Operation manual

DIGIMETER 9

Measuring device for DVB-S2, DVB-C, DVB-T2, DVB-T, UKW, DAB+

TechniSat

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GET TO KNOW YOUR DIGIMETER 9

! CAUTION ! Fully charge the battery before using it for the first time (approx. 6-8 hours)!

FRONT PANEL

NB: The MENU (functions and Graphics) an be change without advise.

• POWER

To turn on press the 'HOME' key.

To turn off press and hold the 'HOME' key

• WHEEL

Use the wheel to navigate across the screen and adjust the values

Rotate to select a menu item or to change a value

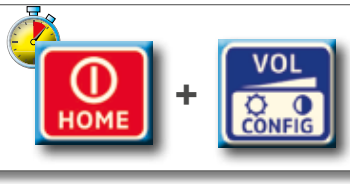
Press to select a menu item or a numeric field,

Select a menu item, press and hold 2" to display the pop-up menu.

• RESET HARDWARE

With instrument ON, Keep the "HOME" key pressed for 10" and turn on again.

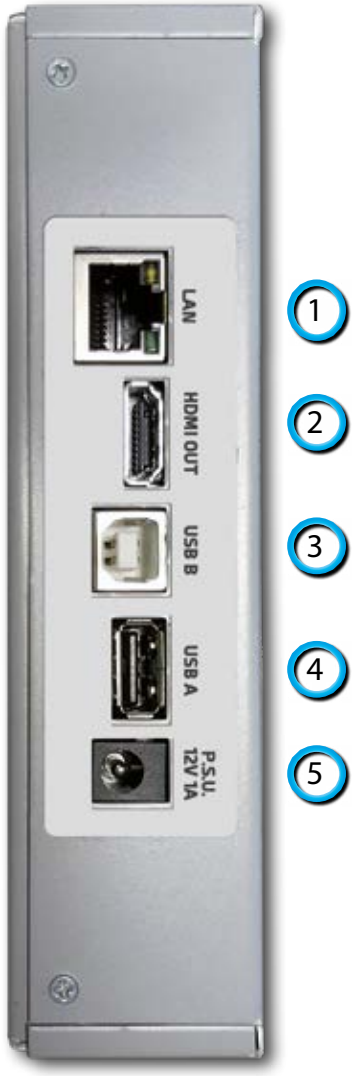
• RESET SOFTWARE



From instrument OFF, Switch on the meter, immediately after keep the "VOLUME" key pressed until a beep is heard.

SIDE PANELS

• LEFT SIDE



• RIGHT SIDE

• TOP SIDE

1. = LAN Eternet RJ45
2. = HDMI Output
3. = USB B SW upgrades
4. = USB A memory stick
5. = Power Supply input (12 V DC - 2A)
6. = Fan
7. = Analog video IN (CVBS)
8. = Remote Power Supply switch DC at RF IN ON/OFF
9. = IF/RF IN “F” 75 Ω
10. = OPTIC IN: SC connector

MULTI-PURPOSE BAG

Make work easier by taking advantage of your multi-purpose bag.

1 Work safely and without restrictions with both hands free.

Connect the shoulder strap to the two hooks at the corners of the bag (top left and bottom right), so you can hang your meter around your neck leaving both hands free. 2

3 The sunlight shield flap allows improved visibility of the high brightness display.

Secure your meter by connecting it to the antenna mast or in your car using the practical ring belt with quick attachment. 4

5 If you change the configuration of the shoulder strap, you can easily carry the meter vertically by your side.

You can also carry your instrument using its practical handle. 6

7 You can use the bag's convenient stand flap for operation on a counter.

HOME AND NAVIGATION

'HOME' SCREEN

Press the 'HOME' key to go to the home screen, then rotate the wheel to navigate on 'SAT', 'TV' or 'CATV' icons and press the wheel to select the measurement mode required.

Press the 'HOME' key at any time to return to the home screen

NAVIGATION

Use the touch screen and the wheel to navigate across the screen and to change values

DISPLAY ZONES

1. tuning parameters
2. live picture
3. measurements
4. channel info
5. transport stream info
6. context sensitive menu

NAVIGATION USING MECHANICAL COMMANDS

How to select from the menus and adjust the value:

- Rotate the wheel and select from the menu required (fig. 1)
- Press the wheel (fig. 2)
- Rotate the wheel to adjust the value (fig. 3)
- Press the wheel and confirm the selection (fig. 4)

Example of TV/CATV channel selection:

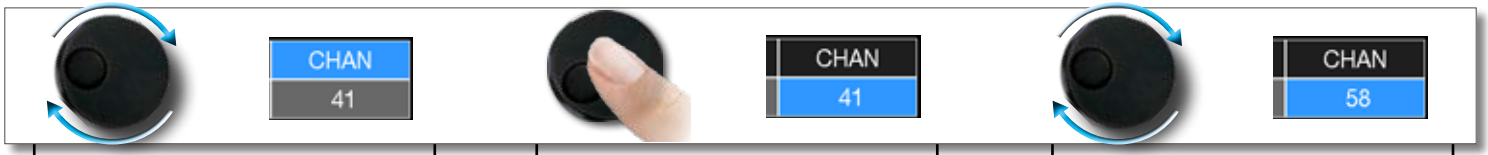


fig. 1 fig. 2 fig. 3

Example of SATELLITE transponder selection (TP/TS):

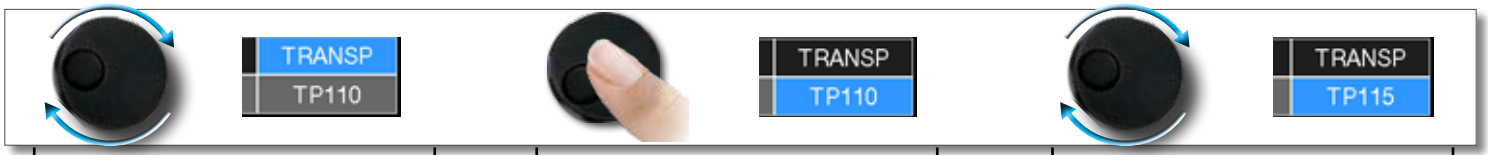


fig. 1 fig. 2 fig. 3

Example of remote TV-CATV power supply selection (DC&RF):

fig. 1 fig. 2 fig. 3 fig. 4

How to select from the menus and change a value using the drop down menus:

- Rotate the wheel and select the menu required (fig. 1)
- Keep the wheel pressed for 2" to visualized the drop down menu (fig. 2)
- Rotate the wheel to adjust the value (fig. 3)
- Press the wheel and confirm the selection (fig. 4)

Example of TV/CATV channel selection:

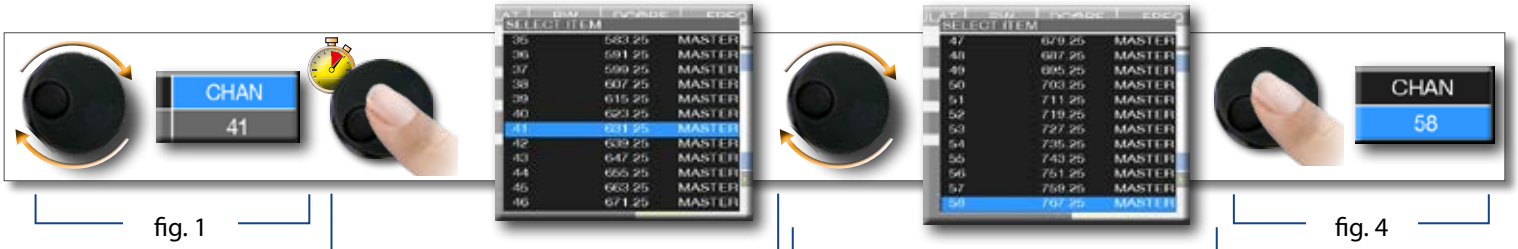


fig. 1 fig. 2 fig. 3 fig. 4

Example of SATELLITE transponder selection (TP/TS):

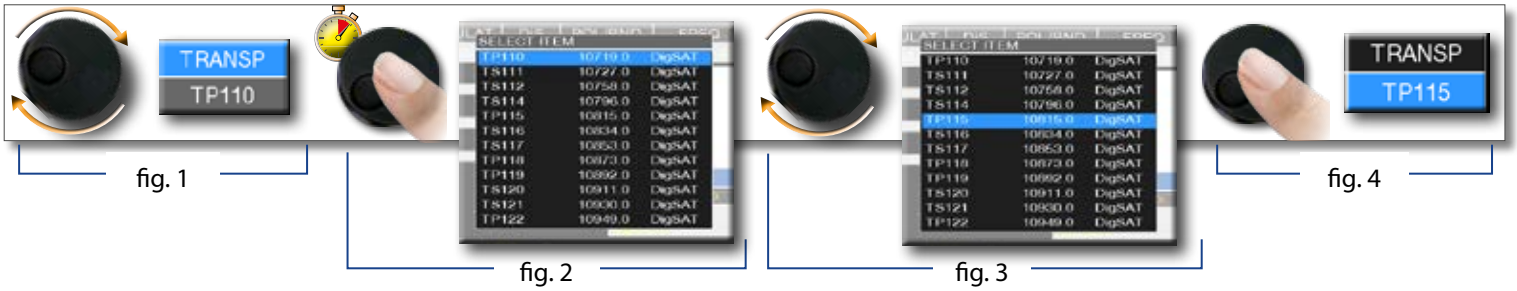


fig. 1 fig. 2 fig. 3 fig. 4

How to select the frequency and set the value using the numerical keyboard:

- Rotate the wheel and select frequency (FREQ) (fig. 1)
- Keep the wheel pressed for 2" to visualize the keyboard (fig. 2)
- Press the relative number keys to digit the frequency value required, rotate the wheel to navigate within the window (fig. 3)
- Finally rotate the wheel and select enter (fig. 4)
- Press the wheel and confirm the selection (fig. 5)

Example of manual frequency (FREQ) selection:

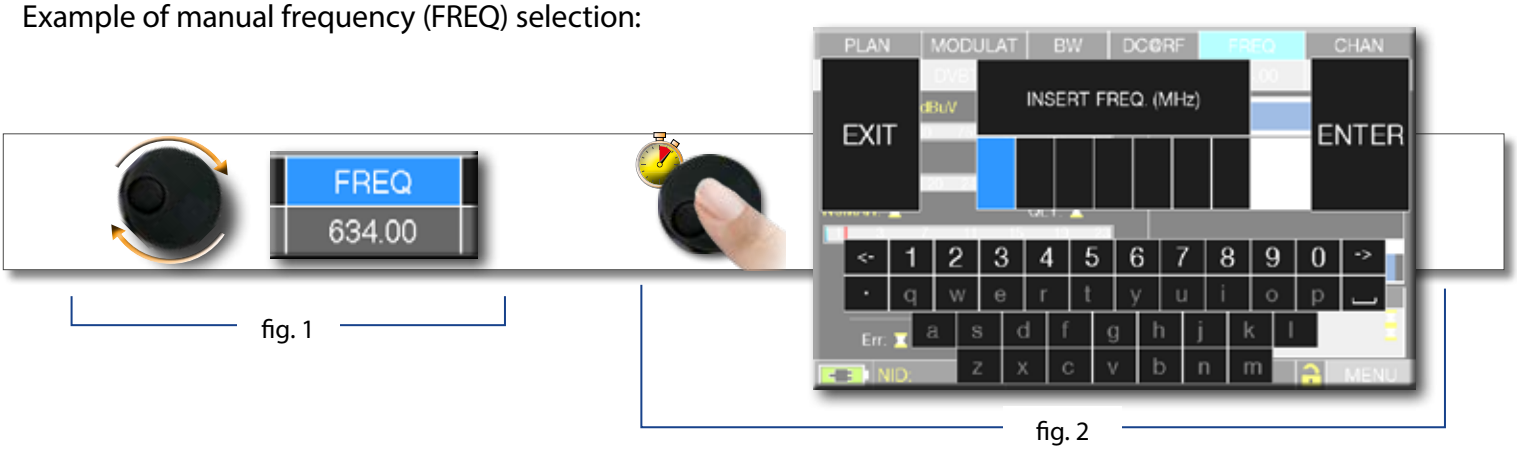


fig. 1 fig. 2

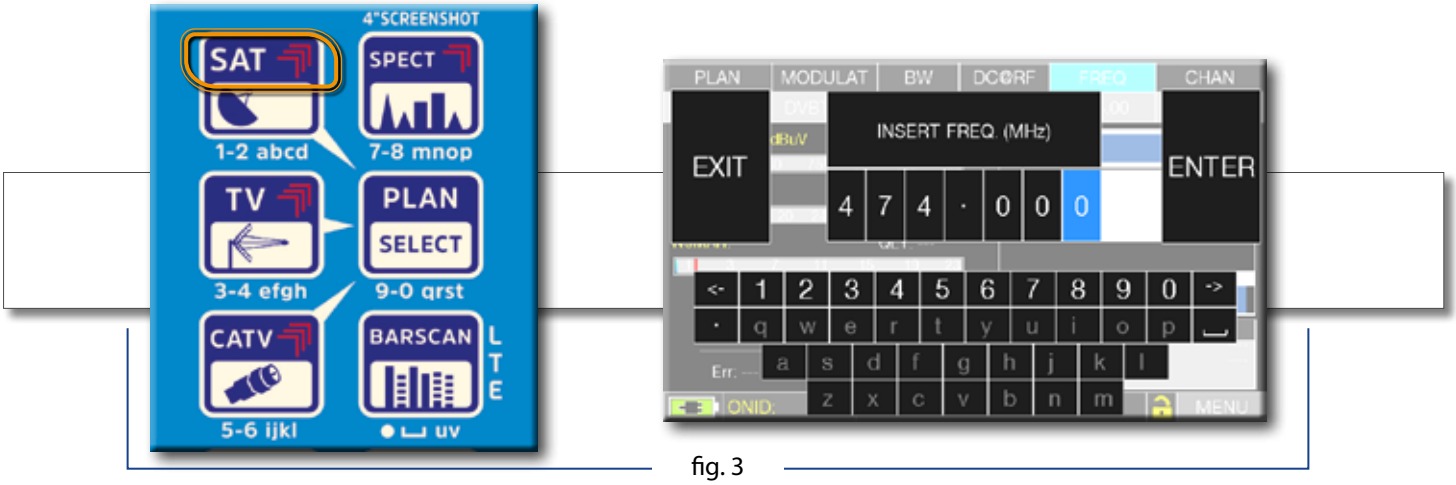


fig. 3

fig. 4

fig. 5

NAVIGATION USING MIXED COMMANDS: MECHANICAL & TOUCH

- Touch a value in the menu (fig. 1)
- Rotate the wheel to adjust the value (fig. 3) or touch the value required (fig.2)
- Press the wheel and confirm the selection (fig.3)
  or touch the monitor outside the drop down menu (fig.3)

Select from the menus and adjust the value using the drop down menu:

- Touch a value in the menu to visualize the drop down menu (fig. 1)
- Rotate the wheel to adjust the value (fig. 2) or touch the value required (fig. 2)
- Press the wheel and confirm the selection (fig. 3), or touch the monitor outside the drop down menu (fig. 3)

Example of TV channel selection:

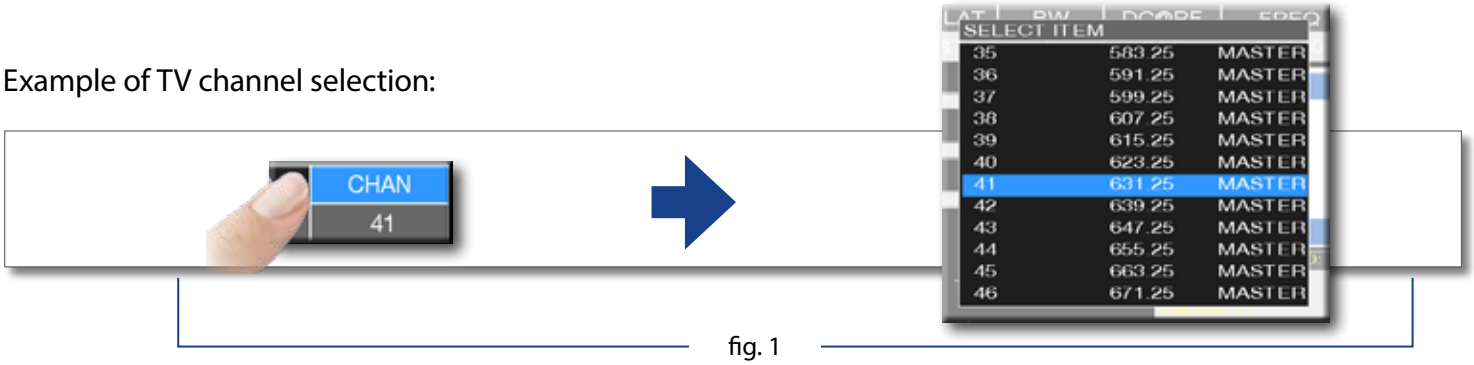


fig. 1

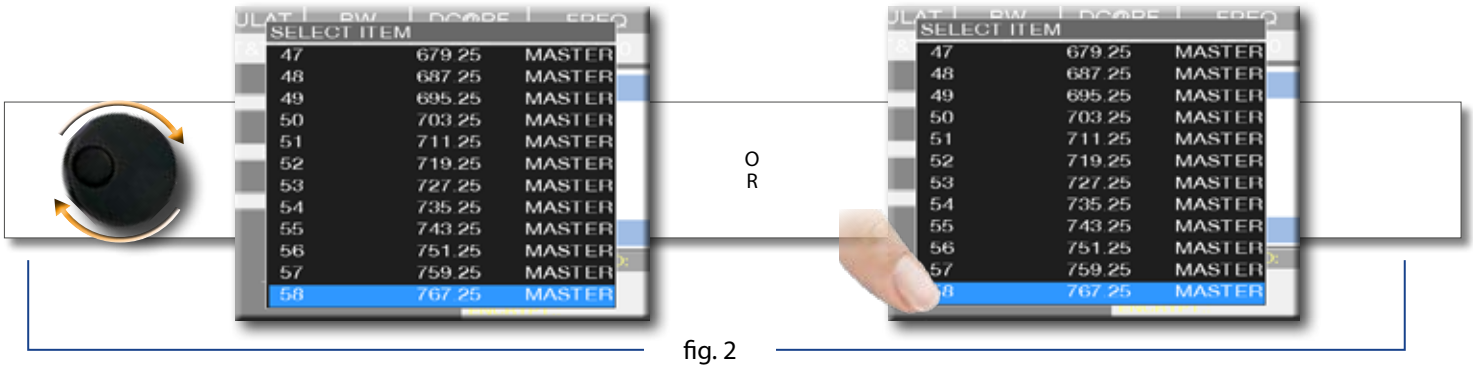


fig. 2

fig. 3

Example of SATELLITE transponder selection (TP/TS):

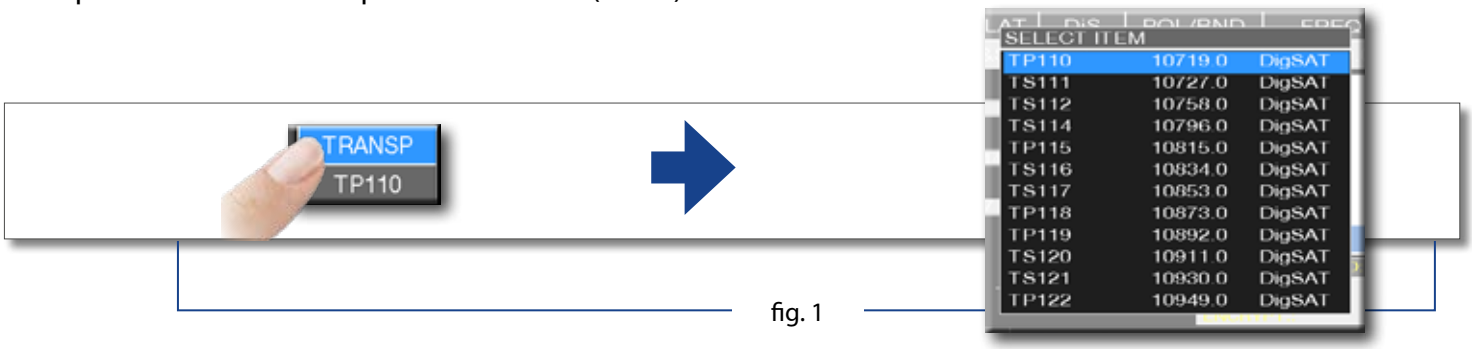


fig. 1

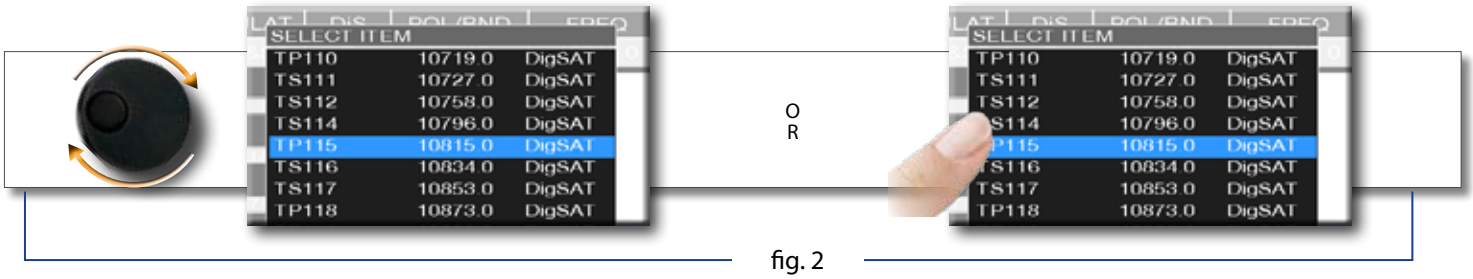


fig. 2

fig. 3

Select the frequency and set the value using the numerical keyboard:

- Touch FREQ to show the menu “INSERT FREQ” (fig. 1)
- Touch the numbers to digit the required frequency value (fig. 2)
- Finally touch enter and confirm the selection (fig. 3)

Example of manual frequency selection (FREQ):

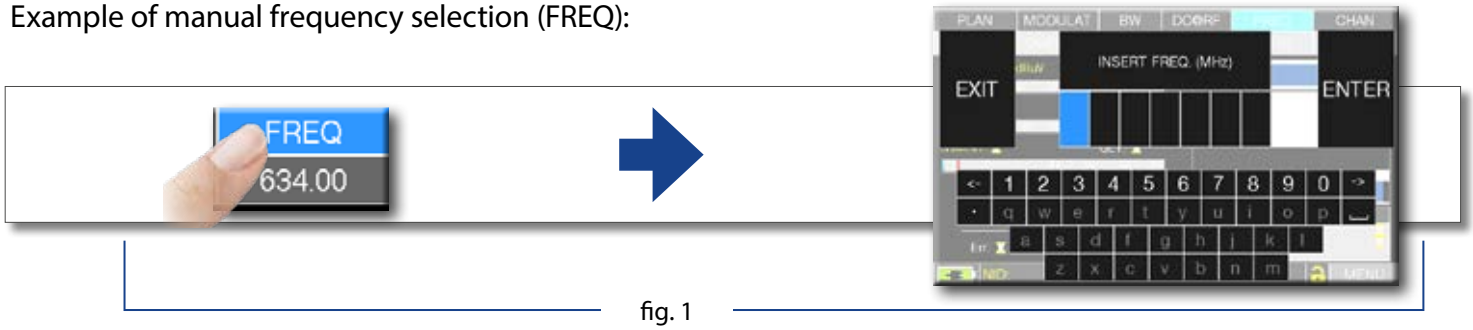


fig. 1

fig. 2

fig. 3

CONFIGURATION

Volume selection is immediately active, press "ENTER" for the Display configuration and other important settings

VIDEO IN AND HDMI OUT

- "HDMI OUT" (connector 2): Connect an HDMI cable to automatically send the TFT monitor pictures to a TV or video projector. The video will only be available on an external display;
- "VIDEO IN" (connector 7): Select "EXT" to visualize an external video source.

BATTERY SAVING AND TIMER OFF

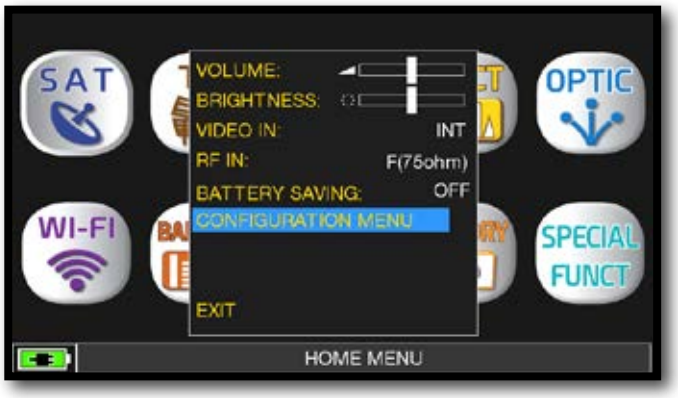
Settings for battery save mode.

Choose "BATTERY SAVING" from the volume screen. In ON mode, if no key is pressed, after 30 seconds, the display brightness is reduced and after 5 minutes the meter automatically turns off. press any key to temporarily reset the battery save mode.

Touch "CONFIGURATION MENU" then "METER" in the volume screen and set the "TIMER OFF" value required. The meter will turn off after 5, 10, 15 or 30 minutes of inactivity. Press any key to interrupt the automatic turn-off.

TOUCHSCREEN CALIBRATION

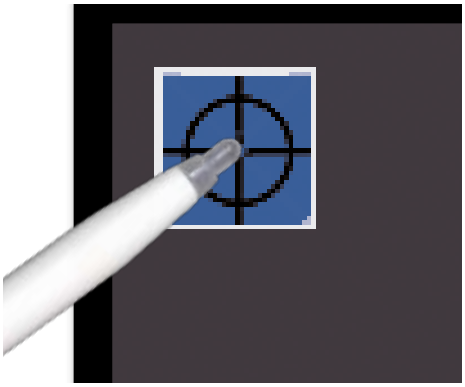
if the touchscreen does not respond to the commands, it may be necessary to calibrate:



Touch “CONFIGURATION MENU”
from the volume window;

Touch “METER”
then “CALIBRATE TOUCHSCREEN”;

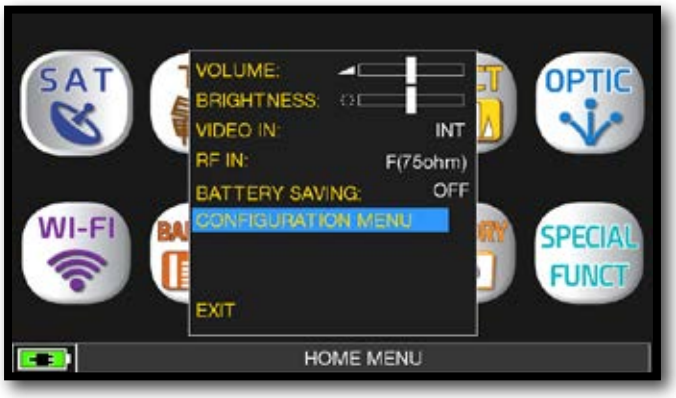
Touch the center of the squares that appear
in the corners of the screen,
repeat four times for every squares.



NOTE: use the pen and touch the the screen exactly in the center of the circle. if you do not carry out this procedure correctly the touch commands may be inaccurate.

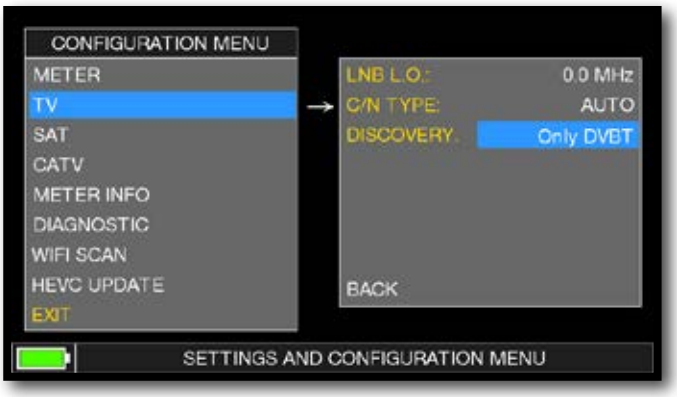
DISCOVERY

Identifies the modulation of a tuned TV channel in the TV master PLAN



Touch the “CONFIGURATION MENU”
in the VOLUME window.

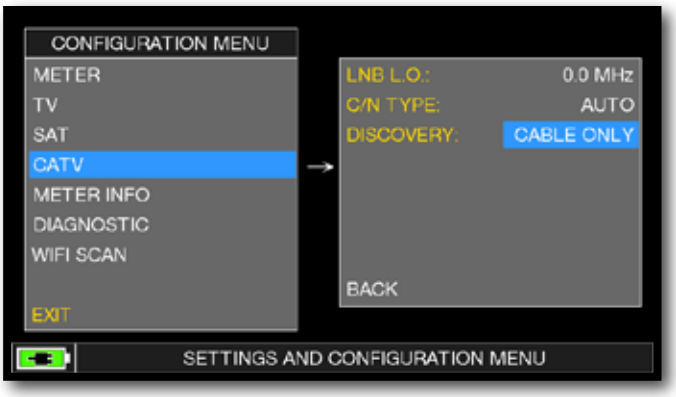
TV MODE



Touch “TV” and then “DISCOVERY”
and set the identification mode:

- ONLY DVBT (only digital DVB-T/T2 signals);
- DVBT&C +AnTV (digital DVB-T/T2/C & TV analogic signals);
- DVBT + AnTV (Digital DVB-T/T2 & TV analogic signals).

CATV (CABLE) MODE



Touch “CATV” and then “DISCOVERY”
and set the identification mode:

- CABLE ONLY
- TERR & CABLE

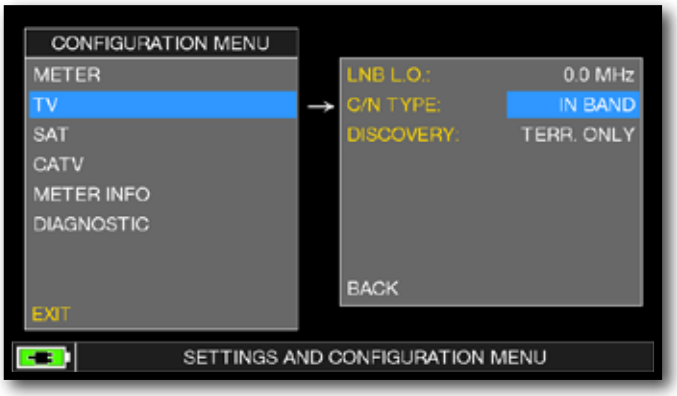
NOTES:

- DISCOVERY mode is active only if the antenna cable is connected to the instrument
- DISCOVERY mode is not active if you use a manual (ManuMemory Mix) or automatic memory plan (Automemory TV)

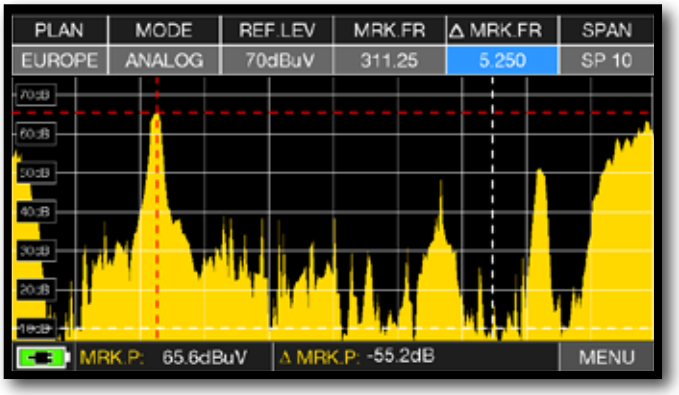
C/N TYPE

Set the measurement mode of the carrier noise ratio “C/N” (in band-out band).

Touch ‘CONFIGURATION MENU’ from the volume screen.

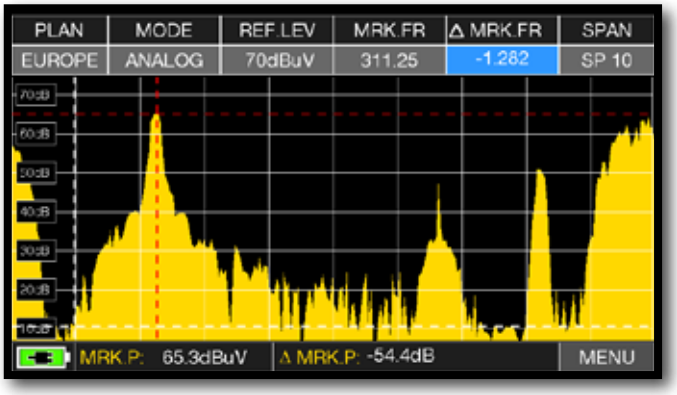


Touch “TV” then “C/N TYPE”.



C/N measurement mode “IN BAND”:

the signal/noise ratio is measured between the signal level of the video carrier (signal/carrier, red marker) and the noise level, estimated in the band between the coloured subcarrier and the audio carrier (white marker).



C/N measurement mode “OUTSIDE THE BAND”:

The signal/noise ratio is measured between the signal level of the video carrier

(signal/carrier, red marker) and the noise level estimated in the guard band

(-1.282 MHz from the video carrier, white marker).

NOTE: the “C/N TYPE” setup is available in TV and CATV mode.

SCREEN SHOT

The “SCREEN SHOT” function allows you to directly save the TFT monitor screens in an external memory.

- Connect an external memory source (not provided) to the USB A socket.
- Set the instrument on the screen to be saved: Spectrum, Measurements, Constellation, Echoes etc.
- Press the SPECT (4” Screenshot) key for 4 seconds keys and wait for file to be saved: the instrument will make a series of beeps.
- Digit the file name and touch ENTER.

N.B.:

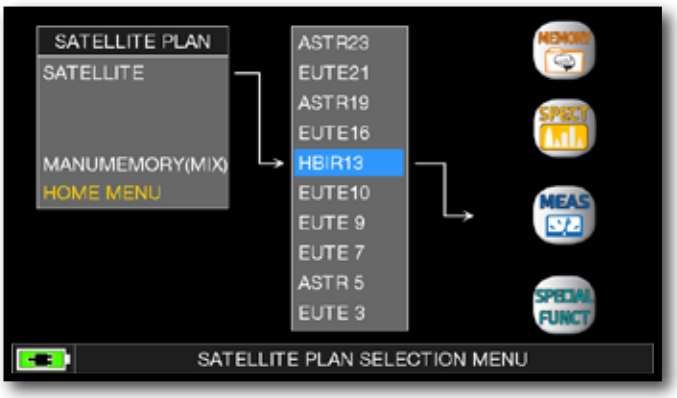
- If the memory is not inserted correctly, or is not recognised, the following message will be shown: “PLEASE INSERT USB MASS STORAGE DEVICE”.
- Full screen picture zooms can not be saved.
- the ENTER command is not active If the file name is already present in the external memory source.
- The files are saved in .bmp (bitmap) format.

SAT MEASUREMENTS

or

Press the “HOME” key.

Touch “SAT”, and then “PLAN” or use the encoder to obtain the Satellite list.



Touch directly the desided satellite, or use the encoder. At the end touch “MEAS” to make the measure or “SPECT” for visualize the spectrum.

NOTE:

The chosen Satellite and Transponder will remain in memory also if you change mode (TV/CATV) or if you switch off the meter.

DVB-S, DVB-S2 & S2M SAT MEASURES

Press the “HOME” key.

Touch “SAT” and then “MEAS & PICT” or use the encoder.

Main measures and image.

RELATED FUNCTIONS

Press repeatedly to navigate into SAT measures screens: Measures, Constellation.

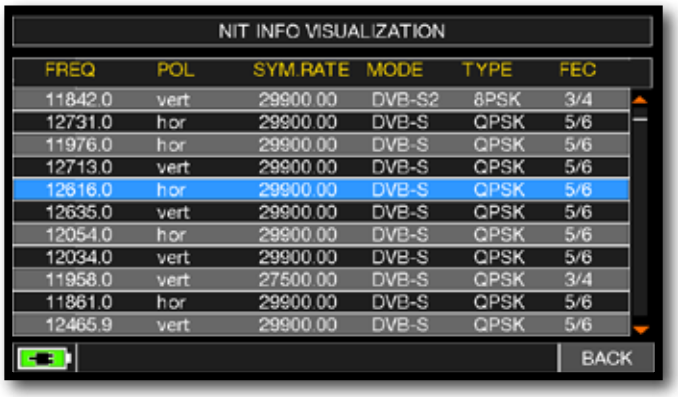
Press to enter in the spectrum.

VISUALIZE NIT

Touch “MENU&?” from the “MAIN MEASUREMENTS & PICTURES”.

Touch “VISUALIZE NIT”.

Example 1:



“NIT INFO VISUALIZATION” referring to an HOTBIRD 13° East transponder

NOTE:

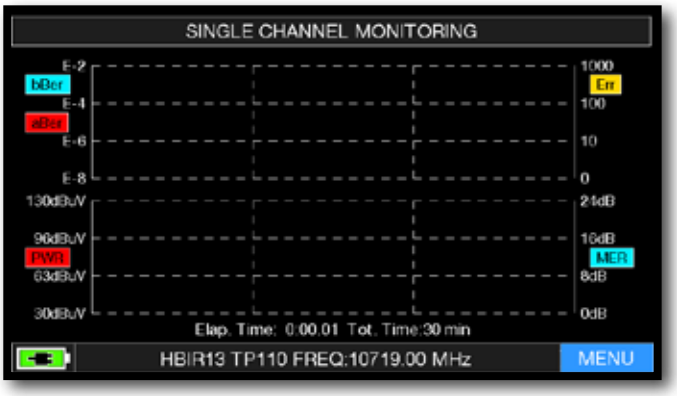
The function VISUALIZE NIT is available also in TV & CATV mode

CHANNEL MONITOR

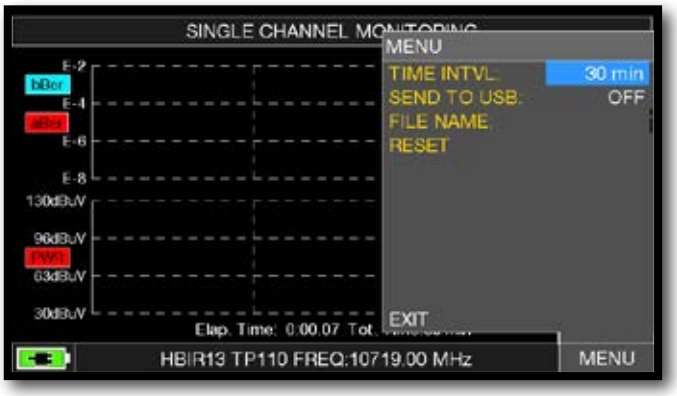
The weekly application of SW CHANNEL MONITOR allow you to controland register the trend of the main parameters of a digital signal over time (from 30 minutes to one week): TV, CATV & SAT. This application is indicated to resolv the reception problems which occur occasionally, it allow you also to measure, memorize and visualize (local or in remote) the digital signals parameters tested: DVB-S/T/C = Power, MER, ERROR, bBer, aBer; DVB-S2 / T2 / C2 = Power, MER, ERROR, aBer, Lber, PER, LDCP.
Every registered parameters is graphically represented on the display using differents colours for a easy identification.

Touch “MENU” from MAIN MEASURES & IMAGES screen.

Touch “CHANNEL LOGGER”.

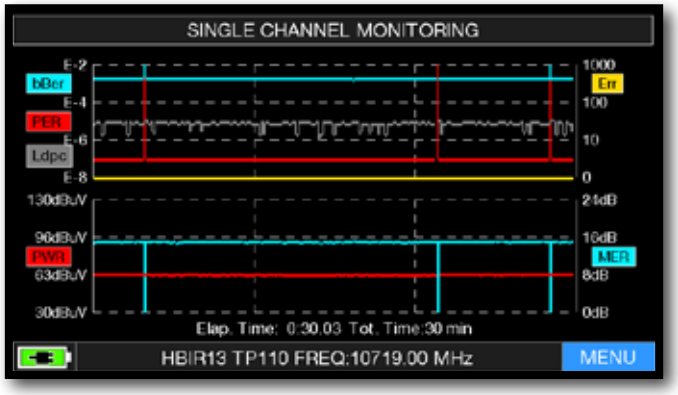


Touch “MENU”.



Select the time interval (TIME INTVL) and where you want to store the file, either in the meter’s memory, or in the USB memory stick (send to USB-ON), with the relative file name (File name).

Example 1:



SINGLE CHANNEL MONITORING: 30 minutes.

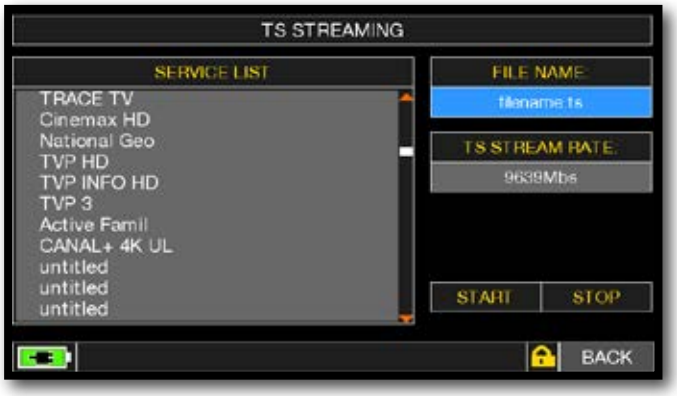
NOTE: the Channel Monitor function is available also in TV and CATV mode.

TS STREAMING (opt.)

The SW TS STREAMING application allows you to record the information contained in the Transport stream in an external USB memory.

Insert a USB memory into the instrument's USB-A port. Touch "MENU" from the MAIN MEASUREMENTS and IMAGES screen

Touch "TS STREAMING"



Touch "FILE NAME" and type, using the keyboard, the name of the Transport Stream file to be recorded. If the USB memory is not inserted, the word "INSERT USB" appears.

Touch the Services whose Video Stream you want to save and all the Transport Stream information.

Touch "STOP" to end the recording

NOTE: if no service is selected the relative video streams will not be recorded but the remaining Transport Stream information will be recorded:
Audio Stream, MPEG Tables, TXT, etc ...

NOTE: the TS STREAMING function is also available in TV and CATV mode.

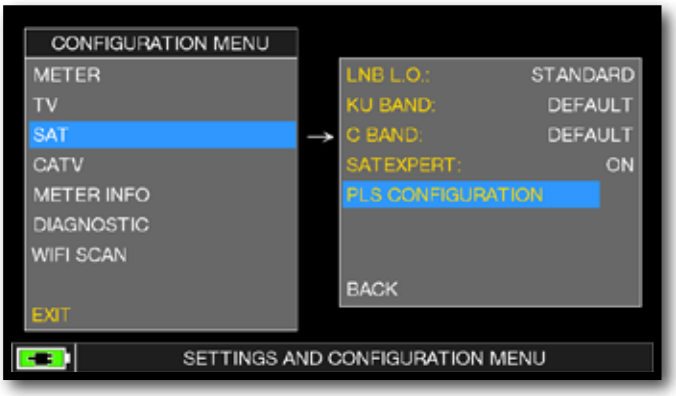
DVB-S2M SIGNAL: ISI SELECTION

Touch “MENU” on the main measurements and picture screen

Touch “ISI #” and select the ISI (Transport Stream) required

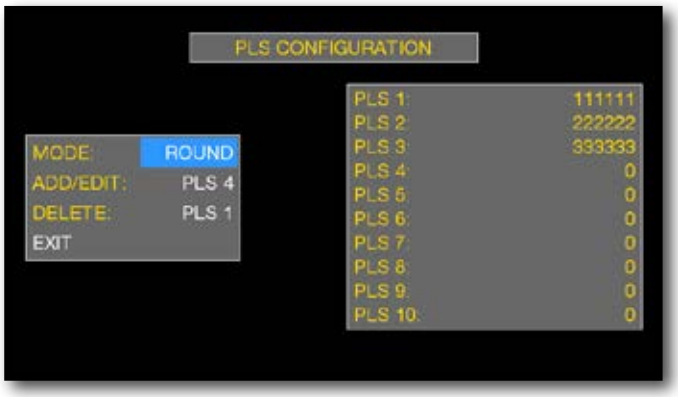
PLS CONFIGURATION

Touch “CONFIGURATION MENU” in the volume window



Touch “SAT” and select “PLS CONFIGURATION”

Example 1:

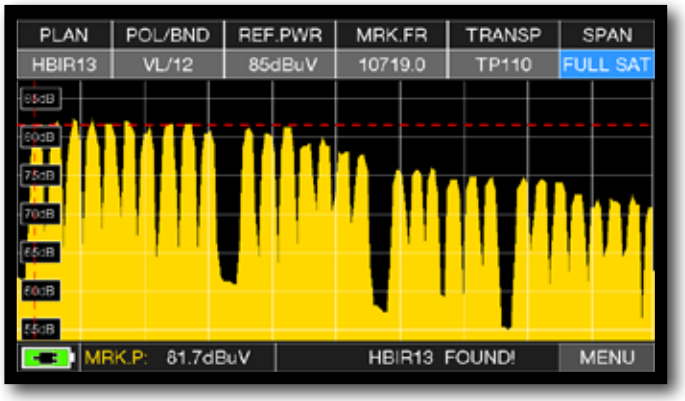


Select the PLS required and set the parameters

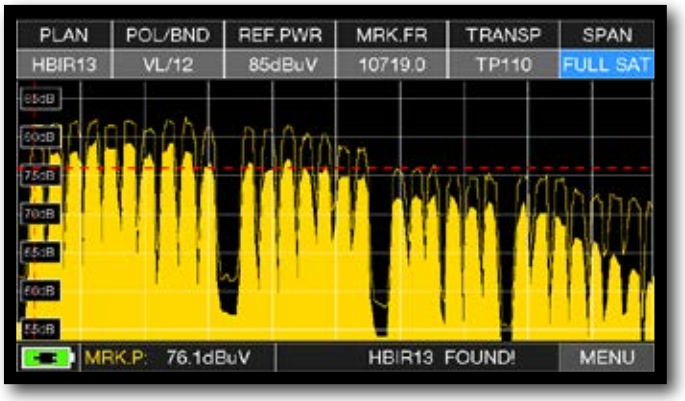
SPECTRUM ANALYZER

Press the “HOME” key.

Touch “SAT” and then “SPECT”or use the encoder.



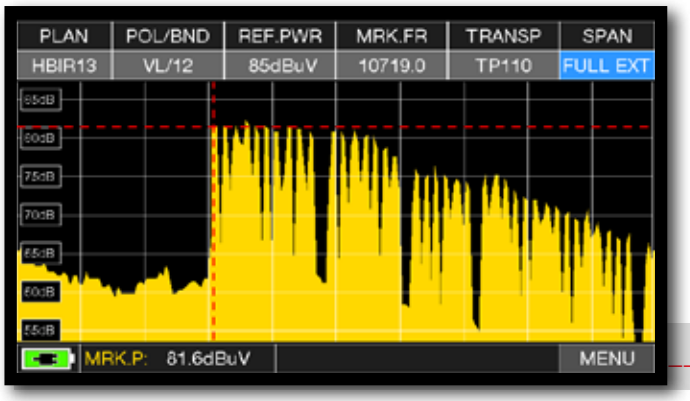
SAT SPAN FULL SAT Spectrum (from 930 to 2250 MHz).



Press again the SPECT key to activate the “MAX HOLD” function.

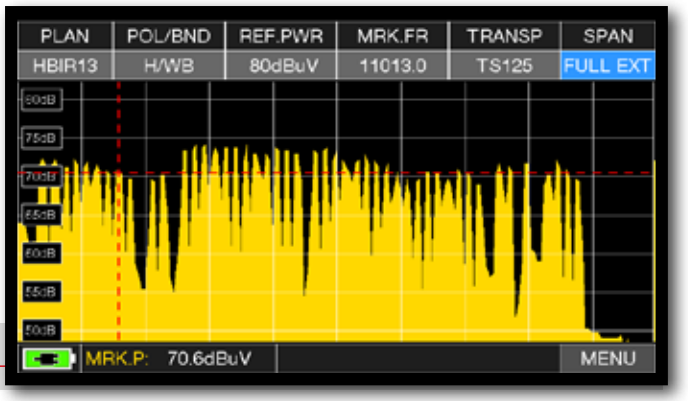
Touch “SPAN” and rotate the encoder to select the SPAN value desired:
10-20-50-100-200-500-FULL SAT-FULL EXT

Example 1:



“SAT” spectrum SPAN FULL EXT (from 230 to 2610 MHz) with universal LNB.

Example 2:



“SAT” spectrum SPAN FULL EXT (from 230 to 2610 MHz) with LNB WIDE BAND.

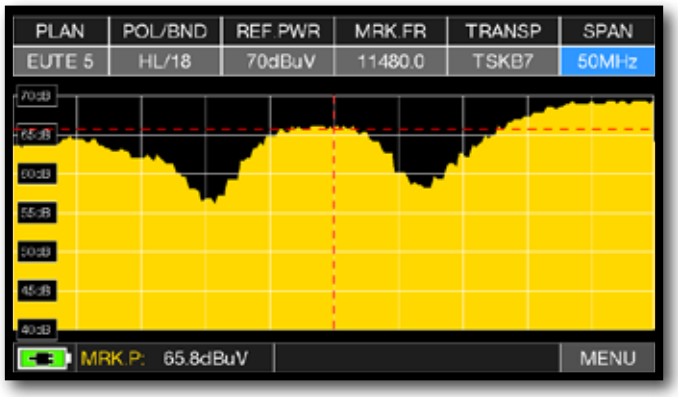
RBW FILTER

The RBW (Resolution Bandwidth) filter function determines the bandwidth of the bandpass filter, which is used to generate the spectrum of the input signal (IF).

This bandpass filter works like a window: the smaller the bandwidth, the more detailed is the representation of the spectrum. However, a smaller value RBW provides a slower refresh rate of the spectrum.

You can choose (high resolution, slower refresh rate) between the RBW filter between a bandwidth of 1 MHz or 5 MHz (lower resolution, fast refresh rate).

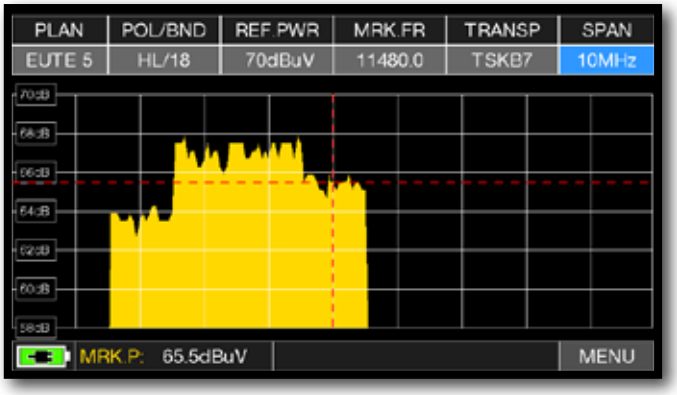
EXAMPLE 1:



Visualization of an SCPC transponder with settings:
"RBW FILTER 5 MHz" and "dB DIV 5dB" (Span 50 MHz)

Touch "MENU&?" from the SAT SPECTRUM screen, select "dB DIV 2dB" and "RBW FILTER 1 MHz".

EXAMPLE 2:



Visualization of a SAT SCPC transponder (SPAN 10 MHz).

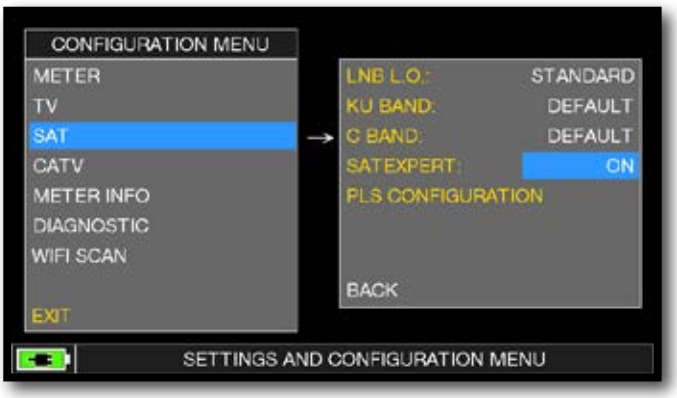
NOTE: You can only select RBW filter in SAT mode.

SAT EXPERT

The SATEXPERT SW function (guided satellite tracking function), is a valuable aid for a fast satellite antenna pointing to a wanted satellite.

Through text messages, which appear from time to time on the screen, the measuring instrument will indicate in which direction to move the satellite dish, to the east or to the west, until you reach the wanted satellite.

Touch “CONFIGURATION MENU” from the VOLUME screen

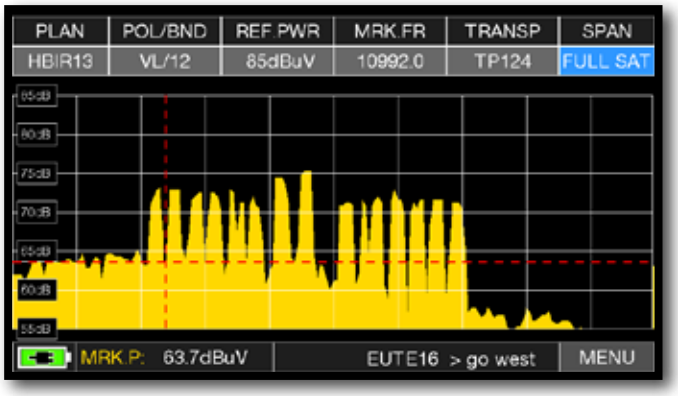


Touch “SAT”, then in “SAT EXPERT” and select “ON”

In SAT mode, press the PLAN key and select the satellite to be pointed, for example HBIR 13.
Press the SPECT key, touch “SPAN” and select “Satxprt”.

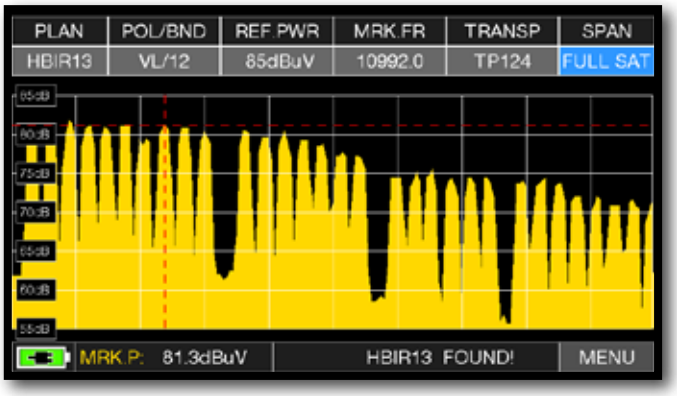
Here you can find some examples:

EXAMPLE 1:



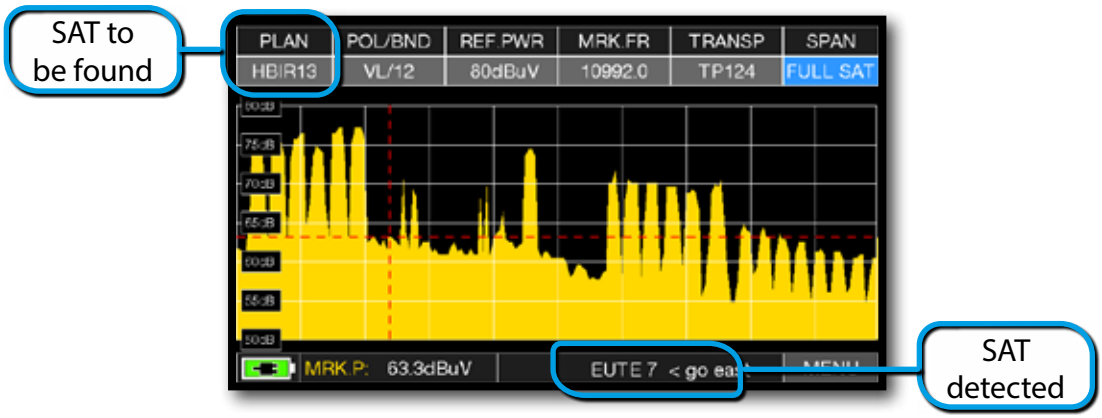
The satellite you have pointed is not correct.
the lower part of the display shows the following information:
EUTE 16 > GO WEST
(move the satellite dish west).

EXAMPLE 2:



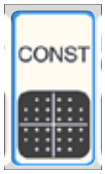
Satellite found.
the lower part of the display shows the following information:
HBIR13 FOUND!
(the satellite that has been pointed is correct)

EXAMPLE 3:



The pointed Salellite is not the correct one.
The lower part of the display shows the following information:
EUTE7 < GO EAST (move the satellite dish EAST).

IMPORTANT: The text messages that from time to time will appear on the screen of the instrument when moving the satellite dish to east or west, are bounded to the diameter of the used antenna: 60-80-90 cm etc.
Therefore, using antennas with a small diameter, the messages related to some satellites may not be reported.



CONSTELLATION ANALYSIS

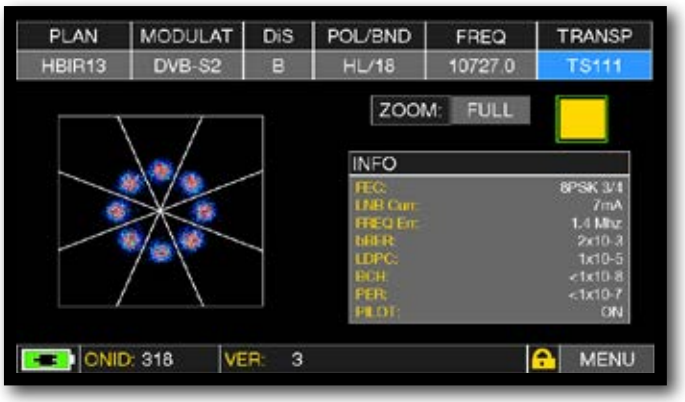
Press the “HOME” key.

Touch “SAT” and then “CONST” or use the encoder.

Example 1:

QPSK constellation.

Example 2:



8PSK constellation.

Touch “FULL and select the zone of constellation to elnarge.

RELATED FUNCTIONS

Press repeatedly to navigate into SAT measures screens: Measures, Constellation.

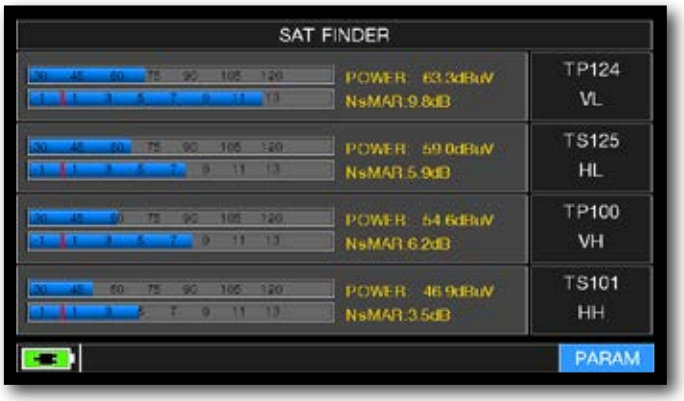
Press to enter in the spectrum.

SAT FINDER

The SAT FINDER function allow you to check the quality of 4 transponders simultaneity and to check the operation of the 4 LNB polarities.

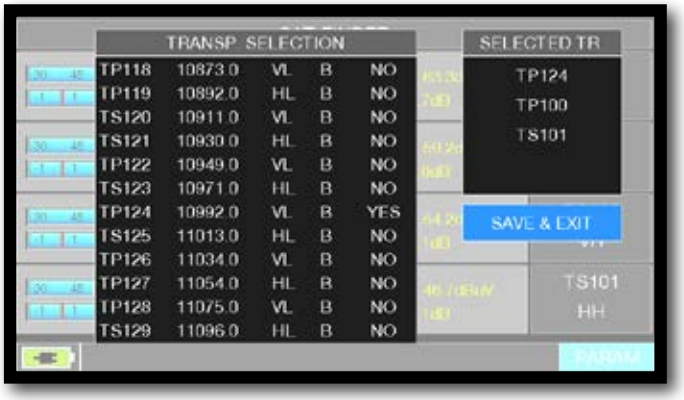
Press the "HOME" key.

Touch "SAT" and then "SAT FINDER" or use the encoder.

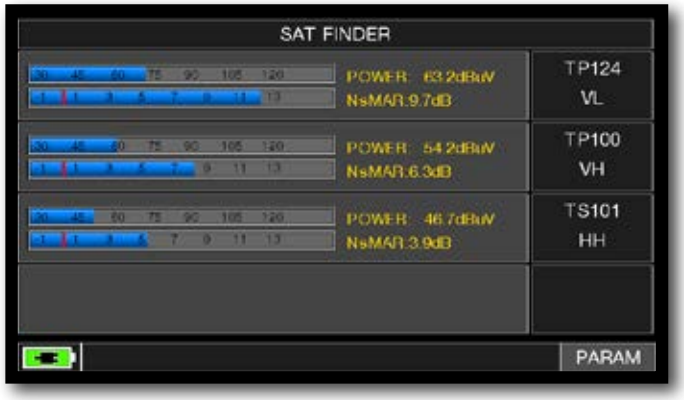


Satellite locked.

Touch "PARAM" to modify the transponders list.



Touch the selected transponder, touch YES/NO to added or delete from list.
Touch "SAVE & EXIT" to save and exit.



Satellite locked.

If the chosen satellite is found the buzzer will start, if this does not happen, continue looking for the right satellite. Optimize the dish alignment and skew to obtain the maximum NsMAR value (noise margin).

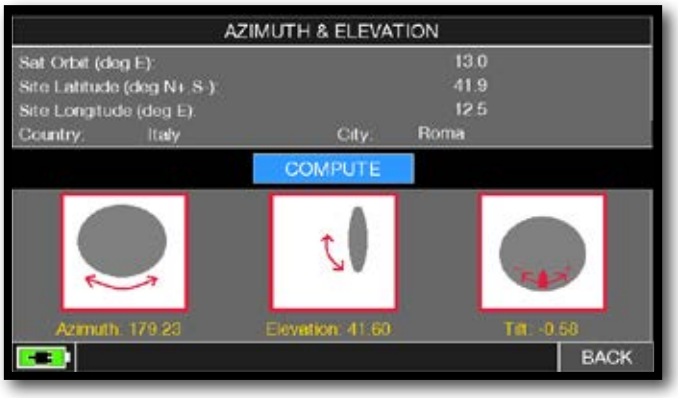
NOTE: For a proper use of the "SAT FINDER" function, verify the tuning parameters for all three transponders (frequency, polarity, band, and symbol rate) and the type of lnb you are using (universal or quatro)

Go to the www.lyngsat.com site for more information

AZ/EL POINTING DATA

Press “HOME” key.

Touch “SAT” and then “AZ/EL”.



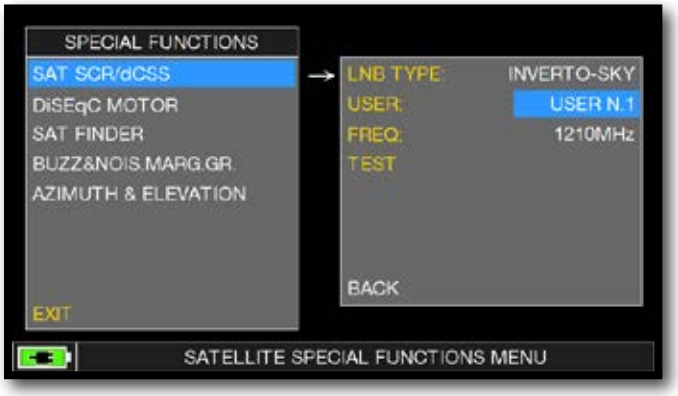
Calculation of the pointing data:

- Touch “SAT ORBIT” and set up the orbit position of the desired satellite, for example 13,0 EAST.
- Touch “COUNTRY” and select your Nation, for example Italy.
- Touch “CITY” and select your city, for example Roma.
- Touch “COMPUTE” to obtain the automatic calculation of pointing parameters: Azimuth, Elevation & Tilt.

MEASURES WITH SCR LNB/MULTISWITCH

Touch the “HOME” key.

Touch “SAT” and then “SCR dCSS” or use the encoder.



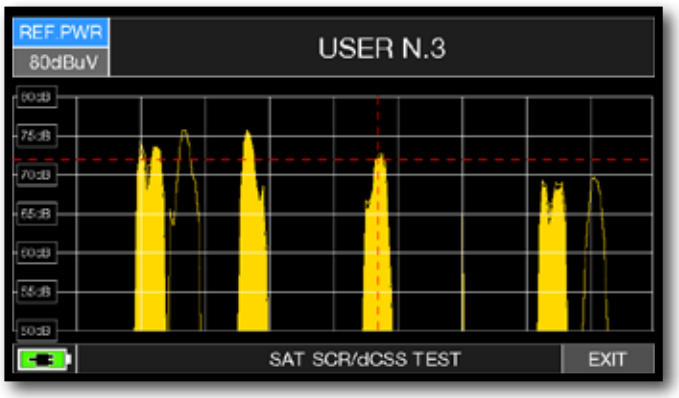
- Touch “LNB TYPE” and select the installed LNB/multiswitch model (see NOTE).

- Touch “USER” and select the user’s number to test (user 1-4).

- Press “SPECT” to visualize the spectrum or “SAT” to make the measure.

SCR measures.

Or touch “TEST”, in Spectrum mode, to perform a verify of the 4 exit frequencies (user 1-4) from LNB/multiswitch.

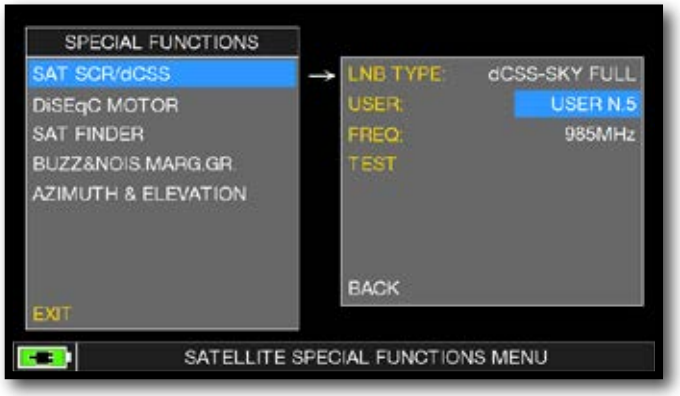


SCR test.

LNB/MULTISWITCH dCSS MEASURES

Press the “HOME” key.

Touch “SAT” and then “SCR dCSS” or use the encoder.

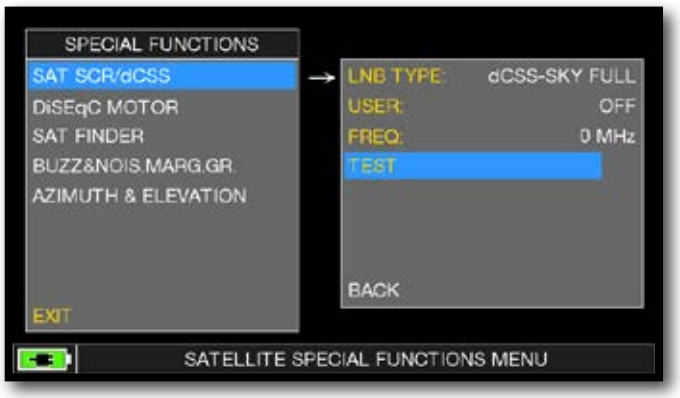


- Touch “LNB TYPE” and select the installed LNB/multiswitch model (see NOTE).

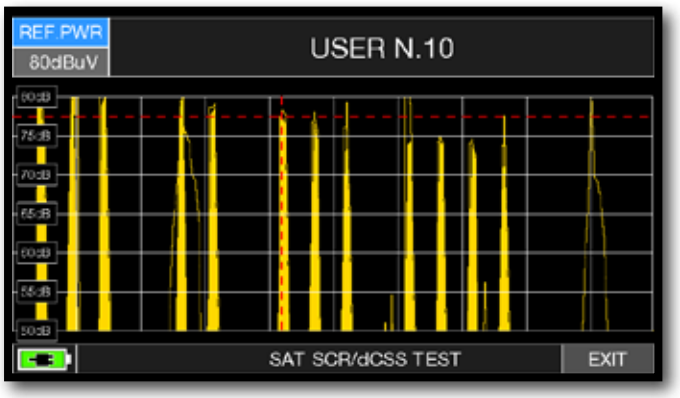
- Touch “USER” and select the user’s number to test (user 5-16).

- Press “SPECT” to visualize the spectrum or “SAT” to make the measure.

dCSS measures.



Or touch “TEST”, in Spectrum mode, to perform a verify of the 12 exit frequencies (user 5-16) from LNB/multiswitch.



dCSS test.

IMAGES VISUALIZATION & SERVICE CHOICE

Press “HOME” key.

Touch “SAT” and then“MPEG”
or use the encoder.

Images and MPEG service list.

Touch directly the RADIO/TV desired
service or use the encoder.

or touch “Vpid-Apid” in Measure screen.

RADIO & TV service selection.

Touch the image to enlarge.
Touch again to come back at the service list.

RELATED FUNCTIONS

Press repeatedly to navigate into
SAT measures screens: Measures,
Constellation.

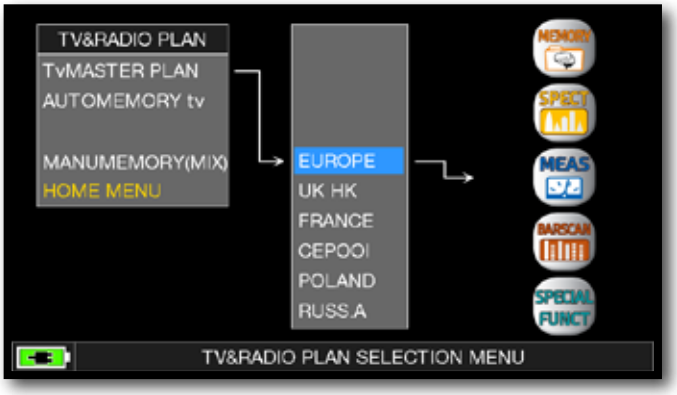
Press to enter
in the spectrum.

TV MEASURE

Press the “HOME” key.

or

Touch “TV” and then “PLAN” or use the encoder to access at the TV canalizations list.



Touch directly the desided canalization or use the encoder. At the end touch “MEAS” to make the measure or “SPECT” for visualize the spectrum.

NOTE:

The chosen canalization and channel will remain in memory also if you change mode (CATV/SAT) or if you switch off the meter.

DIGITAL TV MEASUREMENT DISPLAYS

DVB-T & DVB-T2 M-PLP

Press the “HOME” key.

Touch “TV” and then “MEAS & PICT” or use the encoder.

Main menu and image.

RELATED FUNCTIONS

Press repeatedly to navigate into TV measures screens: Measures, Constellation, Echoes and MER vs CARRIER.

Press to enter in the spectrum.

DVB-T2 SIGNAL: PLP SELECTION

Touch “MENU” from
MAIN MEASURES & IMAGES screen.

Touch “PLP #” and select the desired PLP
(transport Stream)

DVB-T2 SIGNAL: PROFILE SELECTION

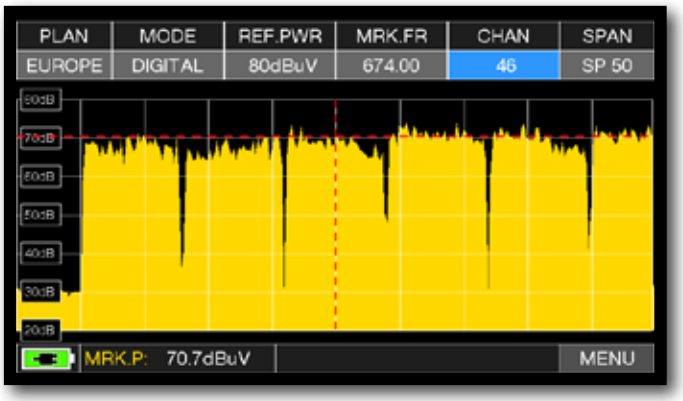
Touch “MENU” from
MAIN MEASURES & IMAGES screen.

Touch “PROFILE”
and select the desired profile:
“Basic” or “Lite”.

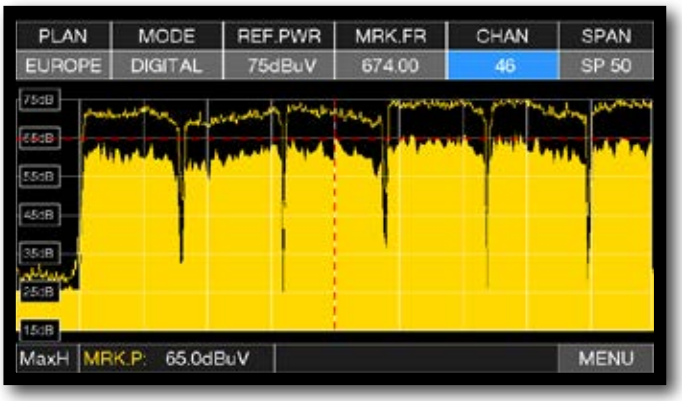
SPECTRUM ANALYZER

Press the “HOME” key.

Touch “TV” and then “SPECT”
or use the encoder.



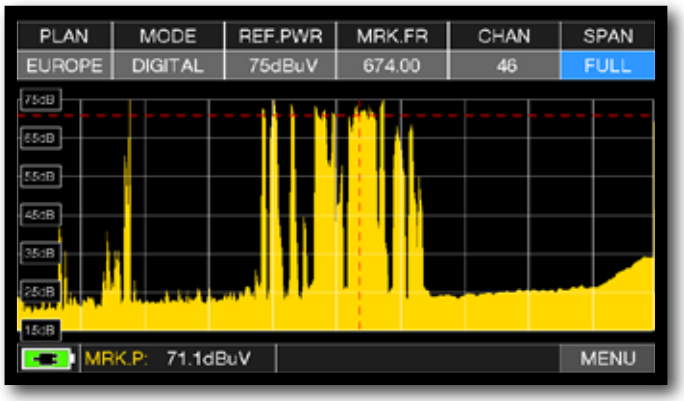
TV spectrum SPAN 50 MHz



Press again te spectrum key to activate
the “MAX HOLD” function.

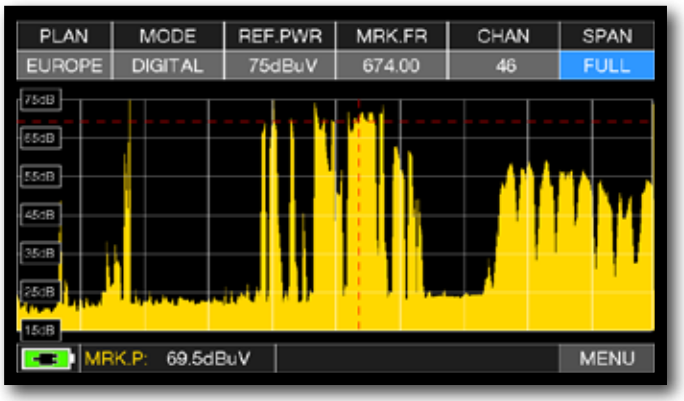
Touch “SPAN” and rotate the encoder to select the desired SPAN value:
1-2-5-7-10-20-50-100-200-500-FULL-UHF VHF

Example 1:

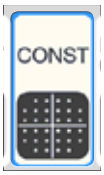


“TV” SPAN FULL spectrum
(from 5 to 1.250 MHz).

Example 2:



TV SPAN FULL spectrum with mixed
channels SAT signals (from 5 to 1.250 MHz).



CONSTELLATION ANALYSIS

Press the “HOME” key.

Touch “TV” and the “CONST” or use the encoder.

Example 1:

Constellation DVB-T.

Example 2:

Constellation DVB-T2.

Touch “FULL” and select the box of constellation to enlarge.

RELATED FUNCTIONS

Press repeatedly to navigate into TV measures screens: Measures, Constellation, Echoes and MER vs CARRIER.

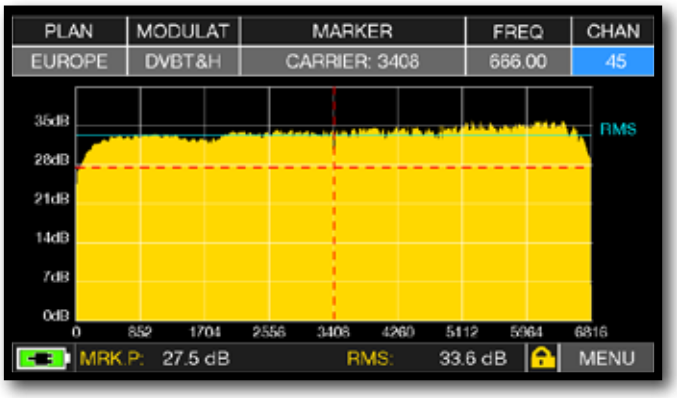
Press to enter in the spectrum.

MER VS CARRIER MEASUREMENT

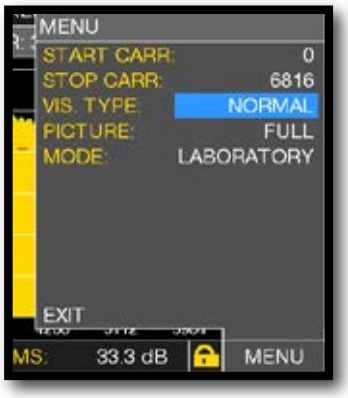
The MER vs CARRIER measure allow to make analysis of the trend MER for single COFDM carriers which make up a signal DVB-T or DVB-T2.

Press the “HOME” key.

Touch “TV” and then “MER vs CARRIER” or use the encoder.

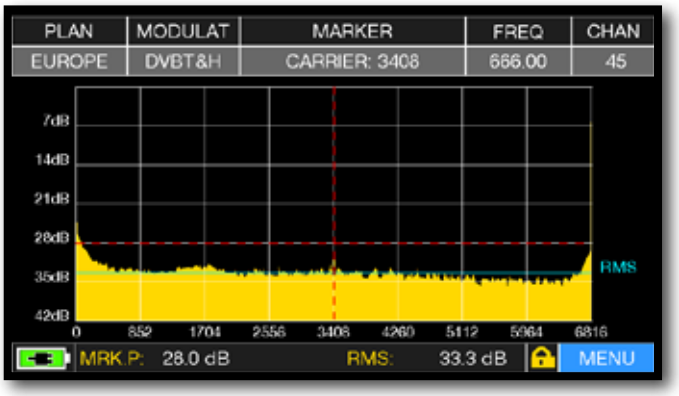


MER vs CARRIER: visualization mode “VIS. TYPE: NORMAL” & “PICTURE: FULL”



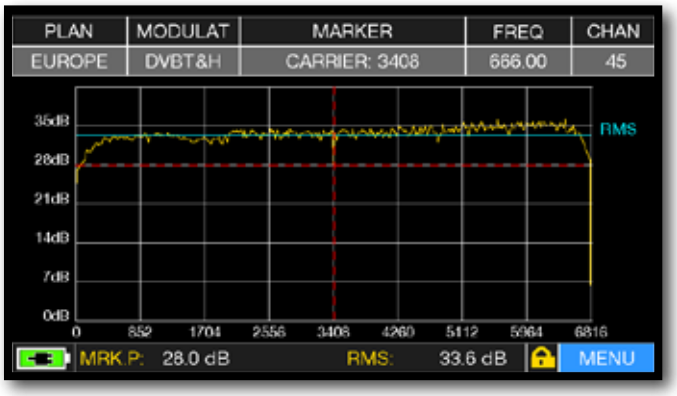
Touch “MENU & ?” to obtain different visualization modes.

Example 1:



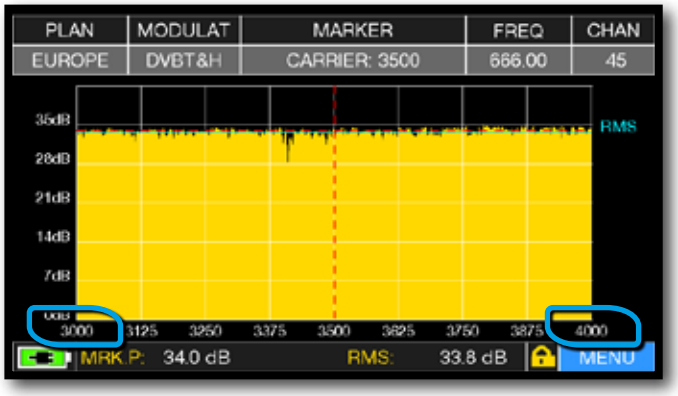
MER vs CARRIER : visualization mode
"VIS. TYPE: REVERSE" & "PICTURE: FULL"

Example 2:



MER vs CARRIER : visualization mode
"VIS. TYPE: NORMAL" & "PICTURE: CONTOURS".

Example 3:



MER vs CARRIER: visualization mode
"VIS. TYPE: NORMAL", "PICTURE: FULL" & "START/STOP CARR
from 3000 to 4000".

RELATED FUNCTIONS

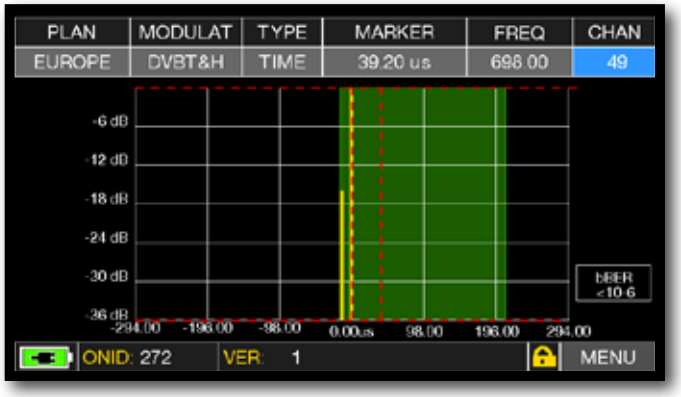
Press repeatedly to navigate into TV measures screens: Measures, Constellation. echoes and MER vs CARRIER.

Press to enter in the spectrum.

ECHOES ANALYSIS

Press the “HOME” key.

Touch “TV” and then “ECHOES”
or use the encoder.



Impulse response (echo).

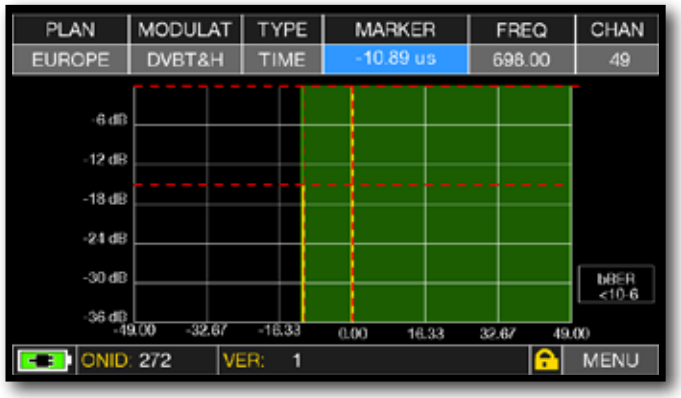
Touch “TYPE”

and select the echoes
visualization mode:

DISTANCE or TIME

MICROECHOES VISUALIZATION

Touch “MENU”, than “TYPE”
and select “µECHOES”.



MicroEchoes visualization, touch the Marker
and rotate the encoder to select the ECHOES.

NOTE: Other echo visualization modes are available in the “TYPE” menus

RELATED FUNCTIONS

Press repeatedly to navigate
into TV measures screens:
Measures, Constellation. echoes
and MER vs CARRIER.

Press to enter in
the spectrum.

ECHO & MICROECHO MEASUREMENT in "SFN" TV NETWORKS

HOW TO REDUCE INTERFERENCES IN "SFN" NETWORKS

The analogue TV switch off is finish in Europe. Some countries, such as Spain and Italy, have decided to install digital TV "SFN" (Single Frequency Networks), in other words a national television broadcaster has the same frequency/channel all over the country. This provides a fantastic opportunity, but also means that in areas between two cells, it is possible to receive the same signals from more than one transmitter.

If the "SFN" network has been designed well, the SFN signals' slight propagation delay (which we will call "echoes"), coming from the different distances in which the transmitters are situated, becomes absorbed in the invaluable GUARD INTERVAL function, present in the DVB-T & T2 (COFDM) modulation and consequently there will not be any reception problems. In any case, experience over the last few years has shown us that reality is different to theory, especially when there are many local television networks that could generate many interferences.

You could therefore encounter the unpleasant experience of receiving a signal with good power, but that cannot show any pictures and not be able to establish the cause of the fault. In this case it is indispensible to measure the IMPULSE RESPONSE in real time, to measure the echo's delay or advance compared to the main signal. When changing direction and position of the antenna it is possible to optimize reception intuitively, by maximising the power of the main signal and minimize the power of interference echoes, also at the expense of the channel power.

Once again Rover Instruments is the first company to supply meters for TV installers, that can measure up to 16 ECHOES and PRE-ECHOES in real time. ROVER meters allow you to see ECHOES, measure the power and the delay in uS and the distance of the interfering broadcaster in Km. There are currently very few meters that allow you to measure ECHOES and PRE-ECHOES, in real time and at a distance of up to 75 Km, higher than the maximum amplitude possible with the GUARD INTERVAL and above all that can highlight, using the green mask, the useful reception area, in other words within the guard interval.

The width of the GUARD INTERVAL varies according to the modulation parameters: consult the table below to find the width of the GUARD INTERVAL and all the possible DVB-T configurations.

Fig. 1:
OPTIMUM RECEPTION:*
no ECHO present either outside or inside the guard interval mask (green area).

Fig. 2:
GOOD RECEPTION:* 2 ECHOES present, but within the guard interval mask (green area) coming from a distance of: 1st echo: 24,50 Km, the same as a 81,67 µs delay.

Fig. 3:
MARGINAL RECEPTION (or IMPOSSIBLE):*
2 ECHOES present outside the guard interval mask (green area), coming from a distance of: 1st echo: 70,56 Km, the same as a 235,20 µs delay.

N.B.* Valid examples for a DVB-T OFDM 8k signal with an 8 MHz Bandwidth and a 1/8 Guard Interval, this data is shown on ROVER meters to the right of the Constellation, see below Fig. 4.

Fig. 4:
DVB-T-64Q CONSTELLATION:
The table to the right shows all the received modulation parameters

TEMPORAL GUARD INTERVAL WIDTH

(already automatically highlighted by the GREEN mask)

DVB-T 2.000 carriers (2K DVB-T)				
GUARD INTERVAL	1/4	1/8	1/16	1/32
max time (microsecondi)	56	28	14	7
max distance (Km)	16.8	8.4	4.2	2.1

DVB-T 8.000 carriers (8K DVB-T)				
GUARD INTERVAL	1/4	1/8	1/16	1/32
max time (microsecondi)	224	112	56	28
max distance (Km)	67.2	33.6	16.8	8.4

IMAGES VISUALIZATION & SERVICE CHOICE

Press “HOME” key.

Touch “TV” and then“MPEG”
ou use the encoder.

Images and MPEG service list.

Touch directly the RADIO/TV desired service or use the encoder.

or touch “Vpid-Apid” in Measure screen.

RADIO & TV service selection.

Touch the image to enlarge.
Touch again to come back at the service list.

RELATED FUNCTIONS

Press repeatedly to navigate into TV measures screens: Measures, Constellation. Echoes and MER vs CARRIER.

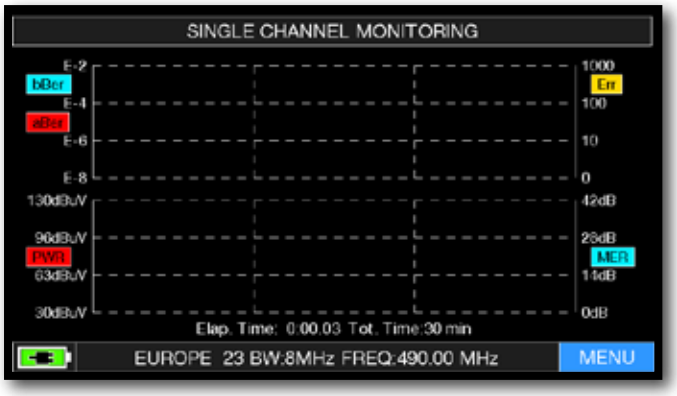
Press to enter in the spectrum.

CHANNEL MONITOR

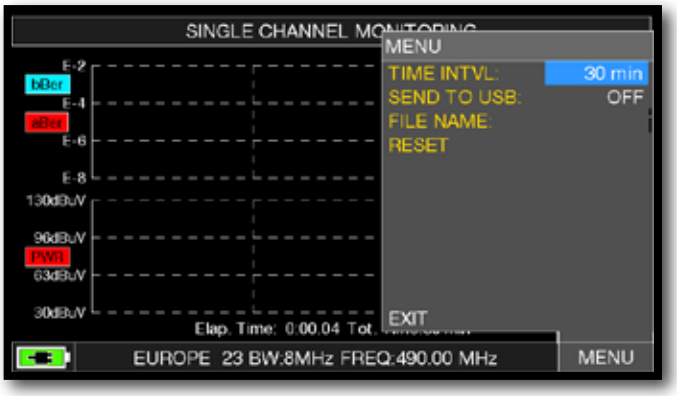
The weekly application of SW CHANNEL MONITOR allow you to controland register the trend of the main parameters of a digital signal over time (from 30 minutes to one week): TV, CATV & SAT. This application is indicated to resolv the reception problems which occur occasionally, it allow you also to measure, memorize and visualize (local or in remote) the digital signals parameters tested: DVB-S/T/C = Power, MER, ERROR, bBer, aBer; DVB-S2 / T2 / C2 = Power, MER, ERROR, aBer, Lber, PER, LDCP.
Every registered parameters is graphically represented on the display using differents colours for a easy identification.

Press the "HOME" key.

Touch "TV" and then "CH MONITOR" or use the encoder.

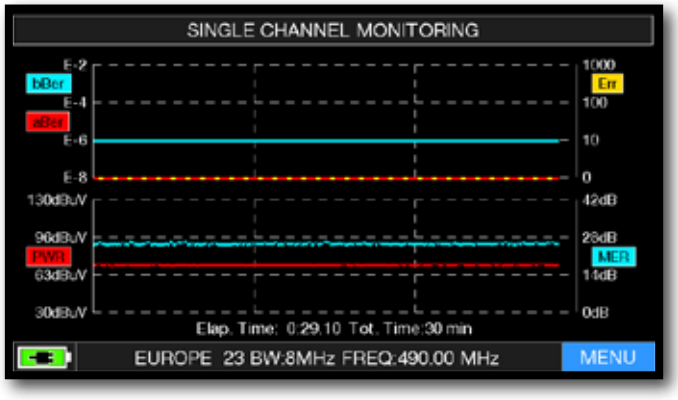


Touch "MENU"



Select the time interval (TIME INTVL) and where you want to store the file, either in the meter's memory, or in the USB memory stick (send to USB-ON), with the relative file name (File name).

Example 1:



SINGLE CHANNEL MONITORING: 30 minutes.

NOTE: the Channel Monitor function is available also in CATV and SAT mode.

TS STREAMING (opt.)

The SW TS STREAMING application allows you to record the information contained in the Transport stream in an external USB memory.

Insert a USB memory into the instrument's USB-A port. Touch "MENU" from the MAIN MEASUREMENTS and IMAGES screen

Touch "TS STREAMING"

Touch "FILE NAME" and type, using the keyboard, the name of the Transport Stream file to be recorded. If the USB memory is not inserted, the word "INSERT USB" appears.

Touch the Services whose Video Stream you want to save and all the Transport Stream information.

Touch "STOP" to end the recording

NOTE: if no service is selected the relative video streams will not be recorded but the remaining Transport Stream information will be recorded:
Audio Stream, MPEG Tables, TXT, etc ...

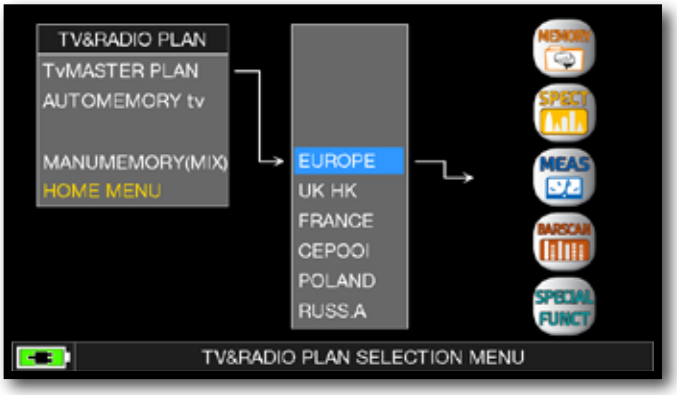
NOTE: the TS STREAMING function is also available in SAT and CATV mode.

FM MEASURE

Press the “HOME” key.

or

Touch “TV” and then “PLAN” or use the encoder to access at the TV canalizations list.



Touch directly the desided canalization or use the encoder. At the end touch “MEAS” to make the measure or “SPECT” for visualize the spectrum.

NOTE:

The chosen canalization and channel will remain in memory also if you change mode (CATV/SAT) or if you switch off the meter.

FM MEASUREMENT

Press the “HOME” key.

Touch “TV” and then “MEAS & PICT” or use the encoder.

Touch “CHAN” and select the “FML” channel or “FMH”.

Touch “FREQ” and type the desired frequency value, then touch “ENTER”.

Main menu.

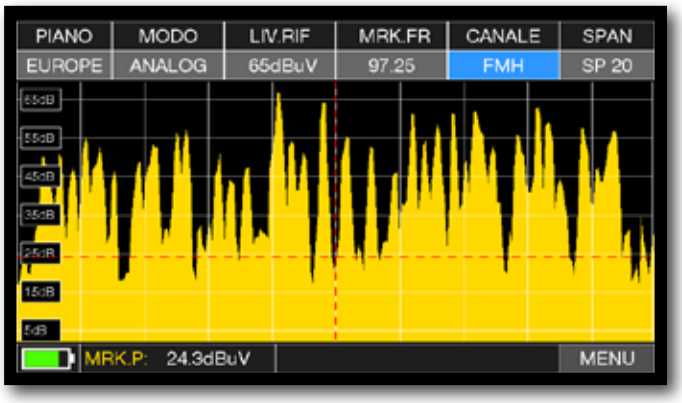
RELATED FUNCTIONS

Press to enter in the spectrum.

SPECTRUM ANALYZER

Press the “HOME” key.

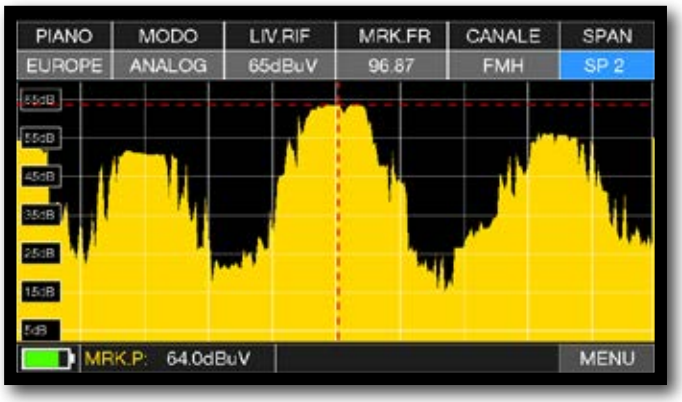
Touch “TV” and then “SPECT”
or use the encoder.



FM spectrum SPAN 20 MHz

Touch “SPAN” and rotate the encoder to select the desired SPAN value:
1-2-5-7-10-20-50-100-200-500-FULL-UHF VHF

Example:



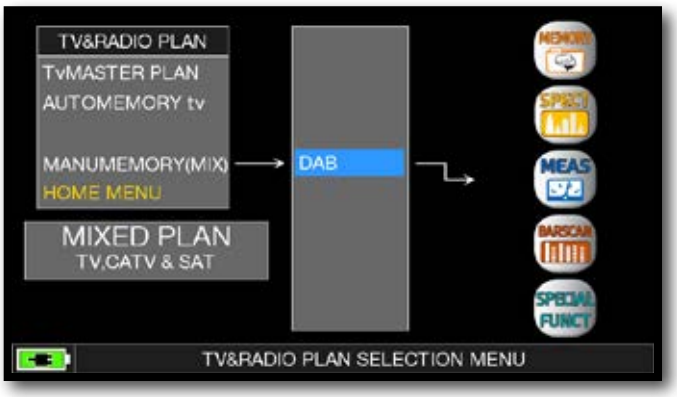
FM spectrum SPAN 2 MHz

DAB MEASURE

Press the “HOME” key.

or

Touch “TV” and then “PLAN” or use the encoder to access at the TV canalizations list.



Touch directly the desided canalization or use the encoder. At the end touch “MEAS” to make the measure or “SPECT” for visualize the spectrum.

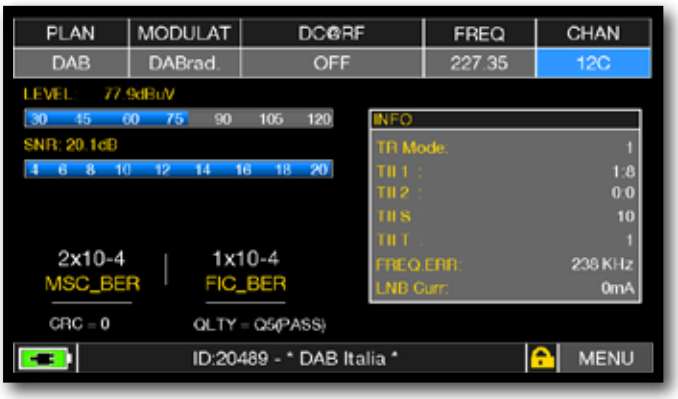
NOTE:

The chosen canalization and channel will remain in memory also if you change mode (CATV/SAT) or if you switch off the meter.

DAB MEASUREMENT

Press the “HOME” key.

Touch “TV” and then “MEAS & PICT”
or use the encoder.



Main menu and image.

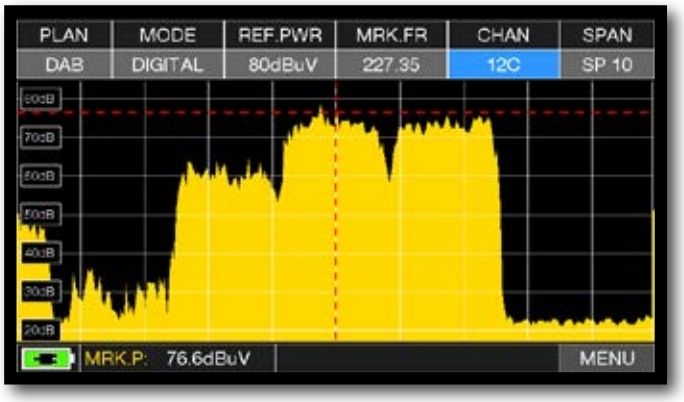
RELATED FUNCTIONS

Press to enter in
the spectrum.

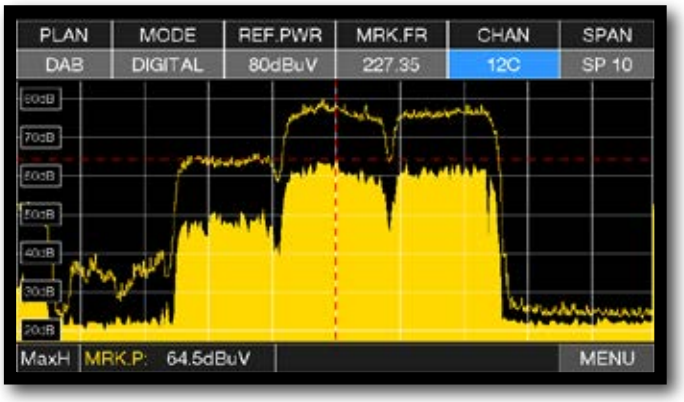
SPECTRUM ANALYZER

Press the “HOME” key.

Touch “TV” and then “SPECT”
or use the encoder.



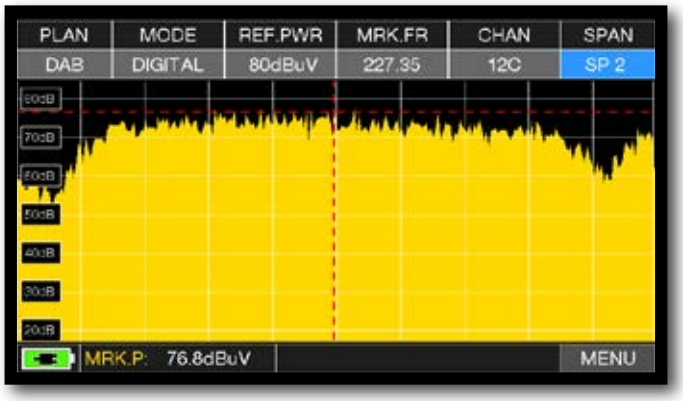
DAB spectrum SPAN 10 MHz.



Press again te spectrum key to activate
the “MAX HOLD” function.

Touch “SPAN” and rotate the encoder to select the desired SPAN value:
1-2-5-7-10-20-50-100-200-500-FULL-UHF VHF.

Example 1:



“DAB” SPAN 2 MHz spectrum.

RELATED FUNCTIONS

Press to enter in
the measures.

SERVICE CHOICE

Press “HOME” key.

Touch “TV” and then“MPEG” or use the encoder.

DAB service list.

Touch directly the DAB desired service or use the encoder.

or touch “Vpid-Apid” in Measure screen.

DAB service selection.

RELATED FUNCTIONS

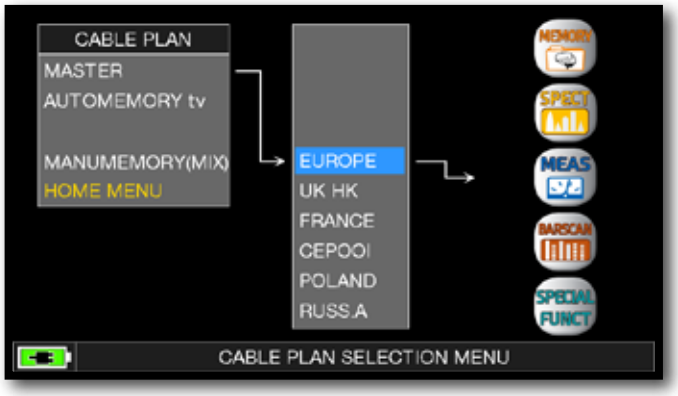
Press to enter in the spectrum.

CATV MEASURES

Press the “HOME” key.

or

Touch “CATV” and then “PLAN” or use the encoder to access at the CATV canalizations list.



Touch directly the desided canalization or use the encoder. At the end touch “MEAS” to make the measure or “SPECT” for visualize the spectrum.

NOTE:

The chosen canalization and channel will remain in memory also if you change mode (TV/SAT) or if you switch off the meter.

DIGITAL DVB-C DVB-C2 MEASURES (OPT.)

Press the “HOME” key.

Touch “CATV” and then “MEAS & PICT” or use the encoder.

Main measures and image.

RELATED FUNCTIONS

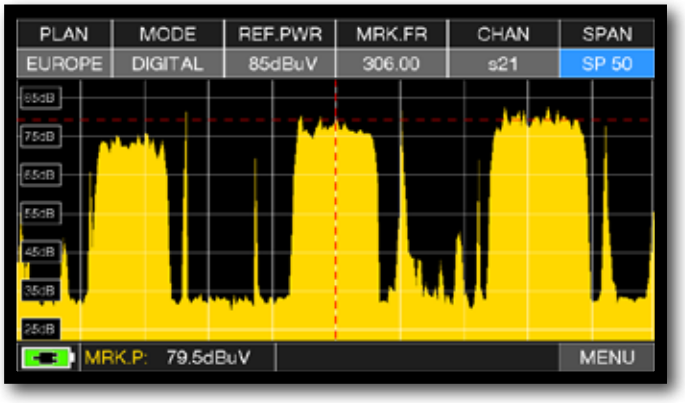
Press repeatedly to navigate into CATV measures screens: Measures, Constellation.

Press to enter in the spectrum.

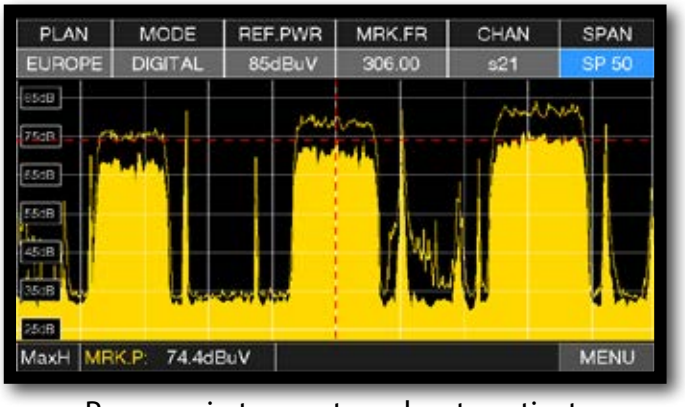
SPECTRUM ANALYZER

Press the “HOME” key.

Touch “CATV” and then “SPECT” or use the encoder.



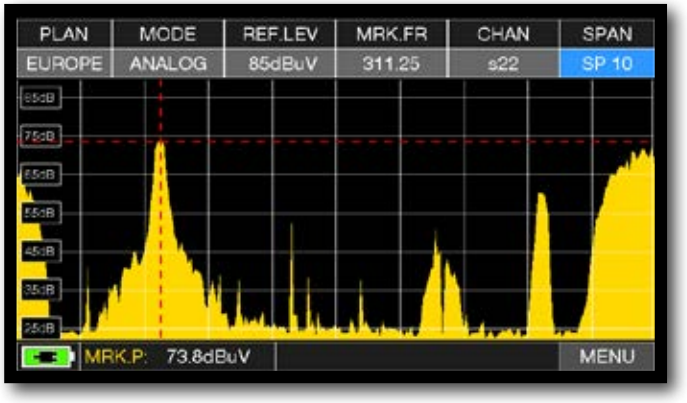
CATV spectrum SPAN 50 MHz.



Press again te spectrum key to activate the “MAX HOLD” function.

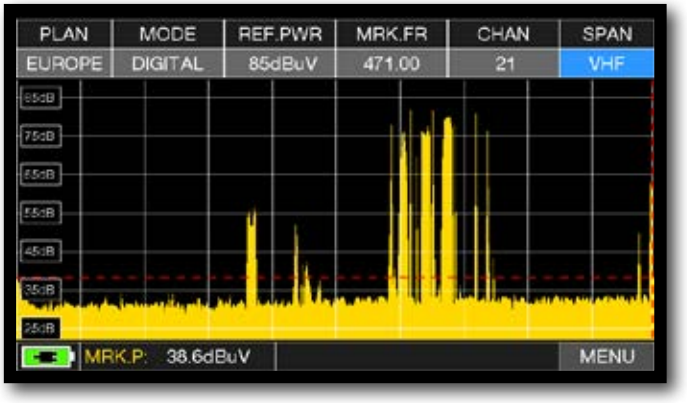
Touch “SPAN” and rotate the encoder to select the desired SPAN value:
1-2-5-7-10-20-50-100-200-500-FULL-UHF VHF

Example 1:

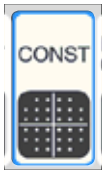


CATV spectrum SPAN “10 MHz”.

Example 2:



CATV spectrum SPAN VHF.



CONSTELLATION ANALYSIS

Press the “HOME” key.

Touch “CATV” and then “CONST” or use the encoder.

Example 1:

64 QAM constellation.

Example 2:

256 QAM constellation.

Touch “FULL” and select the box of constellation to enlarge.

RELATED FUNCTIONS

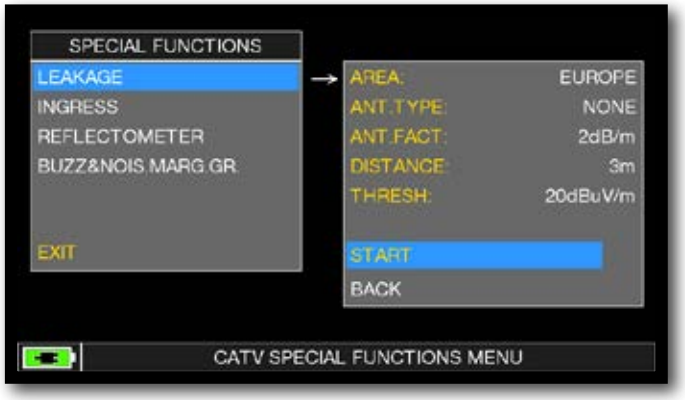
Press repeatedly to navigate into CATV measures screens: Measures, Constellation.

Press to enter in the spectrum.

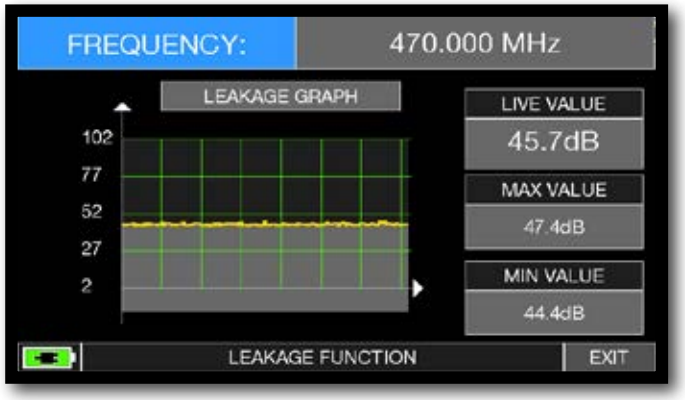
LEAKAGE

Press the “HOME” key.

Touch “CATV” and then “LEAKAGE” or use the encoder.



Set the desired parameters, at the end touch “START” to start the leakage measures.



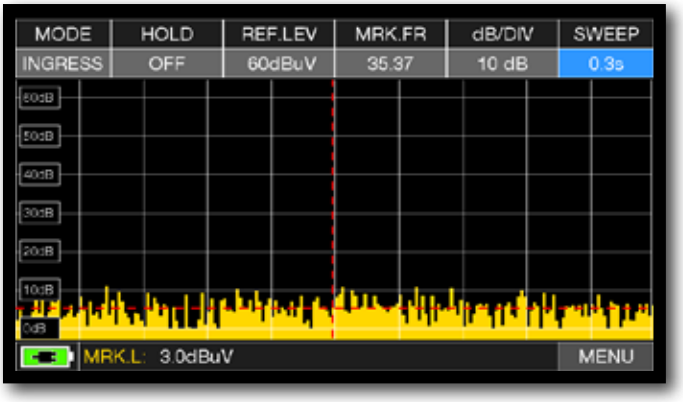
Leakage measures.

INGRESS

Press the “HOME” key.

Touch “CATV” and then “LEAKAGE” or use the encoder.

Set the desired parameters, at the end touch “START” to start the Ingress measures.



Ingress measures.

IMAGES VISUALIZATION & SERVICE CHOICE

Press the “HOME” key.

Touch “CATV” and then “MPEG”
or use the encoder.

Images and MPEG service list.

Touch directly the RADIO/TV desired
service or use the encoder

or touch “Vpid-Apid” in Measure screen.

RADIO & TV service selection.

Touch the image to enlarge.
Touch again to come back at the service list.

RELATED FUNCTIONS

Press repeatedly to navigate
into CATV measures screens:
Measures, Constellation.

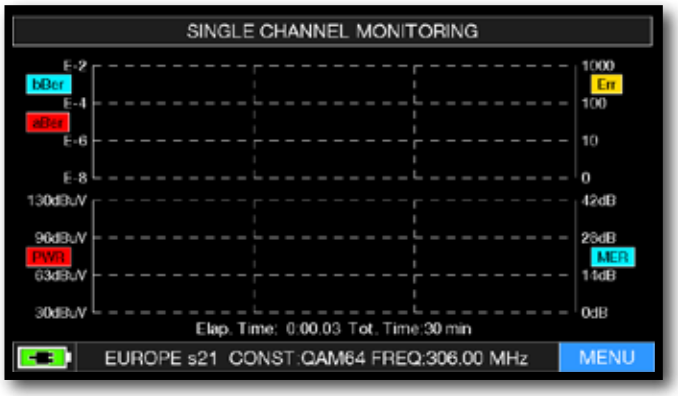
Press to enter in
the spectrum.

CHANNEL MONITOR

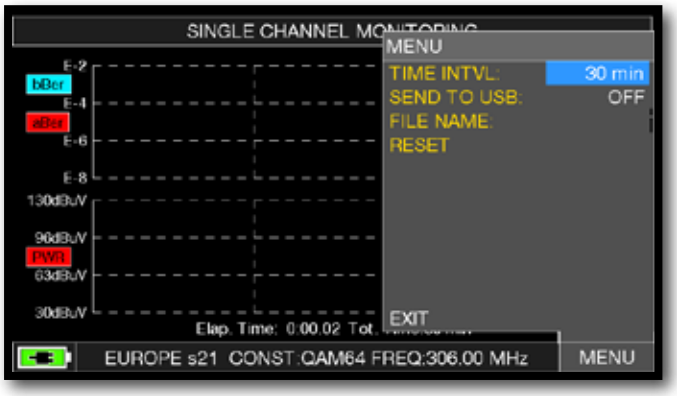
The weekly application of SW CHANNEL MONITOR allow you to controland register the trend of the main parameters of a digital signal over time (from 30 minutes to one week): TV, CATV & SAT. This application is indicated to resolv the reception problems which occur occasionally, it allow you also to measure, memorize and visualize (local or in remote) the digital signals parameters tested: DVB-S/T/C = Power, MER, ERROR, bBer, aBer; DVB-S2 / T2 / C2 = Power, MER, ERROR, aBer, Lber, PER, LDCP.
Every registered parameters is graphically represented on the display using differents colours for a easy identification.

Press the "HOME" key.

Touch "CATV" and then "CH MONITOR" or use the encoder.

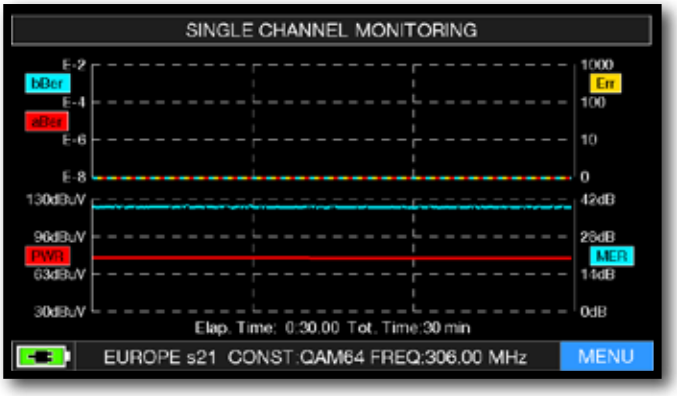


Touch "MENU"



Select the time interval (TIME INTVL) and where you want to store the file, either in the meter's memory, or in the USB memory stick (send to USB-ON), with the relative file name (File name).

Example 1:



SINGLE CHANNEL MONITORING: 30 minutes.

NOTE: the Channel Monitor function is available also in TV and SAT mode.

TS STREAMING (OPT.)

The SW TS STREAMING application allows you to record the information contained in the Transport stream in an external USB memory.

Insert a USB memory into the instrument's USB-A port. Touch "MENU" from the MAIN MEASUREMENTS and IMAGES screen

Touch "TS STREAMING"

Touch "FILE NAME" and type, using the keyboard, the name of the Transport Stream file to be recorded. If the USB memory is not inserted, the word "INSERT USB" appears.

Touch the Services whose Video Stream you want to save and all the Transport Stream information.

Touch "STOP" to end the recording

NOTE: if no service is selected the relative video streams will not be recorded but the remaining Transport Stream information will be recorded:
Audio Stream, MPEG Tables, TXT, etc ...

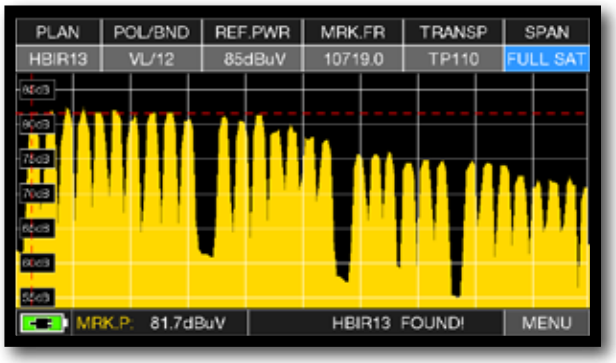
NOTE: the TS STREAMING function is also available in SAT and TV mode.

SPECTRUM ANALYSIS

After selecting the desired Operation Mode, TV, CATV or SAT, you can directly access the Spectrum Analyzer by touching the “SPECT” icon from the “HOME” menu or by pressing the “SPECT” button directly.

SAT SPECTRUM

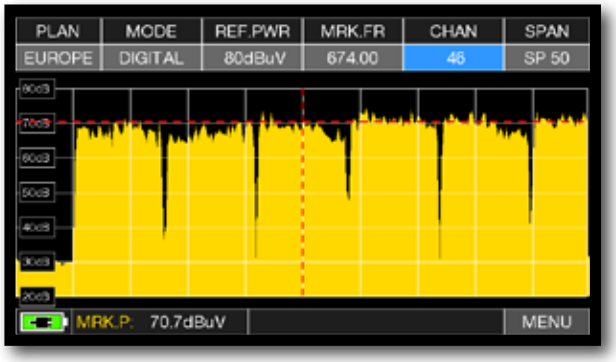
Press the “HOME” key.



SAT spectrum.

TV SPECTRUM

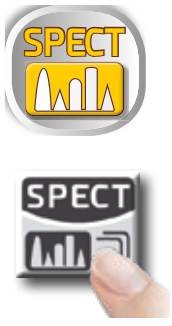
Press the “HOME” key.

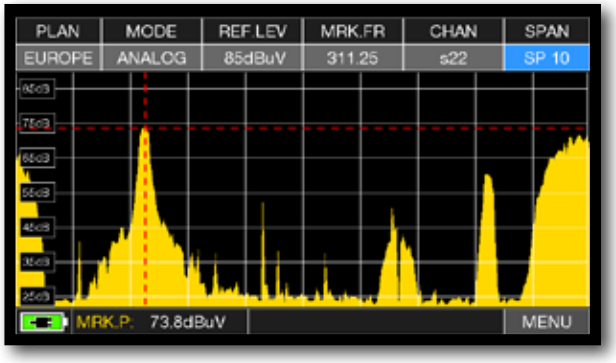


TV spectrum.

CATV SPECTRUM

Press the “HOME” key.





CATV spectrum.

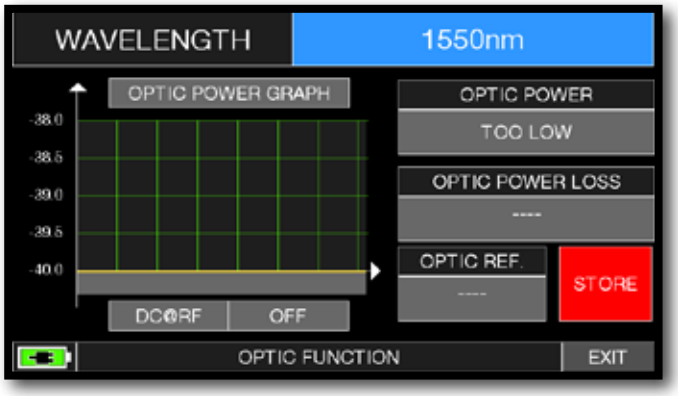
OPTICAL MEASUREMENTS

The instrument, equipped with an internal optical converter, allows you to perform POWER and OPTICAL ATTENUATION measurements as well as perform RF measurements from optical inputs, decode services, and display Spectrum.

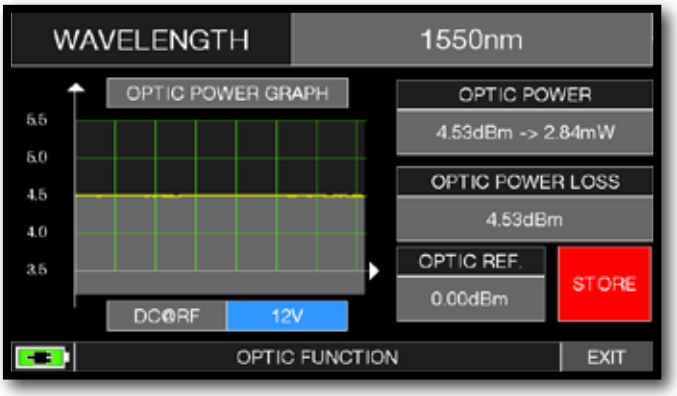
OPTICAL POWER & ATTENUATION MEASURES

Press the “HOME” key.

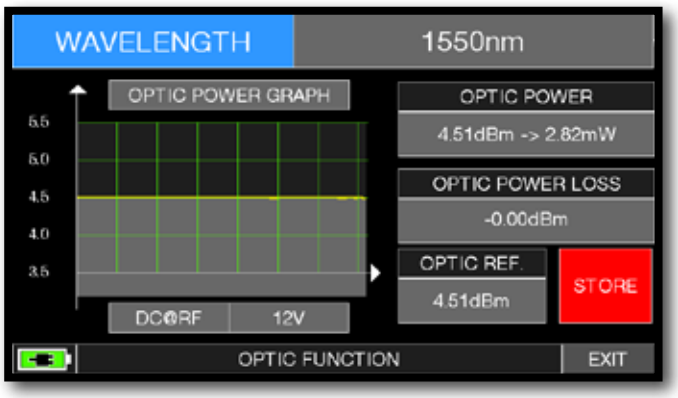
Touch “OPTIC” and then “PWR METER” or use the encoder.



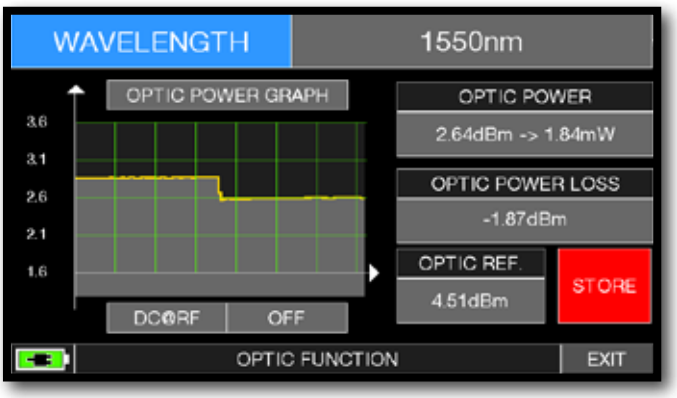
Touch “WAVELENGHT” and select the Wave length desired: for Example 1550 nm.



Touch “DC@RF” and, if required, select the power supply voltage: for Example 12V.



Touch “STORE” and memorizes the measured optical power value (Optic Ref.): for Example 4,51 dBm.



In the “OPTIC POWER LOSS” field, the optical attenuation value is displayed with respect to the stored value (Optic REF): for Example - 1.87 dBm.

OPTICAL INPUT RF MEASURES

After selecting the desired Operation Mode, TV, CATV or SAT, press the "HOME" key.

Touch "OPTIC" and then "MEAS & PICT" or use the encoder.

Example 1:

Main measures and image of a SAT signal.

Example 2:

Main measures and image of a TV signal.

NOTE:

- In optical mode, you can measure the spectrum and measure just on Low Band Vertical.
- It is possible to manually switch the input of the RF IN: F (75 ohm) or OPTICAL signal. Press the VOLUME button, select "RF IN" and choose the desired mode.

Example 1:

F 75 ohm ingress selected.

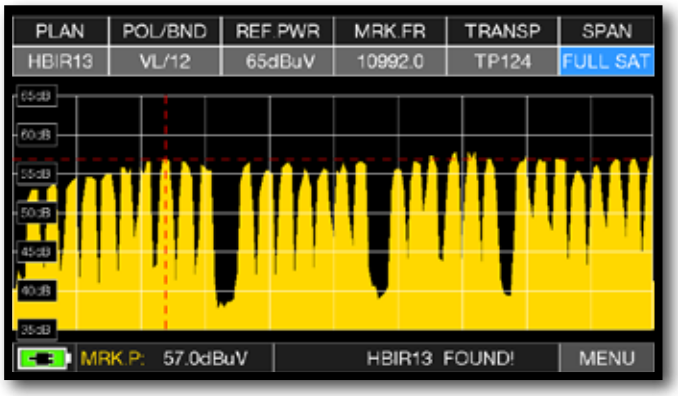
Example 2:

OPTIC ingress selected.

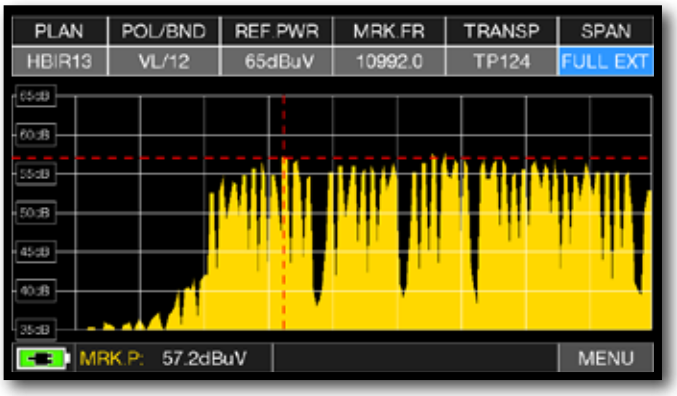
RF SPECTRUM FORM OPTIC INGRESS

After selecting the desired Operation Mode, TV, CATV or SAT, press the “HOME” key.

Touch “OPTIC” and then “SPECT” or use the encoder.



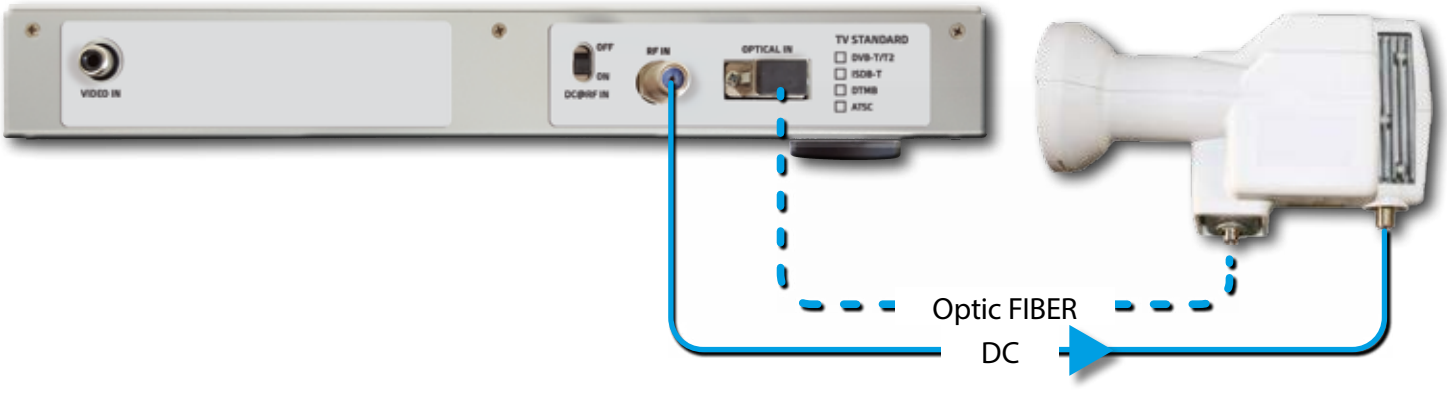
SAT spectrum SPAN “Full SAT” (from 930 to 2250 MHz).



SAT spectrum SPAN “Full EXT” (from 230 to 2610 MHz).

NOTE: In OPTIC mode it is possible to analyze the spectrum and measure only vertical/low band (VL) SAT transponders.

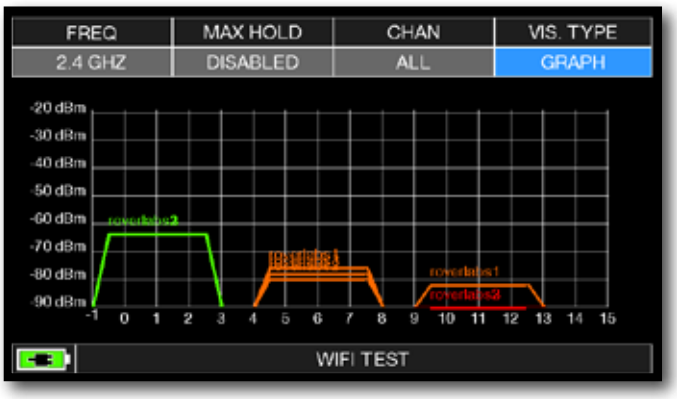
FIBER OPTIC AND REMOTE POWER SUPPLY CABLE CONNECTION



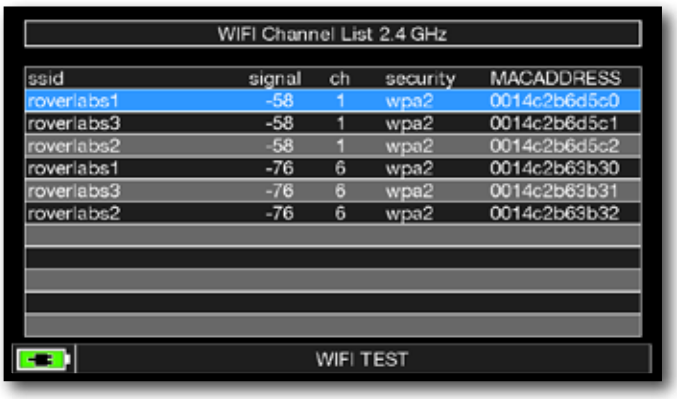
WI-FI ANALYZER (OPT.)

The instrument, equipped with an WI-FI analyzer, allows you to analyze the WI-FI networks present in the building in the 2.4 and 5 GHz frequency range, check the power of the received Signal and display the List of Networks.

Press the “HOME” key.



Touch “WI-FI” to visualize the received WI-FI networks.



Touch “VIS. TYPE” to access to the received WI-FI network list.

- Touch “FREQ” to switch WI-FI band from 2,4 to 5 GHz.

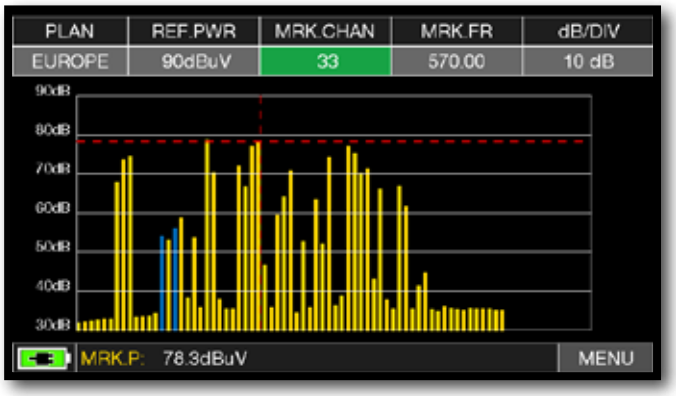
- Touch “MAX HOLD” to enable/disable the maximum level of the received signal memorized.

- Touch “CHAN” to select channels reception modalities, all or from 1 to 13 (for 2,4 GHz networks) and from 36 to 165 (for 5 GHz networks).

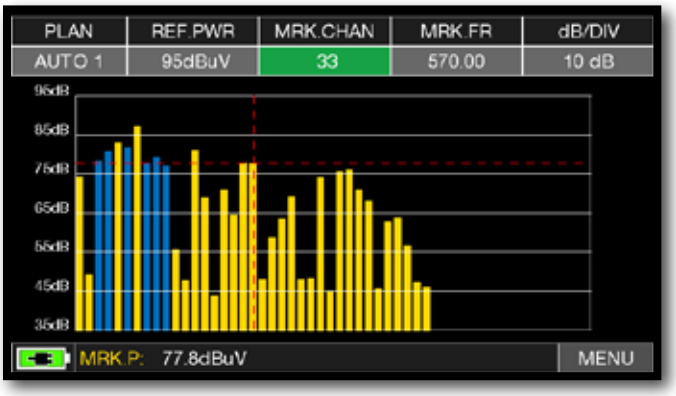
or

Press the “HOME” key, then touch “BARSCAN”.

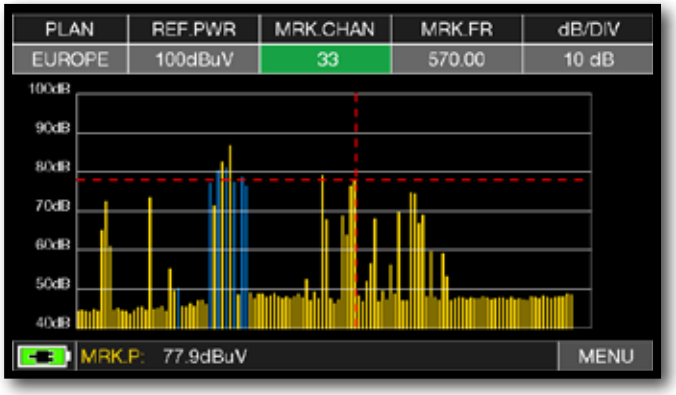
In TV/CATV mode and in the standard manual canalization (MANUMEMORY) or automatic (AUTOMEMORY) the meter displays the received signals and distinguishes the analog signals from the digital ones using two different colors.



Standard BARSCAN TV canalization.

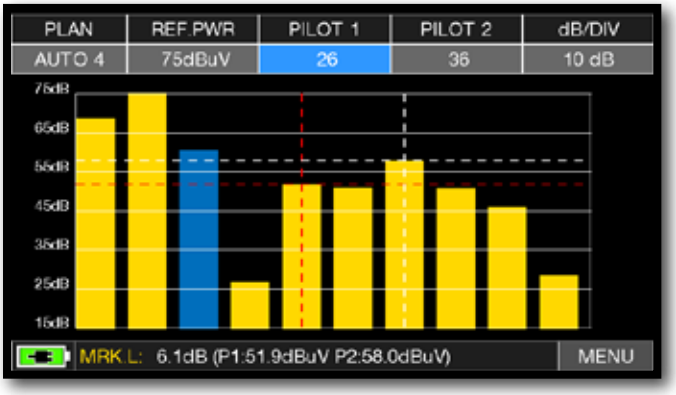


BARSCAN AUTO/MANUALMEMORY.



Standard BARSCAN CATV canalization.

Touch “MENU” to choose the bargraph mode: “LEVEL” or “TILT”.



BARSCAN (TILT GRAPHIC).
Touch “PILOT 1” and “PILOT 2” to select the two channels to be used for the tilt measurement (level difference).

ANALOG CHANNELS

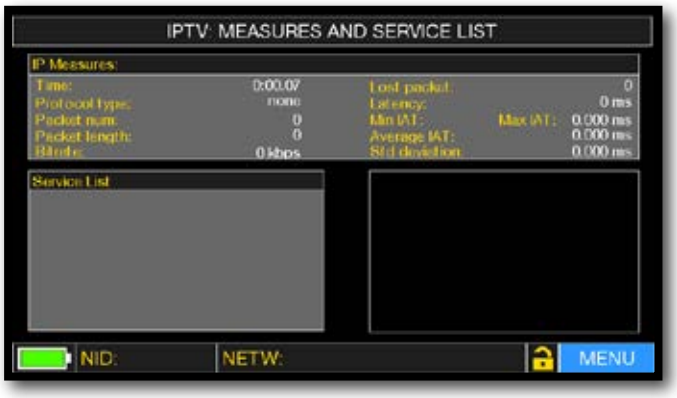
DIGITAL CHANNELS

NOTE: Function available only in TV or CATV mode.

IP MEASURES (OPT.)

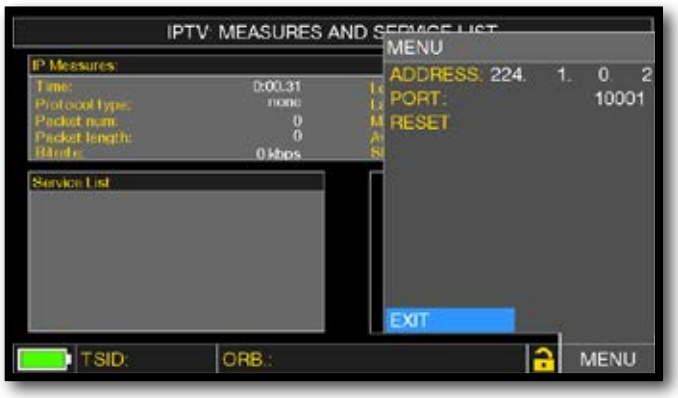
The meter has a TS over IP input. It can deincapsulate the contents of an IP stream and carry out quality measurements on the IP transport and also decode the transported services.

Touch "IPTV" from the HOME screen



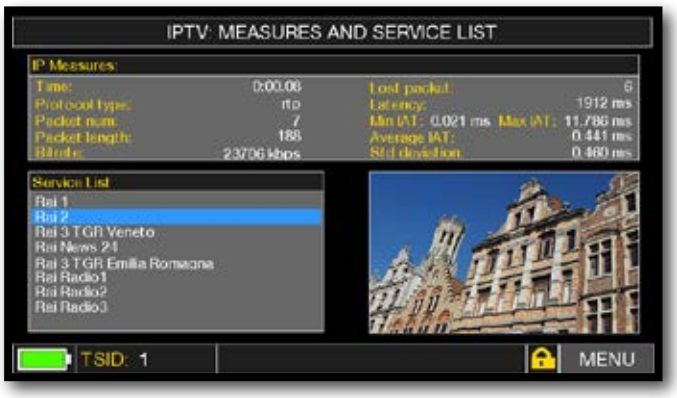
Touch "MENU" to configure the parameters

Connect the IP signal to the LAN ingress (connector 1).



Touch "EXIT" to exit

EXAMPLE 1:



Measurement and decoding example of a service transported in IP.

NOTE:

- The instrument is able to measure and decode an "IP" signal with a maximum flow of 30 Mbbs
- For more information about the "APP"s, contact your distributor or send an e-mail to: wecare@roverinstruments.com

NOTE: for more information about the "APP"s, contact your distributor or send an e-mail to: wecare@roverinstruments.com

MEMORY: CHANNEL PLANS AND LOG FILES

AUTOMEMORY (TV)

Press the “HOME” key.

Touch “MEMORY” then “AUTOMEMORY tv” or use the encoder.

Set the desired parameters:

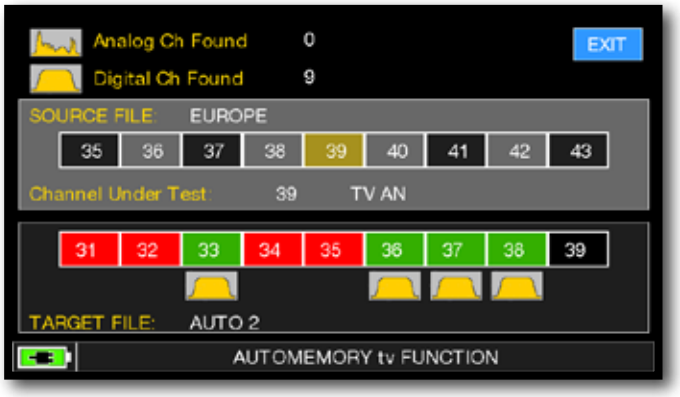
Touch “to FILE N” and select the destination file “AUTO” where the search must be saved.

Touch “LEVEL” and set the minimum level threshold of the analog and digital channels to be searched. Touch “DISCOVERY” and set the channel search mode:

- ONLY DVBT (only digital DVB-T/T2 signals);
- DVBT&C +AnTV (digital DVB-T/T2/C & TV analogic signals);
- DVBT + AnTV (Digital DVB-T/T2 & TV analogic signals).
- Touch “DC&RF” and set the required power supply voltage.

Touch “START SAVE” to create a new channel plan and to activate the search.

NOTE: If the words “START OVERWRITE” appear, the selected file will be overwritten.
wait a few mins, the meter indicates the recorded ANALOG & DIGITAL Channels.



Search channels in progress.

Search channels complete.

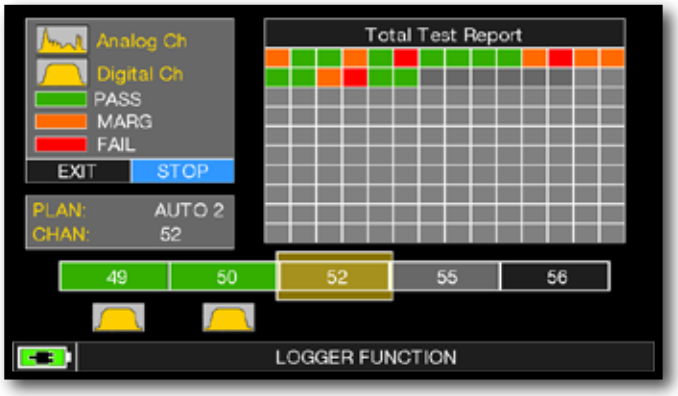
Once the Automemory is completed, the
"AUTO" plan is automatically selected.

LOGGER SAVE (TV/CATV)

Press the “HOME” key.

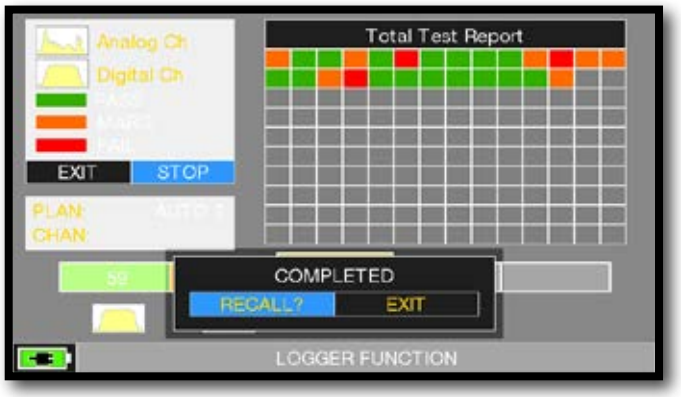
Touch “MEMORY”
and then “SAVE DATALOGGER”.

Set the parameters required. Touch
“START SAVE” to create a new log file.

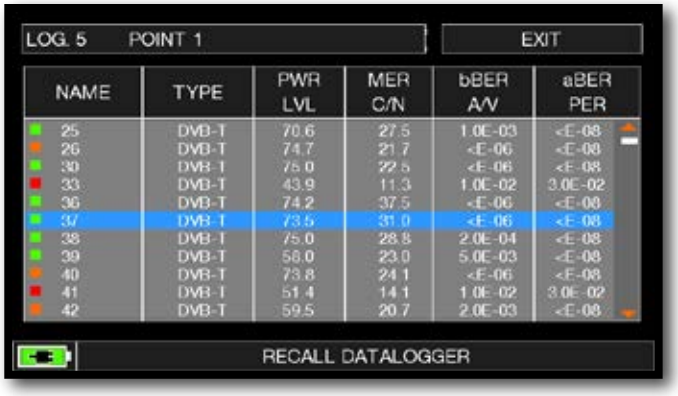


DATA LOGGER run.

NOTE: if the MANU plan has mixed TV and SAT programs, the “STOP&GO” function will assist when running a LOGGER asking to move the cable lead from a TV to a SAT signal source.



Touch “RECALL” to recall the Logger
or “EXIT” to exit.



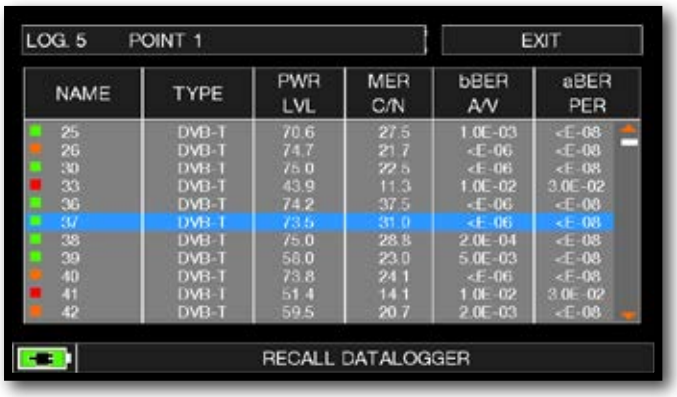
Example of saved measured in the Log file.
Touch the screen to browse through
measurements saved in the log file.

LOGGER RECALL (TV/CATV)

Press the “HOME” key.

Touch “MEMORY”
and then “RECALL DATALOGGER”.

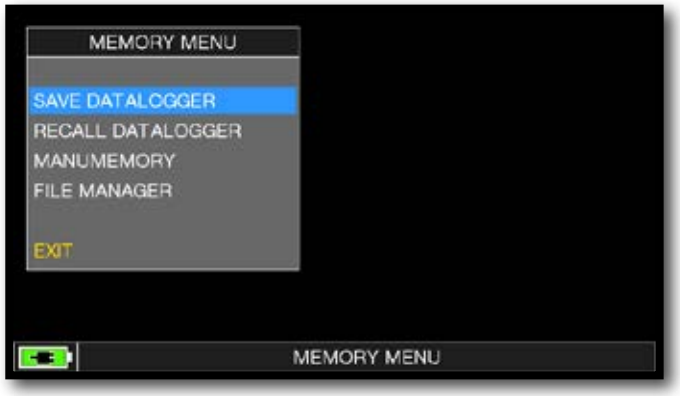
Set the LOG file parameters.
Touch “RECALL?” to see them.



Example of saved measured in the Log file.
Touch the screen to browse through measurements.

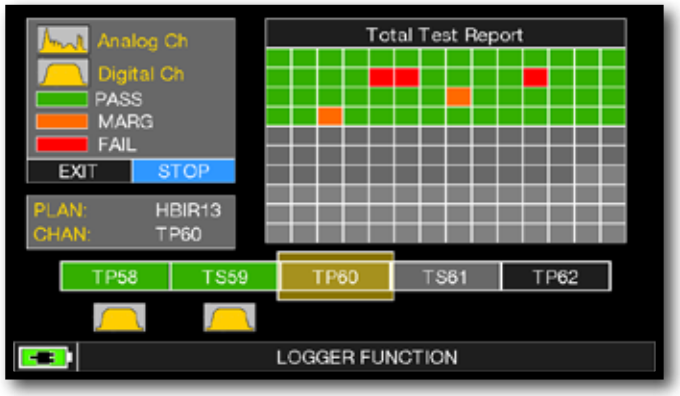
LOGGER SAVE (SAT)

Press the “HOME” key.



Touch “MEMORY” and then “SAVE DATALOGGER”

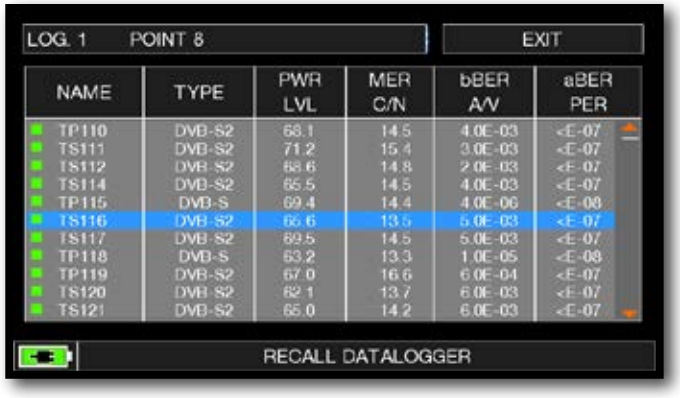
Set the parameters required. Touch “START SAVE” to create a new log file.



DATA LOGGER run.

NOTE: if the MANU plan has mixed TV and SAT programs, the “STOP&GO” function will assist when running a LOGGER asking to move the cable lead from a TV to a SAT signal source.

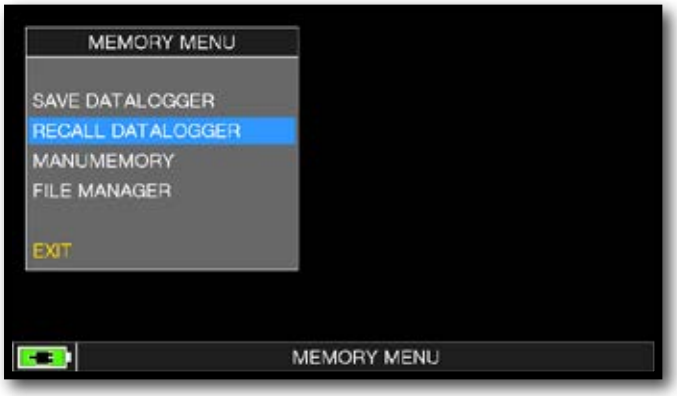
Touch “RECALL” to recall the Logger or “EXIT” to exit.



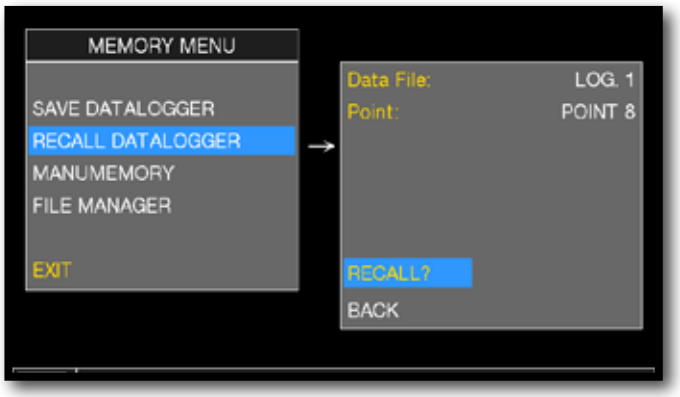
Example of saved measured in the Log file. Touch the screen to browse through measurements.

LOGGER RECALL (SAT)

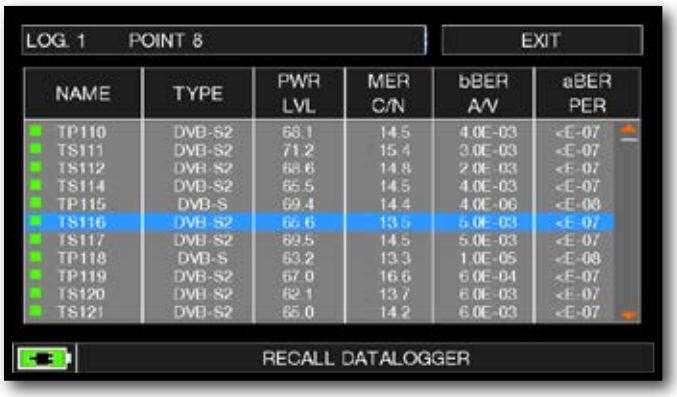
Press the “HOME” key.



Touch “MEMORY”
and then “RECALL DATALOGGER”.



Set the LOG file parameters.
Touch “RECALL?” to see them.



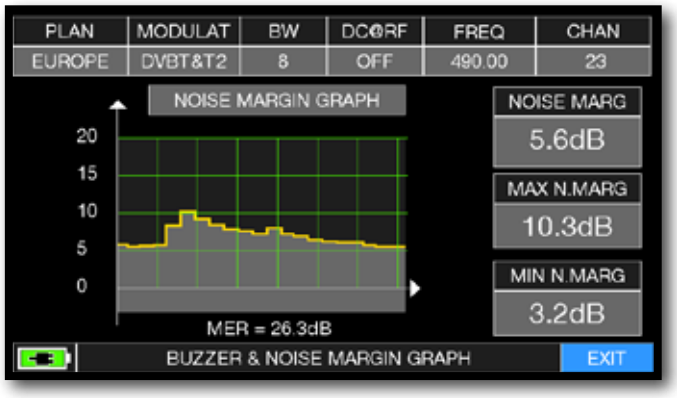
Example of saved measured in the Log file.
Touch the screen to browse through measurements.

TV/CATV SPECIAL FUNCTIONS

BUZZER & NOISE MARGIN GRAPH

After selecting the TV/CATV canalization and the desired channel press the “HOME” key.

Touch “SPECIAL FUNCT”, and then touch “BUZZ & NOIS MARGIN”.



Buzzer & Graphic of the progress of the noise NOISE MARGIN of the TV/CATV tuned channel according to time.

high tones = the BEST Noise Margin level
deep tones = the WORST noise margin level
Noise Marg = real time noise margin
Max n.marg = maximum stored noise margin
MER = MER in real time.

NOTE: The function is also available in CATV and SAT mode.

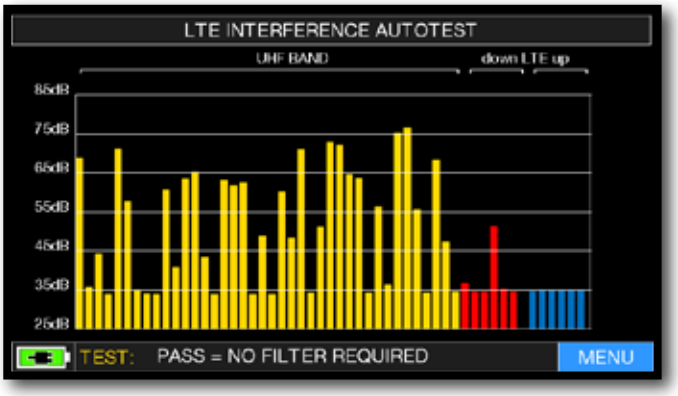
TEST INTERFERENZE LTE

In TV or CATV mode
press the “HOME” key.

Or press 2 time
“BARSCAN” key.

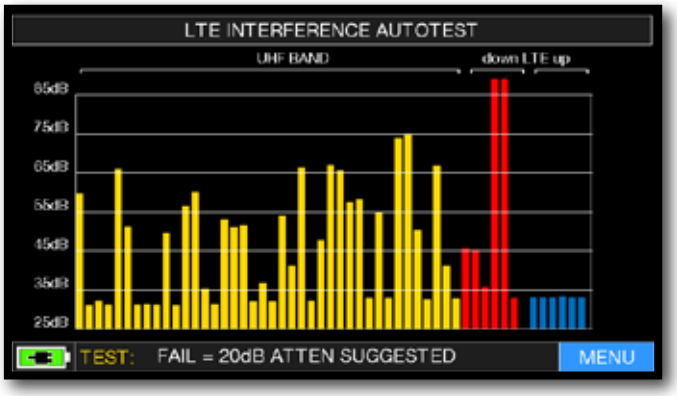
Touch “SPECIAL FUNCT”,
and then “LTE AUTOTEST”.

Example 1:



low LTE interference.
The lower part of the display shows
the following information:
PASS = NO filter required
(No interference detected).

Example 2:



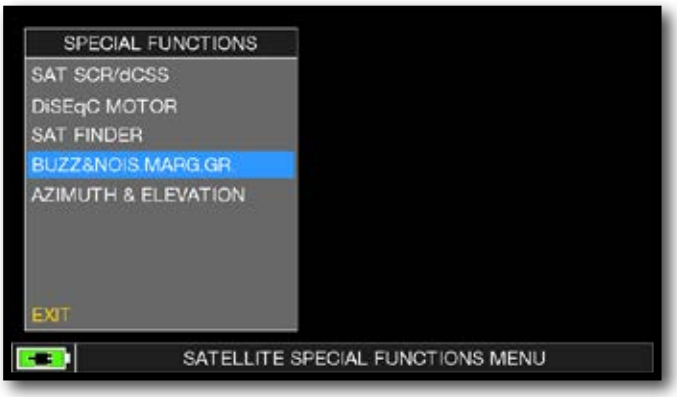
High LTE interference.
The lower part of the display shows the
following information:
FAIL = 20dB ATTEN SUGGESTED
(the instrument suggests attenuating the
interfering LTE signals by 20 dB)

SAT SPECIAL FUNCTIONS

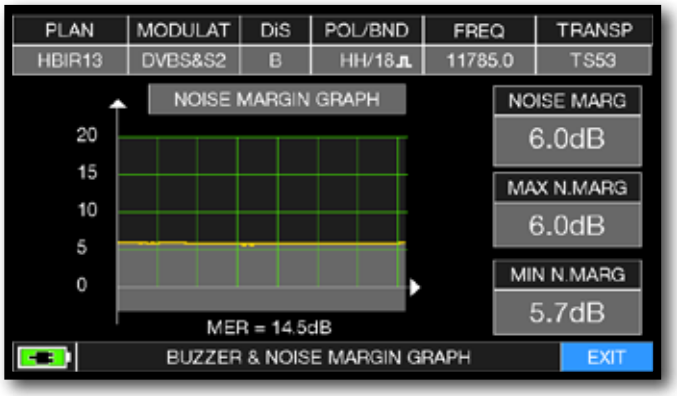
NOTE: the special functions depend on the active operating mode: TV SAT or CATV.

BUZZER & NOISE MARGIN GRAPH

After selected the Satellite and Transponder desired press the "HOME" key.



Touch "SPECIAL FUNCT", and then touch "BUZZ & NOIS MARGIN".



Buzzer & Graphic of the progress of the NOISE MARGIN of the tuned Sat Transponder according to time.

high tones	=	the BEST Noise Margin level
deep tones	=	the WORST noise margin level
Noise Marg	=	real time noise margin
Max n.marg	=	maximum stored noise margin
MER	=	MER in real time.

NOTE: The function is also available in CATV and TV mode.

OPTIONAL “APP’S”

REMOTE CONTROL

The SW REMOTE CONTROL application allow to configure and memorized the instruments and all measurements remotely via web browser (PC, TABLET and SMARTPHONE)

“DHCP” CONFIGURATION EXAMPLES.

Touch “CONFIGURATION MENU” from “VOLUME” screen.

Touch “METER” and then “LAN CONFIGURATION”.

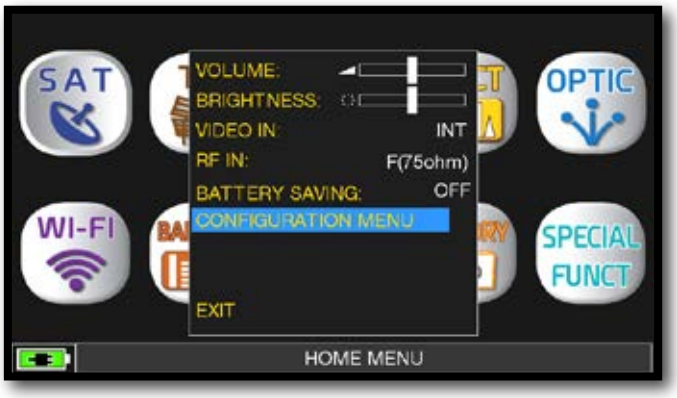
Touch “IP CONFIG” and select “DHCP”.

Touch “CHECK”.

IP address assignment to be inserted into the web browser done.

At the end touch “EXIT” to exit.

EXAMPLE OF “STATIC” CONFIGURATION.



Touch “CONFIGURATION MENU” from “VOLUME” screen.

Touch “METER” and then “LAN CONFIGURATION”

Touch “IP CONFIG” and select “STATIC”, insert the “IP”, “NMASK” and “GWAY” parameters.

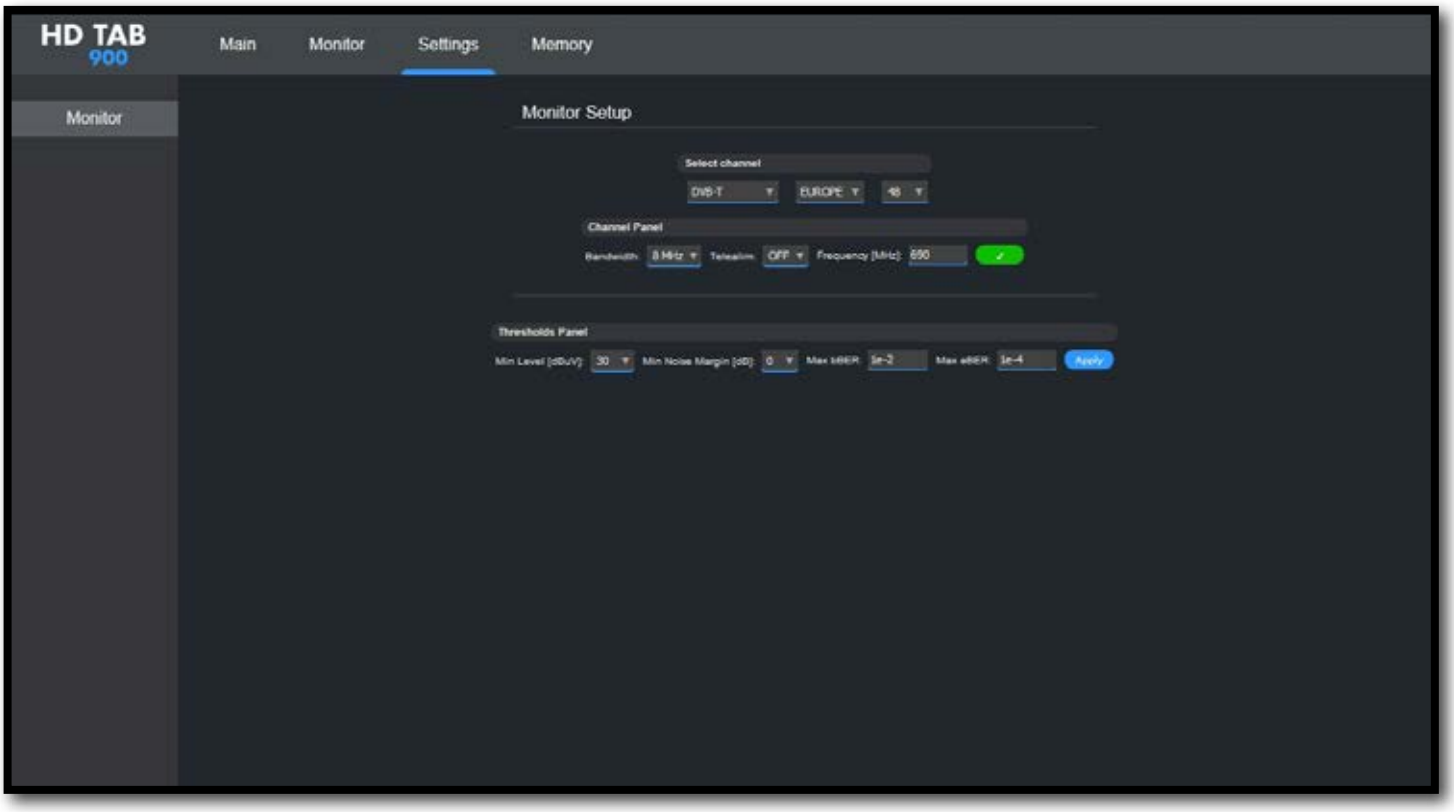
Touch “CHECK”.

At the end touch “EXIT” to exit.

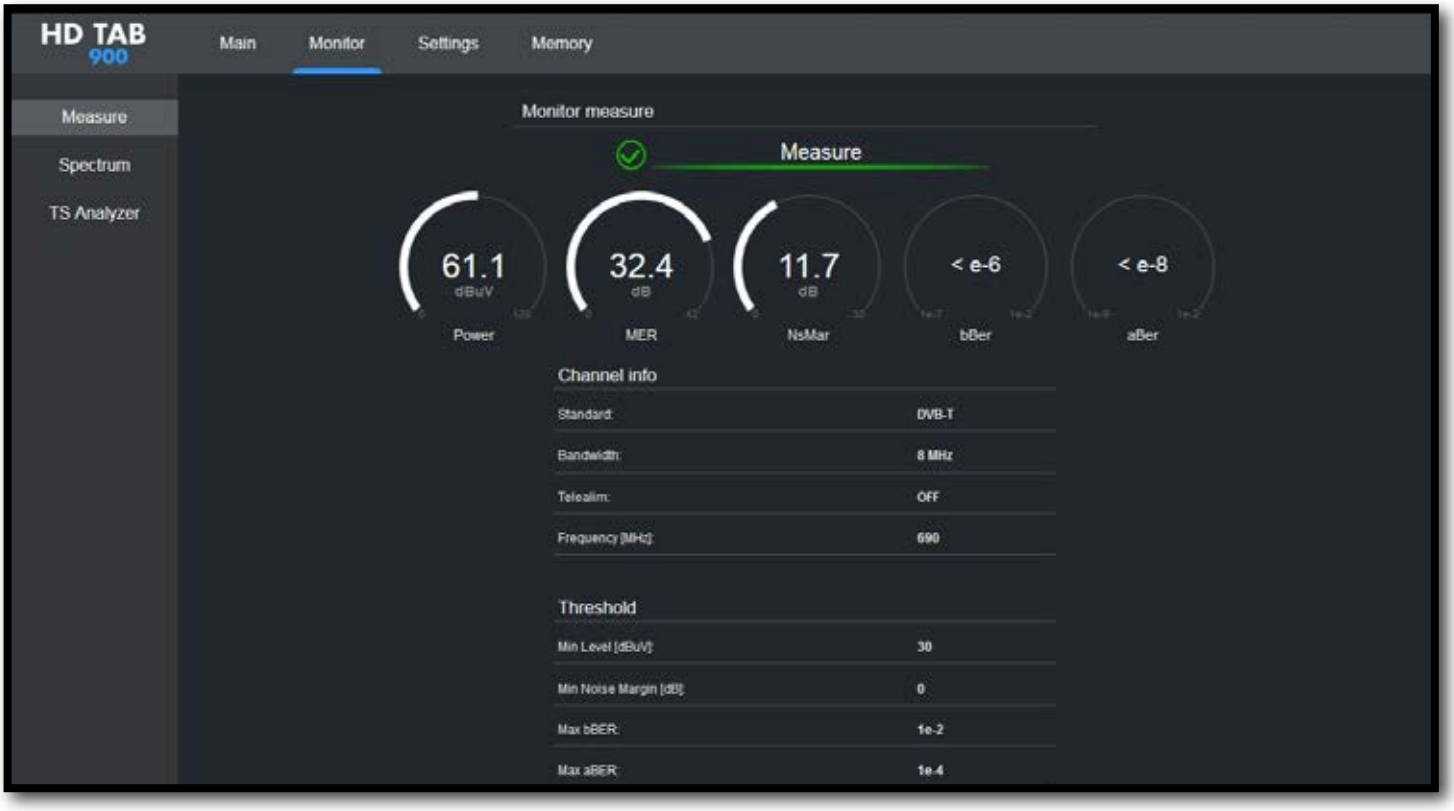
NOTE: for more information about the “APP”s, contact your distributor or send an e-mail to: wecare@roverinstruments.com

REMOTE CONTROL INTERFACE

1. Open a web browser
2. Write the assigned IP address, example 192.168.15.134/index.html

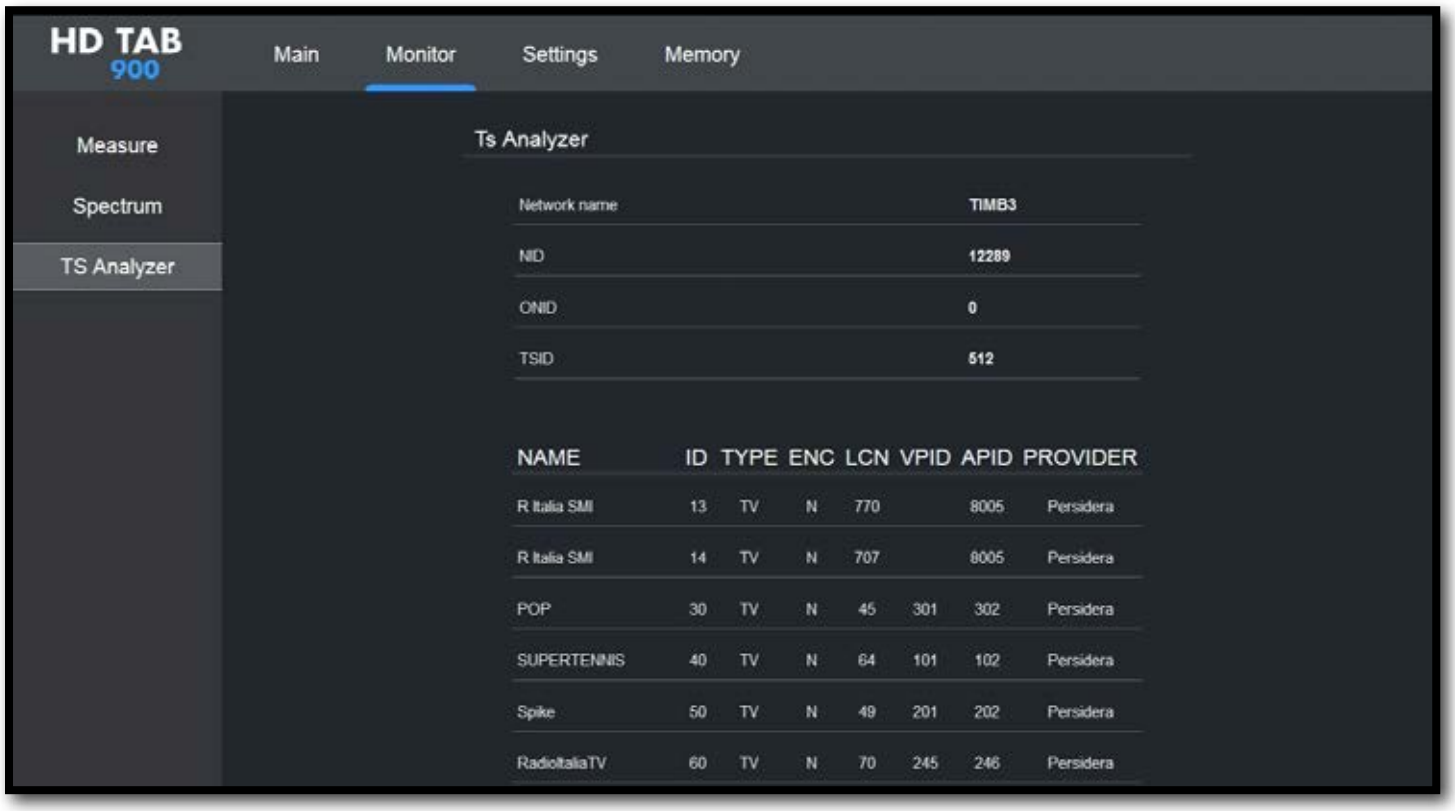


Example of SETTING a TV RECEPTION CHANNEL (DVB-T Standard)
and the related ALARM THRESHOLDS (THRESHOLDS)



Example of MEASUREMENTS of a TV CHANNEL (DVB-T Standard)
and related screen of IMPULSE RESPONSE (ECHOES)

Example of DISPLAY of a TV SPECTRUM, SPAN 50 MHz



Example of TRANSPORT STREAM ANALYSIS

LI-ION POLIMER BATTERIES

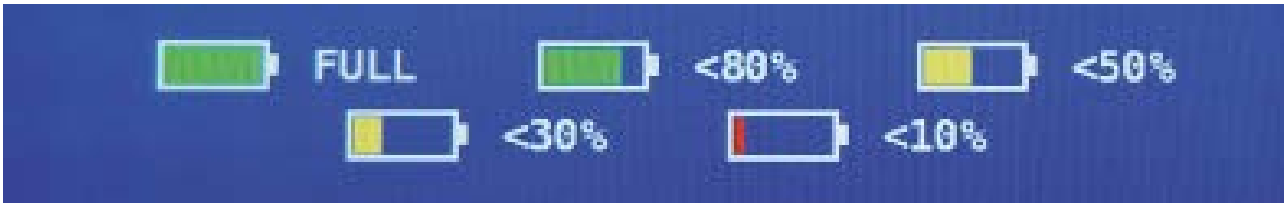
IMPORTANT:

- DO NOT LEAVE THE BATTERIES DISCHARGED FOR LONG PERIODS;
- ALWAYS CHARGE THE BATTERIES AT NIGHT, EVEN IF THEY ARE NOT COMPLETELY DISCHARGED.

USEFUL INFORMATION:

1. The batteries supplied are high quality and tested individually, the autonomy depending on the following conditions:
   - the LNB power consumption: Single, Dual or Quadruple;
   - the external temperature: with temperatures of less than 10°C, 20% of the capacity is lost;
   - the age of the batteries: a 10% loss in efficiency each year;
   - Remember that the TIMER OFF function, that automatically turns off the Meter after 5 o 10 minutes of inactivity saves up to 30%.
2. The battery indicator has a tolerance (like all battery powered electronic devices) according to the following factors:
   - the battery's charging percentage;
   - external temperatures;
   - battery wear and tear;
   - +/- 2 %

ICONS SHOWING THE BATTERY CHARGE STATUS:



BATTERY AUTONOMY:

The battery autonomy is up to 3 hours maximum.

WARNINGS

RECHARGEABLE BATTERY

This device contains a built-in Li-PO (Lithium polimer) battery that can be recharged many times.

The battery contains chemicals that might wear with time even if not used. Please dispose of batteries properly.

Do not take the battery pack apart or expose it to extreme temperatures (over 50°C). If the device has been exposed to very low or high temperatures let it rest at room temperature before use.

RECHARGING THE BATTERY

The Battery must be recharged at room temperature (about 20°C) with the device turned off.

To avoid premature failure of the battery never leave the device with an empty battery for prolonged periods.

BATTERY TEST
& BATTERY REGENERATION

THIS PROCEDURE EXPLAINS HOW TO REGENERATE/CHECK YOUR BATTERIES AND CALIBRATE THE BATTERY CHARGE INDICATOR

USEFUL ADVICE:

- Charge the batteries every night after use, even if they are not completely discharged;
- Always use the "battery save" & "timer off" functions to increase your meter's autonomy;
- The maximum capacity of the batteries and battery charge indicator's accuracy improves by up to 20% if you carry out many battery test cycles;
- Do not replace the batteries: first carry out 3 to 5 battery test cycles until you recover the maximum capacity of the batteries.

"BATTERY TEST" INSTRUCTIONS & PROCEDURE:

1. Before carrying out the test connect the meter to the original battery charger:
   - Turn on the meter;
   - Press the volume key and select "configuration menu" (fig. 1);
   - Select the word "meter" and press "ENTER" (fig. 2) & press "ENTER" to confirm;
   - Select "battery test" and select "on" (fig. 2);
   - Press "enter" to confirm;
   - Carefully read the various screens, pressing "enter" in succession;
   - In the last instructions window, select "start" and press "enter" to start the test.

WARNING: the procedure will be cancelled if you select "exit" on any screen.

FIG. 1*

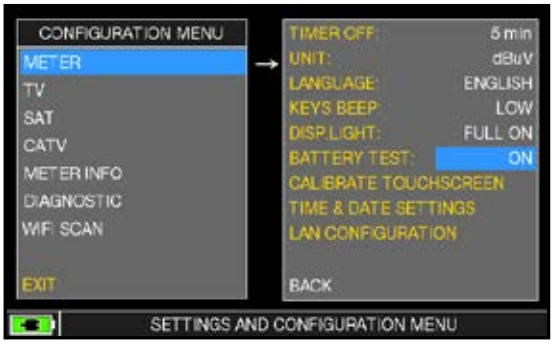


FIG. 2*

FIG. 3

IMPORTANT ADVICE:

- Do not connect any type of load to the "F" input connector (LNB, TV head-end, amplifiers, etc.).
- Extract the conditional access module (CAM), if it is present in your meter.

2. The battery test takes approx. 12/18 Hours according to the model (charging/discharging/recharging activities and measurement of the battery autonomy), during this time the meter must not be used. At the end of the test the meter will turn off automatically. In order to make sure that the test has been carried out correctly, all the meter's commands are blocked except for the reset function, which remains active so that the meter can be turned off if necessary.
3. the batteries will be completely charged at the end of the test.
4. To check the battery test results, enter once again into "meter" in the "configuration menu" and read the results (Fig. 3):
   - for example 265BFEY (fig.3) = 265 minutes.
   The "Y" of YES confirms that the battery is still good enough, whereas an "N" for NO indicates that it could be faulty, too deteriorated or that the cycle was interrupted.

IMPORTANT NOTES:

If the test is interrupted using "reset", the battery charge indicator may provide incorrect indications, therefore repeat the battery test procedure.

* The displays shown in this guide may change according to the model and are subject to change without notice. If you connect your meter, using the s.M.A.R.T. Pro program, from the usb port to the pc, you can download the screens shown above.

POWER SUPPLY (MAINS) AND BATTERY CHARGE (CHRG) LED STATUS

INSTRUMENT	CONNECTED TO THE MAINS POWER SUPPLY	▼ LED MAINS	▽ LED BATT CHRG	NOTES
ON	NO	ON	OFF	Instrument ON or in power up
OFF	YES	ON	Flashing 0.5 SECONDS OFF 0.5 SECONDS ON	Abnormal battery temperature. The recharge cycle has been suspended temporarily and will automatically reset.
OFF	YES	ON	ON	Batteries in charge
OFF	YES	ON	OFF	Battery charge completed
OFF	**WITH A POWER SUPPLY NOT COMPLIANCE**	Flashing 0.5 SECONDS OFF 0.5 SECONDS ON	OFF	**The meter does not turn on. Check the mains power adapter, it must be 12 Vdc and not 18 Vdc**

METER MAINTENANCE

CLEANING THE METER

Cleaning the meter from dust and dirt is easy and helps mantaining it in optimal work conditions through the years. The cleaning procedure is simple and quick and requires only minor attention.

Never use chemical aggressive products (diluent) and/or abrasive or rough clothes which may damage plastics and displays.

Always use a soft cloth, damped with a simple water and alcohol solution or a de-greasing not abrasive liquid soap.

Keyboard and display should be gently cleaned. Rubbing the keyboard and/or the display(s) may seriously damage their functions.

MAINTENANCE AND CARE OF THE METER

This meter has been designed to withstand severe conditions of use. Even so, its life may be prolonged by respecting some simple and effective rules:

- The meter has not been designed to withstand high temperatures (over 60°C or 140° F). Those temperatures can be easily reached when the meter is left in a car, especially behind the windshield, or in the trunk. The LCD display and/or other details may easily be damaged by the extreme temperature.
- The internal battery may rapidly loose its efficiency if exposed to high or low temperatures. This will result in reduced autonomy of the meter when powered by internal battery.
- When recharging the internal battery, do allow a good air circulation around the meter and the adapter: do not cover it with clothes and do not recharge the battery when the meter is contained in its transport case
- The meter is not waterproof, even if it is protected against incidental water drops. In case of contact with water, electronic circuits may be damaged, allow the meter to dry thoroughly before trying to turn it on. Do not use hairdryer or other strong heating sources, but just leave the meter in quiet air. If possible, contact Rover Laboratories S.p.A. Technical Assistance.

DISPOSAL

Electronic devices do not belong in the household waste and must be disposed of properly in accordance with Directive 2012/96/EC OF THE EUROPEAN PARLIAMENT AND COUNCIL dated Juli 4, 2012 concerning waste electrical and electronic equipment. Please return this device to the designated public collection point for disposal at the end of its service life.

CE MARK AND DECLARATION OF CONFORMITY

CE The DIGIMETER 9 has the CE mark.

TechniSat hereby declares that the DIGIMETER 9 equipment complies with Directive 2014/53/EU. The full text of the EU conformity declaration is available at the following Internet address:

DIGIMETER 9: http://konf.tsat.de/?ID=23021

CONTACT ADDRESS

TechniSat Digital GmbH
Julius-Saxler-Str.
D-54550 Daun, Germany
Web www.technisat.de

ACCESSORIES SUPPLIED

LIST OF PROVIDED ACCESSORIES:

- Soft BAG
- Removeable side pocket for tools and accessories
- Shoulder strap
- Safety antenna mast attachment Strap
- USB 2.0 cable for PC connection
- Battery charger power supply
- User guide (hard copy)
- User guide (CD or USB)
- F Female - F Female connector
- BNC Female - F Female connector
- IEC Female - F Female connector
- QUICK F Male - F Female connector

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

ABBREVIATIONS & TECHNICAL TERMS

- APID (Audio Packet Identifier): Audio reception parameters in the MPEG data stream.
- aBER (Bit Error Rate after Viterbi): Ratio of the transmitted bits to the erroneous bits after Reed Solomon (Viterbi).
- BCH (Bose Chaudhuri Hocquenghem): External error protection decoder.
- BER (Bit Error Rate): The bit error rate shows the quality of the DVB signals. It displays the number of erroneous bits in relation to all the transmitted bits.
- bBER (Bit Error Rate before Viterbi): Ratio of the received bits relative to bits that have errors before Reed Solomon (Viterbi).
- CBR (Constant Bit Rate): Is used for MPTS measurements, cf. VBR.
- C/N (Carrier to Noise): Difference between the carrier signal and noise level in dB; see also S/N.
- EVM (Error Vector Magnitude): Measures deviation of the transmitted symbols to the ideal constellation, measured in dB.
- FEC (Forward Error Correction): Forward Error Correction, e.g. in case of the code rate ¾, ¾ of the information is user data, ¼ of the data come from the Viterbi correction.
- Guard Interval: Guard interval by extending the symbol through a gap. Due to this, good reception is possible even in case of strong reflections.
- LCN (Logical Channel Numbering): Logical channel sorting performed by the provider.
- LDPC (Low Density Parity Check): A new error protection method applied in DBV-S2 (Gallager codes). Inner error protection; code rates from 1/2 to 9/10.
- MER (Modulation Error Rate): MER is the ratio of the average signal power to the average error power in dB. It is a kind of a C/N measurement which gives information whether the receiver is able to demodulate the received signal.
- MPTS (Multiple Program Transport Stream).
- NID (Network Identification): Network ID or channel identification number between 0 and 8191.
- NIT (Network Information Table): Contains, for example, information about all available transponders, PIDs, downlink frequency, polarisation, next transponder for the scan; transmitted in the multiplexer transport stream.
- NsMargin (Noise Margin): Signal to Noise Ratio margin.
- OMI (Optical modulation index).
- PER (Packet Error Ratio): The Packet Error Ratio displays the number of incorrectly received data packets relative to the total number of transmitted packets (after Viterbi).
- QEF (Quasi Error Free): Bit error rate equals 2.00e-4.
- Noise Level: Sum of noise factor and thermal noise floors. Noise is created by physically caused molecular motion in electrical conductors.
- RMS (Root Mean Square): Method of a square mean value determination.
- S/N (Signal to Noise): Difference between the wanted signal and the noise level in dB; $S/N \approx C/N + 1,5$; see also C/N.
- SPTS (Single Program Transport Stream).
- TSID (Transport Stream ID): Transponder/multiplex ID.
- VBR (Variable Bit Rate): Is used for MPTS measurements, cf. CBR.
- VPID (Video Packet Identifier): Video reception parameters in the MPEG data stream.

NOTES