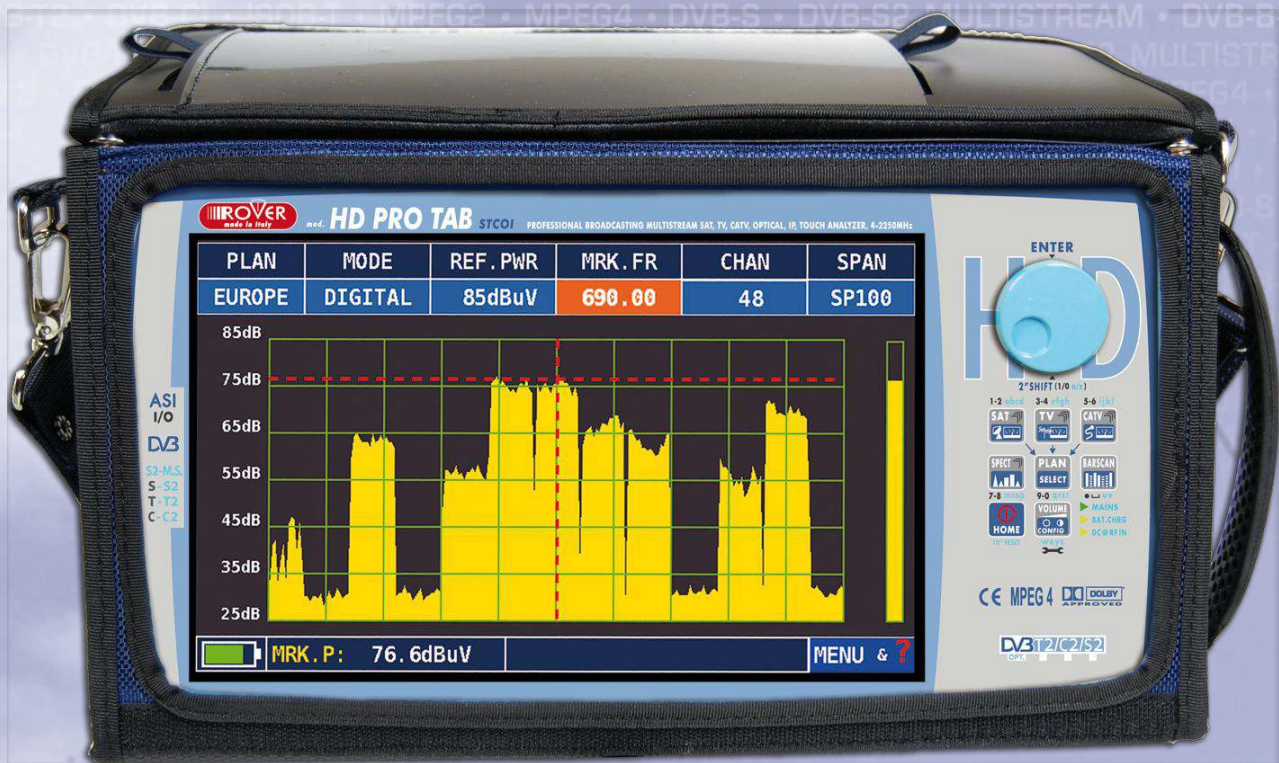




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A STEP AHEAD IN DIGITAL TELEVISION

HD PRO TAB User Guide



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DISCLAIMER OF WARRANTY:

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2. The guarantee covers the replacement free of charge of parts only, when malfunctioning is solely due to manufacturing faults. The faults must be indentified and defined by ROVER personnel only.
3. The guarantee is void if:
 - a. the equipment is tampered with or repaired by non-authorized personnel
 - b. damage is found, caused by the incorrect use of the equipment, without following the advice explained in the User's Guide accompanying the equipment.
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 - c. Bags and carrying cases, including shoulder straps.
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SERVICE NOTES AND AFTER SALE SUPPORT PROCEDURES:

IMPORTANT NOTE:

The equipment can only be repaired by the manufacturer or by an authorized service center.

Before returning the meter for repair, always contact your local distributor or an authorized service center, if present in your area, to obtain the return procedure for your analyzer.

Important: please take note that non-authorized returns for repair to ROVER Laboratories S.p.A. will be rejected.

When returning the meter, always send it with the following documentation attached:

- the fully-compiled FAULT IDENTIFICATION FORM
- transport document
- the eventual request for an estimate of repair costs. Please note that the request for an estimate of repair costs must be submitted upon return of the analyzer with a written note. If the repair cost estimate is not accepted, ROVER Laboratories reserves the right to charge the customer for the estimate costs analysis.

Risks and costs for transport to ROVER Laboratories S.p.A. must be sustained by the buyer. After repair, if the equipment is under guarantee, ROVER Laboratories S.p.A. will pay for the transport returning the goods to the customer. If the instrument is not under guarantee, after repair, the equipment will be returned by courier service with the amount to be paid by the customer shown on the invoice.

The guarantee does not cover compensation for direct or indirect damages of any kind to people or goods caused by the use of the equipment and/or compensation caused by the suspension of use due to eventual repairs.

RO.VE.R. Laboratories. S.p.A. is not responsible for eventual tampering and/or modifications that may cause the goods to no longer adhere to the European "CE" regulations, especially regarding EMC and safety.

DISPOSAL OF ELECTRIC / ELECTRONIC DEVICES

Disposal of electric / electronic devices (applicable in all EU countries and wherever separate waste collection system is applied). The symbol on the packaging indicates that the product should not be considered as domestic waste. The product, at the moment of disposal, should be brought to a waste collection point with the proper facilities to manage electrical/electronic appliances.



Electric/electronic appliances, if not disposed of correctly, may have negative consequences on your health and environment. Furthermore, a proper recycling procedure helps maintaining natural resources.

To have more information about proper disposal of this product, please refer to your local waste management offices or your local distributor.

SAFETY INSTRUCTIONS

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. To clean the meter, never use chemical aggressive products (dilutents) and/or abrasive or rough clothes which may damage plastics and displays. Always use a soft cloth, damped with 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.
6. Do not use the meter near any heat sources such as radiators, heat registers, stoves, or other apparatus that produce heat.
7. 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.
8. No naked flame sources, such as lighted candles, should be placed on the meter.
9. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
10. Only use attachments/accessories specified by the manufacturer.
11. Unplug this apparatus during lightning storms or when unused for long periods of time.
12. Refer all servicing to qualified service personnel. Servicing is required when the meter has been damaged in any way, such as the power-supply cord or plug is damaged, liquids or objects have fallen into the meter, the meter has been exposed to rain or moisture, does not operate normally, or has been dropped. See page 4 for Service notes and After Sale Support Porcedures.
13. Ensure that your mains supply is in the correct range for the input power requirement of the unit.

RECHARGEABLE BATTERIES

This device contains a built-in Li-PO (Lithium Polymers) 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.

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.

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Getting Started

1. Unpacking and inspection

Before unpacking the unit, inspect the outer carton for shipping damage. If the carton shows damage, inspect the unit in those areas.

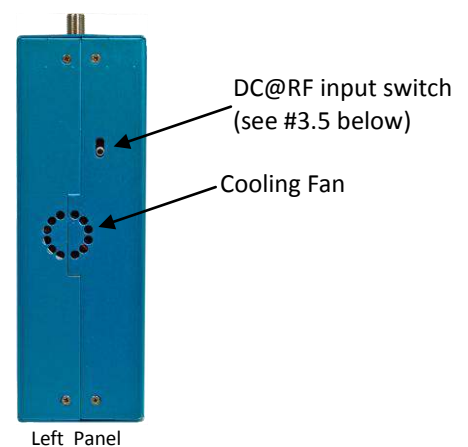
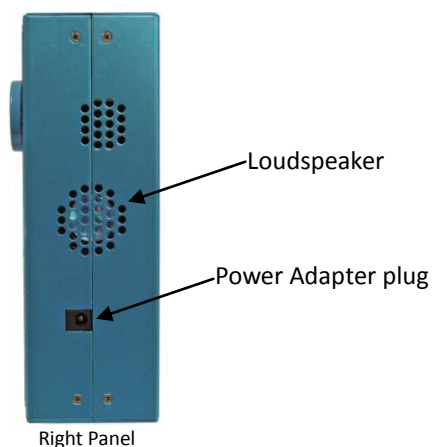
Several essential items are provided with the unit, including:

- Power cords for use in Continental Europe or United States
- 110V-240V AC to 12 VDC Power Adapter
- Composite A/V cables
- A CD-R containing the S.M.A.R.T. application and its documentation, Meter's USB driver and MIB file.
- Warranty and After Sale Support information



Note: To maintain your eligibility for software upgrades, register your product on the software upgrades page at www.roverinstruments.com.

2. Right and Left panels



3. Top panel connectors



3.1 ASI Input and Output

HD PRO TAB is equipped with ASI input and output on standard 75Ω BNC connectors, compliant with standard EN50083-9. The ASI input is always active, while ASI output could be activated in meter's configuration menu.

3.2 10MHz and 1PPS inputs *

HD PRO TAB is equipped with 10MHz and 1PPS inputs on standard 75Ω BNC connectors for Transport Stream analysis purposes, like Network Delay and PCR measurements.

*(Contact us for availability and upgrade information)

3.3 RF inputs: 75Ω F connector and 50Ω N connector

HD PRO TAB has 2 different RF inputs: a 75Ω F connector input and a 50Ω N connector input. Both RF interfaces accept signals with power level between 30 and 120dBμV and comply with standards ETS300744 (OFDM), ETS300421 (QPSK) and EN302307 (QPSK, 8PSK, 16APSK).

3.4 Common Interface

HD PRO TAB is equipped with a Common Interface slot compliant with EN50221 standard (DVB-CI) capable to manage both consumer single service decryption CAM and professional multi-service decryption CAM.

The meter detects automatically the CAM module once inserted in the PCMCIA slot and gives information about the CAM manufacturer, module firmware version and status.

3.5 Remote bypass switch – DC at RF input

HD PRO TAB is able to bias directly LNBS as well as terrestrial antenna distribution systems with a DC voltage from 5 to 24V available on both RF input connectors. The DC internal generator can be activated via software, while configuring the meter for satellite or terrestrial measurements, but can be activated / deactivated via this hardware switch.

Physical switch activation is mandatory for software DC generator configurations to take effect.

3.6 Analog Video and Audio Input



HD PRO TAB is equipped with two input and output connectors to provide to or get from the meter composite video and audio stereo signals.



You can find the suitable cable in the accessories bag delivered with the meter.

On one end, the cable has standard A/V RCA connectors, while on the other end there are the two stereo jack connectors as shown here on the left.

3.7 HDMI Output

HD PRO TAB gives the possibility to connect an external TV or monitor via an HDMI connector. The meter detects automatically when a screen is connected and switches its view from the embedded screen to the external monitor.

3.8 Micro-USB connector

Software upgrades or data upload/download can be done via the micro-USB connector and the S.M.A.R.T. software*. This micro-USB connector supports also the USB-on-the-go standard, to connect external USB drives.

3.9 Ethernet connector

HD PRO TAB is equipped with a standard 10/100 Base-T Ethernet connector supporting both DHCP and static IP configurations. Through the IP interface is possible to stream one Elementary Stream selected among the services decoded in the current signal; it is also possible to browse meter's MIB* and configure / read remotely signal measurements and meter's information.

*See the CD-R provided in Meter's box.

4. Front Panel commands and LEDs.

The HD PRO TAB's front panel is equipped with a 7" touch screen display, a mechanical encoder wheel as well as an 8 buttons keyboard to access all primary functions of the meter.



Touch screen and keyboard are complementary: the meter can be driven completely using either the keyboard or the screen.

The touch screen capability can be excluded in the Meter's configuration menu.




The HOME button brings the user back to the main screen display and acts also as the power-up and power-down button:

- When the meter is on, pressing the HOME button for 2 seconds will toggle the shut-down process at the end of which the meter will be completely switched off.
- When the meter is off, pressing once on HOME button will power-up the meter: it will be up and running within seconds.
- In case the meter becomes unresponsive, pressing the HOME button for 10 seconds will cause a hardware reset. The meter will be restarted automatically.

The meter is delivered with a default (factory) configuration for both system parameters and plan/measurement parameters. If you want to restore the factory default settings, you should:

1. Shut down the meter

2. Switch on the meter and press the  button until you hear a buzzer that confirms the restore defaults operation has been taken into account in meter's power-on procedure.



Pressing the CONFIG button will display meter's basic parameters, such as volume, screen brightness and contrast, ASI output status, etc, and gives the access to the complete configuration menu (see the next chapter for detailed information about meter configuration).



SAT, TV and CATV buttons give access to the measurement interface respectively for Satellite, Terrestrial and Cable TV channels. By default, the basic measurement screen is displayed (refer to chapter XX for detailed information about the measurement interface).



All the measurements are based on a *channel plan* loaded automatically by the meter when entering the measurement interface. This plan can be either a *manual plan* defined by the user or a *canalization plan* loaded on the meter. The button PLAN gives the access to the meter's channel plans library in which the user can select the plan to be used in the measurement campaign.

Note: The list of displayed plans varies depending on which standard has been selected before entering the PLAN menu. For instance, if the user selects SAT and then press PLAN, the channel plans library will show up only satellite canalizations such as HotBird 13°E, Astra 19.2°E, Atlanti Bird 5°W, etc.



The SPECT button gives access to the signal spectrum visualization. Similarly to what happens for channel plans, the signal spectrum displayed on the meter will depend on which is the standard selected before entering the SPECT function (SAT, TV or CATV).



BARSCAN function is only available during Terrestrial TV or Cable TV measurements and gives access to the Bar Graph displaying the detected channels and their RF level. If this menu is also possible to execute the TILT graph, selecting up to 10 channels in the channel plan to be used as reference.

The mechanical encoder could be used to move the selector across the screen's icons or menus; it can be rotated in both clockwise and counter-clockwise directions. Pressing the encoder will act as an "ENTER", enabling parameters configuration or menu activation.



The front panel is also equipped with 3 LEDs: MAINS, BAT.CHRG and DC@RF IN. For the last one, the meaning is straightforward: if the LED is ON, the meter is biasing the signal source with a DC voltage; conversely, if the LED is OFF, no DC supply is given by the meter.

MAINS and BAT.CHRG are linked each other and depending on their status, the meaning can be different. Hereunder you can find a table that summarizes LED statuses and the corresponding meaning:

INSTRUMENT	CONNECTED TO THE MAINS POWER SUPPLY	LED MAINS	LED BAT.CHRG	NOTES
OFF	NO	OFF	OFF	Battery charged
ON	NO	OFF	OFF	Battery operation
OFF	NO	OFF	Flashing 2 SECONDS OFF 0.5 SECONDS ON	The meter does not turn on. Recharge the batteries.
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 fast charge
OFF	YES	ON	OFF	Battery charge completed
OFF	WITH A POWER ADAPTER NOT SUPPLIED FROM ROVER	Flashing 0.5 SECONDS OFF 0.5 SECONDS ON	OFF	The meter does not turn on. Check the power adapter
Switch ON	NO or YES	FLASHES 15 TIMES	OFF	The meter is being turned on
ON	NO or YES	FLASHING SIMULTANEOUSLY 0.5 SECONDS OFF - 0.5 SECONDS ON		The meter detects an error and turns off automatically.
ON	YES	FLASHING ALTERNATIVELY 1 SECOND OFF - 1 SECOND ON		BATTERY TEST being carried out. The meter charges and discharges the battery automatically

Important notes on meter's battery

1. ALWAYS TURN THE INSTRUMENT OFF BEFORE CONNECTING THE BATTERY CHARGER.
2. DO NOT LEAVE THE BATTERIES DISCHARGED FOR LONG PERIODS.
3. ALWAYS CHARGE THE BATTERIES AT NIGHT FOR AT LEAST 7 HOURS, EVEN IF THEY ARE NOT COMPLETELY DISCHARGED.

The batteries supplied are of high quality and tested individually to guarantee autonomy between a minimum of 6 hours and a maximum of 10 hours depending on the following conditions:

- LNB power consumption: Single, Dual or Quadruple
- External temperature: with temperatures of less than 10°C, 20% of the capacity is lost
- Age of the batteries: a 10% loss in efficiency each year could be observed in case of frequent charge/discharge.
- Usage of battery saving and auto-off functions, that can save up to 30% of battery level.

The meter is provided with a battery charge indicator on the bottom-left corner of the screen, showing the current status icon:



Configuring the HD PRO TAB

5. Meter's basic parameters

Pressing the CONFIG button on the front panel keyboard will display on the screen the basic settings menu.



By default, **VOLUME** is selected (as shown in figure), thus rotating the mechanical wheel will result in increasing or decreasing the audio volume; rotating the wheel clockwise, you will see the white cursor moving up; conversely, rotating counter-clockwise, the cursor will move down the volume bar.



Note: the same process can be done using the touch screen: touching the bar on the right side of the cursor will increase the volume; touching it on the left side of the cursor, will decrease the volume.

Touching each parameter of the menu, will result in entering the edition mode, thus being able to change the parameter's value. For "ON/OFF" parameters, touching the actual value will result in toggling it to its opposite (ON → OFF; INT → EXT; etc)

Pressing once the mechanical wheel will confirm the configuration and place the orange selector on VOLUME, ready to be moved on the next parameter to adjust.

BRIGHTNESS configuration follows exactly the same principle explained for VOLUME. The cursor can be moved up or down the bar to adjust screen brightness.

VIDEO OUT can be turned ON or OFF activating or deactivating the availability of a composite video output on the right side panel connectors (see page 10 for connector details).

VIDEO IN by default is configured on INT (internal), meaning that the images displayed on the meter will be those decoded from the signal at the RF input.

Configuring it on EXT (external), the meter will display in the measurement interface the images coming from the composite video input on meter's right side panel.

IMAGE FORMAT by default is configured on 16:9, but it can be configured also on 4:3. It represents the format of the video decoded in the measurement interface.

ASI IN by default is set to OFF. Switching it ON when using the measurement interface will let the instrument detect the Transport Stream, provide Service List and decode automatically the first non encrypted service.

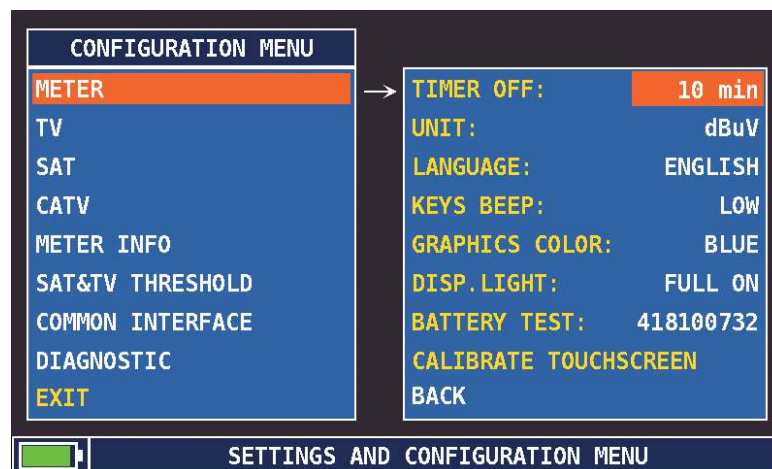
BATTERY SAVING by default set to OFF. When switched to ON it automatically decrease the screen brightness after 30 seconds of inactivity; furthermore, it will shutdown automatically the meter after 5 minutes of inactivity. It is a combination of DISPLAY LIGHT and AUTO OFF parameters with default configurations.

6. HD PRO TAB Configuration menu

Selecting CONFIGURATION MENU from the basic settings screen, the complete meter's configuration menu can be accessed. In this menu the user can configure all the parameters related to meter itself (look and feel, auto-off timer, interface language, etc) as well as all the basic parameters for SAT, TV and CATV measurements.

6.1 METER configuration

The first menu is METER configuration.



TIMER OFF: it determines if the meter should automatically switch off after a certain inactivity period. This parameter can be configured to OFF, 5min (default) and 10 min.

UNIT: it represents the measurement unit for RF level to be displayed in the measurement interface. It can be configured to *dBm*, *dBμV* and *dBmV*.

LANGUAGE: HD PRO TAB has 6 embedded language maps that can be applied on-the-fly, simply changing the selection here. The available languages are *ITALIAN*, *ENGLISH*, *FRENCH*, *GERMAN*, *SPANISH* and *PORTOGUESE*.

KEYS BEEP: by default set to MEDIUM, this parameter sets the buzzer volume on key press. The values this parameter can have are *OFF*, *LOW*, *MEDIUM*, *HIGH*.

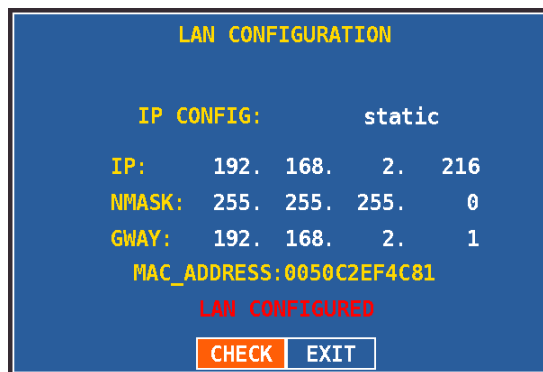
GRAPHIC COLOR: sets the look&feel of the meter. The available themes are *Blue* (default), *Green*, *Brown* and *Grey*.

DISPLAY LIGHT: if set on FULL ON, will result in having the maximum brightness of the screen constantly. When set to 30 seconds, will decrease automatically screen backlight for battery saving after 30 seconds of inactivity.

BATTERY TEST: this code represents the result of the last battery test executed on the equipment:

- The first 3 digits (418 in the picture) represents the time necessary to complete the test, expressed in minutes
- The central 3 digits (100 in the picture) represents the charge status, in percentage
- The 3 last digits (732 in the picture) represents the estimated charge duration in minutes.

LAN CONFIGURATION: via this menu is possible to configure the meter's Ethernet port; the LAN can be configured in both *STATIC* and *DHCP* modes. If in static mode, the user will be asked for the IP Address, Net Mask and Default Gateway.
At the bottom of the screen is possible also to read the LAN MAC Address.



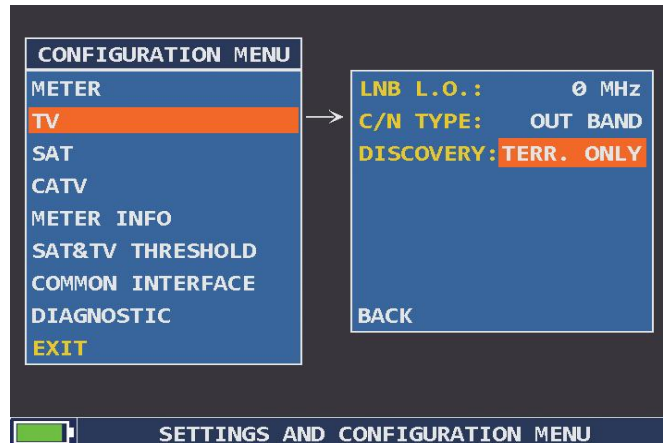
CALIBRATE TOUCHSCREEN: this option activates the touch screen calibration function. As soon as you select the option, an empty screen with 4 small squares on the corners of the screen appears:



Touch each of them to calibrate the meter's touch screen. After this operation, the meter comes back to the Home screen.

5.2 TV Configuration

Selecting TV from the left menu, will open the TV parameters configuration screen:



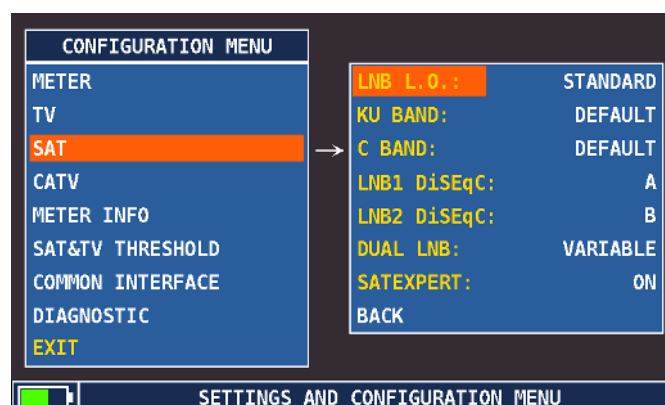
LNB L.O. is set to 0 by default. It should be set to the desired value if it is necessary to down-convert the signal frequency into the TV band (VHF or UHF) before starting the measurements.

C/N TYPE by default is set to *OUT BAND* and can be also set to *IN BAND*. If is set to mode *IN BAND* the signal/noise ratio is measured between the signal level of the video carrier and the noise level, estimated in the band between the colored subcarrier and the audio carrier; if set to *OUT BAND* mode the signal/noise ratio is measured between the signal level of the video carrier and the noise level estimated in the guard band (-1.250 MHz from the video carrier).

DISCOVERY could be set to both *TERRESTRIAL ONLY* or to *TERR&CABLE*. If set to *Terrestrial Only*, it means that the Auto discovery function will look only for terrestrial (DVB-T / T2); when set to *Terr&Cable*, the Auto discovery function will look also for DVB-C channels.

5.3 SAT Configuration

Selecting SAT from the left menu, will open the SAT parameters configuration screen:



LOCAL OSCILLATOR: could be set to *STANDARD* or to *0MHz*. When set to Standard, it enables the selection of down-converter local oscillator from the 2 subsequent menus, ***Ku band*** and ***C band*** and the signal frequencies will be displayed according to the selected values (base-band frequency + local oscillator). When set to *0MHz*, will result in displaying signal frequencies in base-band values (from 950 to 2250 MHz).

D.I.S.Eq.C. 1 and **D.I.S.Eq.C. 2** could be set to *A, B, C, D* and determines which D.I.S.Eq.C. will be assigned to the two satellites used in the ***Dual LNB*** mode.

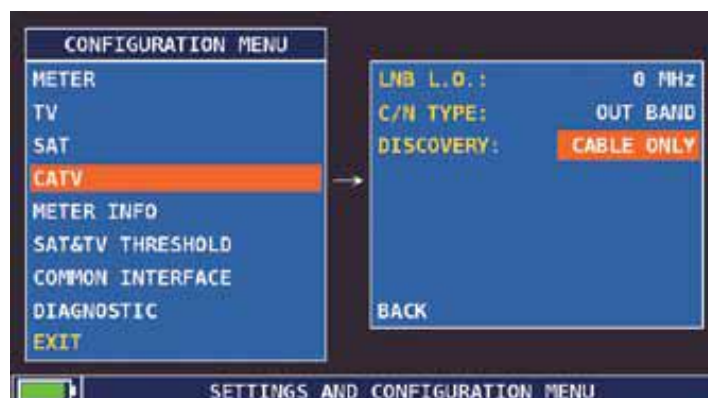
Dual LNB by default is set to *VARIABLE*; it can assume also the values *9° & 13°, or 13°&19° and 19°&23°*. It determines the satellites couple to be addressed during the measurements on Dual LNB installations and on which is applied the ***D.I.S.Eq.C. 1*** and ***D.I.S.Eq.C. 2*** parameters.

SATEXPERT could be set *OFF* and *ON* (default). It is an automatic satellite discovery function that let the user identify the received signal (Astra, HotBird, ect) based on the satellite fingerprint recognition.

If set to *ON*, when doing spectrum analysis of a satellite signal, the meter will compare the fingerprint with a database of compatible configurations and give to the user the name and the exact azimuth of the pointed satellite.

5.4 CATV configuration menu

Selecting TV from the left menu, will open the TV parameters configuration screen:



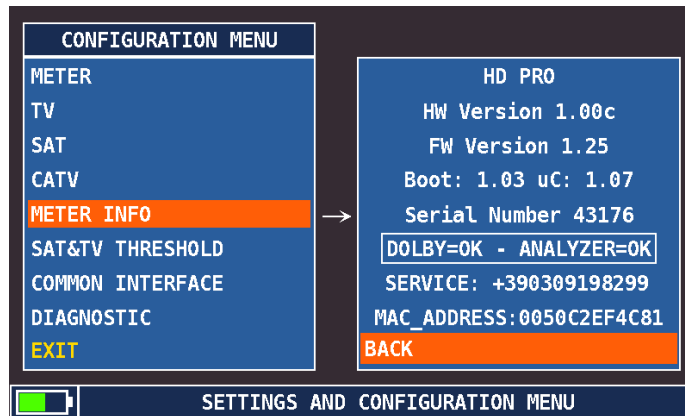
LNB L.O. is set to 0 by default. It should be set to the desired value if it is necessary to down-convert the signal frequency into the TV band (VHF or UHF) before starting the measurements.

C/N TYPE by default is set to *OUT BAND* and can be also set to *IN BAND*. This parameter is used during Analog TV signal measurements to evaluate the C/N of the Video carrier inside the signal band or outside the signal.

DISCOVERY could be set to both *TERRESTRIAL ONLY* or to *TERR&CABLE*. If set to *Cable Only*, it means that the Autodiscovery function will look only for cable channels (DVB-C); when set to *Terr&Cable*, the Autodiscovery function will look also for DVB-T/T2 channels.

5.5 METER INFO

This menu displays a summary of meter's basic information such as the serial number, the firmware version, etc :



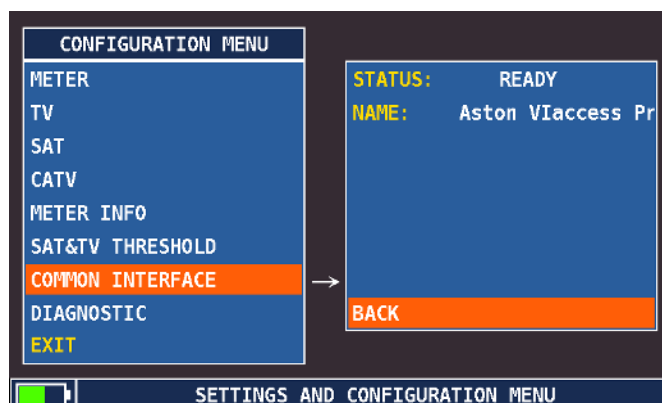
5.6 SAT & TV THRESHOLD

This parameter should be set connecting the instrument to a PC via the micro-USB connector and using the S.M.A.R.T. software.

5.7 COMMON INTERFACE

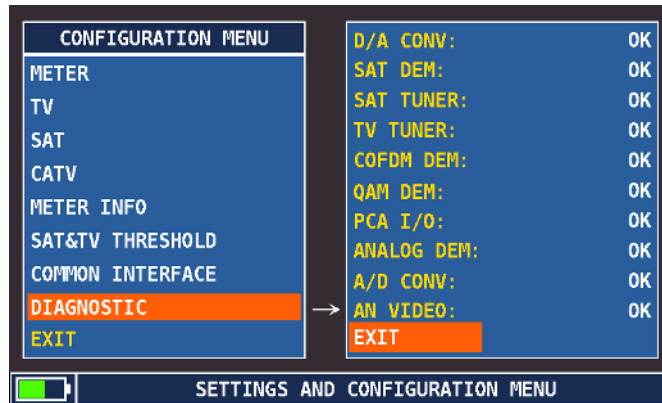
The HD PRO TAB is equipped with a Common Interface slot which can host professional, multi-service and consumer, single-service CAM modules.

In this menu it is possible to verify if the CAM module inserted in the meter is powered up and responsive and also the CAM manufacturer and firmware version.



5.8 DIAGNOSTIC

This screen gives a summary on the status of the different meter's hardware and software modules. Each module's status could be *OK* if it is working correctly, or *NOT OK* if the module doesn't behave properly.



HD PRO TAB Measurement interface

7.1 Accessing the meter's functions from the home page.

The HD PRO TAB's home page gives the access to all the main functions: measurement interface, MPEG services decoding, ASI analysis, and so on.



The **SAT**, **TV** and **CATV** icons gives the access to the meter's measurement interface for respectively Satellite, Terrestrial and Cable signals

The **SPECT** icon gives access to the spectrum analyzer.

The **PLAN SELECT** icon let the user browse the plans library to activate one of the stored channel plans prior to start the measurements. Satellite plans are stored by azimuth and by world region: Europe, America, Australia, etc. TV and Cable plans are listed by country.

The **MPEG SERVICE LIST** icon let the user access the Transport Stream decoding function directly. With this function is possible to see the list of services in the stream and decode both audio and video contents for the selected service. This function is accessible also through the measurement interface.

The **BARSCAN** function gives a histogram representation of the TV (or CATV) band, visualizing both analog and digital carriers, based on the channel plan selected in *Plan Select* menu.

The **ASI ANALYZER** icon activates the ASI analysis on the injected signal. The analysis could be done on the RF inputs (both 50ohm-N and 75ohm-F connectors) and also on the ASI input. See chapter 10 for detailed information.

The **MEMORY** icon gives access to the channel plans management and modification and also to the auto-memory and data logger functions.

The **SPECIAL FUNCTIONS** menu gives the access to Attenuation test and NoiseMargin / Buzzer test.

7.2 Performing Satellite measurements



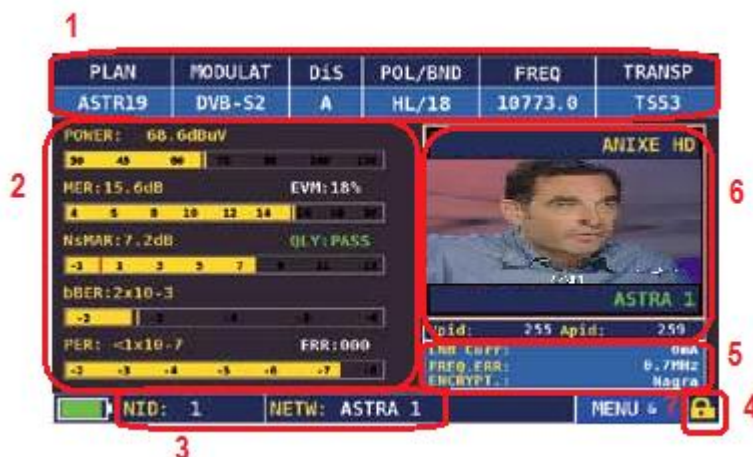
Selecting **SAT** from the Home page, or pressing the *SAT* button on the keyboard will activate the satellite measurement interface. The first time the user enters this function is requested to select a satellite plan among the canalizations stored in the meter:



Once the plan selected, position the selector over the *MEAS* icon to start the measurements.

The satellite measurement interface is composed by two different screens; in the first one, the basic signal parameters are displayed; in the second one, constellation diagrams as well as the Transponder parameters are displayed.

Here is the first measurement screen, with its 6 sections:

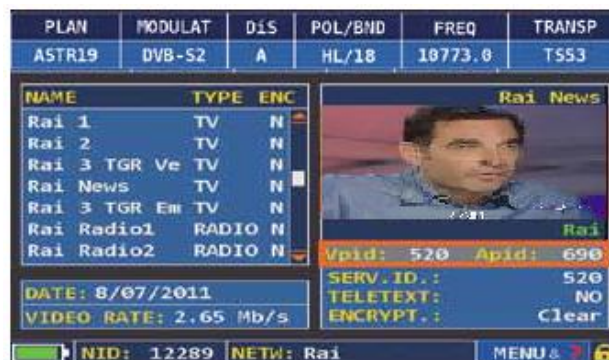


1. Satellite tuning parameters: here the user can find the frequency, the modulation and the polarization parameters for the received satellite signal as well as the chosen satellite plan and transponder number. Once the signal is locked, the modulation type (DVB-S, DVB-S2 Single/Multi-stream, DSS) and Symbol Rate are automatically detected.
2. Basic signal measurements: RF level, MER, Noise Margin, bBER and aBER (DVB-S)/PER (DVB-S2) are displayed. Along with aBER/PER, the meter provides also the parameter ERR. This parameter stores the overall number of errors detected during demodulation so that if the meter is left for a long time on the same signal it is possible to detect temporary signal degradations.
3. Transport Stream ID & ORB alternates with Network ID and Network Name.

4. Lock indication. When the signal is correctly demodulated, the lock is closed and the measurements displayed.
5. Misc parameters. Here the user can find the indication of LNB consumption, Frequency error and CA systems detected in the stream.
6. Service A/V decoding. The meter, once the signal demodulated, automatically decode the Audio and Video content of the first non-encrypted TV service present in the stream. The indication of Vpid and Apid is displayed under the video stream.

Touching the screen over the Video will result in switching to the full screen visualization; on the bottom of the screen, the Video and Audio encoding information will be displayed.

Touching the screen on the Vpid and Apid row, will result in switching to the *MPEG SERVICE LIST* screen (see chapter 8 for detailed information):



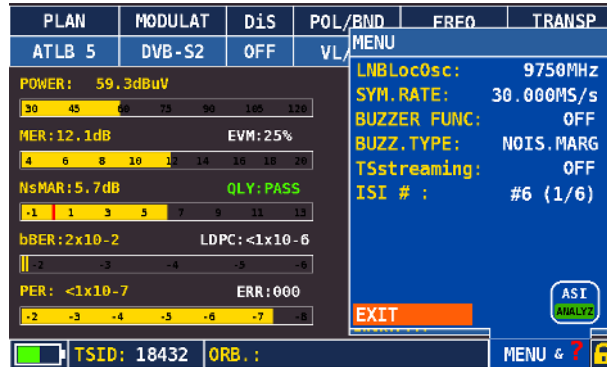
Touching again the Vpid and Apid row, the meter goes back to the measurement interface.

Pressing again the *SAT* button or touching the screen over the measurement bars switches the measurement interface on the second screen.



In this second screen the meter visualizes the constellation diagram and the modulation parameters. Through the ZOOM function it is possible to magnify the constellation and divide it in four quadrants.

For DVB-S2 Multi-stream signals the Meter let the user select which ISI should be demodulated from the signal. By default the meter demodulates the ISI #1. The selection could be done via the “MENU&?” contextual menu:



Once selected the ISI of interest, the meter will automatically demodulate it, providing the constellation and other ISI-dependent modulation information, as well as the service list. In the contextual menu is also possible to set /change the value of Symbol Rate, expressed in MS/s as well as the value of the Local Oscillator.

7.3 Performing Digital TV measurements



The basic principle of the terrestrial measurement interface is very similar to what has been described for the satellite. From the HOME page, the user should touch the screen over the **TV** icon or press the **TV** button on the keyboard.



After having selected the basic canalization plan to be used, the terrestrial measurement interface appears:



The terrestrial measurement interface is composed by four screens. In the first screen the basic measurement parameters are displayed. At the top of the screen the user can find the channel tuning parameters: Modulation type, Channel bandwidth, frequency and channel number. In case the signal is received through a centralized distribution system needing a specific power supply, the meter is capable to bias it, providing at RF input (F connector) a DC voltage variable between 5 and 24V. The voltage value is configurable via the *DC@RF* parameter.

On the left side, similarly to what has been shown for the satellite measurement interface, the meter shows the main RF measurements: RF level, MER and Noise Margin, bBER and aBER/LBER.

On the right side, the meter visualizes the A/V content of the first non-encrypted service of the demodulated signal and provides its Vpid and Apid.

Some miscellaneous information related to the modulation are displayed under the A/V box: signal carrier mode, constellation type and encryption status.

For terrestrial channels, as for satellite ones, the modulation type is automatically detected by the meter as soon as it is locked: DVB-T/H, DVB-T2 or Analog TV.

Touching the screen over the Video box, will result in switching the video visualization in full screen mode and a status bar indicating the Audio and Video encoding format will appear.

Touching the screen on the Vpid and Apid row, will result in switching to the *MPEG SERVICE LIST* screen (see chapter 8 for detailed information). Touching again the Vpid and Apid row, the meter goes back to the measurement interface.

Touching the screen over measurement bars, or pressing again the **TV** button on the keyboard, will result in switching the view to the second measurement screen.

The second measurement screen contains the constellation diagram and the information related to the modulation parameters: Code Rate, FEC, Constellation type, etc.



If the locked signal is a DVB-T2 one, in this screen the user will also see (as shown above) the indication of the PLP being demodulated (by default PLP #1) and the PLP-related information (PLP FEC, PLP constellation, etc).

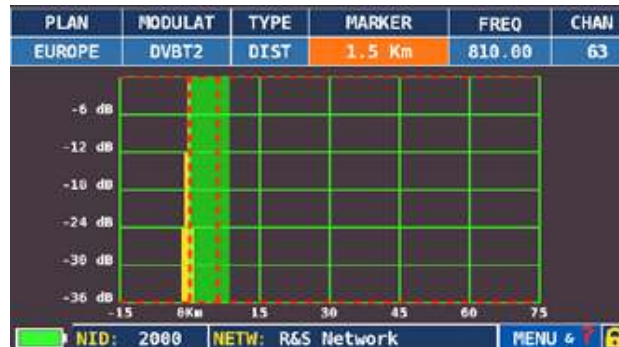
The selection of the PLP to be demodulated could be easily done via the “MENU&?” contextual menu at the bottom-right corner of the screen:



Again, the ZOOM function will let the user to magnify the constellation diagram in a four-quadrant view to better analyze the diagram points and view TPS carriers.

Touching the screen over the diagram or pressing again the TV button on the keyboard will switch the view on the third measurement screen.

The third measurement screen represents the SFN Echo diagram:



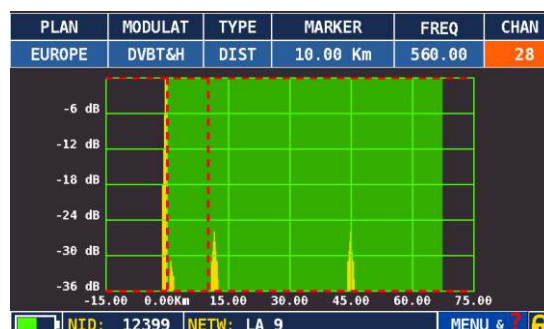
At the top of the screen the meter provides the channel tuning parameters along with the diagram type (Distance or Delay modes) and a marker, which could be moved along the diagram either touching it over the grid, or rotating the mechanical encoder over the keyboard. The value displayed in the *Marker* field represents the distance or the delay (depending on the mode) referred to the principal echo, centered on zero. The Guard Interval mask varies according to the modulation parameters, as the following table resumes:

TEMPORAL GUARD INTERVAL WIDTH

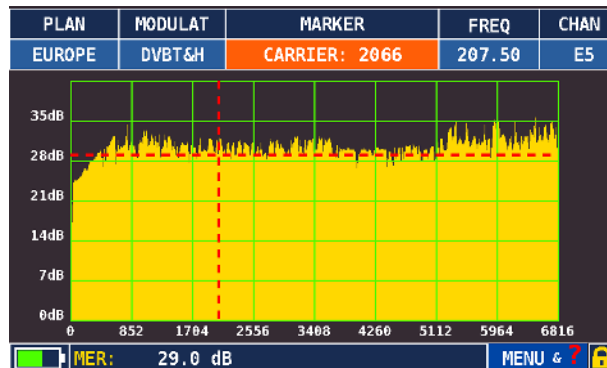
DVB-T				
FFT Size	1/4	1/8	1/16	1/32
2k	56	28	14	7
8k	224	112	56	28

DVB-T2							
FFT Size	1/4	1/8	1/16	1/32	1/128	19/128	19/256
2k	56	28	14	7	-	-	-
8k	224	112	56	28	7	133	66,5
16k	448	224	112	56	14	266	133
32k	-	448	224	112	28	532	266

Via the “MENU&?” contextual menu is possible to activate the *micro-echoes* visualization: this will result in a magnification of the diagram around the Guard Interval section and will visualize all detected micro-echoes:



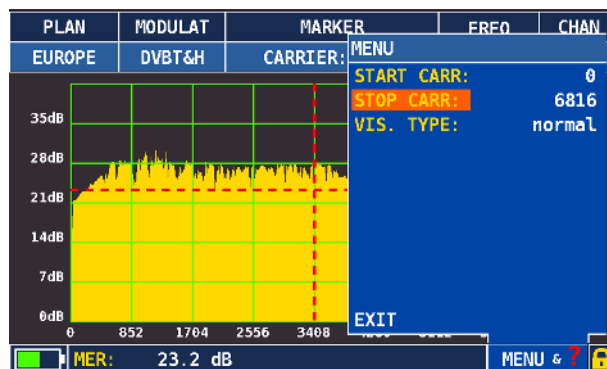
The fourth measurement screen visualizes the **MER per Carrier**. This function allow the user to measure the MER value for each one of the carriers composing the DVB-T or DVB-T2 signal.



The marker can be moved along the signal envelop: at the top of the screen, the *CARRIER* field indicates the carrier number and at the bottom is displayed the MER value of the selected carrier.

By default the graph visualize all signal carriers which, depending on the mode, could be 2000 or 8000 for DVB-T, or 32000 for DVB-T2 signals; the marker is by default positioned at the center of the envelop.

Using the “MENU&?” contextual menu, the user can select the number of carriers to be displayed, specifying from which carrier to start to plot and at which carrier to stop. In this menu is also possible to visualize the graph in normal spectrum view or reverse spectrum view.



7.4. Performing Analog TV measurements

The terrestrial measurement interface allows also performing measurements on Analog TV signals. As the meter auto-detects the modulation type, in presence of an analog signal the interface will switch to the correct view automatically:



As shown above, the basic screen visualizes the tuning parameters (top bar) and the Video carrier level; on the right side, the A/V content is automatically decoded and visualized. Touching the screen over the measurement bar or pressing TV button on the keyboard will switch to the second screen:



On the left side, three measurement bars appear: RF Video carrier level, signal to noise ratio and Audio to Video carrier ratio; in case of stereo audio, also the A/V ratio for the second audio carrier is displayed. In this second screen, the video and audio decoding is not available, as the meter should be able to measure the different components of the signal.

7.5. Performing Cable measurements



From the HOME page, the user should touch the screen over the **TV** icon or press the TV button on the keyboard. The Cable measurement interface is identical to the terrestrial and satellite ones; it is composed by two screens: the first for the RF measurements and A/V decoding; the second for constellation diagram and modulation parameters view.



To pass from the first to the second measurement screen, the user should touch the screen over the measurement bars or press again the CATV button on the keyboard.



The HD PRO TAB provides other measurements for CATV networks, such as the INGRESS TEST and LEAKAGE TEST, to verify the conformance of cables. See chapter XX for detailed information on these tests.

HD PRO TAB Spectrum analyzer

8.1. Performing spectrum analysis



To access the spectrum analyzer from the meter's home page the user should press the *SPECT* button on the screen or the *SPECT* button on the keyboard.



The spectral analysis starts automatically on the canalization plan previously selected or, if the user did SAT, TV or CATV measurements, on the last channel tuned by the meter.

The top of the screen contains the tuning parameters and, in addition, the *SPAN* parameter which gives the user the possibility to increase or decrease graph's span around the measured signal.



Let's exemplify the Satellite spectral analysis, the terrestrial and cable ones being the same. The main marker indicates the transponder on which the meter is actually tuned; the top bar contains its tuning parameters, including LNB polarization, center frequency and transponder number.

Using the mechanical encoder on the keyboard or touching the graph over the signal envelop it is possible to move the selection over other transponders; the marker frequency, transponder number and polarization will change accordingly.

Pressing again the *SPECT* button on the keyboard results in activating the MAX HOLD function:

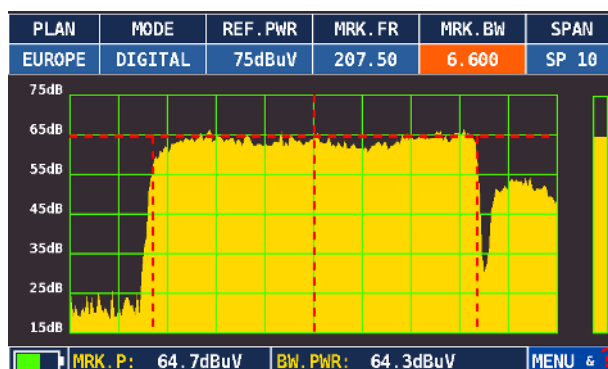


Using the "MENU&?" contextual menu, it is possible to access the following functions:

- Delta Marker: this function activates a second marker controllable either with the mechanical

encoder or touching the screen over the signal envelope. It allows the user to make differential measurements on two points of a signal or two adjacent signals. (i.e. two transponders in the same bouquet).

- Spectrum type: Contours / Full Picture. This function allows to switch the analyzer view either on full picture (as shown in the previous pictures) or contours, showing only the signal envelope.
- Marker BW: this function allows the activation of the BW width and power measurements. Setting this parameter to *ON* will let the user to measure the bandwidth of the tuned signal, appreciating it on the spectrum diagram and reading in the top bar the value of the BW width. Setting it to *BW PWR*, while measuring the signal width the meter will provide to the user also the *channel power*, indicated in the bottom bar:



- Spectrum: Fast / Superfast. If set to *Fast*, the spectrum is refreshed once per second; when set to *Superfast*, the visualization switches to real time, guaranteeing an instantaneous refresh of the spectrum.
- Save / Recall: this function allows the user to make screen captures of the spectrum diagram, including top and bottom bars, as well as the markers. The Recall function could be used to visualize stored screen-shots, selecting them among the saved files list.
- HELP: switches the meter to the Auto-discovery function, with which the meter will try to identify automatically the tuning parameters for the pointed digital carrier. First of all, the meter tries to determine the modulation type among those it can manage; once the modulation has been identified, the meter will determine (in a certain range) the exact center frequency of the carrier. Last, the meter will try to demodulate the signal, either setting different Symbol rate values (for SAT and CATV signals) or Channel BW for DVB-T/T2 channels.



MPEG Services List

9.1. Decoding the signal content



From the Home page, touching the *MPEG SERVICE LIST* icon will activate the meter's MPEG decoder. This function can also be accessed moving the selector on the icon rotating the mechanical encoder.

As briefly seen in the preceding chapters, the MPEG Service List function allows the user to decode the Transport Stream carried by the signal and visualize the list of services composing it:



The meter keeps memory of the last measurement done by the user; this means that the MPEG Decoding interface will tune on the last measured channel, being SAT, TER or CATV.

The screen is composed by seven zones:

1. **Signal tuning parameters:** as for all the measurement interfaces, at the top of the screen the meter provides the essential tuning parameters, including Frequency, channel BW and modulation standard.
2. **Services List:** once the signal is locked and demodulated, the Decoder starts scanning the Transport Stream to find the SI tables (Service Information Tables), containing all the information related to the Transport Stream's structure: number of services, list of PIDs, Services names, etc. When all these information are available, the meter visualizes the list of all the available services and for each of them displays the service type (*TV*, *RADIO* or *DATA*), the encryption status and - for TV services - also the LCN.
3. **Date & Video rate:** in this section the meter visualizes the current Date (read into the TDT) and the Video bit rate of the service being decoded.
4. **Video decoding box:** In this section, the meter visualizes the video content of the selected service; by default (without any selection) the meter starts decoding and visualizing the A/V content of the first non-scrambled service in the list. Moving the selector along the service list (or selecting a service by touching the screen over the service name) will result in switching the A/V decoding on that service instantly. Conversely, touching the screen over the video box, will activate the full screen visualization, as shown in the following picture:



At the bottom of the screen the user can see the Encoding parameters for Audio and Video components. After few seconds, this bar disappears from the screen, giving the user the full screen view of the Video component.

Touching again the screen over the video content, will switch the view back to the Services List.

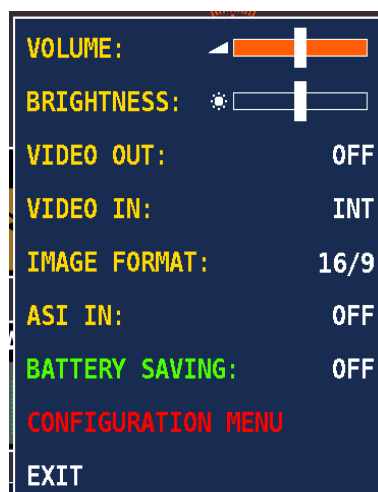
5. Vpid and Apid: this row visualizes the Video and Audio PIDs for the selected service.

6. Miscellaneous information: in this box the meter collects all the misc information about the selected service: Service ID, presence of Teletext and encryption status.

7. Transport Information: In the bottom status bar the meter displays the basic Transport Stream parameters: TS ID, Cell ID, Network ID and Network name.

When the selected service is a Radio, the video box will be empty while the Audio PID will be decoded and diffused by the two embedded stereo loud speakers.

The MPEG Decoder could also be activated on the ASI input. In this case, the user should activate the input via the meter's configuration menu, switching ON the ASI INPUT:



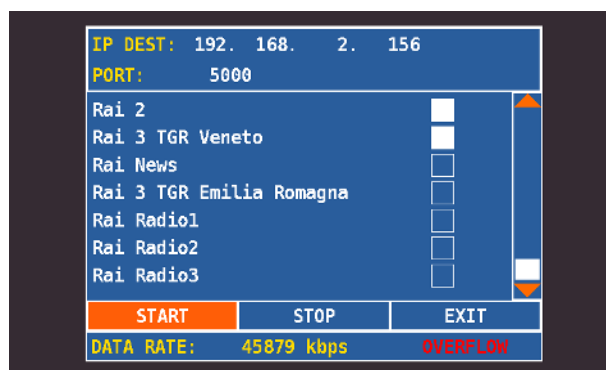
From that point, on the MPEG decoding principle, is the same as explained before.

9.2. Streaming the content over IP

As the meter is equipped with a 10/100 T-Base ethernet port, the user could also activate the streaming of the selected Elementary Stream (service). This function can be activated by accessing the contextual "MENU & ?" menu and toggling to ON the *TS streaming* parameter:



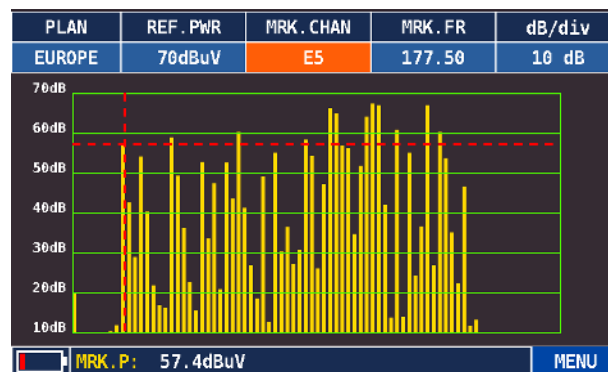
Once the streaming function is enabled, it is possible to access the streaming configuration page, through which the user can set up the IP parameters and select the services to be broadcasted over IP:



Pressing *START* will activate the IP transport to the configured IP address through an UDP unicast connection. On a PC, or any other IP-capable device, it is possible to receive the stream and decode one of the broadcasted services.

Bar and Tilt Graph

The HD PRO TAB provides the Bar Graph and Tilt Graph representations of the band. With the Bar Graph the user can visualize all the channels detected by the meter based on the pre-selected canalization:



Moving the marker over the different bars, the meter will give its power level in the bottom status bar, with the parameter *MRK P* (Marker Power).

Via the contextual *MENU* is possible to toggle the view to the TILT Graph. This graph is often use to determine the power distribution along the monitored band, taking a certain number of carriers as reference and evaluating the average power level as well as the relative difference between two carriers.



Moving the *PILOT 1* and *PILOT 2* markers, is possible to set the carriers on which the differential power measurement is performed; in the bottom status bar, the meter gives the TILT value (power level difference).

As the meter is able to identify both analog and digital channels, both the BAR Graph and the TILT Graph can be done on mixed channel plans, containing analog and digital carriers (as shown in the TILT graph above). For the analog channels, the reference power level is the one of the Video Carrier.

Performing Transport Stream Analysis

11.1. Introduction to the ASI analyzer

The HD PRO TAB is equipped with an embedded Transport Stream Analyzer, providing the full ETR101290 coverage and Template monitoring.

The ETR101290 provides guidelines for measurement in Digital Video Broadcasting satellite, cable and terrestrial and related digital television systems by defining a number of measurement techniques in such detail that the results are actually comparable as long as the measurement is carried out in compliance with the given definitions.

The meter executes the analysis on a Transport Stream either demodulated from one of the RF inputs or injected via the ASI in connector.

11.2. ETR101290 Analysis



To start the analysis function, the user should touch the screen over the *ASI ANALYZER* icon (or move the selector over the icon by rotating the encoder). The following screen appears:

PLAN	INPUT	BW	DC@RF	FREQ	CHAN
EUROPE	RF(75ohm)	7	OFF	177.50	E5
Priority 1 ● TS Sync loss 0 ● Sync byte err 0 ● PAT Interval 0 ● PID 0x00 PAT 0 ● PAT scrambling 0 ● Cont.[Inc. Ord] 0 ● Cont.[Tripl. P.] 0 ● Cont.[P. Lost] 0 ● PHT Interval 0 ● PHT Scrambling 0 ● PID Error 0		Priority 2 ● Transp. Error 1 ● CRC Error 0 ● PCR repetition 0 ● PCR disc. 0 ● PCR accuracy 0 ● PTS error 0 ● CAT [Bad Scr.] 0 ● CAT [Table ID] 0		Priority 3 ● PID 0x10 NIT 0 ● SI repetition 0 ● Buffer error 0 ● Unref. PIDs 0 ● SDT Error 0 ● EIT Error 0 ● RST Error 0 ● TDT Error 0	
TIME: 0:00.08				PAG 1/2 NEXT	
TSID: 1		CID: 6144 (0x1800)		MENU & ?	

Likely to what has been described for the measurement interface, the top section of the analyzer pages contains the channel basic tuning parameters and the indication of the signal source: RF-75ohm, RF-50ohm or ASI in.

The screen is divided into three columns listing respectively the ETR101290 priority 1, 2 and 3 alarms each one with a status led and a counter. The First Priority alarms are those necessary for de-codability of the content (basic monitoring); the Second Priority alarms are those recommended for continuous or periodic monitoring; the Third Priority alarms are intended for application-dependant monitoring.



Note: The original text of the norm is published under the reference **ETSI TR 101 290 V1.2.1 (2001-05) - Digital Video Broadcasting (DVB); Measurement guidelines for DVB systems**

The alarm status led respects the following rules:

1. Green LED: no alarms detected so far
2. Red LED: active alarm
3. Orange LED: past alarm
4. Black LED: alarm not available.

As soon as an alarm is detected, the status led switches to Red and the corresponding counter is incremented; the counter keeps trace (along with the status LED) of all the occurred alarms.

Under the alarm list, a timer is available, to give the user the analysis overall duration so that is possible to estimate the severity of the detected alarms correlating their number to the total monitoring duration.

The analysis could be restarted at any time via a reset; the reset could be done via the *RESET COUNTER* function accessible in the "MENU & ?" contextual menu. This will result in setting all status LEDs to green, all counters to zero and setting the timer to zero as well.

11.3. Transport Stream Template monitoring



Touching the screen over the *NEXT* button will switch the Analyzer to the second page, dedicated to template monitoring. The following screen will appear:



The page has three main sections:

1. *Transport Stream basic parameters*: in this section the meter provides the measurement of the Transport Stream total bitrate, the Stuffing rate and the number of detected services.
2. *Services list*: after decoding the SI tables, the meter lists here the name and the bitrate of all detected services, in the order declared in the PAT.
3. *Service Composition*: for each listed service the meter specifies its content, listing the composing PIDs with *stream_type* information and bitrate. Scrolling the services list (2) will automatically refresh this box with the information of the corresponding service.

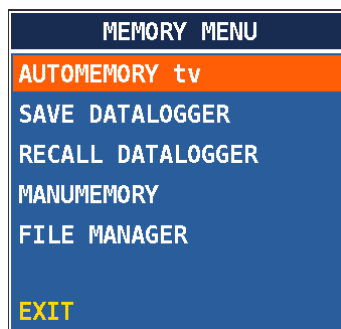
In the bottom status bar the meter provides also the Network ID, Network Name, TS_ID and Cell ID.

Using Memory functions

12.1. The Memory Menu

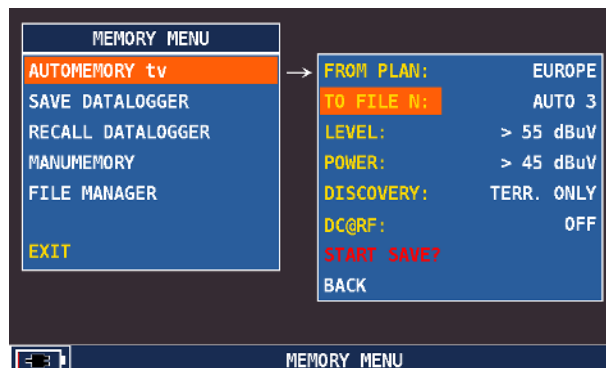


From the HOME page, touching the screen over the *MEMORY* icon, will switch the meter to the Memory functions menu. Scope of this menu is to provide the user with auto-memory, data-logging and canalization editing functions suitable for field measurements and for customizing the channel plans. The Memory menu is structured as follows:



12.2. Automemory

This is an auto-discovery function that could be used to automatically detect all analog & digital channels that may be present in a certain service area. Touching the screen over the *AUTOMEMORY* text will enable the contextual configuration menu, as shown hereunder:



In the first row, the meter displays the channel plan based on which the auto-discovery will be made (by default the last used in the measurement interface). To use a different one, the user should enter the *PLAN SELECT* menu and choose the plan of interest.

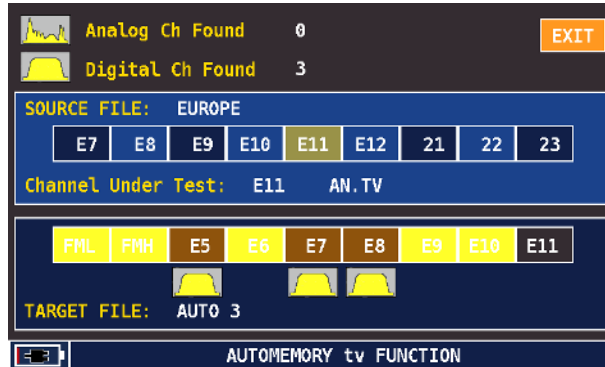
File N parameter lets the user select the *AUTO* plan in which will be stored the measurement results.

LEVEL and *POWER* represent respectively the Analog Video Carrier minimum level and the Digital minimum power level above which the meter detects and stores the channels.

DISCOVERY, as explained also in the meter's configuration menu, let the user specify whether the auto-memory function should search only for TV or also for CATV channels.

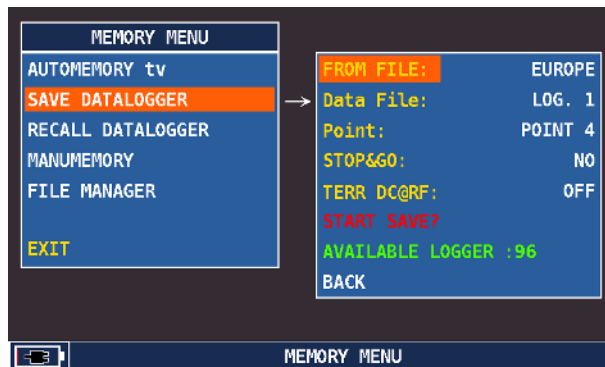
DC@RF parameter should be used if the aerial is connected to the meter through a centralized distribution system or any other system needing a DC power supply to provide the signal.

START SAVE will activate the auto-memory function and start the channels discovery. If the text displayed is *START OVERWRITE* it means that the destination file is already existing and - if the function is started - will be overwritten.



12.3. Data-logger functions

SAVE DATALOGGER: this function could be used on the top of an auto-memory plan or a standard canalization plan to execute precise measurements of signal strength and quality for each channel listed in the selected plan. Typically, once the user executes an auto-memory in a certain area to detect all receivable channels, then it use the data-logger to qualify the channels in terms of power level and main RF characteristics. The configuration menu is the following:



FROM FILE parameter determines on which channel plan the data-logger will be executed. This could be a standard SAT canalization, a Manual memory plan or an auto-memory plan. The data-logger could be done indirectly also on terrestrial plans, via the auto-memory function: if we consider for instance the *EUROPE* plan, this contains the generic channels distribution according to the EBU frequency planning. Conversely, this do not guarantee the presence and the effective type of those channels, that can be Analog or Digital. To avoid problems and possible incoherent measures, the user should perform an auto-memory prior to executing the data-logger.

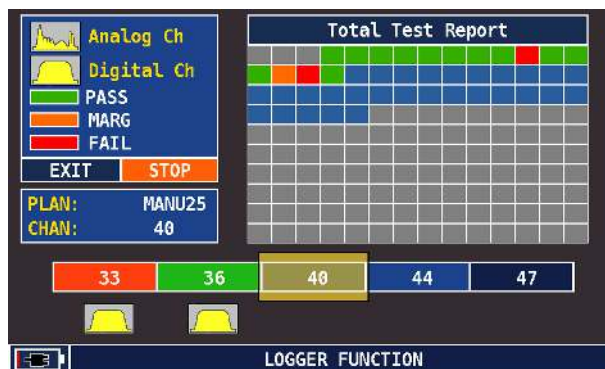
DATA FILE and *POINT* determine in which file the data-logger will be stored. Each *LOG* represents a collection of *POINTS* so for each *LOGx* the user could store up to 100 *POINTS*. Each *POINT* represents the files where the data-logger is actually stored.

STOP&GO function could be used in case of data-loggers executed on plans containing mixed standard

channels (SAT, TV and CATV): each time the standard changes (from SAT to TV, or vice-versa) the user is asked to connect the proper signal source before the meter continues the measurements.

TERR DC@RF parameter should be used if the aerial is connected to the meter through a centralized distribution system or any other system needing a DC power supply to provide the signal.

Once *START SAVE* is selected, the meter starts the data-logging, displaying the following screen:



For each channel composing the selected plan, the meter detects its type (Analog / Digital) and perform the RF measurements, determining signal strength and quality. The PASS/MARG/FAIL indication is based on Noise Margin measurement: a negative Noise Margin (very low MER) will result in a "FAIL" indication; a NM value positive but near to zero will correspond to the "MARGIN" condition. The "PASS" condition will then correspond to a good MER and positive Noise Margin values.



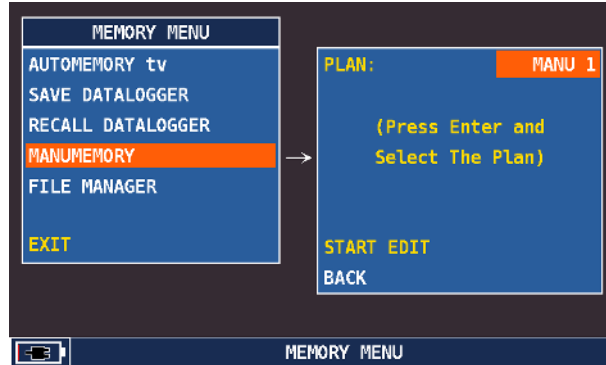
Note: the PASS/MARG/FAIL indication isn't in relation with the LOCK/UNLOCK status: a FAIL quality status still means that the signal is locked and demodulated. Else, the channel indicator below the plan grid would be grey (channel not locked).

RECALL DATALOGGER: this function should be used to recall and open a stored data-logger. It is possible to browse the list of measurements and see channel type, Power / Level, MER, BER values as well as the quality indicator:

LOG. 1 POINT 3		EXIT			
NAME	TYPE	PWR LVL	MER C/N	bBER A/V	aBER PER
E5	DVB-T	59.2	31.1	7.0E-05	<E-08
E8	DVB-T2	55.8	20.6	4.0E-02	<E-08
s18	An TV	65.6	48.9	45.8	
s20	An TV	67.3	47.3	16.2	
s21	DVB-C	68.1	>36	<E-09	<E-09
s22	An TV	69.0	46.2	48.2	
s23	DVB-C	66.5	>36	<E-09	<E-09
s24	An TV	65.2	45.9	60.1	
s26	An TV	66.5	49.2	41.4	
s27	An TV	63.1	48.0	47.3	
21	DVB-T	60.4	22.3	<E-06	<E-08

12.4. Manu Memory

The MANUMEMORY function could be used to generate customized channel plans and to edit existing custom canalizations.



To edit a manual plan, the user should select the desired canalization via the *PLAN* parameter and then select *START EDIT*. once the channels list has been displayed, the user can now:

- Modify channels parameters via the *MODIFY ITEM* function: a pop-up will appear, listing the tuning parameters the user can modify.



Once finished modifying the tuning parameters, pressing *SAVE* will result in storing the new parameters in the selected canalization plan.

- Add a new item, via the functions *ADD BELOW* and *ADD ABOVE*. In this case, a pop-up similar to the one used for editing will appear and the user will be able to insert manually the tuning parameters of the channel of interest. Again, selecting *SAVE*, will store the channel in the plan.
- Delete an item via the *DELETE ITEM* function
- *RETURN* will shift the selector from the tools menu back to the channels list
- *EXIT* will bring back the user to the main *MEMORY* menu.

12.5. File Manager

The meter's File Manager could be used to rename or delete channel plans and / or data-logger and auto-memory files. The file manager's view is a list of all the files present on the meter among which the user can select the one to be renamed and / or deleted:



RETURN will toggle the selector from the Action menu back to the files list
EXIT brings the user back to the main *MEMORY* menu.

Special Functions



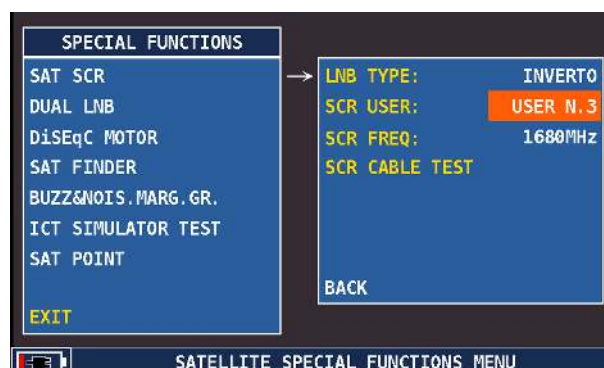
The special functions menu contains some useful tools to qualify the SAT, TV or CATV installation beyond signal reception. The content of this menu varies accordingly to which has been the last measurement performed by the user: for instance, if the user performed a SAT measurement, the special functions menu will display all the tools related to a satellite installation; conversely, if the user performed a TV or CATV measurement, the special functions menu will display (respectively) TV or CATV - related tools.

13.1. SAT Special Functions

The Satellite special functions let the user perform tests and measurements on particular dish configuration such as Dual LNB, SCR or motorized dishes:

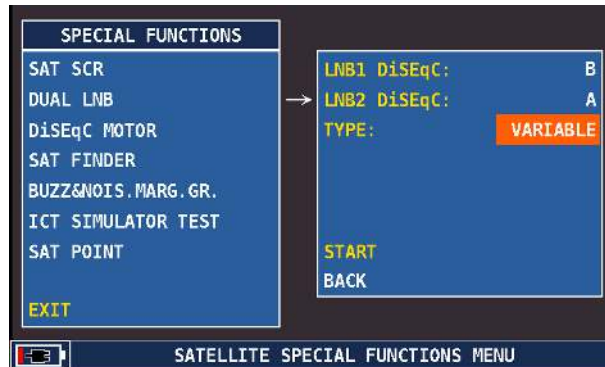


SAT SCR: The Satellite Channel Router (SCR) is a special LNB with typically 4 or 8 RF outputs normally used in buildings centralized installations enabling the connection of up to 8 different receivers (decoders) to the same LNB. Each "User" (RF output) is assigned a specific frequency to which the satellite channels will be down converted before being sent to the receiver.

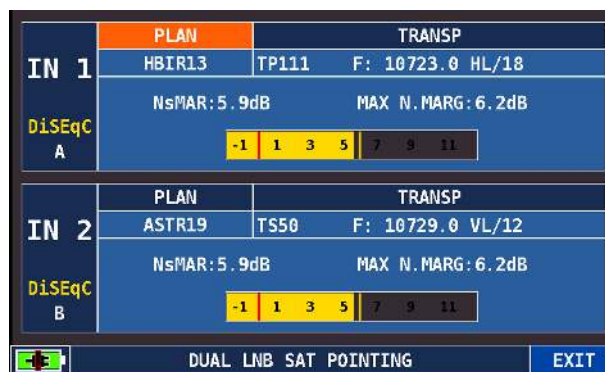


This test provides the user the ability to verify the correct signal reception for each one of the LNB's RF outputs via the spectrum analyzer or the SAT measurement interface. In those screens, the indication of the selected SCR user will be displayed.

DUAL LNB: This function enables the user to verify the installation of a Dual LNB dish, that can be either 9°&13°, 13°&19° or 19°&23°; if the installation type is set to *VARIABLE* it will be possible for the user to perform the test on a couple of independent plans, at choice among those available in the meter. Once selected the azimuth couple, the user can assign a specific Di.S.Eq.C. command to each of them, before starting the measurement:

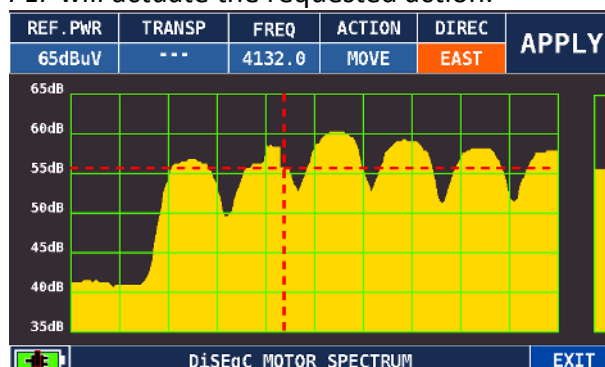


Once the measurement started, the meter will tune on the first TP of each one of the selected plans and give the signal strength and Noise Margin values.



Di.S.Eq.C. MOTOR: this function allows the user to control motorized dish moving the motor via Di.S.Eq.C. commands. The control could be done using either the spectrum analyzer or the SAT measurement interface; the meter provides the information about the current azimuth and the corresponding signal frequency.

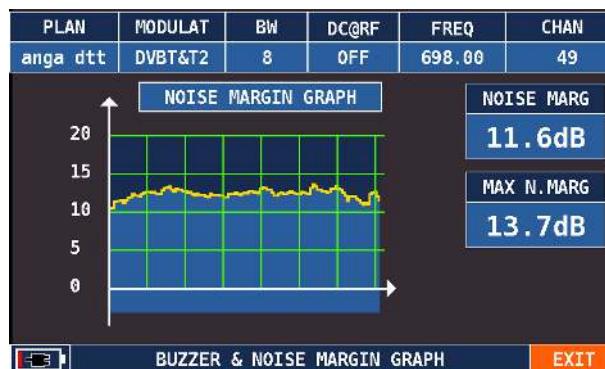
In the top bar the user can activate the motor and move it in EAST and WEST direction (*MOVE*), as well as moving it to a stored position (*GOTO*). Once the user decides which command should be performed, touching the screen over *APPLY* will actuate the requested action.



SAT FINDER: this function allows the user to determine the correctness of the dish pointing via the detection of three transponders selected among those composing the requested satellite. The meter will try to lock the selected TP and once done will display the RF power and Noise Margin measurements.



BUZZER & Noise Margin: This function could be activated on Satellite and Terrestrial canalizations. Its main scope is to provide the user with a real time spectrum of the Noise Margin vs time. The measurement is also associated with a buzzer, synthesizing a tone the intensity of which is proportional to the signal strength. The better the noise margin is, the higher is the tone. This graph keeps also trace of the maximum Noise Margin value detected.



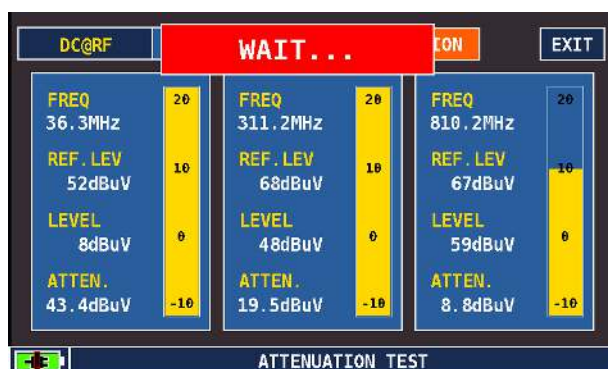
SAT POINT: this function is a special view of the meter's spectrum analyzer in which the Max Hold is active by default and the RF Full Scale range is set to 90dB. Scope of this function is to provide the user with a tool with which is possible to monitor the field strength visualizing the signal envelop and keeping trace of its maximum reached values so that is possible at the end to point the aerial (or the dish) in the max strength direction.

13.2. TV & CATV Special Functions

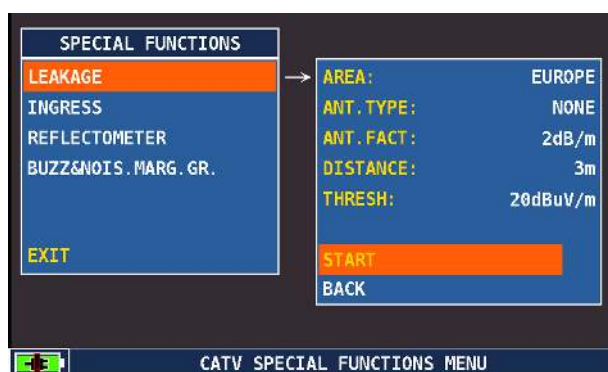
For Terrestrial and Cable TV HD PRO TAB provides some specific tool able to verify the correctness of the aerial and cables installation. One of those tools is the *Buzzer and Noise Margin* already described in the preceding paragraph. The other tools are:

ATTENUATION TEST (TV): When a signal distribution system is installed it is often necessary to verify that all ends receive the same signal strength, to be sure that there are no leaks or other propagation issues. Typically, the technician switches on at one end a small carrier generator which injects three CW tones having known level.

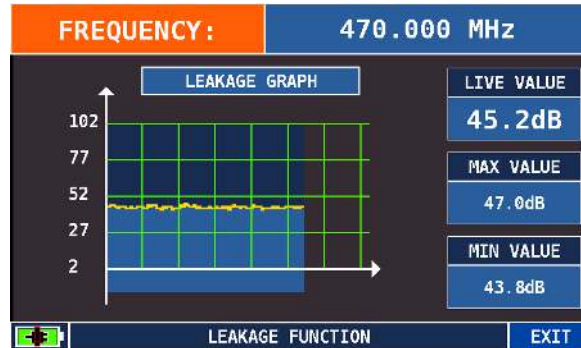
The meter's attenuation test, activated at another end of the distribution, starts doing a frequency sweep to detect those carriers and record their frequencies and signal levels as reference (*calibration mode*). Once the calibration has finished, the user could store those carriers in a special PLAN (MANUxx) that can be later recalled in the measurement interface to perform comparative measurements at the other ends of the distribution system.



LEAKAGE (CATV): Aim of this test is to provide a tool with which a technician can verify the presence of any signal leak in a distribution system. The user can configure the antenna type, the antenna gain, the distance between the meter and the distribution system under test and the threshold above which the measured signal should be considered as a leak:

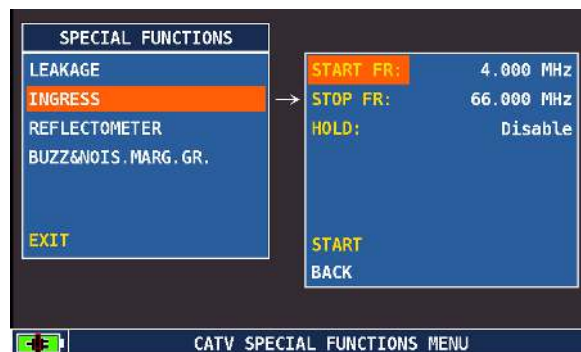


When the test is started, by default the meter tests the frequency 470MHz. By touching the screen over the frequency value (or placing there the selector and pressing the encoder) it is possible to change the frequency test value in a range varying from 250 to 950 MHz.

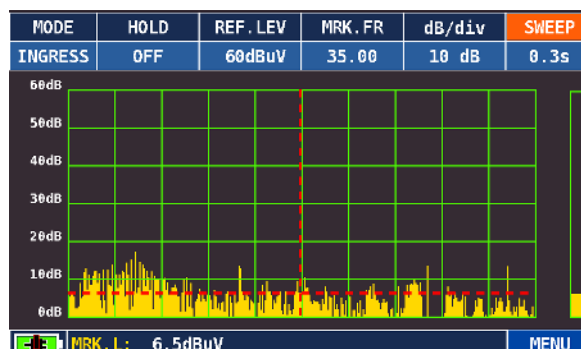


The meter starts plotting the detected signal strength in the graph and displays also actual, minimum and maximum values. If the measured level passes the configured threshold, the meter activate a buzzer, the intensity of which varies according to the magnitude of the difference between signal strength and that threshold.

INGRESS (CATV): Ingress test is typical of the cable TV distribution systems. Its aim is to verify the quality of the CATV uplink path, having a frequency band ranging from 4 to 66MHz. In the configuration menu the user could define the test band's lower and upper frequency limits and enable/disable the maxhold in the spectrum (*HOLD* parameter):



Once started the test, the meter visualizes a spectrum diagram centered around the configured band (4-66MHz). The lower is the detected signal level and noise floor, the better is the quality of the uplink path:

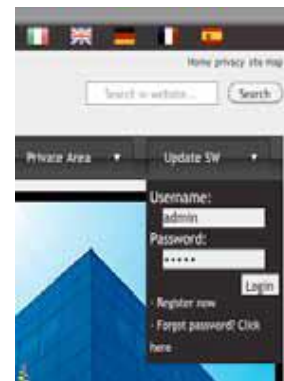


Appendix 1: HD PRO TAB firmware and channel plans upgrade

HD PRO TAB can be upgraded via the micro-USB connector on the left panel. To perform the firmware upgrade it is necessary to install on a Personal Computer the S.M.A.R.T. software that can be downloaded from the corporate website www.roverinstruments.com registering in the **Update SW** area.

The S.M.A.R.T. software is available in two versions:

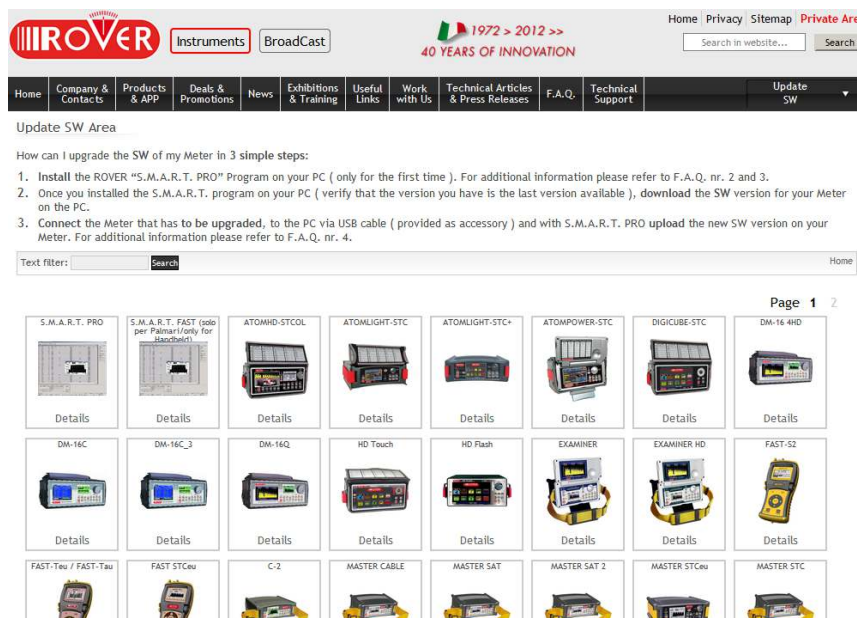
- The STANDARD version allows only the firmware upgrades
- The PRO version beyond firmware upgrade allows also to upload Canalization Plans (file *mem*), to manage the meter's internal memory (MANU FILE, AUTOMEMORY , LOGGER etc.) and to export the data-loggers in XLS format.



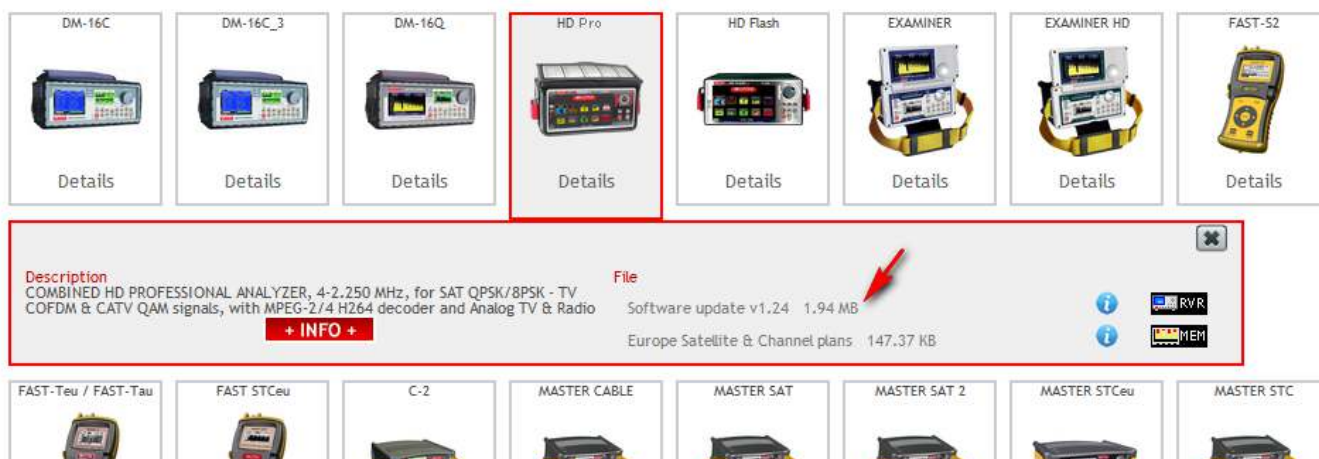
Once installed, the S.M.A.R.T. software will work in **PRO** version for a trial period of 30 days, after which it will continue to work in **STANDARD** version. To purchase the **PRO** license for your S.M.A.R.T. copy, please contact RO.VE.R. After Sales Support at (+39) 03 09 19 82 99 and ask for the S.M.A.R.T. **PRO** license.

Firmware Upgrade procedure

Login into the Update SW area and find your meter among those appearing on the screen:



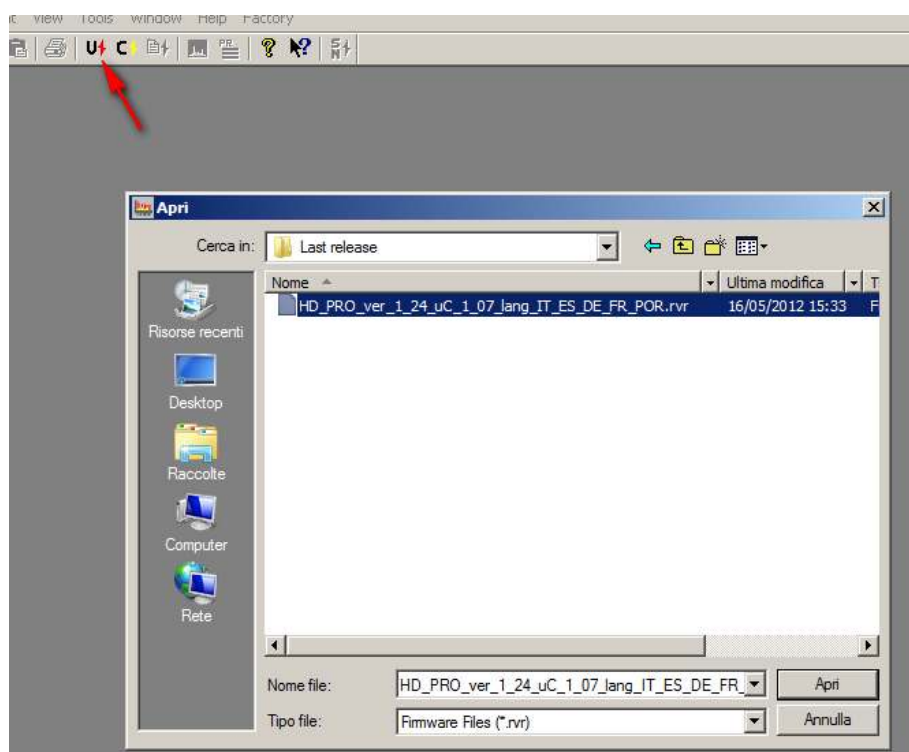
Clicking on the meter's icon, will pop-up an information box, with product description and the list of available files: those files normally include firmware upgrade and / or channel plans.



Identify the upgrade package and click on the "RVR" icon to start download.

Once the download has finished, connect the meter to your Personal Computer via the USB-A / micro-USB cable and launch the S.M.A.R.T. software.

In the tool bar select the Upgrade command icon and browse your PC to the download location where you stored the firmware upgrade package:



Once confirmed the selection by clicking on *Open* button, the upgrade procedure will start automatically.

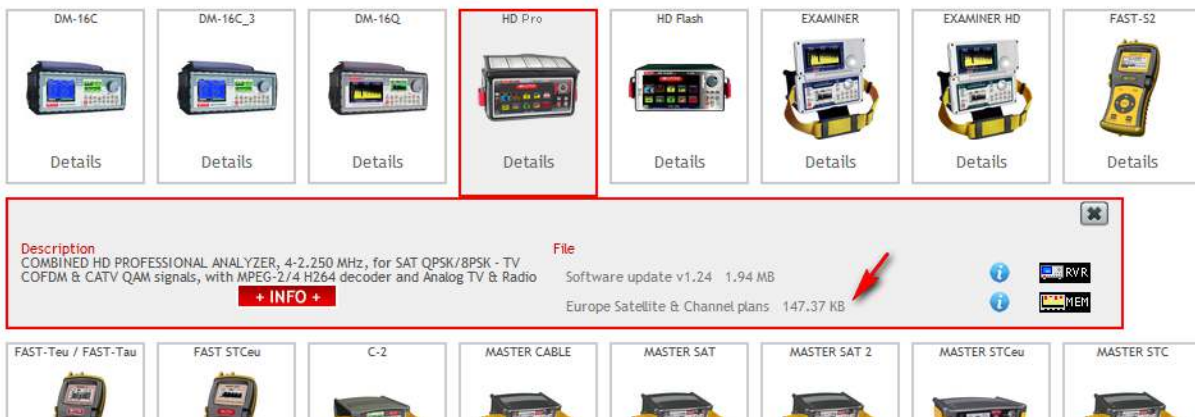
During this procedure, you'll see the meter displaying the text "BOOT MODE"; at the end, the meter will be switched off automatically and the S.M.A.R.T. User interface will display a pop-up message saying ****Program Successful****

Switch on again the meter and verify that the initial splash screen displays the new firmware version.

If you find some troubles during the upgrade procedure or the meter doesn't upgrade correctly, please contact our Customer Support Department at (+39)0309198299 or by e-mail at wecare@roverinstruments.com

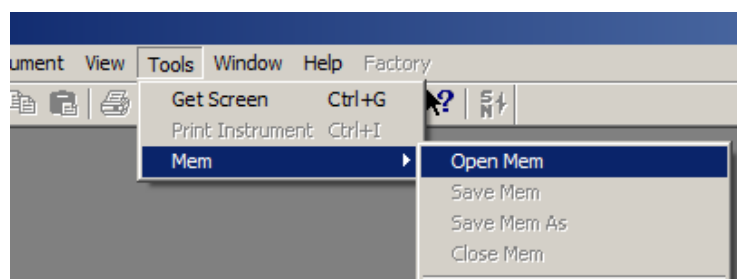
Channel Plans upgrade

The channel plans upgrade is very similar to what has been described in the section above. Once logged in into the Upgrade SW area and identified your meter, in the pop-up information box you'll find the available channel plans just under the firmware upgrade package:



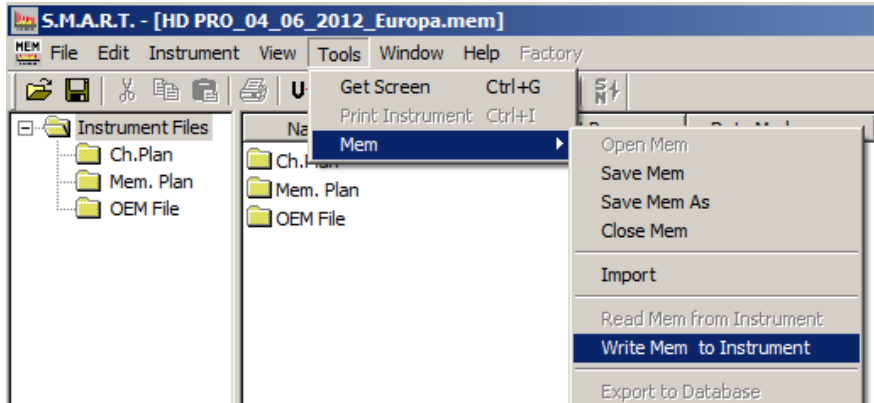
To download it on your Personal Computer, click on the *MEM* icon. Once the download has finished, connect the meter to your Personal Computer via the USB-A / micro-USB cable and launch the S.M.A.R.T. software.

In the toolbar, select the Connection command icon and once the meter is connected (you'll see meter's model, serial number and firmware version in the bottom status bar) go to *Tools* menu and select *Open Mem* function:



Now browse your PC to the download location where you stored the *MEM* file downloaded from corporate website and confirm the selection by pressing the *Open* icon in the dialog window appeared.

Once the channel plan opened, select again the *Tool* menu and the *Write Mem to Instrument* function:



This will automatically start the canalization upload to the connected meter. At the end of the procedure, the S.M.A.R.T. software will confirm with a pop-up message saying "Plan Upload Successful".

Note: the upload of a new channels plan starts with a memory clean up, thus it will erase all existing standard and manual plans eventually present in the meter before uploading the new ones. Please, proceed to a backup of all your personal manual plans via the S.M.A.R.T. File Manager before proceeding to the plans upgrade. (see S.M.A.R.T. User Guide for detailed information).

FAULT IDENTIFICATION FORM

To:
RO.VE.R. Laboratories S.p.A.
Customer Service Department
 Fax: +39 030 990 6894
 e-mail: wecare@roverinstruments.com

Date:

CUSTOMER INFORMATION

- Full name:
- Company:
- Contact name:
- Address:
- City:ZIP code:
- Tel.: Mobile:
- Fax: E-mail:

METER IDENTIFICATION

- Meter Model:
- Purchase date: Invoice number:
- Bought from:
- Firmware version (FW): Hardware version (HW):
- Serial number (S. NO):

***NOTE:** model, serial number, firmware/hardware versions are available in the start-up screen and in the meter's information display in the configuration menu. If the meter does not switch on, you may find the meter's serial number on the label placed on the rear of the meter.*

FAULT DESCRIPTION

Using few, but precise, words please describe here below the fault found and forward to our Service Department for more instructions on how to proceed. If necessary provide pictures or loggers & saved screens using the SMART PC interface software.

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Do not return the meter without our authorization number (RMA) and RO.VE.R. shipment instructions, otherwise the meter will be rejected upon arrival at our premises.

To receive your authorization number dial: +39 030 9198 299



||| A STEP AHEAD IN DIGITAL TELEVISION



ISO 14001
OHSAS 18001

Specifications and features are subject to change without notice.

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