzer, the shape and characteristics of the signal that the filter under examination will be able to pass will be perfectly displayed on the instrument's screen. It will then be very simple to proceed with any calibration or fine-tuning required.
Some field strength meters have a built-in noise generator, but it's preferable to have this component separate because for many measurements (for example, when checking the response of a section of a system) it's necessary to connect it far from the point where the measurement will be taken.
For example, in the tests we perform on TV and satellite systems, we transmit all terrestrial and satellite signals from a few MHz up to 2.5 GHz via coaxial cable. By connecting the noise generator in place of the amplifier headend and checking the various distribution outlets using the field strength meter, we can understand the electrical behavior of the entire system and the user outlets.
An interesting experiment easily performed using the field strength meter and the noise generator is checking the tilt of a section of coaxial cable to monitor its behavior at various operating frequencies.
It's well known that a coaxial cable attenuates the signal proportionally to the increase in operating frequency.

The generator used for the following examples is the CNG 70 USB model.
This is a practical instrument with high spectral power that generates Gaussian white noise. It is designed with a modern SMD circuit board and enclosed in a USB flash drive-style case with a +5VDC power connector that can be connected to a standard power bank or one of the USB connectors on the field strength meter.

- Frequency range: 4 ÷ 2,500 MHz
- Noise type: White Gaussian

- ENR: 70 dB 75 Ω 25°C
- Output power: 56 dBm (measured at 100 KHz RBW)
- Linearity: 1.5 dB typ. 2 max
- Output connector: SMB
- Output impedance: 50 Ω (75 Ω opt.)
- Power supply: USB, 5 VDC
- Power supply current: 80 mA
- Dimensions: USB stick

* The amplitude of the displayed signal may vary depending on the video filter used by the instrument

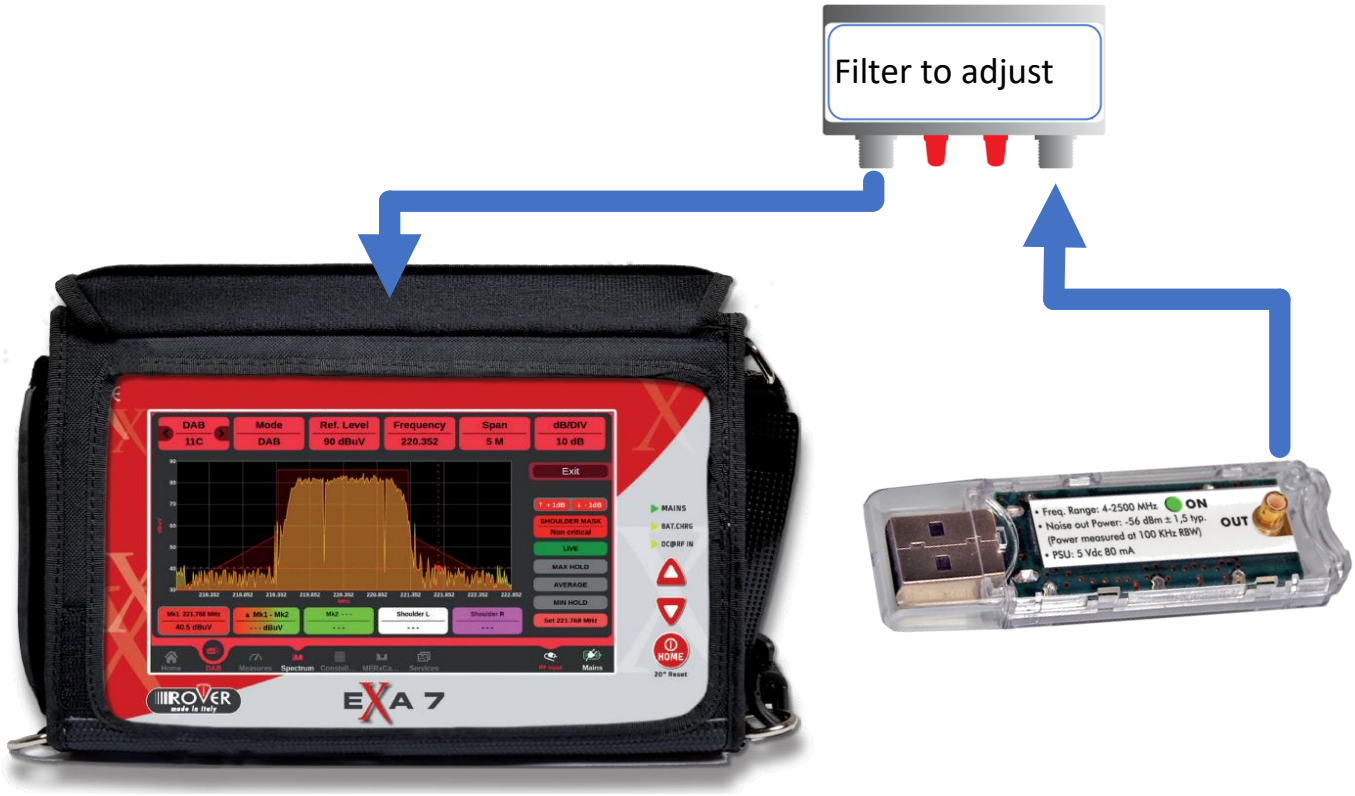
This pocket generator transforms the field analyzer into a scalar network analyzer which, together with some accessories, will allow you to measure:

- ACTIVE DEVICES: Gain, flatness, BW, and SWR;
- PASSIVE DEVICES: Loss, flatness, BW, and SWR
- COAXIAL CABLE: Attenuation, length, short-circuit distance, open-circuit distance, and impedance mismatch.

The CGN 70 USB is the smallest noise generator currently available on the market.
It covers the frequency range from 4 to 2,500 MHz and allows passive testing of coaxial cable networks, even large ones.
It can measure C/N ratio, measure and analyze amplifiers or CATV networks.
It can also be used to calibrate channel filters or verify the characteristics of LTE filters.
The CGN 70 USB can be used with any meter or spectrum analyzer, even from other brands, as long as it is connected to an external 5V USB power supply, or with batteries of the same voltage by connecting it to the USB output of a standard power bank.

Calibration of FILTERS and/or TRAPS

To calibrate the channel filters or traps using the CNG 70 USB generator, it is necessary to connect the device under TEST in series to the RF cable and verify the correct response curve on the instrument spectrum by positioning the markers in the desired points



Use as a REFLECTOMETER

When combined with the REFLECTOMETER APP, available for ROVER Instruments, the CGN 70 USB allows you to check the correct adaptation of a 75 Ohm TV-SAT distribution network or the length of a cable.

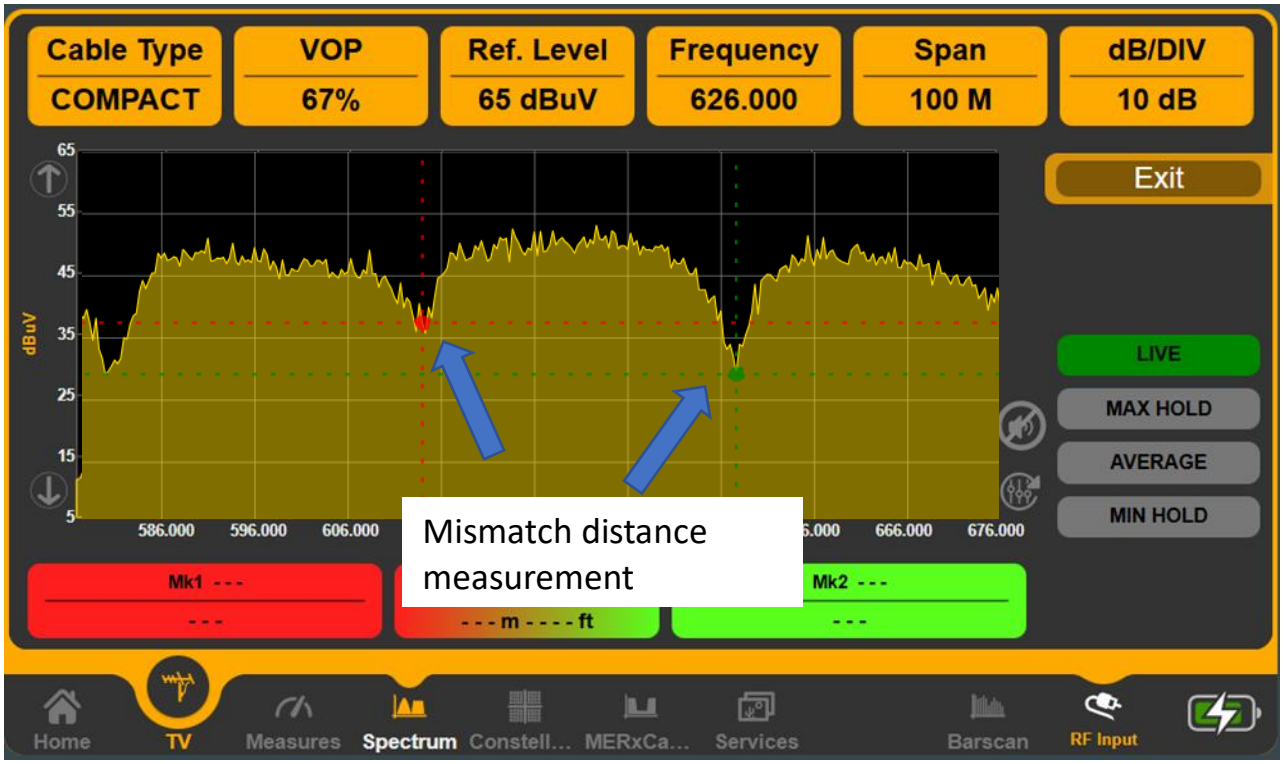
As you can see in the following example, using a T-shaped "F" connector, you can check whether there is a mismatch.

When the distribution is perfectly matched, the instrument will display, in spectrum mode, only the calibrated noise without any dips or significant level variations.

Conversely, if there is a mismatch, such as caused by a shorted, cut, or improperly terminated wire with a 75 Ohm load, a standing wave will be created on the instrument's spectrum. After having chosen the type of cable used in the specific “Cable Type” icon or alternatively after having entered the propagation speed through the “VOP” icon, by using the two markers, positioning them precisely in the “null” noise valleys or in the peaks, you can obtain the exact distance of the cable interruption in the lower part of the display..

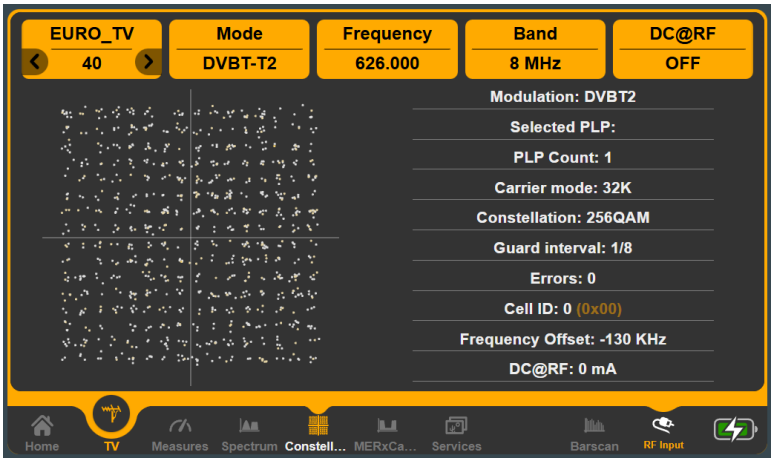
CNG 70 USB

System or cable
to be tested



Mismatch distance measurement

CONSTELLATION

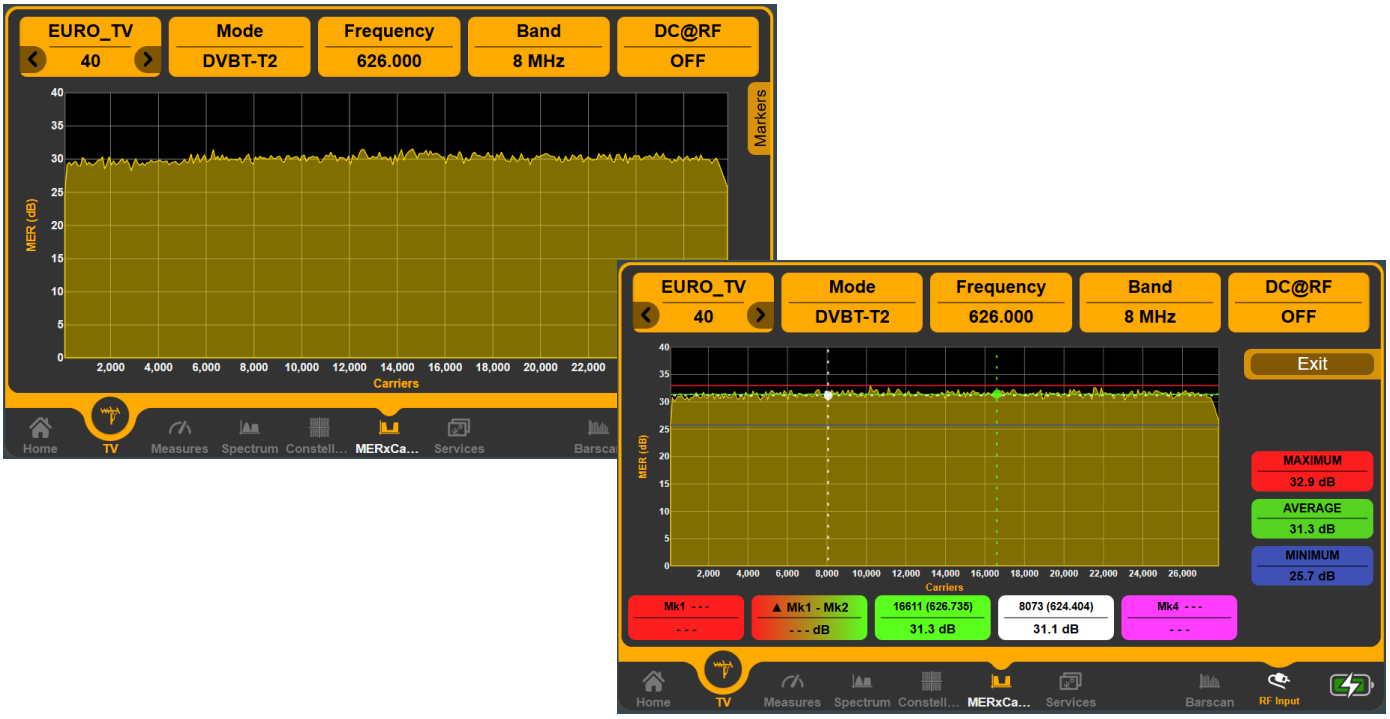


To access the constellation screen, from the MEASUREMENTS menu, tap the icon at the bottom labeled "Constellation..."
You will then be able to graphically view the reception status of the symbols making up the digital signal under examination and all its characteristic parameters.

MER vs CARRIER

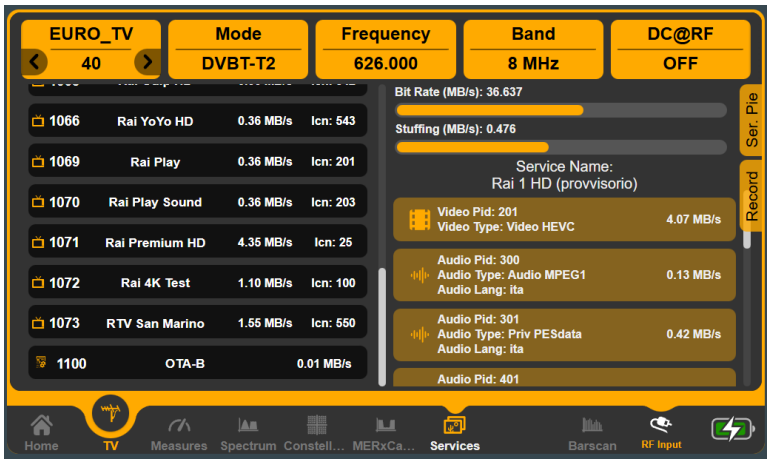
Displaying the MER of digital carriers

By selecting the “MERxPo…” function you access the display of all the digital carriers and their MER which can be measured individually by accessing the “Markers” and setting the desired measurements (see example below).

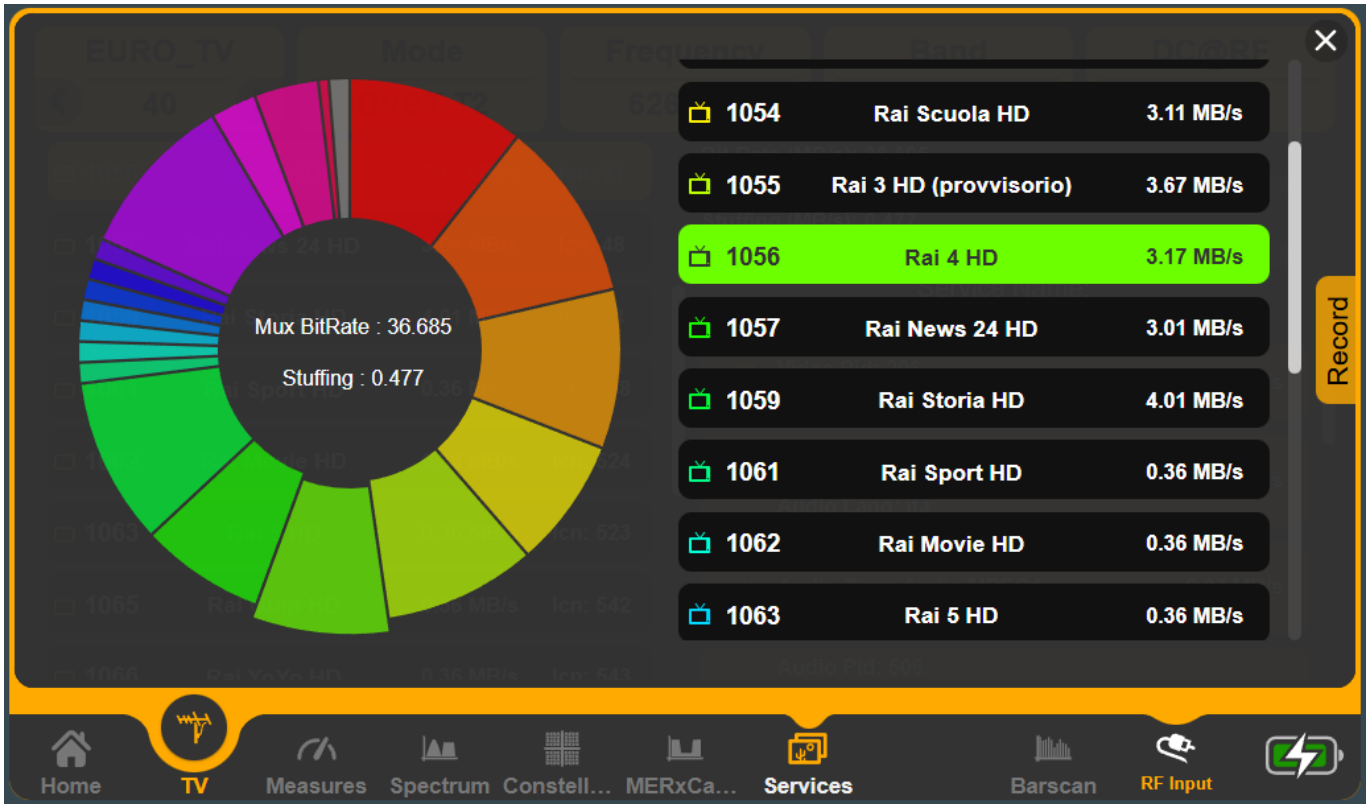


VIEWING IMAGES

MPEG Services



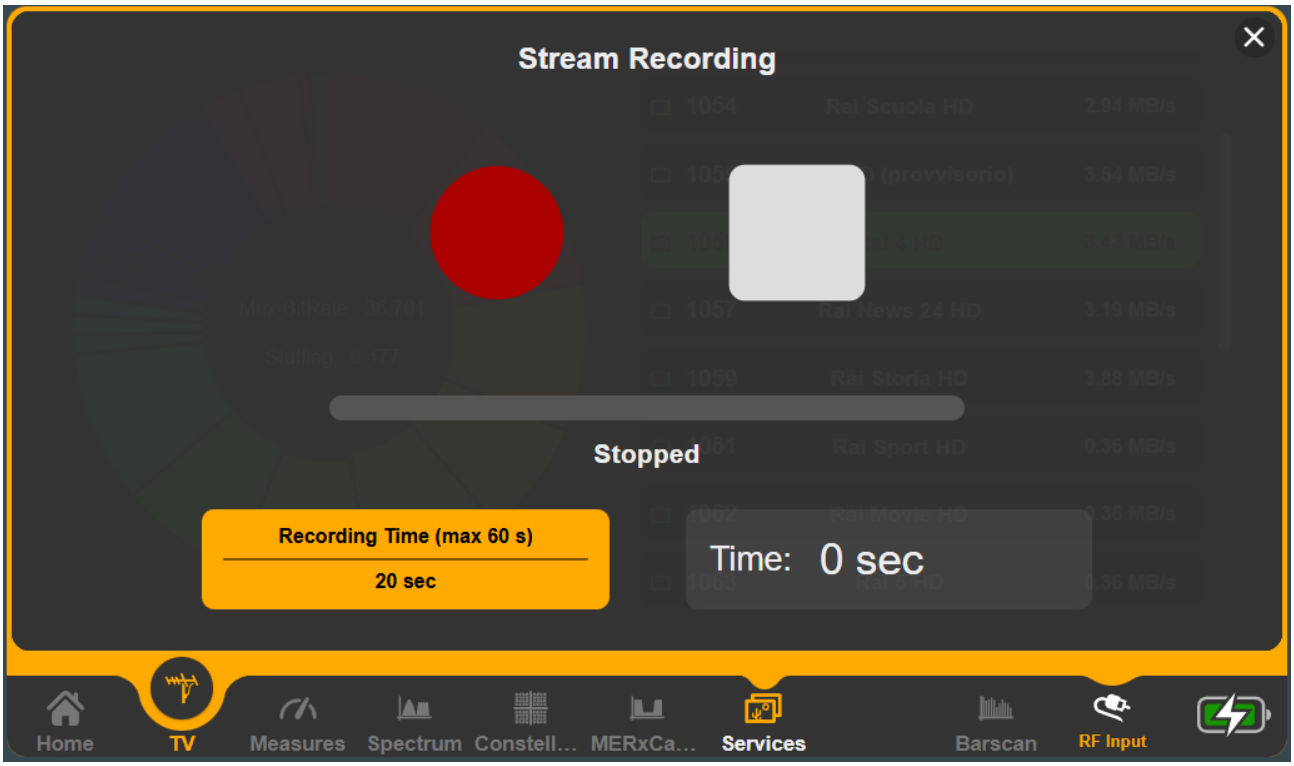
To view broadcast images, tap the "services" icon. This will open the list of services broadcast on the selected channel (in the example, ch40).
Tap the desired program, then tap the "PLAY" icon.



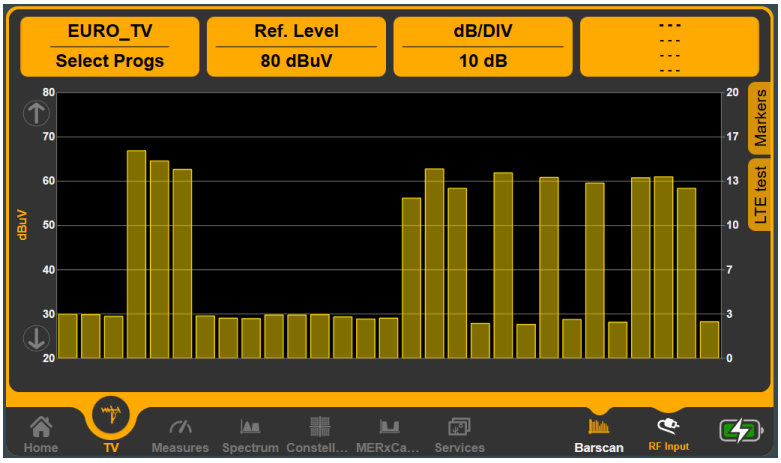
The innovative service display, accessed through the "Total Ser." function, shows the usage of services within the digital stream. This function is very useful when programming a headend, for example, one that remodulates signals from SAT to TV.

TV STREAM RECORDING

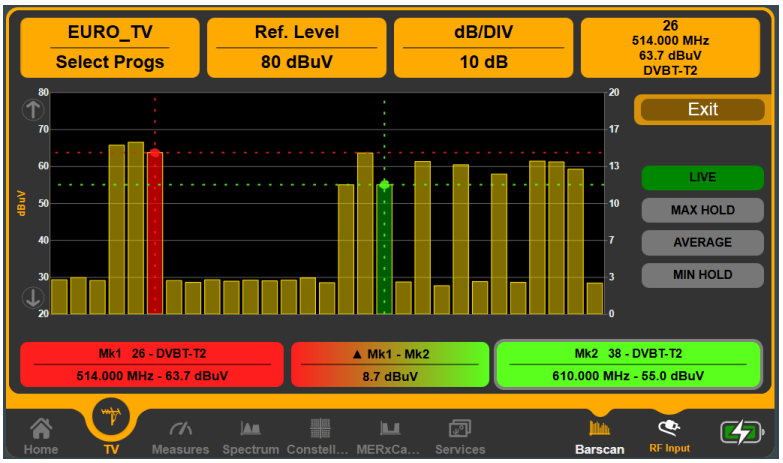
From the screen above, by touching the “Record” icon you can record the data stream transmitted by the television operator and store it both in the instrument and in an external USB memory (not supplied)



BARSCAN MENU



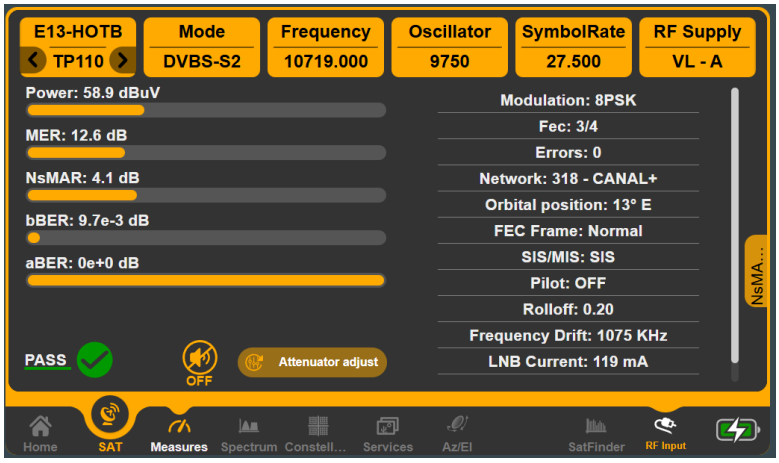
To access the graphical display of digital channels, tap the "Barscan" icon. You'll be able to see all received channels in a compact format on a single screen.
This function is ideal for calibrating headends that require equalization of the channels to be distributed.



Even in the BARSCAN function there is a “Markers” submenu to access the markers and the accessory functions to the function

DVB-S/S2 SAT ANALYSIS

To switch to the digital satellite signal measurement mode, similarly to what is described in the section on TV measurements, from the HOME menu touch the SAT icon.

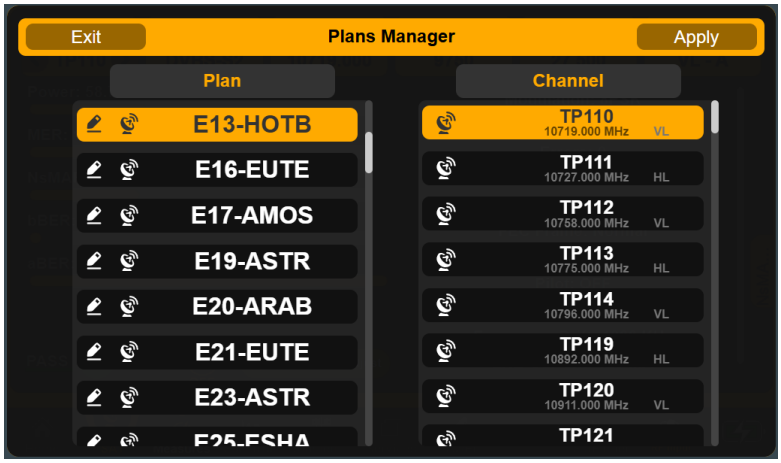


The main digital measurements screen will appear, displaying power, MER, bBER, aBER, the icon summarizing the signal quality, and, if necessary, the attenuator adjustment icon. Starting from the top right of the measurements screen, all information relating to the locked transponder is displayed, and – IMPORTANT – the TRUE orbital position with the LNB's absorption.

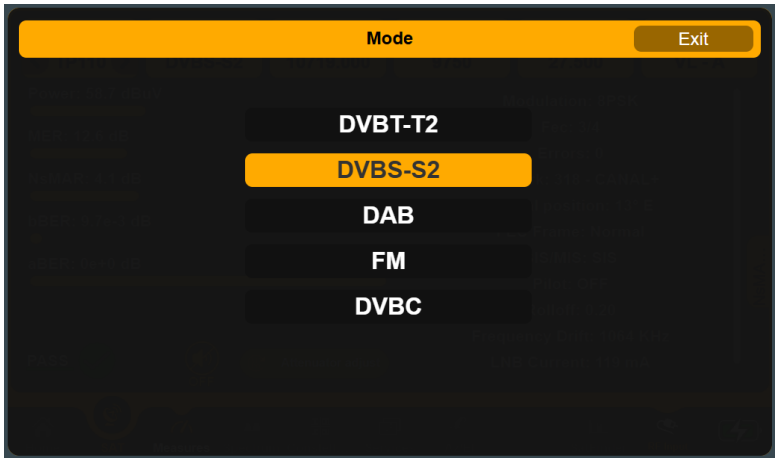
Tapping the left side of the screen, where the bars are, enables peak memory..

ISI and PLP SELECTION

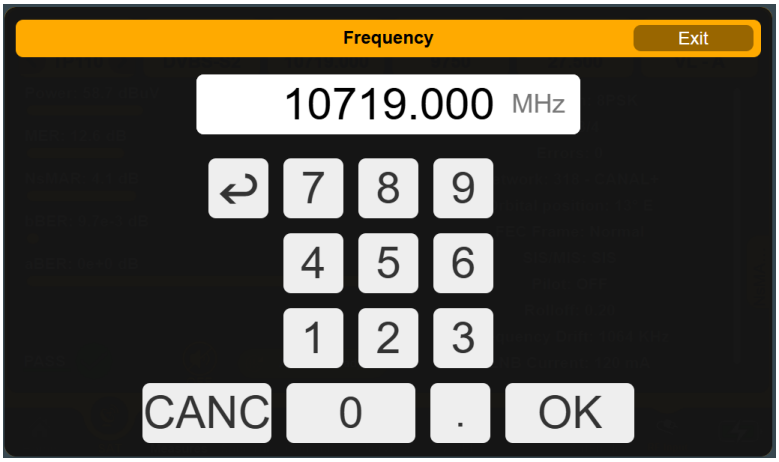
Not Active



By tapping the top left of the screen, you can access the list of preset satellites or AUTO plans. On the right of the screen, you'll find the list of reference transponders. Choose the desired one and tap "Apply".



By touching the “Mode” icon you can quickly access the measurements relating to the modulation you want to receive and measure.



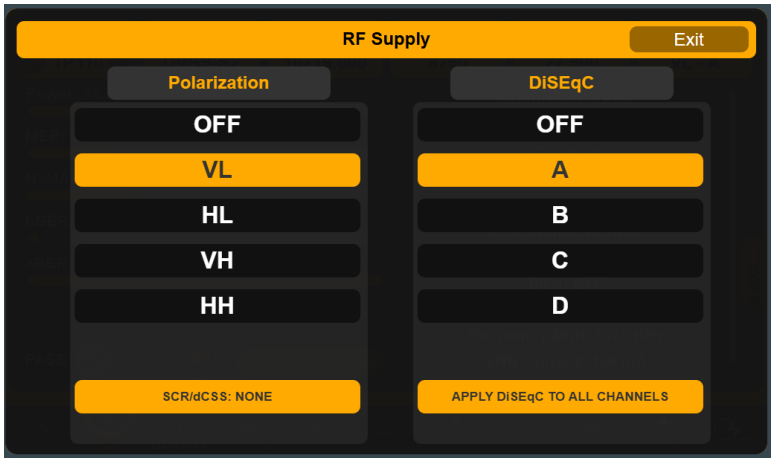
The “Frequency” icon is used to manually enter the frequency of the signal you want to measure.

By touching the “Oscillator” icon you can change the frequency of the LNB's local oscillator

NB: it is recommended to leave the value preset by the instrument to avoid not locking the signal

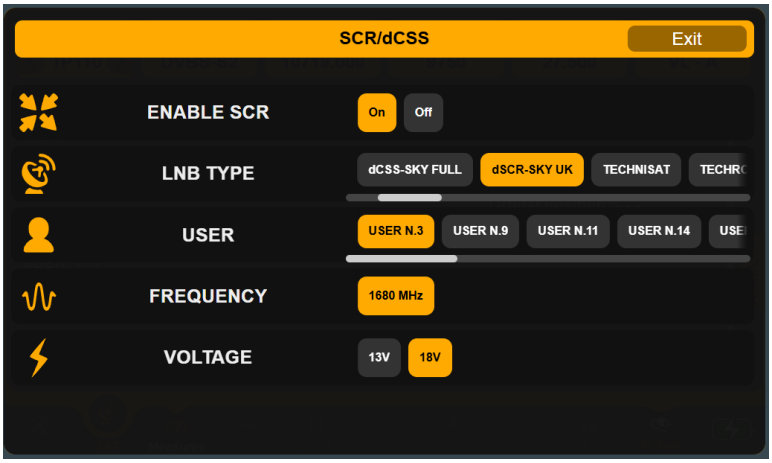
By touching the portion of the window at the top relating to the “SymRate”, you enter the menu corresponding to the “symbol rate” of the transponder under examination..

NB: also in this case it is recommended to leave the value pre-set by the instrument to avoid not locking the signal



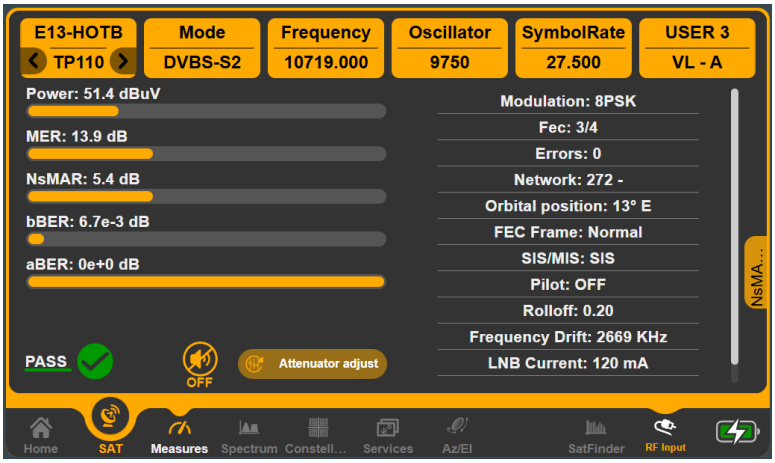
The “DC@RF” icon is used to access the remote power supply menu, which is automatic in the case of SAT measurements (pre-set in the transponders of the various satellites) and the DiSEqC command menu. It is recommended not to change the voltage values preset by the instrument..
The output current is limited to 600mA typical or interrupted in the event of a short circuit. NB: IF THE SWITCH NEAR THE RF INPUT CONNECTOR IS OFF, THE DEVICE WILL NOT POWER THE REMOTE. CHECK AND TURN IT ON.

MENU configurazione DiSEqC – DCSS - SCR



From the "RF Power" menu, tapping "SCR/dCSS..." enables the submenu for LNB or Multiswitch control commands. Selecting "ENABLE SCR" activates several selection lines. The first item is "LNB TYPE." For an SCR LNB, choose "LNB INVERO-SKY"; for a DCSS LNB, select "Dcss-SKY FULL."

Next, activate a user of your choice from those offered and press "Exit." The other parameters (FREQUENCY - VOLTAGE) relate to specific types of use, which are best left as they appear.



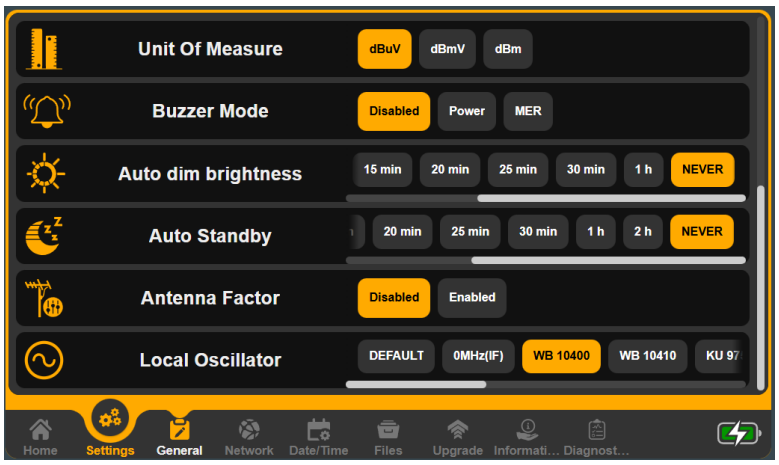
After tapping the "Exit" icon, you will return to the measurement screen, and the wording "USER. 3" will appear in the top right corner in place of the wording "Power...". All measurements can be performed, and the instrument will automatically send all the commands for the switching operations to be performed.

As with the SCR/DCSS command setup, the DiSEqC command selection appears on the right.
The options are:
1. Select the command permanently
2. Select the command temporarily

In the first case, after selecting the desired command, you must "apply it to all channels" by selecting the last option at the bottom.
In the second case, after selecting the desired port, tap "Exit" to perform the measurements. When the transponder under test is changed, the selected port is automatically deselected and the initial state is restored.

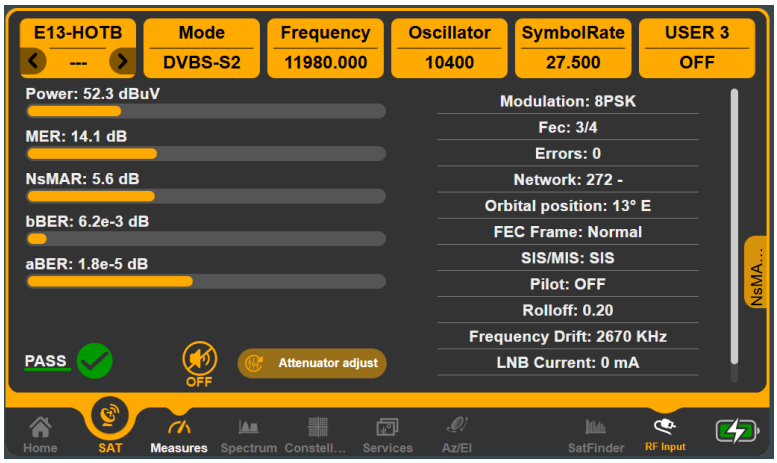
Configurazione LNB Wideband – 0MHz (IF)

Select “Settings” to access the configuration of the type of LNB to use



Scroll down to highlight "Local Oscillator" and choose the type of LNB you want to use.

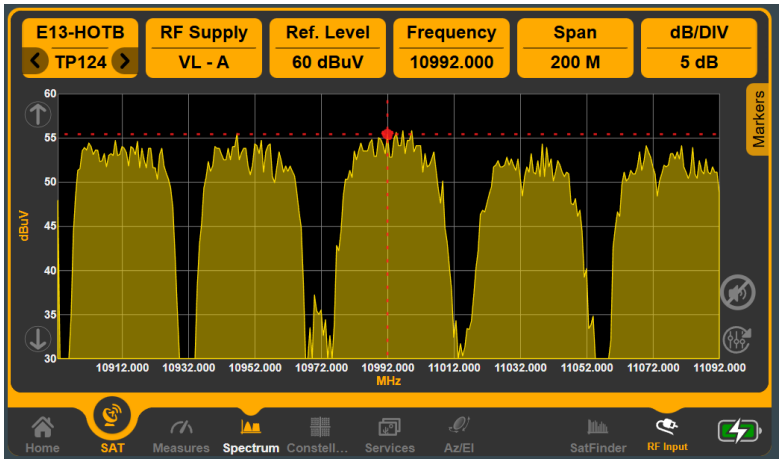
If you only want to highlight the IF frequency, tap the 0MHz (IF) icon or scroll to the other settings.



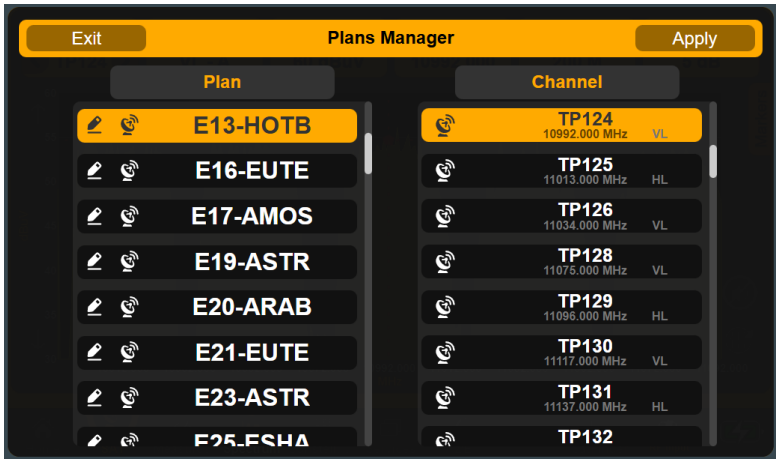
Go directly to SAT or spectrum measurements.

NB: Since the instrument's bandwidth starts at 700 MHz, it is important to keep in mind that the minimum measurement frequency must not fall below this frequency.
For example, in the figure, the 10,410 MHz oscillator was chosen. In this case, the minimum transponder frequency is 11,110 MHz (calculated by adding the 700 MHz of the instrument to the frequency of the chosen oscillator – 10,410 MHz).)

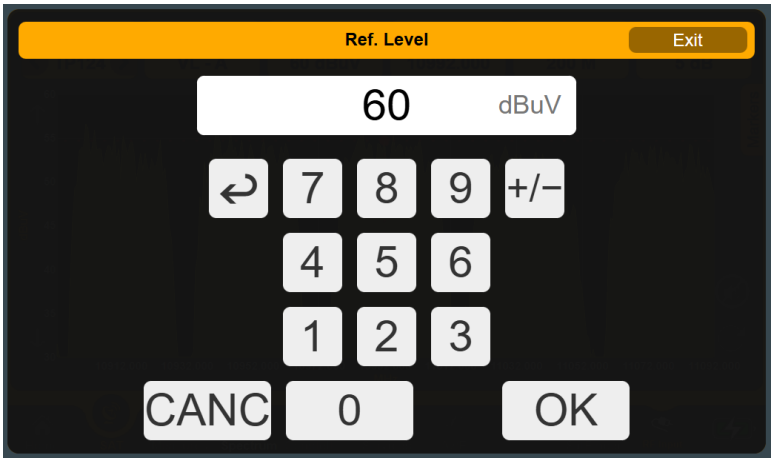
SWITCH to SPECTRUM mode



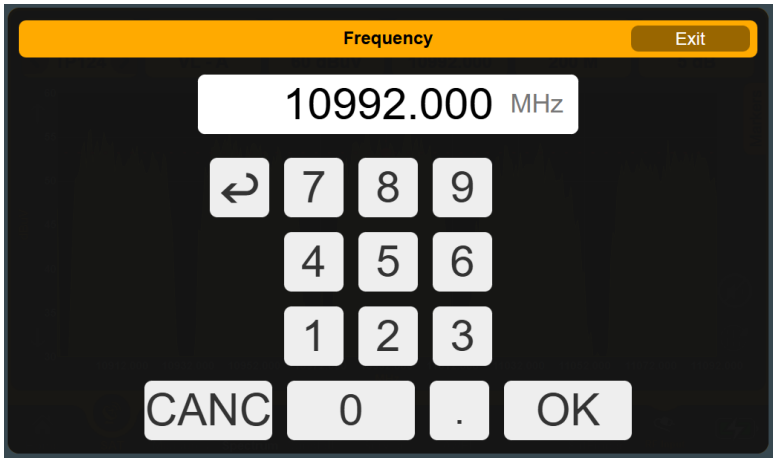
To switch to the spectrum view, tap the "Spectrum" icon at the bottom. On the left you can see a typical example of a digital SAT signal spectrum with the marker (red dotted line in the center of the screen) positioned on the TP124 transponder of the Hot Bird 13° East satellite. Tapping "Power..." returns you to the SCR/DCSS selection menu ... described on the previous page.



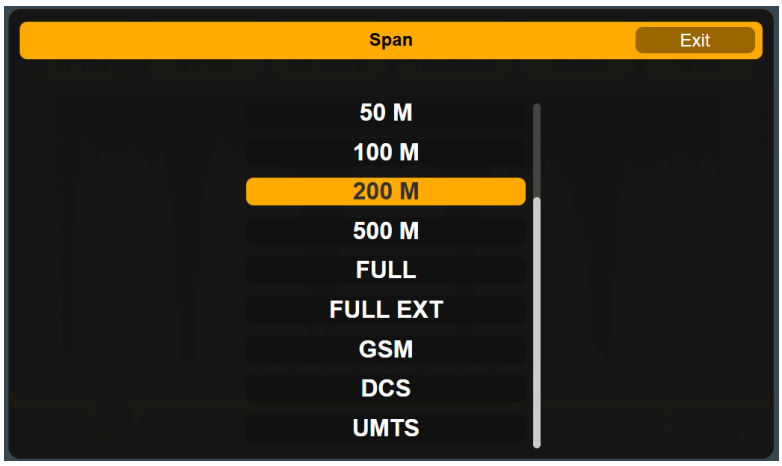
From the menu that appears at the top left of the spectrum, a drop-down menu appears for selecting the satellite plane to use and its transponders. Tapping the icon accesses the satellite selection menu in the left column and the transponder to measure on the right.



The “Ref. Level” icon is used to manually change the measurement level. It is recommended to leave the setting automatically set by the instrument.

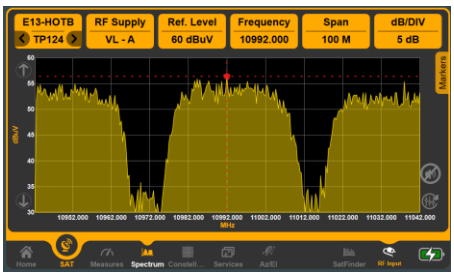


Selecting "Frequency" manually sets the frequency to be measured. This parameter changes automatically when you change transponders, and it is not recommended to change it if you are unfamiliar with the signals and types of control units in use.

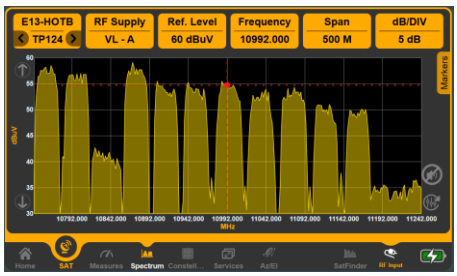


The “Span” item allows you to view the spectrum according to the scale that appears. You can see all the transponders transmitted “FULL” or by choosing 500 M or 100 M only some (below are some examples of spectrum with different SPANs).

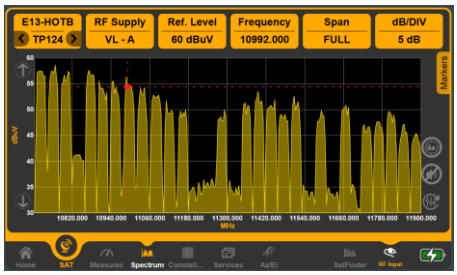
100 MHz Span

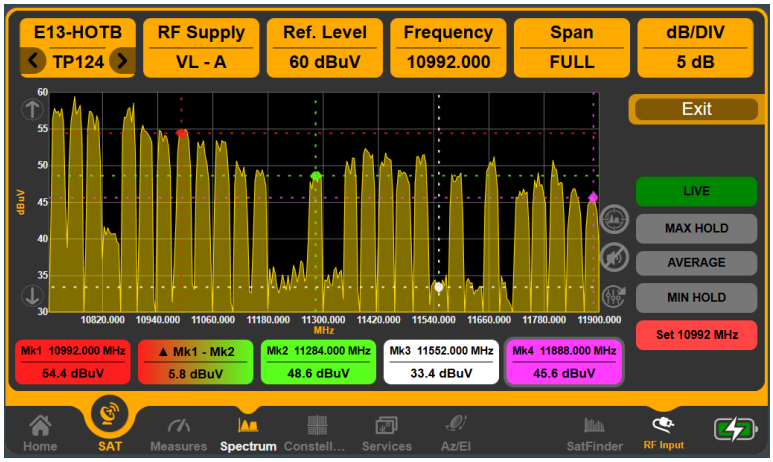


500 MHz Span



FULL Span

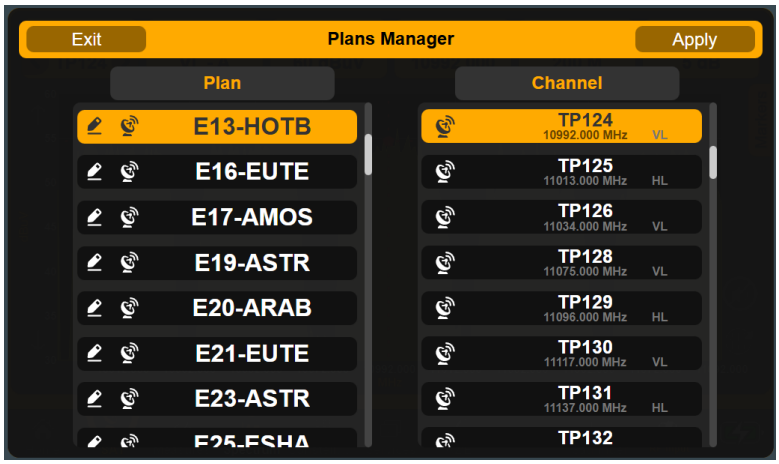




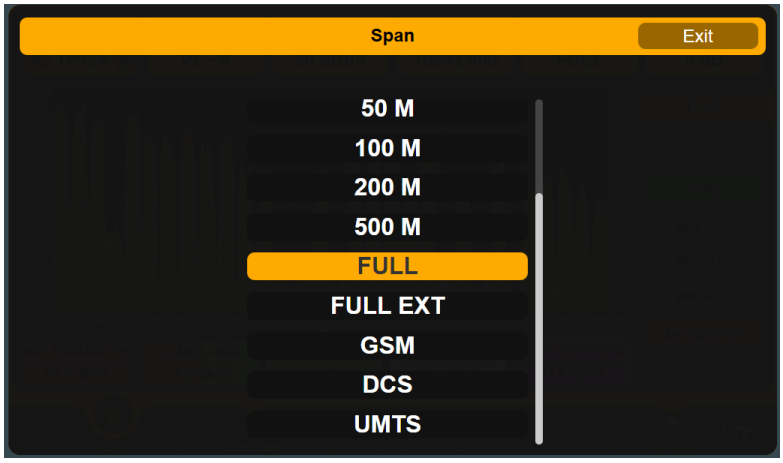
From the spectrum view, tap on the "Markers" item to access the functions relating to the markers and the management of peak, average and minimum measurements

SATEXPERT Function

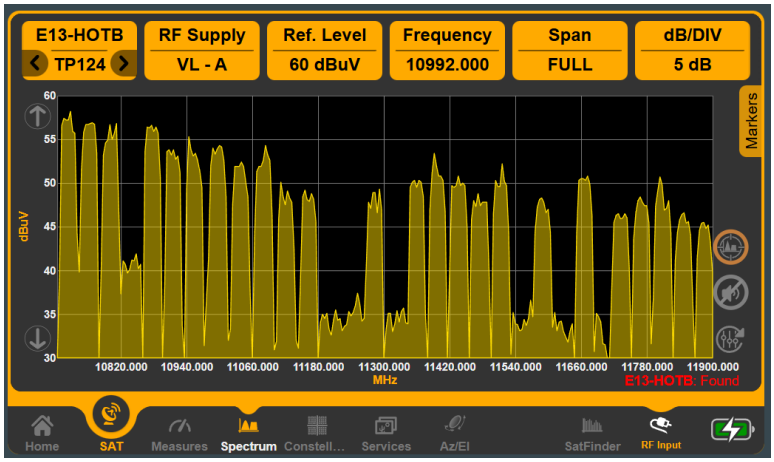
SATEXPERT is a special function designed and created by ROVER to safely point a satellite across the spectrum. This function analyzes the satellite's position by exploiting the instrument's AI capabilities and computing power.



To access this useful function, first you need to select the satellite you want to point to (e.g. Hot Bird 13°east in the figure).



Then in the spectrum display under "Span" select the wording "FULL"

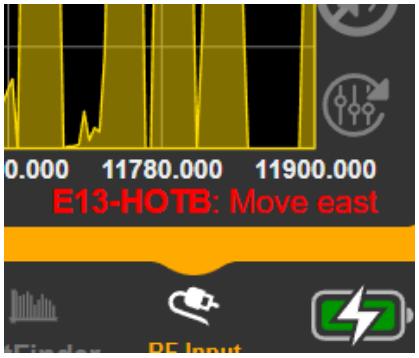


Subsequently, to obtain maximum accuracy and minimize spectral interpretation indecisions, select 5dB/DIV

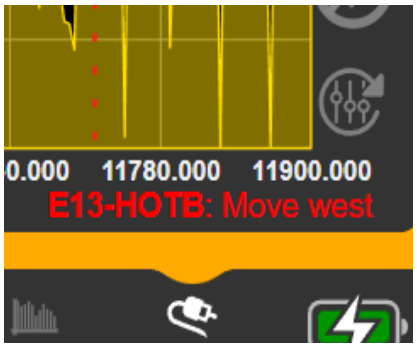
1) Tap the icon indicated by the arrow

2) If the satellite you are aiming for matches the one you selected (Hot Bird 31° East), the red text "E13-HOTB: Found" will appear.

In case of incorrect aiming, the red writing that appears at the bottom will indicate which direction of rotation of the dish must be performed to reach the desired aiming.



In this case the tool suggests to rotate the dish towards the east



in this example the tool of indicates to rotate towards the west

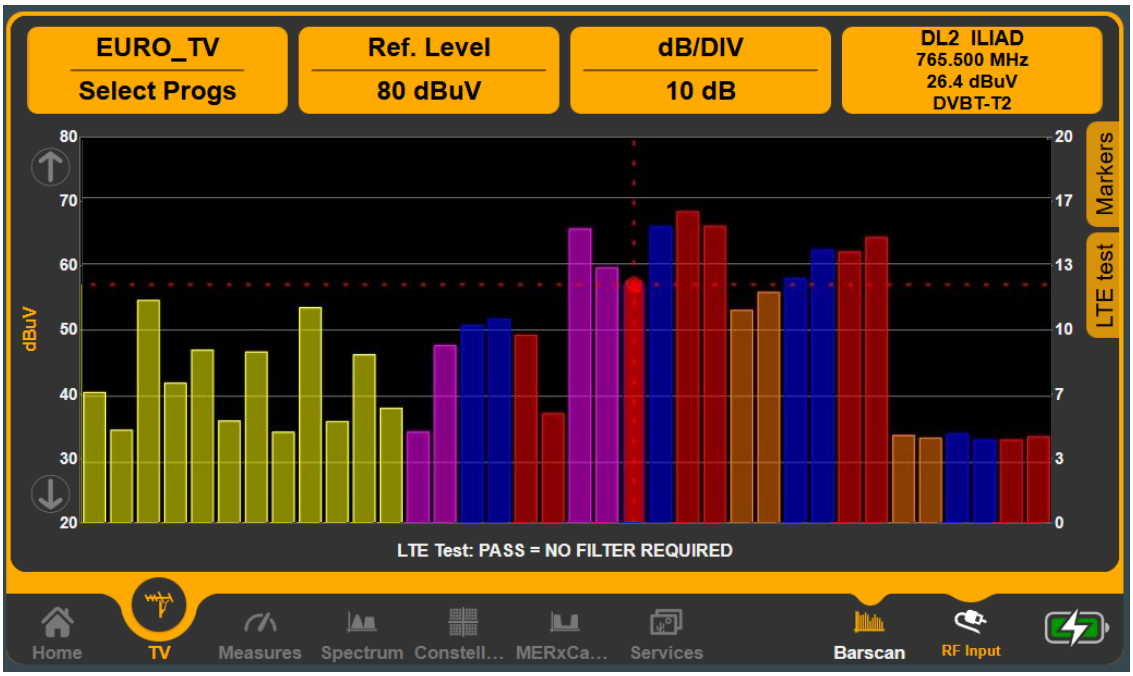
CELL-METER Cellular telephony

Tester for 2G/3G LTS UMTS 5G networks

The mobile phone test function is available in both the TV and SAT sections by accessing it through the "BARSCAN" or "SATFINDER" function. It allows you to scan the mobile phone channels present in the 800, 900, 1800, 2100, and 2600 MHz bands. The signal strength expressed in dBm or dBµV, the cell operator ID, and the frequency of the receiving channel are displayed. The measurement is compatible with all operators and does not require a SIM card.

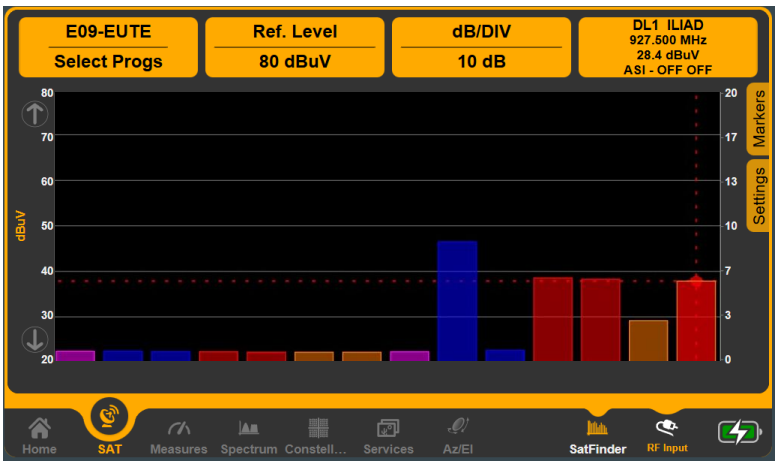
TELEPHONE CELL MEASUREMENTS

By activating the BARSCAN (TV) or SATFINDER (SAT) function, tapping "LTE test" will access the telephone signal strength measurement in the band in use: 2G, 3G, LTE, 4G, and 5G. This useful measurement is used to check telephone coverage. It's a good idea to have a dedicated antenna (not included) to accurately receive signals from cell towers. In the example above, the 700 MHz band is highlighted. The marker is above the TIM cell tower on the 770.500 MHz frequency channel. Note the presence of the digital terrestrial channels on the left (in yellow).



Tapping the colored bars highlights the corresponding operator and the transmission frequency in the top right.

Below are some examples of signals and measurements in some telephone bands:

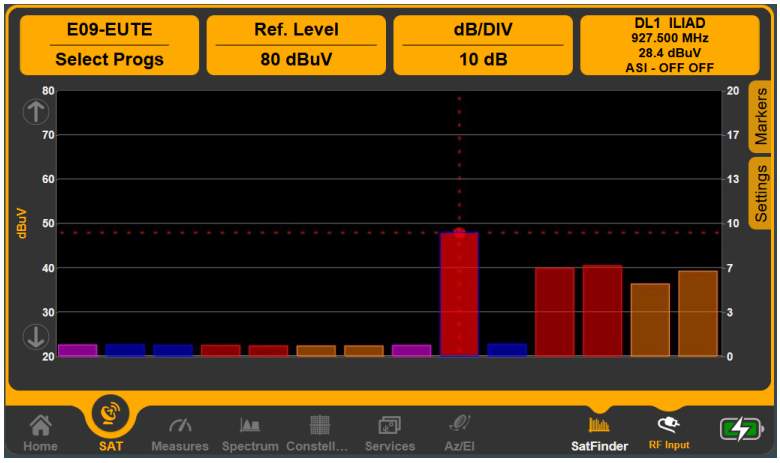


900 MHz Band

The marker is above the WIND cell on the 957.500 MHz frequency channel.

WIND carriers are in orange.
TIM carriers are in light blue.
VODAFONE carriers are in red.

Example 1

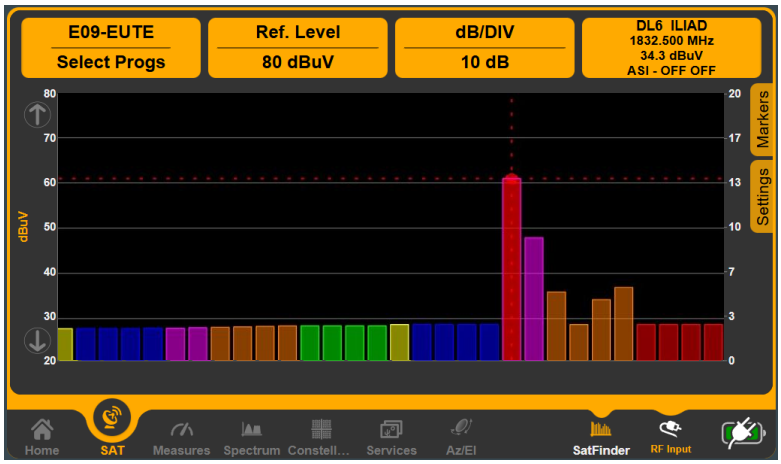


900 MHz band

The marker is above the TIM cell on the 932.500 MHz frequency channel

VODAFONE carriers are in red
WIND carriers are in orange

Example 2



1800 MHz band

The marker is above the ILIAD cell on the 1832.500 MHz frequency channel

ILIAD carriers are in purple
WIND carriers are in orange

Example 3

LAN TESTER

GENERAL TECHNICAL INFORMATION

Physical Structure of Ethernet Cables

LAN (Local Area Network) cables are used to connect devices within a local network, such as computers, routers, switches, and servers. They are used in home, business, and industrial environments to transmit data more reliably, quickly, and stably than the more common Wi-Fi technology, reducing and often eliminating interference and latency.
The cables used for structured cabling, and all Ethernet cables in general, are made up of eight wires twisted into pairs called "twisted pairs," which can be more or less shielded from each other. The twisted pairs are in turn twisted in a precise pattern to minimize losses and external and internal interference (crosstalk).

LAN Cable Usage Classes and Transmission Speeds

LAN cables are classified into categories that indicate their performance:

- Cat 5e: up to 1 Gbps over 100 meters, suitable for home networks.
- Cat 6: up to 10 Gbps over 55 meters, better shielding against interference.
- Cat 6a: Up to 10 Gbps over 100 meters, used in professional environments.
- Cat 7: Up to 10 Gbps with increased protection against electromagnetic noise.
- Cat 8: Up to 40 Gbps over 30 meters, used in data centers and high-performance networks.

Checks for Correct Cabling

To ensure that cabling is correctly installed according to design specifications, several tests should be performed:

- Continuity and wire mapping: Verify that each wire and/or pair is connected correctly.
- Cable length: Verify that the length does not exceed the limits for the category.
- Speed and attenuation tests: Measure the quality of data transmission.
- Interference and crosstalk: Verify protection from internal and external noise.

Good LAN cabling ensures a stable network, with high performance and no packet loss.

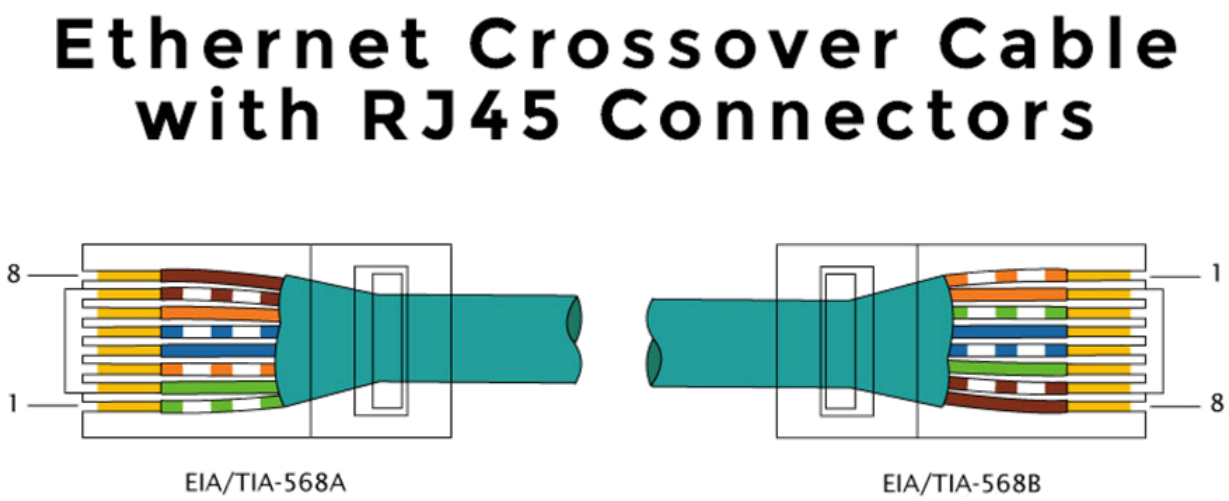
Crossover Cable and Ethernet Cable

In addition to standard "straight" Ethernet cables, there are also crossover or "crossover" cables. An Ethernet cable, also called a straight-through cable, is wired so that pin 1 on one end connects to pin 1 on the other end; the same goes for the remaining 7 pins. With a crossover cable, the connections are not as simple. Pin 1 is connected to pin 3; pin 2 is connected to pin 6; pin 4 is connected to pin 7; and pin 5 is connected to pin 8.

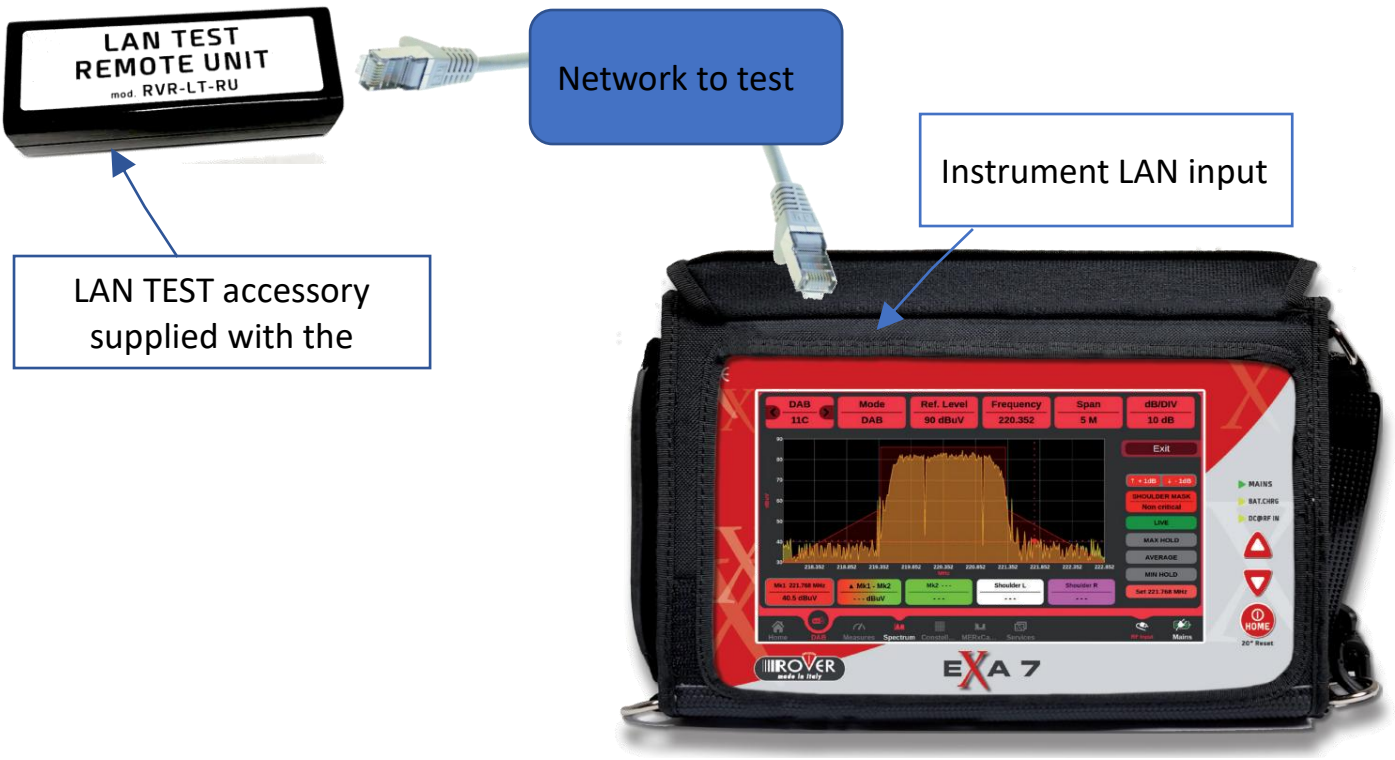
The different interconnection scheme is used to divert the transmission lines on one side to the reception lines on the other. This is useful when using cables to connect two computers without the use of routers or switches.

When should you use crossover cables and when should you use straight cables?

Nowadays, equipment can recognize and adapt to the type of interconnection cable used, so straight cables are used. In rare cases, when dealing with older equipment, hubs or switches, it may be necessary to use crossover interconnect cables.



Connecting to the instrument

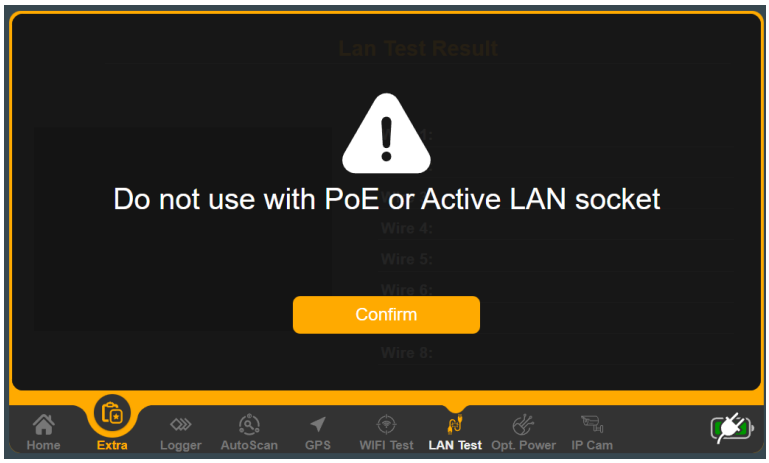


Measurements with the EXA instrument

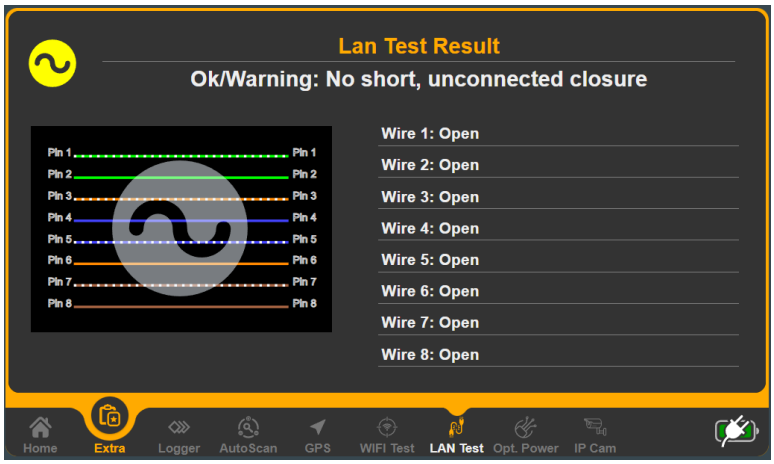
Measurement configuration

To access the Ethernet cable measurements, start from the "HOME" screen and enter the "LAN Test" menu (see arrow)

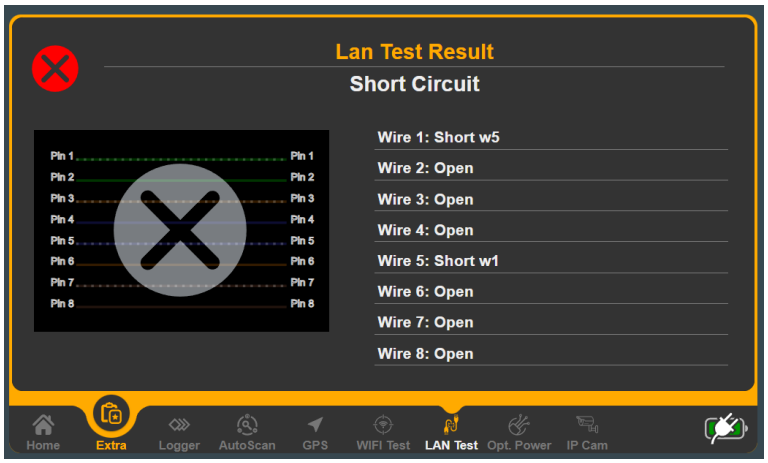
Then activate the item "LAN Test"



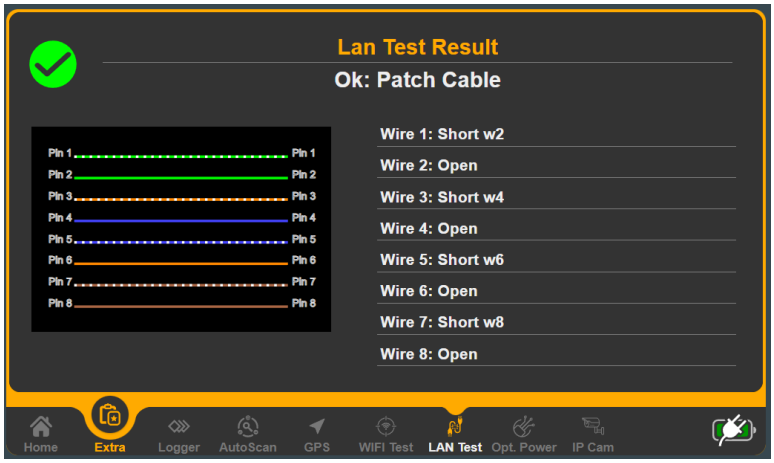
To then enter the screen relating to the test, this first WARNING image will appear, warning you NOT to use the instrument if the network to be tested has POE, i.e. remote power supply in one of the LAN lines.



After confirming, you move to the measurement screen.
This example highlights that the LAN cable being tested is not short-circuited and is not connected to any device (free ends).



This is an example of a wiring with a short circuit between pin 1 and pin 5. The tool is suitable for measuring the correct installation of the cables and checking whether they are of the "straight" or "crossed" type.”



In this example it is shown that the LAN cable under test is correctly connected to the test probe (supplied with the instrument) inserted into a network socket

IP CAMERA MEASUREMENTS

GENERAL TECHNICAL INFORMATION

What is an IP address? IP stands for Internet Protocol. It's a system used to identify devices (such as computers, phones, printers, etc.) on a network, much like a home address. Each device on a network has an IP address, which can be one of the following:
- *IPv4: 192.168.1.10 (the most common, with 4 numbers separated by periods)*
- *IPv6: 2001:0db8:85a3:0000:0000:8a2e:0370:7334 (longer, increasingly used)*

What is an IP network? An IP network is a group of interconnected devices that can communicate using IP addresses. It's like a neighborhood in a city where every house has an address, and everyone can send messages to each other.

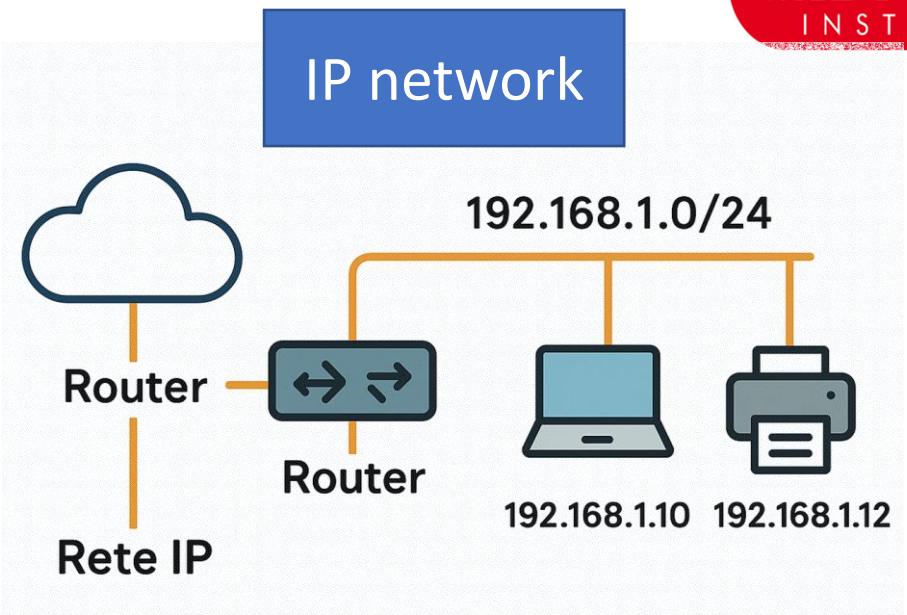
How does it work? IP addresses are divided into two parts:
1. Network part: indicates which network the device belongs to.
2. Host part: indicates which device is on the network.
Example: 192.168.1.10
- *192.168.1 → network*
- *10 → device (host)*

What does an IP network do? It allows communication between devices on the same network or in different networks (via routers).
- *It is the basis of the Internet: every website, server, or user has an IP address.*

Types of IP networks:
- *Local area network (LAN): for example, the devices in your home connected to Wi-Fi.*
- *Public area network (WAN): for example, the Internet.*

Public vs. Private
- *Private IPs: used in local networks, not accessible from the Internet (e.g., 192.168.x.x)*
- *Public IPs: used to communicate over the Internet*

What do you need to connect networks?
- *Router: connects multiple IP networks together (e.g., your local network to the Internet)*
- *Gateway: is the access point to another network*



IP network example

- How do I set up an IP CCTV camera?
- These few steps provide a quick and easy guide to configuring an IP video surveillance camera. Some brands and/or models may have different configurations.

- 1. Connect the camera to your network devices.
- If it's Wi-Fi: Plug it in and wait for it to turn on and initialize.
- If it's wired: Connect the camera to the router via Ethernet cable. First, check the cable's electrical connection. If necessary, use the LAN test tool app (see ROVER AN 131 ETH V1.4 application note), which allows you to test the correct wiring.

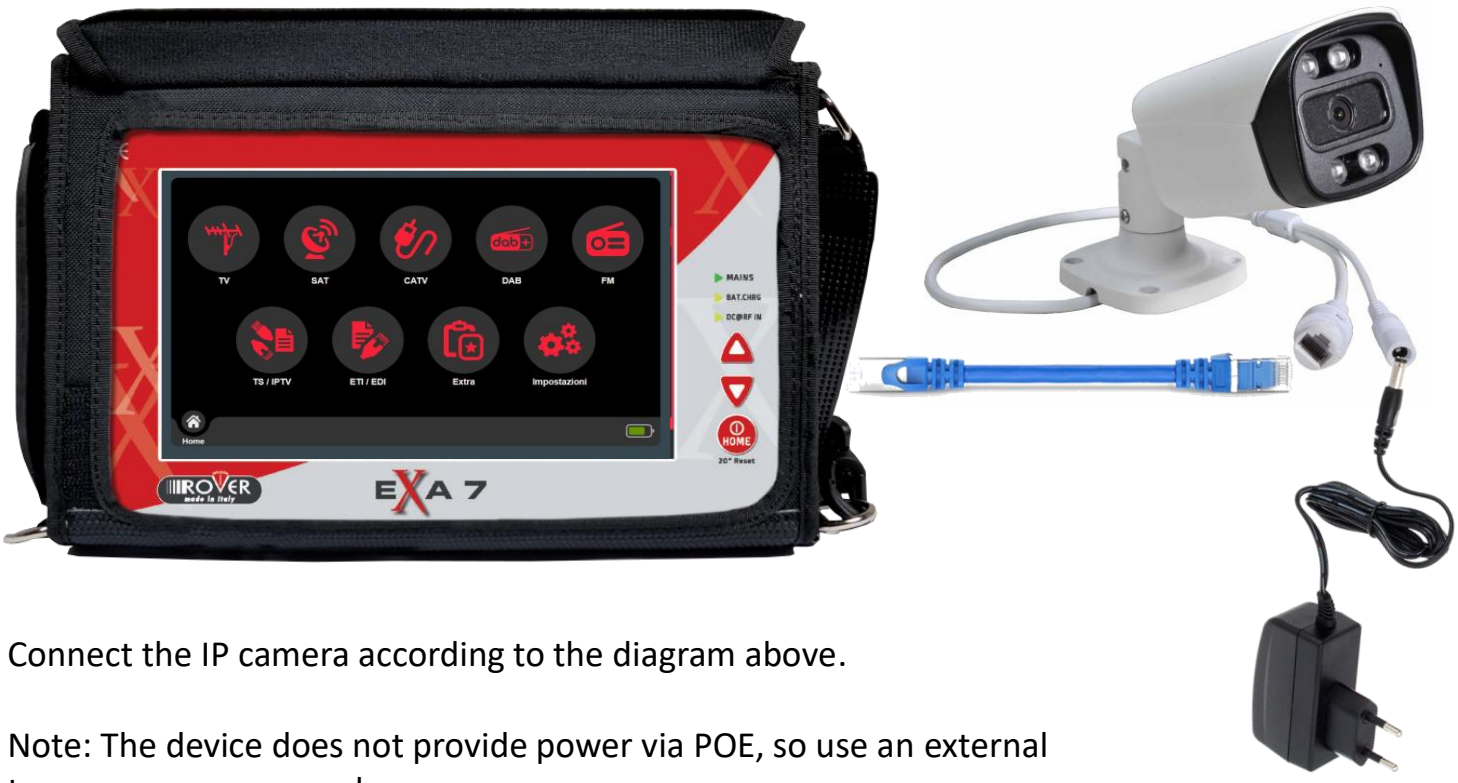
- 2. Find the camera on the network; there are two methods:
- Method 1: Using the manufacturer's app
- Download the official app (e.g., TP-Link, Tapo, Ezviz, Hikvision, etc.).
- Follow the wizard to add the camera (usually with a QR code).

- Method 2: From a PC with software or browser
- Use the manufacturer's software (e.g., SADP Tool for Hikvision).
- Or, open a browser and enter the camera's IP address (e.g., 192.168.2.64).

3. Set up the camera
- Enter your username and password (often: admin/admin or admin/1234)
- Set up:
- Wi-Fi
- Secure password
- Time and date
- Recording to SD card, PC, or cloud

HELPFUL TIPS
- Always change the default password!
- If you want to view it from away from home, enable remote access (cloud or DNS).
- Check if port forwarding is required on your router (for direct access via public IP).

Connection and verification with the EXA tool

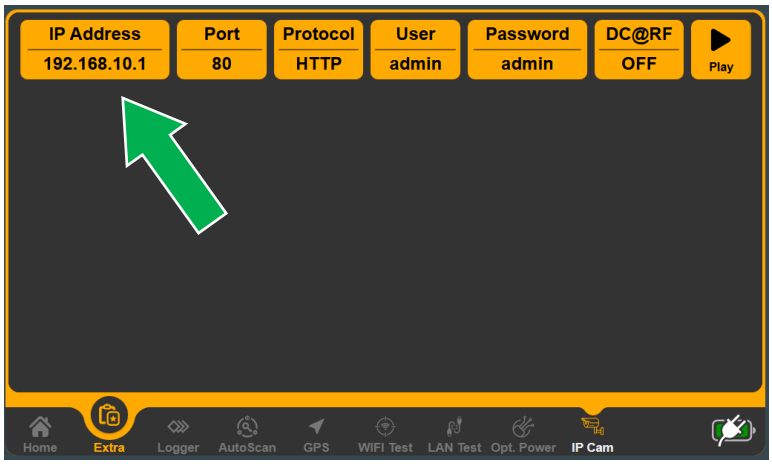


Connect the IP camera according to the diagram above.

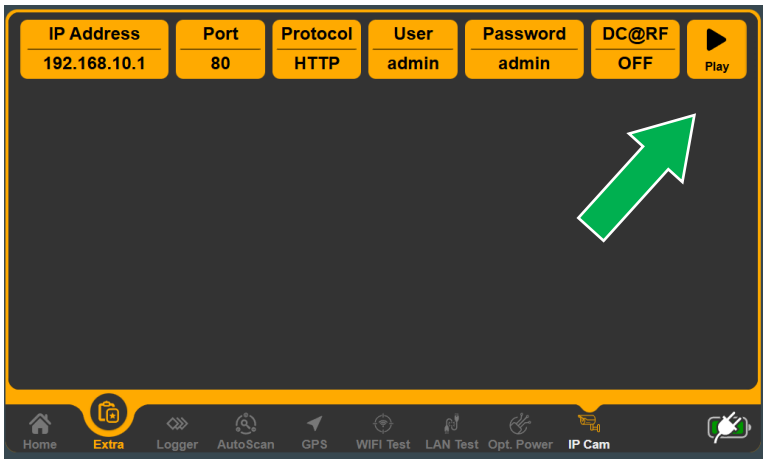
Note: The device does not provide power via POE, so use an external temporary power supply.

Instrument Settings

Go to the HOME menu and then select the “Extras” icon. Then select the icon with the words “IP Cam” in the bottom right.”

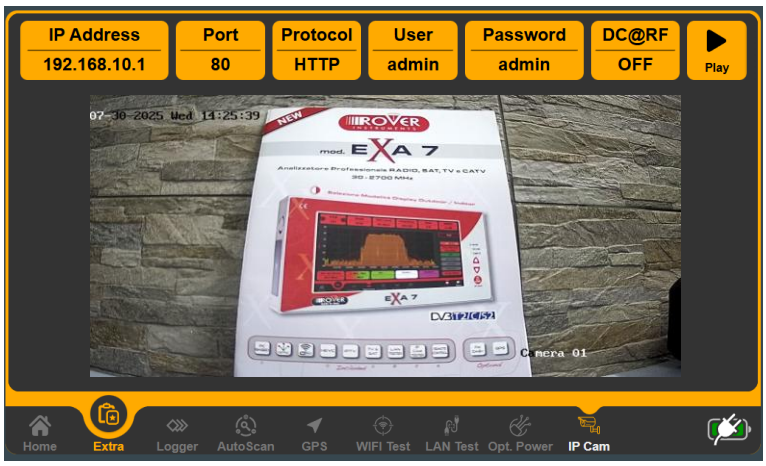


Before connecting to the camera via IP, you must set the device's LAN port to match the IP address of the camera you will be viewing.
Under "IP Address," change the IP address. Finally, confirm by clicking "OK"



This screen will appear where you must enter the following information in this order:
IP Address, Port, Protocol, Username, and Password.

Once you have entered the information for the IP camera you want to test, tap the "Play" icon.”



If the entered data corresponds to the camera setup data, the image will appear.

NB: Please remember that the IP port on the right side of the device is NOT of the POE type

FIBER OPTIC OPTION

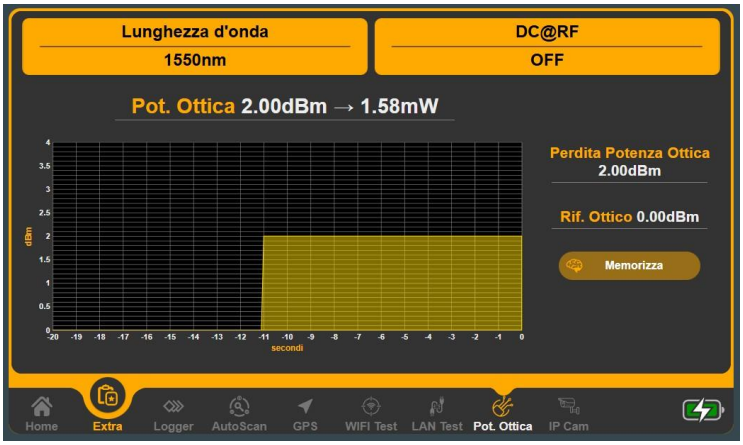
It is essential that the EXA OPTIC option is available on the instrument. If not, contact ROVER support for information on how to install it.

The optical function allows for two types of measurements:

1. Optical power measurement (optical power meter). The optical power of the input signal is measured regardless of its content, e.g., telephony, internet, satellite TV, data, etc.
2. Demodulation and measurement of satellite TV signals. If digital satellite TV signals have been transmitted via fiber, they can be demodulated and analyzed to determine their quality, view the image (if clear), and display the spectrum.

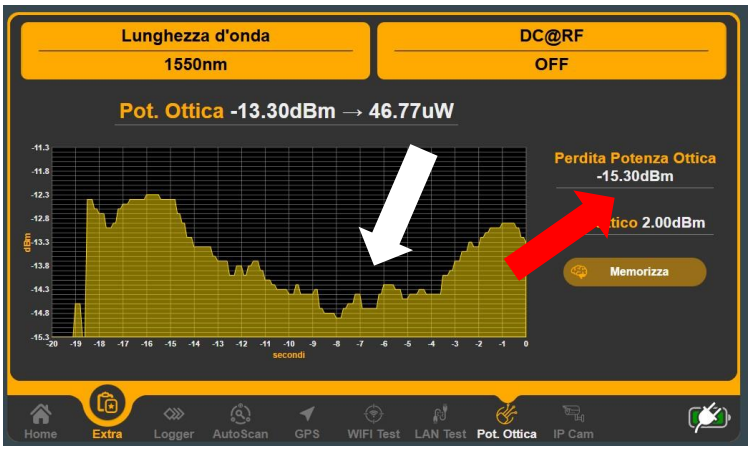
From the HOME screen, enter the “Opt. Power”

The “Opt. Power” item to access the “Optical Power Meter” (OPM) function, which measures the power of the optical signal present at the input of the SC connector and any attenuations.

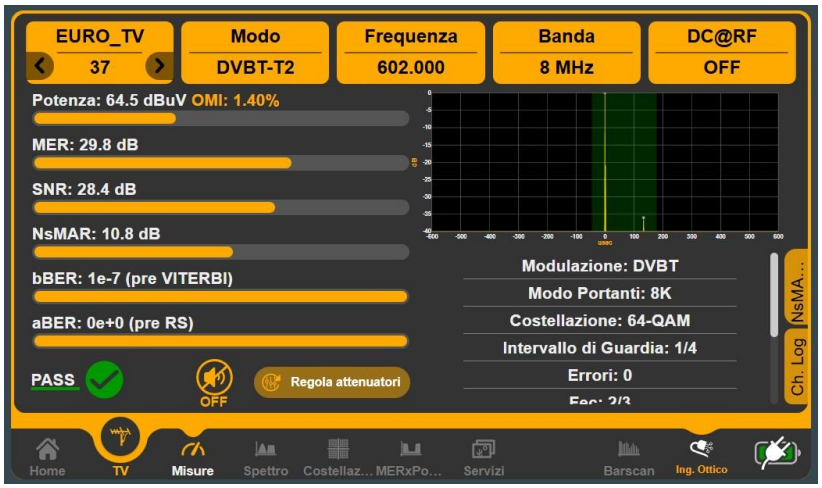


By accessing this function, you can view the status of the optical signal, both graphically and numerically. Before performing the measurement, set the reference optical window by tapping the "Wavelength" icon.
In the example shown, the input optical signal has a wavelength of 1550 nm and a measured power of 2.00 dBm.
The "DC@RF" icon (off by default) allows you to enable remote power supply through the RF connector, if activated.

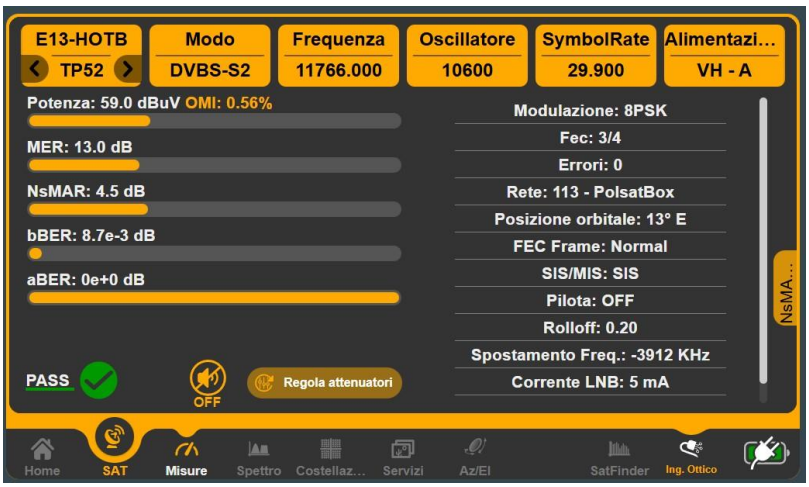
If the measured signal comes from a telephone exchange or switchboard, tap the "Save" icon to save it as a reference signal.
This value can be used for subsequent system attenuation measurements.



The following is an example of an unstable optical signal, likely caused by a dirty connection.
The graph shows the variation of the optical signal over time (white arrow) and a power loss of –15.3 dBm (red arrow).
The attenuation is calculated by subtracting the measured input optical power (–13.3 dBm) from the reference power (+2 dBm).



To measure the quality of a TV signal, go to the HOME menu, tap the "TV" icon, and select the optical input (see arrow).
In this mode, you can perform all standard measurements, in addition to the one displayed next to the RF power value, OMI, which indicates the percentage of optical modulation.
This parameter is useful for checking whether the RF/Optical converter is being driven correctly.

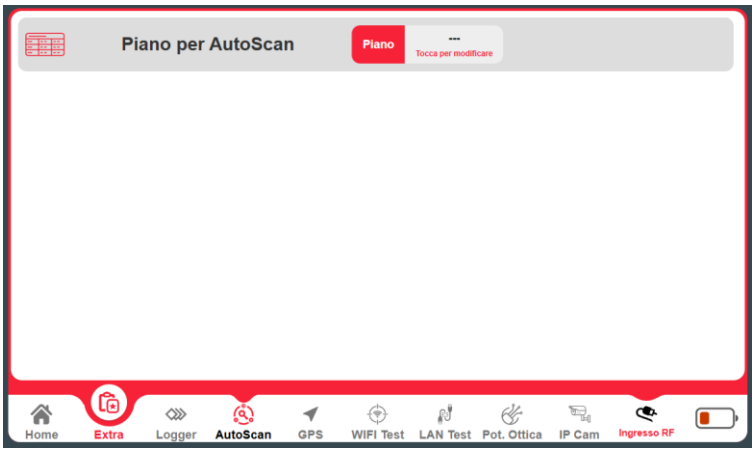


The same procedure applies to SAT, spectrum, and other signals.

NB: Once the Optical or RF input option has been selected, it will remain active until the next selection.

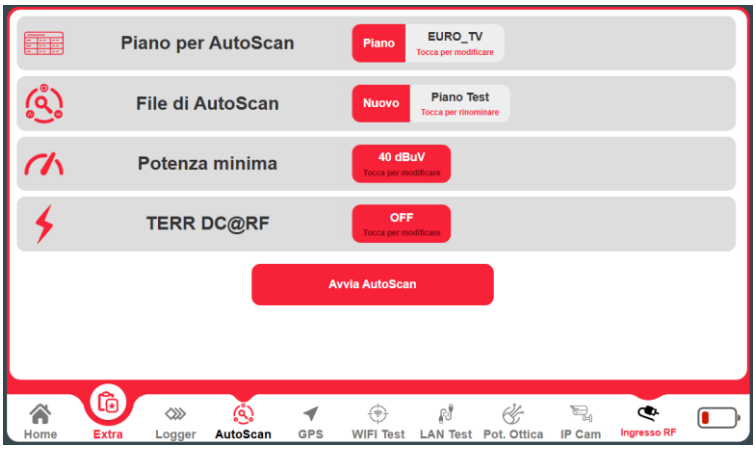
CREATING A CUSTOM MEMORY PLAN

AUTOSCAN mode

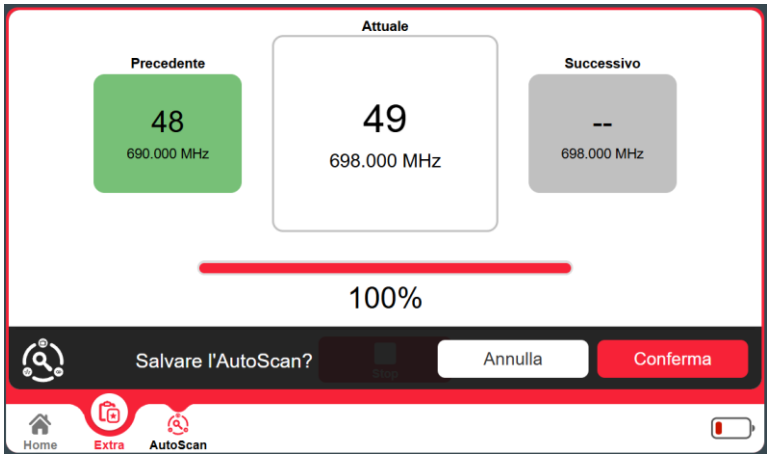


From the main menu, tap EXTRA and then the “Plan” icon

Then proceed by selecting the reference plane to which the instrument will refer. In this example, tap in order: "Planes", "Planes_TV" and select the reference, which in our case will be "EURO_TV".
This will open the following screen, which defines how to perform the AutoScan.

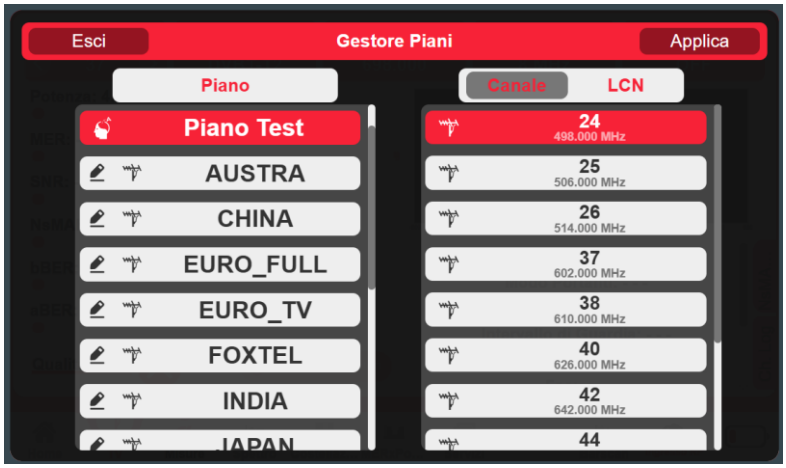


Enter the name for the generated plan in the "AutoScan File" field, e.g., Test Plan. Enter the minimum signal strength below which the instrument will ignore the signal. If necessary, enable remote power supply and start the scan with "Start AutoScan."



During the scan, you will be able to see the progress of the test, which will be indicated by a green color indicating the presence of a signal or a red color indicating the absence of a signal.

At the end of the scan, confirm the plan by tapping "Confirm".

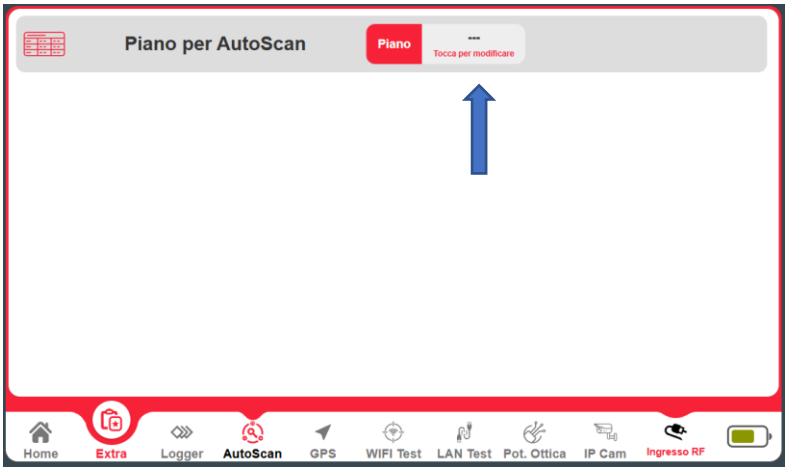


Go to TV measurement mode and select the plan you just generated; in this example, "Test Plan."

Then perform the usual measurements of the channels present.

MEMORY PLANS MANAGEMENT

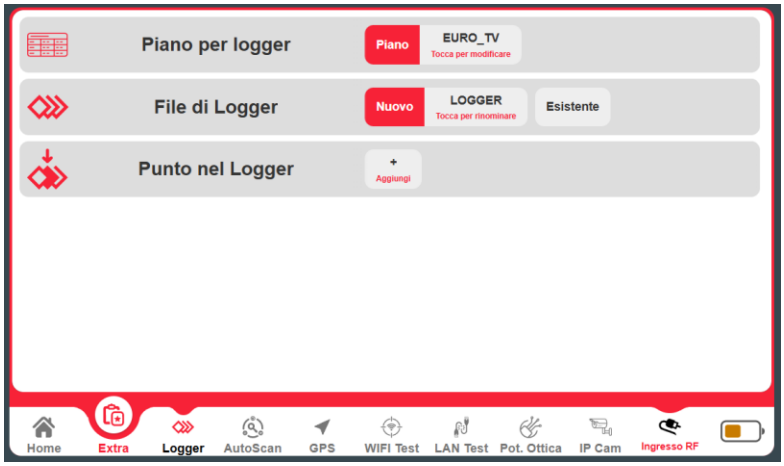
LOGGER function



The AUTOMEMORY function is useful when you want to create a customized plan through the tool's automation. To generate it, you'll need to set some search parameters.
Select "Extras" from the main menu and then tap the icon indicated by the arrow.

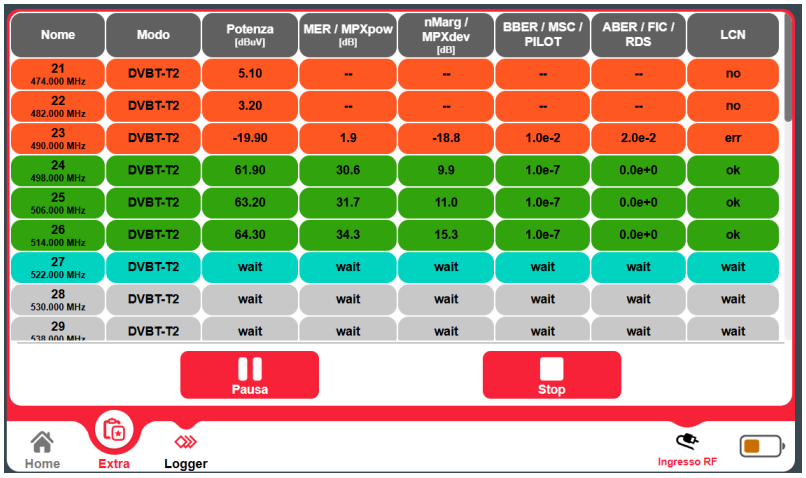
Select the memory plan the tool will refer to for channel searches. In this case, tap the "Plans" icon and then the "TV Plans" icon."

Finally, choose the desired reference plan. For Italy, we recommend the "EURO_TV" or "EURO_FULL" plans.



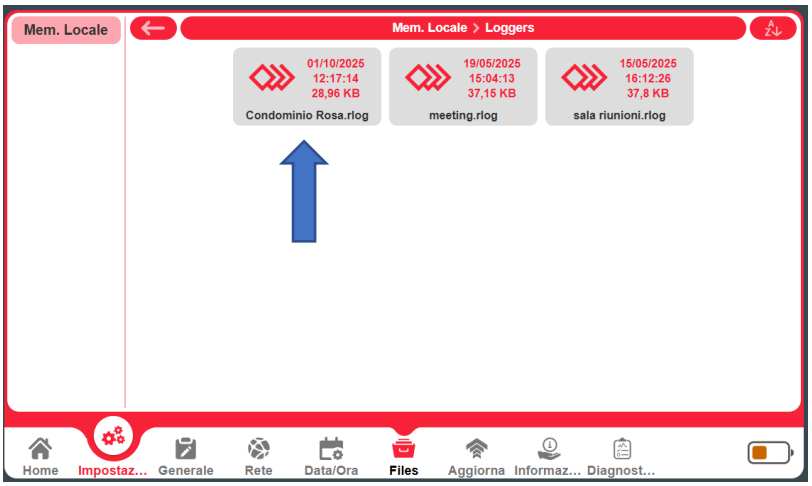
From this screen, you must select some parameters that the tool will take into account before starting the search for occupied TV channels:
Touch the "LOGGER" icon to rename the floor that will then be saved, e.g., "Condominium Red"
Then name the measurement point, if applicable, e.g., "Apartment 1"

In the next step, you must choose whether to use the "Stop & Go" function (which stops the device when switching from TV to SAT if using a mixed plan) or "NO" to prevent the device from remaining in standby mode.
Next, select whether you also want to store the LCNs, whether only TV or SAT, or both, whether DCSS/SCR is present, and whether remote power is required. Finally, tap the "Start Logger" icon and wait for the search to complete, which can be short (if you don't select the LCN option) or longer.

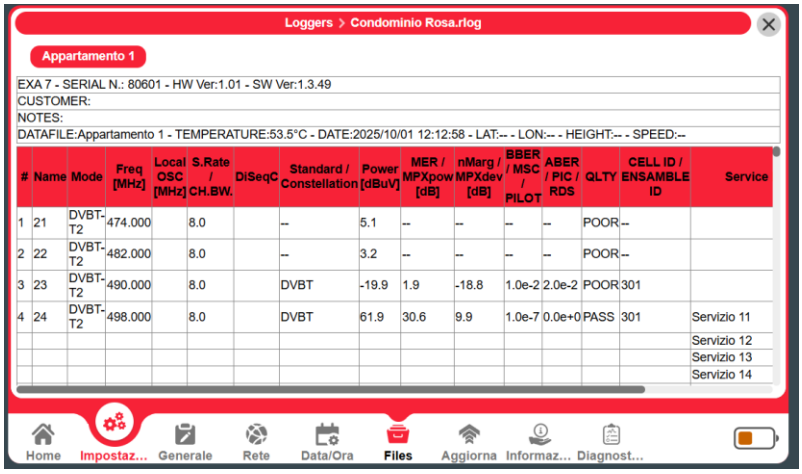


This is the screen that will appear during the search phase. Finally, confirm the saving by tapping the "Confirm" icon.
After a few seconds, tap "View" to view the collected data.

Viewing LOGGER measurements



In a subsequent step, to view the measurements taken with the LOGGER function, select the "Settings" icon from the main screen, then the "Files" section at the bottom of the screen, accessing the icons relating to the folders stored in the instrument. Next, select the "Loggers" section and the previously saved file, which in our case is called "Condominio Rosa" (see arrow).

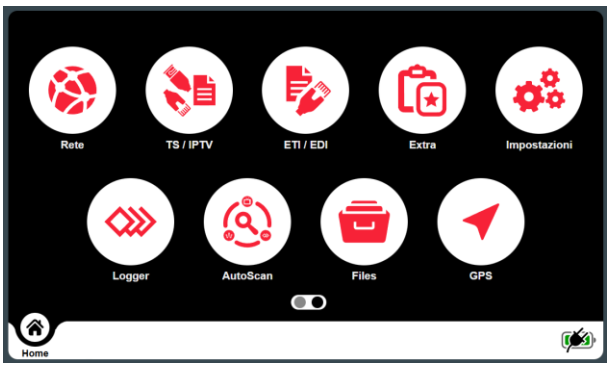


finally "open" to see the measurements or "convert to XLSX" to save it in a format that can be exported to Excel

CONNECTIVITY

If the instrument is equipped with the WiFi option (*), it is possible to exploit its features to connect it to a SMARTPHONE, a TABLET or a PC so as to be able to control it remotely.

The first step is to set up the WiFi interface of the device and activate the “AccessPoint” option according to this procedure:



1) From this screen select the “Network” icon

2) enter the WiFi settings by tapping the relevant text

3) select the AccessPoint function

4) After a few seconds, this screen will appear where you can see the name of the network and the password to choose to connect with your SMARTPHONE, PC, ...

5) access the WiFi configuration menu of your SMARTPHONE, TABLET or PC and select the network name and enter the password that appears on the tool.

IMPORTANT: Some SMARTPHONES and TABLETS require DATA to be turned off in order to connect to the instrument.

Open the BROWSER and enter the address displayed in the “Gateway” line that appears on the instrument screen into the bar: in this case 10.42.0.1

Once connected, you can use all the functions of the field strength meter remotely.

Suggested measurement values

The table below is used to facilitate the interpretation of the measurements read by the instrument and to provide useful information on the minimum and typical parameters of the digital signals (level and quality) present at the user socket.

DVB-T (COFDM)		
Meas	min.	typ.
power	40 dBµV	50 dBµV
noise margin	6 dB	9 dB
bBer	1E-06	2E-08
MER 64qam (fec 2/3)	25 dB	28 dB
MER 16qam (fec 2/3)	20 dB	23 dB
MER 4qpsk (fec 2/3)	14 dB	17 dB

DVB-S (QPSK)		
Meas	min.	typ.
power	40 dBµV	50 dBµV
noise margin	3 dB	6 dB
bBer	2E-06	2,0E-08
MER (fec 2/3)	9 dB	12 dB
MER (fec 3/4)	10 dB	13 dB
MER (fec 5/6)	11 dB	14 dB

DVB-T2 (COFDM)		
Meas	min.	typ.
power	40 dBµV	50 dBµV
noise margin	6 dB	9 dB
bBer	1E-07	1E-08
MER 64qam (fec 2/3)	25 dB	28 dB
MER 16qam (fec 2/3)	26,5 dB	29,5 dB
MER 4qpsk (fec 2/3)	28,5 dB	31,5 dB

DVB-S2 (8PSK)		
Meas	min.	typ.
power	40 dBµV	50 dBµV
noise margin	3 dB	6 dB
Per	1E-07	1E-08
MER (fec 2/3)	11 dB	14 dB
MER (fec 3/4)	12 dB	15 dB
MER (fec 5/6)	13 dB	16 dB

Customer Support

For product assistance, please write to: **wecare@roverinstruments.com** indicating the instrument model, the serial number (written on the box and found in the instrument's information menu or on the label on the back of the instrument), or by selecting SETTINGS > Information on the instrument.

Please describe the problem as accurately and concisely as possible. Our specialized staff will contact you.

Alternatively, call +39 030 91981.

If you need to send the instrument to ROVER, please complete the RMA form in its entirety (see next page) and await a response with the return authorization number.

NB: **DO NOT** ship the instrument without first receiving authorization from ROVER staff. Without this number, the instrument will NOT be accepted by our warehouse.

Accessories supplied

1. Soft carrying case with shoulder strap
2. 12 VDC battery charger
3. "F" and "BMC" connectors
4. LAN TEST probe
5. USB flash drive

NOTE: This list of accessories is subject to change without notice and depends on the instrument configuration.

Cleaning the instrument

Cleaning your instrument from dust and dirt is simple and helps keep it in top working condition for many years. The cleaning procedure is quick and easy and requires only a few simple steps.
Always use a soft cloth dampened with a solution of water and alcohol or a non-abrasive liquid soap that degreases.
The keyboard and screen must be cleaned thoroughly. Rubbing the keyboard and/or screen can seriously damage their functions.
Never use harsh chemicals (thinners) and/or abrasives, or rough fabrics that can damage the plastic and screens.

NOTE: Always check that the screen protector is present to avoid permanently damaging the display from scratches.

MAINTENANCE AND CARE OF THE INSTRUMENT

This instrument is designed to withstand harsh and demanding operating conditions. However, its lifespan can be extended by following a few simple and effective rules:

1. The instrument is not designed to withstand high temperatures (above 60°C or 140°F). These temperatures can easily be reached if left in a car, especially behind the windshield or in the trunk. The LCD screen and/or other components are easily damaged by high temperatures.

2. The internal lithium battery can rapidly lose its effectiveness if the device is exposed to excessively high or low temperatures. This will reduce its operating time.

3. When charging the battery, ensure that air circulates around the device and the power supply. Do not cover or recharge the battery with the meter still in its case.

4. Do not charge the instrument if it is exposed to temperatures above 45°C.

Although protected against accidental drops of water, the device is not waterproof. If liquids get inside, the electronic circuits may be damaged. Therefore, with the device turned off, dry it thoroughly before turning it on.
Do not use a hair dryer or strong heat sources; let it air dry. If necessary, contact ROVER technical support.

WARRANTY and RETURN OF THE INSTRUMENT

Warranty conditions

No returns can be made without a PRIOR RETURN AGREEMENT validated by ROVER. The request must be sent to ROVER by calling +39 030 91981. The instrument must be shipped to ROVER freight prepaid with the (previously authorized) return agreement and a copy of the purchase invoice. Any return package not accompanied by an RMA will not be accepted.

Returned products must be in perfect condition and in their original packaging. Otherwise, or if the instrument has been even minimally used, an additional fee corresponding to the original restoration costs will be applied.

The equipment is guaranteed for 2 years from the invoice date against any manufacturing defect.

The warranty provisions exclude damages or claims resulting from the user's fault or negligence, careless transportation, use of the device that does not comply with applicable regulations or best practices, poor electrical installation or temporary power surges, modifications or conversions not approved by our technical department, or the effects of external factors (fire, humidity, flooding, lightning, excessive exposure to heat or sun, various electrical disturbances, etc.). By express agreement, ROVER shall not be liable for any compensation for indirect or immaterial damages.
Any claim for intrinsic defects in the goods or manufacturing defects, to be valid, must be submitted to ROVER within 30 days of the defect's discovery; the claim must be accompanied by all evidence relating to the alleged defects or faults; the implementation of these provisions in no way creates any presumption of liability on the part of ROVER.

Scope of the warranty

Under this warranty, ROVER shall only be liable for the restoration of the goods to the exclusion of any other compensation, in particular indirect and/or intangible damages such as (but not limited to) operating losses and loss of profit, production or contract.

END OF LIFE OF THE DEVICE

End-of-life of an electrical/electronic appliance (applicable in EU countries and wherever a waste collection system is in place).

The symbol below on the packaging indicates that this product should not be treated as household waste. Upon disposal, the product must be taken to a collection point equipped with appropriate facilities for the recycling of electrical/electronic devices.

Electrical/electronic devices, if not recycled properly, can have serious consequences for health and the environment.

Furthermore, good recycling practices help conserve natural resources. For more information on the proper disposal of this product, contact your local waste management office or the shop where you purchased the product.

WARNINGS

IMPORTANT:
1. ALWAYS TURN OFF THE DEVICE BEFORE CHARGING.
2. DO NOT LEAVE THE BATTERIES DISCHARGED FOR A LONG PERIOD OF TIME.
ALWAYS CHARGE THE BATTERIES OVERNIGHT FOR AT LEAST 7 HOURS, EVEN IF THEY ARE NOT COMPLETELY DISCHARGED.

USEFUL INFORMATION:
The supplied batteries are of the highest quality and are individually tested. Battery life may vary depending on the following conditions of use:

1. LNB consumption: Universal, Twin, or Quattro;

2. External temperature: at temperatures < 10°C, battery capacity decreases by 20%;
3. Battery age: capacity decreases by 10% per year;
4. The AUTO STANDBY function allows the device to turn off after a few minutes of inactivity (settable as desired), saving up to 30% on consumption.

The battery charge indicator has a tolerance (like all battery-powered electronic devices) based on the following:

1. The battery charge percentage;
2. The outside temperature;
3. The battery's state of wear;

IMPORTANT

RECHARGEABLE BATTERY

This device contains a built-in LI-PO (lithium polymer) battery that can be recharged many times. The battery is a chemical component that is consumed even when the device is not in use. Please dispose of the battery at a designated recycling facility. Do not disassemble the battery or expose it to extreme temperatures (above 50°C). If the battery has been exposed to very low or high temperatures, allow it to cool to room temperature before use.

Main technical features

GENERAL SPECIFICATIONS

• 7" (EXA7 – EXA7 Lite version) or 9" (EXA9 version) TFT capacitive touch industrial display: 16:9, high resolution and high brightness
• DC voltage at RF input: 5 – 12 – 18 – 24 V
• DC, DiSEqC, SCR, dCSS, and Wide Band controls
• PC interface: 2 x USB-B
• Front panel: ON/OFF button + arrow keys
• Energy saving: TFT backlight timer, brightness adjustment, standby mode
• PC management via resident web browser (no management software required)
• Power supply: Certified external power supply included 220 VAC – 12 VDC 3A
• Battery: Integrated lithium polymer (LiPo) with a battery life of 3 to 6 hours depending on the function used (e.g., remote power supply current, active video decoding, display intensity, etc.)
• BATTERY TEST function to improve battery management
• Door Removable battery for quick and easy battery replacement
• ROVER AUTODISCOVERY (patented): Artificial Intelligence (AI)-based system for automatic detection and selection of analog and digital COFDM/QAM TV signals, in both measurement and spectrum modes
• Automatic assistant: Signal quality analysis and channel scan memory
• TV and CATV Barscan function: Displays 10 to 100 channels on a single screen
• Real-time monitoring: Buzzer and Noise Margin graph for digital signal micro-interruptions
• Aluminum and steel case
• Padded bag with handle/shoulder strap for transport and use
• Weight: 1.9 / 2.2 kg depending on the version
• Dimensions: H 27.0 x W 15.5 x D 4.0 cm

Integrated Video Interface:
• MPEG2 decoder
• MPEG4 decoder
• HEVC – H265 decoder

Main Features

MEASUREMENTS, SPECTRUM ANALYSIS, and IMAGING
• Frequency range: 30–2700 MHz
• Frequency resolution:

- TV and CATV: 25 KHz
- SAT: 5 MHz
- Resolution filter bandwidth:
- TV and CATV: 100 KHz @ -3 dB
- SAT: 1 MHz @ -3 dB
- Input power range (min. – max.): 5 to 120 dBµV
- Digital measurements:
- Digital power
- MER (36 to 40 dB max. depending on modulation)
- BER, PER, LDPC, BCH
- Noise margin
- MER versus CARRIER
- Automatic digital quality testing: PASS – MARG – FAIL with simplified “traffic light” display
- Measurement resolution: 0.1 dB
- Level measurement accuracy: 1 dB typical; 2dB maximum
- Constellation: for TV/CATV and SAT signals
- Echoes, Pre-echoes, Micro-echoes in Real Time
- Spectrum: Fast with Max Hold, Min Hold, and Average. Spectrum storage with real-time comparison function
- Net-ID, NID, TSID, LCN, TRUE SAT orbital position
- Digital images: MPEG2-4 SD and HD; HEVC images with program list, audio-video PID, LCN, video bitrate all on a single screen
- Channel data flow graph
- Audio: AAC, DOLBY AC3 DD+
- DiSEqC, SCR, dCSS, and Wide Band functions
- SAT FINDER and SAT EXPERT functions
- Customized channel plans: 25 (199 channels per plan), programmable TV, SAT (or combined TV/SAT) from a PC or local keyboard
- Loggers: TV, SAT, and combined with stop & go function
- SAT Memory Plan: More than 2,000 pre-stored transponders for global satellite
- Optical signal measurement (optional):
- Maximum input power: 5 dBm
- SC – SC/APC input connector
- Automatic loss calculation
- Wavelengths (nm): 1310, 1490, 1550
- Range: -25 to +5 dBm (30 dB (optical dynamic range)
- Resolution: 0.1 dB
- Accuracy: +/- 0.5 dB

• Optical to RF conversion (option included with the optical power meter): SAT, TV, and CATV measurements and spectrum.

INPUTS AND OUTPUTS

• RF input: 75 ohms (interchangeable "F")
• SC – SC/APC optical input (optional)
• USB 2.0: 2 Type B
• LAN: ETHERNET Gbit

NOTE:

Some features and/or measurements may be optional.

All technical specifications are subject to change without notice.