



Enya 72

User's manual



Enya 72

ENGLISH

USER'S MANUAL

Warranty.

Your instrument is guaranteed for one year by labor and parts against any manufacturing defect and/or operating hazard by BCN Distribuciones S.A.U., owner of the FTE maximal trademark and hereinafter FTE maximal.

This warranty extends from the date of delivery and ends 365 calendar days later. This warranty does not cover the result of abnormal use, tampering error or error in storage conditions outside the defined range.

In case of application of the warranty, the user must send to the att. The Technical Service, at your expense, the device corresponding to our headquarters:

BCN Distribuciones S.A.U.

Milà i Fontanals, 118-120

08205 Sabadell (Barcelona)

Spain

You must add the duly completed repair form that can be downloaded at: http://ftemaximal.com/images/files/soporte-servicios/Servicio-post-venta/Repair_request.pdf

The standard supplies supplied with the appliance (cables, plugs ...), consumables (batteries, ...) and optional supplies (bags...) have a 3-month warranty against any manufacturing defect. Items such as a suitcase, LCD screen or touchpad are guaranteed for normal use only.

The warranty does not cover use, accidental breakage as a result of a blow or any abnormal use.

The factory options integrated into the appliance are guaranteed for the same duration as the appliance itself.

In case of replacement or repair of the product, the remaining warranty duration shall be:

- The remaining warranty duration if the appliance is still under warranty.
- If the warranty duration is less than 90 days, the replaced part is guaranteed for 90 days.

Any spare part becomes the property of the user and the exchanged parts become the property of Fte maximal.

In case of intervention of an insurance company, the product becomes the property of the insurance company in its entirety. Otherwise, it will remain the property of the user.

The warranty covers only materials manufactured and supplied by Fte maximal.

Any manipulation by the user or any third party without the prior authorization Fte maximal voids the guarantee.

The user will be responsible for the return of his device to our headquarters. Therefore, it will provide appropriate packaging that must protect the equipment during shipping. It shall, on its own account, subscribe to the insurance necessary for transport.

Fte Maximal reserves the right to refuse any poorly conditioned products.

Fte Maximal will not take care of the damage or delays caused by the transport of return of the equipment to our facilities.

Particular battery case: This device comes equipped with a standard lithium-ion battery. It must not be manipulated or removed by the user. Under no circumstances can the user replace it. Factory replacement is required to check the loading system and protective guarantees.

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1 INTRODUCTION.

This field meter is designed to perform accurate measurements of analog/digital television/terrestrial radio and satellite signals. Measurement band ranges range from 5 to 2400 MHz.

Main features:

- 7" capacitive touch TFT display for equipment control.
- Measurements of all analogue television, FM radio and DVB-T/T2, DVB-C/C2, DVB-S/S2 and DSS digital standards.
- DAB level-only measurements. Support for LNB, DISEqC Switch, including Unicable and Unicable 2 (DCSS) models.
- Support for LNB and Wideband equipment.
- Displays the constellation diagram of digital standards and echo measurements for complete analysis. View free to air digital terrestrial or satellite TV channels.
- Auto search for Datalogger channels up to 50 channels per measure. With large storage capacity of measurements, and spectrum captures.
- Video input and Audio USB port to update and import measurements Interface Ethernet to remotely manage the computer.
- Battery life 1 hour and a half powering LNB and up to 2 hours without powering LNB.
- Weight less than 2 kilograms with battery included

2 FIELD METER USE RECOMENDATIONS.

This quick user guide will allow you to understand and use the Enya meter in the best mode, making the most of it. But before we begin, we'd like to give you some advice on using it.

The Enya meter is a portable equipment designed and designed for indoor and outdoor use.

Still, it is important to understand that there are a number of limitations to this:

- It is not advisable to use the meter in the rain as it may be damaged if water enters the interior.
- It is not advisable to use the meter in extreme conditions, such as temperatures below -5 degrees or higher than 40 degrees Celsius.
- The meter should not be used as a stand or allow it to be mounted on it.
- Do not wear gloves, pointers, or other objects on the touch screen. Handle the touchscreen carefully.

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- Use the F/F connectors supplied with the measurement equipment. Any other connector could damage the equipment and lose the warranty of the equipment.
- The external power supply is designed to be used indoors, so it should not be used outdoors. Always use the power adapter supplied with the meter. When charging the device the room temperature should be between 0°C and 35°C.

Also note the following recommendations:

- The meter batteries are specifically designed for it, so don't try to replace them with similar ones, as they may not work, or worse, damage both batteries and the device.
- A field meter is a very sophisticated measuring instrument, sensitive to sudden changes in temperature and humidity, as well as shocks and vibrations.
- Never open the device yourself. Any meter handling requires specific instrumentation. Improper intervention inside the meter can cause serious damage to it, further losing the equipment's warranty conditions.
- Handle the meter gently, as it is a very sophisticated equipment and can break down in case of abrupt handling.
- Do not obstruct the ventilation holes on the sides of the equipment, as it may overheat.
- Avoid using poor quality connectors as well as angled connectors and multiple transitions, as all of these elements degrade the signal quality that reaches the RF-IN input of the meter.

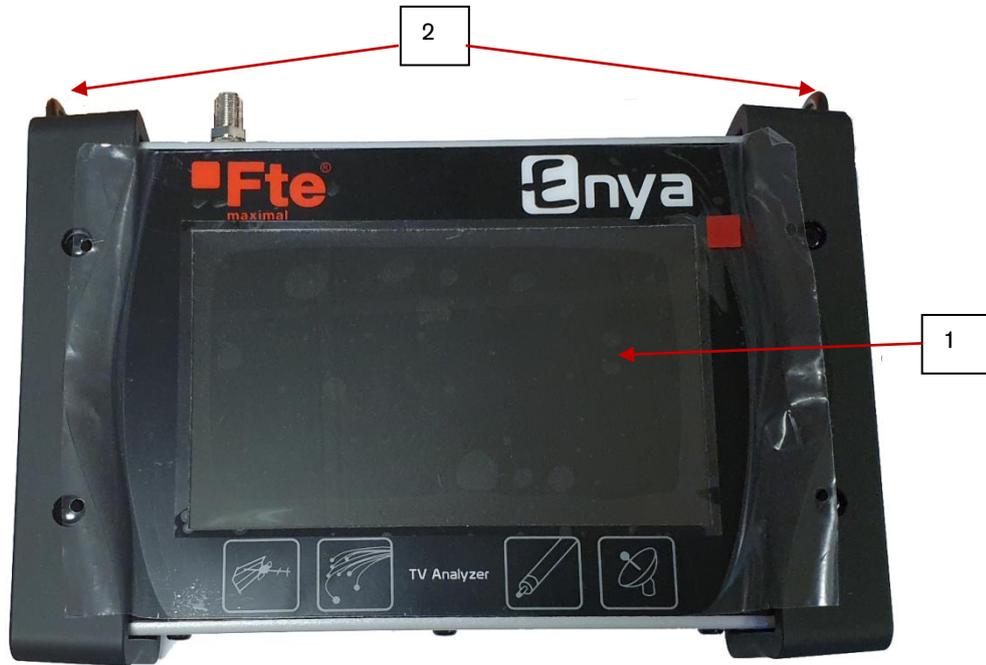
3 PACKAGING CONTENT.

In the packaging of the equipment you will find the following elements:

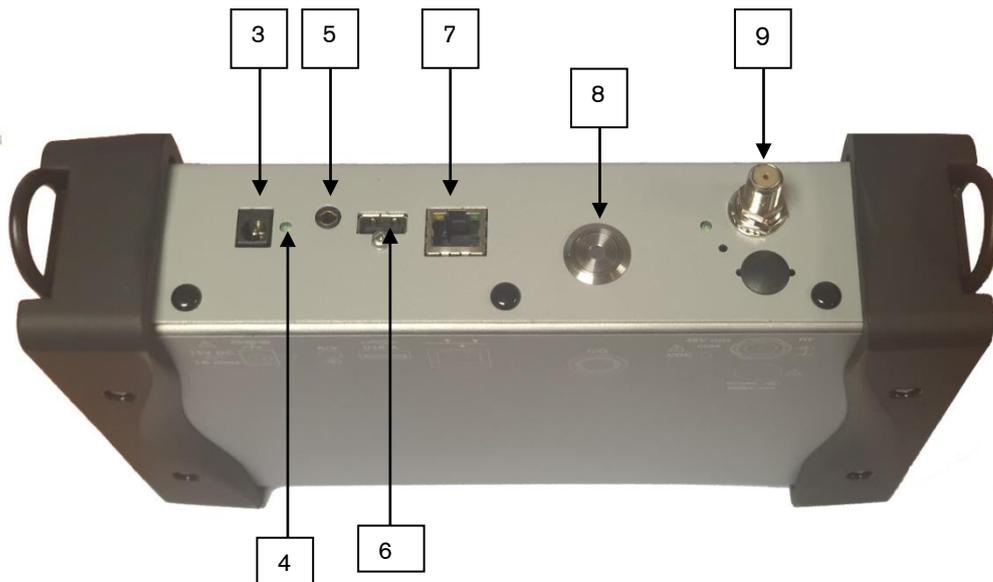
- Field meter.
- Bag and conveyor belt.
- External DC Power Supply 15V 1.0Amp.
- Female F-F adapter. Note that this is a quality adapter. Do not replace it with any adapter you find in the trade, as frequency response characteristics are critical to this type of equipment.
- Equipment instruction manual.
- Document linking equipment elements as well as meter calibration data information.

Store the original packaging as it is specially designed to protect the equipment. You may need it in the future to send the meter to calibrate.

4 FIELD METER DESCRIPTION.



1. TFT 7" capacitive touch screen.
2. Transport belt anchors.



3. Power supply connector for external 15V power supply.
4. Led power indicator.
5. External Video/Audio Input Connector.
6. USB 2.0 input.
7. Ethernet input.
8. Power on/off button.
9. RF input connector.

5 POWERING THE FIELD STRENGTH METER.

The field meter can be powered by its internal batteries or through the external power supply supplied with the equipment.

5.1 Battery.

The Enya meter includes a Lithium-Ion battery, which will provide some hours of operation.

When the battery is almost discharged, the meter will warn "Low Battery", and then turn off after a few minutes.

5.1.1 Security advices.

- Do not throw the battery into a fire or heat it.
- Do not drill the battery.
- Do not disassemble the battery.
- Don't reverse battery polarity.
- The battery contains a protective part that should not be damaged or removed.
- Protect the battery from heat while stored. Do not leave the product in the sun inside a vehicle.

5.1.2 Advices for increasing battery life.

- Prevent the battery from draining completely.
- When you are not using the product for some time make sure that the device has, at least, 40% battery.
- Do not fully charge or discharge the battery when you are not using the meter for several days.

5.1.3 Battery charge.

To charge the battery connect the 15Vdc output of the external power supply to the field strength meter, the internal battery will start charging immediately and the green LED will turn on.

Warning: 

- Use only this supplied power adapter otherwise it may damage the equipment. The use of a power supply different from the one supplied with the equipment may damage it and the warranty could be lost.
- The meter battery replacement can only be performed by authorized technical service.
- The battery will only charge with the equipment turned off.

5.2 External power supply.

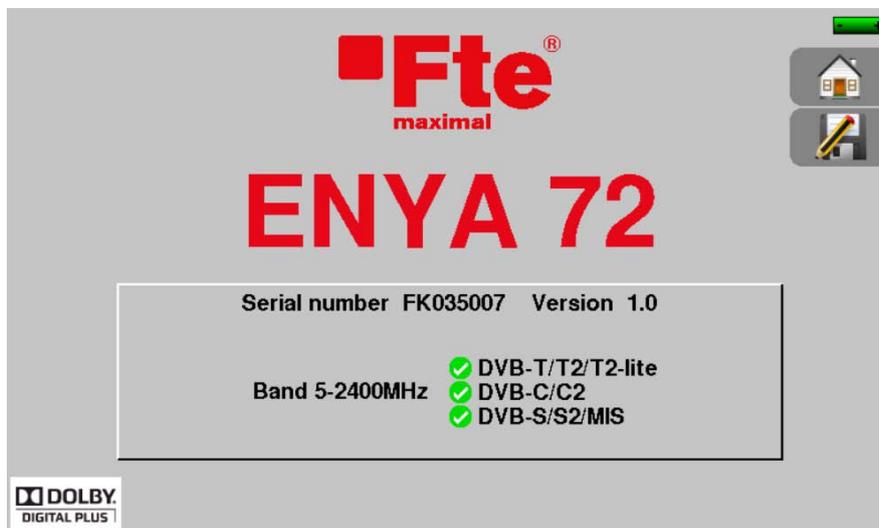
The power adapter supplied with the equipment and used to charge the battery also functions as an external power supply.

The equipment operates on a 15V (1.0A) power supply).

Use only the power supply provided with the equipment. The use of a power adapter other than the one supplied may damage it and could not be eligible for the warranty.

6 POWERING ON/OFF.

To turn on the meter, press the power button. The meter power LED will light up and the screen will display the following screen.



To turn off press the meter power button, the meter will turn off.

Warning: If the meter power button is pressed for an extended time, a power-off of the equipment will be forced. Do it only if necessary.

7 QUICK START-UP GUIDE.

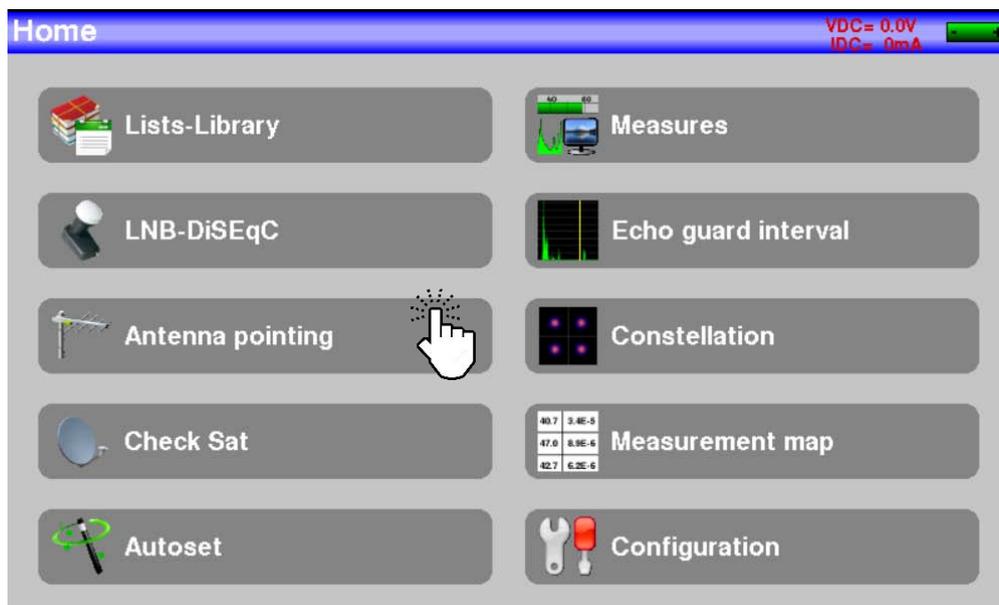
7.1 Terrestrial antenna instalation.

There are two methods for installing a terrestrial antenna:

- Using antenna pointing functionality.
- Using spectrum measurement functionality.

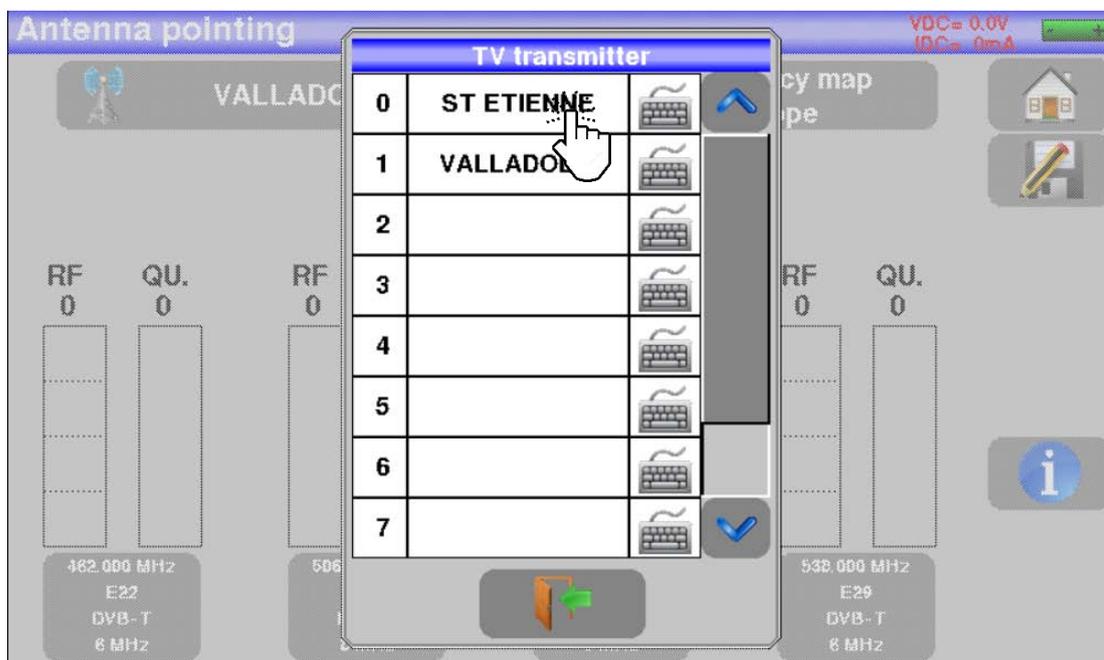
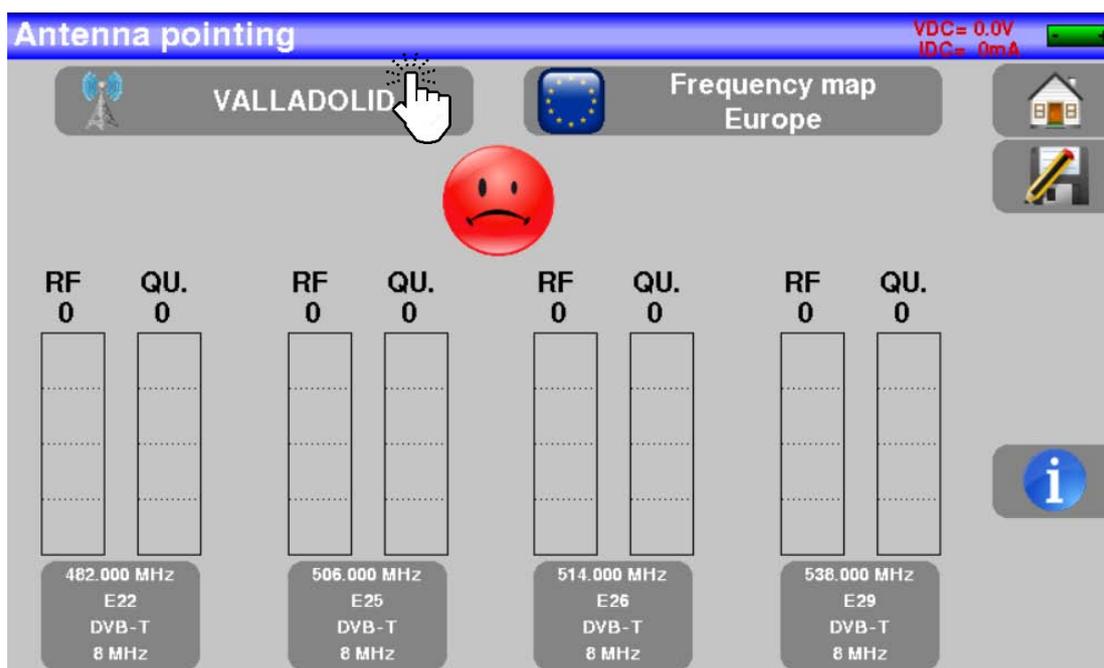
7.1.1 Using antenna pointing functionality.

The equipment has an "Antenna Orientation" mode to be able to quickly and easily point a terrestrial antenna. To access this mode from the start menu press "Antenna Pointing".



- Select the emitter you want to point to from the list: For example Barcelona, Valladolid, etc....

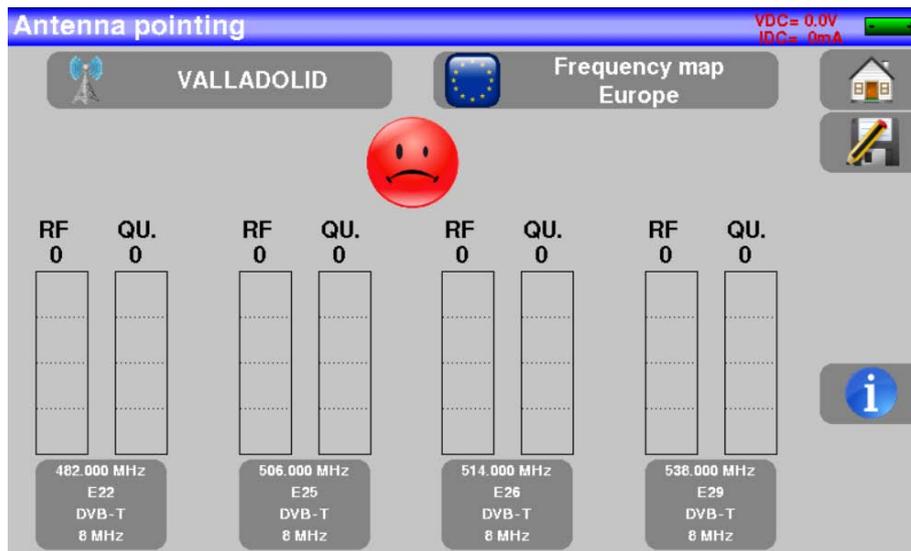
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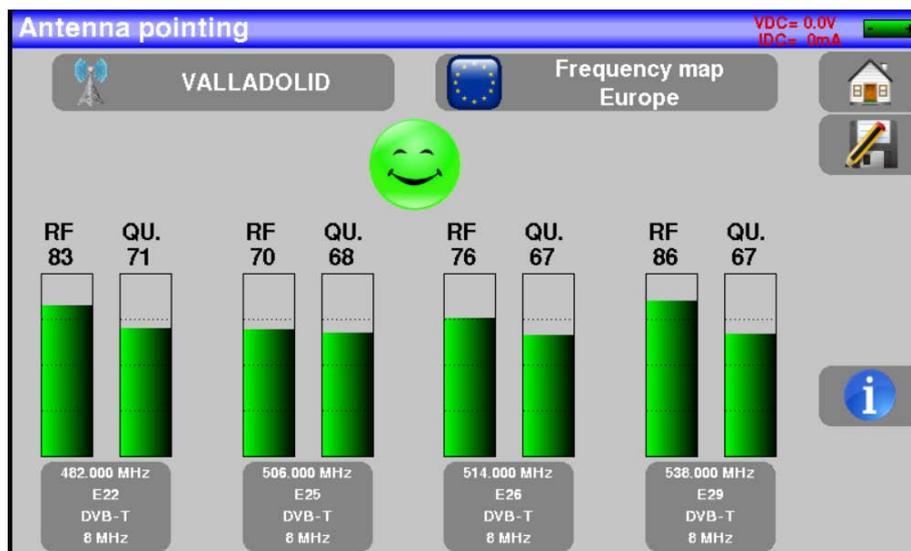
- The device scans successively 4 channels showing RF information corresponding to the level and quality of the signal receiving by the antenna. As shown in the images below:

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Uncorrectly pointed antenna:



Correctly pointed antenna:

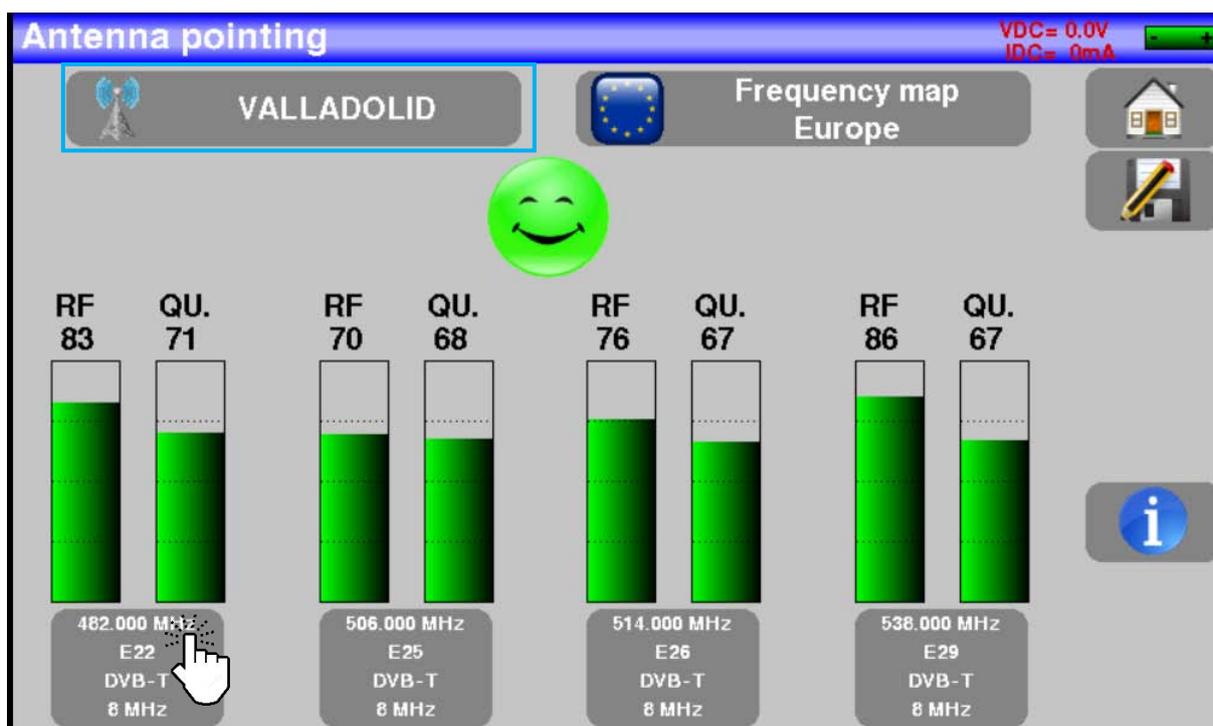


- No transmitter found, bad quality reception.
- Regular quality reception, lower than 50%.
- Good quality reception, more than 50%.

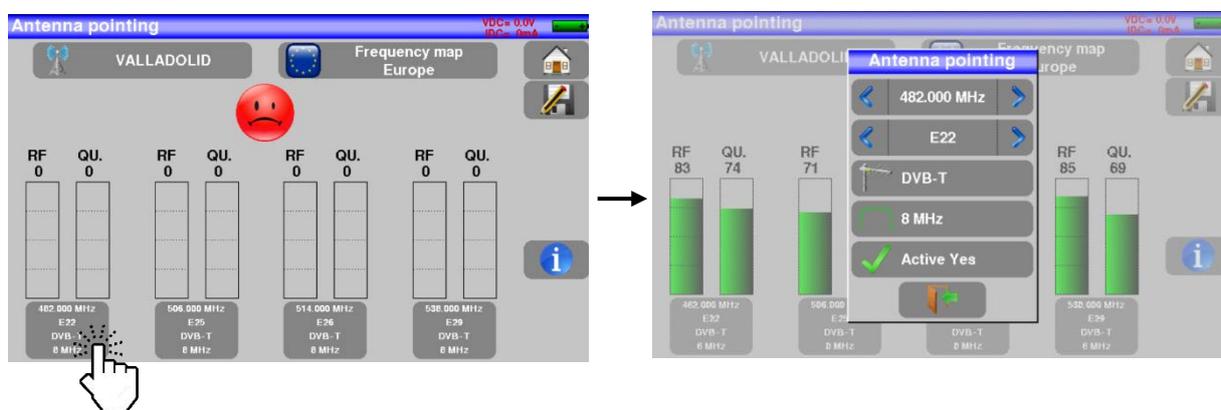


- Move the antenna slowly until you hear the melody indicating the 4 frequencies have signal until you get the best quality.

The symbol  validates the transmitter showing the TV services of each frequency/channel.

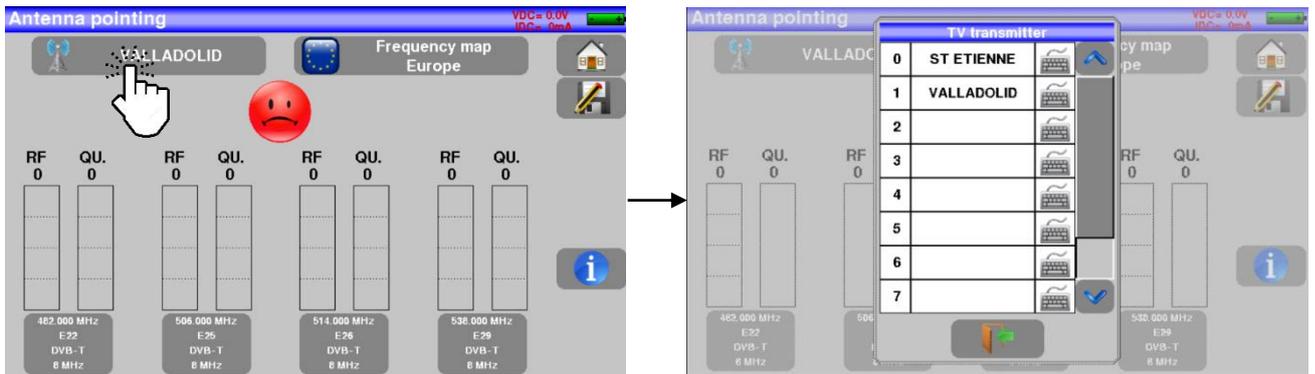


The 4 frequencies used to point the antenna can be changed to fit your location.



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You can edit and save up to 10 different locations/emitters:

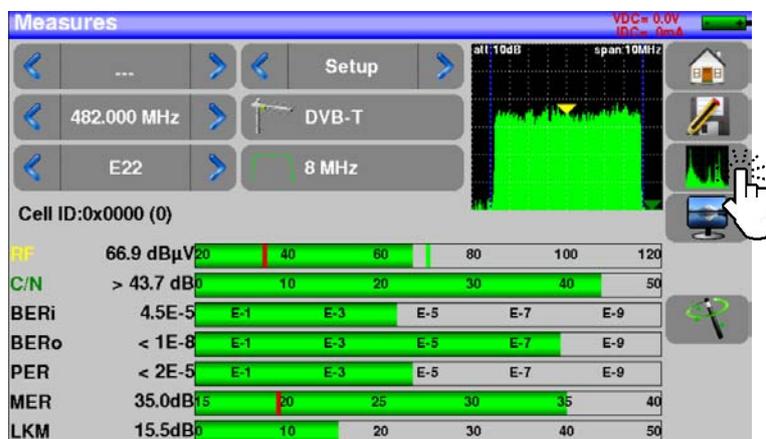


7.1.2 Using the spectrum.

- 1) From the home menu, click  "Measures".

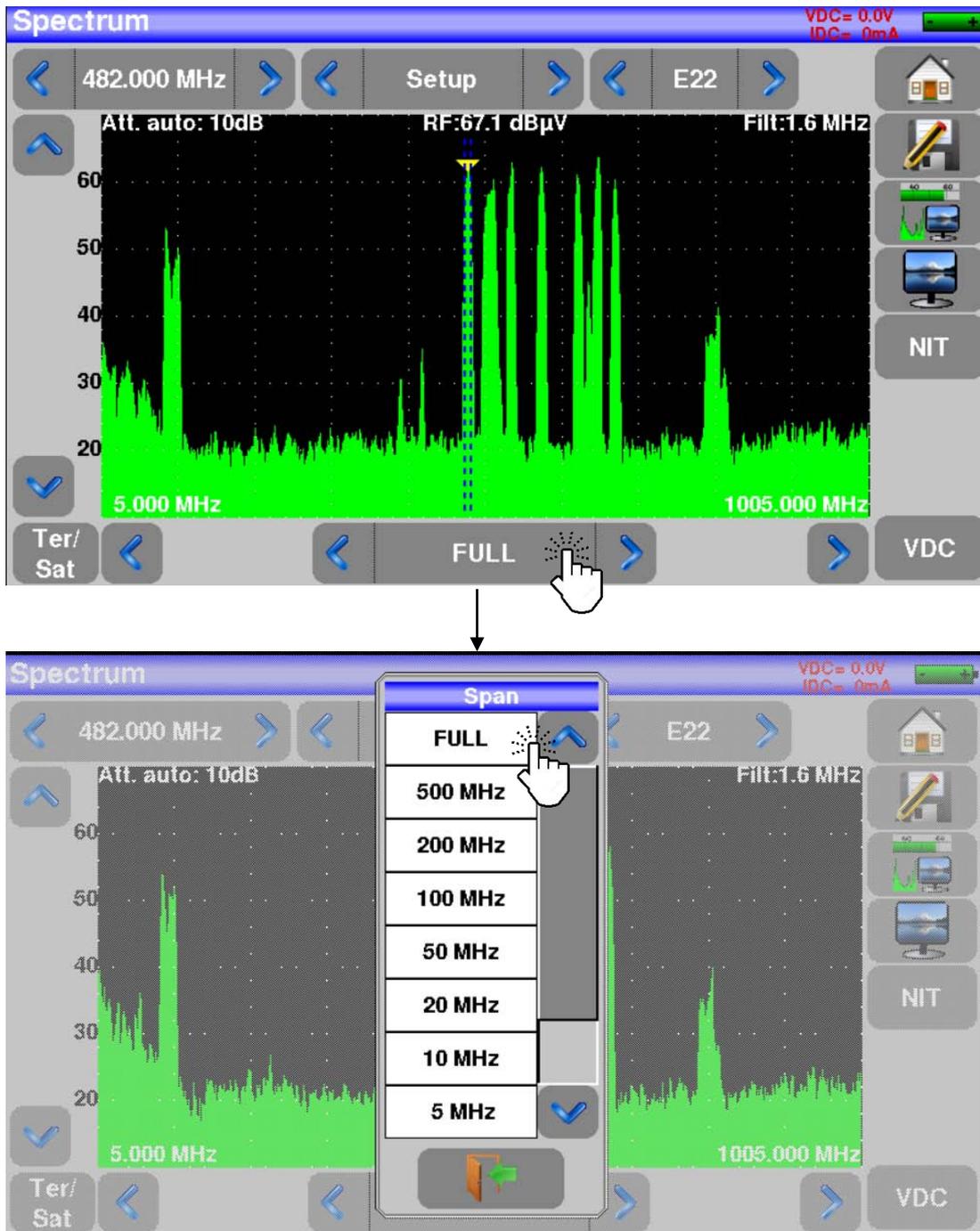


- 2) Click on  icon, "spectrum".



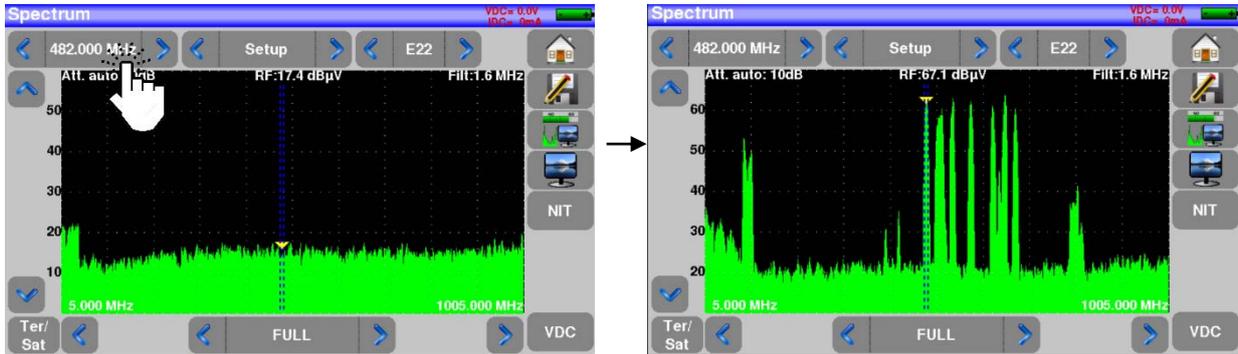
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3) Access to “full” span mode.



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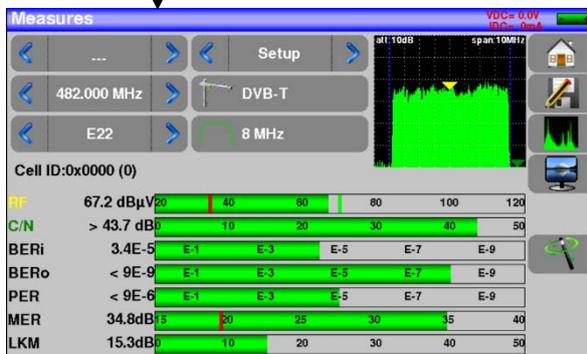
- 4) Select a valid multiplex and point the antenna slowly until you find the highest possible signal level.



- 5) Press the NIT icon, the device will automatically find all the signal parameters. Once the search is complete, the network name and network ID will be displayed).



You can now take all relevant measures: level, BER/MER, etc ... pressing  and watch the TV services on the screen 



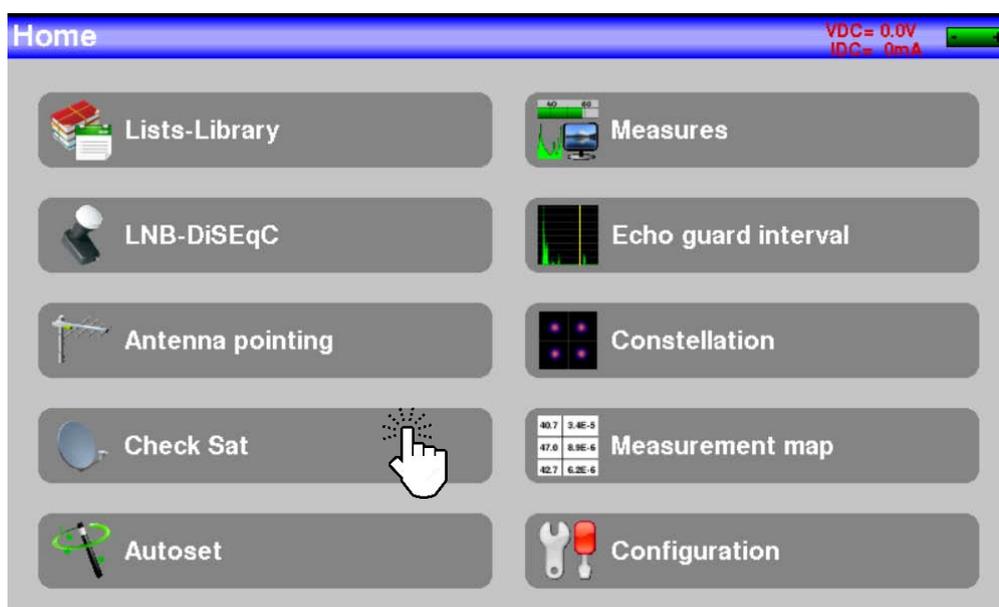
7.2 Satellite antenna installation.

There are two methods available to install a satellite antenna:

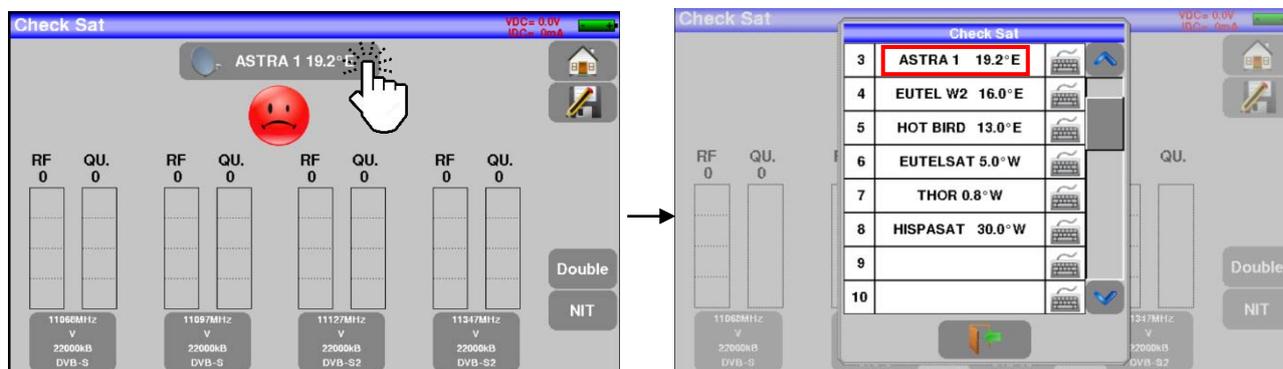
- Using antenna orientation functionality.
- Using spectrum measurement functionality.

7.2.1 Using pointing antenna functionality / Check Sat

The equipment has an "Antenna Orientation" mode to be able to quickly and easily point a satellite antenna. To access this mode from the start menu press the "Check Sat".

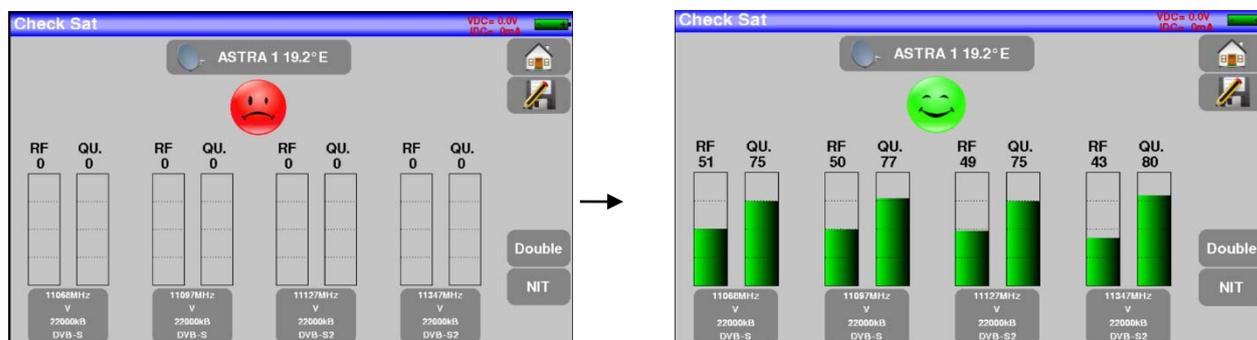


- 1) Select the satellite to which you want to point the antenna.



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- 2) The equipment scans successively 4 transponders showing RF information corresponding to the level and quality of the signal received by the antenna. As shown in the images below:



wrong pointed antenna.

Antenna correctly pointed.

- Poor quality reception.
- Regular quality reception, lower than 50%.
- Good quality reception, more than 50%.



- 3) Point the antenna slowly until you hear the melody indicating that all 4 frequencies have signal until you get the best quality.

Warning: A satellite antenna must be powered directly by current: Remote power supply.

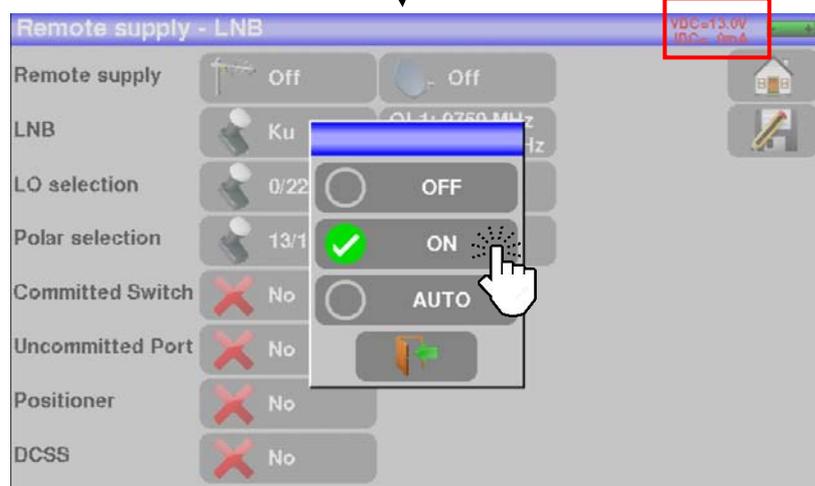
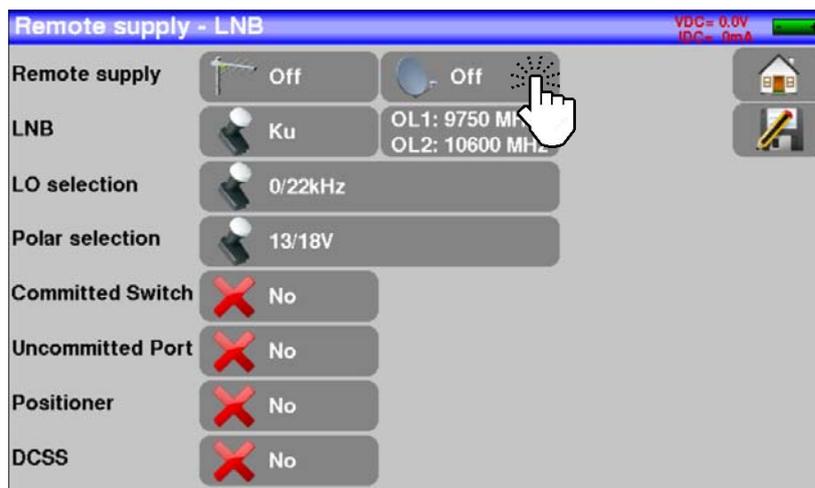
To access the remote power supply screen press the icon



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The following screen will be opened. If you need to power the satellite antenna make sure that the remote power is set to "ON". If it is not as in the image, press the icon where the satellite antenna is displayed and change the power to "ON".

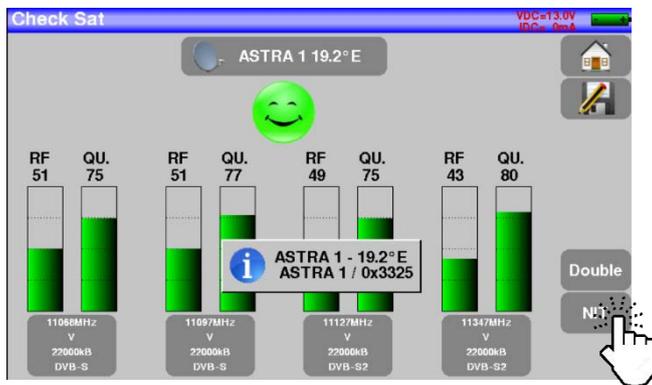


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You can check the voltage and current that your LNB is consuming by looking at the top right corner:

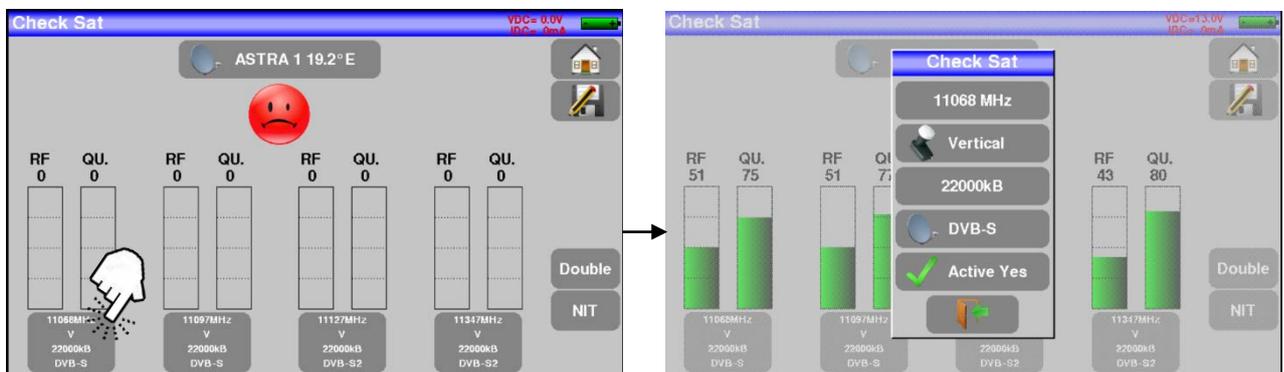


- 4) To check that the satellite pointed by the antenna is the desired one press the icon . The device will look for the NIT table on one of the 4 transponders and display the name of the satellite to which the antenna is currently oriented.



Warning: The name displayed depends on the contents of the NIT table. Some service providers may not retransmit the table or retransmit it with incomplete content. Because of this the information displayed could be erroneous.

Note: The 4 frequencies of the transponders corresponding to the satellite to which the antenna is being oriented are editable. Just press on one of the transponders.

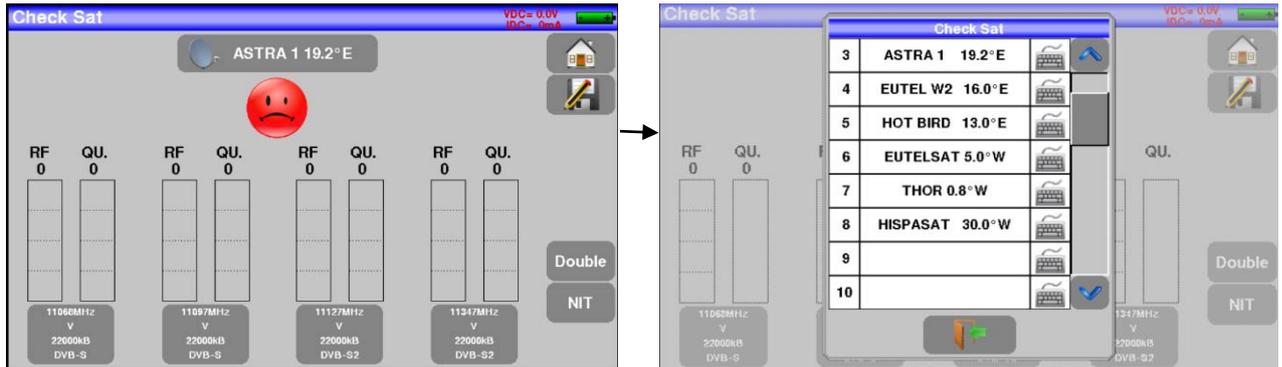


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Warning: To identify a satellite, the equipment must tune the signal on the 4 transponders with a quality greater than 0. However, some transponders are regularly modified. Check the satellite's current frequency table.

Warning: Some switches or LNBs work only using DiSEqC commands. In this case, set the Band (OL) and DiSEqC Polarization on the LNB-DiSEqC configuration page. In this case the "Check Sat" functionality is slower because you are using DiSEqC commands.

It can store a maximum of 10 satellites. To do this press the satellite selection button and then add one as shown in the image:



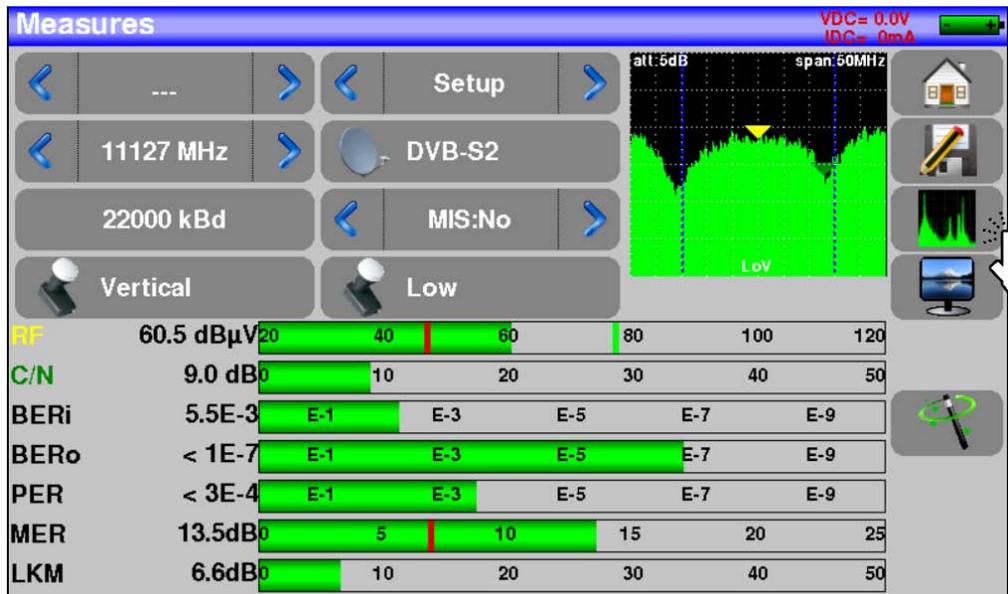
7.2.2 Using spectrum.

- 1) From the main menu, tap on the "Measures"

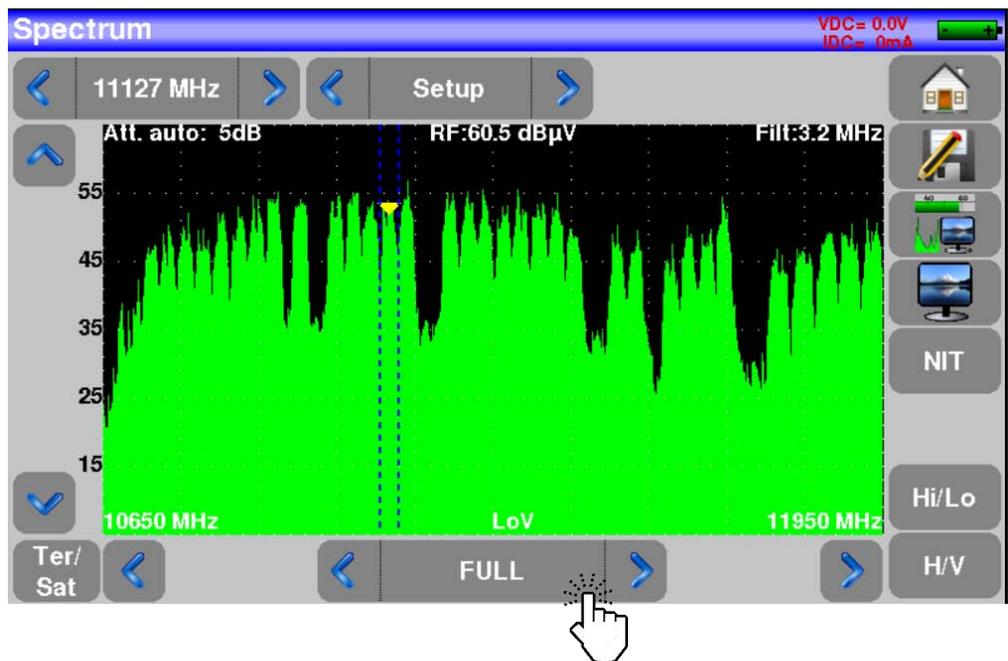


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2) Tap on the icon  spectrum.

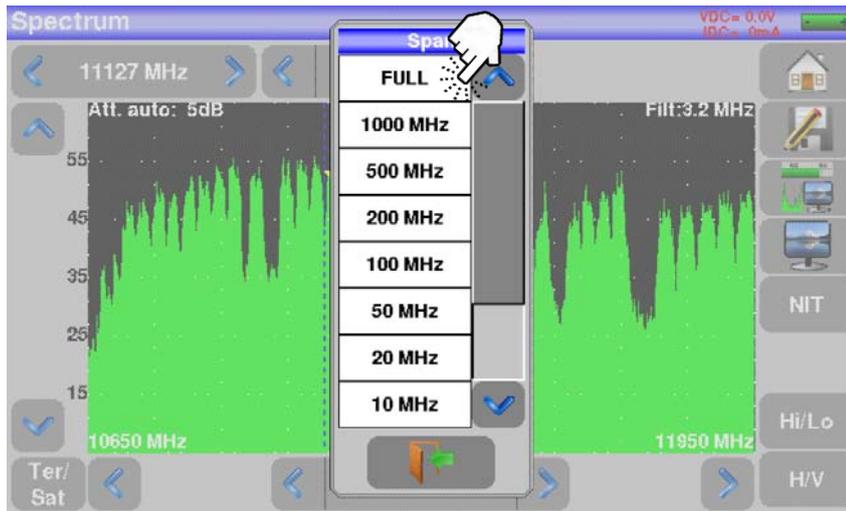


3) Enter full span mode "full".

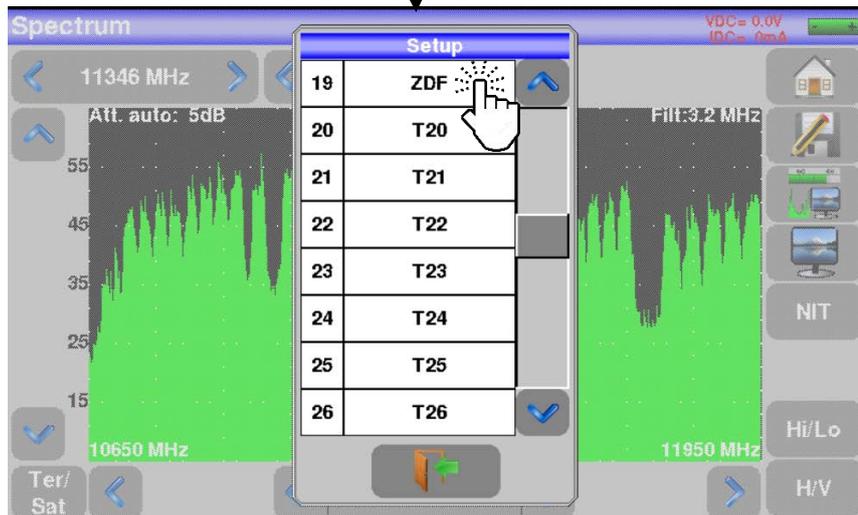
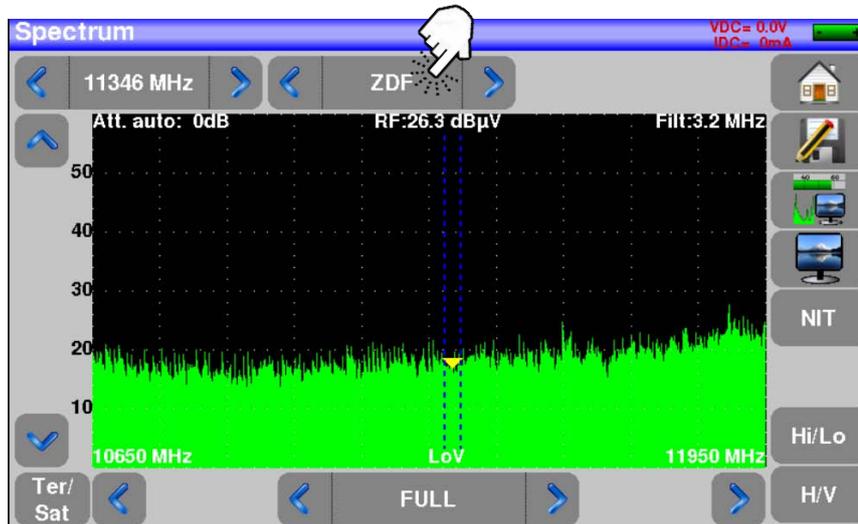


Press the icon in the image above and the span selection will open as in the image below. Select the desired value for the span.

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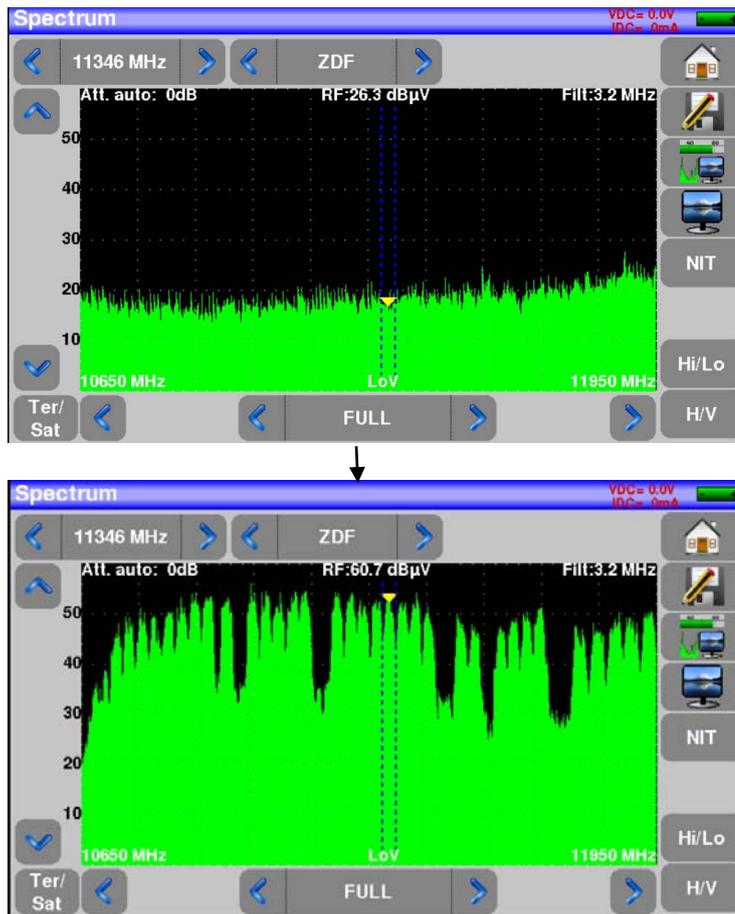


4) Choose a transponder.



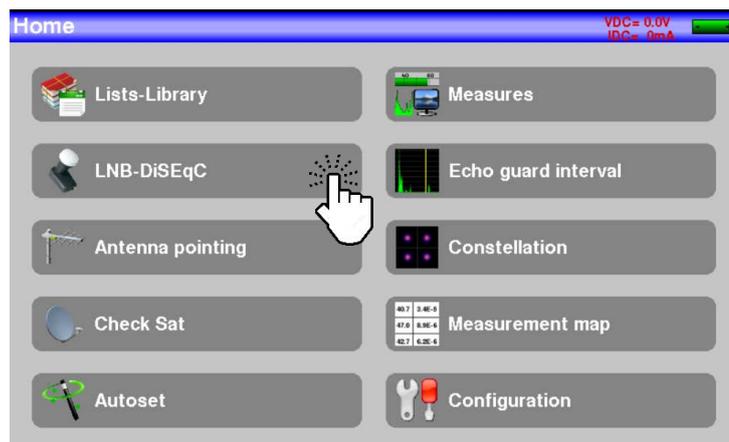
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- 5) Slowly adjust the satellite antenna until you find the strongest possible signal level.



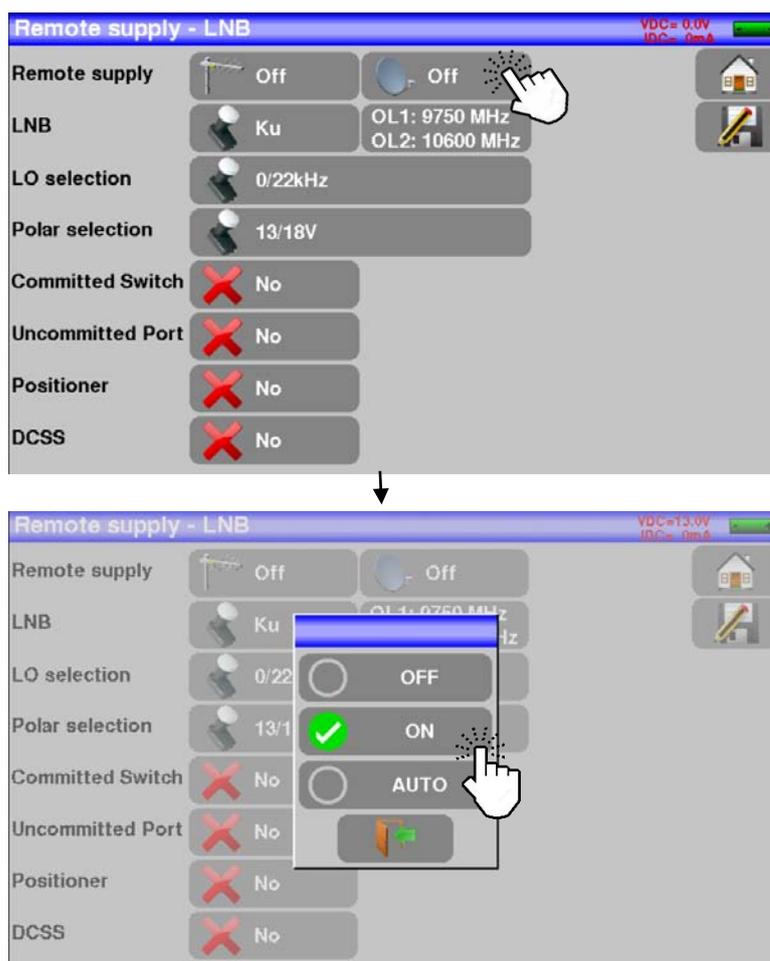
Warning: A satellite antenna must be powered: remote power supply.

To access the remote power supply screen tap the icon



The following screen will be opened. If you need to power the satellite antenna make sure that the remote power is set to "ON". If it is not as in the image, press the icon where the satellite antenna is displayed and change the power to "ON".

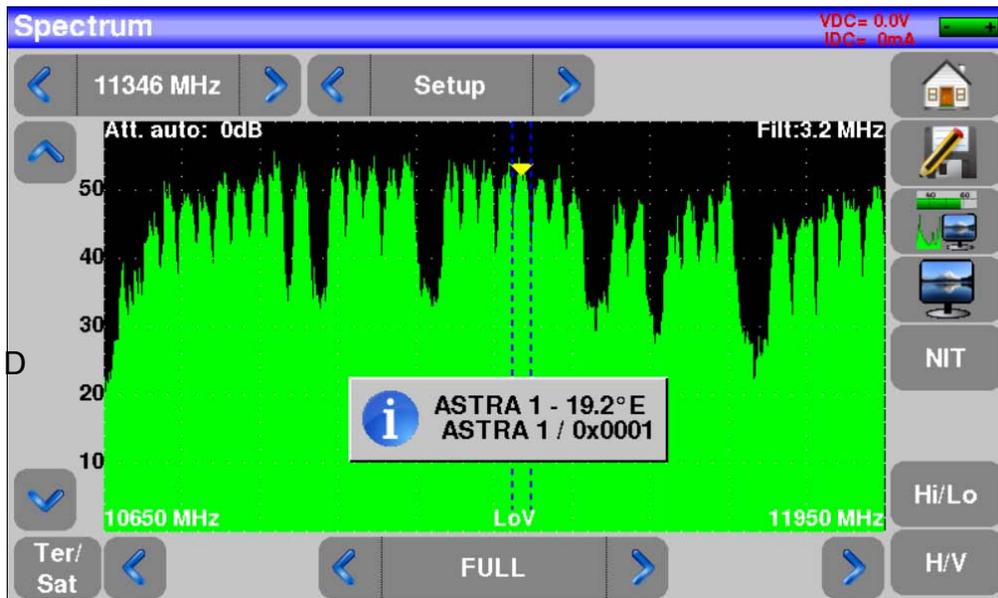
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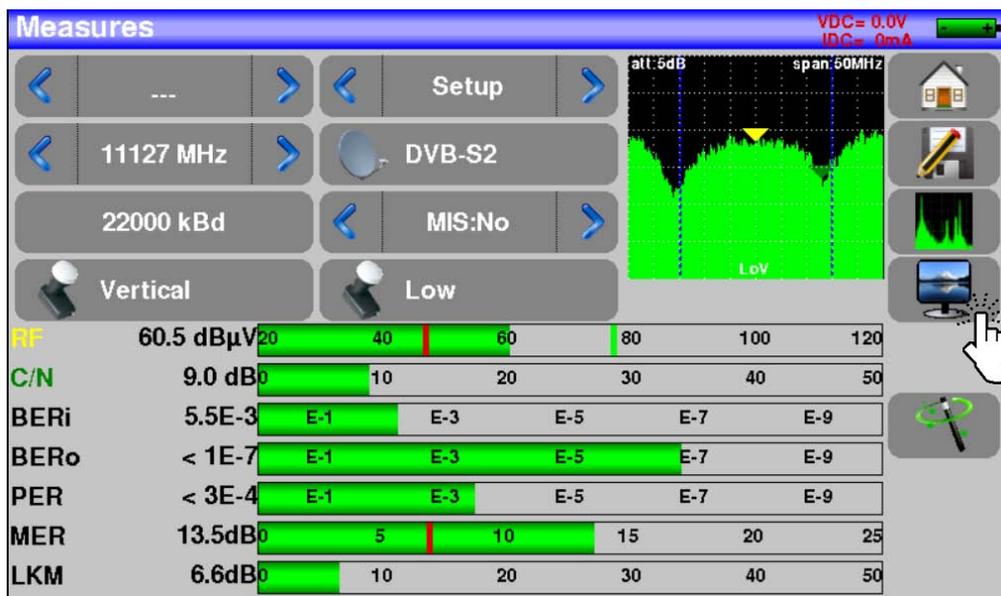
You can check the voltage and the LNB current consumption in the top right corner:



- 6) Tap the NIT icon, the device will automatically find all the signal parameters. Once the search is complete, the Network Name and Network ID will be displayed.



You can now perform all relevant measurements such as signal level, BER/MER and view TV channels by clicking on the icon 



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You can also display the list of services available on the current transponder. Tapping on the icon :



The service you select from the list will be displayed:



You can hide toolbars and display the service in full screen by simply pressing the icon .



The volume setting of the displayed service can be changed by pressing .

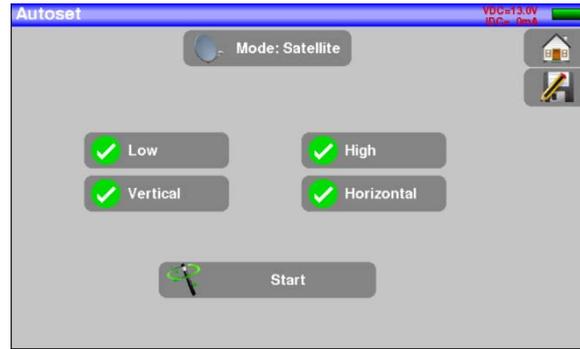
7.3 Verifying an installation.

The equipment allows to analyze and validate an existing installation, whether terrestrial, satellite, or coaxial. Autoset functionality detects all channels distributed in the installation, and scans them one after the other using the "Measurement map" function.

To do this press the icon  to access the home screen, then press "Autoset"

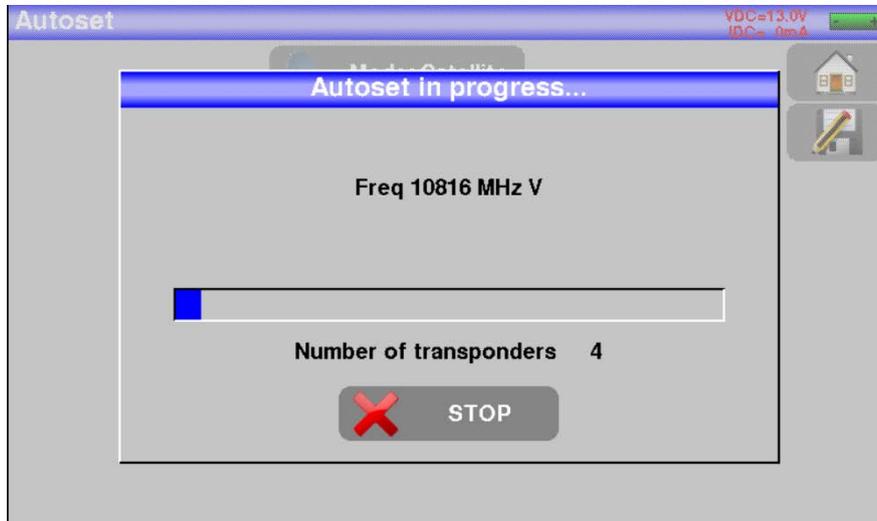


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For more details see the chapter dedicated to the "Autoset" function.

Once the channel scan is complete, the "Measurement map" will be automatically showed.



freq.	std	RF	C/N	BERi	BERo	PER	MER	LKM
10728 VL	DVB-S2	54.1	6.2	2.7E-2	<9E-7	<1E-3	10.5	3.6
10757 VL	DVB-S	55.8	9.4	2.9E-4	<1E-6	<2E-3	11.2	3.9
10787 VL	DVB-S	56.7	7.9	8.7E-5	<1E-6	<2E-3	12.0	4.7
10816 VL	DVB-S2	55.8	9.0	1.3E-2	<9E-7	<1E-3	11.7	4.8
10847 VL	DVB-S	58.0	10.8	1.3E-4	<1E-6	<2E-3	11.7	4.4
10876 VL	DVB-S	58.8	8.2	6.3E-5	<1E-6	<2E-3	12.2	4.9
10905 VL	DVB-S2	60.1	7.9	1.0E-2	<9E-7	<1E-3	12.2	5.3
10935 VL	DVB-S2	61.2	16.2	5.7E-3	<9E-7	<1E-3	13.2	6.3

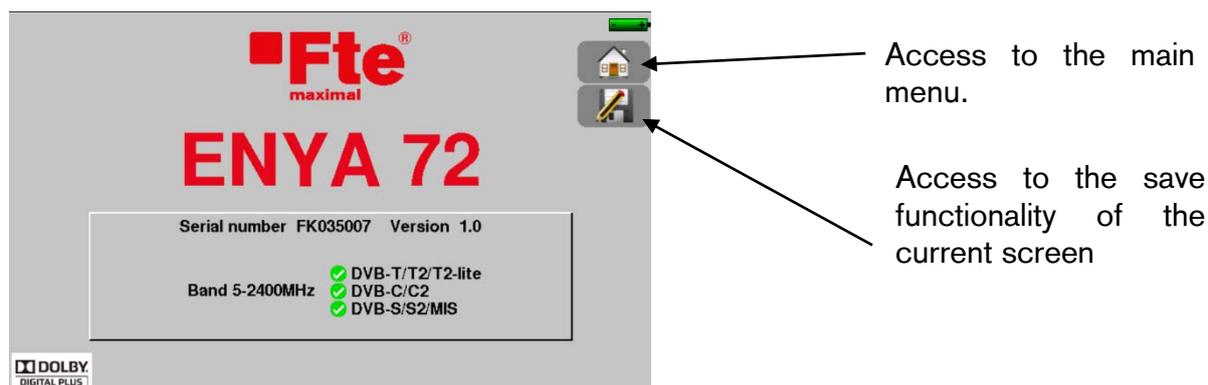
Through this measurement map you will have a summary of all the channels distributed in the installation and their corresponding measures.

8 MAN-MACHINE INTERFACE.

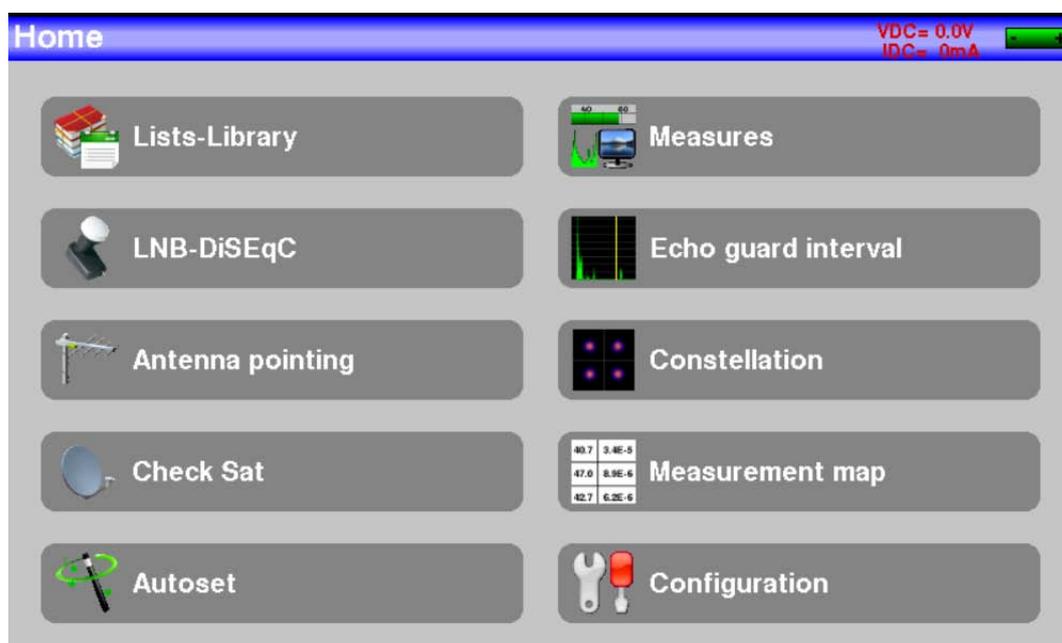
8.1 Screen content.

The device is equipped with a capacitive touch screen. Gloves should not be used for proper use of the display and it is highly recommended that you do not use any type of pointer or object when using it, just your finger. Using pointers could damage the screen.

The keys that the user can press on the screen are easily recognizable by having a dark gray background, for example the key that opens the home screen. 



The home screen allows to navigate through each of the functions of the device: settings, measurements



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The top bar displays the following information depending on the screen you are on.

Screen title

Satellite indications: siwtches DiSEqC, DCSS, SATCR

Antenna power supply. Voltage and current

Battery status.

RF	60.9 dBμV	20	40	60	80	100	120
C/N	10.3 dB	10	20	30	40	50	
BERi	< 2E-7	E-1	E-3	E-5	E-7	E-9	
BERo	< 2E-7	E-1	E-3	E-5	E-7	E-9	
PER	< 9E-4	E-1	E-3	E-5	E-7	E-9	
MER	14.5dB	5	10	15	20	25	
LKM	7.2dB	10	20	30	40	50	

To scroll through a table, there is a vertical scroll bar with two arrows. These arrows allow scrolling up and down in the table. To move faster you can move the scroll bar cursor using your fingers.

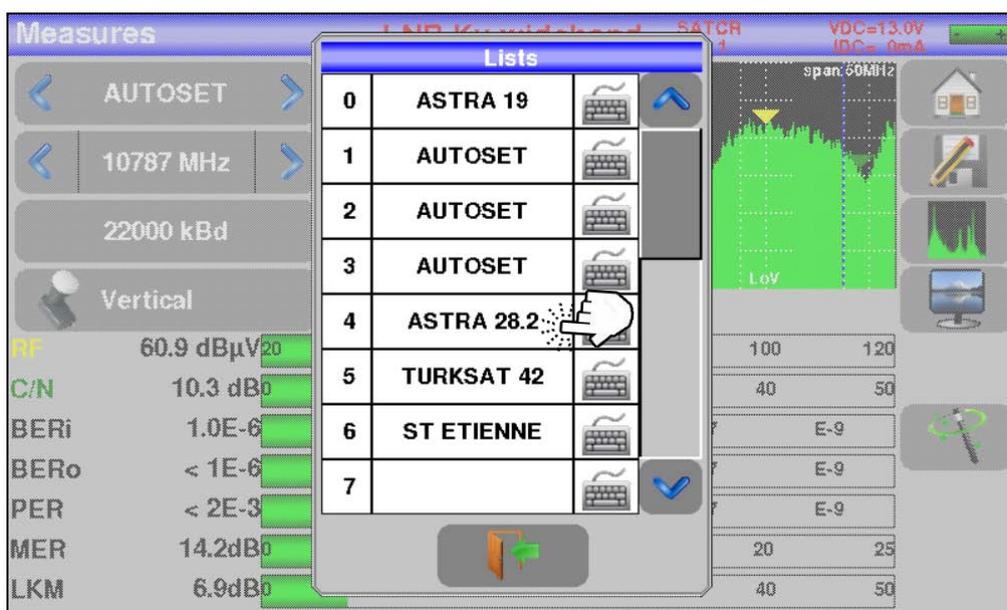
List : AUTOSET Library

#	name	freq.	standard	config.
60	T18 Autoset	11347 VL	DVB-S2 22000	---
61	T19 Autoset	11376 VL	DVB-S2 22000	---
62	T20 Autoset	11406 VL	DVB-S2 22000	---
63	T21 Autoset	11435 VL	DVB-S2 22000	---
64	T22 Autoset	11508 VL	DVB-S 22000	---
65	T23 Autoset	11538 VL	DVB-S 22000	---
66	T24 Autoset	11597 VL	DVB-S 22000	---
67	T25 Autoset	11626 VL	DVB-S 22000	---

Move up and down the list

Cursor to move quickly up and down

To select an item, line, from a table simply tap on the line you want to choose. This is valid for choosing a service/channel, selecting a configuration for the signal, selecting a TV image, etc...



If you want to edit the name of an entry you only have to press the icon . The following screen will appear on which the user will be able to insert text and validate the edition.



8.2 Measurements lists and setup library. Introducción.

To facilitate data collection, the equipment has 20 measurement lists of 50 inputs/lines each and a library of 1000 configurations. Each configuration corresponds to a terrestrial, satellite or cable emission.

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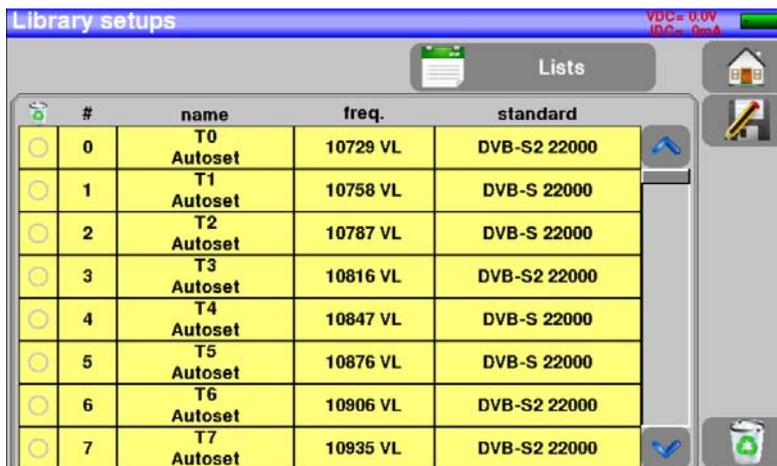
Each measurement list corresponds to a particular installation. This installation, for example, can have several satellite antennas, switches, etc....

Example of a measurement list. The background of the list is white.



#	name	freq.	standard	config.
0	T0 Autoset	10729 VL	DVB-S2 22000	---
1	T1 Autoset	10758 VL	DVB-S 22000	---
2	T2 Autoset	10787 VL	DVB-S 22000	---
3	T3 Autoset	10816 VL	DVB-S2 22000	---
4	T4 Autoset	10847 VL	DVB-S 22000	---
5	T5 Autoset	10876 VL	DVB-S 22000	---
6	T6 Autoset	10906 VL	DVB-S2 22000	---
7	T7 Autoset	10935 VL	DVB-S2 22000	---

Example of library. The background of the library is yellow.



#	name	freq.	standard
0	T0 Autoset	10729 VL	DVB-S2 22000
1	T1 Autoset	10758 VL	DVB-S 22000
2	T2 Autoset	10787 VL	DVB-S 22000
3	T3 Autoset	10816 VL	DVB-S2 22000
4	T4 Autoset	10847 VL	DVB-S 22000
5	T5 Autoset	10876 VL	DVB-S 22000
6	T6 Autoset	10906 VL	DVB-S2 22000
7	T7 Autoset	10935 VL	DVB-S2 22000

Considerations to take into account:

- The same library settings can be used for multiple measurement lists.
- The same installation can have two satellite antennas:
 - Astra 19.2 in position A of DiSEqC.
 - Hotbird 13 in position B of DiSEqC.
- Another installation may have 3 satellite antennas:
 - Atlantic Bird 3 in position A of DiSEqC.
 - Astra 1 in position B of DiSEqC.
 - Hotbird in position C of DiSEqC.
- The same configuration from the library can be used multiple times in the same list of measures.
 - ZDF in slot 0 of SatCR.
 - ZDF in slot 1 of SatCR.

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- ZDF in slot 2 of SatCR.
-
- If a configuration parameter changes, for example symbol rate or DVBS to DVBS2, only the configuration that is inside the library has to be changed, as it is shared.
- A list of measures consists of:
 - A name of up to 10 characters.
 - The low frequency of the local LNB oscillator (OL1). (satellite only).
 - The high frequency of the local LNB oscillator (OL2). (satellite only).
 - The LNB's low band/high band selection mode. (satellite only).
 - The polarization of the LNB, vertical or horizontal. (satellite only).
 - In the event that the satellite antenna is motorized, the position number.
 - 50 lines, each of which includes:
 - A configuration number corresponding to the configuration list.
 - The existence or not and the mode of operation of the "committed switch". (satellite only).
 - The "committed switch" position. (satellite only).
 - The existence or not and the mode of operation of the "uncommitted switch". (satellite only).
 - The "uncommitted switch" position. (satellite only).
 - The existence or other existence of SatCR equipment. (satellite only).
 - The slot number of the SatCR switch. (satellite only).
 - The position of the SatCR switch. (satellite only).
- A library configuration consists of:
 - An 8-character name.
 - A 10-character place name.
 - A frequency.
 - A channel number for terrestrial and cable modes.
 - A frequency map for terrestrial and cable modes.
 - Vertical or horizontal polarization if using satellite mode.
 - Low or high LNB band for satellite mode.
 - The DVB standard used (DVBS, DVBT,...)
 - Constellation type (64 QAM, 256 QAM) for cable mode.
 - 5, 6, 7, 8 Mhz bandwidth for DVBT/DVBT2.
 - Tasa de símbolos para DVBC, DVBS, DVBS2, DSS.

Some parameters have no relevance depending on whether the mode chosen is terrestrial, cable or satellite and the standard.

The place-name can distinguish two different emitters, for example, TF1 Fourviare and TF1 Chambéry.

The frequency and channel number are equivalent. A valid channel number takes precedence over a frequency.

The frequency map parameter associated with the configuration allows you to continue using channel numbers at border locations.

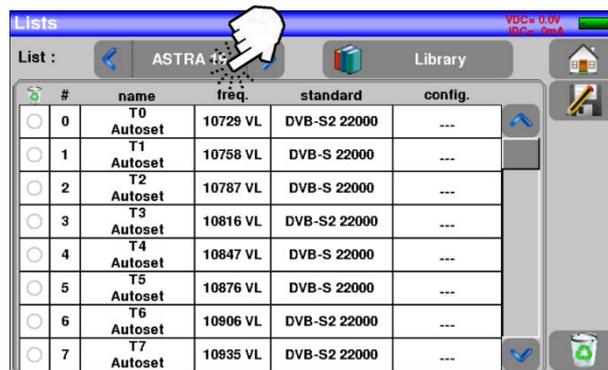
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Selecting a list on the list screen retrieves all the information associated with that list.

Selecting a setting on a action screen automatically retrieves all the information associated with that setting.

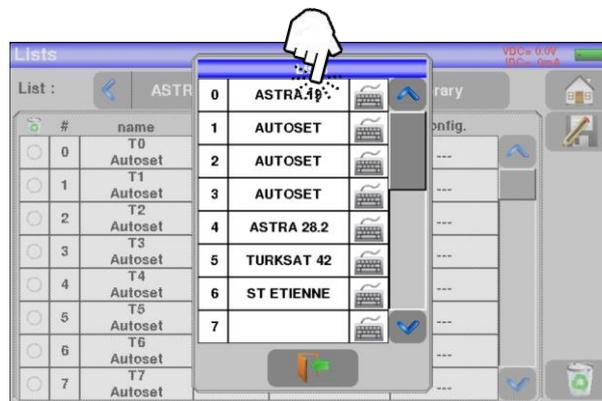
8.2.1 Measurement lists.

To access the lists screen press the icon  and then  of the home screen. On this screen you can select the list you will use when working with measurements.



#	name	freq.	standard	config.
0	T0 Autoset	10729 VL	DVB-S2 22000	---
1	T1 Autoset	10758 VL	DVB-S 22000	---
2	T2 Autoset	10787 VL	DVB-S 22000	---
3	T3 Autoset	10816 VL	DVB-S2 22000	---
4	T4 Autoset	10847 VL	DVB-S 22000	---
5	T5 Autoset	10876 VL	DVB-S 22000	---
6	T6 Autoset	10906 VL	DVB-S2 22000	---
7	T7 Autoset	10935 VL	DVB-S2 22000	---

The lists are numbered from 0 to 19. To select the one you want to press the key indicated in the previous image. Doing so will display the lists.

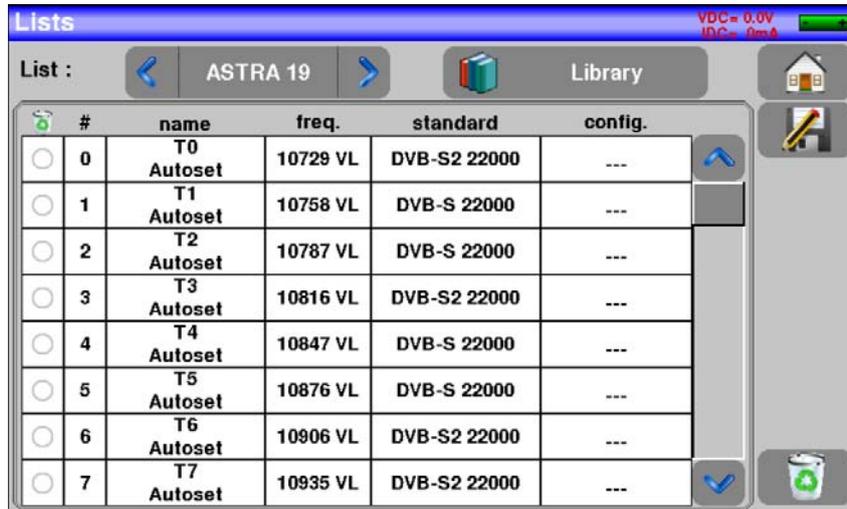


#	name	freq.	standard	config.
0	T0 Autoset	10729 VL	DVB-S2 22000	---
1	T1 Autoset	10758 VL	DVB-S 22000	---
2	T2 Autoset	10787 VL	DVB-S 22000	---
3	T3 Autoset	10816 VL	DVB-S2 22000	---
4	T4 Autoset	10847 VL	DVB-S 22000	---
5	T5 Autoset	10876 VL	DVB-S 22000	---
6	T6 Autoset	10906 VL	DVB-S2 22000	---
7	T7 Autoset	10935 VL	DVB-S2 22000	---

0	ASTRA 19.2
1	AUTOSET
2	AUTOSET
3	AUTOSET
4	ASTRA 28.2
5	TURKSAT 42
6	ST ETIENNE
7	

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Select the list you want. In the example above we selected list number 0, corresponding to ASTRA 19.2 by pressing with your finger on it. We will be shown the contents of the list quickly:



#	name	freq.	standard	config.
0	T0 Autoset	10729 VL	DVB-S2 22000	---
1	T1 Autoset	10758 VL	DVB-S 22000	---
2	T2 Autoset	10787 VL	DVB-S 22000	---
3	T3 Autoset	10816 VL	DVB-S2 22000	---
4	T4 Autoset	10847 VL	DVB-S 22000	---
5	T5 Autoset	10876 VL	DVB-S 22000	---
6	T6 Autoset	10906 VL	DVB-S2 22000	---
7	T7 Autoset	10935 VL	DVB-S2 22000	---

Warning: A list may contain satellite and terrestrial settings.

8.2.1.1 List modification.

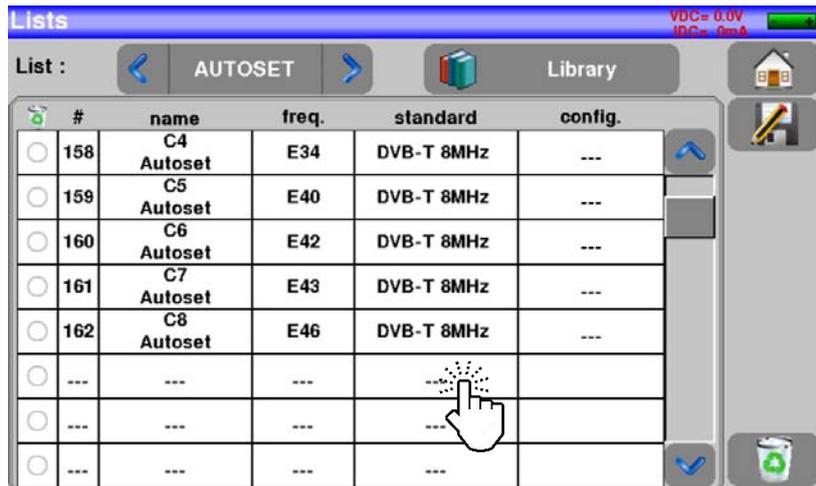
To modify the name of a list, you must click on it. Then tap on the keyboard symbol . A virtual keyboard opens with which you can change/modify the name of the list.



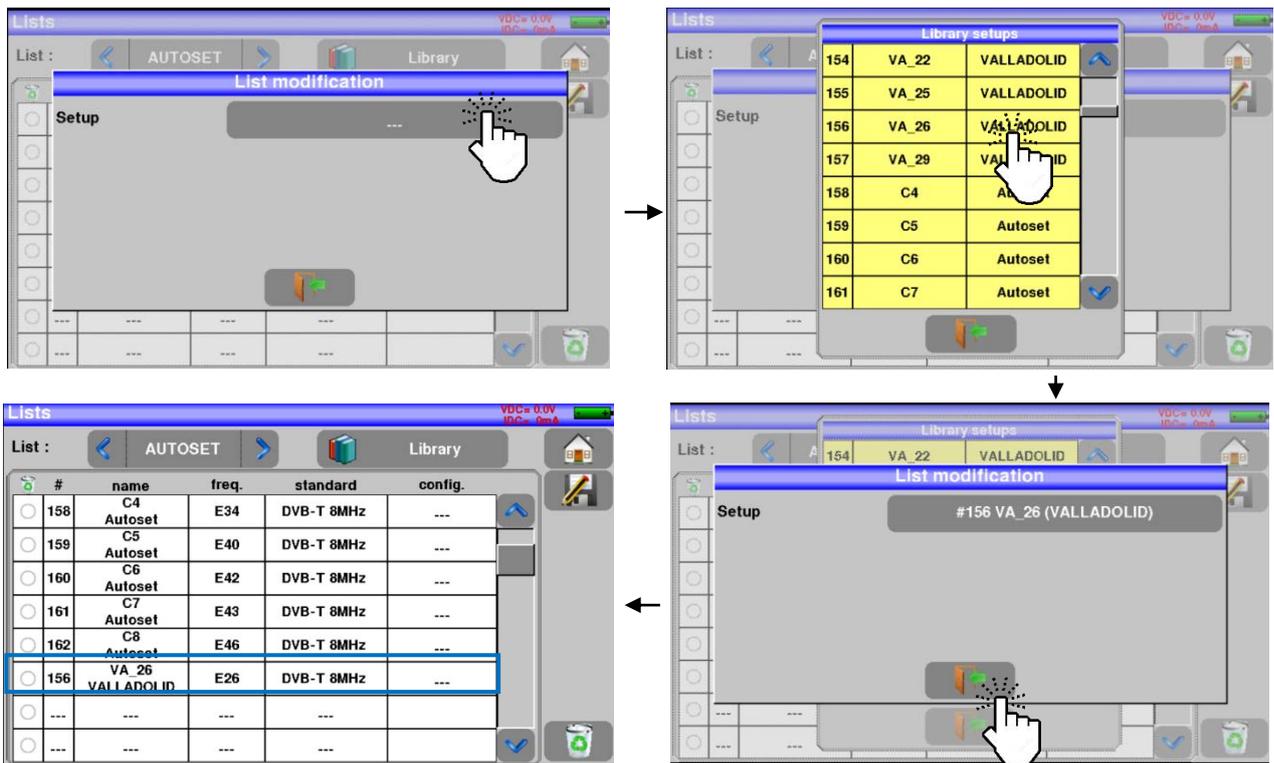
Once you have finished editing the name press the key .

To add a configuration to a list you have to select the line on which you will save those settings.

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The next screen will be shown, on which you will need to press the indicated key on the image. Once you press it, a screen will be opened showing all the settings available in the library. Select the settings you want to add to the list by clicking on its name. In this case we select BCN_C47



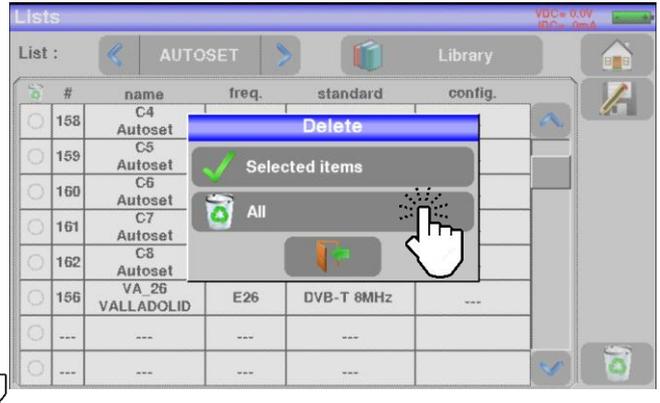
We already have added the VA_26 to the AUTOSSET list.

Warning: If the selected line already contains a configuration it will be deleted if it is modified. To exit press the key 

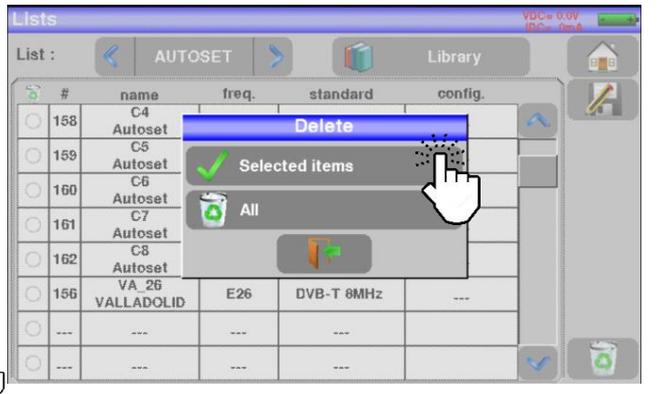
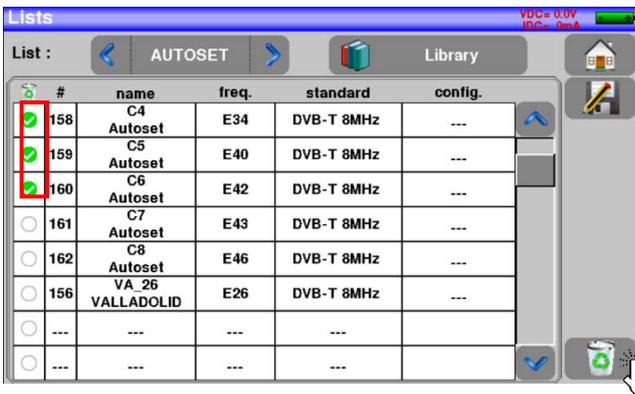
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You can delete an entire list by pressing the key  and then

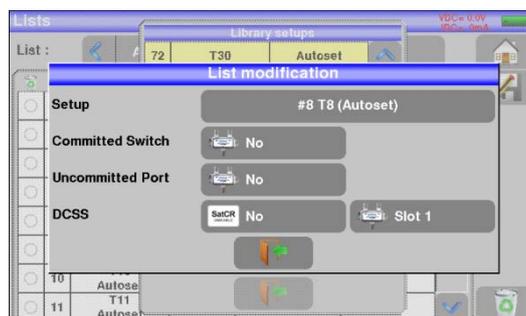
 All



Or you can select the settings from the list you want to delete and then tap  and then  Selected items :



In the satellite configuration you can modify the "switch", the "Uncommitted Port" and "DCSS". This change will only affect the settings in this list, not the settings present in the library.



8.2.2 Setup library.

To access the Lists screen press the icon  and then  of the main menu. Then press the key , and you'll access all the settings stored in the library.

Library setups VDC= 0.0V
IDC= 0mA

Lists

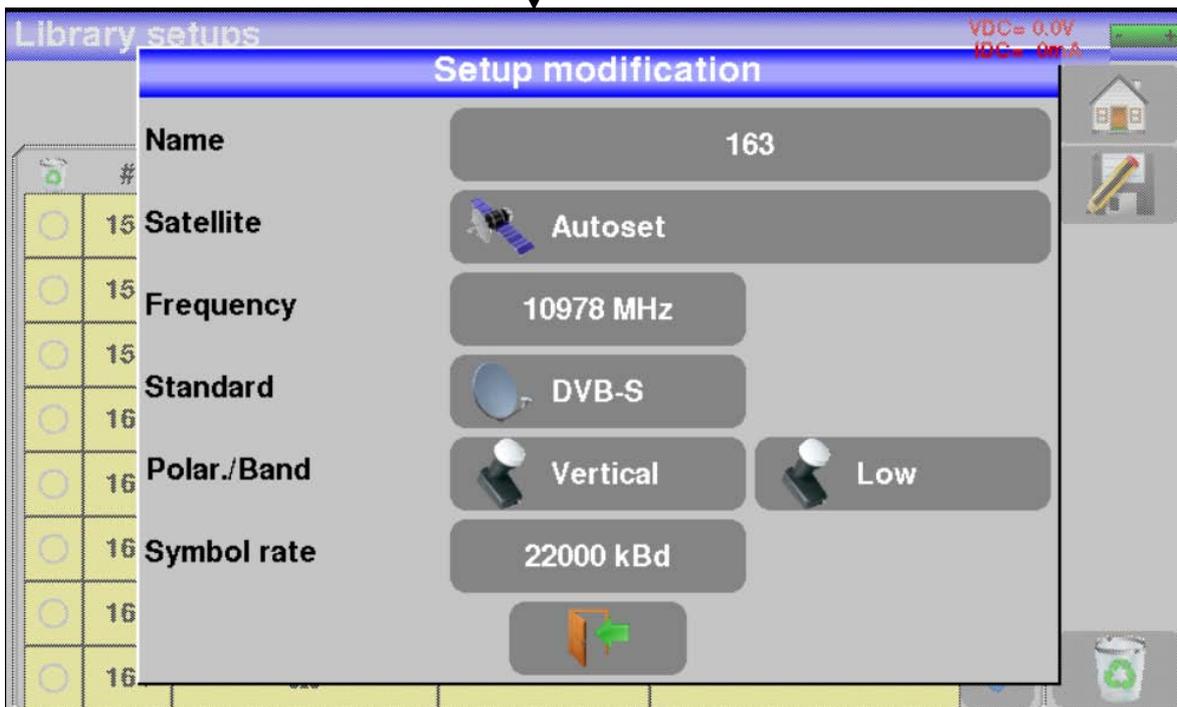
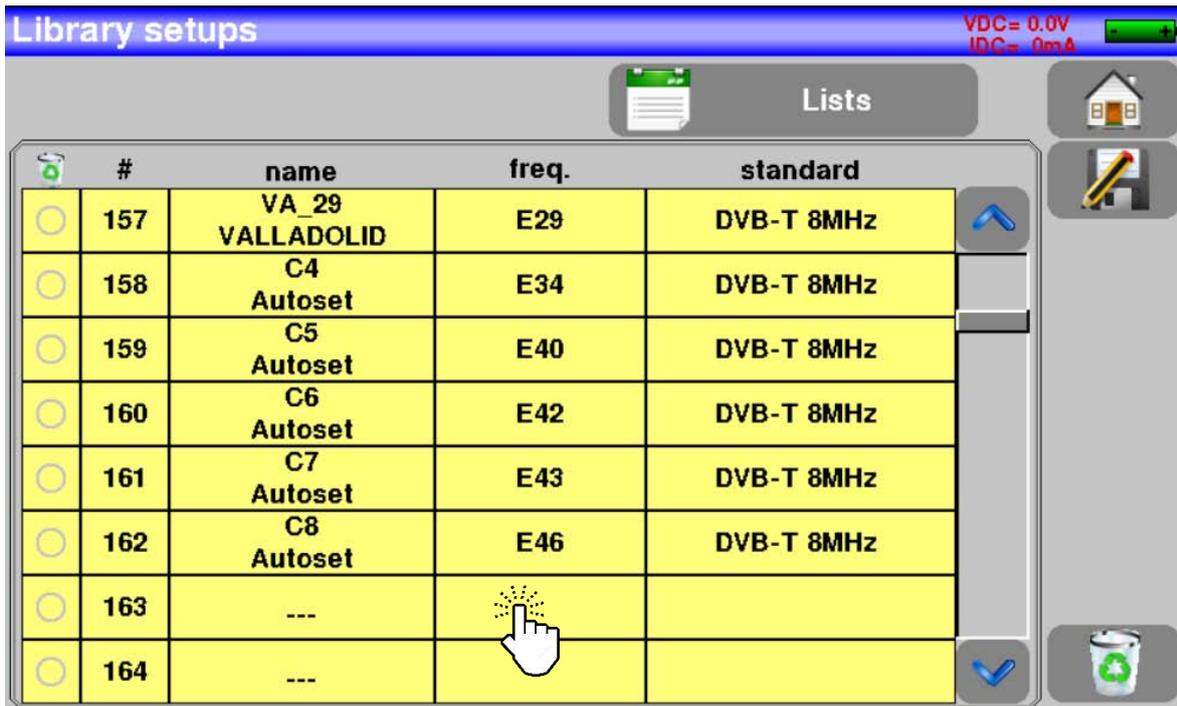
#	name	freq.	standard
0	T0 Autoset	10729 VL	DVB-S2 22000
1	T1 Autoset	10758 VL	DVB-S 22000
2	T2 Autoset	10787 VL	DVB-S 22000
3	T3 Autoset	10816 VL	DVB-S2 22000
4	T4 Autoset	10847 VL	DVB-S 22000
5	T5 Autoset	10876 VL	DVB-S 22000
6	T6 Autoset	10906 VL	DVB-S2 22000
7	T7 Autoset	10935 VL	DVB-S2 22000

8.2.2.1 Creation or modification of the setups in a library.

To create or modify a library configuration, select a line in the table that displays the configurations. Select an empty line to add a new configuration without deleting one of the existing ones.

Warning: If the selected line already contained a configuration it will be deleted. If you chose it by mistake, press the exit key .

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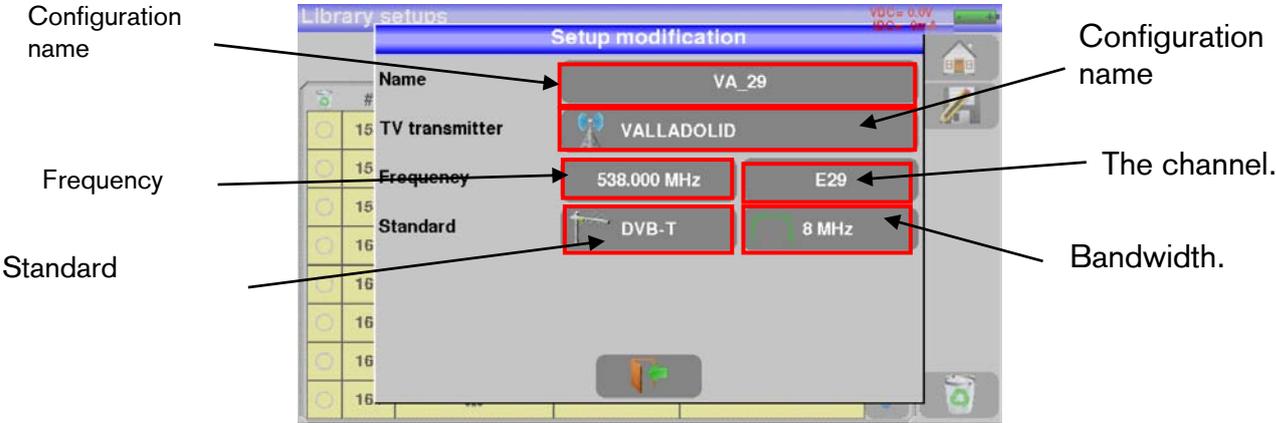
In this screen you can create a terrestrial, cable or satellite configuration (KU,L or C).

You can delete all settings by pressing the key  and then tapping  All . Or you can select the settings you want to delete and then press  followed by pressing  Selected items  :

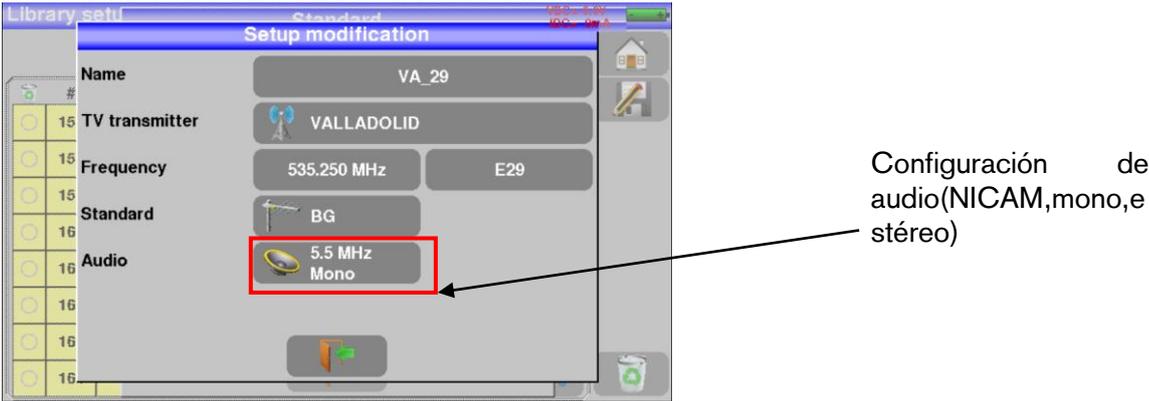
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8.2.2.1.1 Configuración Terrestre.

DVB-T/DVB-T2

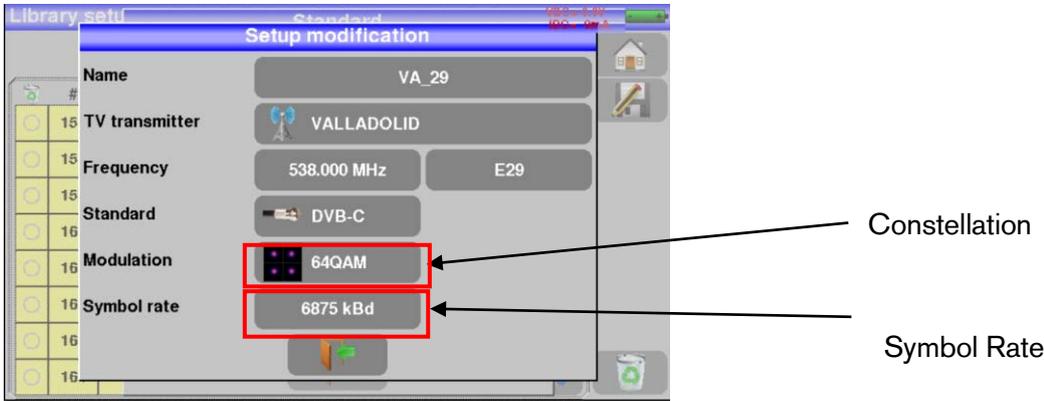


Terrestrial analog Standard (L,BG,DK,I, MN)



8.2.2.1.2 Cable configuration.

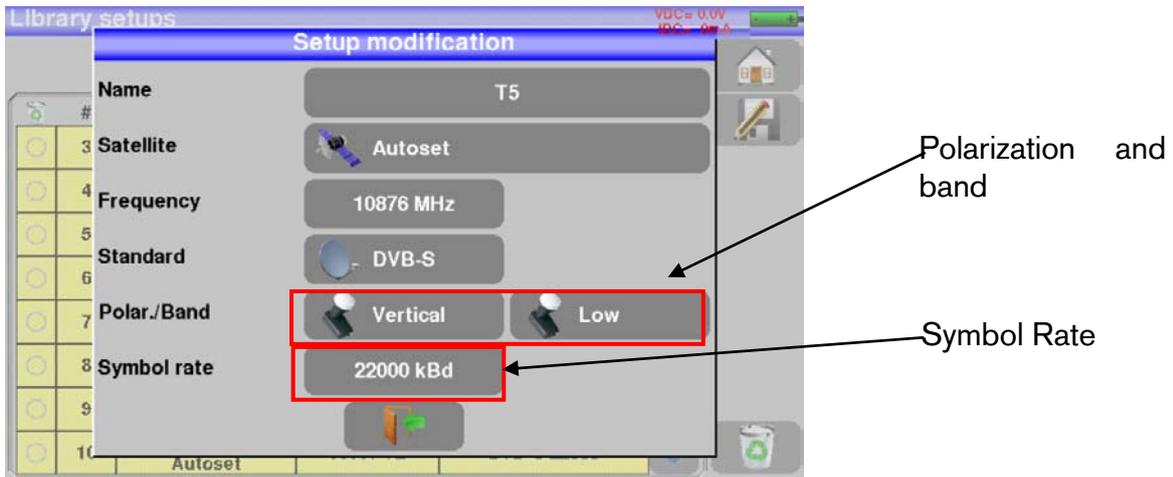
DVB-C/DVB-C2



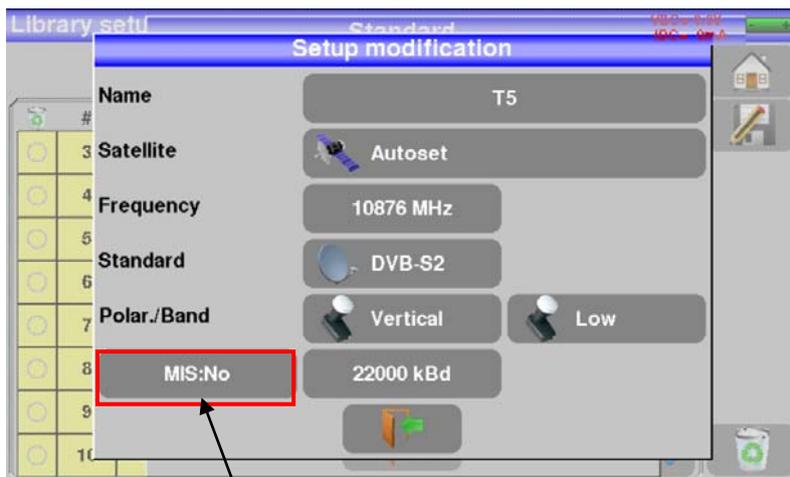
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8.2.2.1.3 Satellite Configuration.

DVB-S

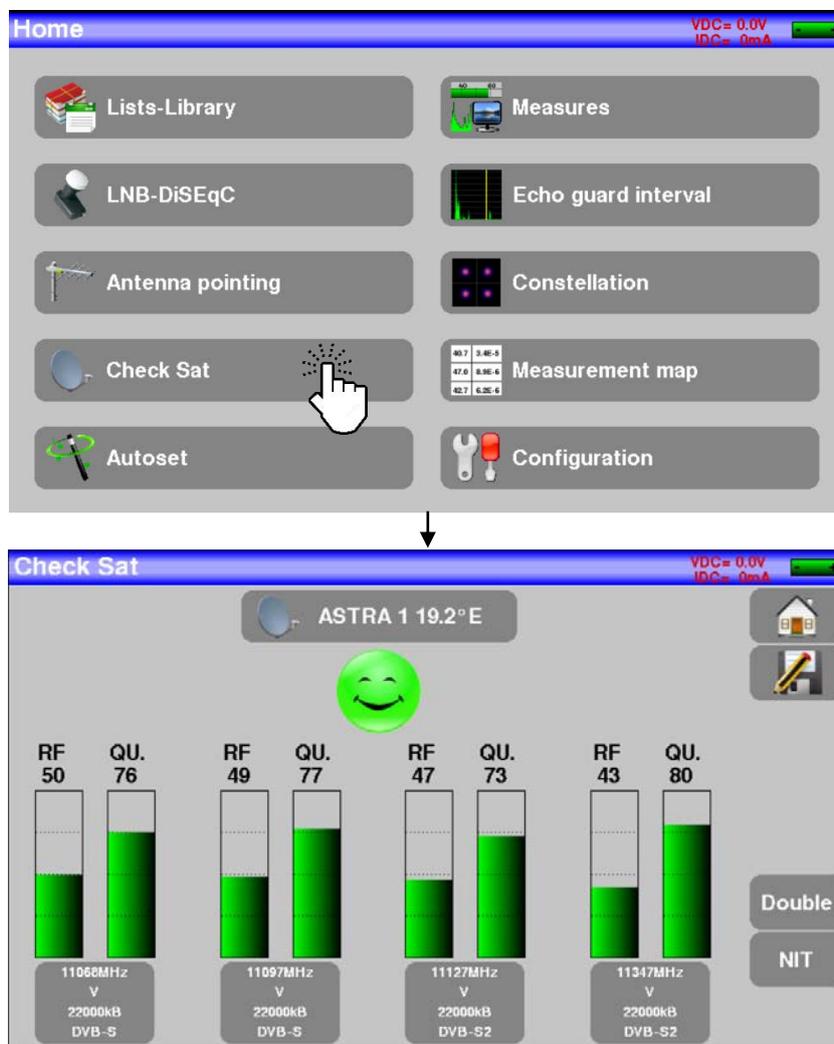


DVB-S2



8.3 Satellite check.

To access the functionality that allows you to validate the correct orientation of a satellite antenna press the  Chequear Sat from the main menu.



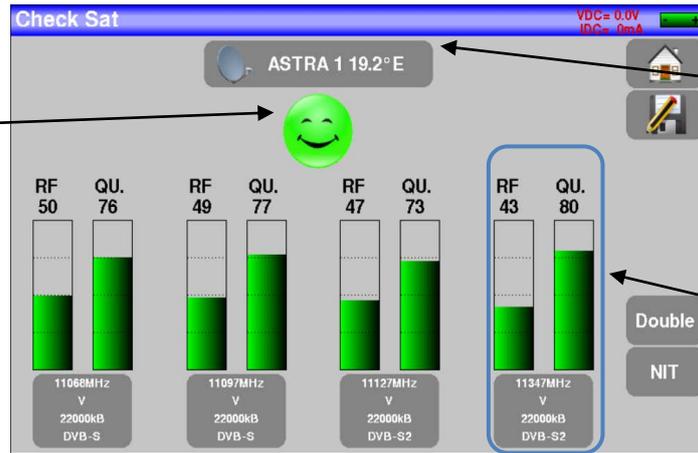
8.3.1 General functioning.

The device has the possibility of having 32 orbital positions of the different satellites. It is provided with a few factory-configured orbital positions. For each of these configurations there are 4 transponders stored.

The meter successively scans these 4 transponders and provides RF information corresponding to the signal level and quality received by the antenna.

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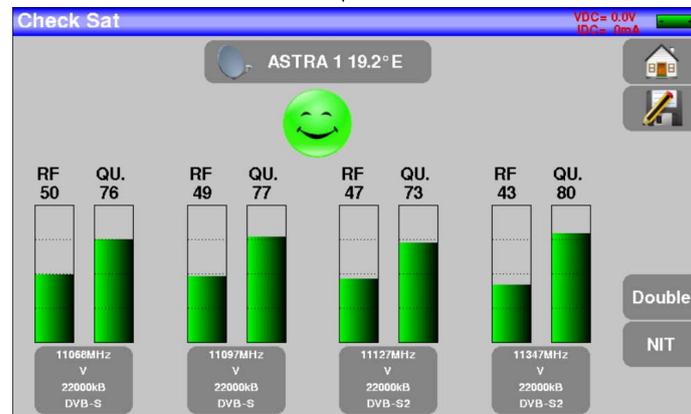
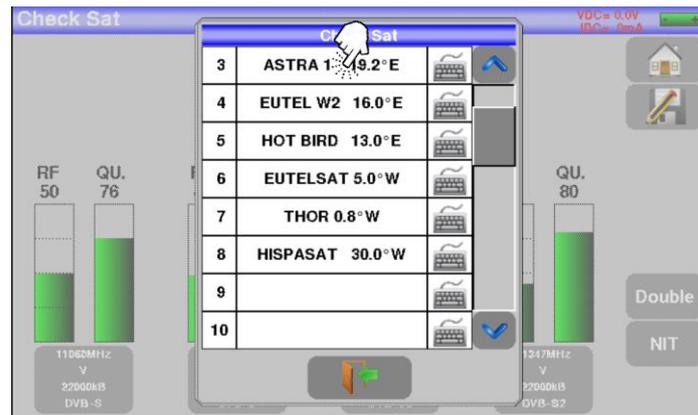
Indicator of the overall quality of the received signal



Satellite name and orbital position

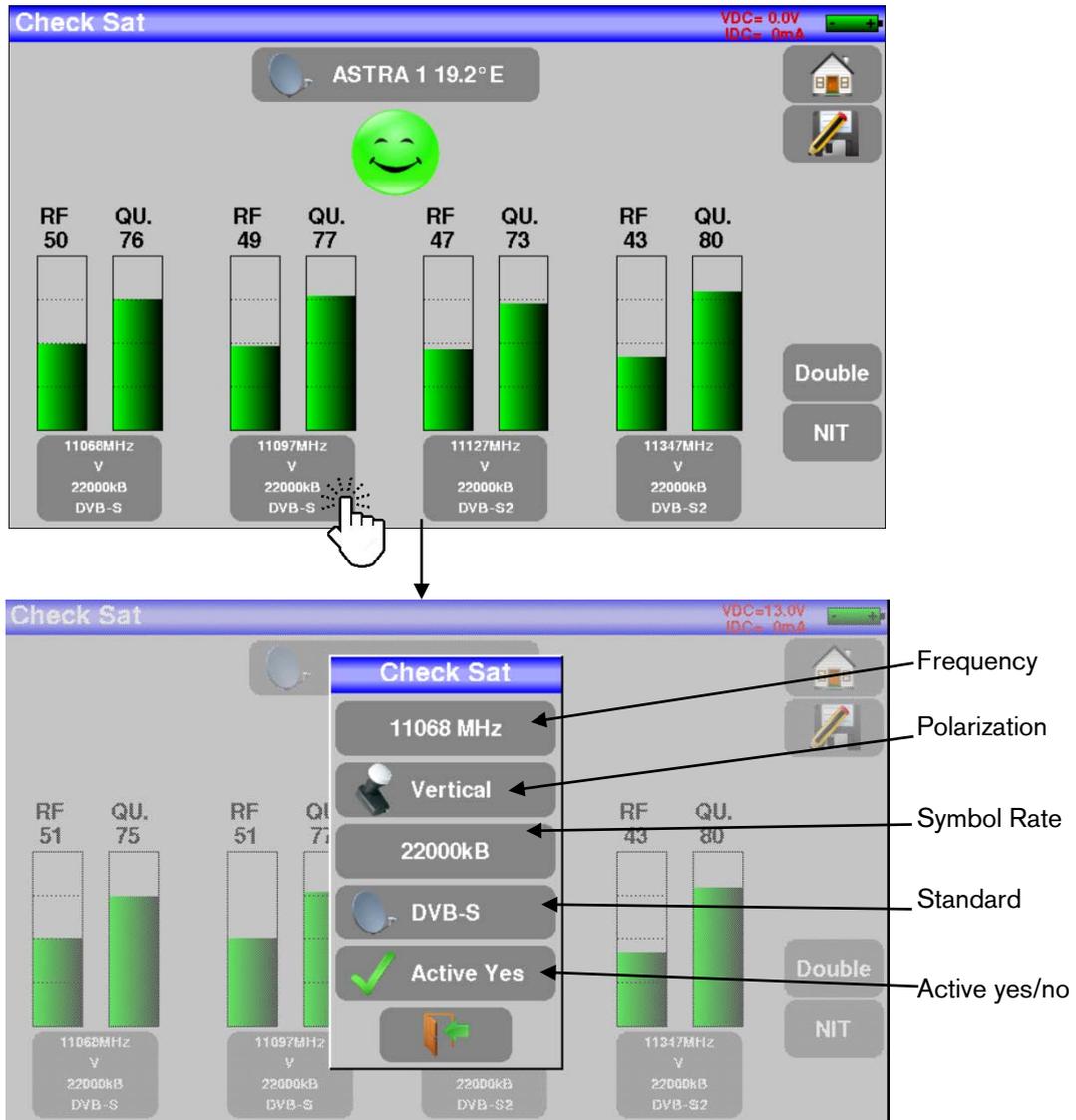
Transponder data and corresponding signal quality and level

To select the satellite press the key **ASTRA 1 19.2° E**. A screen will be opened with a list of possible satellites that the user can choose. Press on the name of one of them and the satellite will be chosen.



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You can modify each of the 4 transponders associated with the chosen satellite. To do this, simply press the area where the transponder information is displayed.



8.3.2 Updating satellites.

You can update the frequencies of satellite transponders. This update can be performed manually directly on your computer or by importing the existing settings at the following link: <http://ftemaximal.com/en/support-services/software-and-updates/field-strength-meters/enya-2>

Once downloaded the file with extension ".csv" copy it to a USB. Then go to "Settings" by pressing  Configuration in the main menu. The settings screen will be opened. Now tap on  Configuration import .

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It is recommended to review and update frequencies every three months.

8.3.3 Instruction for use.

Review the information in the section [Using pointing antenna functionality / Check Sat.](#)

8.3.4 Orientar antena con LNB doble.

This mode allows you to point a dual LNB by reviewing 4 transponders of each of the 2 selected satellites. A dual LNB consists of two LNBs and one DiSEqC switch. For example, a dual LNB ASTRA 19.2°E / HOTBIRD 13°E consists of two LNBs and a DiSEqC switch with ASTRA in POS A and HOTBIRD in POS B.

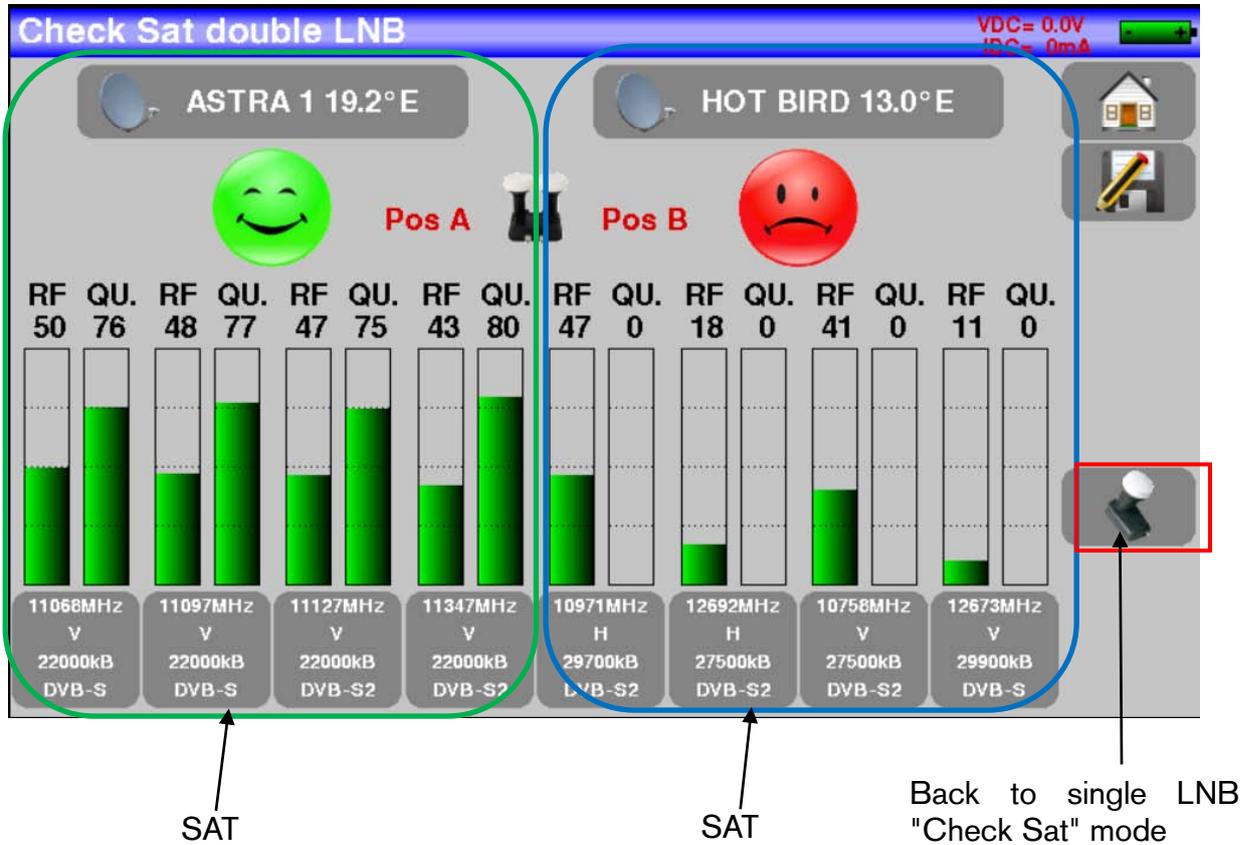
The way of working is the same as the one described to orient a satellite antenna with a single LNB.

To access this mode you must press the key **Doble**.



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The following screen opens. In it we can see how 8 transponders appear, the first 4 corresponding to the first satellite, in this case Astra 19.2°E and the next 4 corresponding to Hotbird 13°E.



8.3.5 Installation parameters.

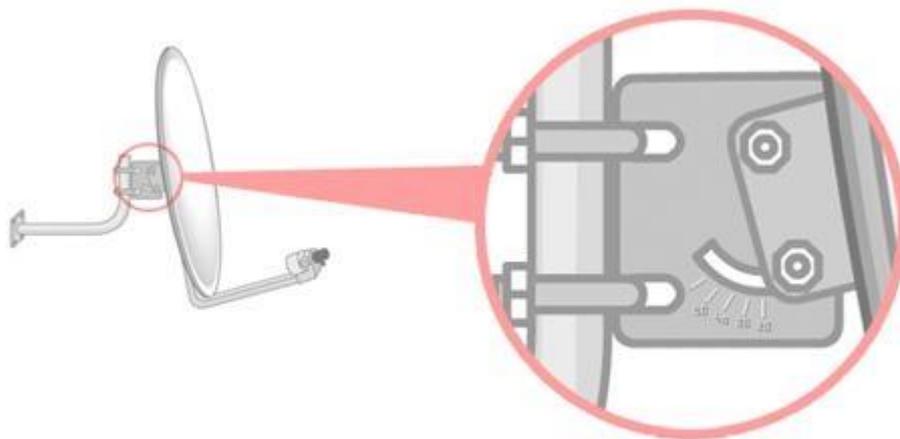
AZIMUT

The azimuth is the horizontal angle at which the antenna axis is to be rotated, from the earth's geographic north pole to the satellite. Sometimes this angle is indicated relative to the south pole.



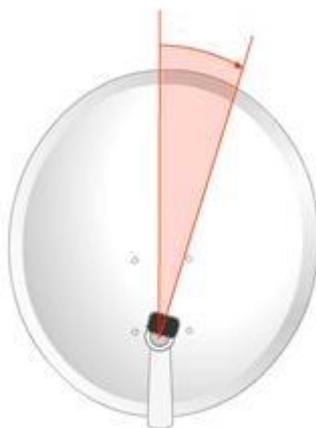
ELEVATION

Elevation is the angle to raise the antenna from the horizon to locate the desired satellite.



POLARIZACIÓN

Polarization displacement is the angle that the antenna LNB must be rotated so that horizontal and vertical polarization have a perfect effect on the LNB.



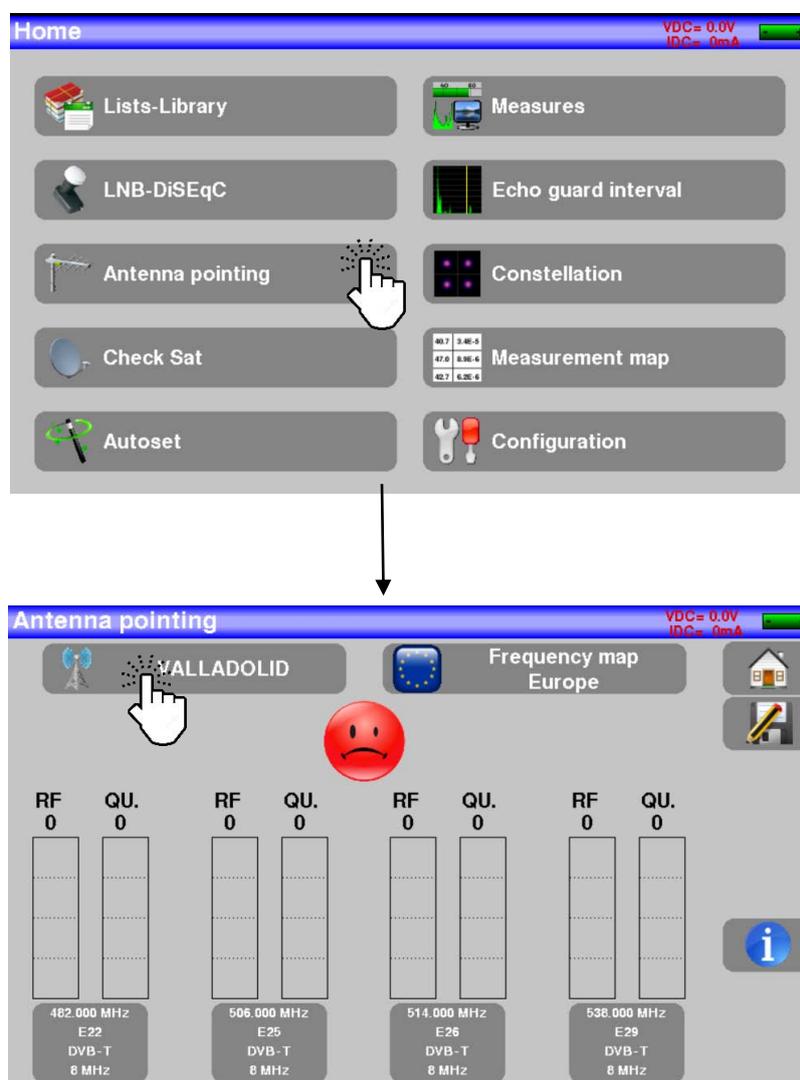
8.4 Orientación de antena terrestre.

To access the "antenna orientation" functionality press  Antenna pointing .

8.4.1 Funcionamiento general.

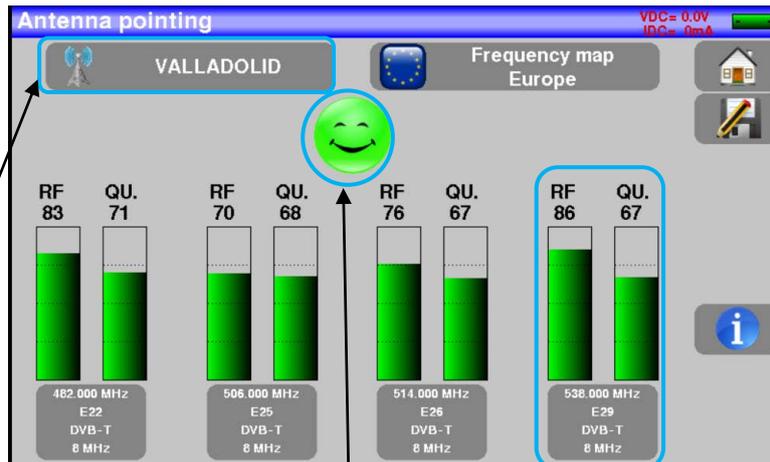
The equipment has a list capable of storing up to 10 emitters. The equipment can bring one of them up at the factory. The user can delete, edit, or add new issuers up to a maximum of 10 in the list. Each of the emitters has 4 channels associated with it.

Once the emitter is chosen, the device will scan each of the 4 channels in succession, providing information on the level and quality of the signal received by the antenna for each of them.



The emitter is selected by pressing on the key indicated in the image above. Once pressed, the list of issuers will open where the user will be able to make their choice.

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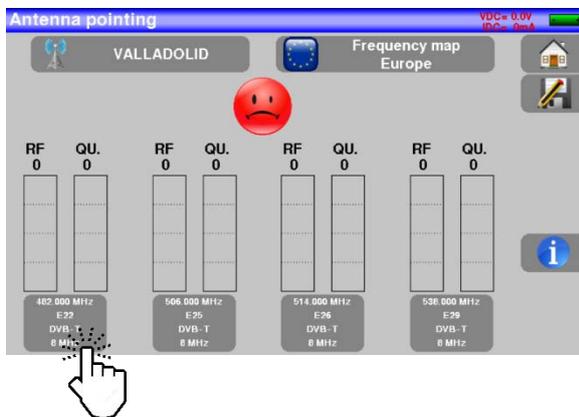


Name of the selected issuer.

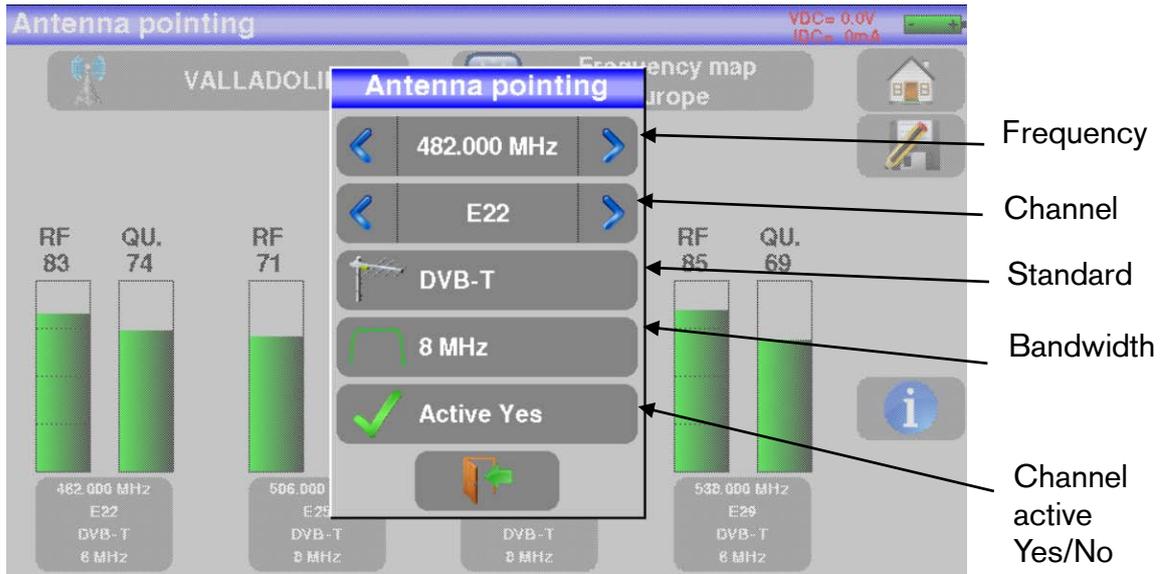
General indicator of signal quality

Frequency, channel, standard, level and quality of the signal

The 4 frequencies used to point the antenna can be changed to fit the geographical location where the antenna is installed.



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Once the parameters have been changed press the exit key 

8.4.2 Transmitter update.

You can update the list of frequencies/names of transmitters. This update can be done manually directly on your device or by importing the ".csv" file settings for terrestrial.

Copy the file with the ".csv" extension to a USB. Then go to "Settings" by pressing  Configuration on the main menú screen. The settings screen will be opened. That's where you click  Configuration import .



8.4.3 Use instructions.

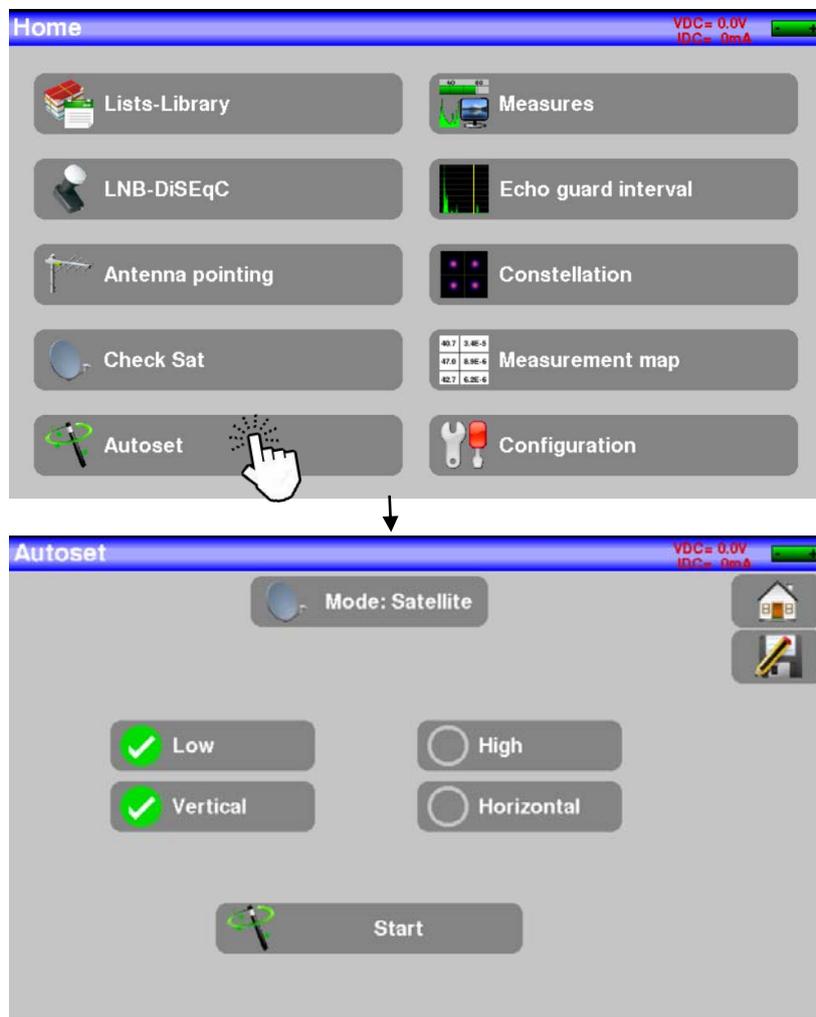
Review the information of the section [Using antenna pointing functionality.](#)

8.5 Autose.

This mode enables automatic channel search and provides information about the current installation.

Warning: Automatic channel search is only possible to use (autose) when at least an empty list is available and with space available in the library.

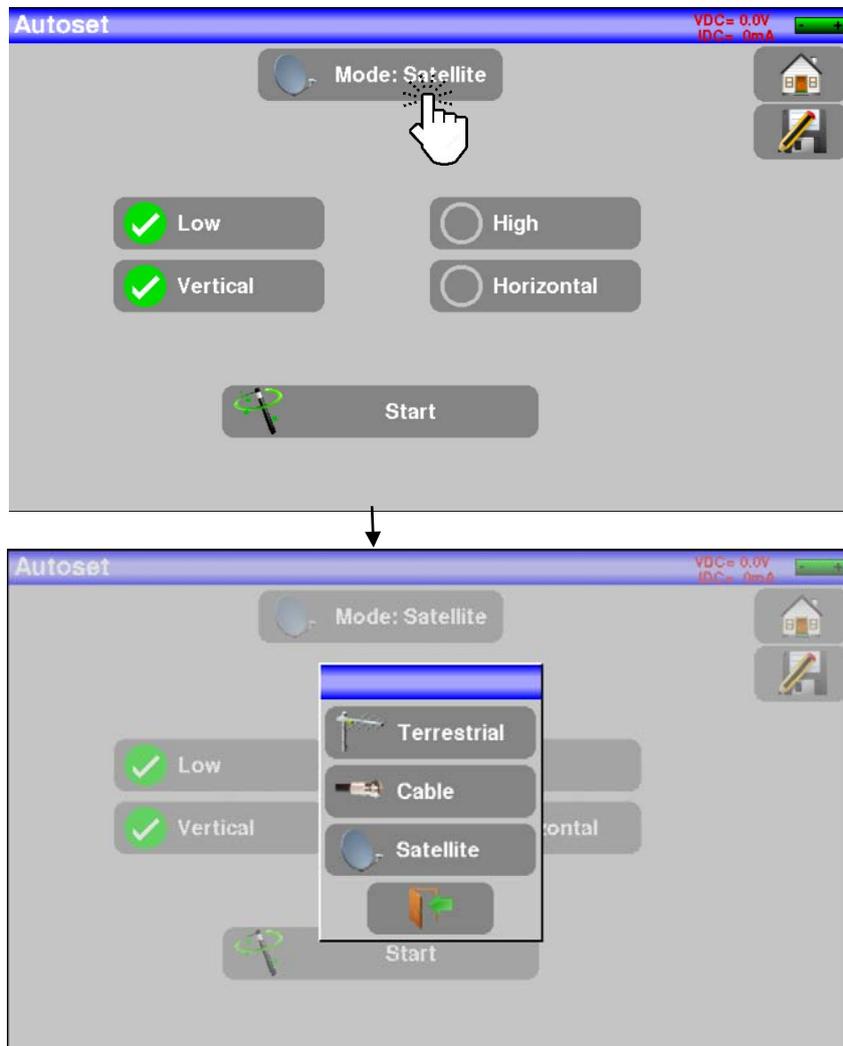
To enter this mode the user has to press the key  in the main menu, in the same way as the following image shows.



Before starting the automatic search the user has to choose the mode, that is, whether the search will be performed on a satellite, terrestrial or cable antenna. Tap on the icon



as shown in the image below. Then select how the automatic search will be performed.



Once the mode is selected, the corresponding screen will appear. The parameters shown are different for each mode (type of the chosen signal). Each of the parameters that appear is assigned a validation symbol in green  or grey . Green means that parameter will be taken into account for the search and will be used. If the symbol displayed next to the parameter is grey, then it will not be active and will not be considered for automatic search.

The more options selected with the symbol , the slower will be the search.

8.5.1 Terrestrial mode.

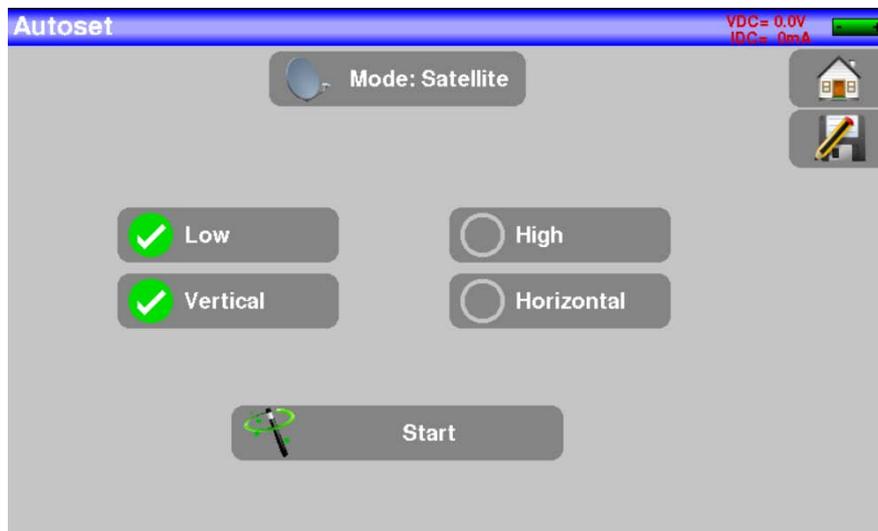
This mode allows automatic search in the terrestrial frequency band.



You can select the standards to be used (DVB-T, DVB-T2), the bandwidth, and the range of channels on which the search will be performed. The fewer options that are selected, the faster the results will appear.

8.5.2 Satellite mode.

This mode allows automatic search in the satellite frequency band.



You can select the bands (high, low, both) and polarizations (vertical, horizontal, or both) in which the automatic search will be performed. Again, the fewer options selected, the faster the results appear.

8.5.3 Cable mode.

This mode allows automatic search in the cable frequency band.

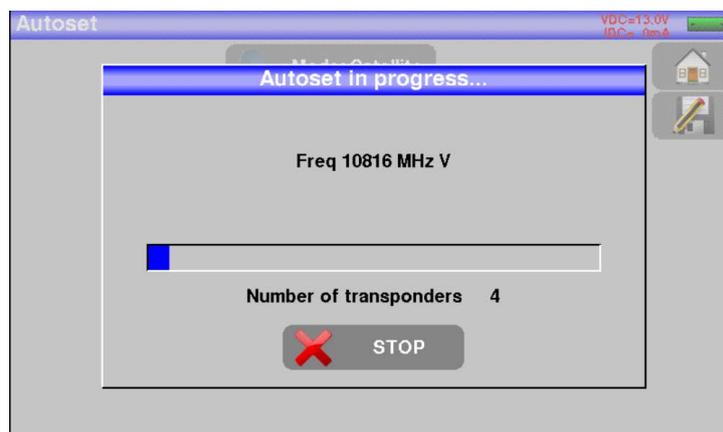


You can select the standards (DVB-C, DVB-T, DVB-C2), bandwidth, and channel range on which the search will be performed.

As in the other modes, the fewer options are selected in green, the faster the search will be.

8.5.4 General operation.

Once the user has selected the mode for the search and has chosen the parameters that suit them you can press the key  **Start**. No matter which mode was selected, once this key is pressed the automatic search will start.



The user can abort the search at any time by clicking  **STOP**

When the search is complete or the user has aborted it the computer will show the plane of measurements obtained for the frequencies found.

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Measurement map VDC=13.0V
IDC= 0mA

< AUTOSET > 3/50

freq.	std	RF	C/N	BERi	BERo	PER	MER	LKM
10728 VL	DVB-S2	54.1	6.2	2.7E-2	<9E-7	<1E-3	10.5	3.6
10757 VL	DVB-S	55.8	9.4	2.9E-4	<1E-6	<2E-3	11.2	3.9
10787 VL	DVB-S	56.7	7.9	8.7E-5	<1E-6	<2E-3	12.0	4.7
10816 VL	DVB-S2	55.8	9.0	1.3E-2	<9E-7	<1E-3	11.7	4.8
10847 VL	DVB-S	58.0	10.8	1.3E-4	<1E-6	<2E-3	11.7	4.4
10876 VL	DVB-S	58.8	8.2	6.3E-5	<1E-6	<2E-3	12.2	4.9
10905 VL	DVB-S2	60.1	7.9	1.0E-2	<9E-7	<1E-3	12.2	5.3
10935 VL	DVB-S2	61.2	16.2	5.7E-3	<9E-7	<1E-3	13.2	6.3

All found channels will be recorded in the first empty list (which will be automatically named "AUTOSET"), and in the first empty configuration of the library.

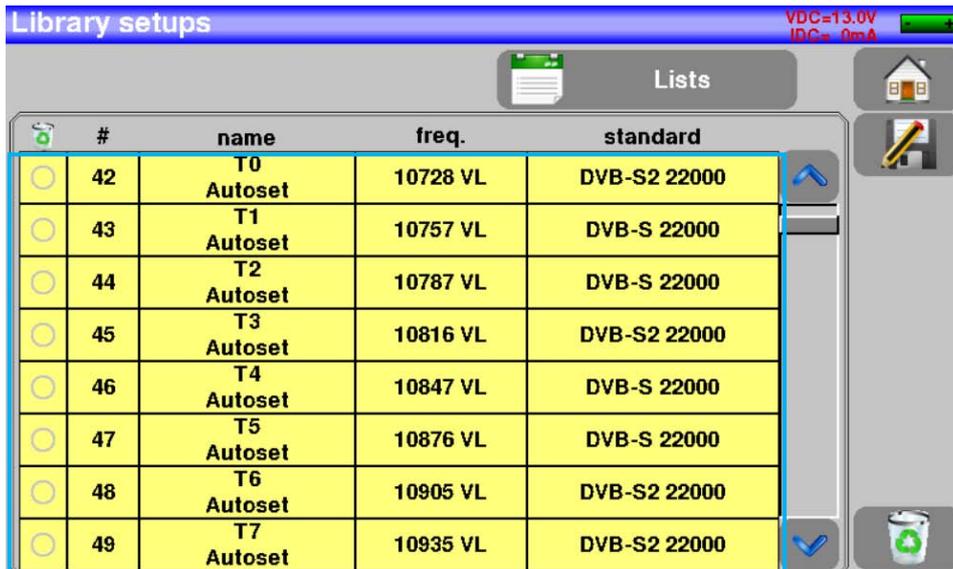
Lists VDC=13.0V
IDC= 0mA

List : < **AUTOSET** > Library

#	name	freq.	standard	config.
<input type="radio"/> 164	T0 Autoset	10728 VL	DVB-S2 22000	---
<input type="radio"/> 165	T1 Autoset	10757 VL	DVB-S 22000	---
<input type="radio"/> 166	T2 Autoset	10787 VL	DVB-S 22000	---
<input type="radio"/> 167	T3 Autoset	10817 VL	DVB-S2 22000	---
<input type="radio"/> 168	T4 Autoset	10846 VL	DVB-S 22000	---
<input type="radio"/> 169	T5 Autoset	10875 VL	DVB-S 22000	---
<input type="radio"/> 170	T6 Autoset	10905 VL	DVB-S2 22000	---
<input type="radio"/> 171	T7 Autoset	10935 VL	DVB-S2 22000	---

New channels are added one by one to the new list

Similarly, as already described, the new channels found are added one by one in the free settings of the program library starting at the end of the table.

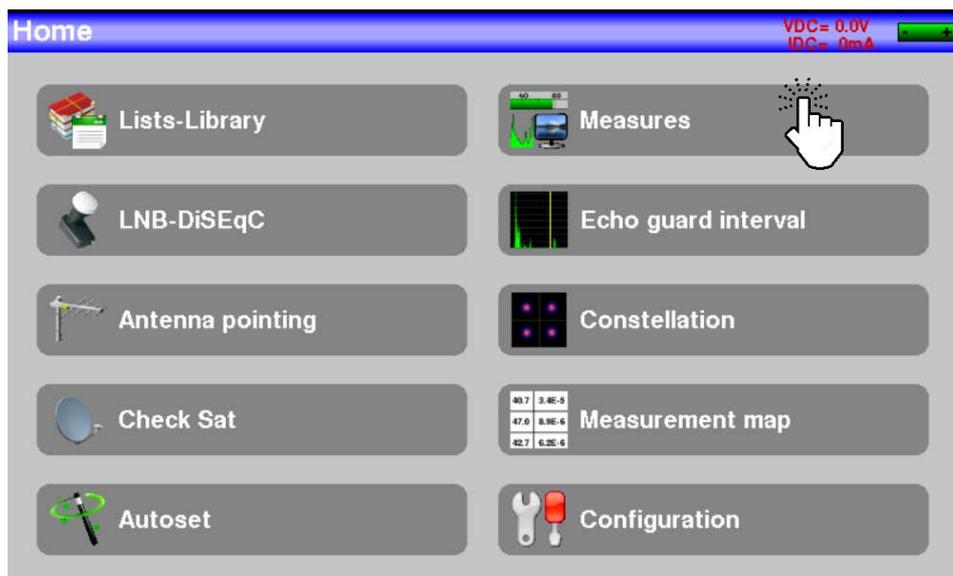


The screenshot shows the 'Library setups' screen with a table of channel configurations. The table has four columns: '#', 'name', 'freq.', and 'standard'. The rows are numbered 42 to 49, each representing an 'Autoset' channel. The frequency and standard are listed for each channel. The top right corner shows 'VDC=13.0V' and 'IDC= 0mA'. There are navigation icons for home, edit, and delete on the right side.

#	name	freq.	standard
42	T0 Autoset	10728 VL	DVB-S2 22000
43	T1 Autoset	10757 VL	DVB-S 22000
44	T2 Autoset	10787 VL	DVB-S 22000
45	T3 Autoset	10816 VL	DVB-S2 22000
46	T4 Autoset	10847 VL	DVB-S 22000
47	T5 Autoset	10876 VL	DVB-S 22000
48	T6 Autoset	10905 VL	DVB-S2 22000
49	T7 Autoset	10935 VL	DVB-S2 22000

8.6 Measures.

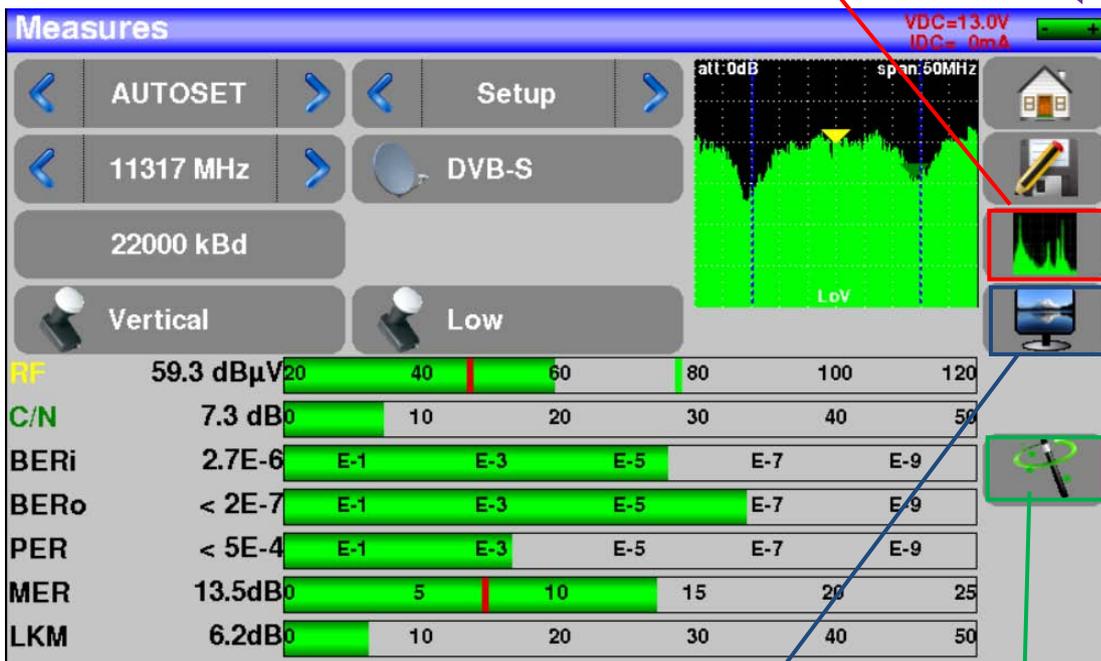
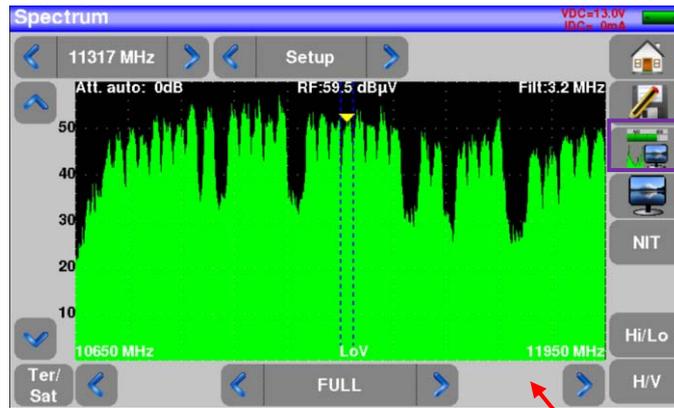
To enter this mode the user has to tap the key  Measures in the main menu.



On this screen the user can perform measurements:

- Entering the signal parameters manually.
- Using a program/configuration of the current selected list.
- Using the "autolock" function if the user does not know the parameters of the input signal.

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Autolock function. Option if the user does not know the parameters of the input signal.

As you can see, from this screen in addition to getting the measurements for a frequency, we can access TV mode or full spectrum mode.

Warning: You can switch from terrestrial, to cable or to satellite:

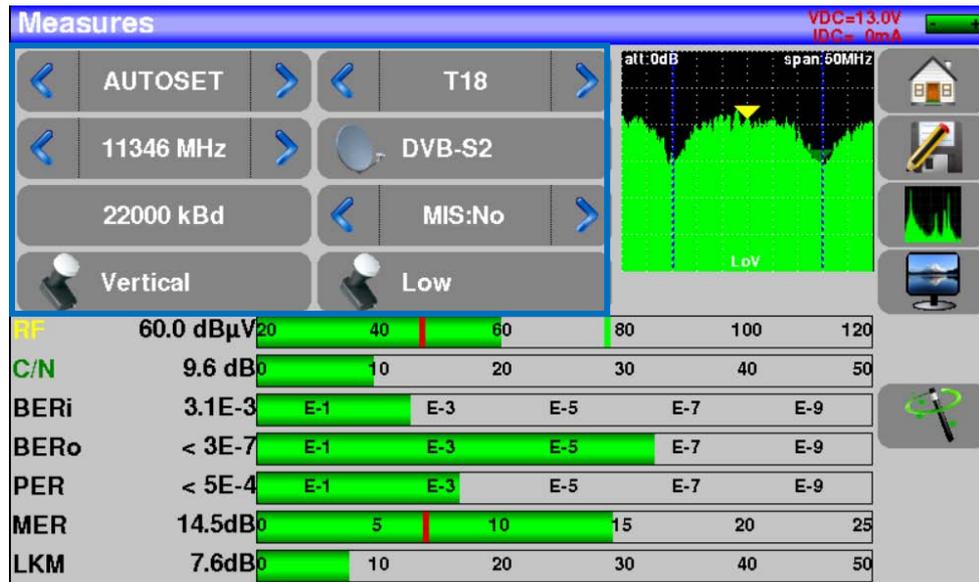
- Changing the frequency.

- Changing the standard.
- Changing the setup (from terrestrial to satellite setup).

8.6.1 Parameters modification.

Depending on whether we are working in satellite mode, terrestrial the parameters shown will be different.

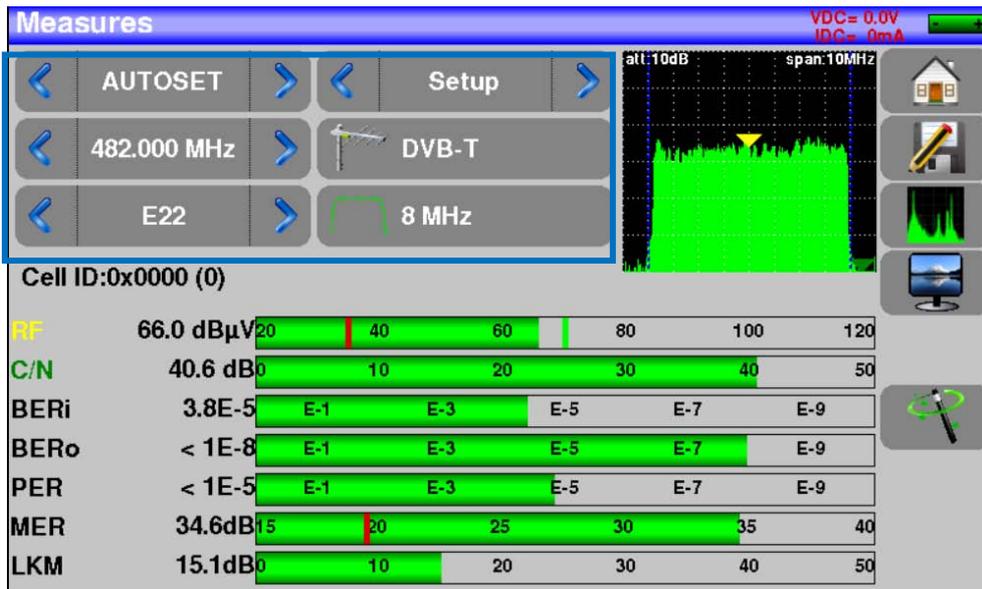
8.6.1.1 Satellite.



The parameters that the user can modify on this screen are as follows:

- The name of the configuration chosen for the measurement. In this case "Program" corresponding to the current list "AUTOSET".
- The Frequency. In this case 11346 MHz.
- The standard. DVB-S2 in this case.
- The Symbol Rate. In this case 22000 kBd.
- Polarization. Vertical in this case.
- The band. Low band in this case.
- Multistream active. Not active in this case.

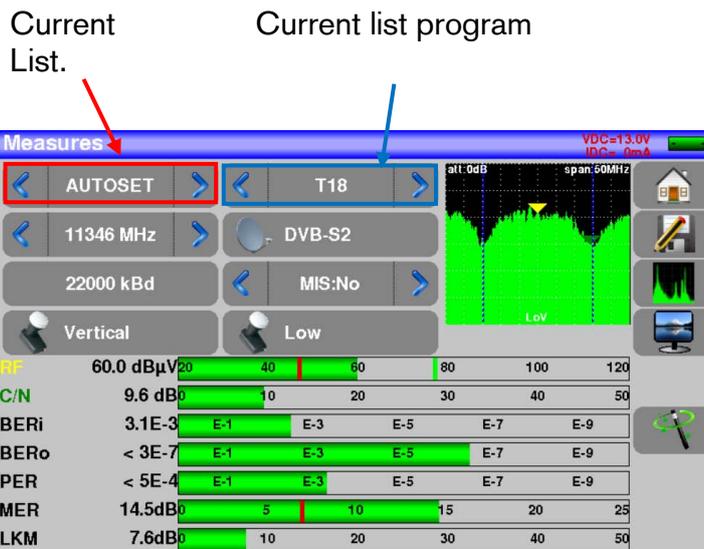
8.6.1.2 Terrestrial.



The parameters that the user can modify on this screen are as follows:

- The name of the configuration chosen for the measurement. In this case "Program" corresponding to the current list "AUTOSET".
- The Frequency. In this case 482,000 MHz.
- The standard. DVB-T in this case.
- Bandwidth. 8 MHz in this case.
- The channel. E22 in this case.

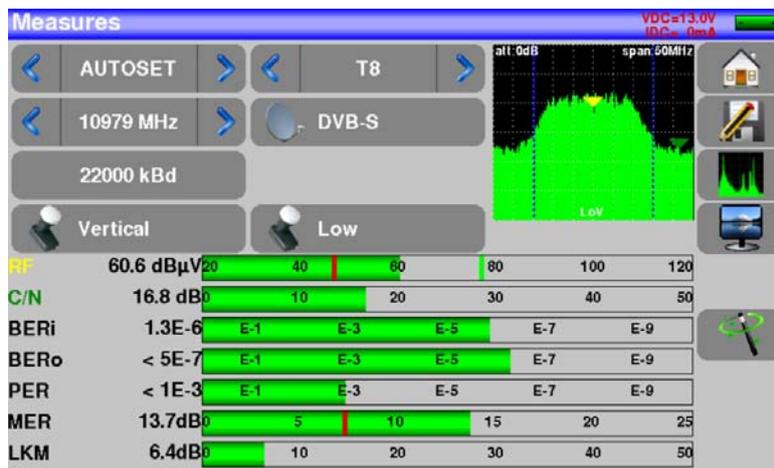
8.6.2 Measurement list use.



If the user clicks on the program selection, a table will open with all existing programs in the current list. Shown in the image below.



You can select the desired program from that list. Once the user has chosen the program they want all the parameters will be displayed on the screen. They have been recovered from automatically. In this case, the parameters corresponding to program "T8" have been loaded from the list "ASTRA 19.2"



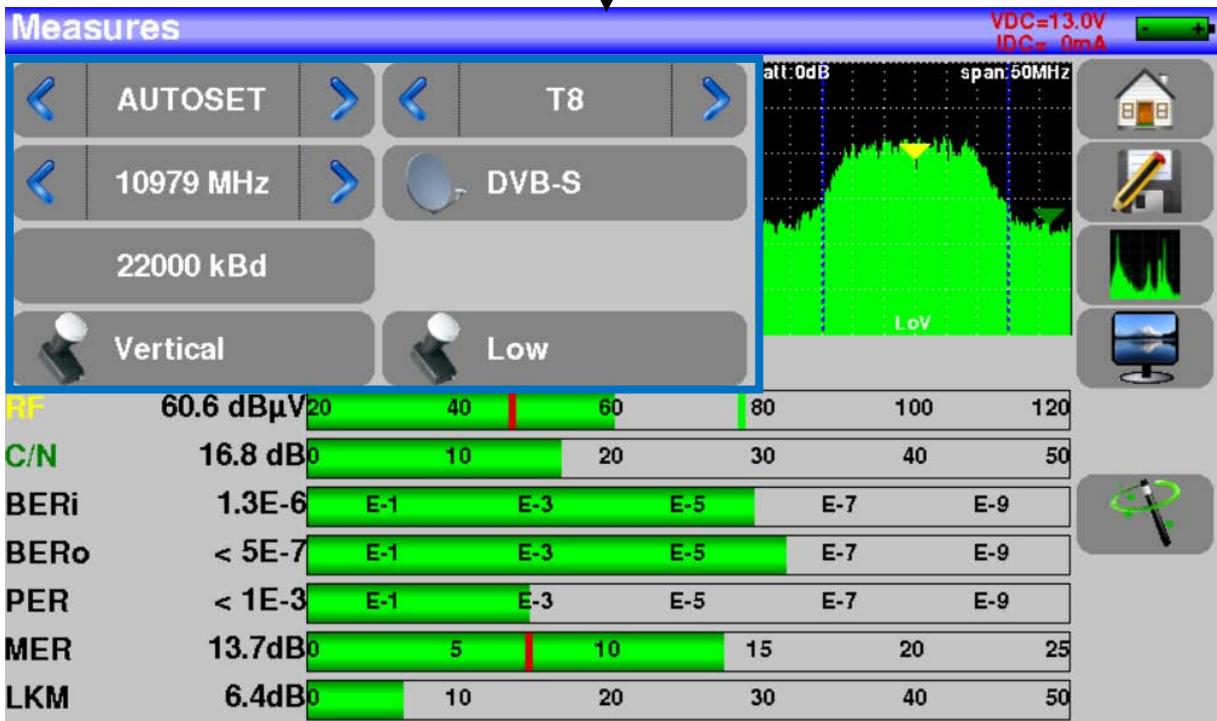
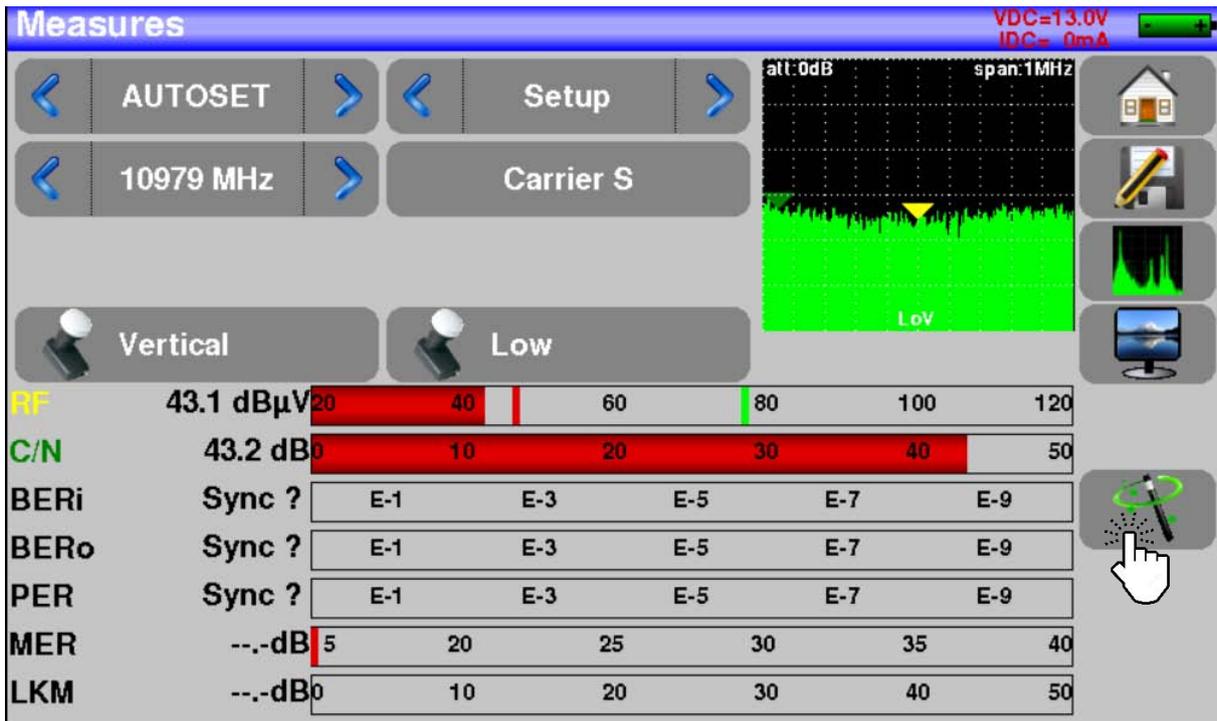
8.6.3 Autolock.

This functionality is designed to tune a digital signal, whether terrestrial, satellite or cable.

The user only has to enter the frequency or channel, and then press the "autolock" . The equipment will automatically find in a short time interval the digital standard, the type of modulation and the rest of the parameters associated with the type of digital standard detected. Very useful, in case the user does not know all the parameters of the input signal.

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An example of satellite:



The equipment within a few seconds of pressing "autolock" has found the digital standard, and the rest of the correct parameters for the chosen frequency.

8.6.4 Level measurements.

The user can measure the levels of the signal received for each of the different digital standards.

Warning: Signal levels must be in these ranges for good reception.

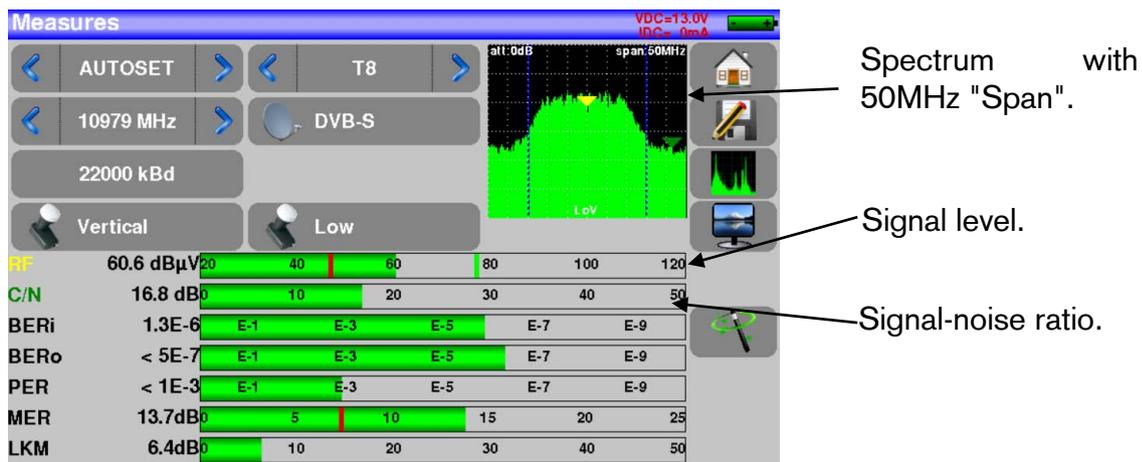
Terrestrial band:

- Between 40 and 70 dB μ V in the case of FM signal.
- Between 47 and 70 dB μ V in the case of DVB-T/DVB-H, DVB-T2.
- Between 45 and 70 dB μ V in the case of DVB-C 64QAM.
- Between 57 and 80 dB μ V for the rest of the cases.

Satellite band:

- Between 47 and 77 dB μ V.

Example of satellite signal:



The equipment can perform different measurements depending on the standard:

- Average measurement.
- Peak measurement.
- Power measurement.

Take a look to the tables below for more information.

8.6.4.1 Satellite band.

The following table summarizes the type of measurement performed and the frequencies of the audio carrier in each standard.

STANDARD	CARRIER	MEASUREMENT
PAL	FM	PEAK
SECAM	FM	PEAK
NTSC	FM	PEAK
DVB-S	DIGITAL	POWER
DSS	DIGITAL	POWER
DVB-S2	DIGITAL	POWER

8.6.4.2 Terrestrial band.

The following table summarizes the type of measurement performed and the frequencies of the audio carrier in each standard.

STANDARD	CARRIER	MEASUREMENT	AUDIO CARRIER		
			MONO	STEREO	NICAM
BG	AM, negative	PEAK	FM 5.5MHz	FM 5.74MHz	DQPSK 5.85MHz
DK	AM, negative	PEAK	FM 6.5MHz	FM 6.258MHz	DQPSK 5.85MHz
I	AM, positive	PEAK	FM 6.0MHz		DQPSK 6.552 MHz
L	AM, positive	PEAK	AM 6.5MHz		DQPSK 5.85MHz
MN	Am, negative	PEAK	FM 4.5MHz	FM 4.72MHz	
DVB-C	DIGITAL	POWER			
DVB-T/H	DIGITAL	POWER			
DVB-T2	DIGITAL	POWER			
DAB/DAB+	DIGITAL	POWER			
FM	FM	AVERAGE			
CARRIER	WITHOUT MODULATION	AVERAGE			

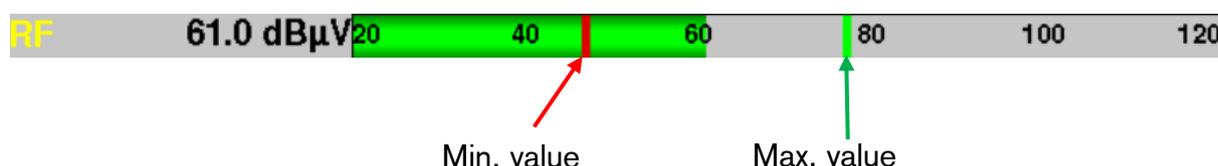
The equipment shows the level of the video carrier and the C/N ratio.

8.6.4.3 Thresholds.

Predefined thresholds are used to know if the signal has an optimal measurement value.

STANDARD	MIN.	MAX.
Analog terrestrial TV	57 dB μ V	74 dB μ V
DVB-C/DVB-C2	57 dB μ V	74 dB μ V
DVB-T/DVB-T2	47 dB μ V	70 dB μ V
DAB-DAB+	30 dB μ V	70 dB μ V
FM, Carrier	50 dB μ V	66 dB μ V
Analog satellite TV	47 dB μ V	77 dB μ V
DVB-S / DSS	47 dB μ V	77 dB μ V
DVB-S2	47 dB μ V	77 dB μ V

Example for RF measurement of a DVB-S signal. The measured signal level is between the minimum value and the maximum.



8.6.5 Digital measurements.

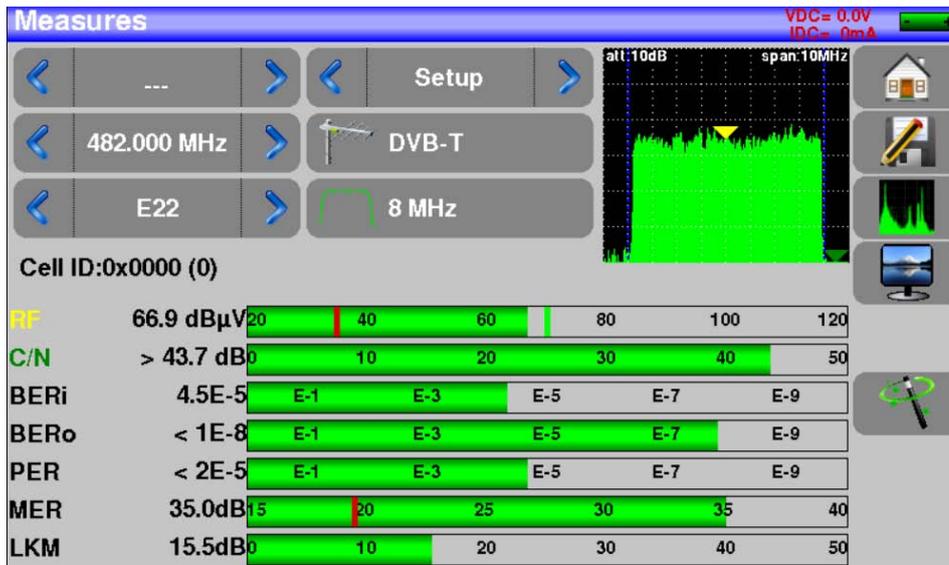
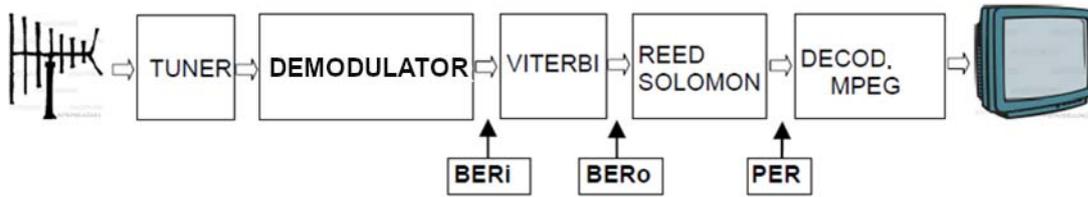
The meter, in digital measurements (DVB-T/T2/T2Lite, DVB-C/C2, DVB-S/S2 or DSS), in addition to the RF level of the signal and the C/N ratio also shows the values of BER (Bit Error Rate), PER (Packet Error Rate), and MER (Modulation Error Rate).

LKM (Link Margin) is also displayed. This value, shown in dB, is the difference between the measured MER value and the MER limit before the image disconnects. It is a quality parameter of a signal. It tells us how much the signal can get worse before we stop viewing the channel.

Warning:

- When "Sync?" is displayed on the screen it means that there is no signal present or that the device has not been able to tune/lock the signal. If this happens we should check the modulation parameters, if the antenna is powered, and the parameters of the LNB and DiSEqC in case you are working in the satellite band.

8.6.5.1 DVB-T



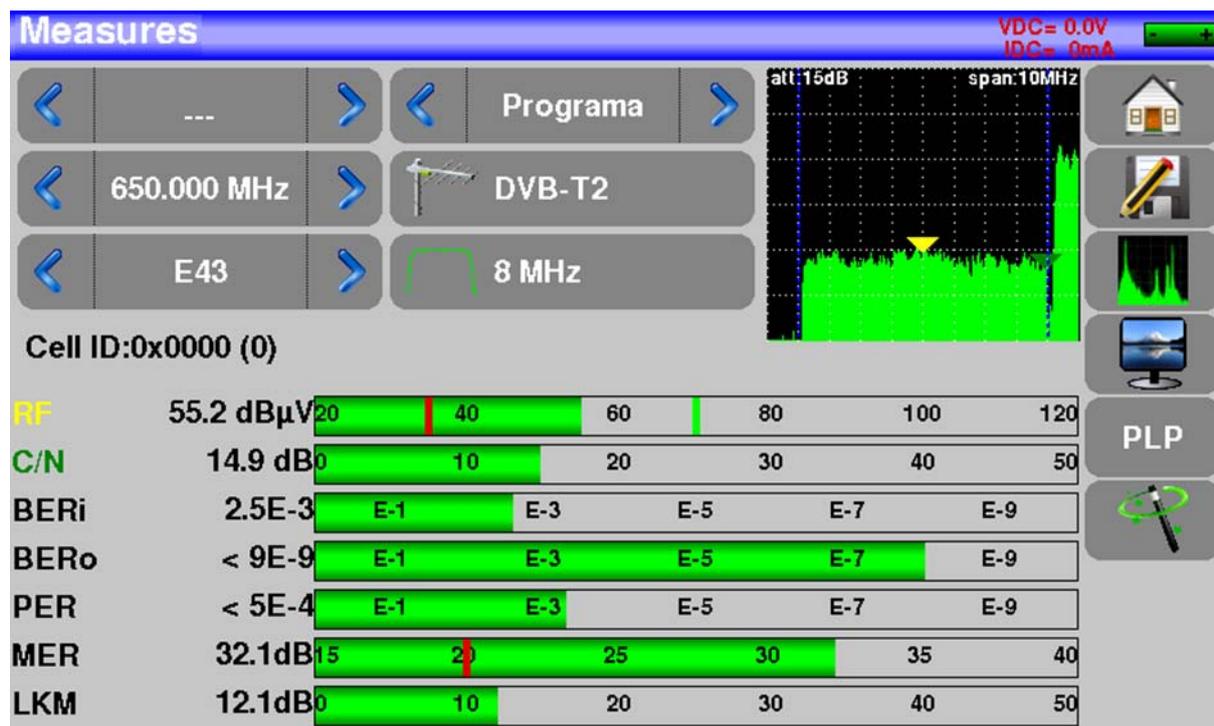
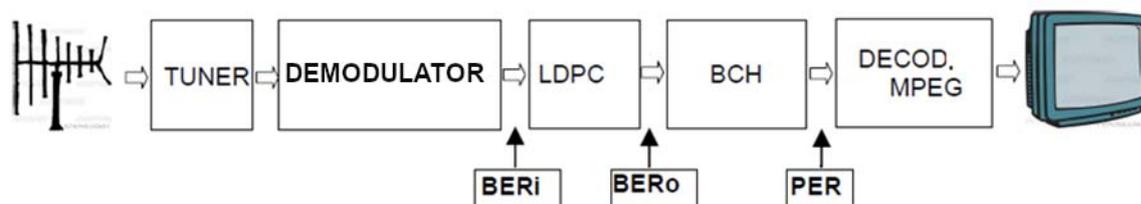
The measures shown are as follows:

- BERi: Error rate before applying Viterbi.
- BERo: Error rate after applying Viterbi.
- PER: Error rate after applying REED SOLOMON. Packet error rate.
- MER: Modulation error rate.
- LKM: Noise margin. Link margin.

Remark:

- BERx: wrong bitrate. Number of wrong bits / number of bits transmitted.
- PER: erroneous packet rate. Number of wrong packets / number of packets transmitted.
- Remember that in DVB-T/H a packet is composed of 204 bytes. A packet is "wrong" if it includes more than 8 incorrect bytes.

8.6.5.2 DVB-T2/T2 Lite.

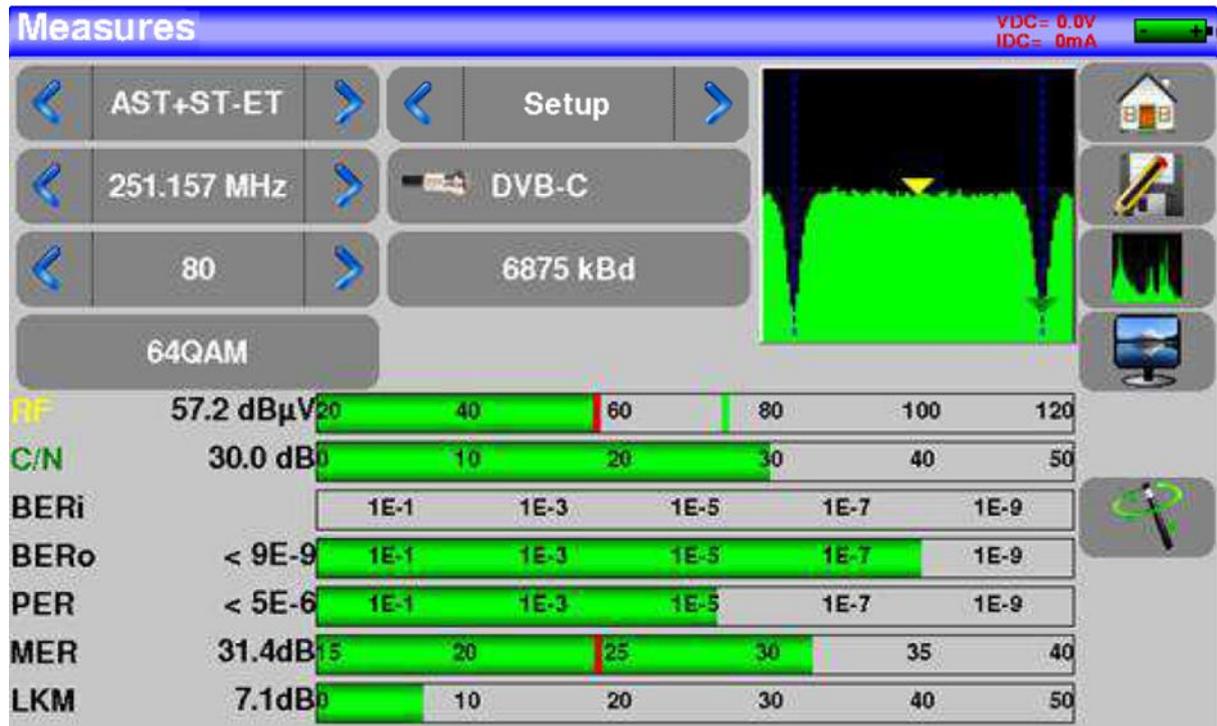
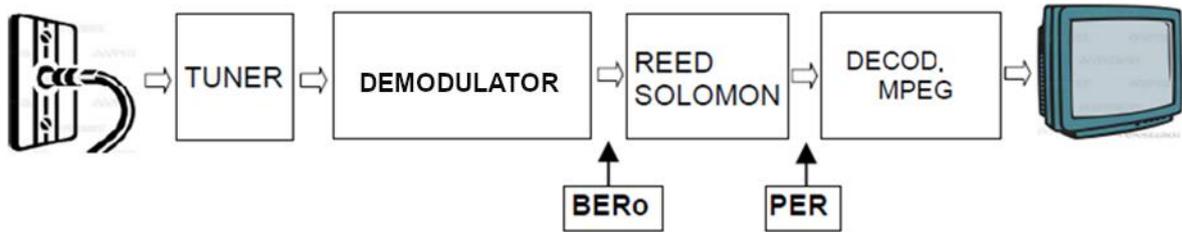


The measures shown are as follows:

- BERi: Error rate before applying LDPC(Low Density Parity Check).
- BERo: Error rate after applying LDPC(Low Density Parity Check).
- PER: Error rate after applying BCH (Bose Chauhuri Houqueno hem). Lost packets.
- MER: Modulation error rate.
- LKM: Noise margin. Link margin.

The Viterbi+Reed Solomon correction used in DVB-T/H has been replaced by LDPC+BCH in DVBT2.

8.6.5.3 DVB-C.



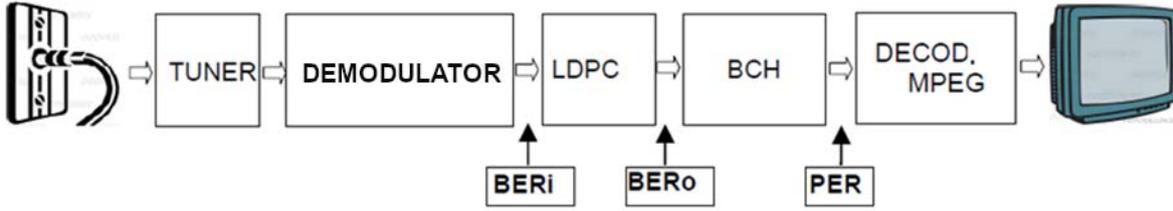
The measures shown are as follows:

- BERo: Error rate before applying REED SOLOMON.
- PER: Error rate after applying REED SOLOMON. Packet error rate.
- MER: Modulation error rate.
- LKM: Noise margin.

To be taken into account:

- BERx: Wrong bitrate. Number of wrong bits / number of bits transmitted.
- PER: erroneous packet rate. Number of wrong packets / number of packets transmitted.
- Remember that in DVB-C a packet is composed of 204 bytes. A packet is "wrong" if it includes more than 8 incorrect bytes.

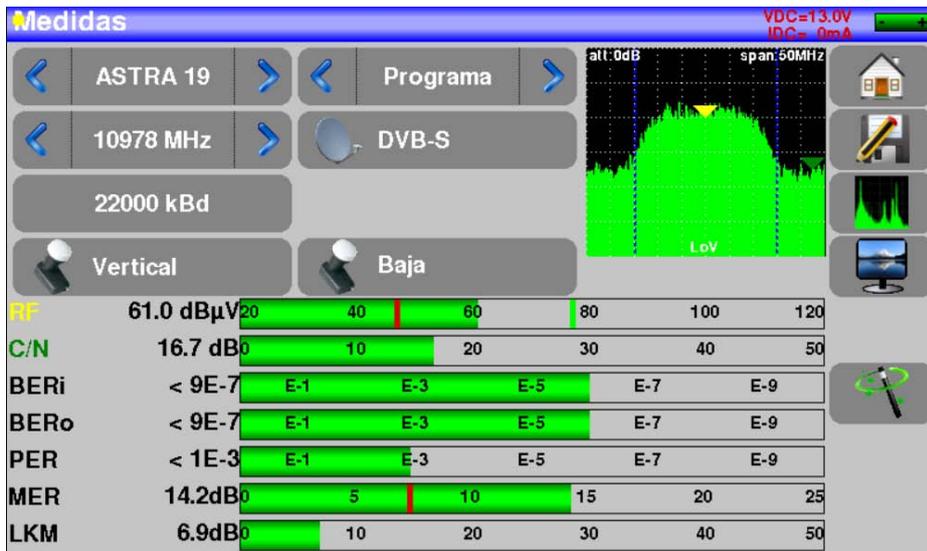
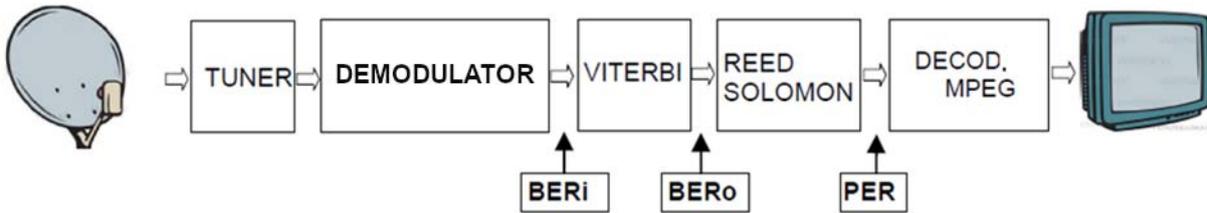
8.6.5.4 DVB-C2.



The measures shown are as follows:

- BERi: Error rate before applying LDPC(Low Density Parity Check).
- BERo: Error rate after applying LDPC(Low Density Parity Check).
- PER: Error rate after applying BCH (Bose Chauhuri Houquenohe). Lost packages.
- MER: Modulation error rate.
- LKM: Noise margin.

8.6.5.5 DVB-S /DSS.



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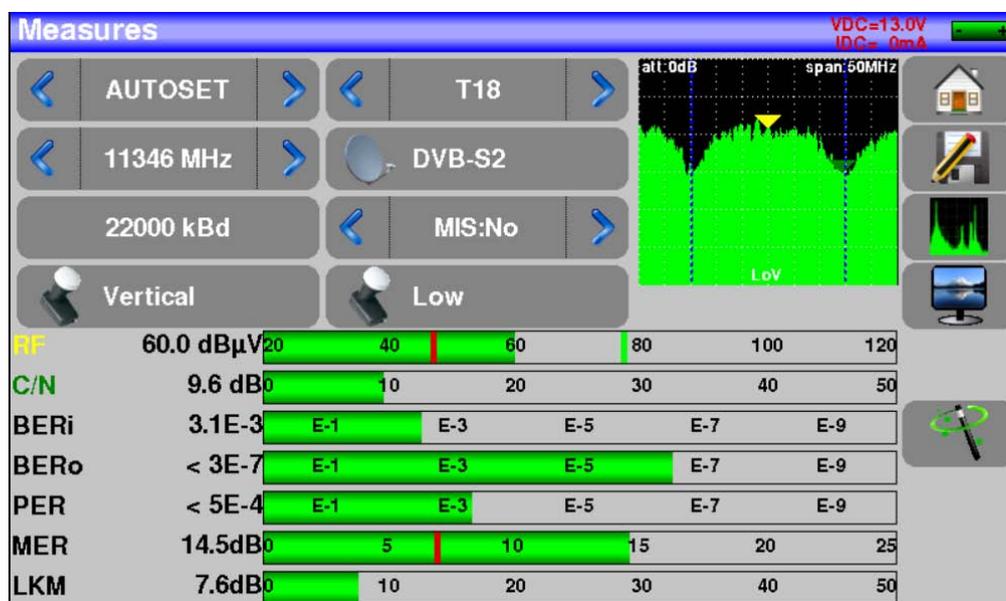
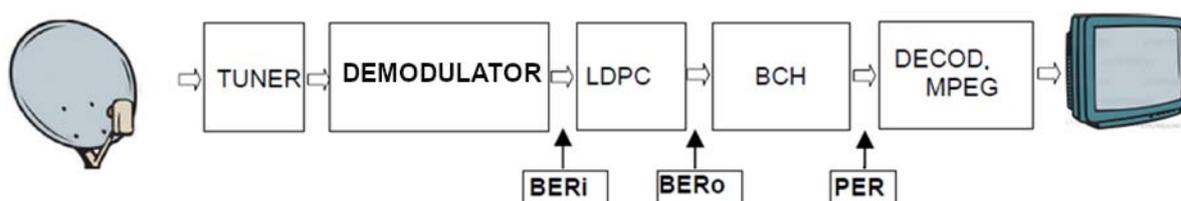
The measures shown are as follows:

- BERi: Error rate before Viterbi.
- BERo: Error rate after Viterbi.
- PER: Error rate after REED SOLOMON. Packet error rate.
- MER: Modulation error rate.
- LKM: Noise margin.

To be taken into account:

- BERx: bit error rate. Number of wrong bits / number of bits transmitted.
- PER: packet error rate. Number of wrong packets / number of packets transmitted.
- Let's remember that in DVB-S a packet is composed of 204 bytes. A packet is "wrong" if it includes more than 8 incorrect bytes. In DSS a packet is composed of 146 bytes.

8.6.5.6 DVB-S2.



The measures shown are as follows:

- BERi: Error rate before applying LDPC(Low Density Parity Check).
- BERo: Error rate after applying LDPC(Low Density Parity Check).
- PER: Error rate after applying BCH (Bose Chauhuri Houquenoem). Lost packages.

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- MER: Modulation error rate.
- LKM: Noise Margin.

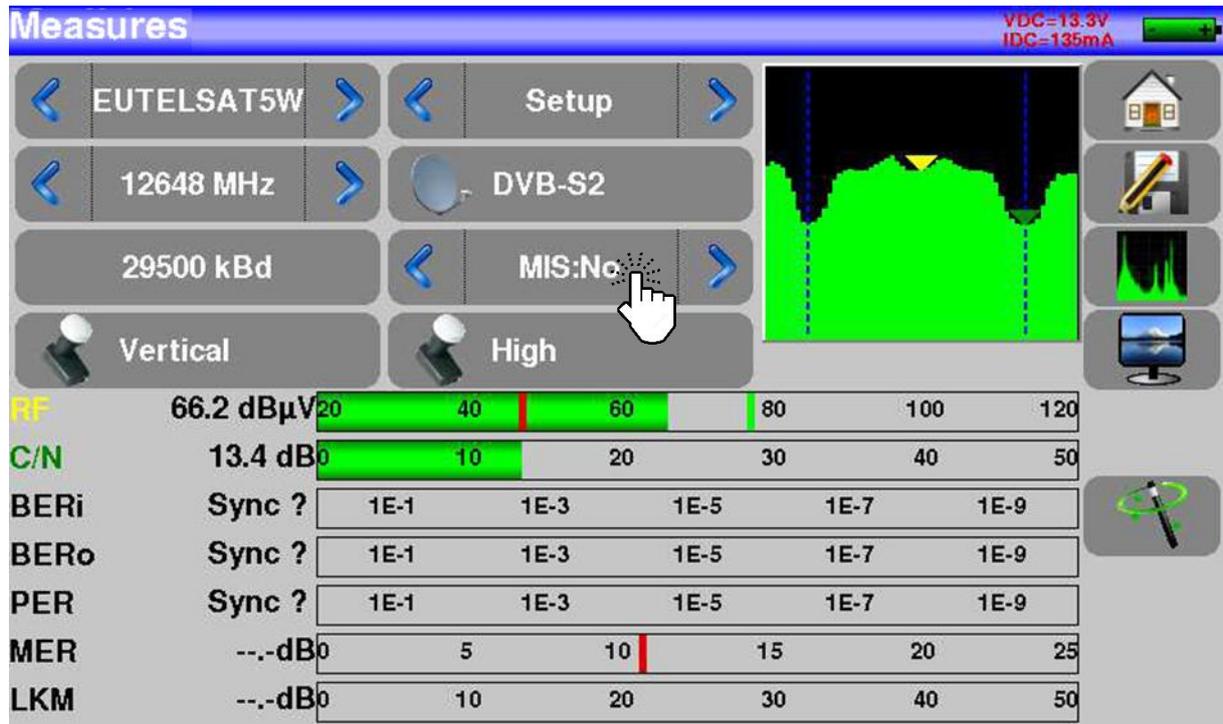
The Viterbi+Reed Solomon correction used in DVB-S has been replaced by LDPC+BCH in DVB-S2.

8.6.5.6.1 Multistream.

The multistream ("MIS") option allows you to display a DVB-S2 signal that uses Multiple Transport Stream technology. Multiplexes are transported on the same transponder simultaneously.

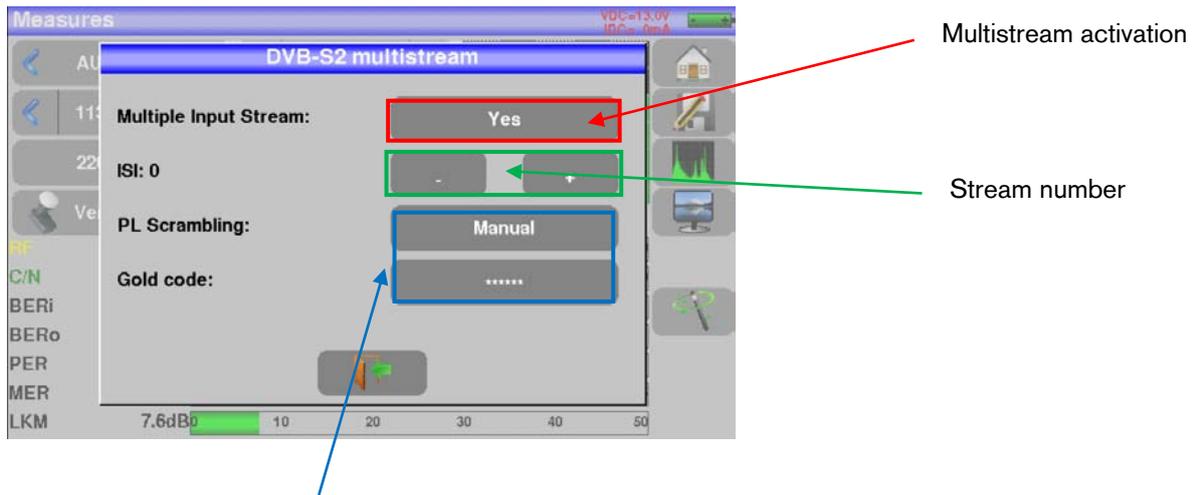
An example is the emission of two TNT multiplexes on the Eutelsat 5 West satellite on the same transponder. Standard DVB-S2, frequency is 12648Mhz, Vertical Polarization, Symbol Rate 29500, ISI: 1 , Gold code: 121212.

To enable multistream functionality, press the "MY" 



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Then the next screen will open:



Stream encryption:

- No: without encryption
- Manual: Enter a cod to decrypt.

Once the multistream parameters are set we will get the result:



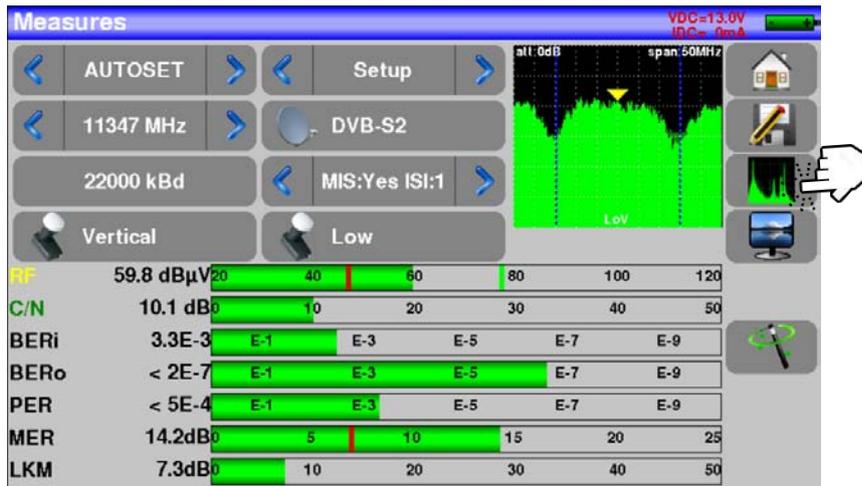
8.6.6 Spectrum analyzer.

8.6.6.1 General description.

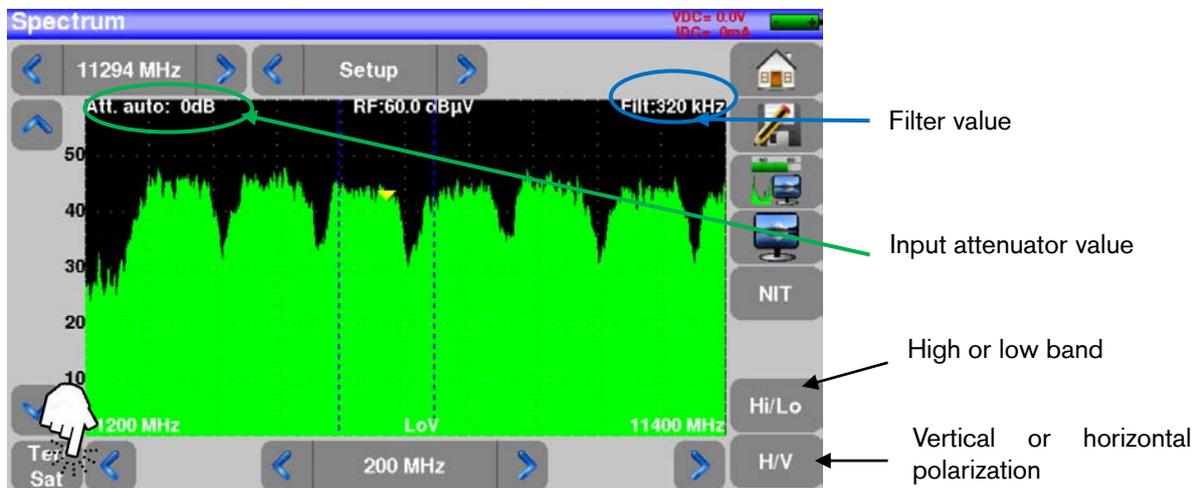
The device has spectrum analyzer functionality. It is a graphical frequency/amplitude representation of the signal present at the meter input.

To access this feature the user has to press the icon  placed inside measures screen.

Satellite mode display:



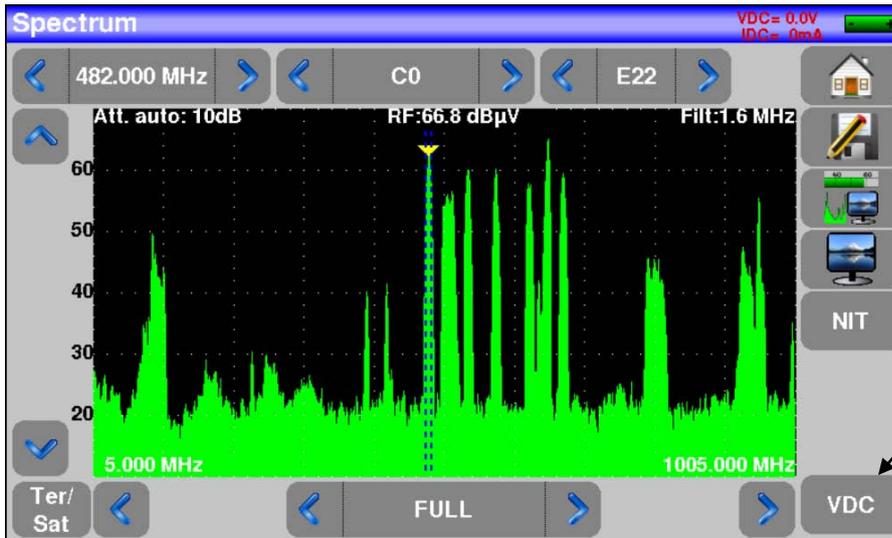
You can switch between terrestrial and satellite mode by simply clicking indicated in the following image:



- The input attenuator is automatically adjusted according to the value of the measured signals. In the example, the input attenuator has been automatically set to a value of 0dB.
- Filters are automatically selected by the equipment depending on the span value chosen.

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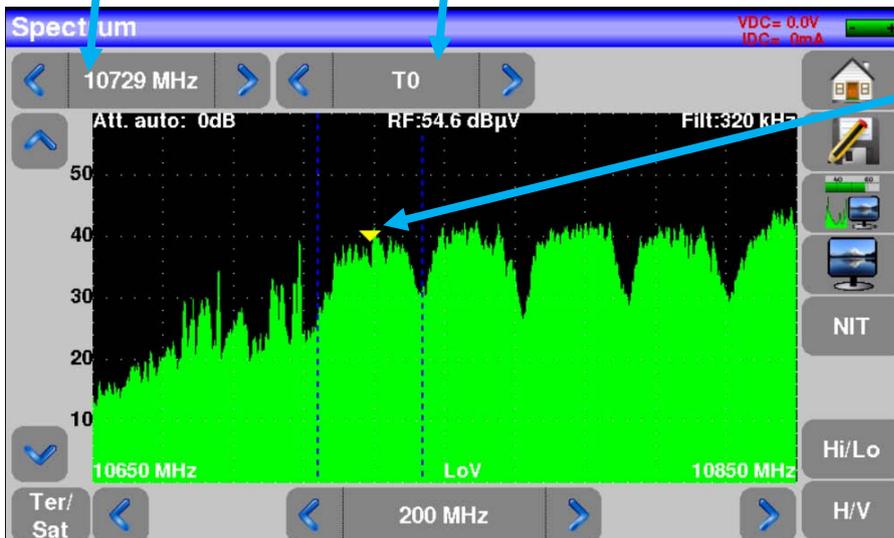
Display in terrestrial mode:



We are going to show and explain the different parameters of the Spectrum screen. The parameters described below are the same in satellite and terrestrial mode:

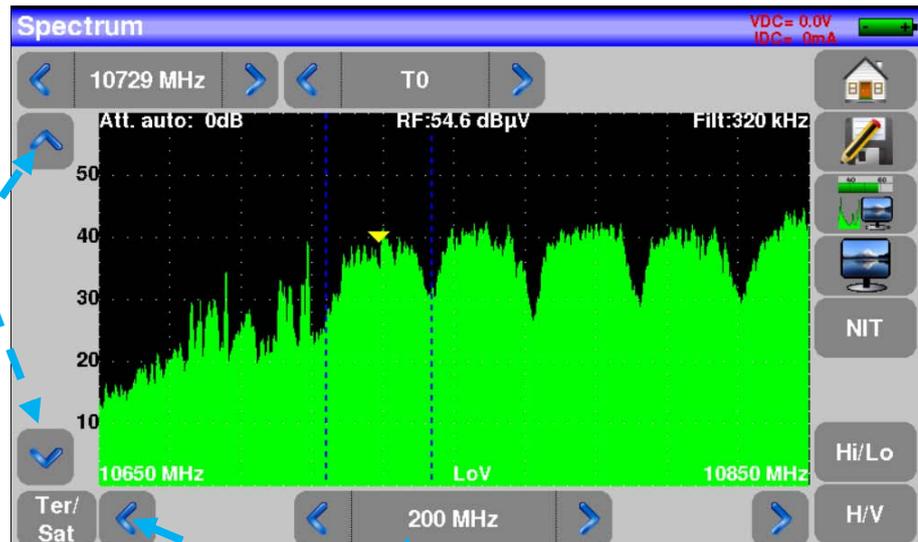
Value of the frequency where the cursor is located

You can select a program from the current list.



Cursor. Just press with your finger where you want to place it

Reference level. It can be modified by clicking on one of both arrows to increase or reduce it

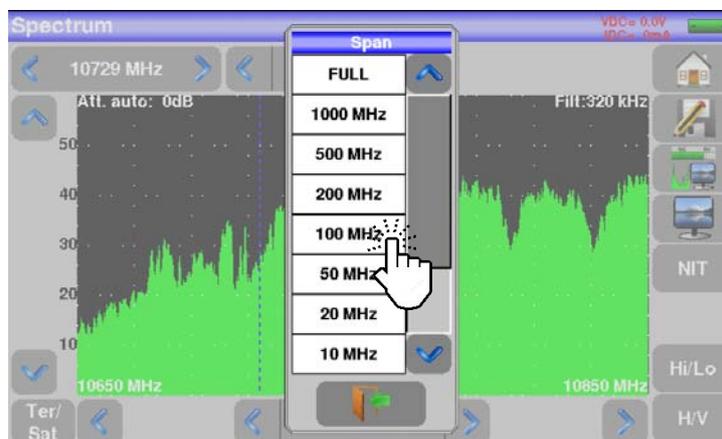


Span. Frequency span around intermediate frequency.

Frequency range. It can be modified by clicking on one of the arrows to set the lower and upper frequency.

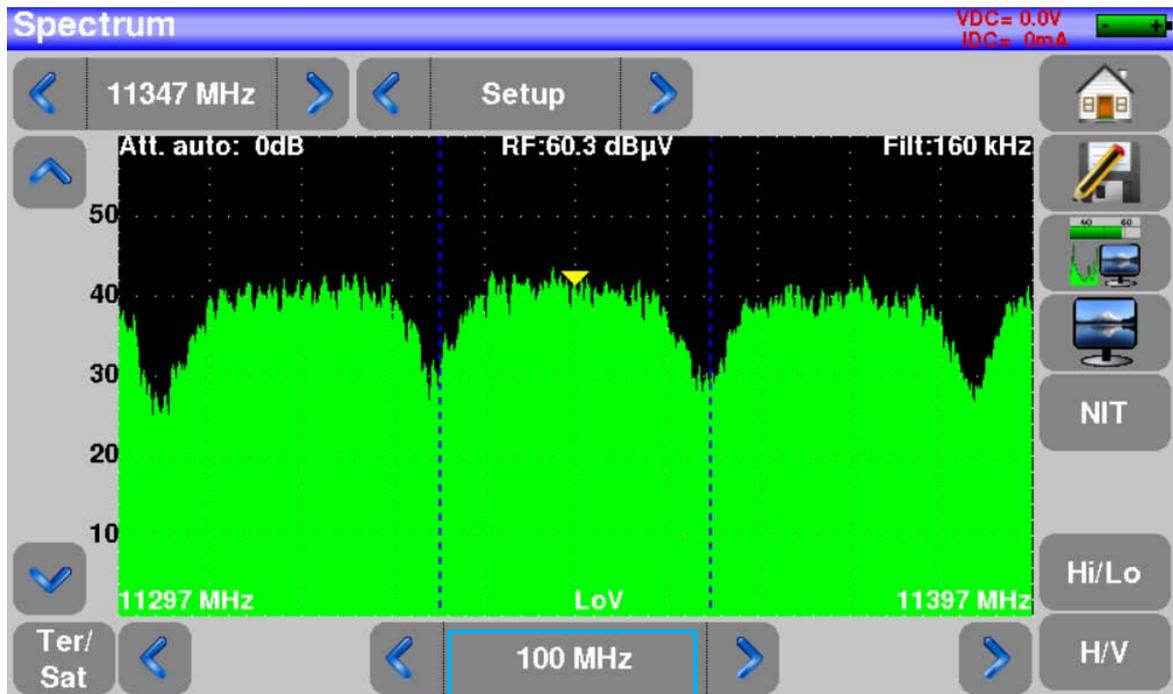
8.6.6.2 Changing Span.

To modify the "Span" just press one of the arrows on the key , or tap on the current "Span" value. A list opens where the user can choose a value between 1MHz and 1000MHz, or full span. Once the list is opened the user will be able to choose the value they want for the "Span".



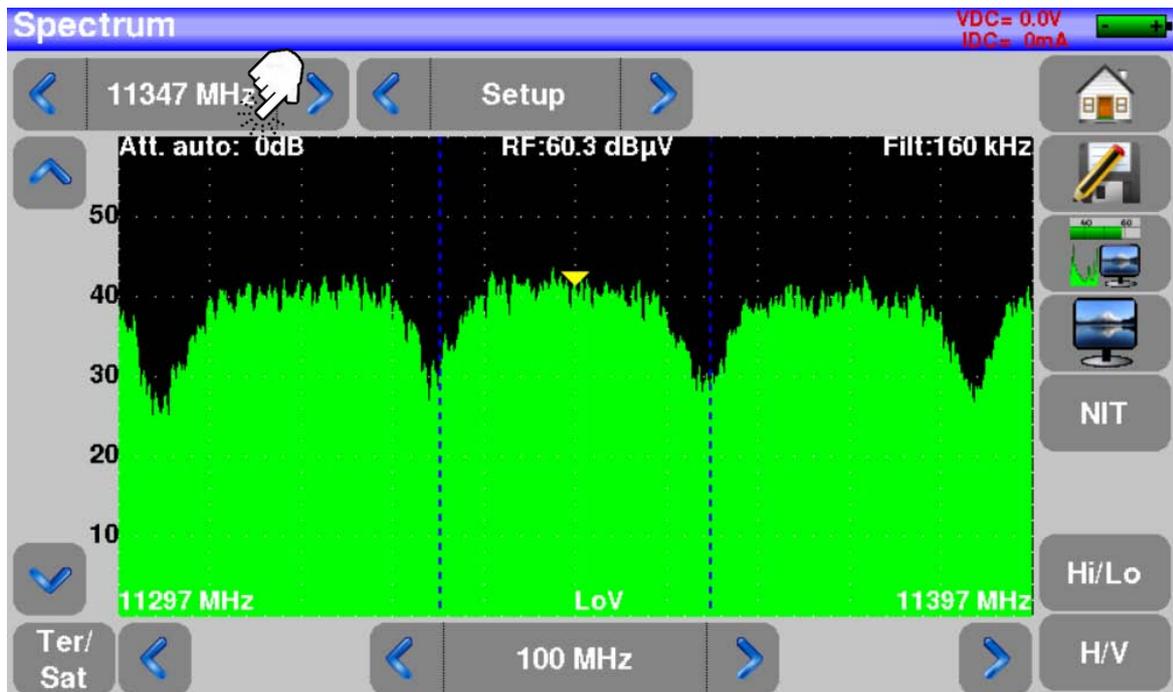
User manual – Enya 72

In the above example we have selected a value for the "Span" of 100 MHz. Once the value is pressed we return to the spectrum screen and see the value already set.



8.6.6.3 Changing frequency value.

The user can vary the frequency value either by using the arrows on the sides that shows the current frequency value or by clicking on the current frequency value. In this case, a virtual keyboard will be displayed so that the new value can be entered.

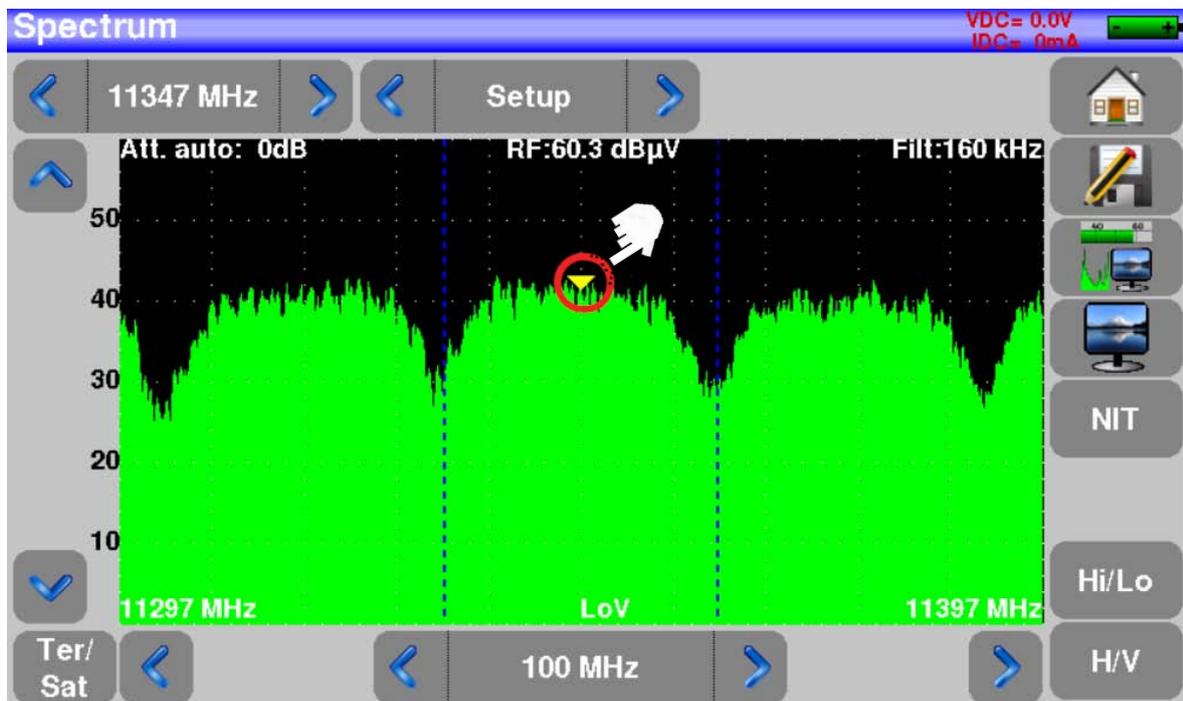


User manual – Enya 72



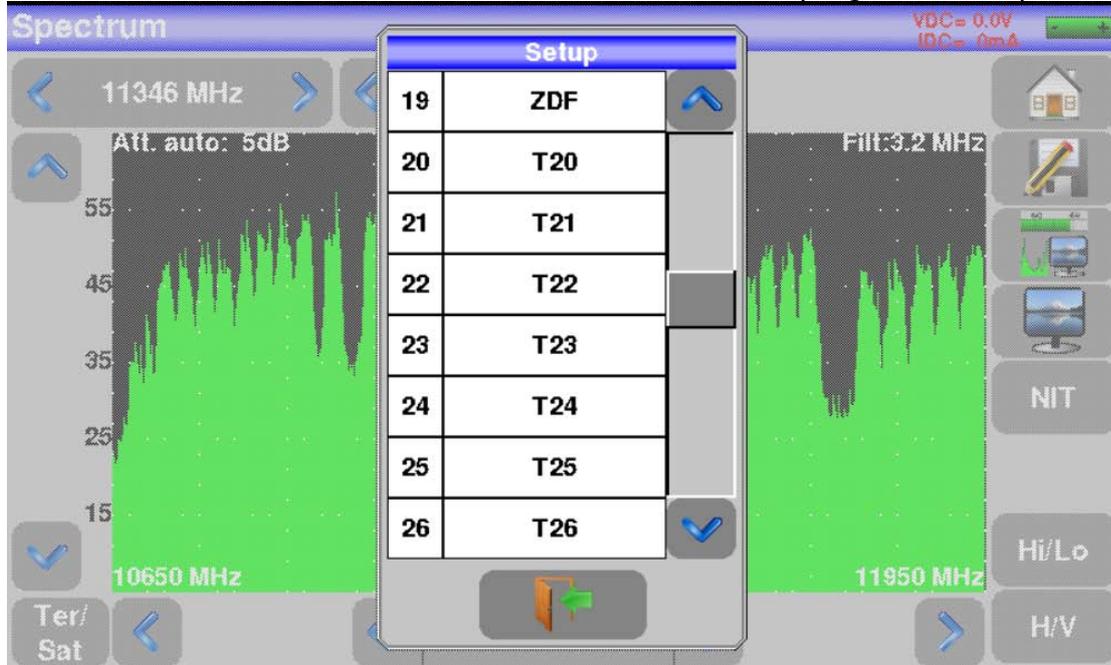
At the end of entering the desired value press the confirmation key. ✓

You can also change the frequency value by directly clicking the desired location on the spectrum. The course will move to the pressed place and the frequency will change to the new value chosen and marked by the yellow cursor.

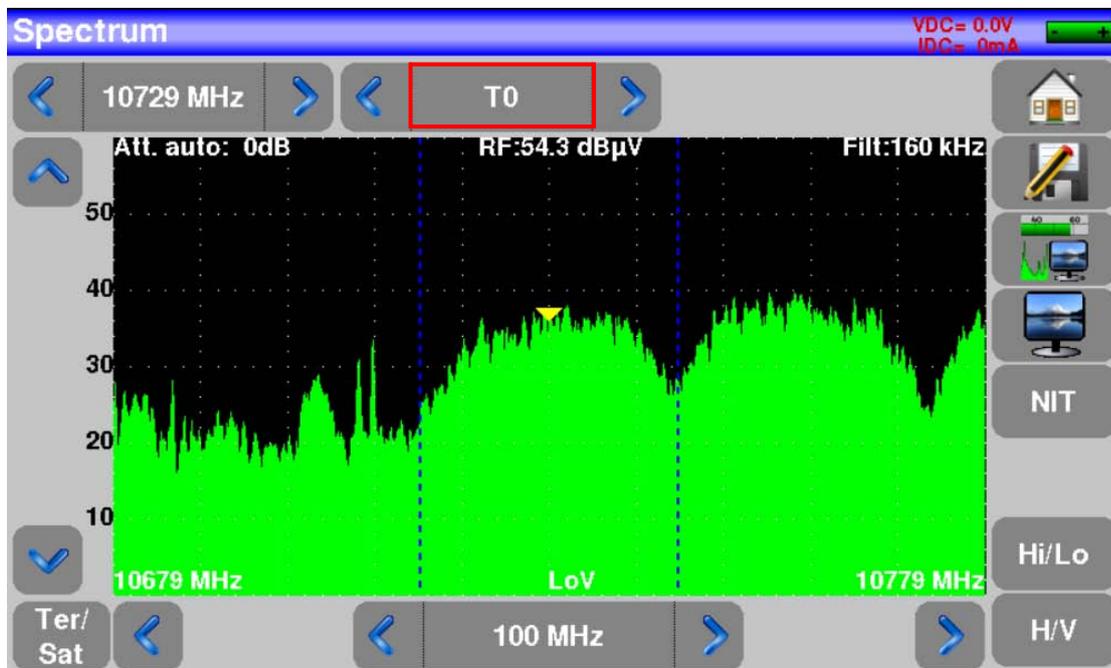


8.6.6.4 Changing the program.

It is also feasible to choose a program from the current list. The team will use the frequency and values of the program and display the resulting spectrum. To do this, you will need to click on the program option key.



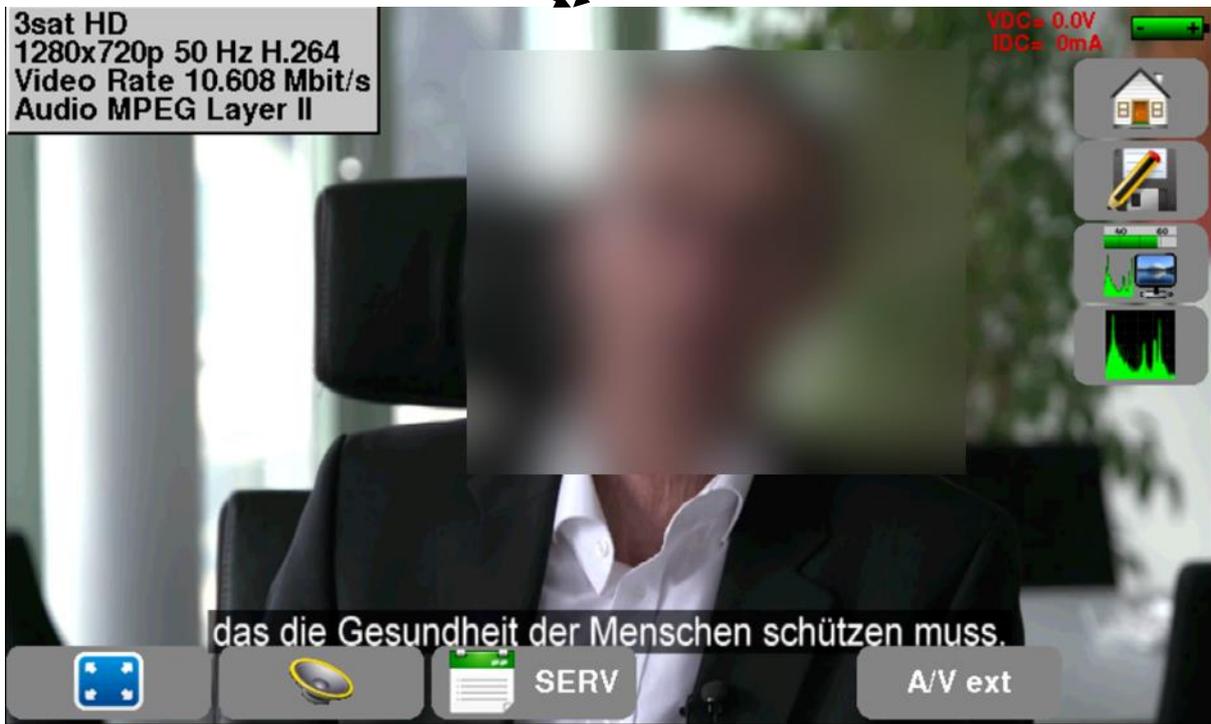
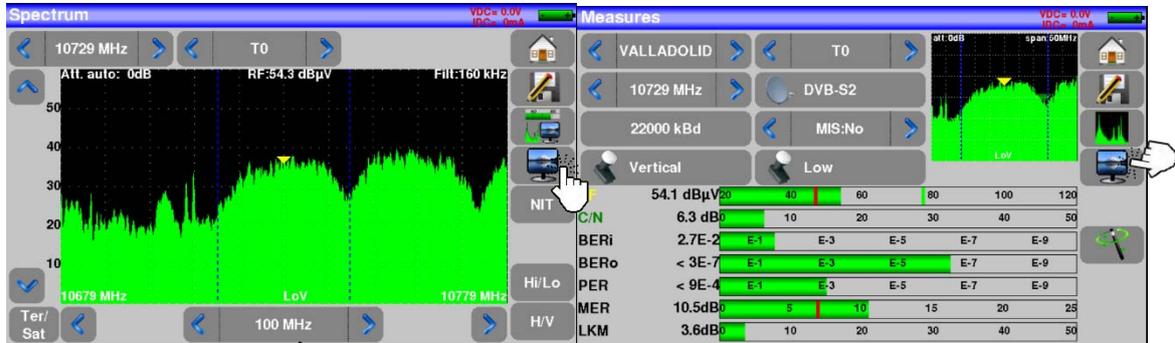
Once the desired program is selected (e.g. T0) we will return to the spectrum screen. The spectrum corresponding to the parameters of the chosen program will be displayed.



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8.6.7 Image and sound.

Pressing the TV icon , either from the "Measurements" screen or from the "Spectre" screen we will access TV mode.



8.6.7.1 Digital television.

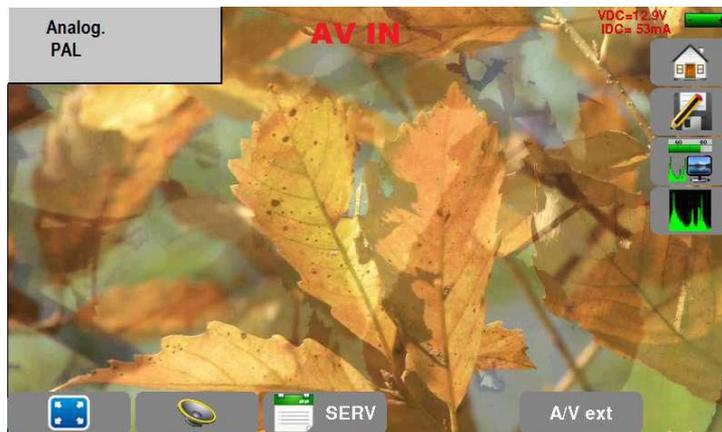
The name of the service and its main features will be displayed in the upper left corner.



- Image resolution. In the example 1280x720p
- Frame frequency. In the example 50 Hz.
- Picture compression. In the example H.264.
- Video rate. In the example 13.520 Mbit/s.
- Audio compression. In the example MPEG Layer II.

8.6.7.2 External analog video.

Tapping the icon **A/V ext** the equipment will switch to the analog video signal that is connected to the meter connector arranged for this purpose.



An analog video signal can be displayed on the meter in PAL, NTSC or SECAM format. This signal can come from a camera, a Set Top Box, ...

8.6.7.3 Audio.

The volume setting of the displayed service can be changed by pressing .

Your device can decode the following digital formats:

MPEG-1 L1/L2

AAC Advanced Audio Coding License Via Licensing

HE-AAC High Efficiency AAC License Via Licensing

Dolby Digital License Dolby®

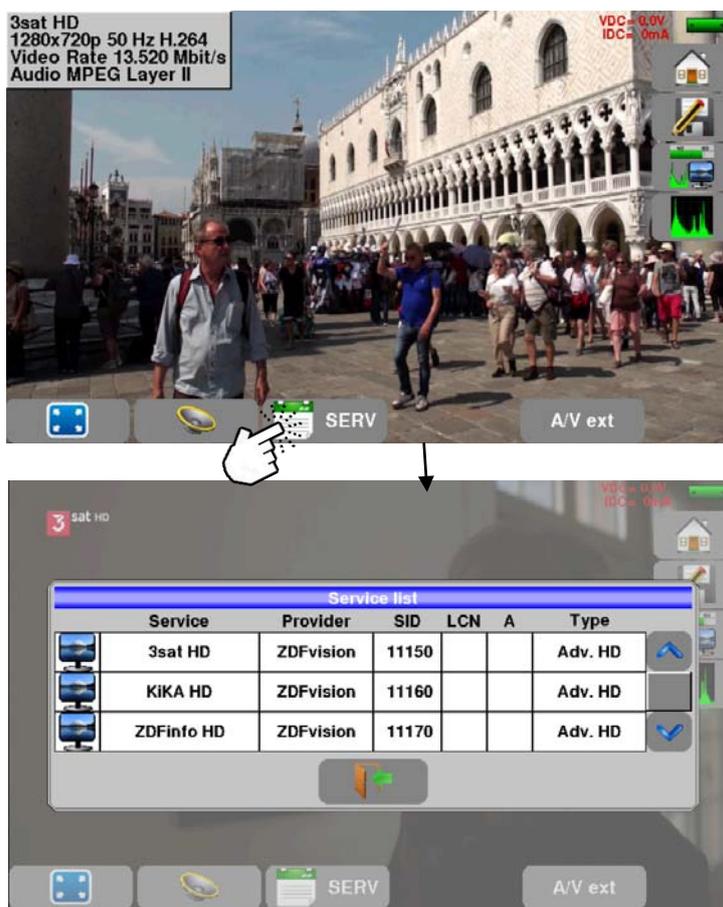
Dolby Digital Plus License Dolby®

Created under license by laboratories Dolby.

Dolby the double-D symbol are trademarks of the Laboratorios Dolby.

8.6.8 Services table.

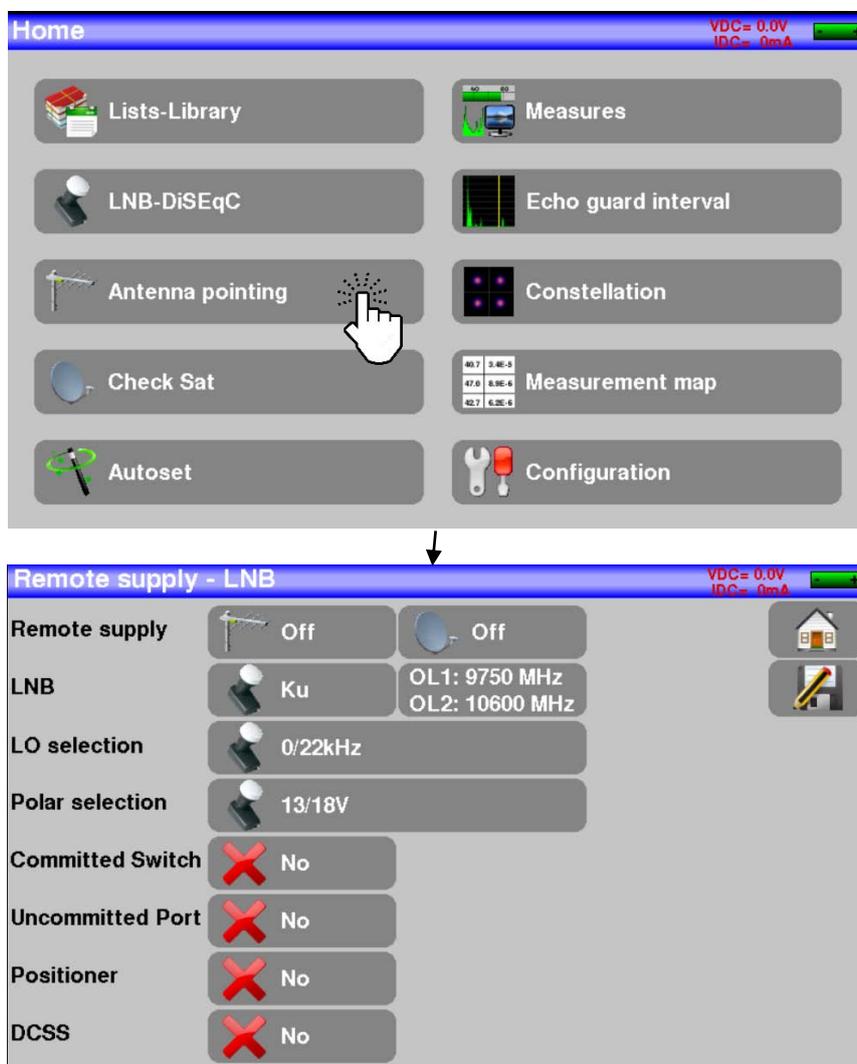
Tapping icon  you will be able to view the list of available services.



By pressing the line corresponding to the service you want, the chosen service will be instantly showed.

8.7 LNB-DiSEqC (remote power supply).

Pressing the key  you will access the RF input settings. You will be able to power preamps, LNB and DiSEqC equipment.



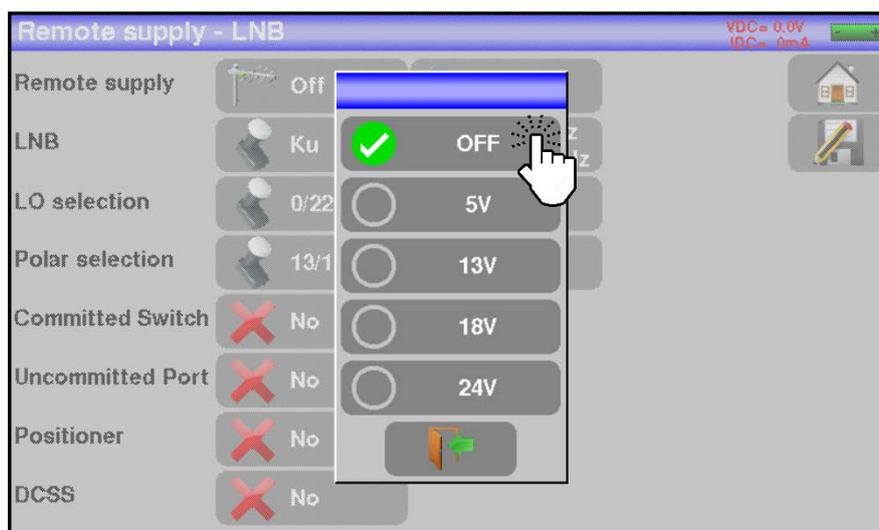
On terrestrial this screen will allow you to power an external amplifier for example, with voltages of 5V,13V,18V or 24V.

On satellite you will be able to power the LNB present in the antenna and configure the DiSEqC values of the installation.

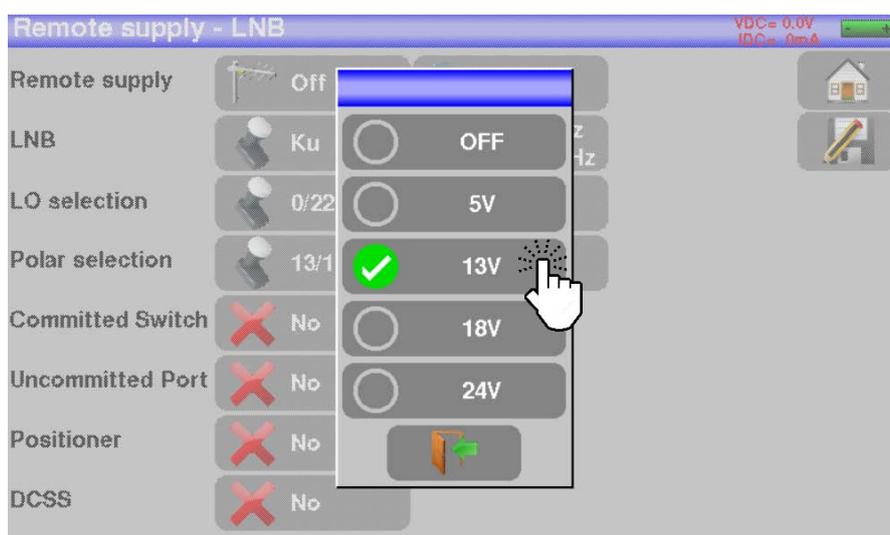
8.7.1 Terrestrial configuration.

For terrestrial, the only useful configuration within this screen is "remote power supply". Allows you to power external devices such as a power amplifier to the antenna cable connected to the equipment.

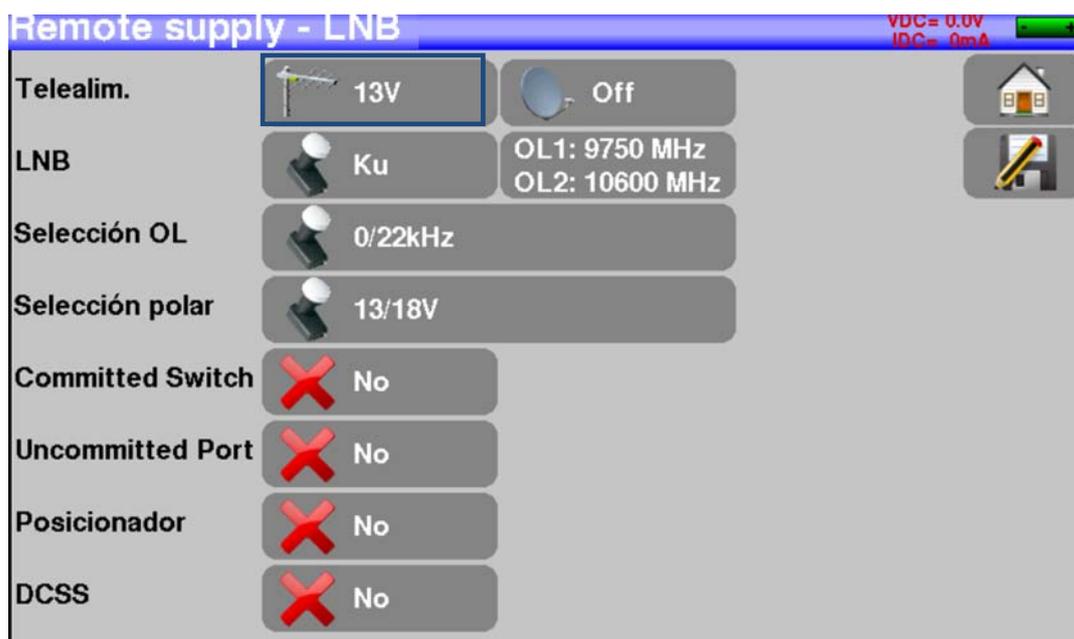
To change the "remote power supply" mode of the terrestrial antenna simply press the icon . The following screen will appear.



In it you can choose between various power values (OFF, 5V, 13V, 18V, or 24V). Simply choose a value, then press the key . The device will start supplying the chosen power via the antenna cable connected to the field meter.



The value provided by the device right now is the value selected on the previous screen.

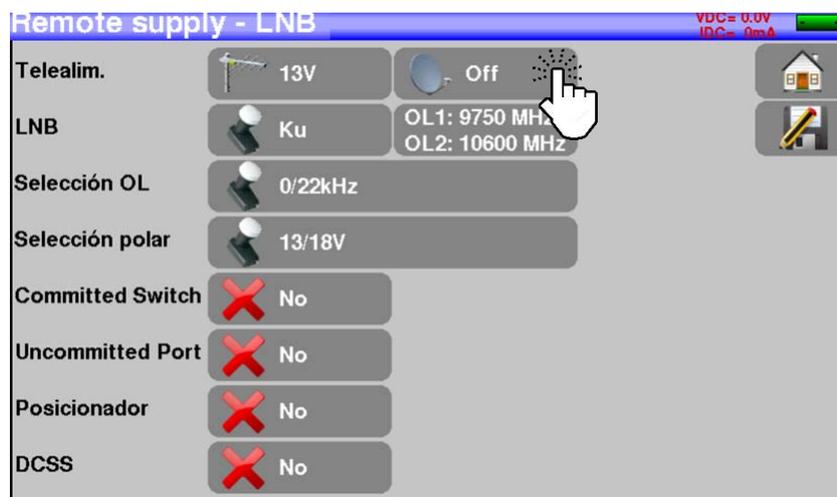


8.7.2 Satellite configuration.

In this screen the user can configure both the power supplied to the LNB present in the antenna, configuration of DiSEqC switches, antenna positioner (motor), or SRC/DCSS equipment such as LNB or SRC/DCSS switches.

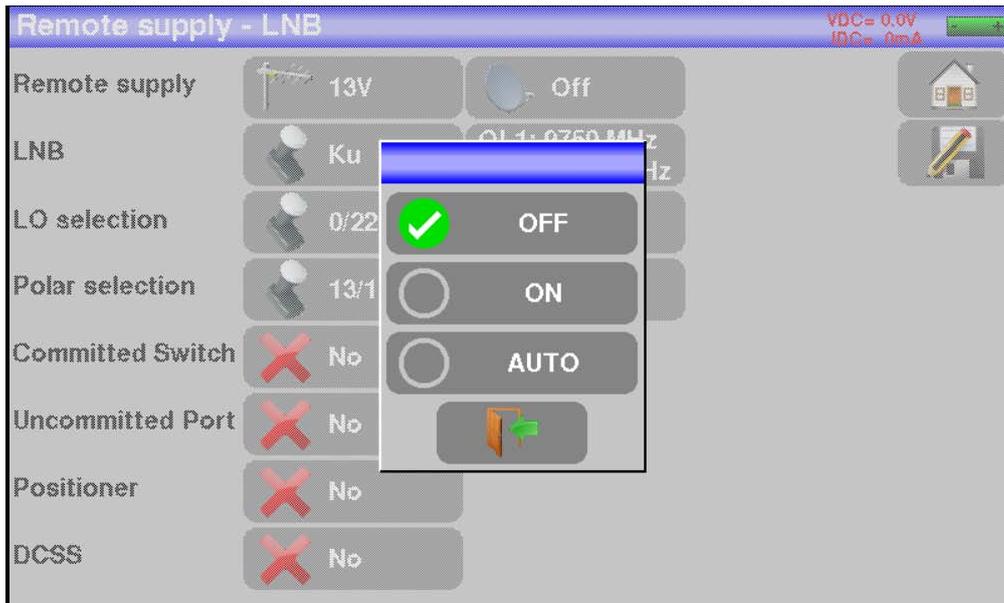
8.7.2.1 Powering the LNB.

To activate the satellite antenna power, simply press the icon .



Once you press the icon the next screen will appear:

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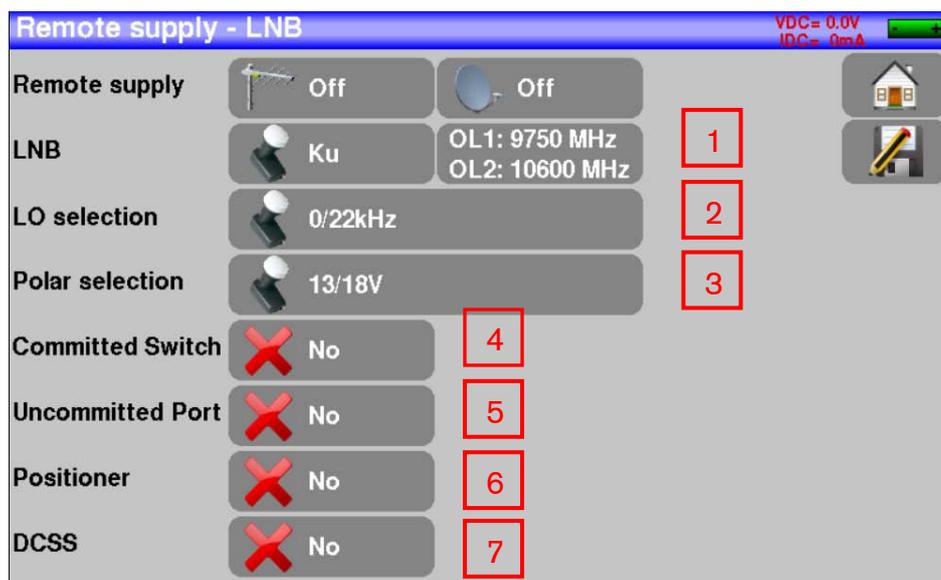


In it the user can choose from 3 options:

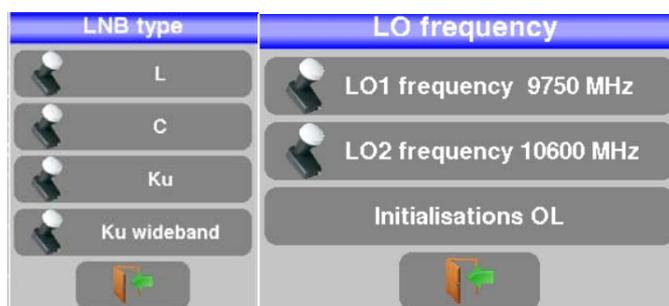
- OFF: Power is off. On the previous screen it appears  showing that "OFF" is selected.
- ON: power is on.
- AUTO: activate the antenna power in satellite measurements mode, even after the equipment is turned off.

To select one or the other option, simply choose it and, once done, press the .

8.7.2.2 Other configurations.



- 1) LNB. Select the LNB type and local oscillators.
 - OL1 Oscillator for Low Band.
 - OL2 oscillator for high band.



- 2) OL selection. LNB band switching. (22KHz, Tone Burst o DiSEqC).



3) Polarization.



4) Committed Switch. Switch committed and position.



5) Uncommitted Port. Uncommitted switch and position. In the case of choosing DiSEqC you will also have to set a position from 1 to 16.



6) Positioner. Here it is established whether a motorized antenna exists in the installation or not. In the event of a motorized antenna we will establish the position.

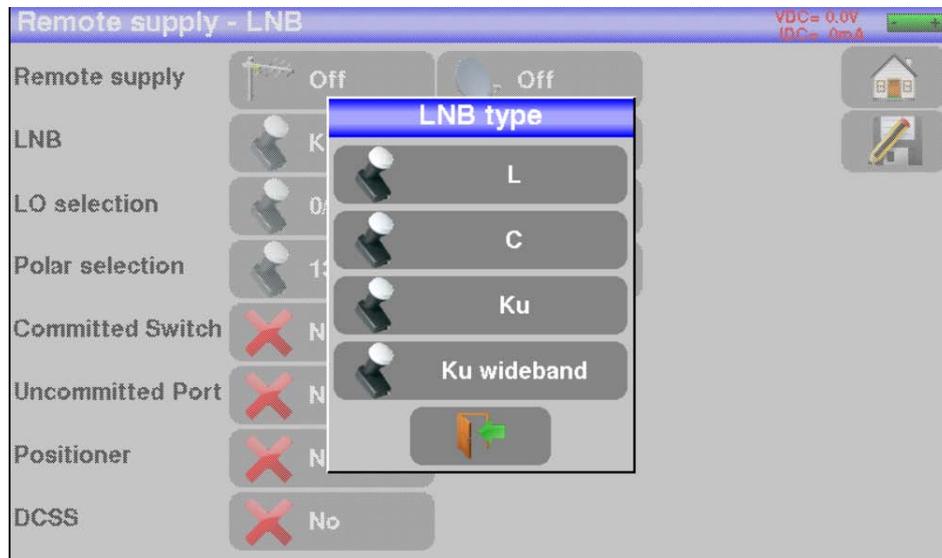


7) DCSS (Digital Channel Stacking). The following modes are available.



8.7.2.3 LNB type.

The user must choose the type of LNB present in the facility that is used with the meter.



The types of LNB (Low Noise Block) that can be configured are as follows:

- L band.
 - BIS (Intermediate Satellite Band) frequencies from 200 to 2400MHz.
 - No local OL oscillator frequency needed.
- C band.
 - Frequencies range from 3,650 to 4,200GHz.
 - The frequency of the local oscillator is 5150MHz by default, but can be adjusted by the user using the virtual keyboard that appears when you click on the current value.



- Ku band.
 - Frequencies range from 10,700 to 12,750GHz
 - The default frequency value for the low-band oscillator (OL1) is 9750MHz, but the user can adjust it using the virtual keyboard that appears when they click on the current value.

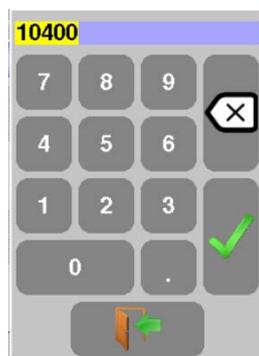
User manual – Enya 72



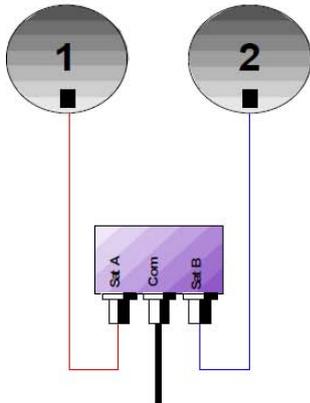
- The default frequency value for the high band oscillator (OL2) is 10600MHz, but the user can adjust it using the virtual keyboard that appears when clicking on the current value.



- Ku Wideband.
 - Frequencies range from 10,700 to 12,750GHz.
 - The default oscillator frequency (OL) is 10400, but can be adjusted by the user using the virtual keyboard that appears when you click on the current value.

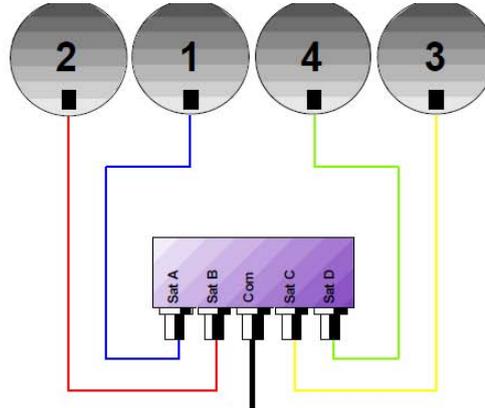


8.7.2.4 Switches DiSEqC.



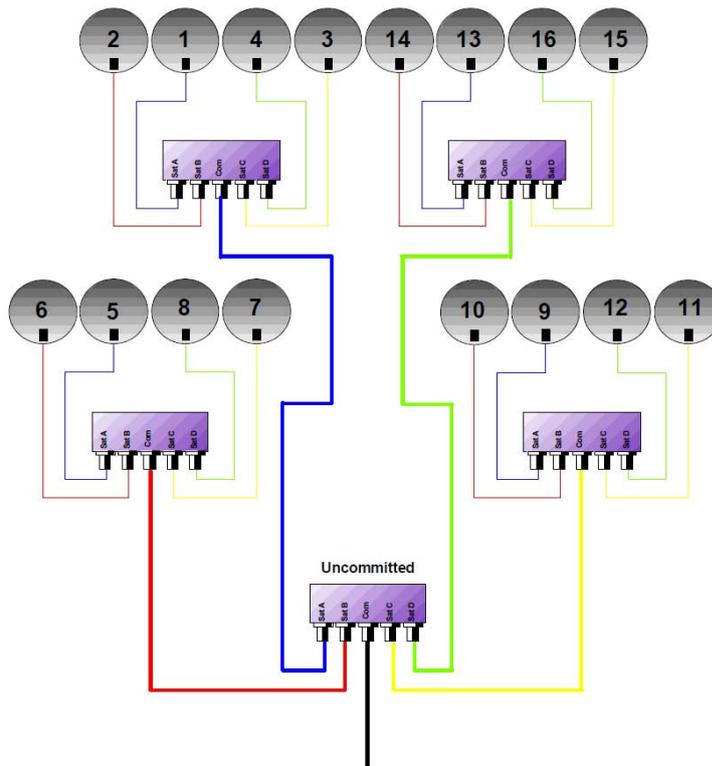
Switch of 2 satellite inputs. It can be managed by:

- 22KHz.
- ToneBurst (MiniDiSEqC)
- DiSEqC committed or uncommitted.



Switch of 4 satellite inputs. It can be managed by:

- DiSEqC committed or uncommitted.



Switch of 16 satellite inputs. DiSEqC committed + uncommitted.

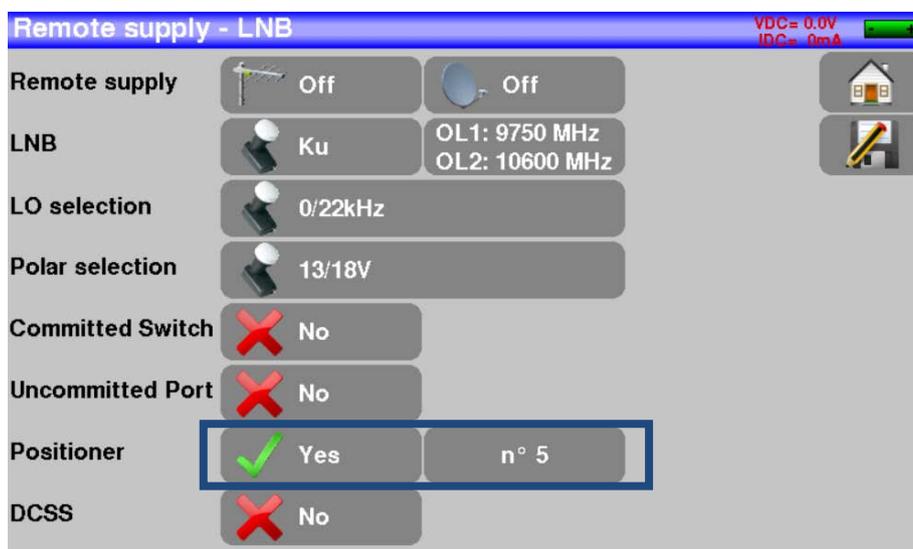
User manual – Enya 72

Satellite	Switch line		Uncommitted line	
	Position	Comande DiSEqC	Position	Comande DiSEqC
1	Pos A	Option A + Position A	Pos 1	Input 1
2	Pos B	Option A + Position B	Pos 1	Input 1
3	Pos C	Option B + Position A	Pos 1	Input 1
4	Pos D	Option B + Position B	Pos 1	Input 1
5	Pos A	Option A + Position A	Pos 2	Input 2
6	Pos B	Option A + Position B	Pos 2	Input 2
7	Pos C	Option B + Position A	Pos 2	Input 2
8	Pos D	Option B + Position B	Pos 2	Input 2
9	Pos A	Option A + Position A	Pos 3	Input 3
10	Pos B	Option A + Position B	Pos 3	Input 3
11	Pos C	Option B + Position A	Pos 3	Input 3
12	Pos D	Option B + Position B	Pos 3	Input 3
13	Pos A	Option A + Position A	Pos 4	Input 4
14	Pos B	Option A + Position B	Pos 4	Input 4
15	Pos C	Option B + Position A	Pos 4	Input 4
16	Pos D	Option B + Position B	Pos 4	Input 4

8.7.2.5 Motorized satellite dish control.

The device can move a motorized antenna by sending DiSEqC commands. The antenna will rotate to the desired position once the command is sent.

You must activate the Positioner and fill the position to which you want the antenna to move to.



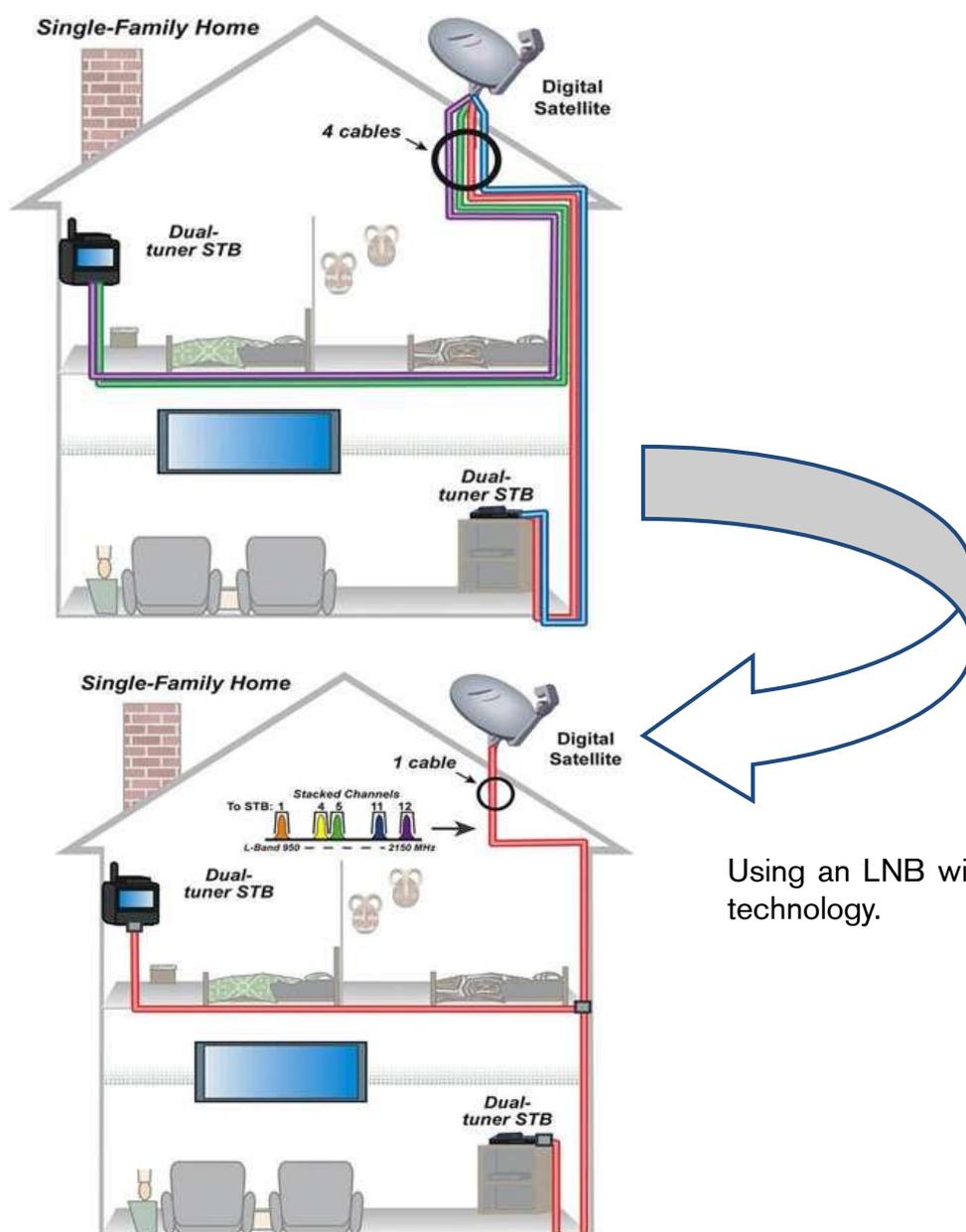
In the example we have enabled the sending of DiSEqC commands to the antenna motor. Position number 5 (of the presets on the antenna motor) has been set..

8.7.2.6 DCSS.

DCSS (Digital Channel Stacking System): is a signal distribution system by transposing frequencies. Used in satellite signal distribution for single or multiple homes with multiple set-top boxes.

To give access to multiple receivers to the entire spectrum and polarizations simultaneously it is necessary to have one coaxial cable per receiver and that the installation is adequate (several LNB, LNB Quad and multi switches).

This system allows the signal from one or more satellites to be brought to homes using a single coaxial cable (SCD – Single Cable Distribution).

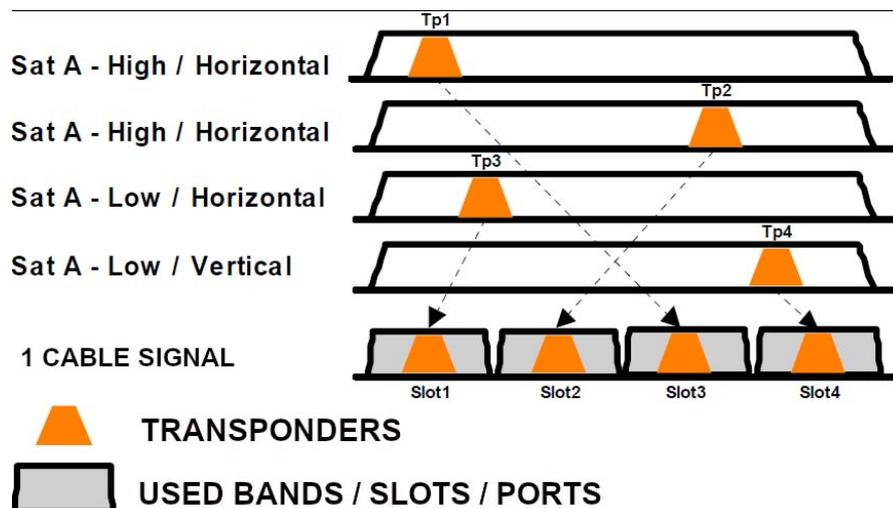


Using an LNB with DCSS technology.

DCSS is an extension of the DiSEqC protocol that allows you to connect multiple receivers to the same coaxial cable regardless of whether each of them wants to use a different band or polarity from the rest.

How does it work?

- 1) Each satellite receiver is assigned a fixed frequency called a slot or port.
- 2) Receiver asks for a particular transponder frequency using a DiSEqC command.
- 3) Some installation device, either an LNB or a switch receives that command and moves the requested frequency to the intermediate frequency of the receiver slot/port. The mixing equipment adds each user band/slot to a single output (up to 32 different slots are supported).

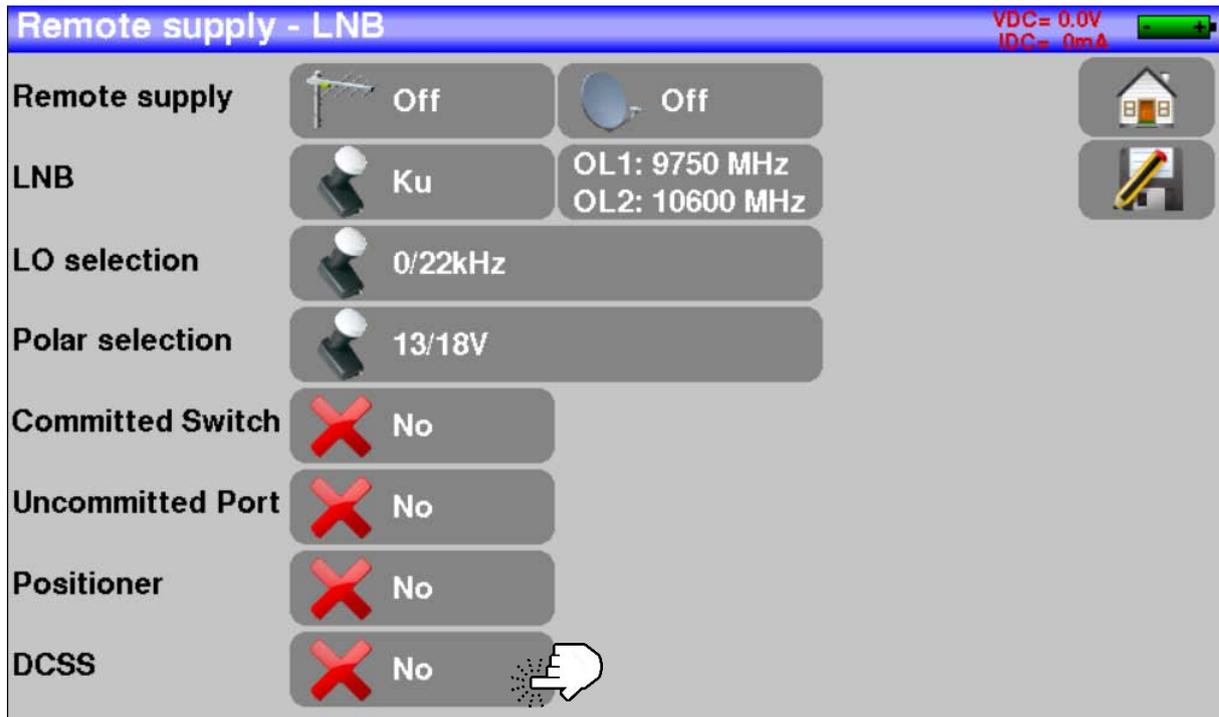


We have 3 different modes:

- 1) SATCR (Satellite Channel Router). EN50494 standard, also known as SCD (Single Cable Distribution) or Unicable. Distribution of the satellite signal by a single coaxial cable to 2.4 or 8 satellite receivers.
- 2) SCD2 (Single Cable Distribution version 2). EN50607 standard, also known as Unicable 2 or JESS. Distribution of the satellite signal by a single coaxial cable to a maximum of 32 receivers. Using DiSEqC 2.0 the installation becomes easier and faster, since the different devices compatible with this standard present in the coaxial cable can be interrogated.
- 3) SKY ITALIA. It is a new mode based on SCD2 but with predefined frequencies for the first 4 slots that are used for SATCR. All other frequencies in slot 5 through 16 are those used in DCSS.

To select DCSS mode the user must press the first key just to the right of the mode marked as DCSS.

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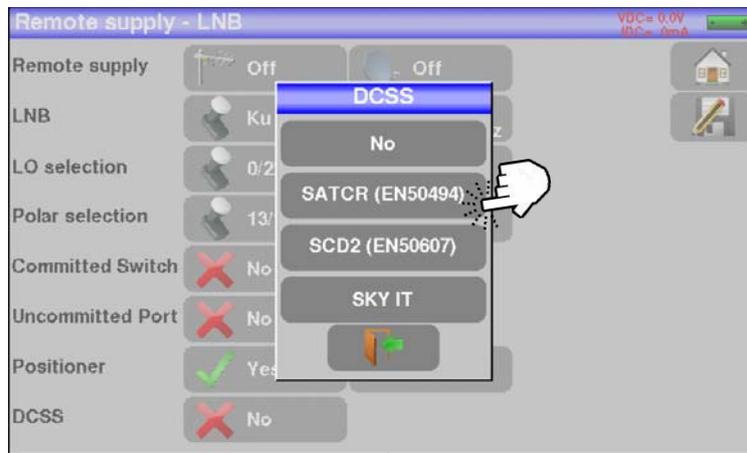
Then the DCSS mode selection screen opens:



User manual – Enya 72

8.7.2.6.1 SATCR (EN50494).

Press on the key indicated in the following image.

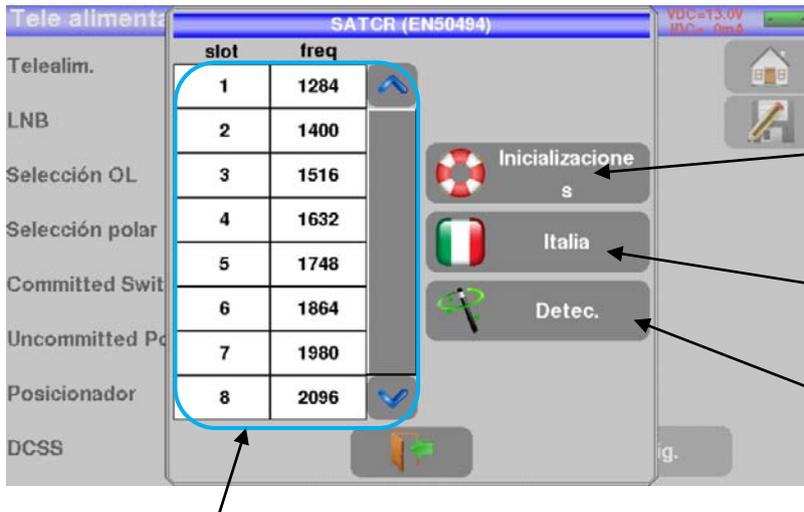


Slot x. Currently active slot. If you want to change the slot press on this key.

Configuration. From this screen you can configure each of the slots.



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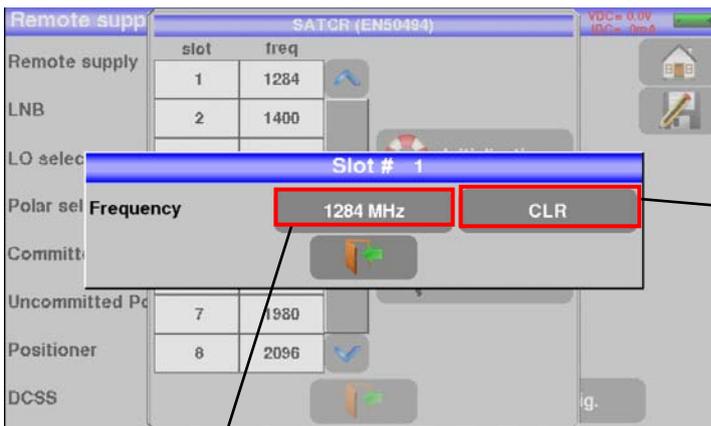


Initializations. Initialize slots at their predefined frequencies

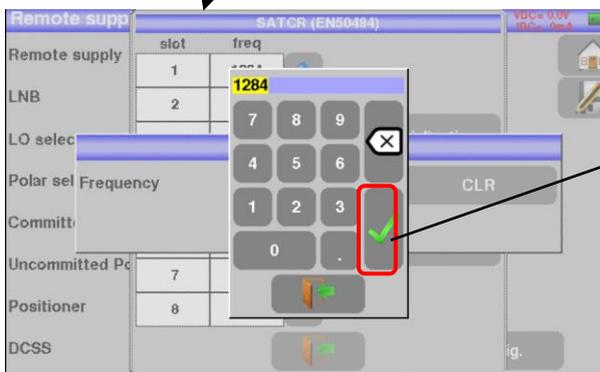
Italy: pre-defined frequencies for Italy.

Detection. The equipment detects the frequencies of the slots existing in the installation.

List of slots. By clicking on one of them we can modify the frequency



CLR. Clear the slot frequency.

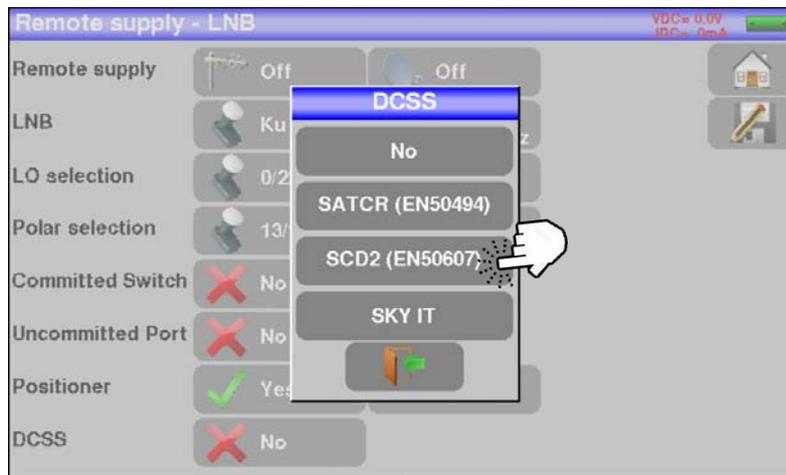


Confirmation key for modifications. Once the frequency has been edited click this icon

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8.7.2.6.2 SCD2.

Press the key indicated in the following image.



Slot x. Currently active slot. If you want to change the slot press on this key.



Configuration. From this screen you can configure each of the slots.



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SCD2 (EN50607)				
slot	freq	EN	PIN	BW
1	974	EN50607		
2	1076	EN50607		
3	1178	EN50607		
4	1280	EN50607		
5	1382	EN50607		
6	1484	EN50607		
7	1586	EN50607		

Initializations. Initializes all 32 slots at their predefined frequencies

Allocation. Displays the status of each slot.

Detection. The machine detects the frequencies of existing slots in the installation. Based on DiSEqC 2.0.

List of slots. By clicking on one of them we can modify the frequency

Slots Allocation																															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

READ

legende

not available

in use

free

PIN protected

Slot # 32

Frequency	2132 MHz	CLR
Norme	EN50607	CLR
PIN code:	-	CLR
Bandwidth:	-	CLR

Slot frequency. It can be modified by clicking on it.

Pin code. Slot protection by pin. Accepted values range from 0 to 255.

Slot bandwidth.

The "CLR" keys allow the deletion of the line on which it is tán.

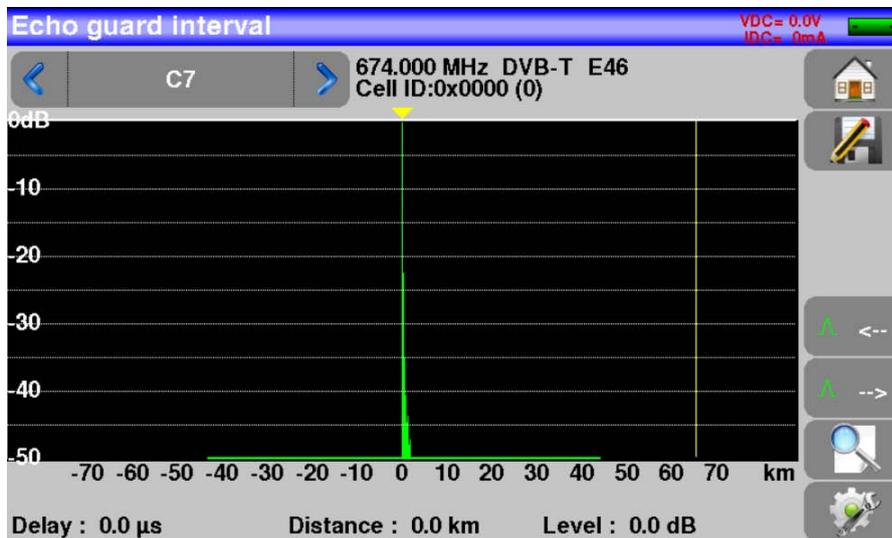
8.8 Multipath / guard interval.

To enter the "Guard Interval" functionality, simply press the key  Echo guard interval in the main menu.

Only available for DVB-T, DVB-T2, DVB-C2.

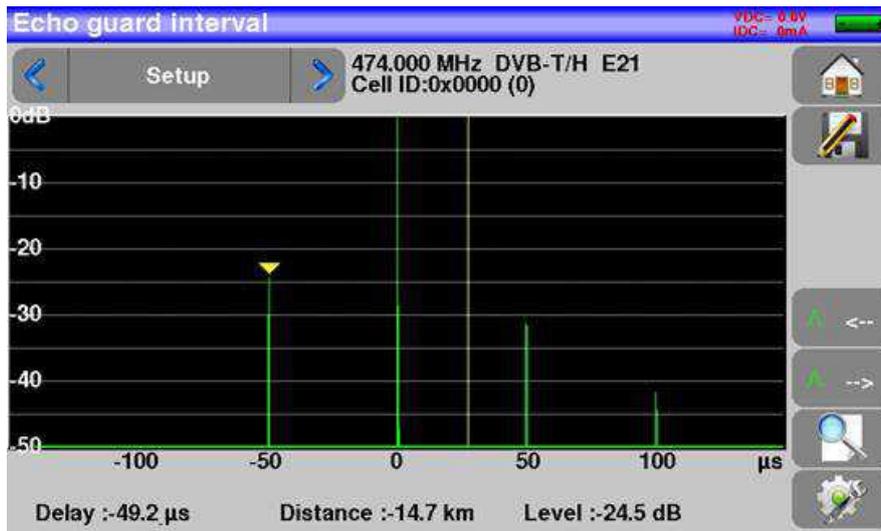


Example of an echoless signal:



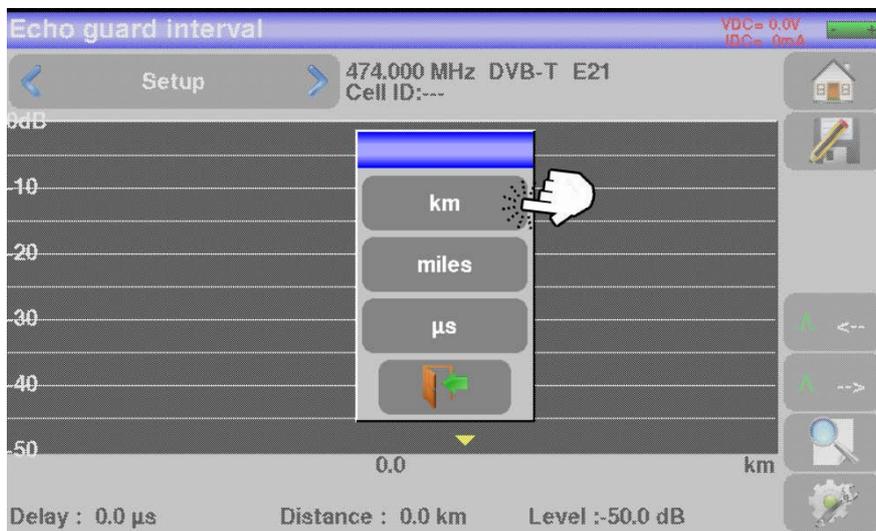
User manual – Enya 72

Example of a signal with echoes and pre-echoes:



When pressing  you will change the horizontal scale, distance.

The horizontal scale can be displayed in microseconds, kilometers or miles. To switch from one measurement unit to another, simply press the key , and then choose the measurement unit, Km in this case.

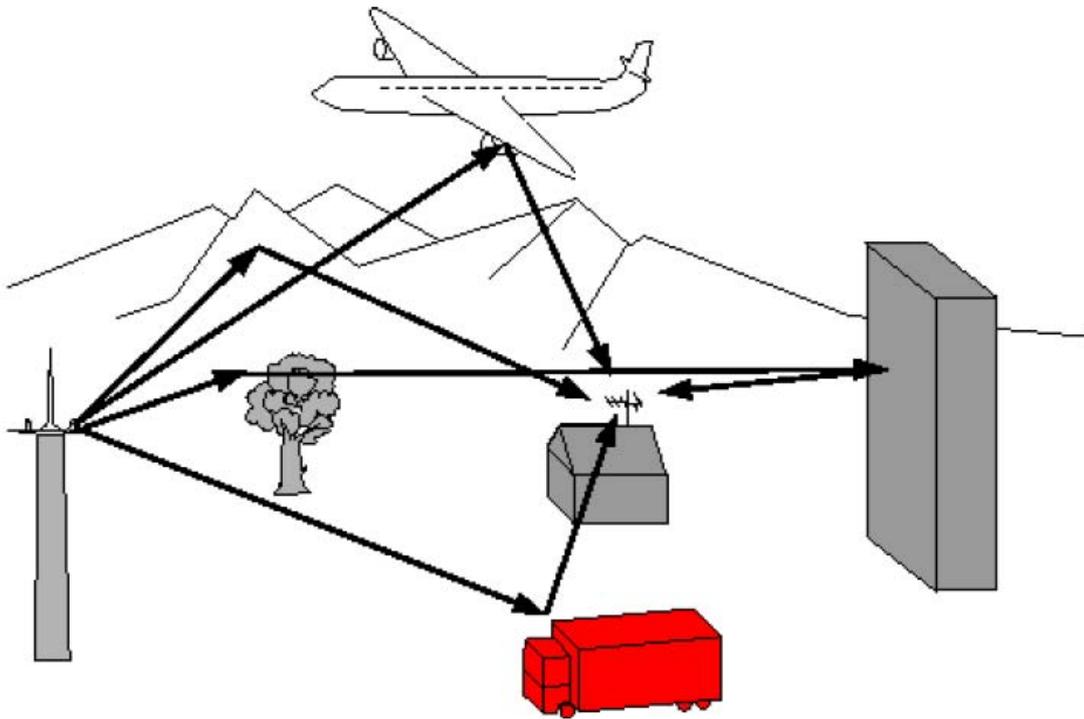


The yellow measurement cursor can be moved by pressing directly on the screen or by pressing on the auto-search keys  and  .

The end of the save interval indicates the yellow vertical line mean.

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In terrestrial television broadcasts the signal received by the antenna can have a variable source, either from the repeater itself or by rebounds.



In DVB-T/T2 broadcasts these bounces can help or degrade the signal, and therefore the image, depending on the delay of the different signals reaching the receiving antenna.

DVB-T/T2 emission standards define a modulation parameter called "Guard Interval" where echoes will not degrade the signal.

The transmission of digital data (symbols) is interrupted during the guard interval.

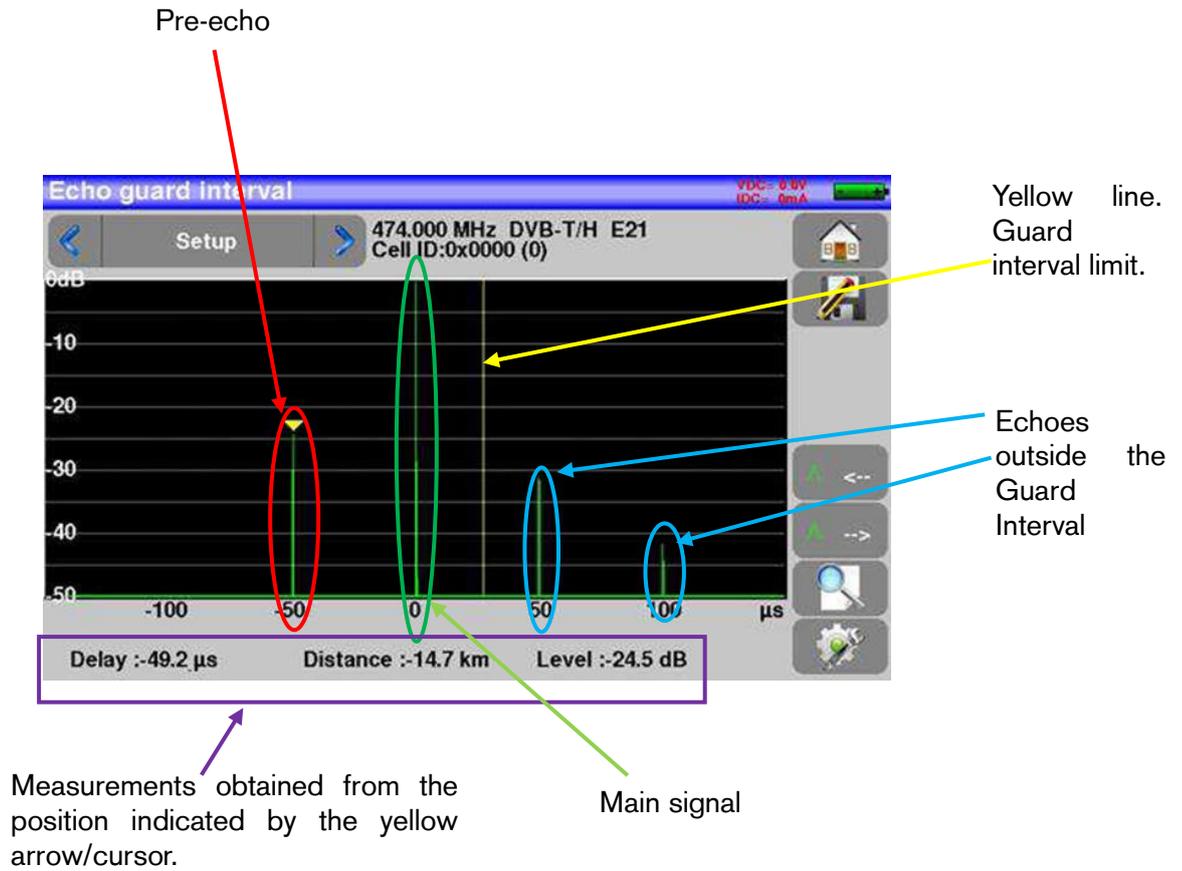
In this way:

- A symbol received with an anticipation or delay less than the guard interval will not degrade the signal.
- A symbol received with a higher anticipation or delay than the save interval will affect the signal.

The installer should try to minimize echo reception by better orienting the antenna or using a more directional antenna.

With this functionality the equipment allows to detect the possible echoes, and therefore reduce them accordingly.

User manual – Enya 72



Warning: A high amplitude pulse within the guard range will also affect the signal.

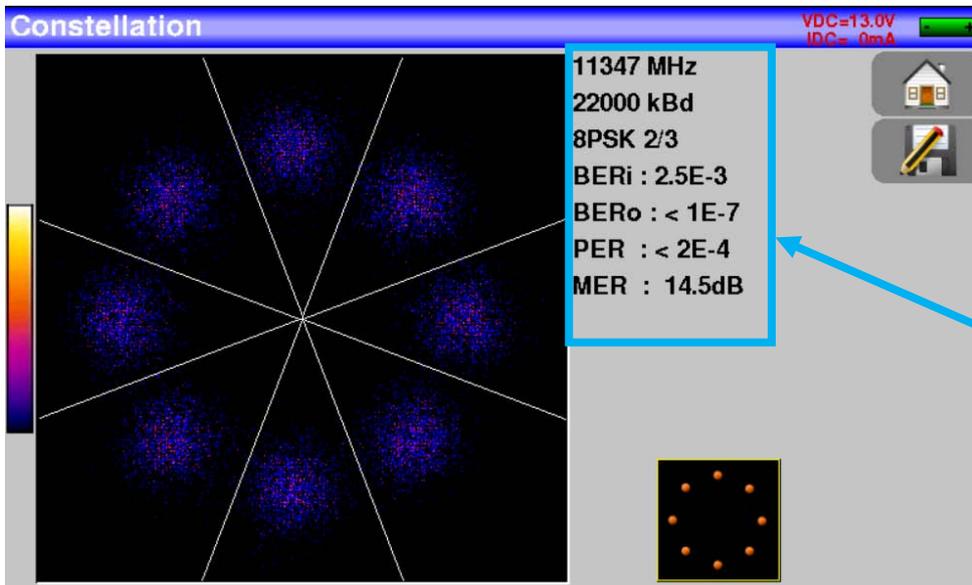
8.9 Constellation.

To enter the "Constellation" functionality, simply press the key  Constelacion from the main menu.



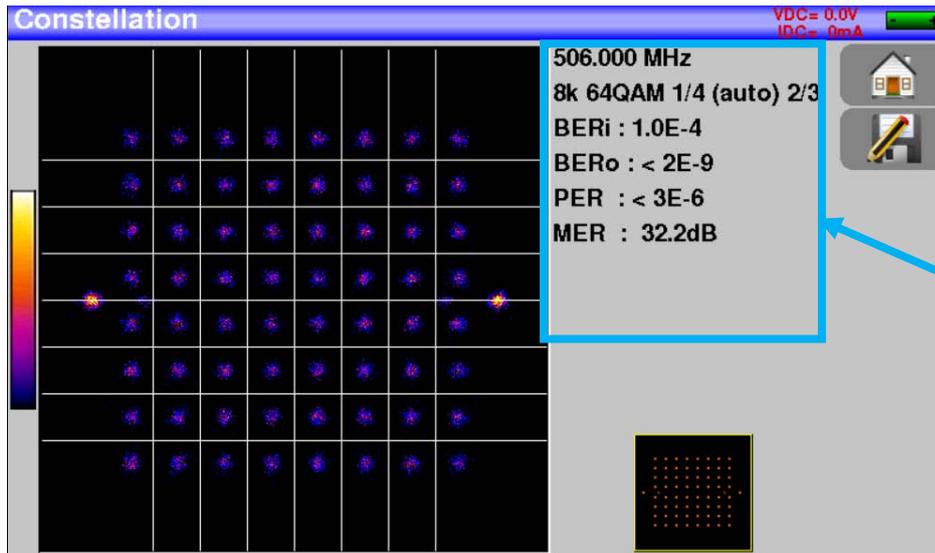
The device will show the constellation of the current signal.

The measurements shown are available if you are using DVB-T, DVB-T2, DVB-C, DVB-C2, DVB-S, DVB-S2, DSS standard.



Measurements shown for DVB-S2.

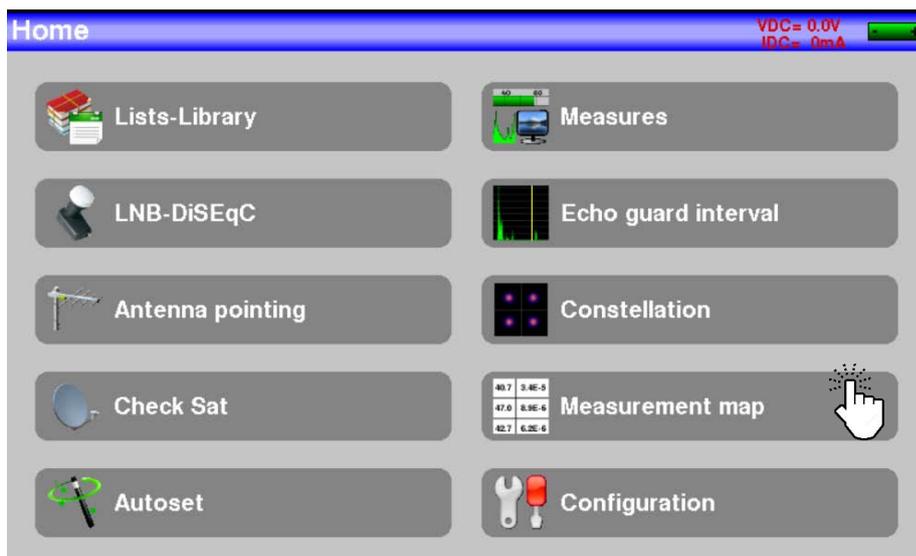
User manual – Enya 72



Measurements shown for DVB-T.

8.10 Measurement map.

To access the measurement map press on the key  Plano de medidas from the main menu.



A table is displayed with the signal level and error rate of the settings in the list of measures with the labeling of those that go outside the tolerance range.

Measurements for channel 46 on DVB-T.

frec.	estándar	RF	C/N	BERi	BERo	PER	MER	LKM
E22	DVB-T	66.8	>43.9	9.0E-7	<1E-8	<2E-5	34.8	15.3
E25	DVB-T	61.5	34.1	9.3E-5	<1E-8	<2E-5	33.4	13.9
E26	DVB-T	63.3	32.1	2.8E-6	<1E-8	<2E-5	35.0	15.5
E29	DVB-T	66.0	40.3	4.7E-6	<1E-8	<2E-5	33.9	14.4
E34	DVB-T	64.7	>41.8	9.9E-6	<1E-8	<2E-5	34.6	15.1
E40	DVB-T	62.1	>39.2	7.6E-7	<1E-8	<2E-5	34.7	15.2
E43	DVB-T	69.2	>41.3	4.9E-4	<1E-8	<2E-5	30.8	11.3
E46	DVB-T	62.3	>39.4	3.0E-6	<1E-8	<2E-5	35.5	16.0

BERi, BERo, or PER are very commonly used terms.

- BERi, input BER.
- BERo, output BER.
- PER (Packet Error Rate). Wrong/wrong packet rate.

On this screen the progress bar indicates the evolution of the scan. The background of the progress bar shows whether the scan was complete or not:

- Red background. The scan is not complete completely.



- Green background. The scan is completely complete and is in another scan pass.



Warning: In case of having a mixed level of measurements (satellite + terrestrial), the LNB power takes precedence and the power of the terrestrial antenna will be ignored.

8.10.1 Out of tolerance values.

Measured digital values are colored according to the tolerance range.

- If they are below the minimum range they are colored red.
- If they are above the maximum range they are colored orange.

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8.11 Configuration.

To enter the settings menu press the key  Configuration from the main menu.



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8.11.1 Language.

Press the indicated key and select the desired language for the menus.

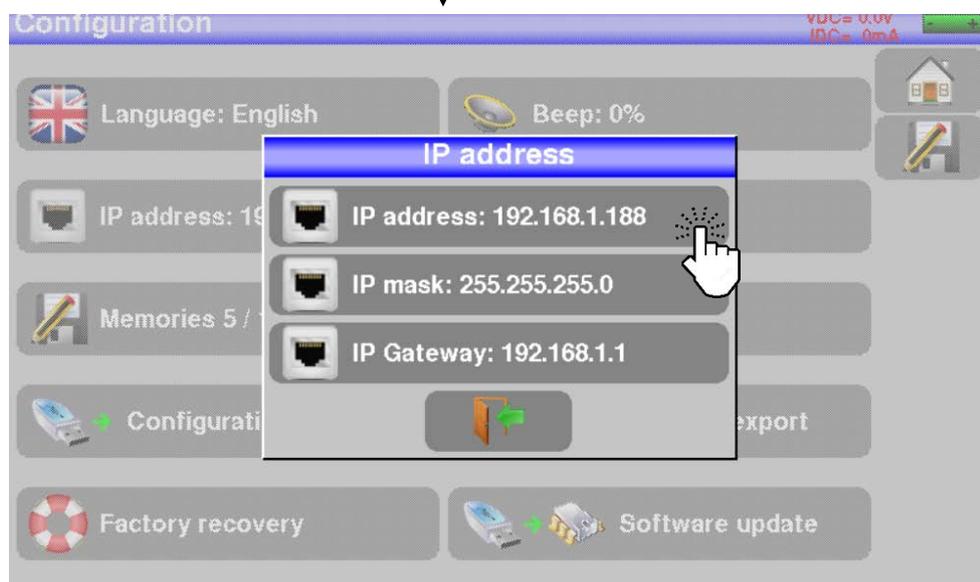


From now on the menus will be displayed in the chosen language.

8.11.2 IP address.

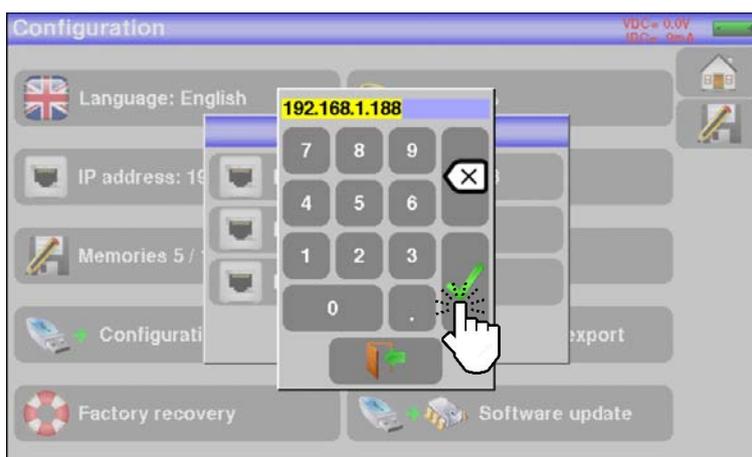
The device has an ethernet port that makes it possible to connect directly to a PC or to a LAN. If you do this directly to a PC you may need to use a crossover ethernet cable, it will depend on the ethernet port of your PC.

Press the key indicated to enter the meter's network settings.



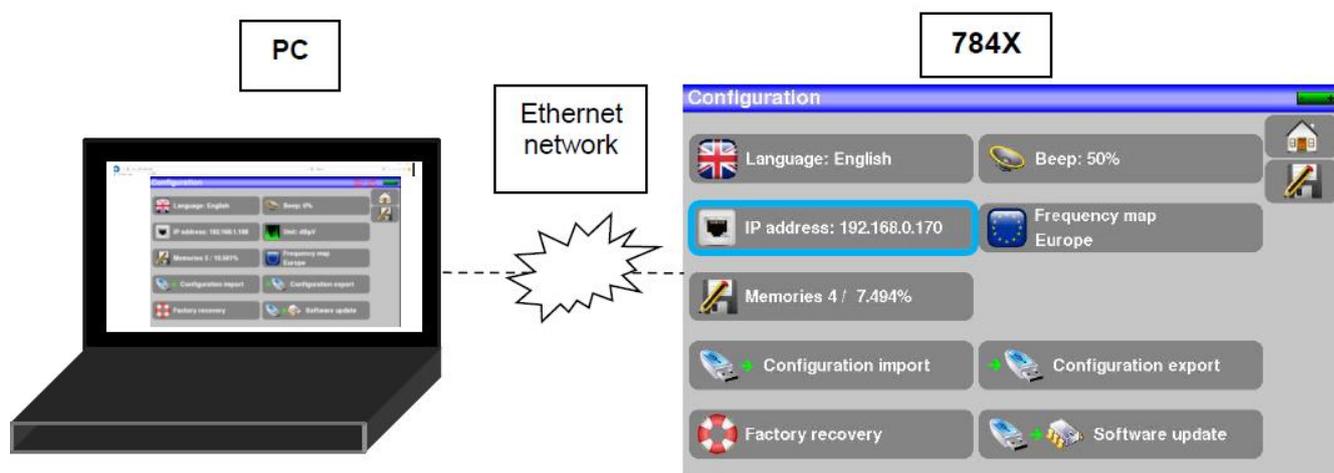
If you click on one of the 3 fields shown: IP address, IP-mask, or gateway you can edit them. To make this possible, a virtual numeric keypad will appear. Set the appropriate values for your LAN and then press the confirmation key .

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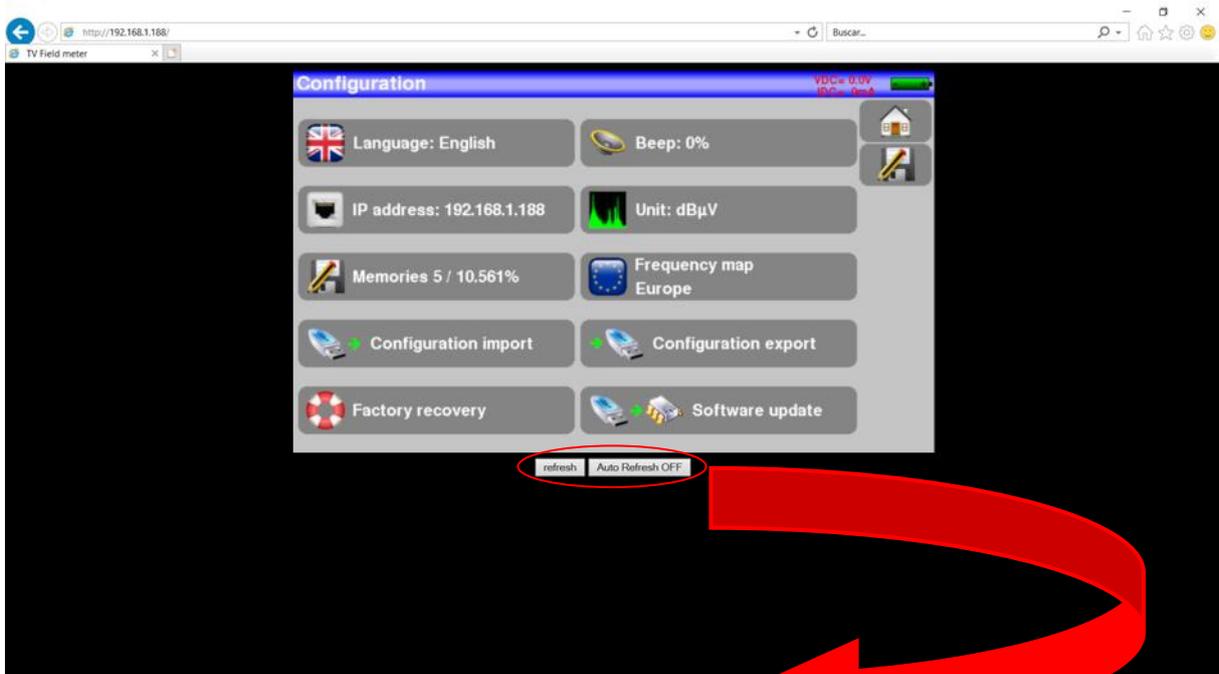


For the PC to be able to connect to the meter it is necessary that your IP is in the same range and the network mask also matches the one configured on the meter.

Once both computers are properly configured you will be able to open a WEB browser on your PC and after typing the IP address of the meter you will access the meter's web page server. This way you can view on a PC the same thing that is being displayed on the meter screen.



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Press this key to refresh the screen

Auto Refresh. Can be set between OFF, 5S, 10S.

8.11.3 Configuration import.

You can import a previously saved configuration into a USB by pressing the



All backup settings/lists present on the USB will be uploaded to the meter.

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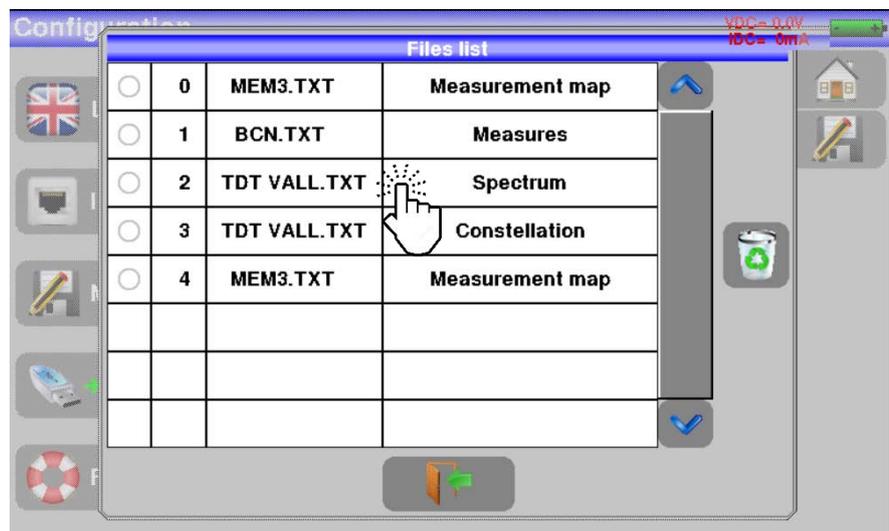
8.11.4 Memories.

To save an image or any other feature, vea el apartado ["Save"](#)

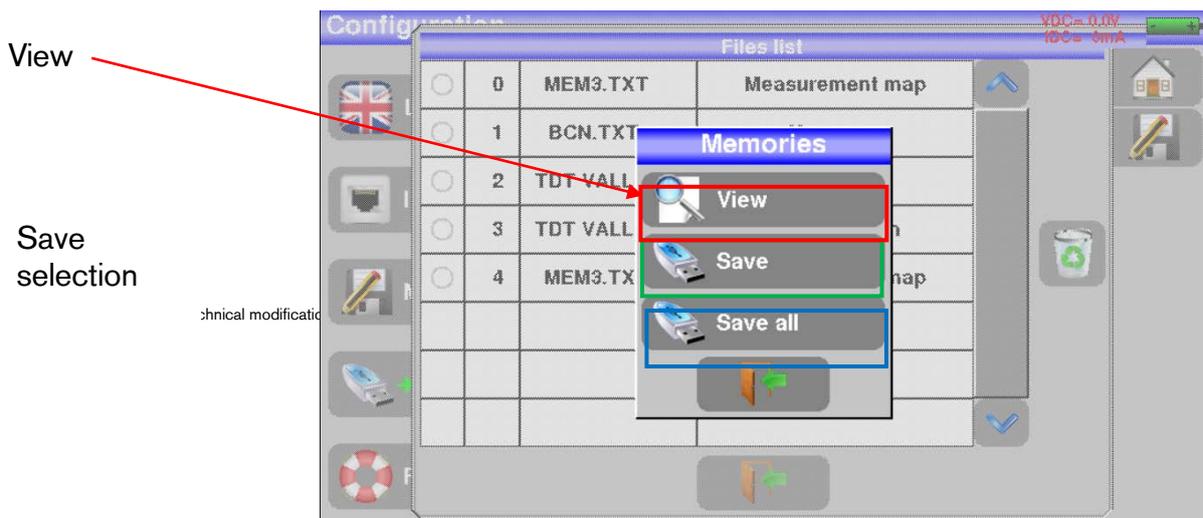
The number of files saved and the total size occupied on the device are displayed on the key.



Once this key is pressed, a list will be displayed showing the different files with their name and description.



Pressing on one of the rows will open another screen with various options:



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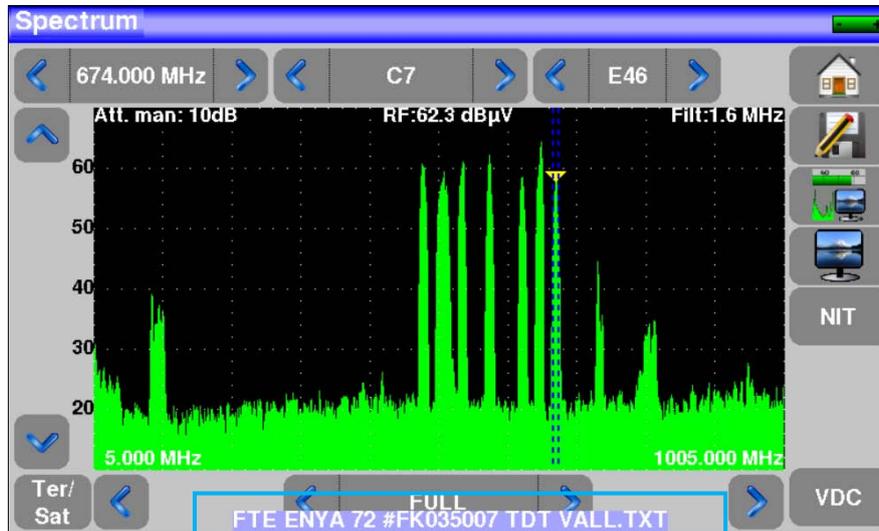
Save all



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8.11.4.1 View.

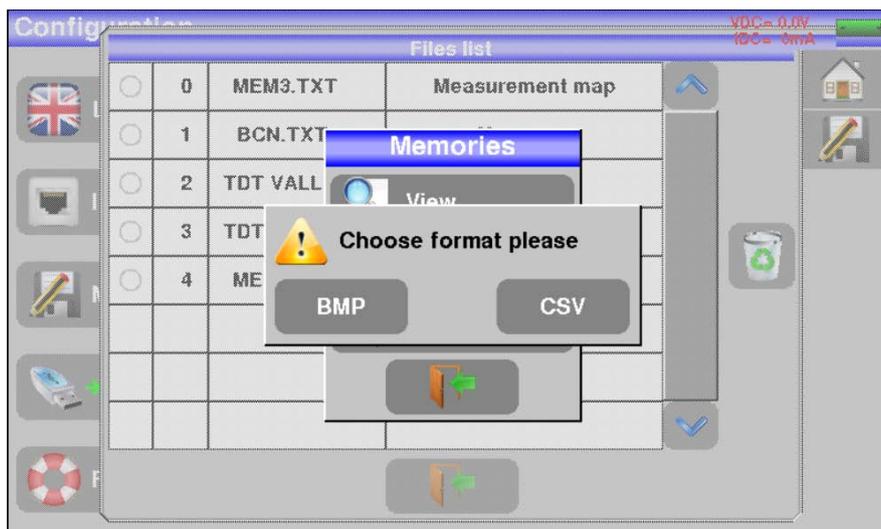
Tapping this icon  we'll visualize the contents of the file.



Device and filename

8.11.4.2 Save.

Tapping icon  you can export the file in two different formats to an USB.

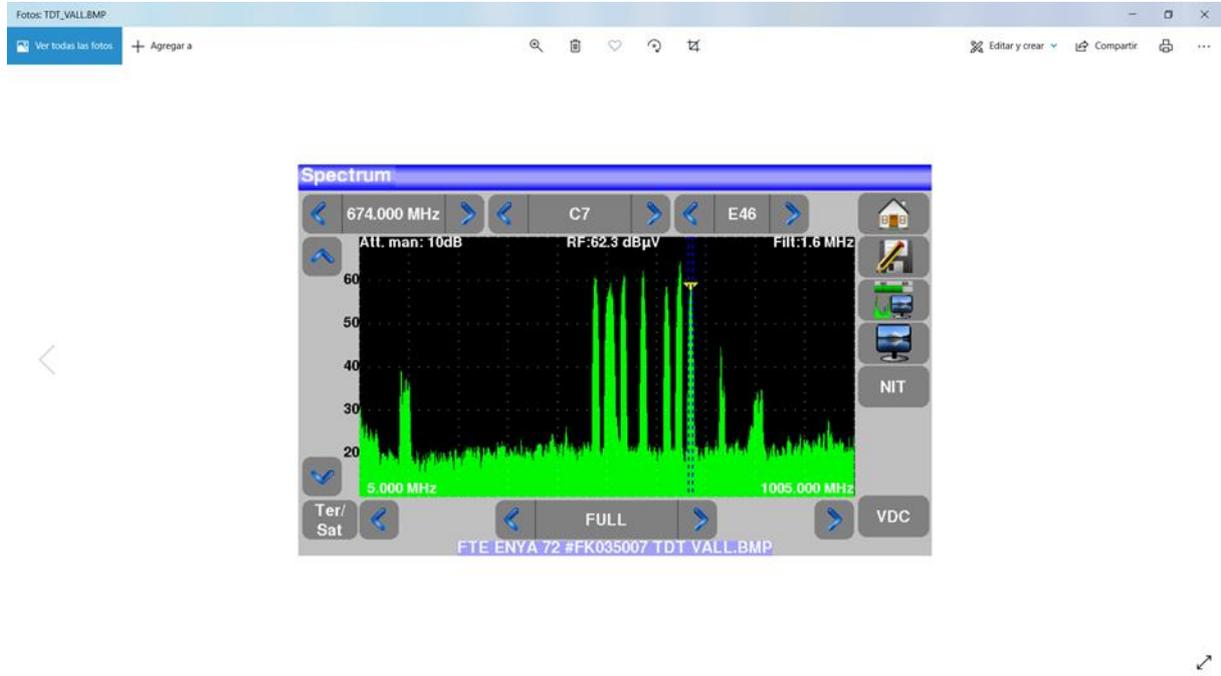


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8.11.4.2.1 Saving in BMP format.

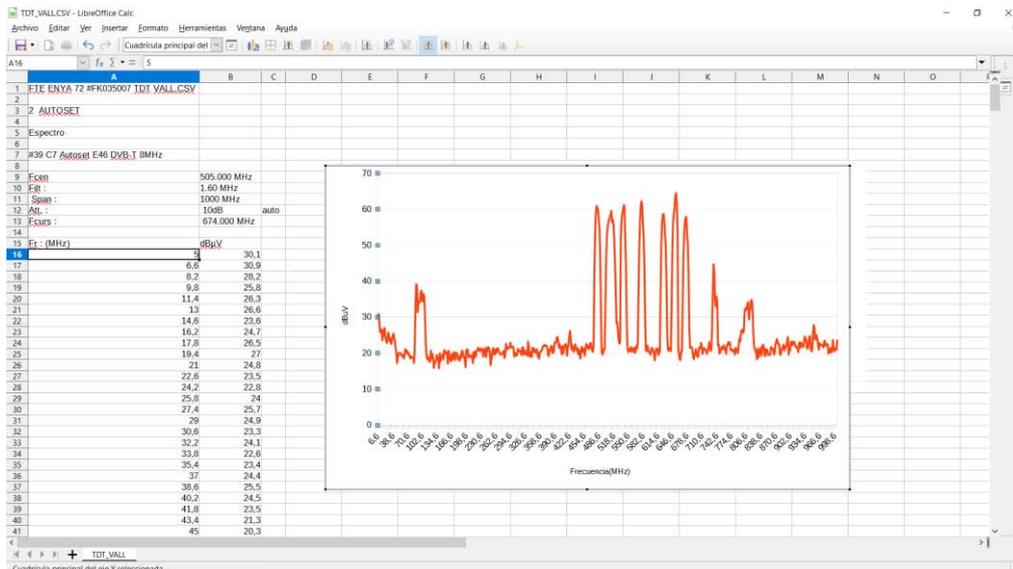
It allows us to save/export the chosen file to a USB in BMP format. It is useful for taking screenshots and then viewing them on a PC.

Below is a file exported in BMP and viewed on a PC with an image editor.



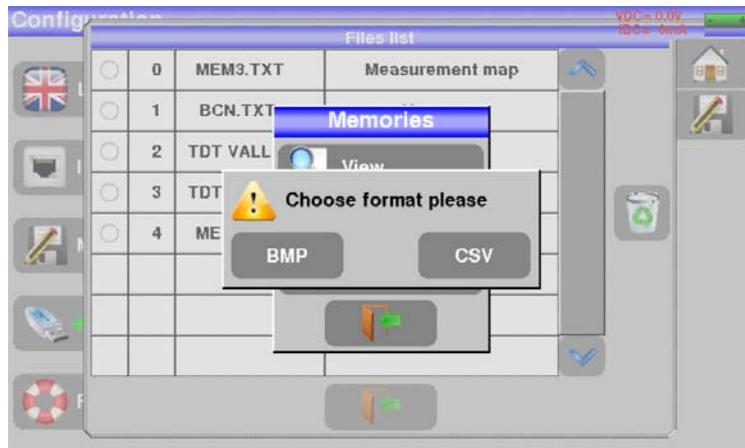
8.11.4.2.2 Saving in CSV format.

It allows us to save/export the chosen file to a USB in CSV format. It is to analyze values in a spreadsheet on the PC.



8.11.4.3 Saving all.

Tapping  it will allow you to save all the files in the format you choose below.



8.11.4.3.1 Saving all in BMP format.

Saves all files on your meter's memory to a USB in BMP format. Different directories will be created on the USB under the following names:

- LEVEL. For files containing signal level measurements.
- MAPS. For files containing measurements map.
- SPECTRUM. For files containing spectrum measurements.
- BER-MER. For files containing error rate measures.
- CONST. For files related to the constellation.
- ECHO. For files containing data related to echoes.

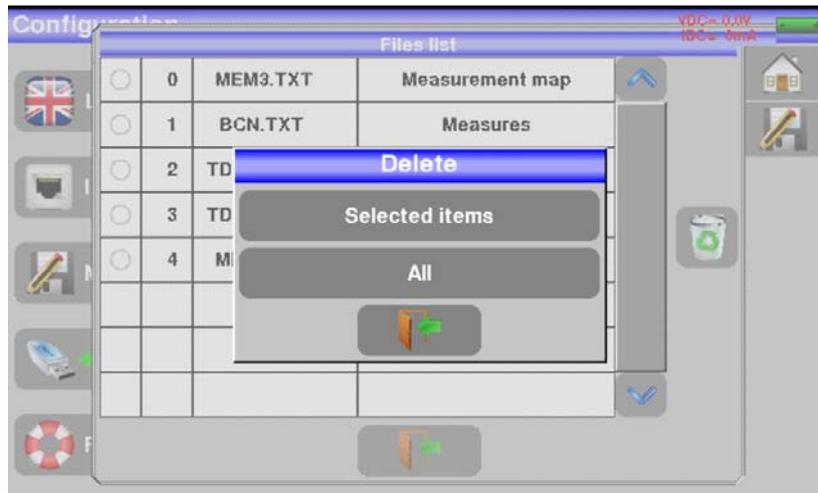
8.11.4.3.2 Saving all in CSV format.

Saves all files on your meter's memory to a USB in CSV format. Different directories will be created on the USB under the following names:

- LEVEL. For files containing signal level measurements.
- MAPS. For files containing measurements map.
- SPECTRUM. For files containing spectrum measurements.
- BER-MER. For files containing error rate measures.
- CONST. For files related to the constellation.
- ECHO. For files containing data related to echoes.

8.11.4.4 Deleting files from memory.

To delete one or all of the files we will press the icon  from the memory screen. The following screen will appear.



In it you can delete all the files if you press **All** , or delete only those that we have previously selected by pressing the key **Selected items** .

8.11.5 Configuration export.

You can back up your computer's settings and lists by pressing the **Configuration export** . Debe usar un USB.



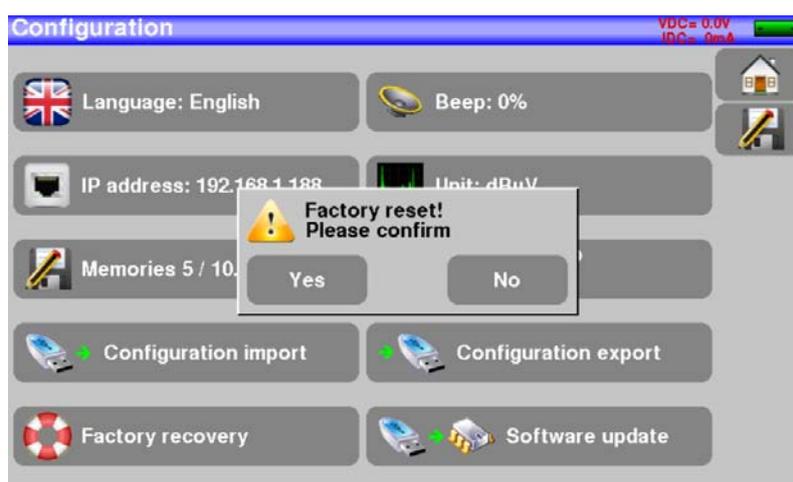
A CONF directory/folder will be created on the USB with the backup.

8.11.6 Factory recovery.

This option allows you to reset all factory settings on your meter. To use it press the key



The device will ask for confirmation to perform the reset using the following screen:



Press "Yes" if you are sure you want to reset your computer to factory settings. Otherwise press "No" to exit and take no action.

Warning: In case of factory reset you will lose:

- The settings you have in the library.
- The lists of measures.

8.11.7 Sound.

To adjust the volume of the sounds emitted by the meter press the key



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The following screen will appear on which you can select the desired volume value.

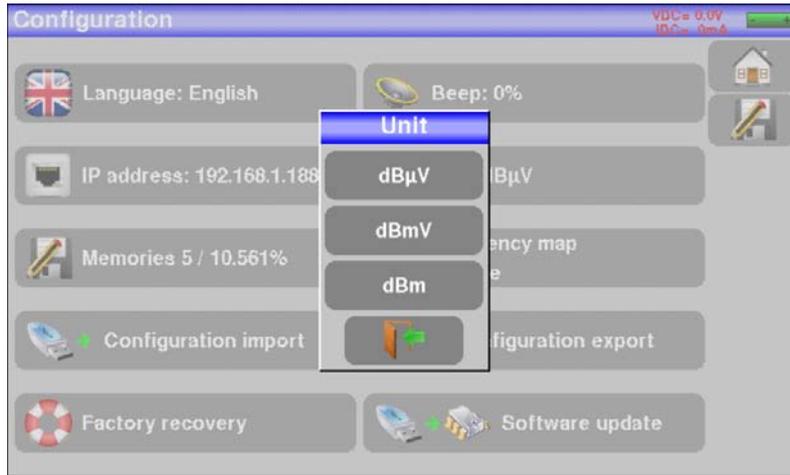


8.11.8 Measurement units.

To select the unit of measurement that the meter will use press on the key .



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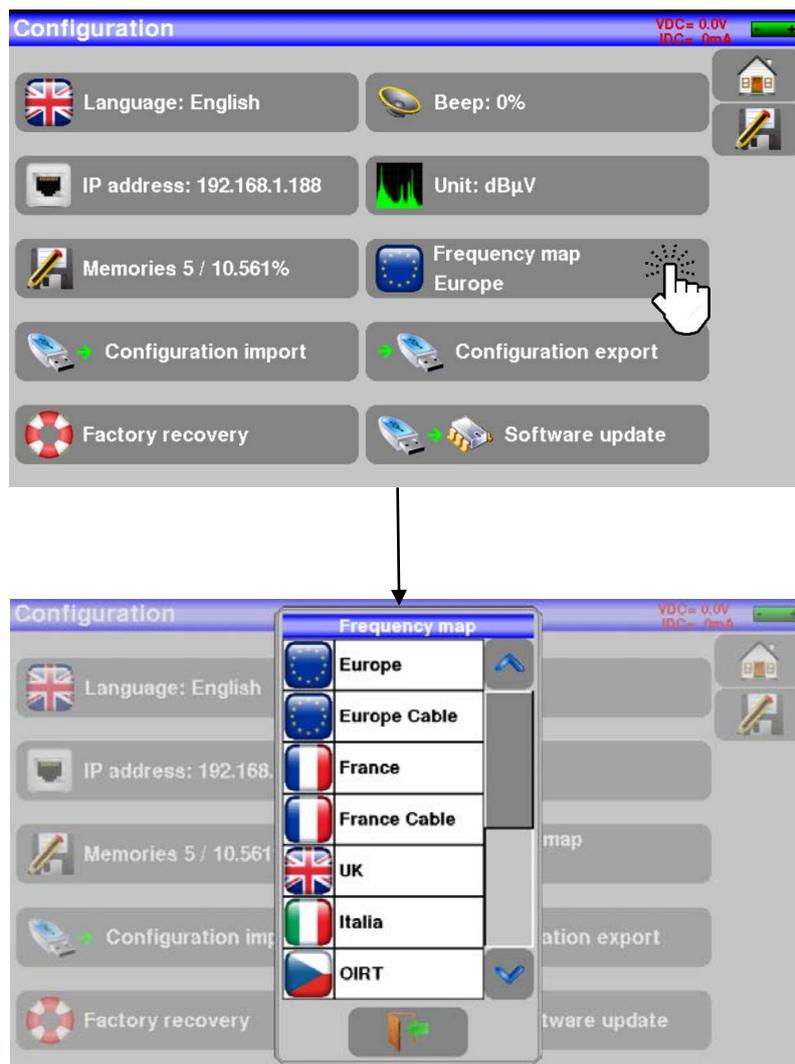


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- **dB μ V**: 0 dB μ V corresponds to 1 μ V.
- **dBmV**: 0 dBmV corresponds to 1mV.
- **dBm**: 0 dBm corresponds to 274mV, 1 mW with 75 Ω impedance.

8.11.9 Frequency map.

Tapping icon  you can choose the terrestrial frequency map that your device will use.



8.11.10 Software upgrade.

This functionality allows you to update your computer's software when new features are needed.

Warning: Be careful that the battery has a charge of more than 30% before performing a software update. If the battery does not have sufficient charge connect the equipment to the supplied external power supply.

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To perform the upgrade follow these steps:

- 1) Download the 784X_VX.X (ZIP) file containing the update from our website.
- 2) Connect a USB to your PC.
- 3) Unzip the downloaded file to the USB home directory.
- 4) Disconnect the USB from the PC once all the files have been unzipped.
- 5) Connect the USB to the device/meter.
- 6) Tap key  .

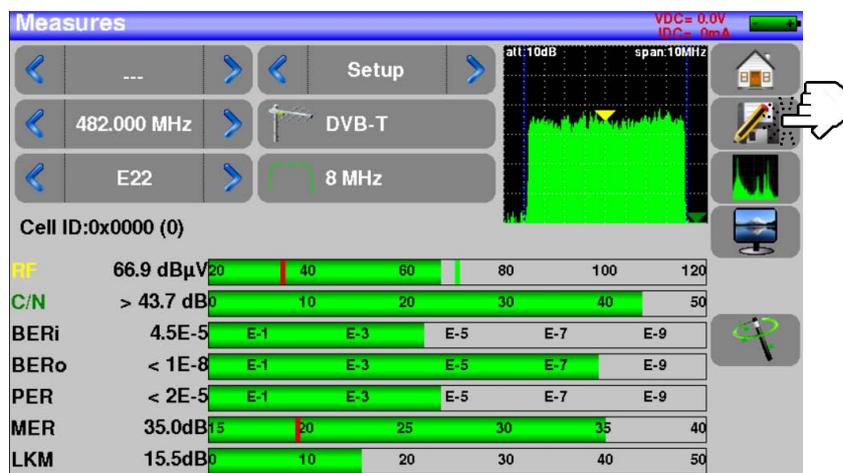
Warning:

Do not turn off the meter while the update is in progress.

The upgrade process takes about 10 minutes. At the end of the computer the computer will ask you to reset it. Once this is done, the update is complete and the team will have the new software version.

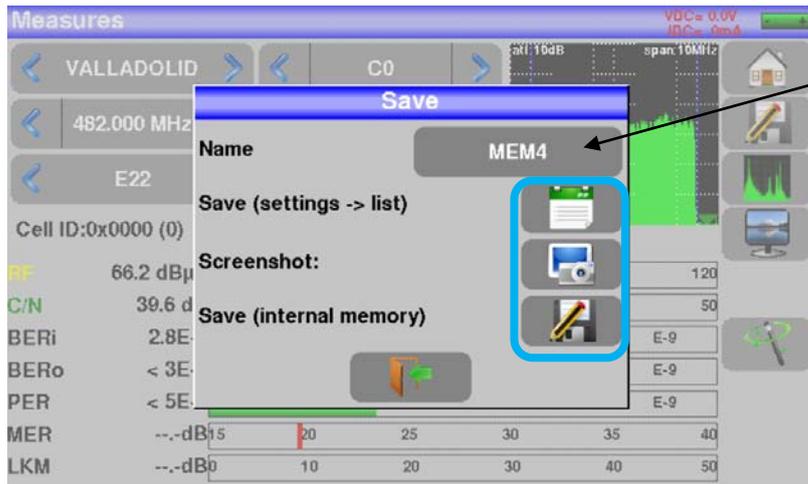
8.12 Save.

Tapping key  which appears on some screens you can save the displayed data from the screen you are working on. Let's look at an example being on the action screen.



The next screen will be opened after pressing the key  .

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File name. Press to modify it

On this screen you can save:

- The current measurement parameters of the current list .
- A screenshot on a USB .
- Save to the device's internal memory . It can only be stored in internal memory from spectrum screens, measurements, constellation, eco save interval and measurement map.

You can also change the file name. By default, the file name will be MEM(X+1). X is the number of files saved on your computer. The maximum number of characters allowed for the file name is 8.

8.13 Maintenance.

The equipment requires some care in order to ensure its proper functioning over time.

	CONSEQUENCES	RECOMMENDED PERIODICITY OF CONTROLS	RECOMMENDED LIMIT USE
BATTERY	Reduction of battery life		200 charge/discharge cycles or 2 years.
STRAPS	Equipment drop and breakage.	Check the holding of the straps at each use	
BACK LIGHT SCREEN	Reduction of visibility		1 year
MEASUREMENTS: Adjust/Check	Wrong measurements	Once a year	1 year
CONNECTIONS	Wrong measurements	At each use, check the state and cleanliness of the RF input	

These tips are useful for proper equipment conservation and do not engage the responsibility of FTE maximal.

Routine maintenance:

Basic maintenance includes only external cleaning of the equipment. Any other type of action will require specialized staff.

Disconnect the equipment before any type of intervention.

Do not put the equipment under a jet of water. Danger of equipment damage and electrocution to the user.

Regularly perform an external cleaning of the equipment by following these steps:

- Use a damp, perfectly drained cloth.
- Never use products containing solvents, gasoline, benzene, alcohol ...
- Use a soft lint-free cloth.
- Use a solvent-free antistatic product to clean the screen.

RF input.

- Make sure there are no copper specks between the weigh and mass of the input RF connector.
- Periodically replace the F/F adapter. A poor conditions adapter will distort all the measurements.

INFORMATION ABOUT THE ACTIVE MATRIX COLOR LCD SCREEN.

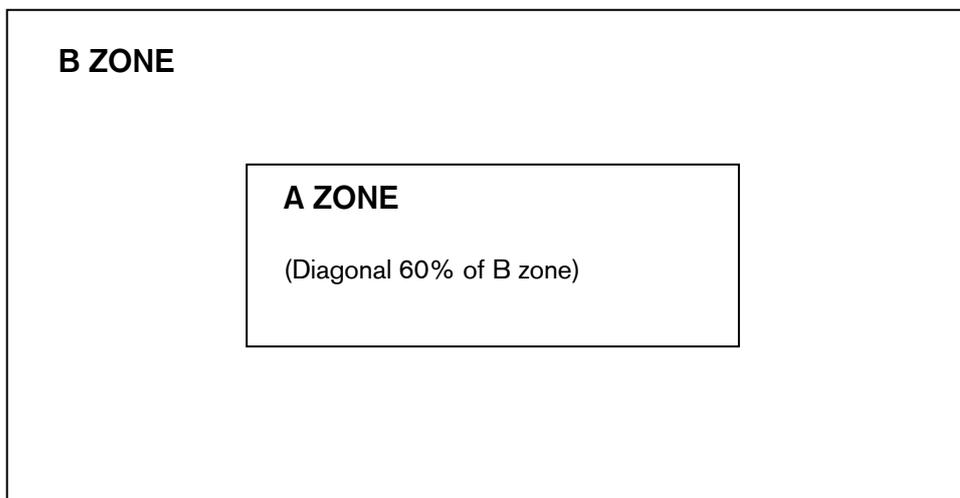
Your Fte maximal field meter is equipped with an active matrix LCD color display.

This screen is provided by renowned manufacturers.

With current technical manufacturing conditions they cannot ensure the proper functioning of 100% of the pixels in the display zone. Specify a maximum possible number of defective pixels in the screen area.

Fte Maximal's Quality service has mounted the display on your equipment taking into account the quality acceptance conditions specified by the manufacturer of the same.

Screen description:



Screen acceptance criterion:

- Zone A, central area. A total of less than 5 defective pixels, less than 3 contiguous.
- Zone B, full screen. Less than 9 defective pixels across the entire screen surface, with respect to the prevailing conditions described for Zone A.

A pixel is considered defective if it is constantly off, or if it is turned on in a different color than expected.

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The contractual guarantee of your field strength meter can only be exercised if these specified criteria are not met, both at the time of delivery of the equipment and during its warranty period.

8.14 Technical specifications.

8.14.1 Functionalities.

Frequency	5-2400MHz
DVB-T/T2/T2 Lite	✓
DVB-C/C2	✓
DVB-S/S2, DSS, Multistream	✓
MPEG2/4, SD/HD	✓
A/V analog input	✓
Spectrum analyzer	✓
Display TV, PID, NIT	✓
Constellation DVB-T/T2	✓
Multipath DVB-T/T2	✓
Terrestrial antenna pointing	✓
Satellite dish pointing, LNB and dual LNB	✓
Terrestrial remote power supply	✓
Satellite remote power supply – DISEQC	✓
SATCR EN50494, DCSS EN50607	✓
Ethernet	✓
USB	✓

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8.14.2 Specifications.

	TERRESTRIAL BAND	SATELLITE BAND
Frequencies		
Range	5-1005MHz	200-2400MHz
Resolution	Measurement 50KHz, display 1KHz	Measurement 1MHz, display 1MHz
Level measurements		
Dynamic range	20-120 dB μ V	20-120 dB μ V
Units	dB μ V, dBmV, dBm	
Accuracy	2dB +/- 0.05dB/°C	
Resolution	0,1dB	
Measurement filters	32 kHz	160 KHz
Standards	DVB-T/T2/T2lite, DVB-C/C2, DAB BG, DK, I, L, MN, carrier	DVB-S/S2, DSS PAL, SECAM, NTSC, carrier
Measures	RF Level/Power, C/N	
Spectrum analyzer		
Span	1 MHz to full span 1, 2, 5 step	
Speed	100 ms mini, 1000 ms maxi	
Filters (according to span)	1.6kHz, 3.2kHz, 8kHz, 16kHz, 32kHz, 80kHz, 160kHz, 320kHz, 800kHz, 1.6MHz, 3.2MHz	
Attenuator	Automatic or manual (0 - 55 dB con paso de 5 dB)	
Dynamic range (display)	60 dB (10 dB/div)	
Multipath DVB-T/T2/C2		
Dynamic range	DVB-T : 50 dB, -75km +75km (8k) DVB-T2 : 50 dB, -75km +75km (8k) DVB-C2 : 50 dB, -35km +35km (4k)	
Units	μ s, km, miles	
Constellation View		
	Sí, Standards DVB-T/T2/T2 Lite, DVB-C/C2, DVB-S/S2, DSS	
Measurement Map		
Capacity	Scanning of 50 setups maximum.	
Display	Text table	
TV MPEG		
Digital multiplex (not encrypted)	MPEG2 SD (standard definition) MPEG4 HD (high definition H.264)	
DVB-SI	SDT, LCN	
Sound	MPEG-1, MPEG-2, AAC, HE AAC, Dolby® Digital, Dolby® Digital Plus	

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8.14.3 Digital measurements.

DVB-T	
Bit Error Rate (BER)	CBER (before Viterbi BERi) VBER (after Viterbi BERo) UNC (lost packets PER) Noise margin.
Modulation Error Rate (MER)	15 - 35dB
Sensitivity	< 35dB μ V
Bandwidth	6MHz, 7 MHz, 8 MHz
FFT type	2k, 8k
Constellation	QPSK, 16QAM, 64QAM
Viterbi rate	1/2, 2/3, 3/4, 5/6, 7/8
Guard interval	1/4, 1/8, 1/16, 1/32
Spectrum inversion	auto
HP/LP – PLP – Data Slice	HP/LP
Standards	ETS 300-744

DVB-T2 / T2 Lite	
Bit Error Rate (BER)	LDPC (BERi) BCH (BERo) FER (frame error PER) Noise margin
Modulation Error Rate (MER)	15 - 35dB
Sensitivity	< 35dB μ V
Bandwidth	1.7MHz, 5MHz, 6MHz, 7 MHz, 8 MHz
Mode	SISO, MISO, PLP single or multiple
FFT type	1k, 2k, 4k, 8k, 16k, 32k + extended bandwidth
Constellation	QPSK, 16QAM, 64QAM, 256QAM
Guard interval	1/4, 1/8, 1/16, 1/32, 1/128, 19/128, 19/256
Spectrum inversion	auto
HP/LP – PLP – Data Slice	PLP
Standards	ETS 302-755

DVB-C J83A	
Bit Error Rate (BER)	BER (Before Reed Solomon BERo) UNC (lost packets PER) Noise margin
Modulation Error Rate (MER)	20 - 40dB
Sensitivity	< 55dB μ V
Symbol rate	1 to 7.224 Ms/s
Constellation	16 / 32 / 64 / 128 / 256 QAM
Spectrum inversion	auto
Standards	ETS 300-429

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DVB-C2	
Bit Error Rate (BER)	LDPC (BER _i) BCH (BER _o) FER (frame error PER) Noise margin
Modulation Error Rate (MER)	25 - 35dB
Sensitivity	< 55dB μ V
Bandwidth	6MHz, 8 MHz
Mode	PLP and data slice, single or multiple
FFT type	4k
Constellation	16 / 64 / 256 / 1024 / 4096 QAM
Guard interval	auto
Spectrum inversion	auto
HP/LP – PLP – Data Slice	PLP + Data Slice
Standards	ETS 302-769

DVB-S / DSS	
Bit Error Rate (BER)	CBER (before Viterbi BER _i) VBER (after Viterbi BER _o) UNC (lost packets PER) Link Margin (LKM)
Modulation Error Rate (MER)	0 - 20dB
Sensitivity	< 47dB μ V
Symbol rate	1 to 50Ms/s
Constellation	QPSK
Viterbi rate	1/2, 2/3, 3/4, 5/6, 7/8
Inversion spectrum	Auto
Standards	ETS 300-421

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DVB-S2	
Bit Error Rate (BER)	LDPC (BER _i) BCH (BER _o) PER Link Margin
Modulation Error Rate (MER)	0 - 20dB
Sensitivity	< 47dB μ V
Symbol rate	1 to 50Ms/s
Constellation	QPSK, 8PSK, 16APSK, 32APSK
Modulation	CCM, VCM
Code LDPC	QPSK : 1/2, 2/3, 3/4, 3/5, 4/5, 5/6, 8/9, 9/10 8PSK : 2/3, 3/4, 3/5, 5/6, 8/9, 9/10 16APSK : 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 32APSK : 3/4, 4/5, 5/6, 8/9, 9/10
Roll-off	0.20, 0.25, 0.35
Spectrum inversion	Auto
Standards	ETS 302-307 Part 1

MULTISTREAM	
ISI (stream number)	0 to 255
PLS (scrambling)	YES
Gold code	0 to 999999

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8.14.4 Divers.

REMOTE POWER SUPPLY	TERRESTRE	SATÉLITE
Voltage	5V/13V/18 V/24V 500 mA max (300mA for 24V)	13/18 V 500 mA max
DiSEqC		DiSEqC 2.1 control of dish motor switches committed & uncommitted bi-directionnal
Mini DiSEqC (22KHz)		22 kHz, ToneBurst
SCD /SATCR EN 50494 Single cable satellite distribution		8 slots max automatic detect (pilots detect)
SCD2 EN 50607 Single cable satellite distribution v2		32 slots max code PIN, adjustable slot bandwidth automatic detection (bi-directionnal Diseqc)

STORAGE	
Memory	Internal on non-volatile memory, or external USB stick (not supplied)
Data saved	measurements (level, BER/MER, Measurement Maps, Spectrum,...)
Capacity	About 150 files

INPUTS / OUTPUTS	
RF input	75 Ohms, F male possible adaptators F-F, F-BNC, F-IEC maximum available voltage : 50V DC, 33V RMS / 50Hz
A/V analog video input	JACK 3.5mm, multipole 4 poles video : 75 Ohms, 1Vpp max
Interfaces	USB A, Ethernet 10/100baseT (RJ45)
DC supply input	jack 5.5 mm 15 V max, 1 A max

8.14.5 General specifications.

GENERAL SPECIFICATIONS				
Screen	LCD TFT color 7 inch. 16/9 Luminosity 500cd/m ² 800x400 pixels Touch capacitive			
External power supply	Main adaptator 110/230VAC 5,5 mm Jack 15V 1A			
Battery	Ion-Litio 33W		Ion-Litio 93W	
Autonomy (1)	DVB-T no remote supply 2H Typical	DVB-S2 with remote supply 13V/180mA 1H 30 minutes typical	DVB-T no remote supply 6H Typical	DVB-S2 with remote supply 13V/180mA 4H 30 min typical
Charging time	2 hours for reaching 80% 3 hours for reaching 100%		9 hours for reaching 80% 10 hours for reaching 100%	
Operating temperature	-5°C a 40°C			
Charging temperature	0°C a 35°C			
Storage temperature	-10°C a 60°C			
EMC and safety	NF EN 61326-1(2013) y NF EN 61326-2-1(2013) B class, basic electromagnetic environment NF EN 61010-1			
Dimensions	250 x 165 x 65 mm			
Weight	1,350 kg		1,650 kg	

(1) The range is calculated at 25°C, with the brightness of the display reduced, no ethernet or USB connected and volume at 10%.

8.15 dB μ V, dBmV and dBm conversion.

- dB μ V is a logarithmic ratio between a measured voltage "Ud" and a reference voltage "Ur". The reference voltage is Ur = 1 μ V

$$N = 20 \log (Ud/Ur)$$

- dBmV is a logarithmic ratio between a measured voltage "Ud" and a reference voltage "Ur". The reference voltage is Ur = 1mV.

$$N = 20 \log (Ud/Ur)$$

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- dBm is a logarithmic ratio between a measured power "Pd" and a reference power "Pr". The reference power is Pr = 1mW 75 Ohm.

$$N = 10 \log (Pd/Pr) \text{ with } Pd = Ud^2 / 75$$

$$Ud = 1 \mu V \quad N = 0 \text{ dB}\mu V \quad N = -60 \text{ dBmV} \quad N = -108.75 \text{ dBm}$$

$$Ud = 1 \text{ mV} \quad N = 60 \text{ dB}\mu V \quad N = 0 \text{ dBmV} \quad N = -48.75 \text{ dBm}$$

$$Ud = 1 \text{ V} \quad N = 120 \text{ dB}\mu V \quad N = 60 \text{ dBmV} \quad N = 11.25 \text{ dBm}$$

8.16 Typical values for measurements.

MEASUREMENTS	Level, power (dBμV)		C/N (dB)	BER	MER (dB)	Modulation
	Min.	Max.				
TERRESTRIAL						
Analog TV	57	74	>45	-	-	-
FM	50	66	>38	-	-	-
DAB/DAB+	35	70		BER<2 ^E -4	-	2K
DVB-T	35	70	>26	VBER<2 ^E -4	>26	8K, 64QAM, 1/32, 2/3
DVB-T2	35	70	>22	FER<2 ^E -7	>22	32K, 256QAM, 1/8, 2/3
DVB-C	57	74	>31	BER<2 ^E -4	>31	64QAM
SATELLITE						
DVB-S / DSS	47	77	>11	VBER<2 ^E -4	>11	QPSK, 3/4
DVB-S2	47	77	>8	PER<1 ^E -7	>8	8PSK, 2/3

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