

DRAFT

DM14B/C DIGIMAX

USER GUIDE and MENU NAVIGATION

COMBINED DIGITAL & ANALOG PROFESSIONAL ANALYZERS FOR: RADIO, TV, CATV & SATELLITE

4-2250 MHz QPSK-COFDM-QAM-MPEG



Subject to change without notice



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USEFUL SUGGESTIONS

- 1) Thank you for choosing our measuring equipment, which is currently used and appreciated by the most important Satellite Service Providers, Broadcasters and by many installers, because it is user friendly and provides complete and accurate measurements. On our part, we will do our best to fulfil your requirements now and in the future.
- 2) This is a new concept, quick user guide that is easy to consult. Select the function/measurement you need directly from the index and on the respective page you will find all the relative menus.
- 3) First of all please do not be concerned about the large quantity of menus found on the following pages; as this meter is the most complete and advanced TV & SAT analyser available on the market, it is clear that it is capable of carrying out many measurements. If you take a closer look you will notice that the menus are similar and basically divided into two groups: MEASUREMENTS and SPECTRUM.
 - **MEASURE:** analogue TV, COFDM, QAM & 8VSB digital TV, analogue Sat & QPSK digital Sat, Radio FM and DAB.
 - **SPECTRUM:** analogue TV, COFDM, QAM & 8VSB digital TV, analogue Satellite and digital QPSK satellite, Radio FM and DAB.
- 4) You will also see from a very early stage that all you have to do is store the various plans (PLAN) and programs (PRG) (or ask your supplier to do it for you using the PC program, opt. SMART PRO), then choose the plan (PLAN) and the program (PRG) needed each time. Select the spectrum function (SPECT) or the measurement function (MEAS) and the meter will do everything automatically. Isn't that great? We also suggest you photocopy, cut-out and fill-in the tables on pages 108/109 and insert them in the transparent pocket in the instrument's bag flap.
- 5) Important: The instrument leaves the manufacturer with some default settings for test and demonstration purposes:
 - a) The instrument turns off after 5 minutes' inactivity, for transport by air.
This setting can be modified from the CONFIGURATION menu (see page 12).
 - b) Check that you are using a meter with the correct channel plans for your country.
It is possible to modify this setting from the CONFIGURATION menu (see page 12).
 - c) Some plans have been previously stored in the meter using one or more programmes in the various operation modes, for example:

PLAN	MODE	PLAN	MODE
1	ANALOG TV	80	Mixed for factory tests
2	FM RADIO	81	
3	QAM		
4	COFDM		
5	ANALOG SAT		
6	QPSK		
7	DAB-PLAN		
8	ASTRA 19,2 E		
9	EUTELSAT 13°° E		

N.B. These are only examples to help you use and understand your meter. We suggest you store a mixed plan for every town or for every type of installation or modulation. Important: Do not cancel these channel plans.

- 6) The most important keys are:



ON/OFF switch and Reset button (keep it pressed for 10 seconds to activate the RESET function if the meter stalls).

10" RESET

2" PRINT



For measurement mode selection, (AN. TV, QAM, COFDM, AN. SAT, QPSK, FM RADIO, DAB)



For memory plan selection from 1 to 99.



For stored prog selection from 1 to 199, chan, LNB & DiSEqC power supply, freq.



Frequency selection (keep pressed for 2 seconds to activate RPL spectrum function)

ESCAPE



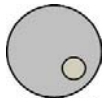
To select MEASURE or SPECTRUM mode and ESCAPE, to quit the various menus and go directly to measurement mode



To select PLAN-PRG-CHAN-FREQ decrease, etc



To select PLAN-PRG-CHAN-FREQ increase, etc.



ENTER

To activate, confirm and/or quit the various menus, measurements or settings (keep pressed for 2" to activate the numerical keyboard and the scroll menu)




Activates, in cycles, the various measurement levels.




Activates/disactivates the various menus related to the activated function.

N.B. Dual function keys: when you see the words 2" or 10" (2 or 10 seconds) written above the keys, you should keep the key pressed for 2 or 10 seconds to activate the second function.

All the remaining keys are just as easy to use and you can find complete descriptions on the last page (folded) of this guide: we suggest you open it out for easier use.

To use the **numerical keyboard** (SHIFT function), keep the  key pressed for 2 seconds,

digit the number of the plan, channel, program, frequency etc. and press  again to confirm.

If you prefer, you can adjust/select all the various parameters by rotating the  knob.



- 7) We promised you a user-friendly instrument, capable of doing everything by itself (or nearly); as you can see when you are in measurement mode (MEAS) the upper part of the screen shows all the settings, for example: MODE-PLAN-PRG-CHAN- FREQ-LNB- DiSeqC, etc. whereas the lower part of the screen shows all the measurements. These can be seen individually or all together, by pressing the MORE MEAS key once according to the measurement level you require (you can program levels 1-2-3 in CONFIG. See p. 12)
- 8) If when navigating within the measurements you change any parameters, the program number will disappear. Simply press PRG and reselect the previous program number by pressing the arrow keys to recall the previous parameters, or if you want, press MEMORY to store the configuration you are using (see page 14).
- 9) Now, please read the index on page 3, then carefully study the three most important menus to start:
 - **CONFIGURATION MENU** *Page 12*
 - **SPECIAL FUNCTION MENU** *Page 13*
 - **PROGRAM STORE MENU** *Pages 14-15-16*

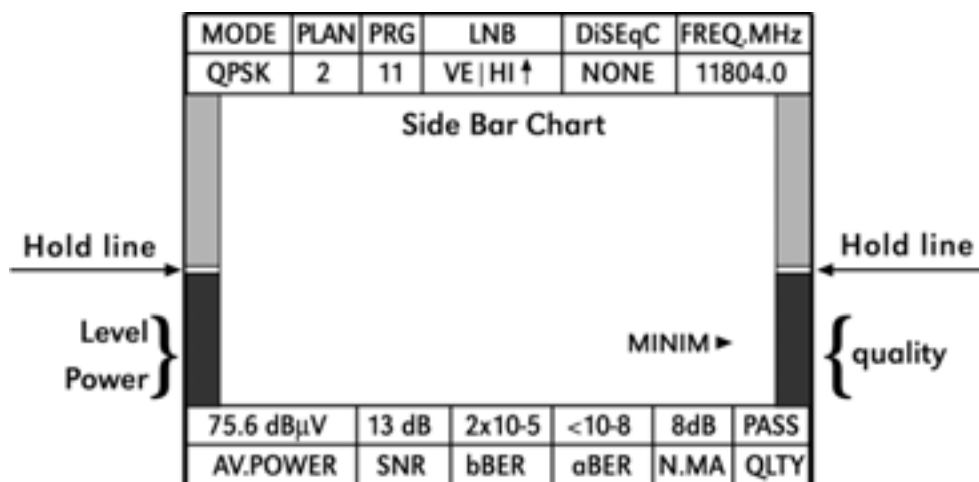
You will learn the remaining functions in a few days by using the instrument. The first time you use the meter, we strongly advise you connect it to a satellite dish or antenna which has already been installed and is operational and where you know the channels and frequencies well.
- 10) As you can see, in MEASUREMENT mode, the top left hand side of the display shows in which function you are positioned, for example: QPSK. The upper part of the screen shows all the meter's settings (MODE), for example: PROG-CHAN-FREQ etc., which can be directly recalled using the respective, direct function keys. The lower part of the screen shows the POWER/LEVEL measurement and if you press the key MORE MEAS key once or twice you can recall all the other measurements, which can be carried out. By pressing SPECTRUM, the meter instantly shows, in the lower left-hand side of the screen, the mode you are in. (Remember that the spectrum can be automatic or manual, see relative MENU).
- 11) You can navigate in every screen using the UP and DOWN keys and in measurement mode using the direct function keys. Please remember that this type of navigation is the same for all of your meter's menus and screens and that when you are in digital mode, the response of the various menus becomes a little slower.
- 12) Now go to the **CONFIGURATION MENU**, keep the SPECIAL key pressed for two seconds (see page 10). Select your country's standard, the measurement unit you prefer and the TIMER setting (if you set "5 min" the meter turns off after 5 minutes of inactivity and re-starts from the last measurement without losing data). You can adjust the

volume of the keys' beep sound. To exit CONFIG. MENU press ESCAPE/MEAS. Please avoid using the cancellation menu of the memory banks until you are confident with the use of the meter.

- 13) Now let us take a look at the **SPECIAL MENU** (see page 13). To reach this menu, press the SPECIAL key once:
- **SELF TEST:** this is used if there are faults to see which parts are not communicating and to obtain the various data information needed to inform the ROVER service (including the SW and FW versions and the instrument's serial number SN).
 - **A/V MONITOR:** forces the video/audio input from the Scart socket (even without 12 V on the relevant PIN).
 - **TEST MONITOR:** generates a test pattern (which can be used to test TV DC installations).
The video is available on pin 15 of the SCART socket.
 - **RF/IF INPUT SEL:** selects the meter's RF IN, either RF or IF: (38.0 / 38.9 / 45.75 MHz)
 - **VOLTMETER:** measures the AC/DC voltage present at the RF connector.
 - **REFLECTOMETER:** to measure the distance of a short circuit, interruption or mismatching in coaxial cables.
 - **AUTO SCAN (TV):** to scan a channel plan for the search of analog or digital (COFDM) TV channels and the relative automatic memorization inside the plan.
 - **FILE MANAGER:** for file management (canalizations, plans, loggers, etc...) in the memory.
- 14) **BARS SCAN FUNCTION:** This activates the bar chart graphics representation. In a display it is possible to see the level/power of all the TV programmes stored in a plan. This function is useful for tilt adjustments and equalizations in cable distribution networks and headends.
- 15) **NAVIGATION IN MEASUREMENT MODE** (from pages 17 to 35) the various parameters can be quickly changed using the direct function keys. We remind you once again that in this case the program number disappears. At this point you have two options:
- a) Press the programme key and select the same or another program number.
 - b) Press MEMORY and store the selected parameters previously modified (see page 14).
- 16) **NAVIGATION IN SPECTRUM MODE** (from pages 36 to 47): the various parameters can be navigated using the arrow and ENTER keys and are the same as those used by other more expensive, professional spectrum analysers. The measurement dynamic range and the spectrum speed of this instrument are by far the best in this category and despite everything, AUTOMATIC mode is very easy to use. Let's take a look at some of the main functions:
- **Reference level:** this is the level of the reference line (the first line at the top of the grid) is adjusted automatically to the carrier with the highest level inside the SPAN. When the SPAN varies, press SPECTRUM twice to up-date and obviously you can also manually adjust it using the UP & DOWN keys. (N.B. The ref. level corresponds to the attenuator of previous instruments). Remember that each time you change mode or turn on the instrument again the ref. level automatically returns to the top of the ref. level (also in manual mode).
 - **Marker Frequency:** shows the marker frequency (vertical dotted line); automatically in digital and analogue SAT and it always positions in the centre of the carrier, whereas in analogue TV it always positions on the video carrier. N.B.: The FREQUENCY MARKER is basically the meter's frequency tuning; in fact the marker can be moved on the various carriers and when you go to MEAS mode you are automatically positioned on the same frequency. If this frequency is exactly the same as one of the memorised channels, you will also see the relevant channel, otherwise the display shows 3 lines (to remind you that something has been changed). Important: the cursor also navigates outside the SPAN's limits, to the far left (start), to the far right (stop). If you release the arrow keys every now and then, the tuned carriers are shown (the ones that were previously out of the SPAN range). Naturally if you change from SPECT to MEAS, you can go directly to the tuned carrier/channel. For easier viewing in Analogue TV and with 10 MHz SPAN, the centre of the channel will be positioned in the centre of the display, whereas with the rest of the SPAN the marker is positioned in the display's centre.
 - **Marker level:** shows the level of the signal measured by the marker (horizontal dotted line with crosses) and is connected to the marker frequency position.
(N.B. When the MRK level line is on the highest carrier, it may be confused with the REF LEVEL line, the highest line on the grid and become invisible).
 - **SPAN:** this always shows the total bandwidth in MHz between the extreme left and extreme right of the display (if you divide the value by 10 you can obtain the value of each square division).
 - **dB/div:** shows the value in dB between each division of the horizontal grid. This is very helpful if you require a wide dynamic range, e.g. 10 dB/div., to see noise AND interferences or a high resolution, 1 dB/div. For very accurate SAT dish pointing both in SAT & TV. In this condition you can easily appreciate variations in dB decimals.
 - **MODE:** it shows which mode the instrument is working in (the various digital or analogue modulations, TV or SAT etc.) and in SAT, you can also select the satellite dish pointing function; it automatically sets the spectrum to easily point any satellite dish. To quit this function press ESCAPE/MEAS. MODE can also be used to select the V.SAT function, providing a high resolution spectrum for V.SAT and SCPC installations.
May we remind you that when you press MENU you can also select:
 - **SPECTRUM:** automatic or manual. If positioned on AUTOMATIC it always adjusts the SPAN and the dB/ so you can see the carrier, which is being examined.
 - **DEFINITION:** high, medium, low. This increases the spectrum speed (to facilitate dish pointing).

- **PICTURE:** spectrum with outlines only or full white
 - **Δ MARKER:** freq./level difference between two signals and C/N measurement
 - **MARKER BW:** to adjust filters, amplifiers, etc. and to measure digital power in SPECT mode “BW-PWR”.
 - **MAX HOLD:** peak memory. Maintains the max. peak reached during a series of measurements
 - **DC at RF in:** output power supply (5, 12, 15, 18, 24 V – OFF).
 - **LNB L.O.:** local oscillator.
 - **BUZZER:** ON/OFF activates an acoustic sound which varies with the signal level or digital satellite quality.
- 17) **EMULATED COFDM/QAM DIGITAL TV MEASUREMENTS (DEMODULATED MEASUREMENTS: COFDM supplied, QAM optional):** These allow you to carry out perfect average power and C/N measurements, provide a BER evaluation and the quality of the signal (FAIL-MARGINAL-PASS).
HOW THE EMULATED DIGITAL MEASUREMENT WORKS: The signal is measured in RF based on the C/N measurement and multiplex flatness. Thanks to a series of special algorithms, defined and registered by ROVER in co-operation with some UK DTG (Digital Terrestrial Group) engineers in 1998 and later optimised, it is possible to provide a good signal evaluation in both cases of adjacent and non-adjacent channels (selectable n/f – near/far) without demodulating the digital signal. The measurement accuracy is very high, except in rare cases of interference completely hidden under the digital multiplex spectrum.
- 18) **LNB-POL & DiSeqC:** as you have already seen, there are two different settings, which make the instrument the most complete and easiest to use in the world:
- **LNB:** OFF, VERT HIGH, VERT LOW, HORIZ HIGH and HORIZ LOW Polarization
 - **DiSeqC:** off-a-b-c-d, the combination of these two parameters enables you to select the various multi-switches with 4 cables “a”, 8 cables “b”, 12 cables “c”, 16 cables “d”.
- 19) You can obtain other very interesting spectrum functions with your instrument if you connect it to an optional noise generator, for example the “CNG-80” or “CNG-70”:
- **Scalar network analyser** (wobulator), in “MRK BW” spectrum function, for the calibration and test of channel filters, amplifiers, splitters, traps, outlets, coaxial cables and relevant VSWR or R.L. measurement of standing waves ratio (with a reflect meter bridge).
 - **Coaxial cable reflect meter** (“Δ MRK” spectrum function) to measure the distance of a short circuit or interruption in coaxial cables (using a "T" connector and slide rule).
- 20) **RESET:** if the meter stalls and you are unable to turn it off, keep the ON key pressed for 10 secs and the instrument will immediately restart. If you find that the instrument always blocks in the same situation, please contact the manufacturer and you will be given, as an award, a year's service free of charge in addition to the standard one.
- 21) **SOFTWARE UP-GRADE:** As you well know, another excellent function of this meter is the possibility of up-grading software free-of-charge via internet. To carry out this operation, consult Rover Instruments web site (www.roverinstruments.com) and/or contact the service in your country.
- 22) **START-UP MENU:** this appears for two seconds every time you turn on your instrument and contains all the information necessary for the service technicians in the case of repairs or software up-upgrades via internet (you can find the same data in the SPECIAL, SELF TEST Menu).
- 23) We suggest turning off the meter when connecting or disconnecting the **RS232** interface.
- 24) It is possible to store separate or mixed multi-standard plans (e.g. France/Europe or China/Hong Kong) according to your requirements.
- 25) The instrument is supplied with interchangeable input connectors “F”, “BNC”, “IEC” or “N”.
- 26) If the TV signals are weak, or have lots of interference, and you have difficulty in tuning the TV pictures, exclude the OSD and reactivate it, this operation should help you to tune TV pictures.
- 27) If the words on the screen do not tune during the frequency tuning of analogue TV and SAT programmes, briefly remove the signal from the RF input and the words should stabilize.
- 28) If the instrument loses the vertical sync., with TV and SAT analogue pictures, press MENU and check that it is set to the correct standard: 50 Hz PAL-SECAM and 60 Hz NTSC.
- 29) To eliminate the MENU words, press the MENU key.
- 30) Linear bar chart for level/power with memory & digital quality, e.g. QPSK, these are available in MEAS level 2.

N.B. With reference to fig. 8, the NETWORK name you can read in the centre to the right, e.g. NETNAME=SKY, is the NET.ID table transmitted via satellite by the operator and which the instrument reads by extracting the information from the MPEG data. However, the prog. name, read in the centre to the left under the word MENU, e.g. PROG NAME: SKY1, is the one you, or your dealer, has pre-stored and can be varied only using a PC, opt. (see page 19).



N.B. When you activate MORE MEAS 3 (where available) and MENU, due to problems with space, the quality bar chart and the level/power bar chart both respectively disappear. The white arrow, near to the quality bar chart, indicates the minimum quality required to achieve a PASS in automatic tests.

32) C/N MEASUREMENT

In some cases the C/N measurement of analog signals may vary with the level because when the level increases some RF attenuators could be inserted. The automatic insertion of attenuators reduces the instrument's sensitivity and consequently reduces the C/N read on the screen, which will be less than the real one. To avoid this carry out the following procedure:

- Select normal spectrum mode (without activating the C/N measurement)
- Fix the span at 200 MHz when in AN-SAT (analog satellite)
- Fix the span at 10 MHz (or 20 MHz) when in AN-TV (analog TV)
- Increase the REF-LEVEL (reference level) using the UP key, in 1 dB steps, until you see the noise lower by approximately 10 dB
- If the noise goes under the line at the bottom of the screen, change the spectrum scale and set it at 10 dB/DIV (this may occur in analog sat mode)
- Press MENU and select the Δ MRK (delta marker) activate the C/N select.
WARNING: make sure you do not press MEAS or any other key, because the attenuators will set using standard values.
- Using the UP and DOWN keys bring the marker to the point where you want to measure the noise and read the C/N value (which will correspond to the measurement filter bandwidth), in the window in the lower part of the screen (Δ MRK C/N),
- May we remind you that when you measure the C/N in analog TV or SAT mode with the _MRK (without specifying the C/N), the band correlation is not carried out automatically. In this case you should subtract 10 dB from the measurement value if you are carrying out a satellite measurement, and 16 dB from the value for TV measurements.

33) C/N Measurements in emulated COFDM demodulation mode.

We suggest following these rules when carrying out emulated C/N measurements:

- Use C/N far when there are adjacent channels
- Always use C/N NEAR when there aren't any adjacent channels
- If you are carrying out measurements on a head-end with selective filters and channel converters, only use the C/N near measurement. In this case the C/N far measurement could measure a higher C/N than the real value.

To fix a C/N far or C/N near measurement, activate the configuration menu (see page 10 which contains the configuration menu description).

DM-14B & DM-14Color Digimax

The DM-14B and DM-14Color meters allow you to visualise digital pictures of non-encrypted services (FREE-TO-AIR), contained in the digital signals received at the RF input of the meter, in other words:

- Digital transponder transmitted via satellite with QPSK encryption,
- Digital multiplex transmitted via ether with COFDM encryption,
- Digital multiplex transmitted via cable with QAM encryption.

There are many services (TV or Radio programmes) inside a digital signal, such as the ones listed above. The MPEG board allows you to see/listen to any of these services as long as they are not encrypted. To select one of these services and obtain both the picture and the data of the Audio and Video PID, please refer to the description of the "SERVICES" option in the MENU described on pages 22-27 and 34 of the manual.

It is important to note that when a digital signal is tuned and you want to see the picture of one of the services, you should select a service using the "SERVICES" menu (see pages 22-27 or 34). Whenever a digital signal is stored in a program in a memory plan, the visualization of the picture regarding a service contained within it occurs only if this service was selected using the "SERVICES" menu. Consequently it is important to note that every time you recall a digital program contained in any memory plan, the picture shown will be the one belonging to the last selected service available for that transponder (see pages 22-27 and 34). If this selection is not used, the board will not show any picture.








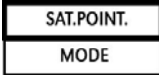
Example of a picture and relative data from the indicated transponder, obtained using the "SERVICES" selection contained in the menu associated with digital signals.

SATELLITE DISH POINTING (SAT POINT function)

As this is a function which is used often and is, at the same time, facilitated by our automated high-resolution spectrum, we thought we would dedicate a chapter to this subject (please also refer to the "QPSK" SPECTRUM).

- a) Activate SAT mode, analog or QPSK   (whichever you prefer).

or simply select a SAT programme, preferably in centre band, already pre-stored to receive the satellite and relative band and polarization you require (e.g. Hot bird 13° E, VE ■ HI ↑, 11842,0 MHz).

- b) Press SPECTRUM. 
- c) Press ENTER  (to quit MRK FREQ)
- d) Press the  key twice to go to MODE.
- e) Press , and press  once or twice to go to 
- f) Connect the LNB assembled on the dish to the RF IN of your meter.
- g) At this point the SAT POINT function has already automatically set the best SAT spectrum vision for you to carry out satellite dish pointing, without having to touch your meter again (see fig.1).

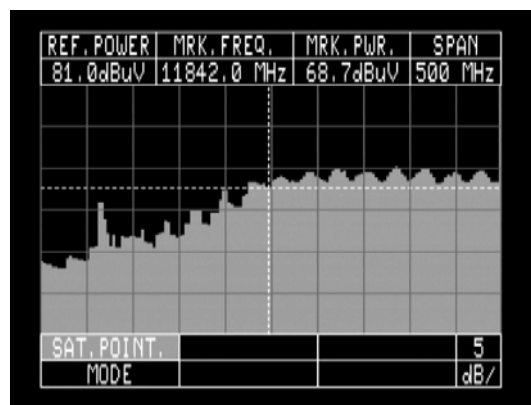


Fig.1 LNB noise, without carriers

- h) Start pointing your dish (whose elevation has already been adjusted) in the correct direction until you can see some carriers appear out of the noise and maximise them as shown in the two examples below (fig. 2 and 3). In theory the satellite dish pointing is now complete; later we will see how to make it perfect and/or simplify the procedure using some of the instruments special functions.

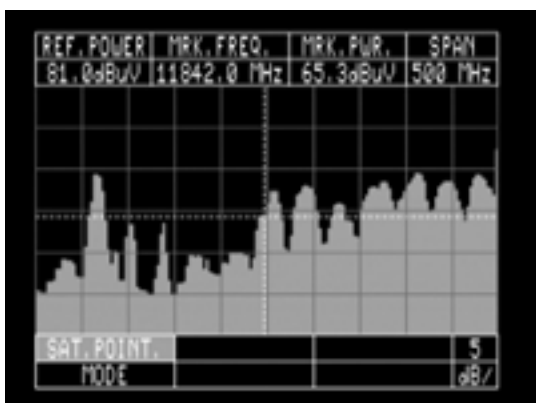


Fig.2 The carriers start to appear from the noise

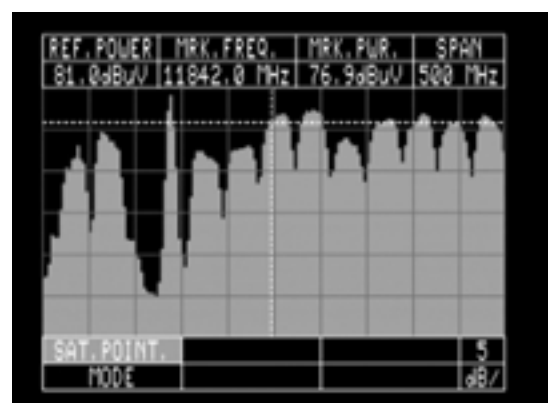


Fig.3 Satellite dish pointing completed

- i) Now select 1 or 2 dB/DIV (in the lower right hand corner); in this configuration you have maximum spectrum resolution, which allows you to perfect your dish pointing. If the carriers go over the reference level, increase it by 1 or 2 dB to see all the transponder peaks.
- j) At this point, return to 5 dB/div., you could also press the MENU key and activate MAX HOLD, bringing it to ON, press MENU again to remove the descriptions. MAX HOLD function shows in white the spectrum at the maximum peak measured. You can therefore check that the pointing is actually at the maximum (this is a fast and precise system, see fig. 5).

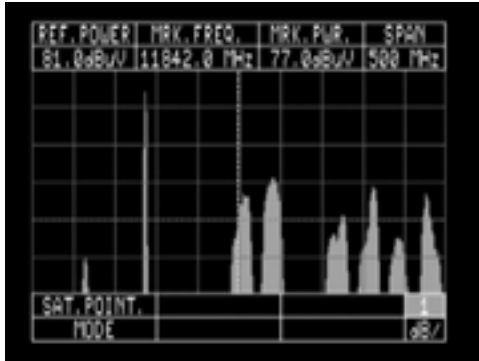


Fig.4 1 dB/DIV spectrum for fine pointing

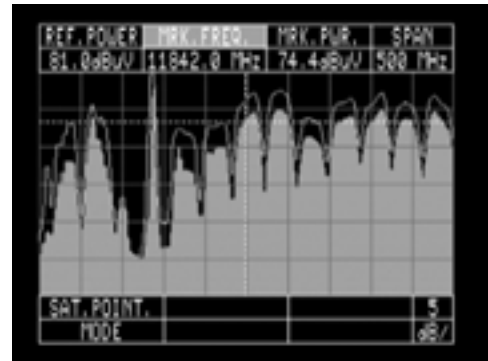


Fig.5 MAX HOLD function, peak memory

- k) Press MENU again, remove the MAX HOLD and if necessary reselect HIGH definition, then adjust the cross polarization to achieve the best results (this can also be carried out in MEAS, by bringing to the maximum the Noise Margin value and the respective total quality bar).
- l) Go to measurement mode by pressing the MEAS key (level 1) and in the lower half of the screen you can see the POWER value of the signal received (see fig. 6). Press the MORE MEAS key (level 2) and, if everything has been stored well and you have pointed your satellite dish correctly, you should have all the measurements in the lower half of the display, as shown in the example below (fig. 7).
N.B. By passing into MEAS you quit the SAT POINT function (and also the V.SAT function). To return, repeat the operation from point b) to point e).
Press MORE MEAS again (level 3) and you can see the NETWORK and BOUQUET names as well as all the other data and check to see if you are receiving the correct satellite/bouquet (N.B. Level 3 is the menu excluding the quality and level bars, see fig. 8).



Fig.6 QPSK measurement, level 1, with power bar



Fig.7 QPSK measurement, level 2, with power bar to the left and quality to the right, the white arrow shows the suggested minimum quality.



Fig.8 QPSK measurement, level 3, with N.ID plus MENU

- m) If, in the images shown in fig. 7 or 8 lines appear instead of measurements, it means that you have carried out the wrong satellite pointing or storing procedure. Check everything once again and the first times always refer to a dish that is already operational. In any case go to SPAN 50 MHz and see if there is a carrier exactly in the centre of the marker (if there isn't you are on the wrong satellite, or band, or polarization, or symbol rate, or frequency).

N.B. With reference to fig. 8, the NETWORK name you can read in the centre to the right (e.g. NETNAME=SKY) and the other information are those transmitted via satellite and which the instrument obtains by extracting from the MPEG data. However, the program name, read in the centre to the left under the word MENU, e.g. PROG NAME: SKY, is the one you, or your dealer, has pre-stored and can be varied only using a PC, opt., see page 19. Adjust only using a PC or cancel all the respective plans using the file manager DELETE, see pages 19 and 59.

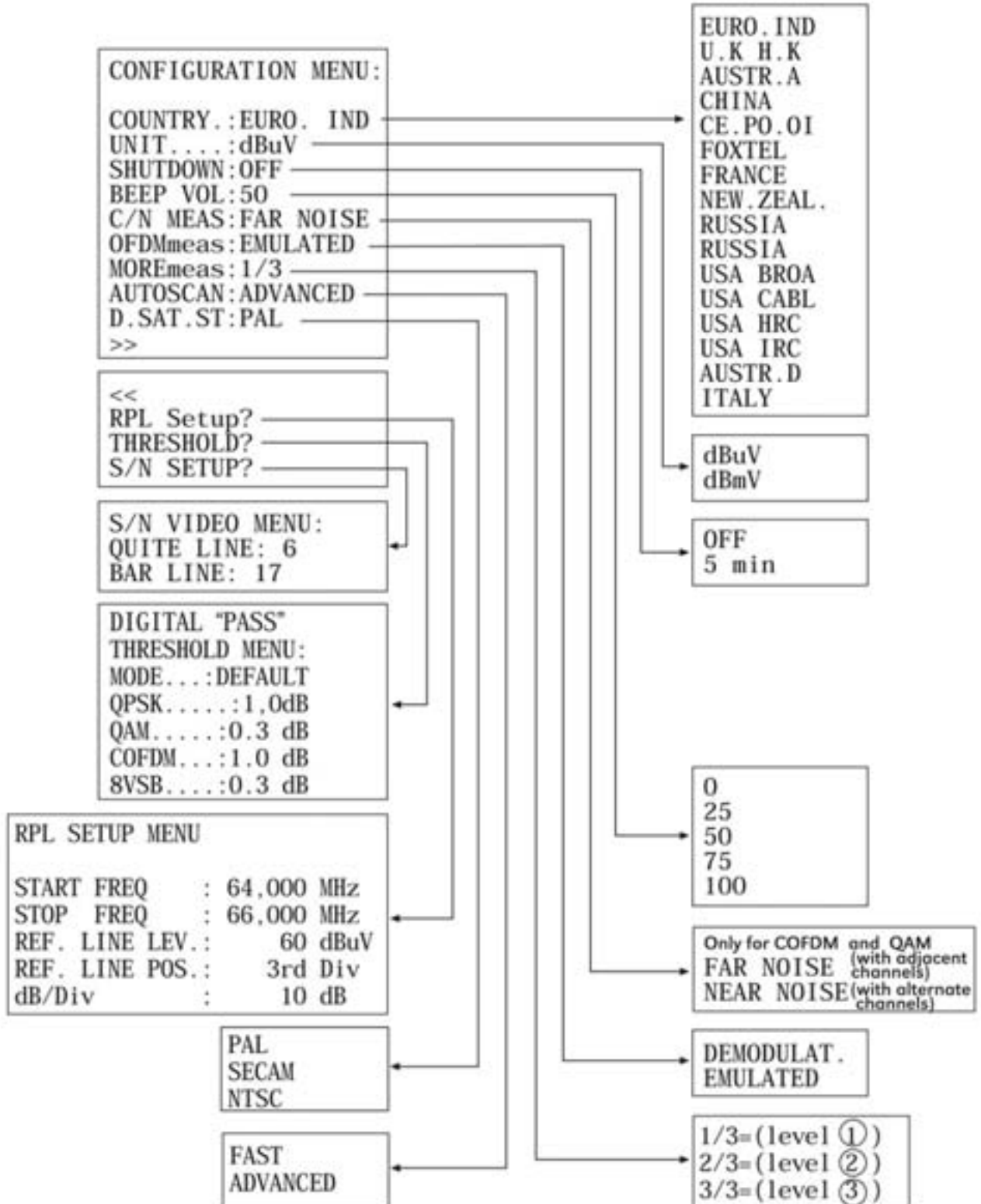
CONFIGURATION MENU



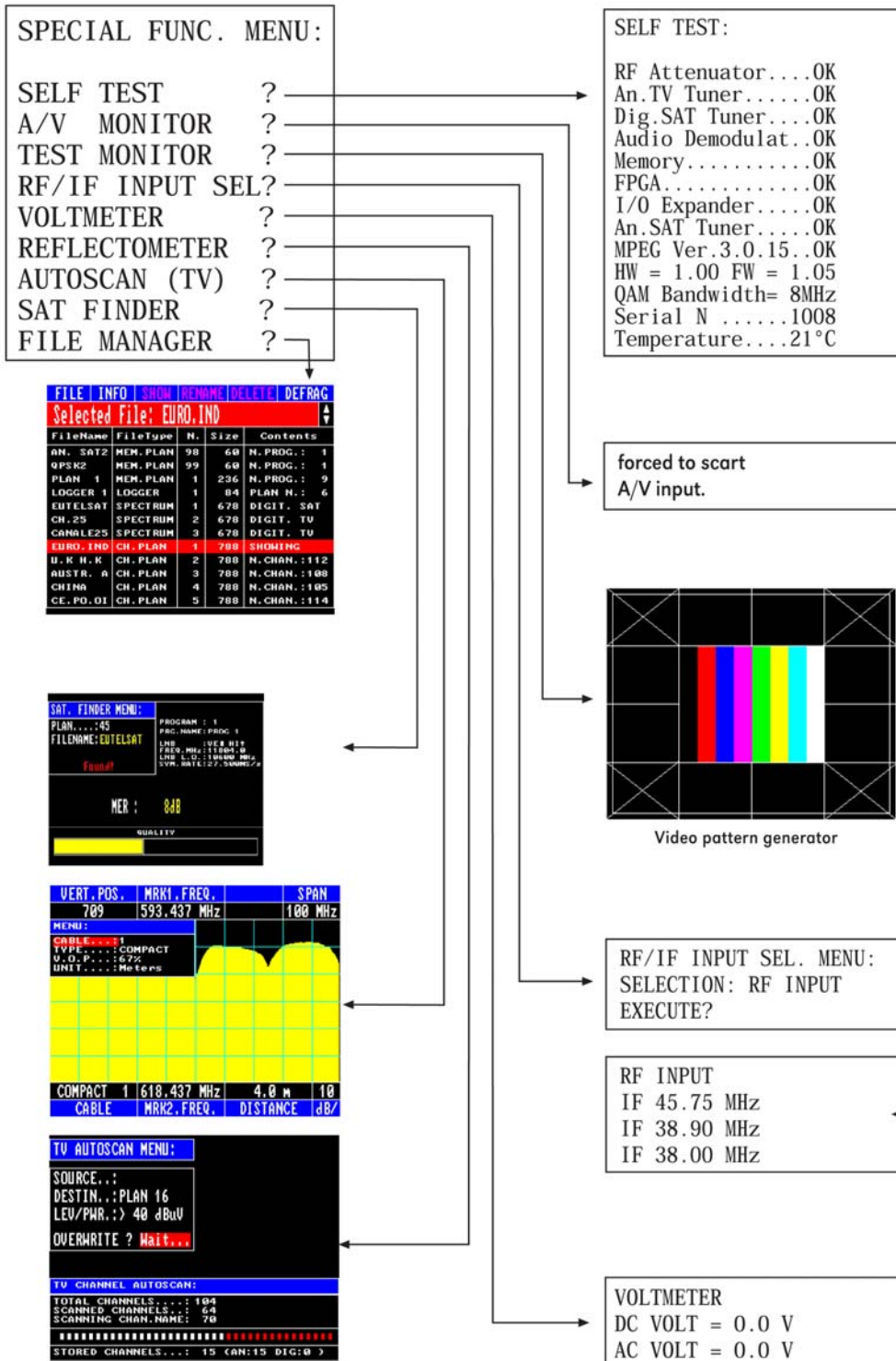
2" CONF



Keep pressed (hold) for 2 seconds



SPECIAL FUNCTIONS MENU & VIDEO TEST PATTERN GENERATOR



PROGRAM STORE MENU (MEMORY)



The **MEMORY MENU** is very easy to use and is required to store programs. Basically, if you rotate the encoder, you move the cursor (grey background) to the line that corresponds to the parameter to be adjusted, for example QPSK as shown below.

Press the encoder and it will position on the value of the parameter/status you want to adjust/store. (See example under the frequency line). Once the data required has been adjusted, rotate the encoder and press it again to quit. Rotate the encoder again to go to STORE? or OVERWRITE? (STORE? appears automatically if the program number to be stored in the plan has not yet been used, alternatively the word OVERWRITE? appears, to allow you to overwrite/replace an existing program). Press encoder again to store the program. The program number increases one number at a time, e.g. it will go to 2 (only if the programs have never been stored before, if not go ahead one at a time manually). The cursor will go to the parameter to be adjusted (e.g. frequency for the QPSK function shown below). If you do not need to modify any other parameters, adjust only the frequency of the next program, for example 2. Press the encoder again to quit and using the arrow keys go to STORE, press ENTER again to store and continue until you have completed all the channels/programmes required.

N.B. You can store without navigating on STORE? by pressing MEMORY for 2 seconds.

It is possible to store up to 199 mixed programmes for each plan in each of the various modes of the instrument (e.g. RADIO-TV-SAT-etc even with different standards, for example France/Europe or China/Hong Kong or Russia/Europe)

To exit the PROGRAM STORE menu, press the MEAS/ESCAPE key and you will always go directly to the main menu MEASURE. Press MEAS/SPECT again to go to SPECTRUM mode. Easy, don't you think? Remember that it is not possible to store on identical programmes, because this is not necessary, however if you want to do this, simply move the frequency by 25 KHz in TV and 100 KHz in SAT.

N.B. If in the MEAS menu, instead of the programme you find two small lines, you must have varied a parameter, enter in the programme and bring it to the one required (or if you want to keep that configuration press MEMORY to store it).

The VHF channels, e.g. E10-Z10-S10 cannot be selected from the numerical keyboard, but must be selected using the UP and DOWN keys.

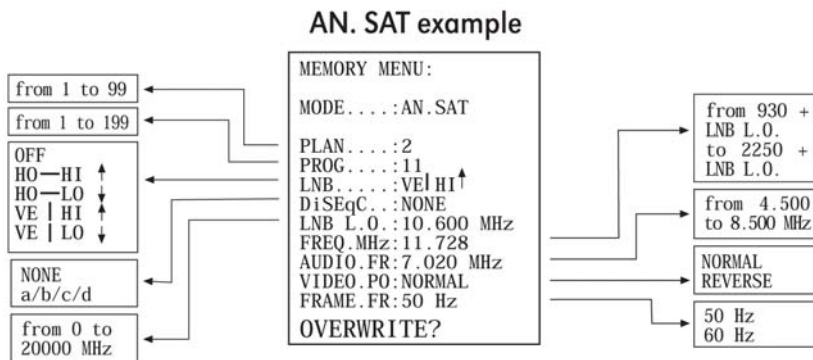
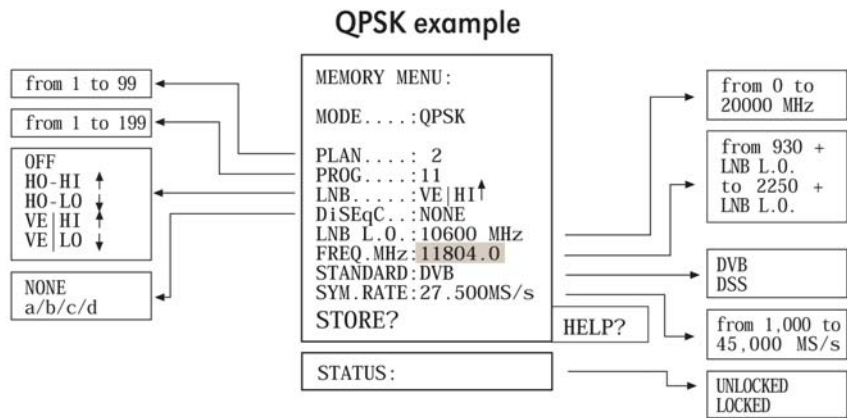
REMEMBER THAT:

- You have 99 memory plans available
- You can store up to 199 mixed programs in each plan (RADIO-AN TV-QPSK-QAM- 8VSB - COFDM-DAB)
- We suggest you store a plan for each city or each type of installation; this will facilitate the registration of measurements and data of the various installations (Data Logger) and the subsequent PC filing and print-out.

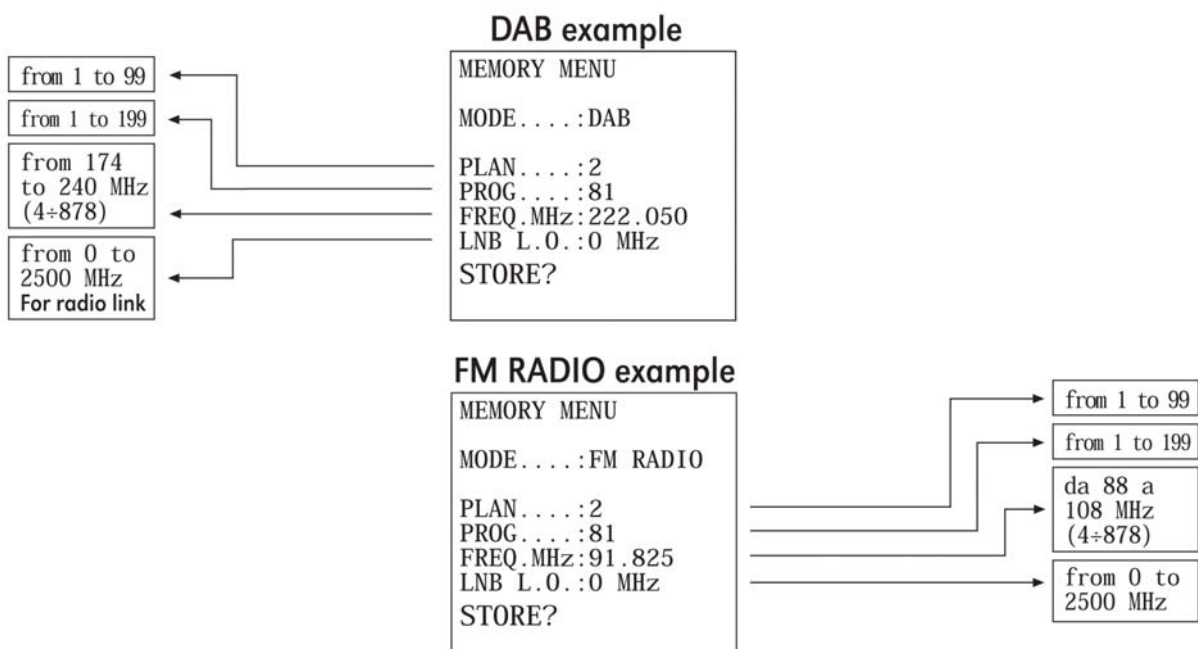
For your commodity you can note the plan and program in the table on pages 108 and 109.



PROGRAM STORE SAT MENU (MEMORY) EXAMPLES



RADIO MEMORIZATION MENU EXAMPLES

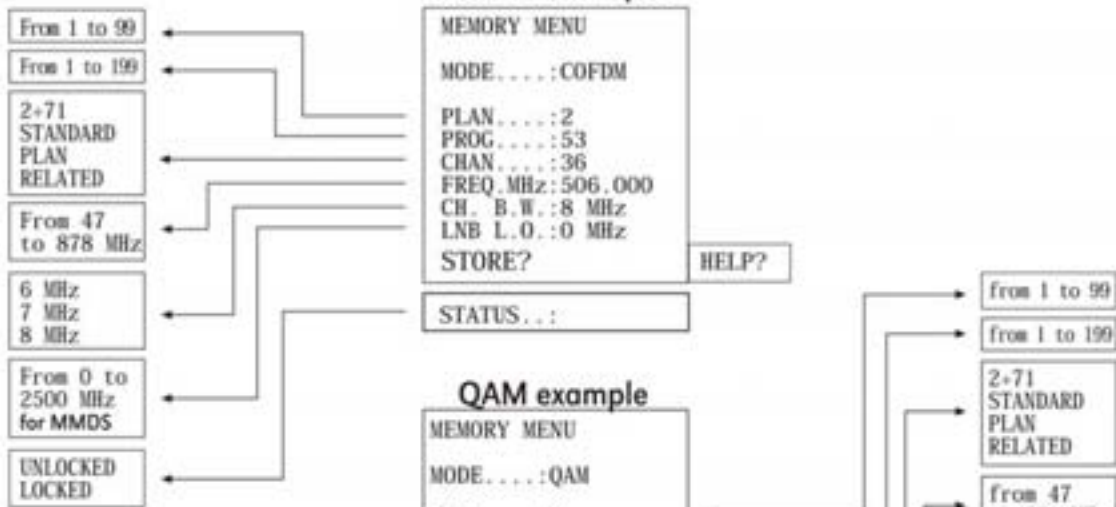


PROGRAM STORE TV MENU (MEMORY) EXAMPLES

ANALOG TV example



COFDM example



QAM example




8VSB example





ANALOG TV MEASUREMENT

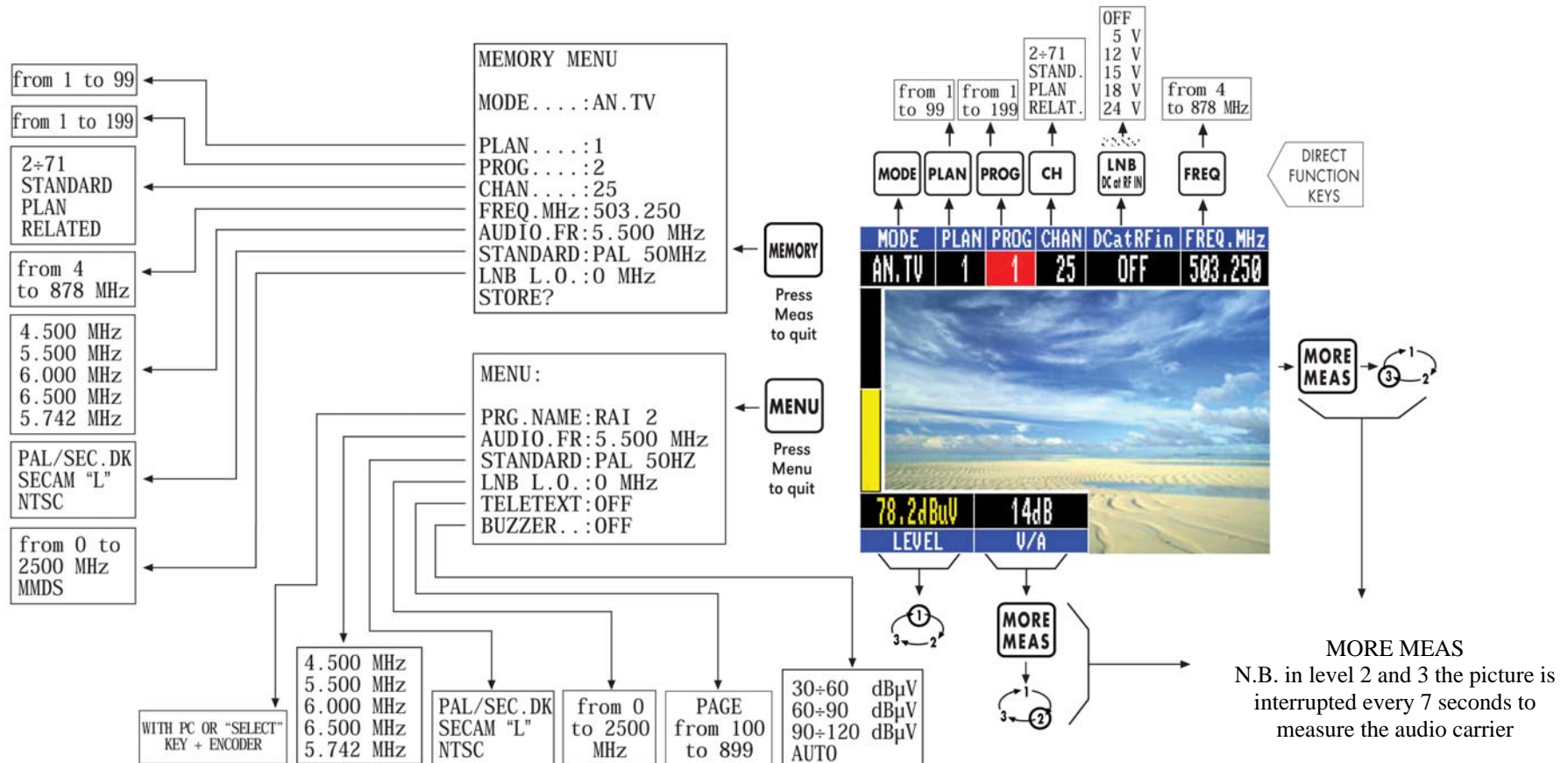
How to reach measurement mode:

DIRECT = From any previously stored "PLAN" & AN. TV "PRG" you are already in AN. TV meas (analog terrestrial TV measurement).

NAVIGATION = Press **MODE** rotate the encoder and  select

MODE
AN.TV

 then navigate in the parameters at the top of the screen, which can be reached directly using the respective keys, or by rotating the encoder  Press  to confirm the selection.



VIDEO LINES FUNCTION

(To visualise the synchro. active area and synchro oscilloscope and all the video lines)

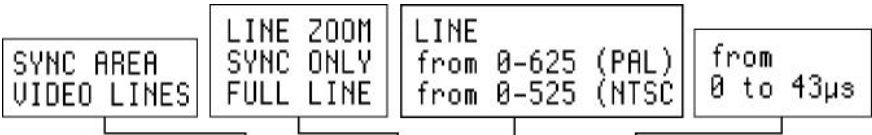
(Useful for Analog TV and SAT and Video signals coming from a Scart socket)

THE MAIN OBJECTIVE OF THE MEASUREMENT IS: to analyse the SYNCHRO area of a video line in the amplitude dominium, to visualise eventual interferences or reflections, as well as signal distortions and compressions.

DIRECT: To activate the H-Sync function, press the



key for two seconds.



Synch. Visualisation in VIDEO LINES



LINE ZOOM Synch. pulse visualisation



SYNC ONLY Synch. pulse visualisation

H-SYNC FUNCTION FOR DM-14B (Visualisation of the Analog TV & SAT synchro. active area)

DIRECT: To activate the H-SYNC function, by pressing the



key for 2 seconds, select SYNC AREA using the encoder.

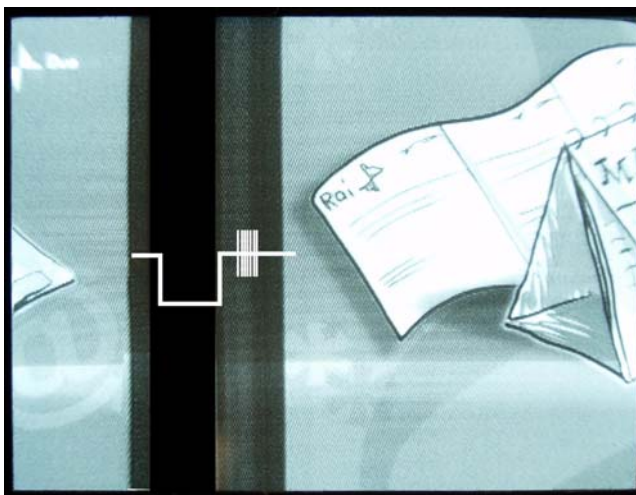


Photo Description { The picture is moved and the synchro graphic generated, locked to the signal received, to show the function “visualisation of the active synch area”. As you can see the darker bar (black) is the synchronism, the dark grey bars are the front and back on the synchro and the lighter bar represents the chroma BURST.

- a) THE MAIN OBJECTIVE OF THE MEASUREMENT is to analyse the SYNCHRO H area in time, to visualise possible interferences or reflections, as well as signal distortions and compressions.
- b) In the synchro's lighter bars, it is much easier to recognise all the various types and quantities of reflections and/or interferences, even with moving pictures, because this active area is not influenced by the content of the picture and it should be clean in order to have a perfect picture. For example, a white line to the right of the synchro represents a “reflected signal”, which is whiter, stronger and viceversa.
- c) When there are signal compressions and/or saturations, the dark/light areas tend to unify in intensity (compression) and distort (saturation). This function shows all the phenomena described above, which are usually difficult to see with moving pictures or with a simple SYNC visualisation.



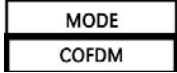


S/N_w MEASUREMENT FOR DM-14C – Being prepared

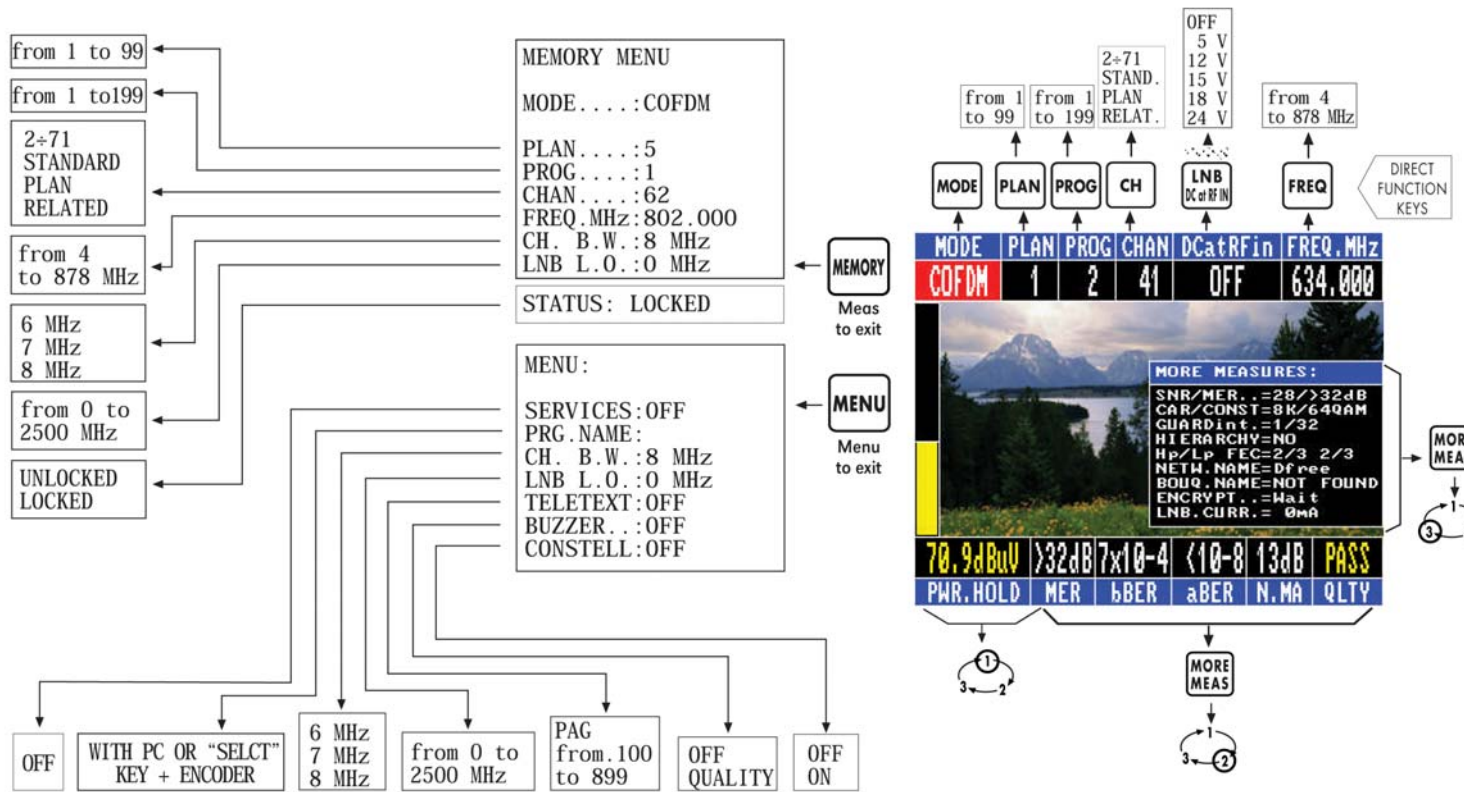
DEMODULATED "COFDM" DIGITAL TV MEASUREMENT

The COFDM measurement can be demodulated or emulated by selecting from the configuration menu (see "Configuration Menu" on page 12).

How to reach measurement mode:

DIRECT = From any previously stored "PLAN" and COFDM "PRG" you are already in COFDM meas. (digital terrestrial TV).


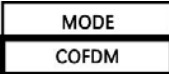

NAVIGATION = Press  by rotating the encoder  select  and then navigate the various parameters in the top of the screen which can be reached using the appropriate keys, or by rotating the encoder  and pressing  to confirm the selection.






DEMODULATED "COFDM" DIGITAL TV MEASUREMENT: "CONSTELLATION"

How to reach measurement mode:

DIRECT = From any previously stored "PLAN" and COFDM "PRG" you are already in COFDM meas. (digital terrestrial TV).

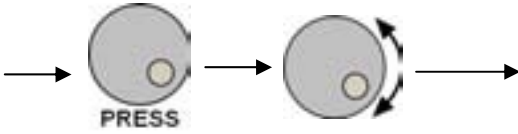
NAVIGATION = Press **MODE** rotate the encoder  and select  then press **MORE MEAS** and **MENU** Using the encoder  select "Constell."

press  and rotate the encoder  to activate the constellation.





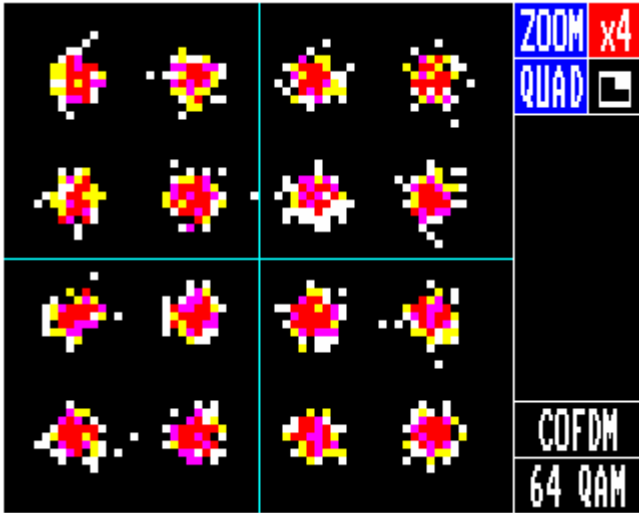
COFDM-64 QAM constellation example



To activate the zoom in the top right hand corner

To return to measurement mode

press 



Constellation zoom example.



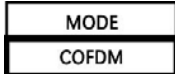








Using the UP-DOWN-ENTER keys you can select the zoom value and the quadrant to be analyzed

DEMODULATED "COFDM" DIGITAL TV MEASUREMENT: "SERVICES"

The COFDM measurement can be demodulated or emulated, this setting has to be selected in the configuration menu (see "Configuration Menu" on page 12).

How to reach measurement mode:


DIRECT = From any previously stored "PLAN" and COFDM "PRG" you are already in COFDM meas. (digital terrestrial TV).

NAVIGATION = Press  and with  select  then press the following keys       press   to select a service.

Activate the **INFO** function to visualise the data of the chosen service.

SERVICE	SHOW	INFO		
Service sel.: C5 DTT				
SERVICE NAME	AUD	V. PID	A. PID	ENC
C5 DTT	1	513	660	NO
I1 DTT	1	512	650	NO
LCI / Prima	1	514	670	NO
Si Dfree	1	515	680	NO
Radio Italia tv	1	526	790	NO
dv	2	8100	8101	NO

INFO

- press  to return to measurement mode

SERVICE	SHOW	INFO		
Service sel.: I1 DTT				
				


Example of the services list contain in the COFDM multiplex.



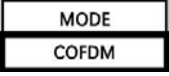



Example of the data regarding the chosen service with digital pictures

COFDM PARAMETERS AUTOMATIC SEARCH HELP FUNCTION

With this function it is possible to automatically search, with the signal connected, the main parameters to lock the terrestrial digital signal, after having selecting the plan and program number.

How to reach HELP function:

DIRECT = from any "PLAN" and COFDM "PRG", press  to directly enter the memorization menu.

NAVIGATION = Press  rotate the encoder  select  press  to set the plan, program and select the channel on which you want to carry out the search  select HELP? Press  to start the automatic search of the COFDM parameters.




Search example.



Once the search has finished, the cursor moves to STORE? or OVERWRITE? press ENTER per save.

N.B.


- If the search is positive the word FOUND will appear, if however it was unable to find the information the words NOT FOUND will be shown. The meter can save the data. When the search has finished, select the word STORE or OVERWRITE, then press  to finish the memorisation.
- In the STATUS bar the word LOCKED will appear if the channel is locked. If it is not locked the word UNLOCKED appears.

EMULATED "COFDM" DIGITAL TV MEASUREMENT



The COFDM measurement can be demodulated or emulated by selecting this mode from the configuration menu (see "Configuration Menu" section on page 12).

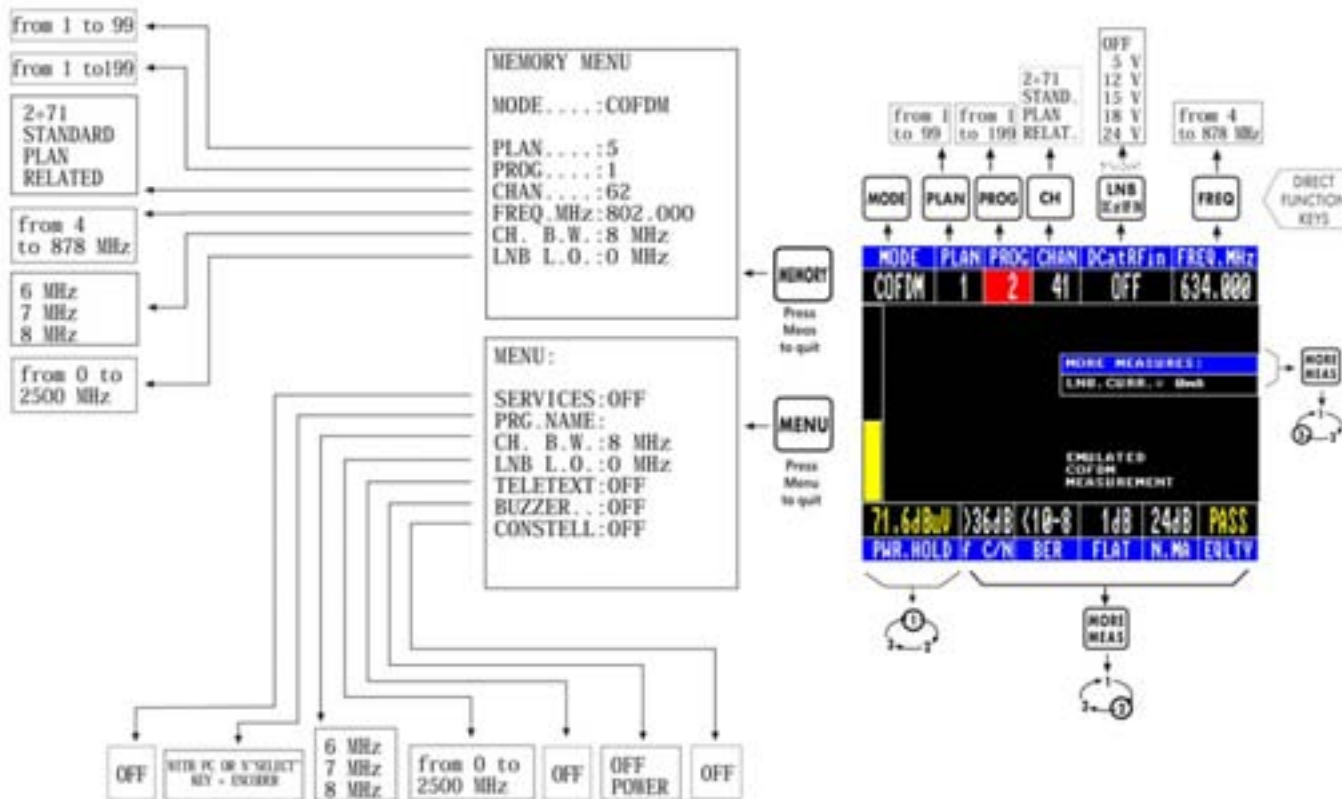
How to reach this measurement:

DIRECT = From any previously stored "PLAN" and COFDM "PRG" you are already in COFDM (digital terrestrial TV).

NAVIGATION = Press **MODE** rotate the encoder  select

MODE
COFDM

 then navigate in the parameters at the top of the screen, which can be reached using the appropriate keys, or by rotating the encoder  press  to confirm the selection.



N.B. Emulated OFDM measurement.


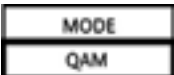


- use C/N far (f) when there are adjacent channels
- use C/N near (n) when there are no adjacent channels
- in the case of selective conversion head-ends, use only C/N near (n). In some cases C/N far (f) could measure a C/N which is too high.

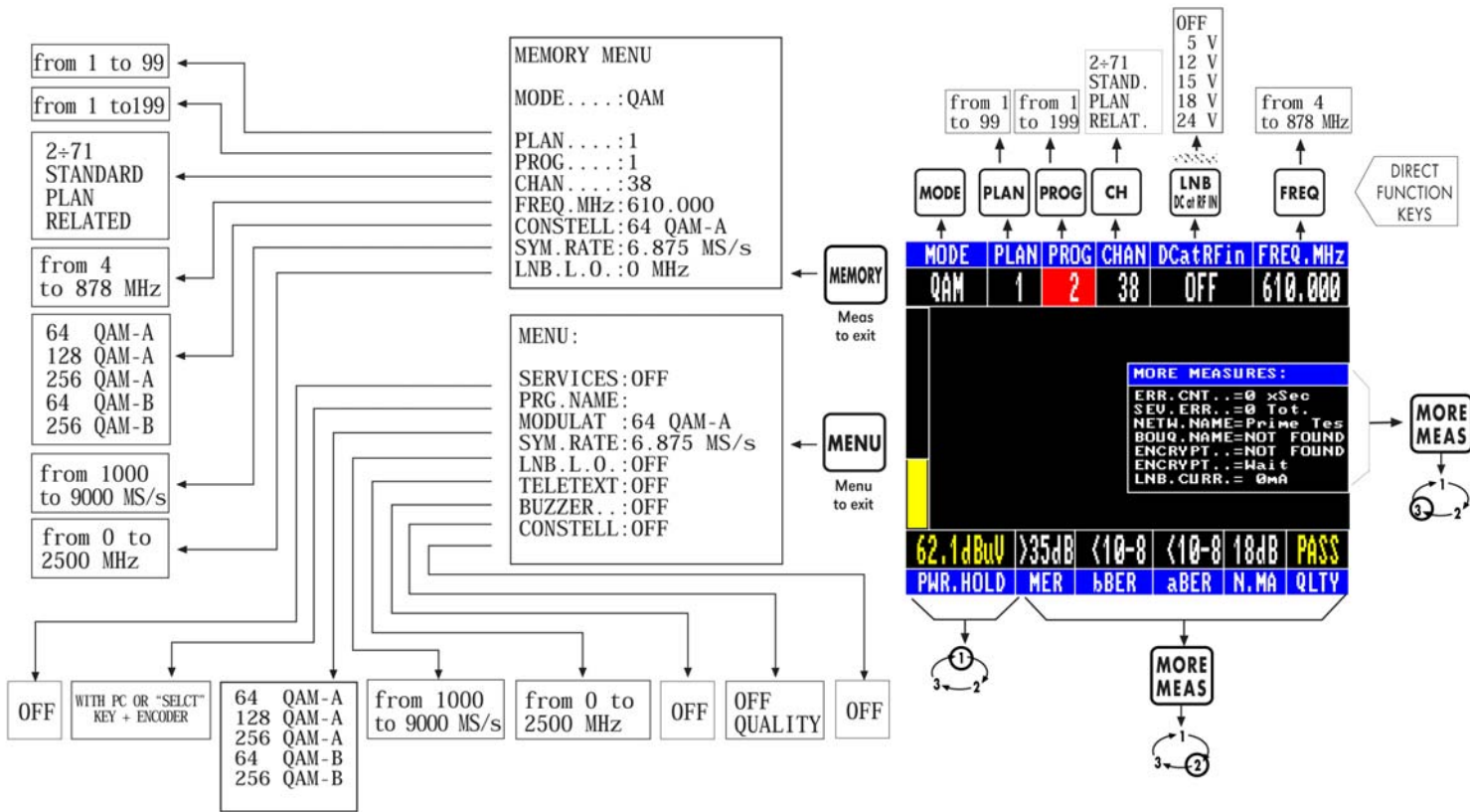
(See Configuration menu on p. 12).

DEMODULATED "QAM" DIGITAL TV MEASUREMENT: (demodulator opt.)

How to reach this measurement:

DIRECT = from any "PLAN" and prestored QAM "PRG" you are already in QAM measurement (digital cable TV).

NAVIGATION = Press **MODE** rotate the encoder  select  then navigate in the various parameters at the top of the screen, which can be reached using the appropriate keys, or by rotating the encoder  pressing it  to confirm the selection.


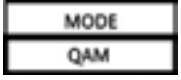






N.B.: When you insert the QAM/8VSB demodulation board (optional), the emulated measurements are replaced by the demodulated ones.

DEMODULATED "QAM" DIGITAL TV MEASUREMENT: "CONSTELLATION" (demodulator opt.)

How to reach this measurement:

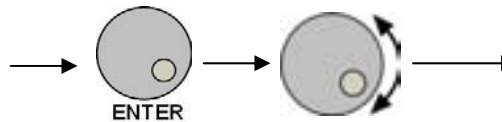
DIRECT = from any "PLAN" and prestored QAM "PRG" you are already in QAM measurement (digital TV via cable).

NAVIGATION = Press **MODE** rotate the encoder  select  press the keys   then using the encoder

Select "Constell." press  and rotate the encoder  to activate the constellation.



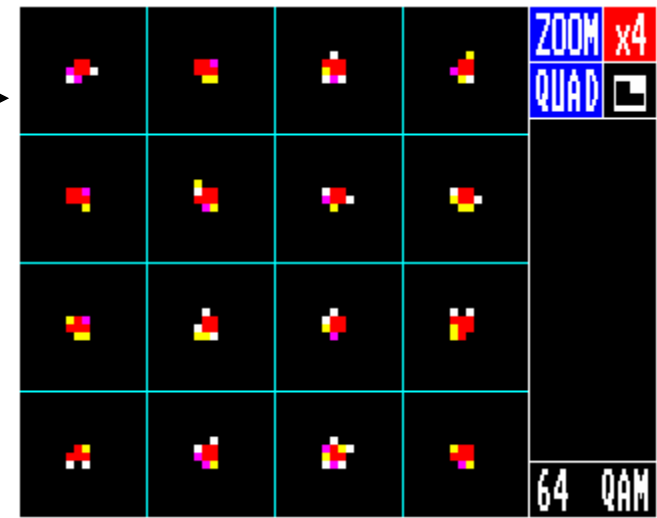
64 QAM constellation example



- to activate the zoom in the window in the upper right-hand corner:



- press
to return to measurement





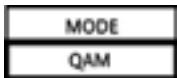






Constellation zoom example.

Using the UP-DOWN-ENTER keys you can select the zoom value and area to be analyzed.

DEMODULATED "QAM" DIGITAL TV MEASUREMENT: "SERVICES" (demodulator opt.)

How to reach this measurement:


DIRECT = from any "PLAN" and prestored QAM "PRG" you are already in QAM measurement (digital cable TV).


NAVIGATION = Press  and with  select , press the following keys:     and press  and press  to select a service.

Activate the function **INFO** to visualise the data of the chosen service.

SERVICE	SHOW	INFO		
Service sel.: RaiSportSat				
SERVICE NAME	AUD	V. PID	A. PID	ENC
SAT2000	2	518	656	NO
RAITEST 2	1	515	653	NO
FD auditorium	1	---	665	NO
Rai Doc-Futura	1	522	663	NO
RaiSportSat	1	512	650	NO
RaiNotizie24	1	516	654	NO
Rai Edu1	1	514	652	NO
RADIOUNO	1	---	670	NO
RADIOUE	1	---	671	NO
BLUSAT2000	1	---	677	NO
RADIOTRE	1	---	672	NO
Camera Deputati	1	517	655	NO

Example of the list of services container in the QAM Multiplex.

→  →

- press  to return to measurement

SERVICE	SHOW	INFO		
Service sel.: RaiSportSat				
		SERVICE INFO: TYPE... = VIDEO VID. PID. = 512 AUD. PID. = 650 ENCRYPTED = NO LANGUAGE = ita TELETEXT = NO ORB. POS. = 13.0 E		



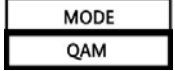



Example of the data relative to the chosen service

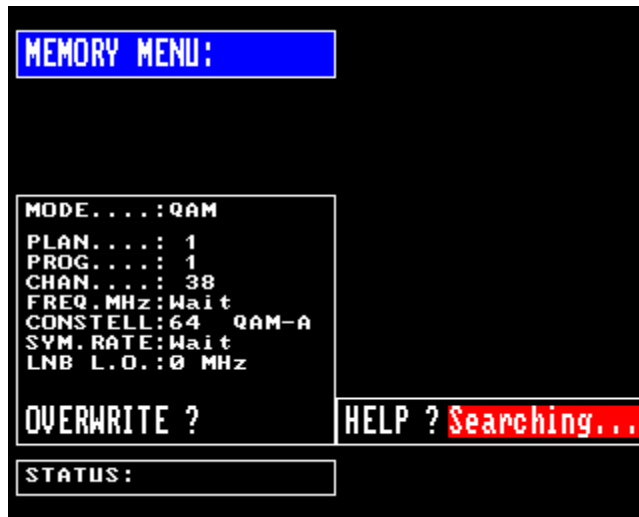
QAM PARAMETERS AUTOMATIC SEARCH HELP FUNCTION

With this function it is possible to automatically search for the Symbol Rate of a selected program in a memory Plan, in an RF QAM multiplex.

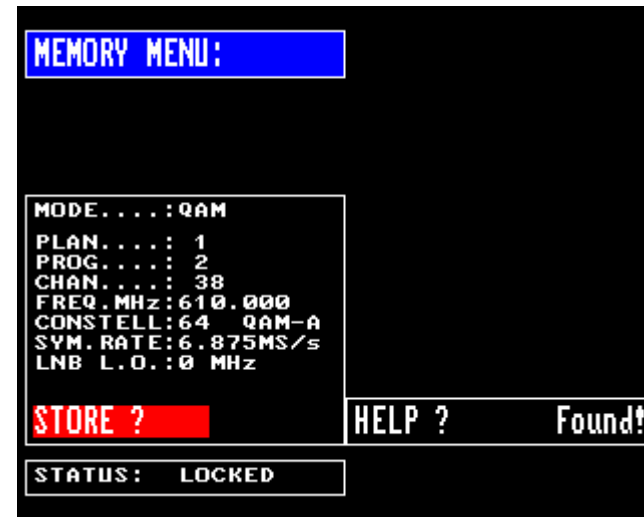
How to reach the HELP function:

DIRECT = From any "PLAN" and QAM "PRG" press  and you directly enter the memorization menu.

NAVIGATION = Press  with  select  press  set the plan and program and select the channel in which you wish to carry out the search using  select HELP ? and press  to activate the automatic search of the Symbol Rate and frequency.




Search example.



Once the search has finished, the cursor moves to STORE?, or OVERWRITE press ENTER for save.

N.B.

- *If the search is successful the word FOUND will appear, alternatively the words NOT FOUND will be shown. The meter will in any case allow the memorisation.*

Once the search has finished, select STORE or OVERWRITE and press  to terminate memorisation.




- **The STATUS bar shows whether the channel is LOCKED or UNLOCKED.**

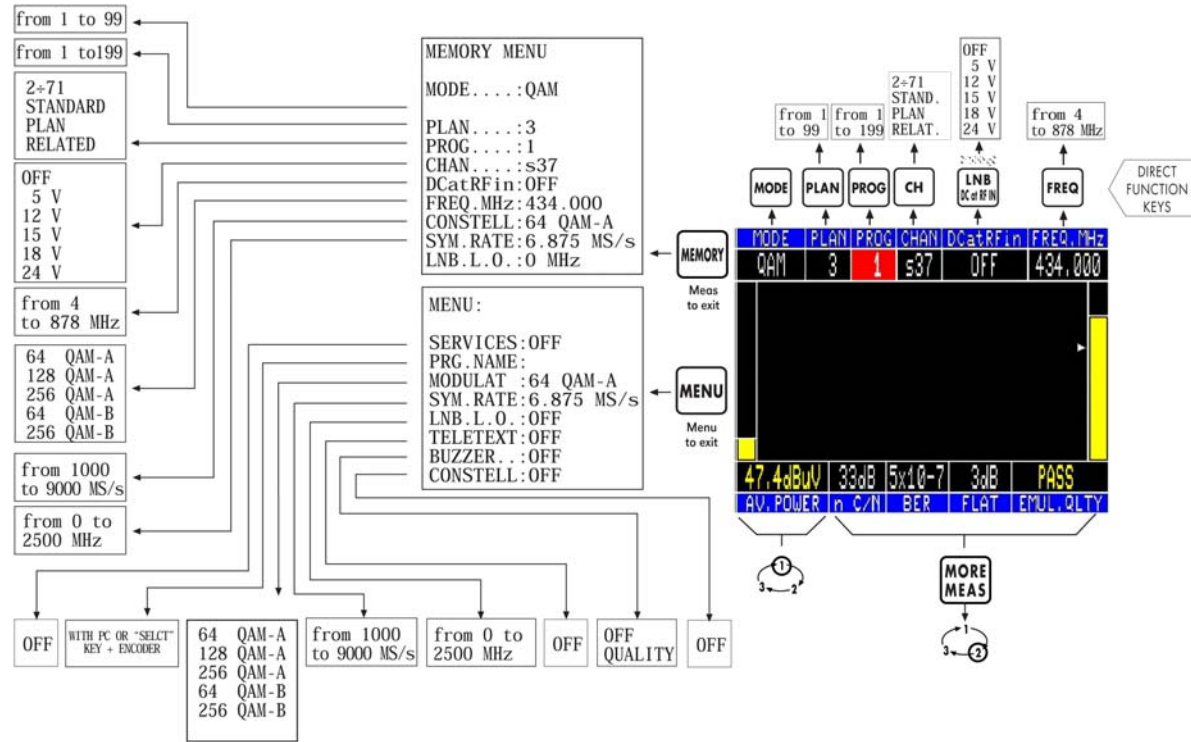
EMULATED "QAM" DIGITAL TV MEASUREMENT

The QAM measurement can be emulated or demodulated (opt.) by selecting this mode from the configuration menu (see "Configuration Menu" section on page 10).

How to reach the measurement:

DIRECT = from any previously stored "PLAN" and QAM "PRG" you are already in QAM measurement (digital cable TV).

NAVIGATION = Press **MODE** rotate the encoder  select **MODE QAM** and then navigate in the various parameters in the top of the screen, which can be reached directly using the appropriate keys, or rotate the encoder  and press it  to confirm the selection.



N.B. Emulated QAM measurements


- use C/N far (f) when there are adjacent channels
- always use C/N near (n) when there are adjacent channels
- in the case of selective conversion head-ends (H.E.) only use C/N near (n), C/N far (f) in some cases could measure a C/N which is too high (see configuration menu on page 12)

N.B. When you insert the QAM/8VSB demodulation board (optional), the emulated measurements are replaced by demodulated ones.



DEMODULATED "8VSB" DIGITAL TV MEASUREMENT (optional demodulator)

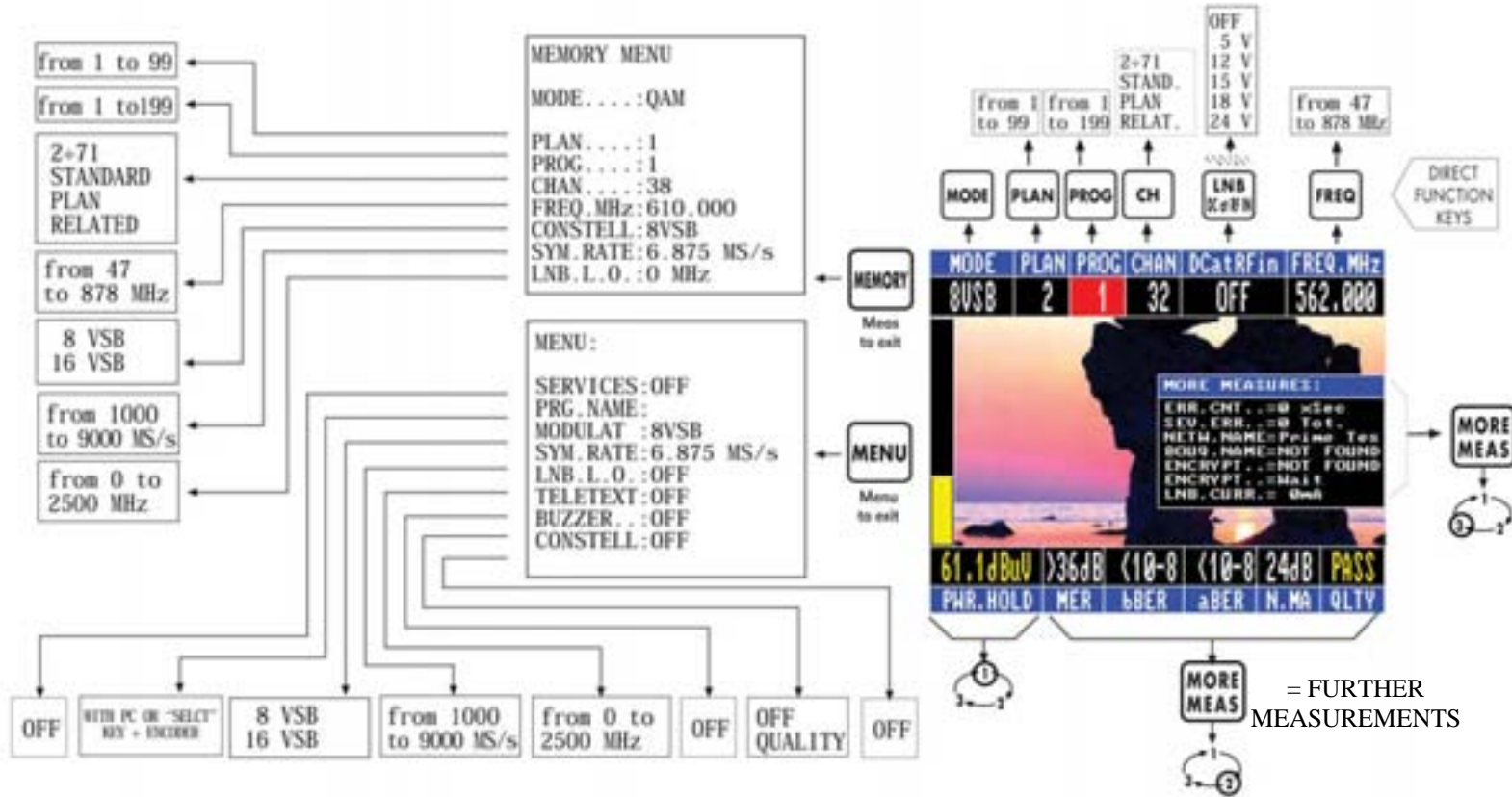
How to reach the measurement:

DIRECT = From any "PLAN" and pre-memorised 8VSB "PRG", go to 8 VSB measurement.

NAVIGATION = Press **MODE** by rotating the encoder  select

MODE
8VSB

 and then navigate in the parameters at the top of the screen, which can be directly reached using the appropriate keys, or rotate the encoder  then press  **ENTER** to confirm the selection.




N.B.

- When you insert the QAM/8VSB demodulation board (optional), the emulated measurements are replaced by demodulated ones.




DEMODULATED "8VSB" DIGITAL TV MEASUREMENT: "CONSTELLATION" (opt. demodulator)

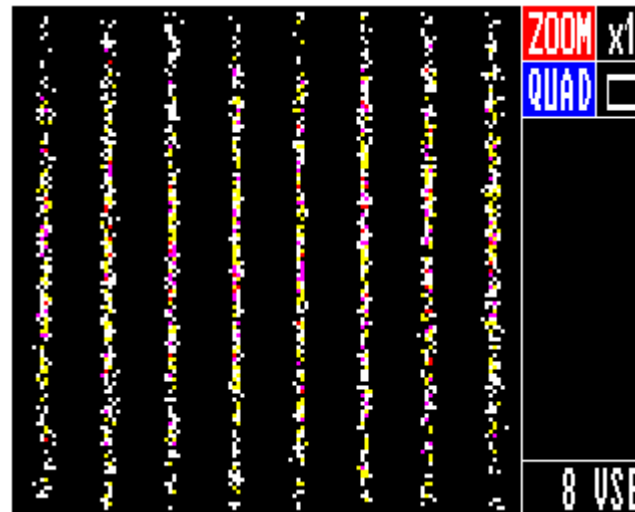
How to reach the measurement:

DIRECT = From any "PLAN" and prememorised 8VSB "PRG" you are already in the 8VSB measurement.

NAVIGATION = Press **MODE** rotate the encoder  select

MODE
8VSB

 then press **MORE MEAS** and **MENU** Using the encoder  select "Constell." press  and rotate the encoder  to activate the constellation.



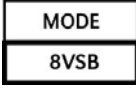










8 VSB Constellation visualisation

DEMODULATED "8VSB" DIGITAL TV MEASUREMENT: "SERVICES" (optional demodulator)

How to reach the measurement:

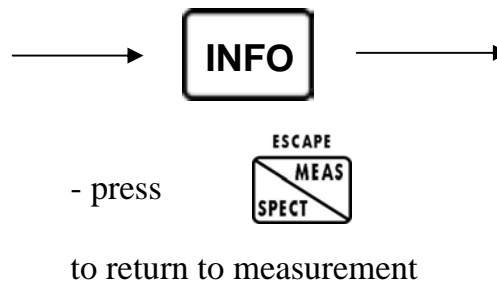
DIRECT = From any "PLAN" and prememorised 8VSB "PRG" you are already in the 8VSB measurement.

NAVIGATION = Press  and with  select , then press the following keys       and press   to select a service.

Activate the **INFO** function to visualise the data of the chosen service.

SERVICE	SHOW	INFO			
Service sel.: RaiSportSat					
SERVICE NAME	AUD	V. PID	A. PID	ENC	
SAT2000	2	518	656	NO	
RAITEST 2	1	515	653	NO	
FD auditorium	1	---	665	NO	
Rai Doc-Futura	1	522	663	NO	
RaiSportSat	1	512	650	NO	
RaiNotizie24	1	516	654	NO	
Rai Edu1	1	514	652	NO	
RADIOUNO	1	---	670	NO	
RADIOUE	1	---	671	NO	
BLUSAT2000	1	---	677	NO	
RADIOTRE	1	---	672	NO	
Camera Deputati	1	517	655	NO	

Example of the list of services container in the 8VSB Multiplex




SERVICE	SHOW	INFO			
Service sel.: RaiSportSat					
					
					SERVICE INFO:
TYPE... = VIDEO					
VID. PID. = 512					
AUD. PID. = 650					
ENCRYPTED = NO					
LANGUAGE = ita					
TELETEXT = NO					
ORB. POS. = 13.0 E					



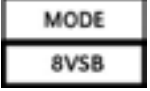



Example of data in the chosen service.

HELP FUNCTION & AUTOMATIC SEARCH FOR 8VSB PARAMETERS (optional demodulator)

With this function it is possible to automatically search the Symbol Rate of a selected program in a memory Plan in an RF QAM multiplex.

How to reach the HELP function:

DIRECT = from any "PLAN" and "PRG" 8VSB by pressing  and you directly enter the memorisation menu.

NAVIGATION = Press  with  select  press  and set the plan and program. Select the channel on which you wish to carry out the search using the encoder  select HELP ? and press  to start the automatic search of the Symbol Rate and frequency..




8VSB search example



N.B.

- If the search is successful the word **FOUND** will appear, alternatively the words **NOT FOUND** will be shown. The meter will in any case allow the memorisation.

Once the search has finished, select **STORE** or **OVERWRITE** and press  to terminate memorisation.

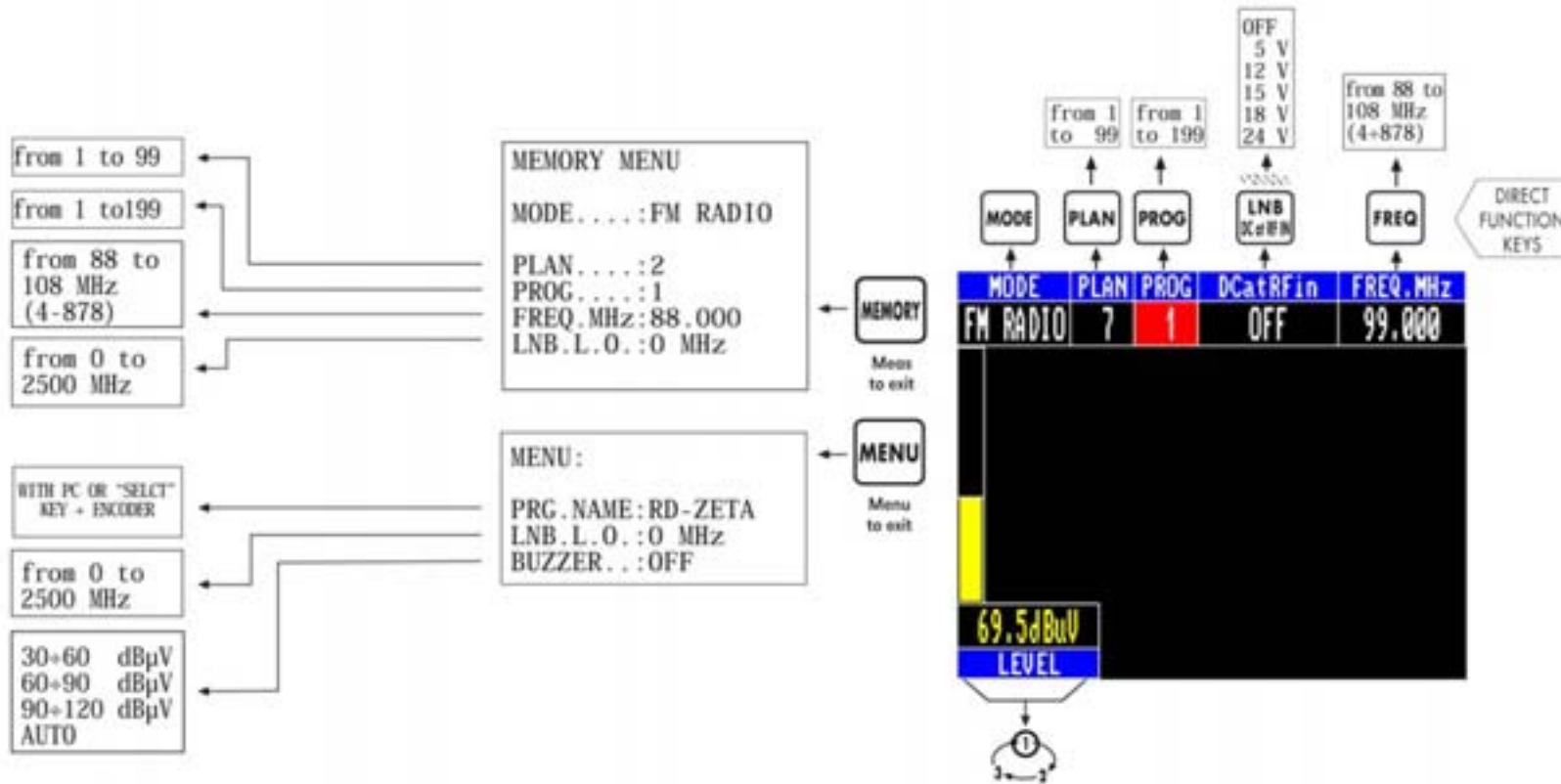
- The **STATUS** bar shows whether the channel is **LOCKED** or **UNLOCKED**.

FM RADIO MEASUREMENT

How to reach the measurement:

DIRECT = From any previously stored "PLAN" and FM RADIO "PRG" you are already in FM RADIO mode.


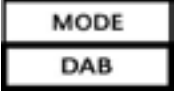


NAVIGATION = Press **MODE** and rotate the encoder then select **MODE FM RADIO** and navigate in the parameters in the top of the screen, which can be reached using the appropriate keys, or rotate the encoder press **ENTER** to confirm the selection.

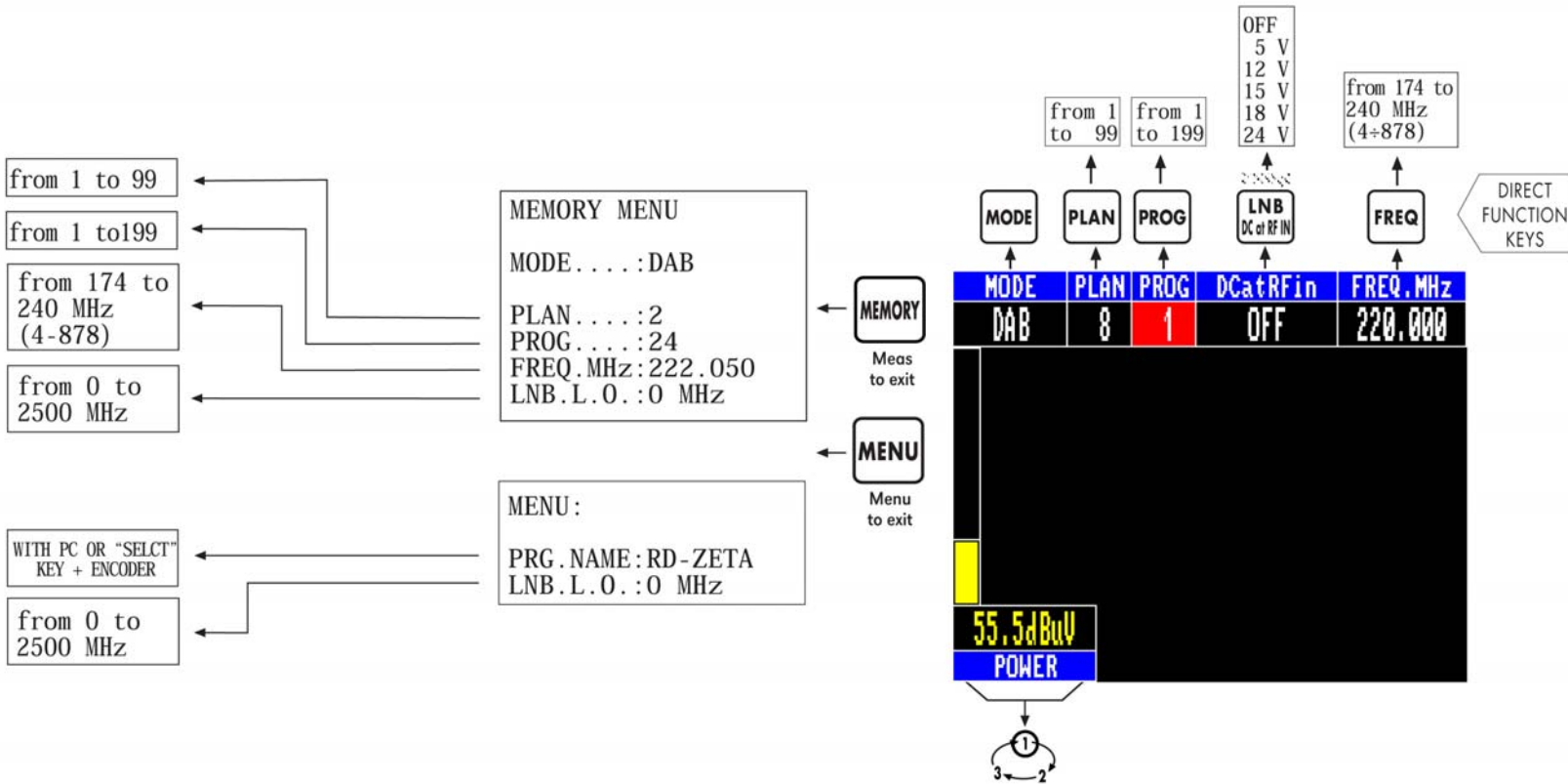


DAB (Digital Audio Broadcast) MEASUREMENT

How to reach this measurement:

DIRECT = from any "PLAN" and stored DAB "PRG" you are already in DAB measurement.


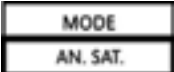
NAVIGATION = Press **MODE** rotate the encoder  select  and then navigate in the various parameters at the top of the screen, which can be reached using the appropriate keys, or rotate the encoder  then press  to confirm the selection.





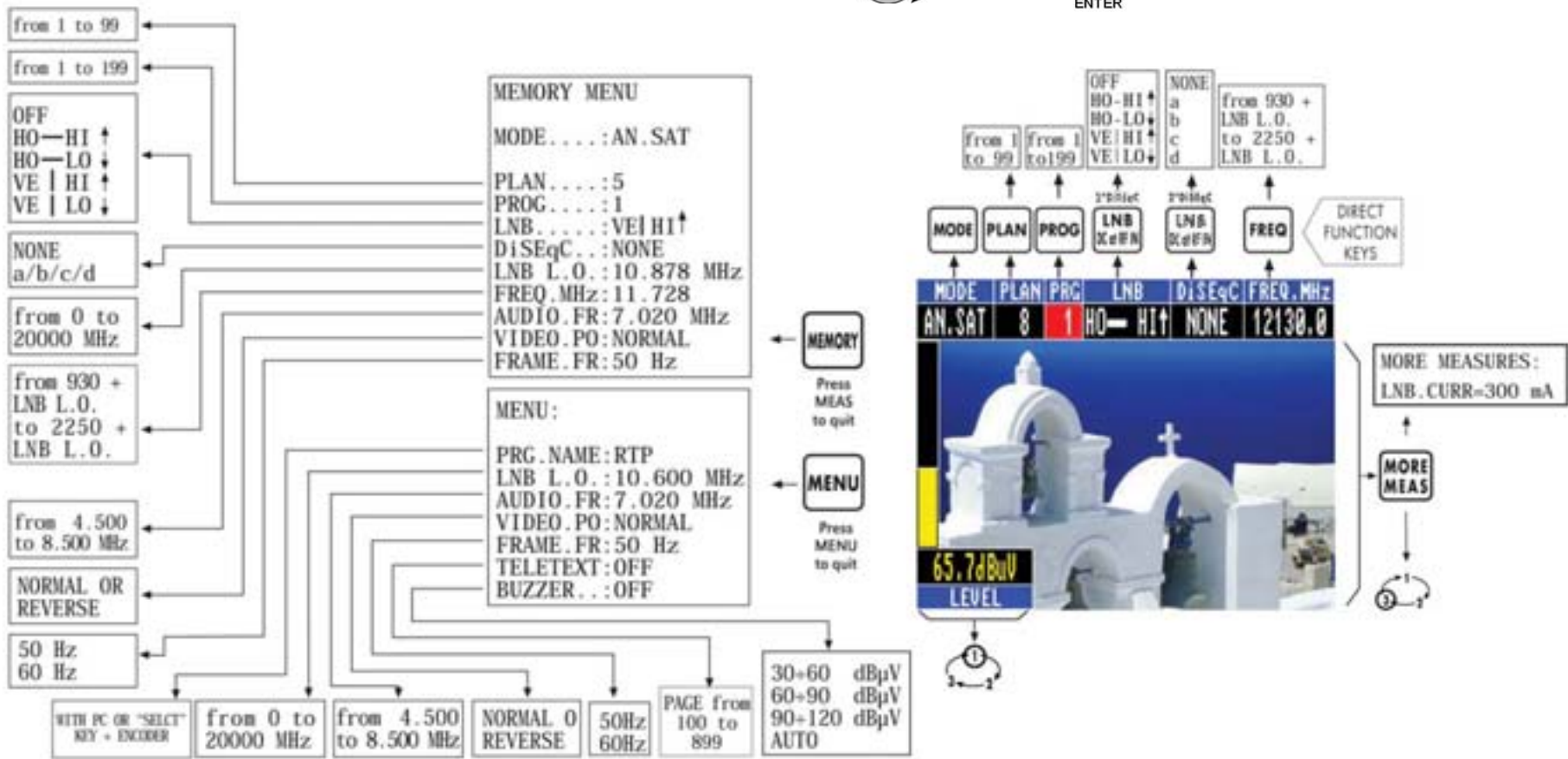
ANALOG SAT MEASUREMENT

How to reach the measurement:

DIRECT = From any previously stored "PLAN" and AN.SAT "PRG" you are already in AN. SAT mode (Analog Satellite).

NAVIGATION = Press **MODE** rotate the encoder  select  and then navigate in the various parameters at the top of the screen,


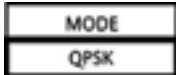
which can be reached using the appropriate keys, or rotate the encoder  then press  to confirm the selection.





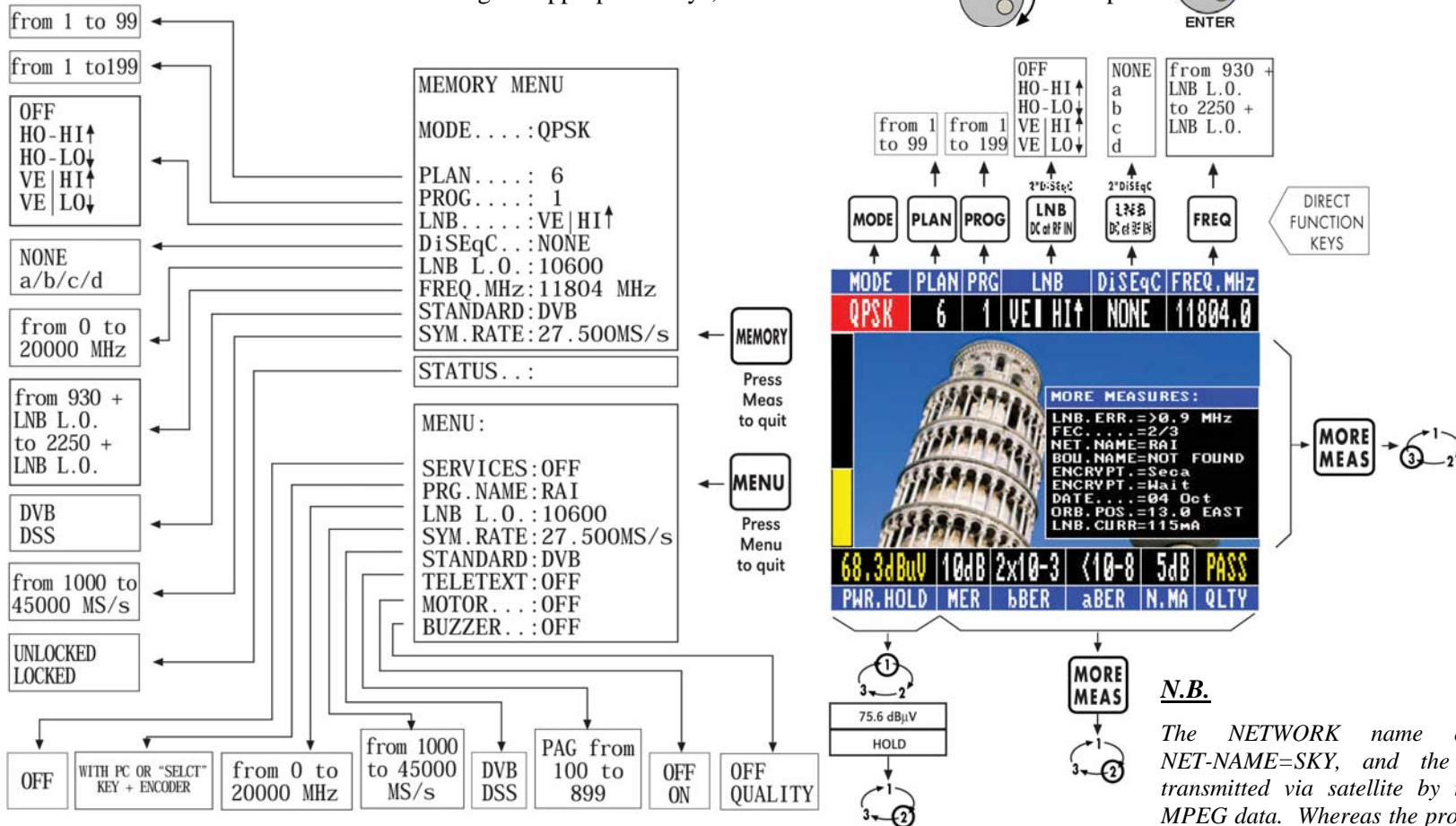
DEMODULATED DIGITAL SAT "QPSK" MEASUREMENT

How to reach the measurement:

DIRECT = From any previously stored "PLAN" and QPSK "PRG" you are already in QPSK mode (Digital Satellite).

NAVIGATION = Press **MODE** rotate the encoder  select  and then navigate in the various parameters at the top of the screen,

which can be reached using the appropriate keys, or rotate the encoder  then press  to confirm the selection.



N.B.

The NETWORK name on the right window, e.g. NET-NAME=SKY, and the NET.ID. table is information transmitted via satellite by the operator, extracted from the MPEG data. Whereas the program name in the MENU window, e.g. PROG.NAME: SKY, is the one you, or your vendor prestored.

DEMODULATED DIGITAL SAT "QPSK": "SERVICES"



How to reach the measurement:

DIRECT = From any previously stored "PLAN" and QPSK "PRG", you are already in QPSK (Digital Satellite).

NAVIGATION = Press **MODE** with  select

MODE
QPSK

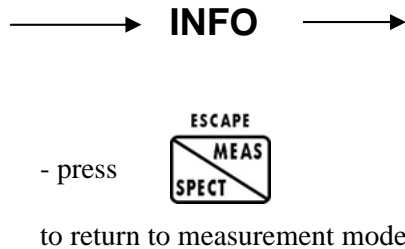
 then press the following keys    

To obtain a list of the services contained in the digital transponder. Use the encoder  and press  to select a service.

Activate **INFO** to show the data of the chosen service.

SERVICE	SHOW	INFO		
Service sel.: RaiSportSat				
SERVICE NAME	AUD	U. PID	A. PID	ENC
SAT2000	2	518	656	NO
RAITEST 2	1	515	653	NO
FD auditorium	1	---	665	NO
Rai Doc-Futura	1	522	663	NO
RaiSportSat	1	512	650	NO
RaiNotizie24	1	516	654	NO
Rai Edu1	1	514	652	NO
RADIOUNO	1	---	670	NO
RADIOUE	1	---	671	NO
BLUSAT2000	1	---	677	NO
RADIOTRE	1	---	672	NO
Camera Deputati	1	517	655	NO

Example of the services list contained in the transponder SATELLITE.




SERVICE	SHOW	INFO		
Service sel.: RaiNotizie24				
				
SERVICE INFO:				
TYPE. . . . = VIDEO				
UID. PID. . = 516				
AUD. PID. . = 654				
ENCRYPTED = NO				
LANGUAGE. = ita				
TELETEXT. = NO				
ORB. POS. . = 13.0 E				

Example of the relative data of the chosen service



QPSK PARAMETERS AUTOMATIC SEARCH HELP FUNCTION

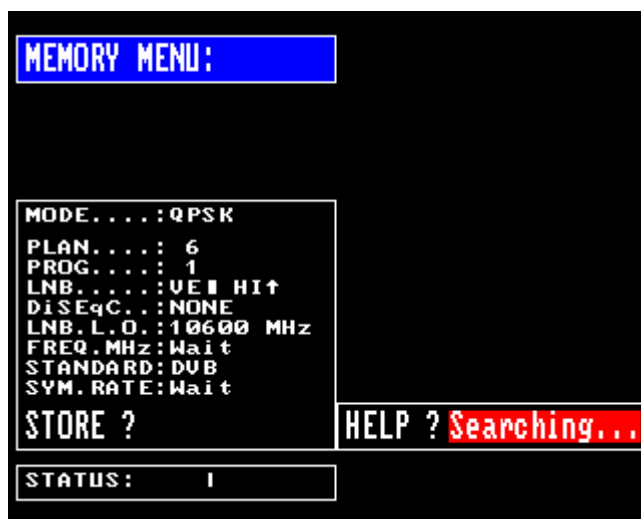
With this function it is possible to automatically search for the symbol rate, with the signal connected and after having selected the plan and program number, and then store the channel.

How to reach the **HELP** function:

DIRECT = From any "PLAN" and QPSK "PRG" QPSK press  to enter directly into the memorisation menu.

NAVIGATION = Press  with  select  press  set the plan and program and select the frequency and Polariz. (LNB)


On which you wish to carry out the search  select HELP ? and press  to activate the Symbol Rate automatic search.



Search example.





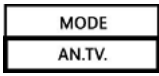

N.B.

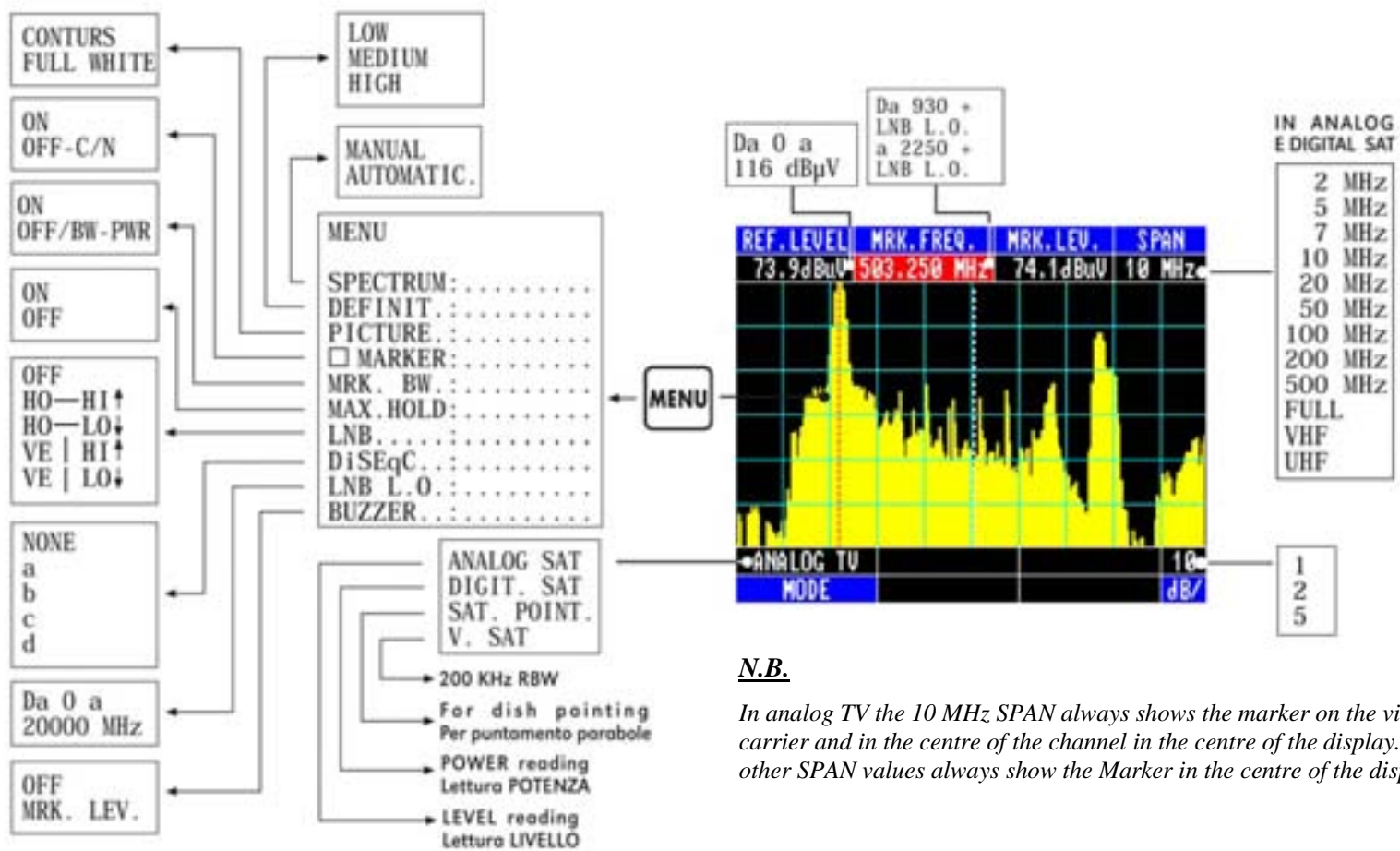
- If the search finds the data it will indicate FOUND. If the search is unsuccessful the words NOT FOUND will be shown. The instrument will, in any case prompt you to store. Once the search has finished, select STORE or OVERWRITE and press  to terminate the store procedure.
- The status bar shows if a channel is LOCKED or UNLOCKED.

ANALOG TV SPECTRUM

How to reach spectrum function:

DIRECT = For any previously stored "PLAN" and AN. TV "PRG" press  and you go directly to analog TV spectrum mode.

NAVIGATION = Press  with  select  and then press  to go to analog TV spectrum.





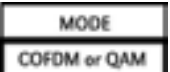

N.B.

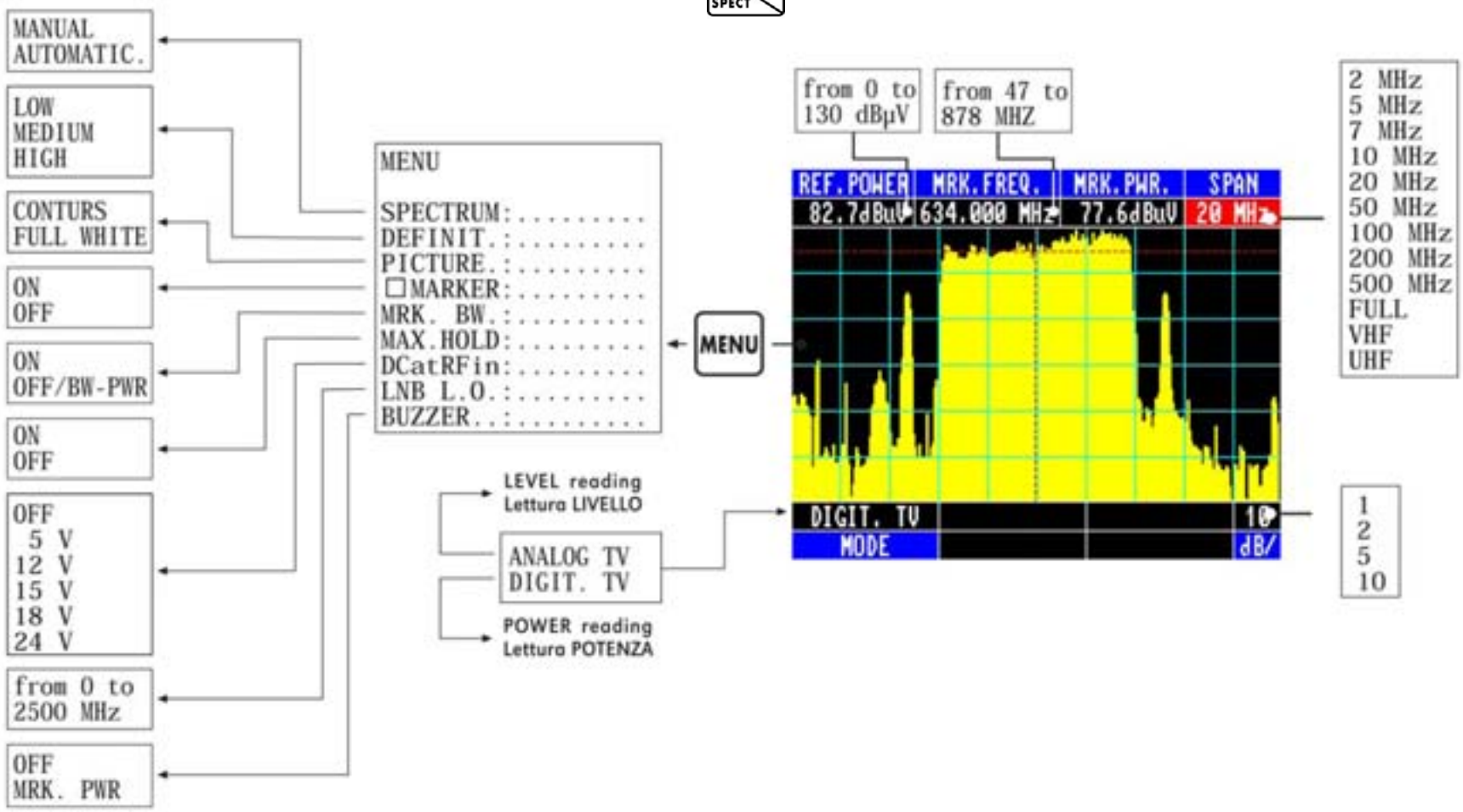
In analog TV the 10 MHz SPAN always shows the marker on the video carrier and in the centre of the channel in the centre of the display. The other SPAN values always show the Marker in the centre of the display.

“COFDM-QAM-8VSB” SPECTRUM (Digital TV)

How to reach spectrum mode:


DIRECT = From any previously store "PLAN" and COFDM/QAM PRG, press  and you go directly to digital TV spectrum mode.



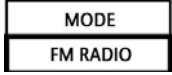

NAVIGATION = Press  with  select  then press  and go to digital TV spectrum.

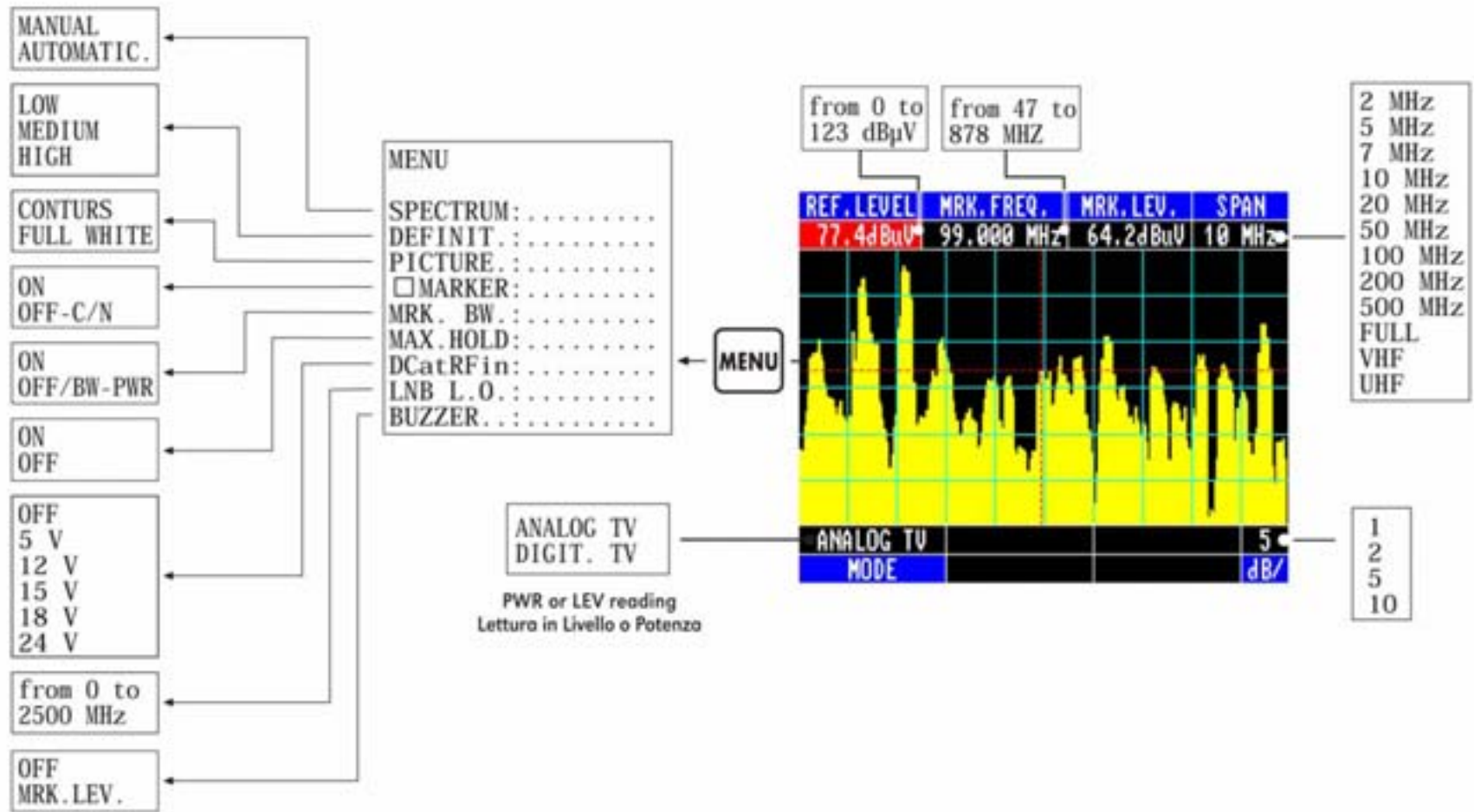


FM RADIO SPECTRUM

How to reach spectrum mode:


DIRECT = from any previously stored "PLAN" and FM RADIO "PRG" press  and you go directly to Radio Spectrum (analog TV).





NAVIGATION = Press  with  select  and then press  and go to radio spectrum (analog TV).

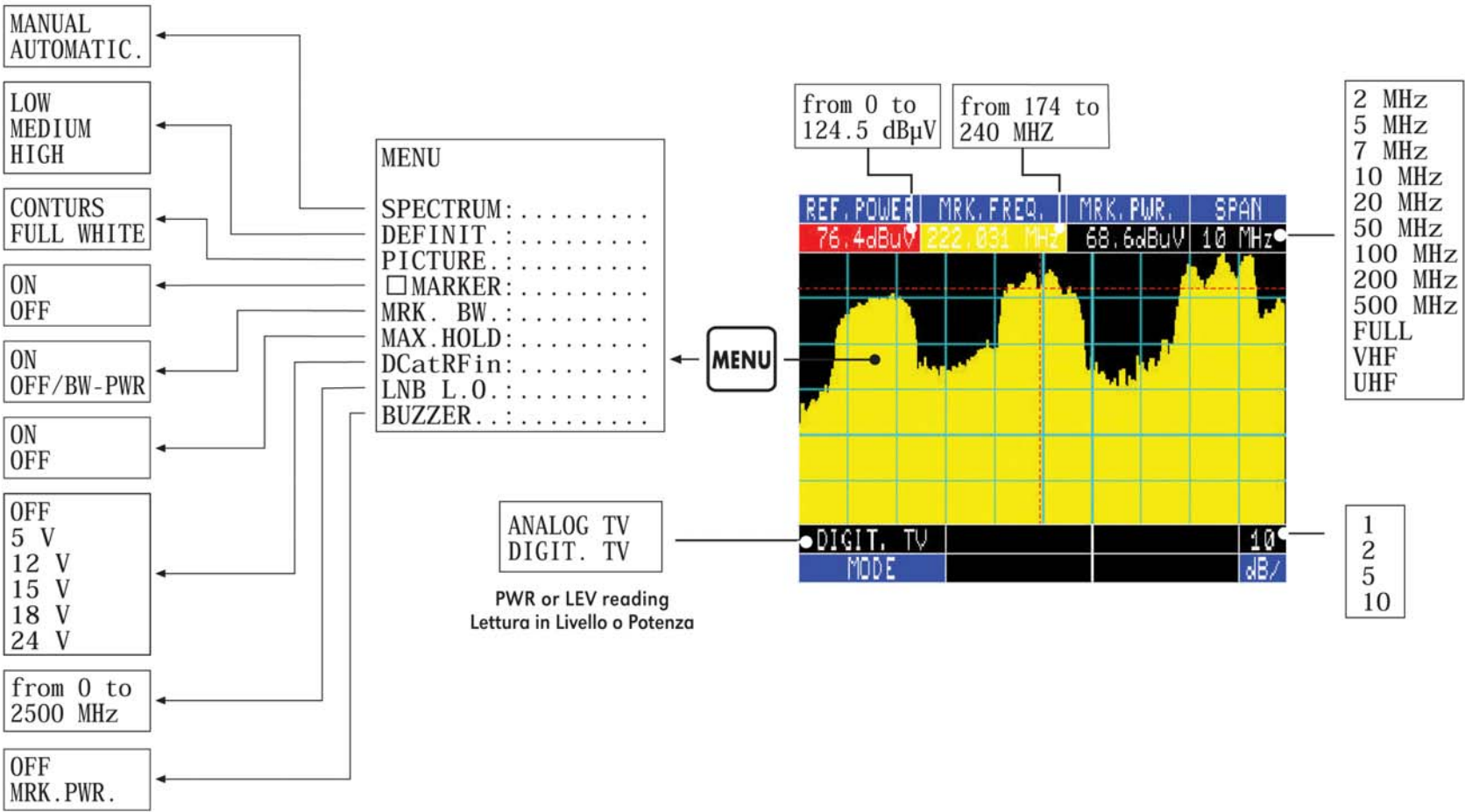


DAB SPECTRUM (Digital Audio Broadcast)

How to reach the spectrum function:

DIRECT = from any "PLAN" and prestored DAB "PRG", press  and you go directly to DAB spectrum.



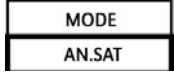

NAVIGATION = Press  with  select  and then press  to go to DAB spectrum.

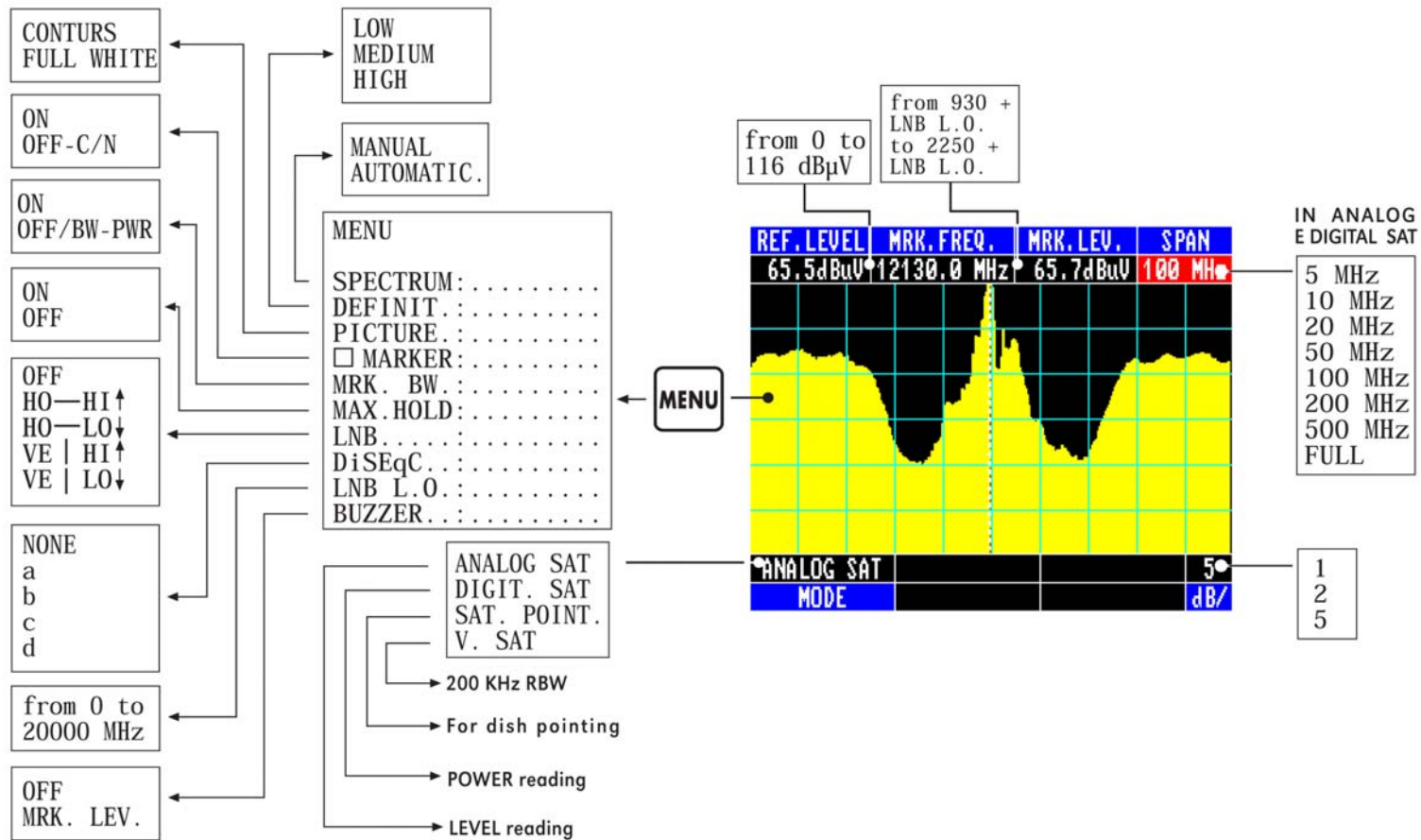


ANALOG SAT SPECTRUM

How to reach spectrum mode:

DIRECT = from any previously stored "PLAN" and AN. SAT "PRG" press  and go directly to analog SAT spectrum mode.



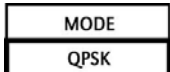

NAVIGATION = Press  with  select  and then press  to go to analog SAT spectrum.

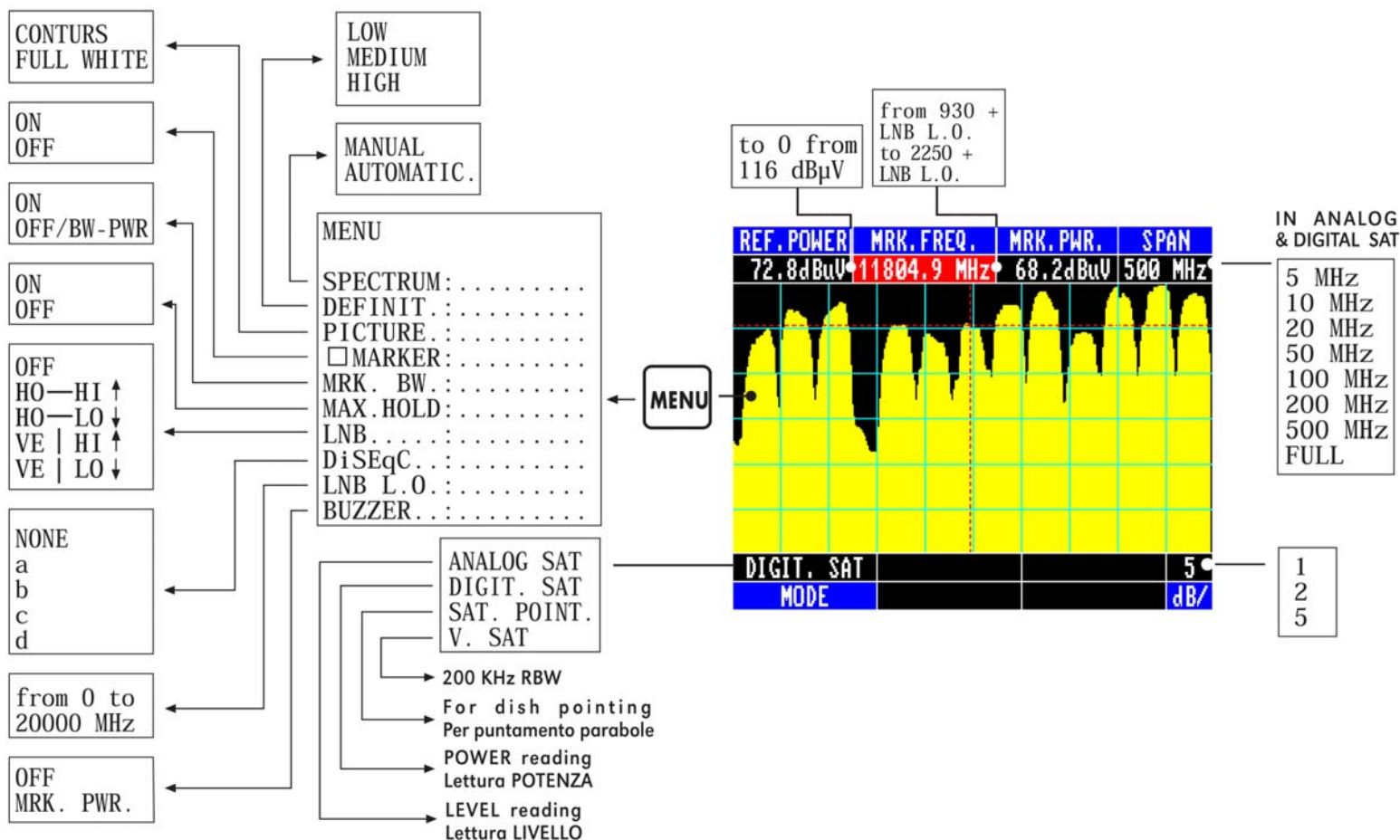


“QPSK” SPECTRUM (Digital SAT)

How to reach spectrum function:



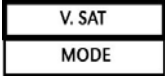
DIRECT = From any previously stored "PLAN" and QPSK "PRG" press  and you go directly to digital SAT spectrum.

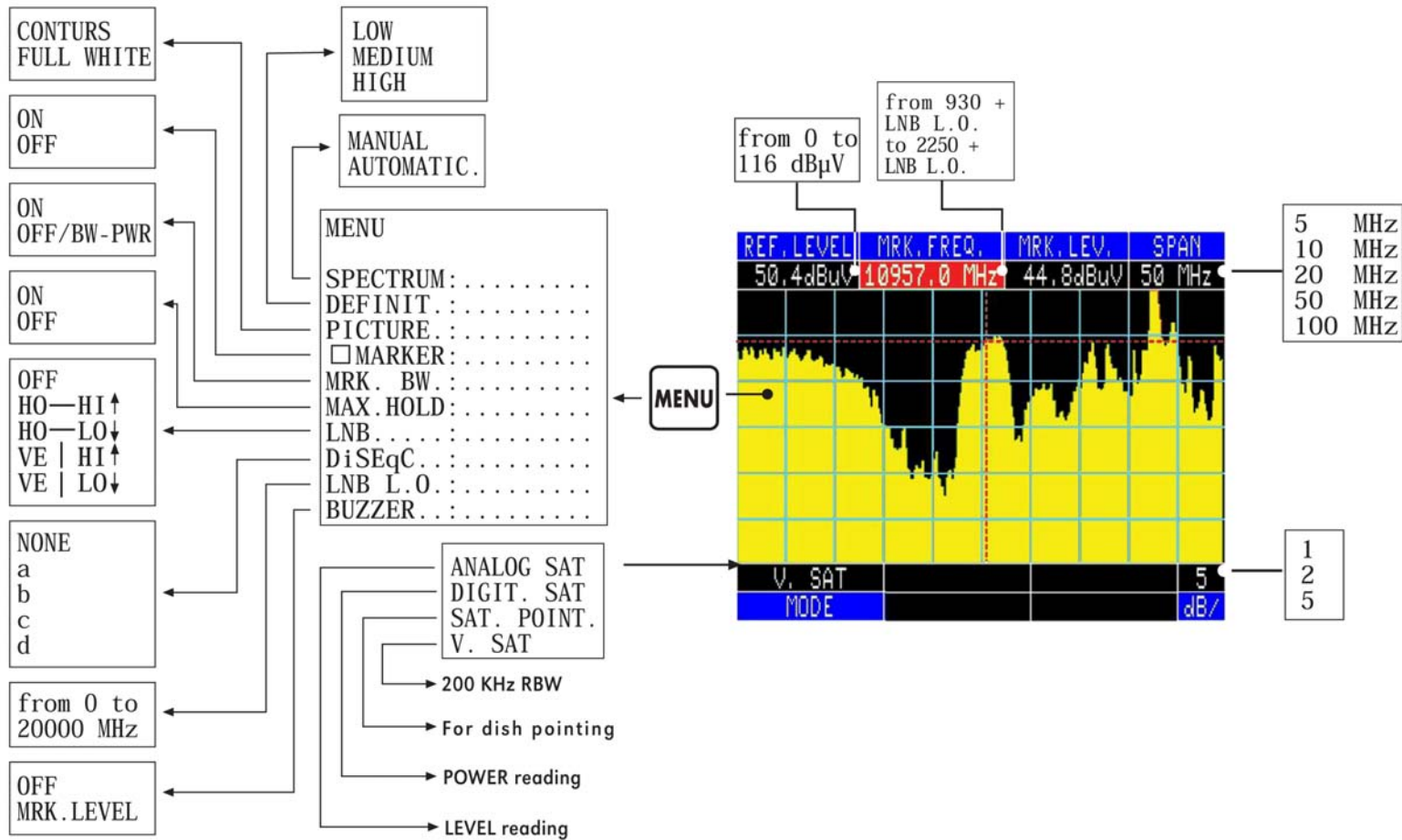
NAVIGATION = Press  with  select  then press  to go to digital SAT spectrums.



V.SAT SPECTRUM MODE



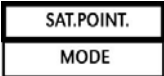
How to reach Spectrum mode from a SAT programme:

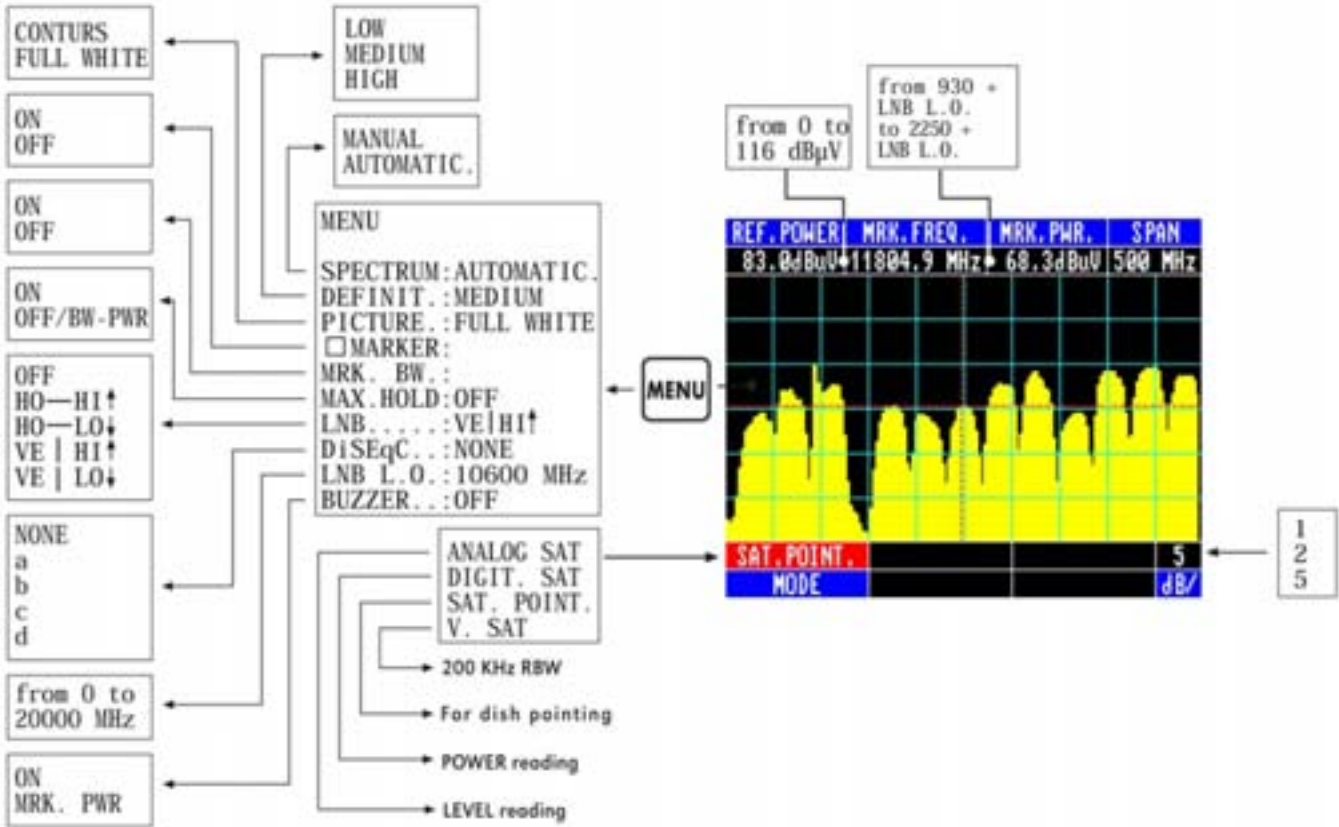
NAVIGATION = Press  with  select  to go to the V. SAT Spectrum function.



SAT POINT SPECTRUM MODE (See descriptions on pages 10-11)

How to reach spectrum mode from a SAT:

NAVIGATION = Press  with  select  and go to the SAT POINT spectrum function.



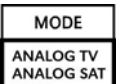


Δ MRK SPECTRUM MODE


(Level or frequency “Δ” (difference) ratio measurement, with manual frequency selection)

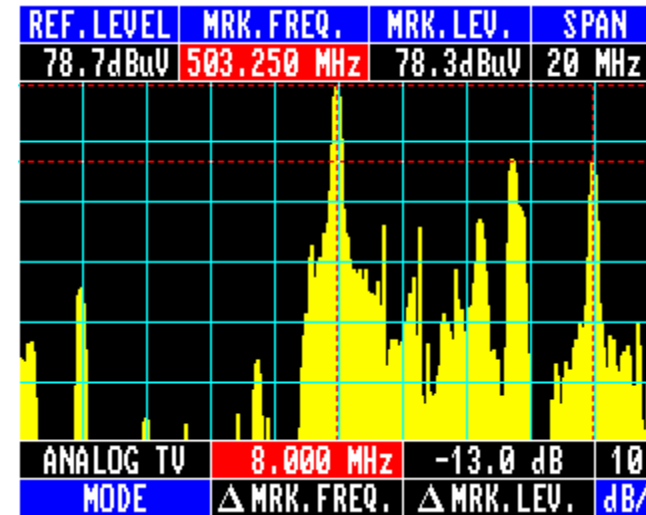
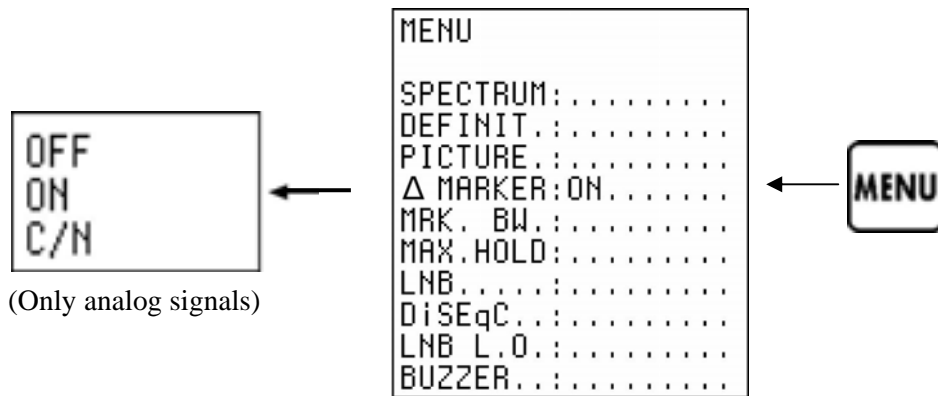
How to reach ΔMRK spectrum mode:

DIRECT = from any previously stored “PLAN” and SAT or TV “PRG” press  and you will go directly to spectrum. Press  then  To activate ΔMRK mode.



NAVIGATION = Press  with  select the required function:  Select the programme or channel or frequency.

Press  to go directly to spectrum mode. Press  with  to activate the ΔMRK function.

Press  again to remove the menu window.



EXAMPLE:
Measurement of the difference in level between two carriers.

- N.B.**
- To quit the ΔMRK function press  navigate with  until ΔMRK and press  to select OFF.
 - Press MENU again to remove the window.

Δ MRK-C/N SPECTRUM MODE

(Signal/noise ratio measurement of analog signals with manual selection of noise frequencies)

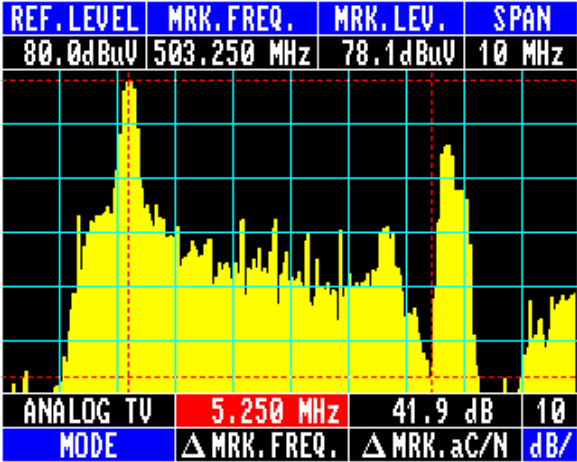
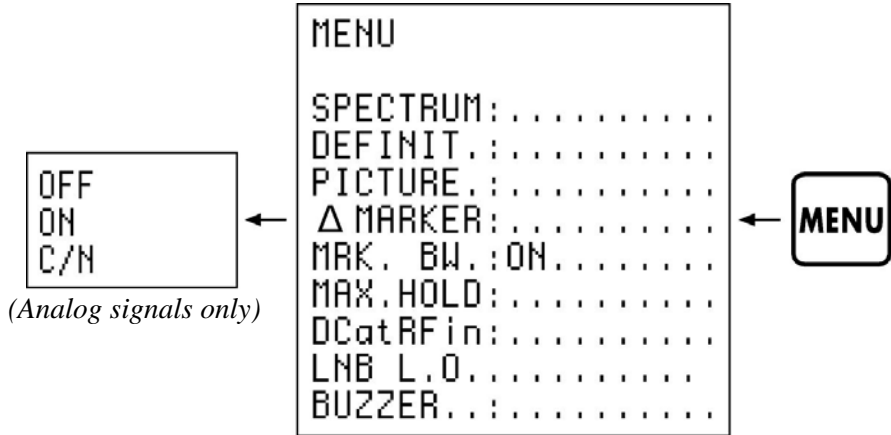
How to reach ΔMRK-C/N spectrum mode:

DIRECT = From any previously “PLAN” & SAT or TV “PRG” mode, press to go directly to spectrum. Press with to activate ΔMRK-C/N

NAVIGATION = Press with select the mode required: Select the programme or the channel or the frequency required.

Press to go directly to Spectrum mode. Press with to activate the Δ MRK-C/N function.

Press to remove the menu window.



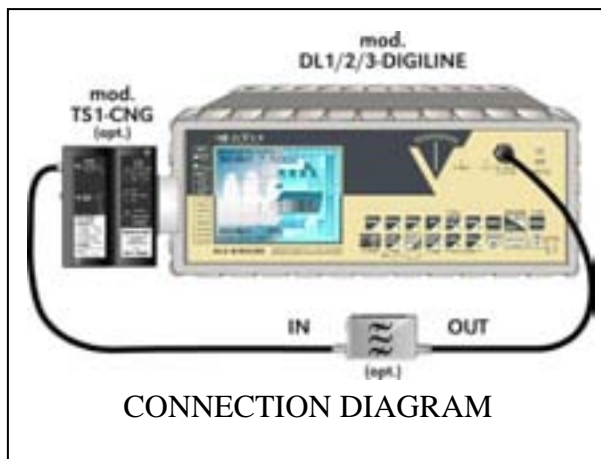
EXAMPLE:
C/N measurement in analog TV, the MRK has been positioned manually between the chroma and audio carriers. The C/N measurement takes into consideration the measurement filter band.

- N.B.**
- To quit the ΔMRK-C/N function. Press navigate with until you reach ΔMRK, press and select OFF
 - Press again to remove the window.

MRK BW SPECTRUM MODE

(Triple marker for the calibration of filters, amplifiers, etc. in SAT and TV band)

- a) Measurement objective: Filter, amplifiers, etc. calibration in the SAT and TV band.
- b) Accessories and/or necessary devices (opt.) required:
 - TS1 CNG calibrated noise generator
 - Assortment of very short, high quality cable, preferably already equipped with semi-professional connectors.
- c) Connection diagram:



d) How to reach the measurement:

- **DIRECT** = From any previously stored “PLAN” and SAT or TV “PRG”, press to go directly to spectrum mode.
- **NAVIGATION** = Press with and select the mode required.
Press to go directly to spectrum.

c) Activate the MRK.BW function by pressing and following the procedure illustrated below.

OFF
ON
BW-PWR

MENU

SPECTRUM:

DEFINIT:

PICTURE:

Δ MARKER:

MRK. BW: ON.....

MAX. HOLD:

DCatRF in:

LNB L.O.

BUZZER:

MENU




*EXAMPLE:
25 UHF channel filter calibration with 8 MHz band.*



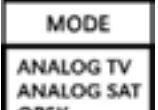
- N.B.:**
- We suggest you store the channels in **MODE – COFDM or QAM**, and choose spectrum – **SPAN 10 MHz** to visualise the MRK in the channel centre.
 - To quit MRK BW mode press , navigate using until you reach MRK BW and press to select OFF.
 - Press again to remove the window, or turn off.

SPECTRUM FUNCTION *MRK BW PWR*


(Triple marker to measure the power according to the bandwidth (S.R.) of TV and SAT digital bouquets)

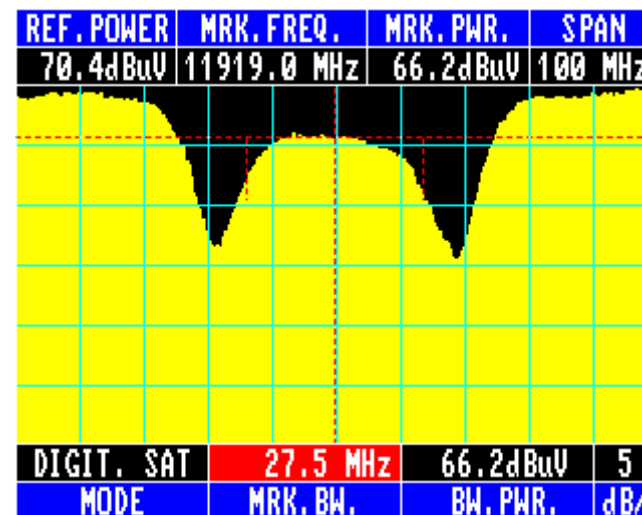
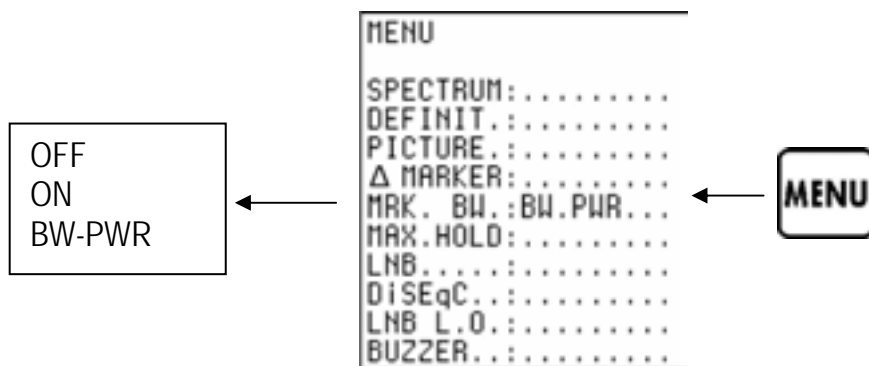
How to reach the Spectrum MRK BW PWR mode:

DIRECT = from any previously stored "PLAN" and SAT or TV "PRG" press  and you directly to Spectrum. Press  with  activate the MRKBW-PWR function.





NAVIGATION = Press  with  select the desired mode: . Select the program or channel or frequency required.

Press  to go directly to Spectrum. Press  with  to activate the MRK BW. PWR function.

Press  again to remove the menu window.



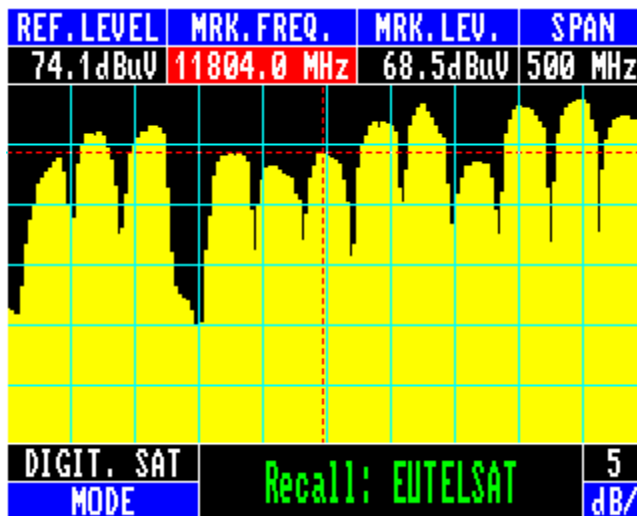
EXAMPLE:
PWR measurement of a transponder

- NOTES:**
- The same measurement is carried out automatically in MEASUREMENT mode.
 - To quit the MRK BW-PWR function press  navigate using  until you reach MRK BW and press  to select OFF.
 - Press again  to remove the window, or turn the instrument off and on again.

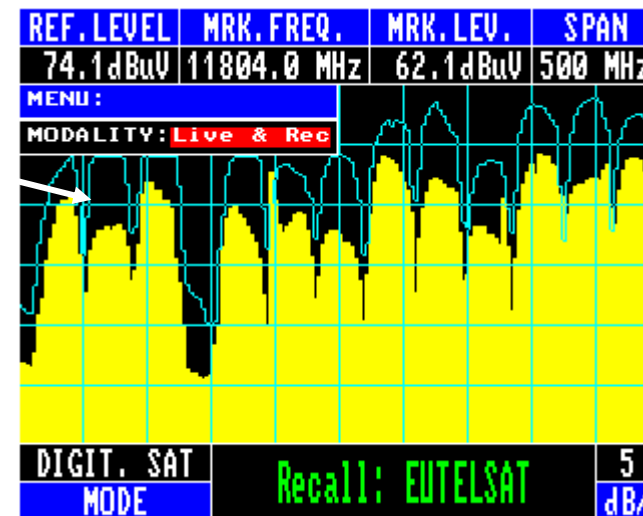
LIVE & RECALL SPECTRUM FUNCTION

This function allows you to simultaneously visualise the stored spectrum, using the SAVE operation, and the real time spectrum received at the RF input of the instrument (live spectrum vision).

LIVE: to activate this function, in spectrum mode, press the **RECALL** key, recall the spectrum vision previously saved, press **MENU**, select LIVE & RECALL mode then press **MENU** again to remove the Menu window.



Recall spectrum
contour



N.B.:

- The saved spectrum is shown as a contour line. The real time spectrum (live spectrum) is shown in full white mode.
- In LIVE & REC mode, if you adjust the Marker Frequency, the level or power measurements are carried out only on the live spectrum.
- To return to the Recall function, select RECALL mode in the menu window.

SCROLL MENU FUNCTION

The SCROLL MENU function allows the fast selection of tuning parameters by activating a scroll menu where all the possible parameters are listed.

In the AN. TV, COFDM, QAM modulations it is possible to change:

- in measurement mode the MODE, PLAN, PROG and CHAN,
- with the MEMORY function it is possible to adjust the channel.

In the QPSK, AN. SAT, DAB and FM modulations it is possible to change:

- in measurement mode the MODE, PLAN and PROG.

DIRECT: The SCROLL MENU function is activated by pressing the  key, corresponding to the parameter you wish to change.

Example of scroll menu selections:

SELECT MODE:	
-	AN.TV
-	QAM
-	COFDM
-	AN.SAT
-	QPSK
-	FM RADIO
-	DAB
-	8VSB

Modulation selection

SELECT PLAN:	
1	HILTON
2	DU LAC
3	DU PARC
4	VITTORIA
10	VIENNA
15	MILANO
25	ZURIGO
30	ITALIA
50	MOZART
70	VILLA 1
80	BERNA
99	BOLZANO

Memory plan selection

SELECT PROGRAM:	
1	RAI 1
2	RAI 2
3	RAI 3
4	RETE 4
5	CANALE 5
6	ITALIA 1
7	LA 7
8	C. 5 DTT
9	LA 9
10	TRI VEN.
11	S.ITALIA
12	C.ITALIA

Program selection

SELECT CHANNEL:	
CH.	FREQ. MHz
25	506.000
26	514.000
27	522.000
28	530.000
29	538.000
30	546.000
31	554.000
32	562.000
33	570.000
34	578.000
35	586.000
36	594.000

Channel selection

Scroll down the menu using the encoder  and confirm the selection by pressing it .

N.B.:

- The frequency all the other parameters in MEMORY function (PLAN, PROG) can be selected using the numerical keyboard.

SPECIAL TV BARS SCAN FUNCTION

The BARS SCAN function activates the graphics representation of the bar spectrum. Each bar shown represents the value of the level/average power of TV programmes (analogue or digital) stored in the chosen memory plan.

This spectrum representation is useful in the TV band to easily equalise a channelised head-end output. The analog terrestrial channels are represented by a thin bar whose height is proportional to the level of the video carrier, whereas the digital terrestrial channels are represented by a wider bar whose height is proportional to the average power of the digital package.

How to activate the TV BARS SCAN function:

DIRECT: Select a memory plan, previously stored, then press the key  for 2 seconds. Move from one bar to another using PROG. NAME.

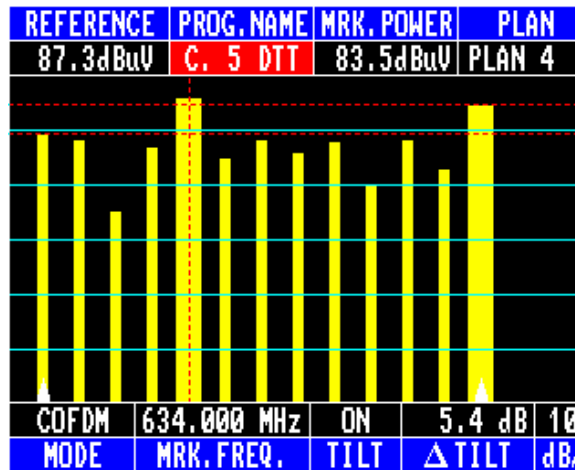









Figure 1

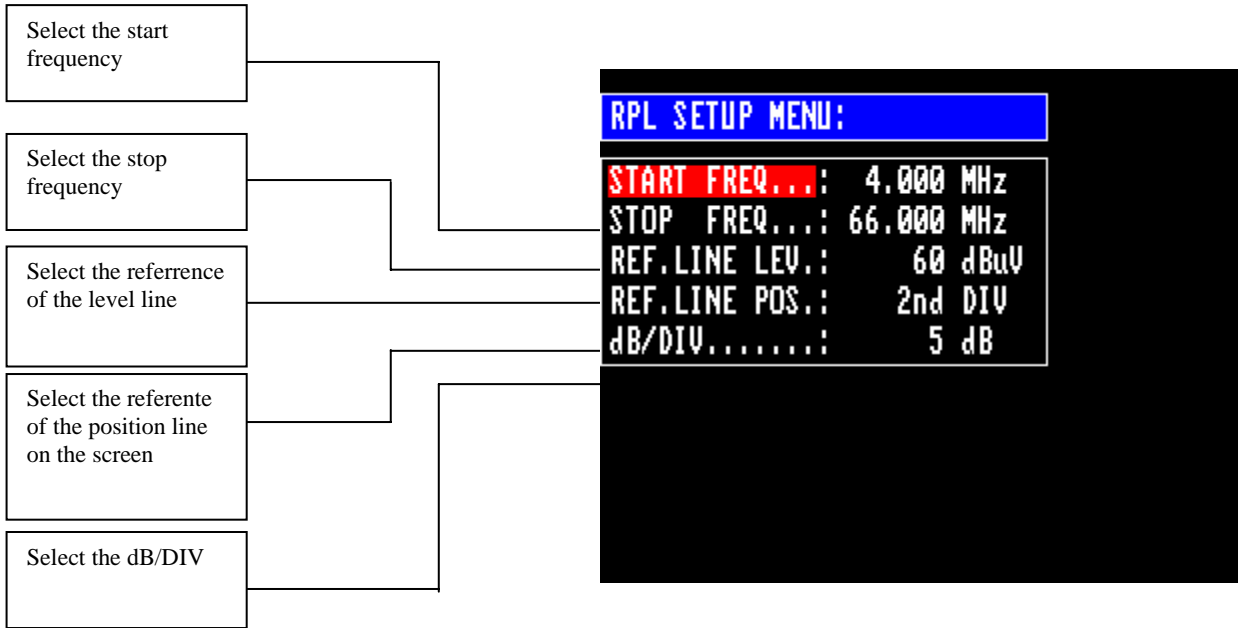
APPLICATION NOTES:


- In the BARS SCAN function it is possible to activate the TILT measurement, ie the difference in dB between the two carriers selected and shown by the marker. ▲
 To activate the function, bring the cursor  to the word TILT, press  and select ON with the encoder .
 Press the  key to adjust the position of the two pilot markers for the TILT measurement. Position the markers of the carriers you want to measure by changing the programme (PROG. NAME).
- It is also possible to visualise for each analog bar (TV) the bar level associated with an audio carrier.
 To activate this function, press the key  with  select AUDIO LEV. Press  and select ON.

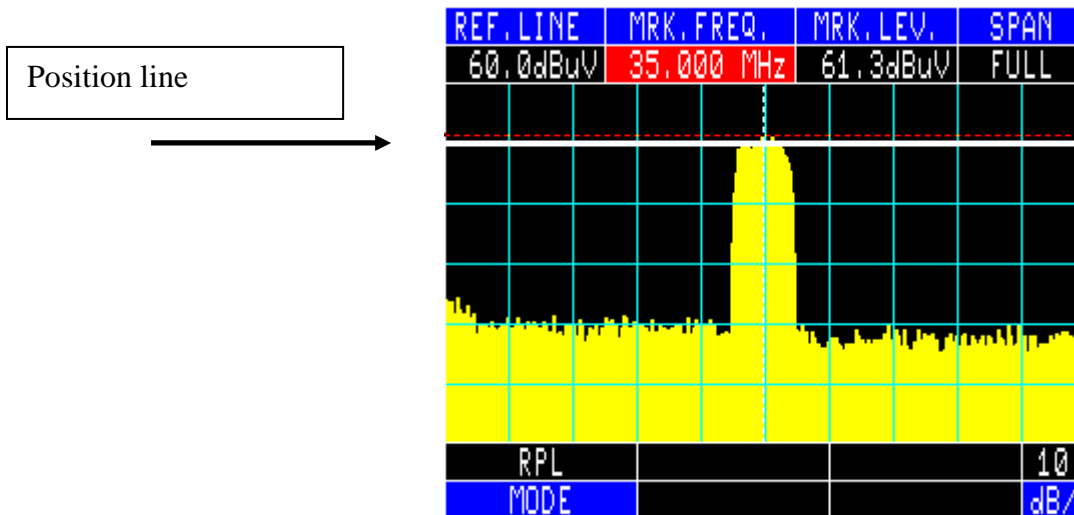
SPECIAL RPL SPECTRUM FUNCTION (return path)

The RPL function activates a special spectrum for the measurement of channels in the return path. Before carrying out this function, we suggest setting the parameters in the "RPL Setup" menu to obtain improved spectrum visualisation:

To set the "RPL Setup" parameters, press the  key for 2 seconds, select "RPL Setup?" and press 



DIRECT: To activate the RPL function, press the  key for 3 seconds.



SAT FINDER – Being prepared

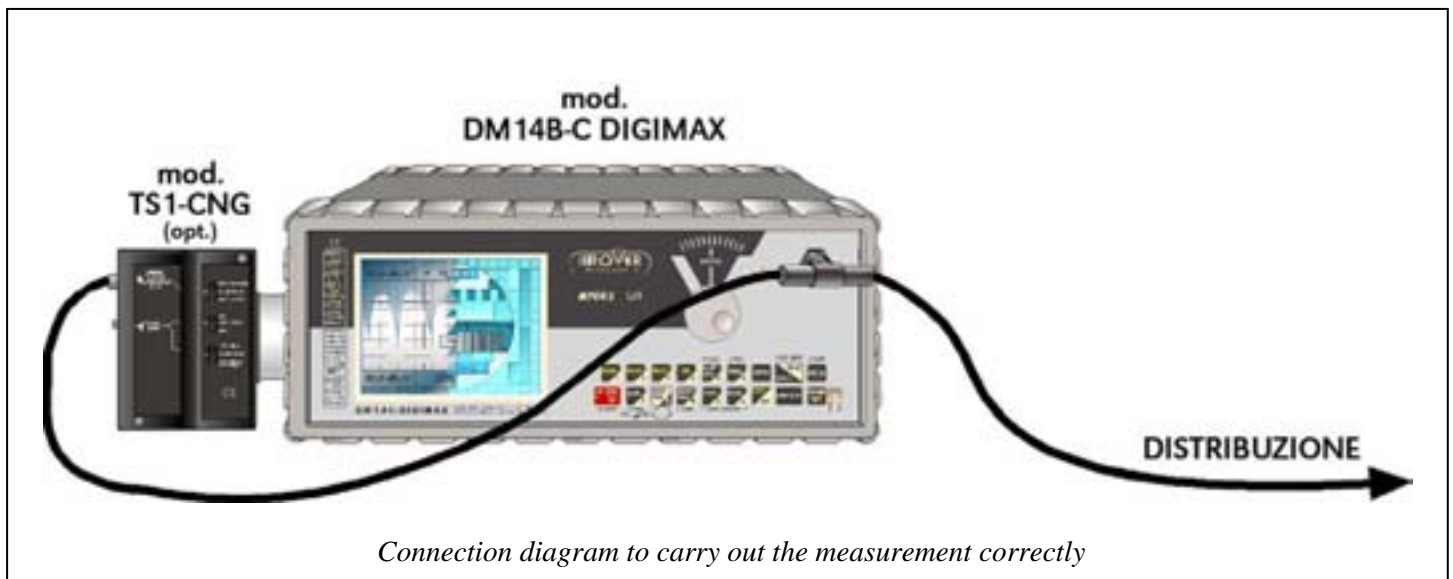
SPECIAL REFLECTOMETER BRIDGE FUNCTION (to measure a short-circuit or interruption in coaxial cables)

a) **Measurement objective:** to measure a short-circuit or open-circuit or a mismatch location distance in coaxial cables.

b) **Necessary accessories and devices (optional):**

- a. CNG 70DL calibrated noise generator
- b. Triple "F" adaptor



c) **Connection diagram:**



d) **How to reach this function:**

DIRECT = Press **SPECIAL** with  select REFLECTOMETER and press 

e) **Storing the settings:**

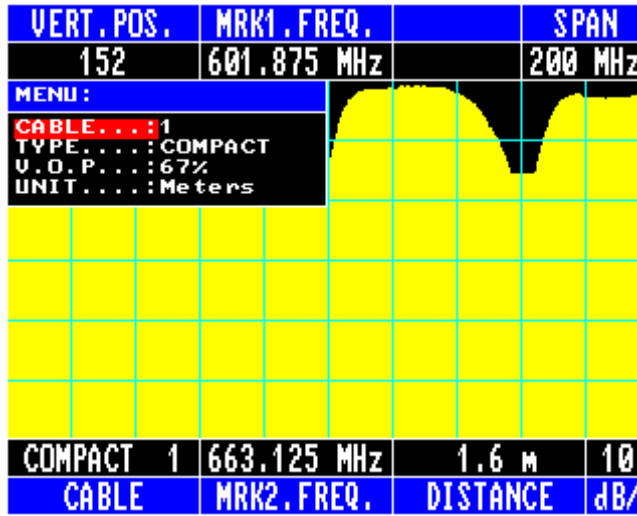
Press **MENU** with  and  to scroll the menu where it is possible to save 5 settings regarding 5 different cables. For each cable you can specify:

- The type of cable (compact, airspac and foam),
- The propagation speed VOP (from 0% to 100%)
- The measurement unit required (Meters or Feet).

The five settings, once inserted, are automatically saved; all you have to do is select the cable number to recall the cable settings.

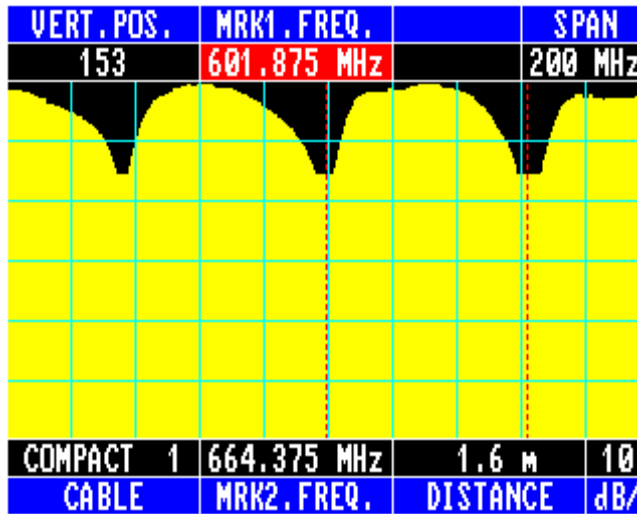
f) Measurement example:

- Recall from the menu window the previously saved cable number or insert it manually if the distribution under test uses a type of cable with parameters which are different from those saved.



*Menu setting:
Cable number, type, propagation speed and measurement unit.*

- Using the “UP”, “DOWN” and “ENTER” keys, position Marker 1 in a curve dip and Marker 2 in the curve dip nearest to Marker 1. Read the distance calculated by the meter in the “DISTANCE” window (see example below).



Reflectometer measurement example

NOTES:

1. PROPAGATION SPEED MEASUREMENT:

If the propagation speed percentage is not known (because it is not specified by the manufacturer), you can calculate it using the reflectometer function.





With reference to the connection diagram on page 40, connect the “T” adapter at the output to 5 meters of coaxial cable whose propagation speed is unknown, without closure resistance. Then recall the menu and vary the propagation speed percentage until 5.0 m appears in the “DISTANCE” window. The resulting propagation speed value obtained is the one related to the cable you are using.

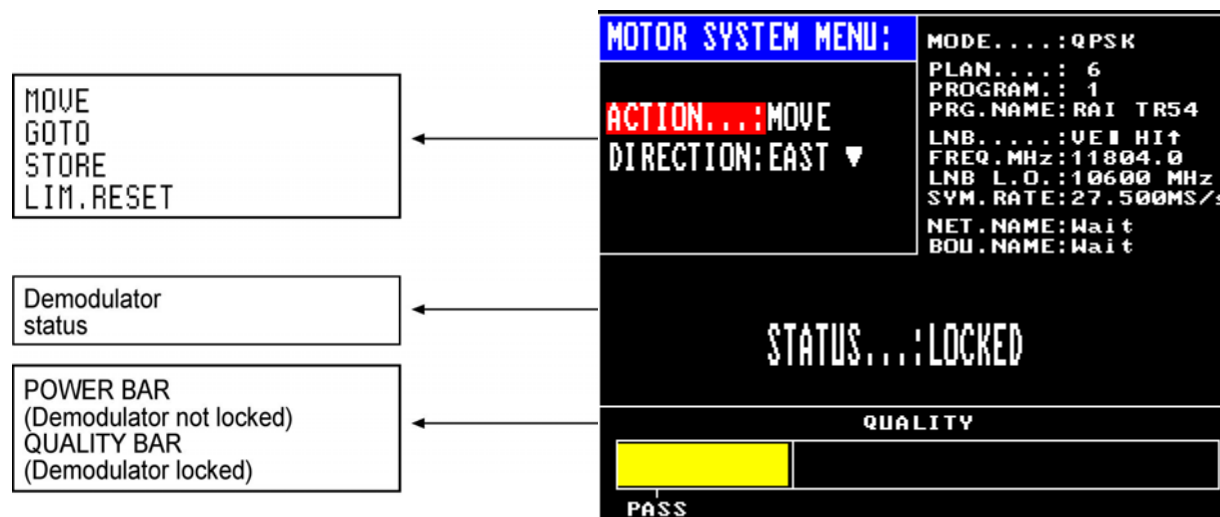
2. PROGRAMMING MODIFICATION:

To vary the programming of any cable, simply change it manually and the new parameter will store automatically.



FUNCTION: COMMAND FOR DiSEqC 1.2 ROTOR

To activate the function:

In QPSK measurement, after you have set the polarization, frequency, symbol rate and local oscillator, press  and using the  keys
Select "Motor", press  and  to activate the function (see figure 1).

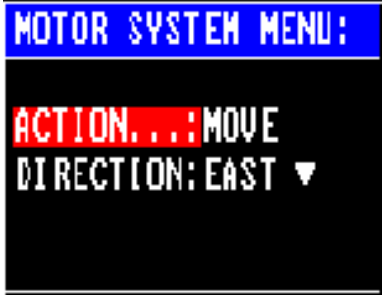


(Figure 1)

To select the commands, position the cursor on ACTION and press , then select the type of command using .


- MOVE: motor rotation per step.
- GOTO: rotation in the position saved in the memory.
- STORE: memorization of current position.
- LIMITS RESET: cancellation of rotation limits.

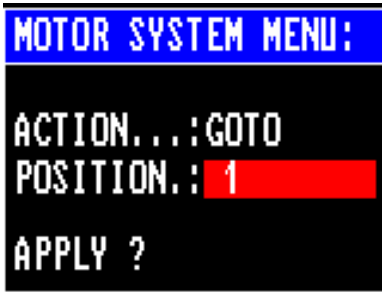
DESCRIPTION OF THE VARIOUS FUNCTIONS:




MOVE COMMAND:


Position the cursor on the word EAST or WEST, press the  key for a WEST rotation.

Press the  key for an EAST rotation.




GO TO COMMAND:

Position the cursor on the position number using  and select the position. Position on

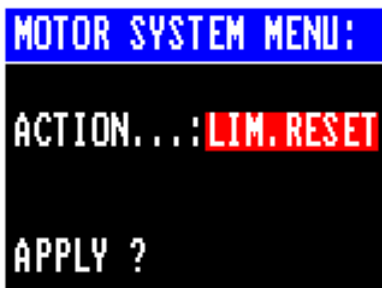
APPLY? And press , wait for the positioning to end.



STORE COMMAND:

Position the cursor on the position number using  and select the position. Position on

STORE? and press  to store.



LIMITS RESET COMMAND:

Position the cursor on APPLY? press  to cancel the the motor's rotation limits

FAST & ADVANCED AUTOSCAN FUNCTION (AUTOMATIC TV SEARCH)

The Autoscan function is required to carry out the automatic scan of a channel plan, to search for Analog, Digital COFDM and QAM (if the optional board is fitted) TV channels and to automatically store them in a memory plan.

You can chose two types of autoscan modes: Fast and Advanced.

- **FAST:** when this is set, the meter carries out a search by storing in the selected memory plan, the analog and digital TV channels whose Level/Power is above the selected threshold. Considering that all digital muxes are COFDM, no QAM/COFDM discrimination is made.
- **ADVANCED:** when this is set, the meter, after completing the search for analog and digital TV channels, identifies the COFDM from the QAM muxes and selects and memorises the main parameters necessary to lock onto the digital packages. Once this procedure is completed, the channels are stored in the plan that was previously selected.

SELECTION OF THE TYPE OF AUTOSCAN:

To select FAST or ADVANCED autoscan, enter in CONFIG. by keeping the  key pressed for two seconds and rotating the encoder . Select Autoscan, press  with the encoder  select FAST or ADVANCED and quit by pressing .

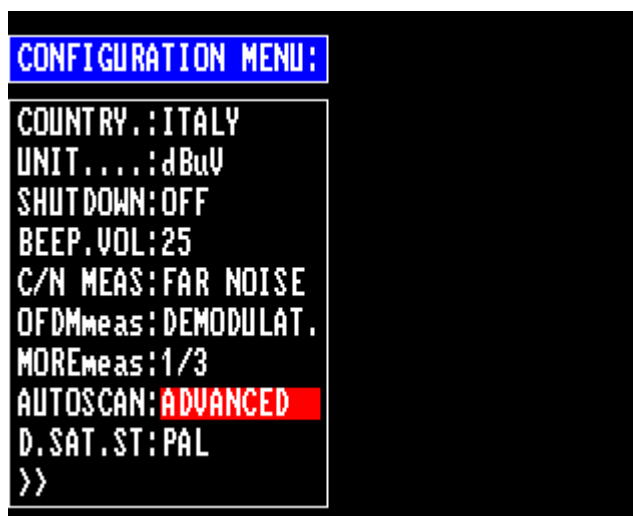


Figure 1: Selection of the type of Autoscan in the Configuration menu

HOW TO ACTIVATE THE FUNCTION:

To start scanning select, using the encoder



“Auto Scan TV”, set the Destination plan (DESTIN.) and the threshold level (LEV/POW), as shown below:

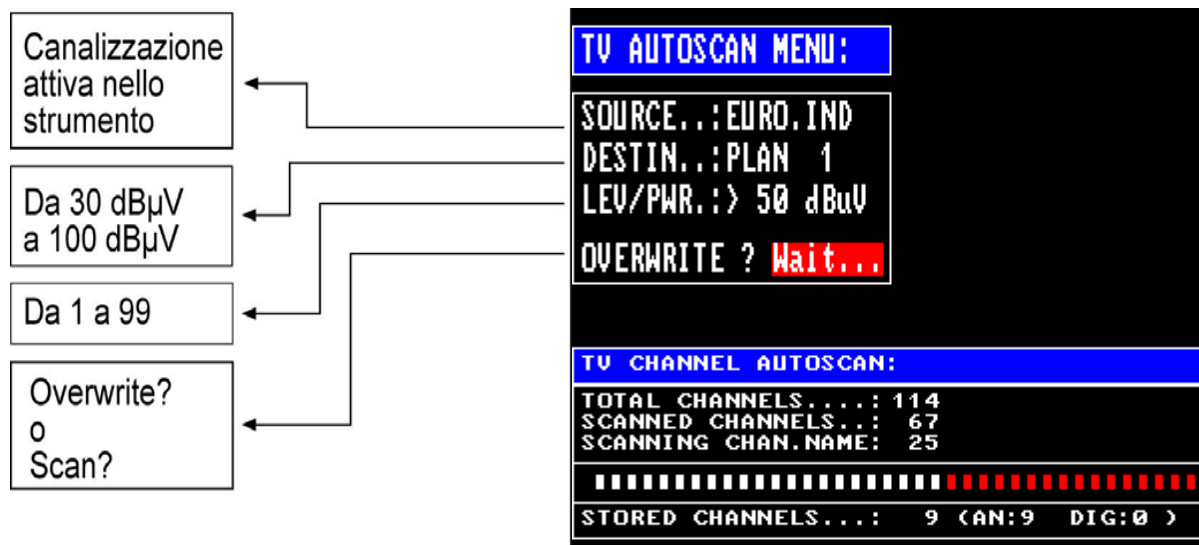


Figure 2: Scan example

Set the configuration parameters in the AUTOSCAN MENU selection table:

- SOURCE: the channel plan, which is active in the meter, is automatically shown.
- DESTIN.: select the Plan where to save the Auto Scan.
- LEV/POW.: allows you to select the threshold value, which must be near to the levels you expect to achieve. If you select a value that is too low (for example 30dBuV with a 90 dBuV reception level), saturations may be generated, which can cause errors in the program search.

Press  SAVE? or OVERWRITE? To confirm and start scanning.

N:B.:

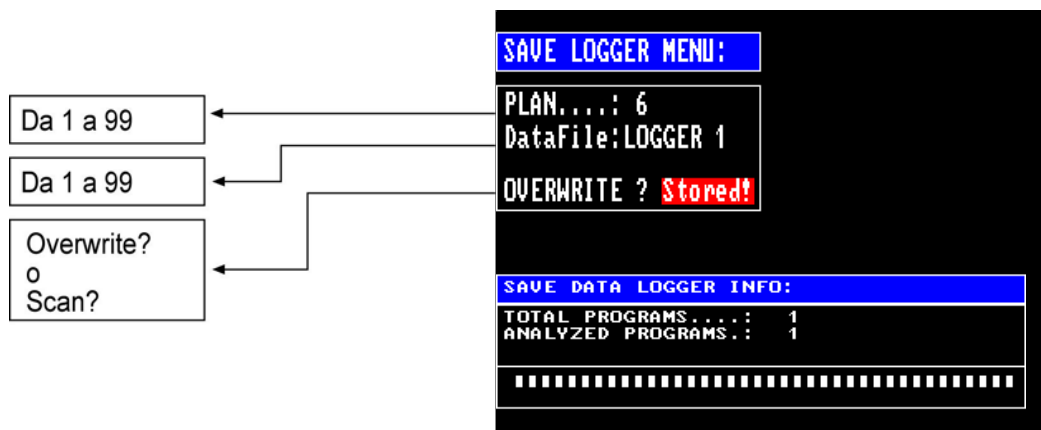
- If the destination plan is not used, the word SCAN? appears, if however the destination plan is used, the word OVERWRITE? will appear. The previously saved plan will be cancelled and overwritten if this option is selected.

DATA LOGGER “MEASUREMENT” SAVE

With this function it is possible to automatically carry out all the measurements on all the channels stored in a chosen frequency plan. The measurements are saved in the memory so they can be used and printed at a later date.

How to reach this function:

DIRECT = Press  in measurement mode.



This example shows Logger 1 being saved on Plan 10.

To start scanning the plan press




N.B.:

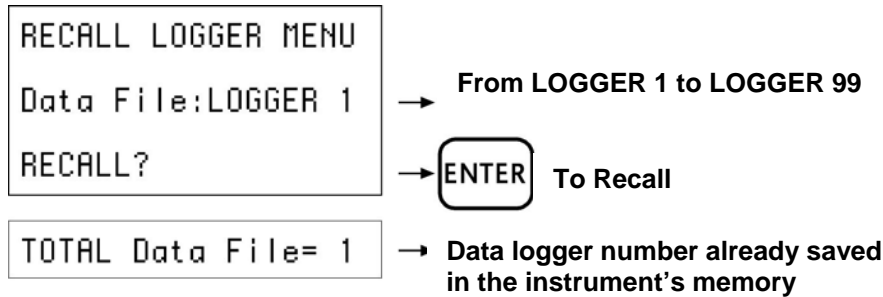
SAVE? Appears automatically if the Logger number to be stored for the selected plan has not been used. If the word OVERWRITE? appears, the selected logger will be overwritten.

DATA LOGGER "MEASUREMENT": RECALL

How to reach this function:

DIRECT = Press 

This function is used to recall a DATA LOGGER which has been previously stored, in order to be able to analyse it on a video screen or print it.






MODE	LOG	PRG	LNB	DiSeqC	FREQ.MHz
QPSK	1	1	VEH HI↑	NONE	11804.0
MENU :			MORE MEASURES :		
SERVICES:-----			LNB.ERR.=>0.9 MHz		
PRG.NAME:RAI TR54			FEC.....=2/3		
LNB L.O.:10600 MHz			NET.NAME=----		
SYM.RATE:27.500MS/s			BOU.NAME=----		
STANDARD:DVB			ENCRYPT.-----		
TELETEXT:-----			ENCRYPT.-----		
MOTOR...:-----			DATE.....:-----		
BUZZER..:-----			ORB.POS.-----		
			LNB.CURR=----		
67.9dBuV	10dB	2x10-3	<10-8	4dB	PASS
PWR.HOLD	MER	bBER	aBER	N.MA	QLTY

Visualization example of a Data Logger measurement in plan 6, page 61

FILE MANAGER “FILE”


The “Manager” function allows you to visualise a list of all the files stored inside the meter, to see their characteristics and carry out maintenance.

How to reach the file manager function:

DIRECT: from any function press  select using the  keys the “FILE MANAGER” function then press 


The screen will show:



Activate the “FILE” function with 

You will see the complete list of all the previously stored files

FileName	FileType	N.	Size	Contents
AN. SAT2	MEM. PLAN	98	60	N. PROG. : 1
QPSK2	MEM. PLAN	99	60	N. PROG. : 1
PLAN 1	MEM. PLAN	1	236	N. PROG. : 9
LOGGER 1	LOGGER	1	84	PLAN N. : 6
EUTELSAT	SPECTRUM	1	678	DIGIT. SAT
CH. 25	SPECTRUM	2	678	DIGIT. TV
CANALE25	SPECTRUM	3	678	DIGIT. TV
EURO. IND	CH. PLAN	1	788	SHOWING
U. K H. K	CH. PLAN	2	788	N. CHAN. :112
AUSTR. A	CH. PLAN	3	788	N. CHAN. :108
CHINA	CH. PLAN	4	788	N. CHAN. :105
CE. PO. OI	CH. PLAN	5	788	N. CHAN. :114

Press  to scroll the whole list

and press  to select one of the files.

EXAMPLE:
List of files contained in the meter's memory, with the currently used CH. PLAN called EURO. IND highlighted.



NOTES:

- **FILE NAME:** file name,
 - for MEM. PLAN and Spectrum files the name is provided by the PC or renamed using the meter's keyboard
 - for CH. PLAN files the name is provided only by PC
- **FILE TYPE:** file characteristic
 - CUSTOM: memory plan created by the user
 - CH. PLAN: standard canalization of the countries which can only be varied using a PC
 - SPECTRUM: spectrum vision stored by the user
 - LOGGER: Data Logger number created by the user
 - USER DATA: information regarding the user.
- **N.:** sequence in which the files are stored/shown by the meter
- **SIZE:** amount of memory occupied by the file in byte
- **CONTENTS:** additional information
 - In MEM. PLAN it indicates the number of programmes contained and stored by the user (Showing = currently in use)
 - For the Logger it indicates the memory plan of origin.
 - In CH. PLAN it indicates the number of channels contained (Showing = currently in use)


FILE MANAGER “INFO”

(First read the FILE MANAGER: “FILE”)

The “INFO” function allows you to visualise the characteristics of the previously selected file.

Select a file and activate INFO using the  key and press 

FILE	INFO	SHOW	RENAME	DELETE	DEFRAG
Selected File: test AGO					
PROG	MODE	CHAN	FREQ. MHz	PROG. NAME	
11	AN.TU	25	1503.250	LOC OSC	
12	AN.TU	32	559.250	RAI 3	
13	AN.TU	69	855.250	RETE 4	
14	FM RADIO	---	88.000	RADIO 1	
15	FM RADIO	---	103.500	RADIO 2	
16	FM RADIO	---	106.900	RADIO 3	
17	QAM	s37	434.000	DISTRIB	
18	QAM	s37	434.000	64 QLT	
19	QAM	s37	434.000	128 QLT	
20	QAM	s37	434.000	256 QLT	
21	COFDM	62	802.000	OFDM 2k	
22	COFDM	41	634.000	OFDM 8k	

Press  to scroll the whole list.

EXAMPLE:

List showing the contents of the programs in the “Test AGO” plan, where programmes 11 to 22 are shown. Four are QAM, two COFDM treeFM Radio and tree ANALOG TV. The programme name (associated with the programme) can be typed in from the PC or on the meter’s keyboard.

FILE	INFO	SHOW	RENAME	DELETE	DEFRAG
Selected File: LOGGER 1					
DATA LOGGER PLAN:		PROG	MODE	CHAN	
PLAN 1		35	AN.TU	50	
		36	AN.TU	51	
		37	AN.TU	52	
		38	AN.TU	53	
		39	COFDM	54	
		40	AN.TU	55	
		41	AN.TU	56	
		42	AN.TU	57	
		43	COFDM	58	
		44	AN.TU	59	
		45	AN.TU	60	
		46	AN.TU	61	

EXAMPLE:

Info of a Logger No.1 file where the PROGs from 35 to 46 are shown. ”

FILE	INFO	SHOW	RENAME	DELETE	DEFRAG
Selected File: EUTELSAT					
PROGRAM MODE.: QPSK					
SPECTRUM MODE: DIGIT. SAT					
CENTER FREQ.: 11804.0 MHz					
SPAN.....: 500 MHz					
dB/DIVISION.: 5					
DEFINITION...: MEDIUM					
PICTURE.....: FULL WHITE					
MAX.HOLD.....: OFF					

EXAMPLE:

Info of the configuration status of a spectrum file

FILE	INFO	SHOW	RENAME	DELETE	DEFRAG
Selected File: ITALY					
CHAN	FREQ. MHz	AUDIO 1 : 5.500 MHz			
rp1	6.250	AUDIO 2 : 5.740 MHz			
rp2	13.250	STANDARD : PAL/SEC.DK			
rp3	20.250				
rp4	27.250				
rp5	34.250				
rp6	41.250				
E2	48.250				
A	53.750				
E3	55.250				
B	62.250				
C	82.250				
D	175.250				

EXAMPLE:



Contents (Info) of a Channel Plan file with Italian canalization.

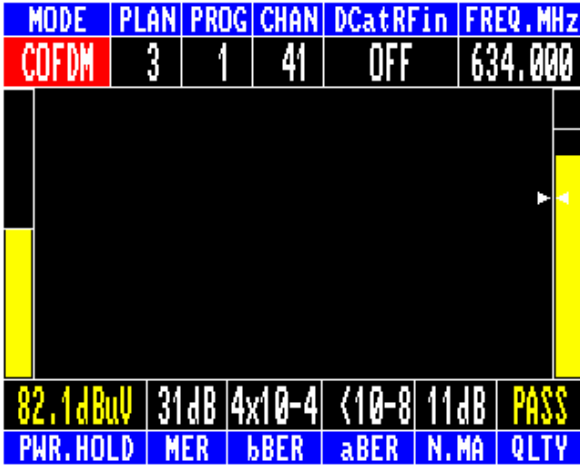
If you want to see all the files again press  , select FILE and press  again.

FILE MANAGER “SHOW”

(First read the page FILE MANAGER: “FILE”)

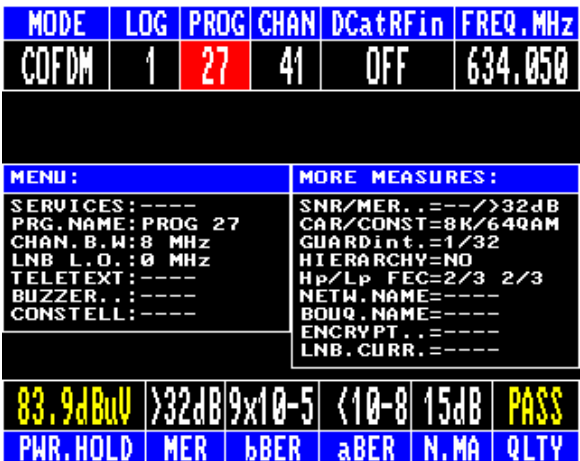
The “SHOW” function allows you to visualize the measurements/spectrum relative to the program of the selected file.

Select a file and active SHOW using the  keys and press 



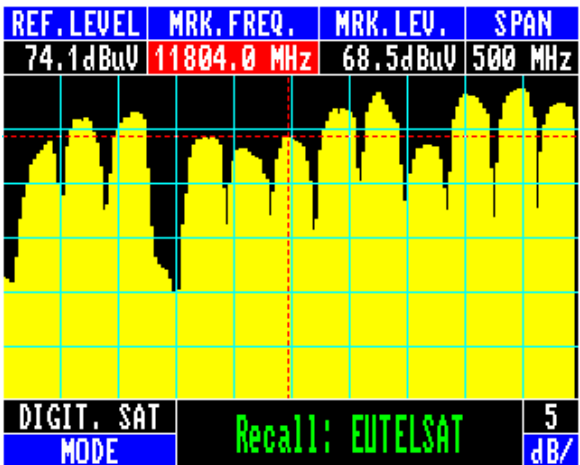
EXAMPLE:

View of PROG 1 in memory plan 3 (when there is an antenna signal the measurements are carried out in real time).



EXAMPLE:

View of Data Logger 1 file PROG 27. The measurements are recalled by the prestored Data Logger



EXAMPLE:



View of file Spect 1.

If you want to see all the files again press  select “File Manager” with 
and press 

FILE MANAGER “RENAME”



(First read the page FILE MANAGER: “FILE”)

The “RENAME” function allows you to only change the names of MEM. PLAN and spectrum files.

Select a file, activate RENAME using the  keys and press  ENTER



EXAMPLE:
Rename the MEM PLAN file called “test lab”


Select using the  keys the letter required and confirm using the  ENTER key.



The cursor will move to the next letter.

Select:

YES To store the file name;

NO If you do not want to change the original name.



Press  ENTER to confirm the selection.

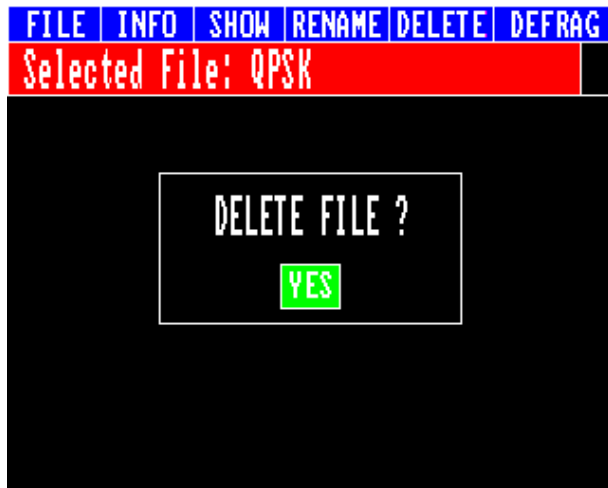
To return to the visualization of all the files, select FILE using the  keys and press  ENTER

FILE MANAGER “DELETE”

(First read the page FILE MANAGER “FILE”)

The “DELETE” function allows you to cancel a custom file, logger or spectrum from the meter’s memory. This function allows you to remove old memory plans, data loggers and spectrums which are no longer used.

Select a File, activate DELETE using the  keys and press 






*EXAMPLE:
Delete the MEM. PLAN file called “hotel 01”*

Select:

YES To eliminate the selected file;

NO If you do not want to eliminate the selected file.

Press  to confirm the selection.



To return to the visualization of all the files, highlight FILE using the  keys and press 

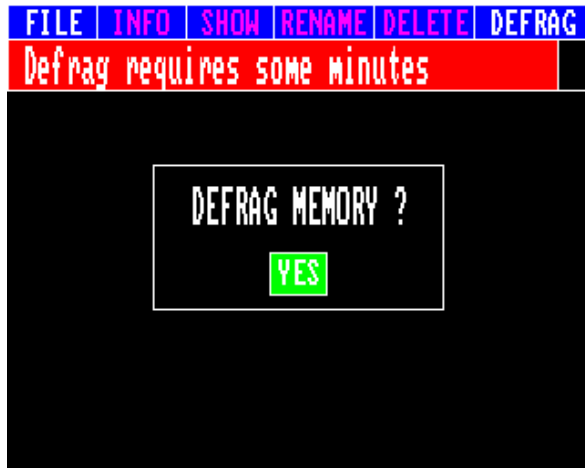
FILE MANAGER “DEFRAG”


(First read the FILE MANAGER “FILE” page)

The “DEFRAG” function allows you to optimize and compact the meter’s memory.

We suggest using this function after you have repeatedly created and cancelled memory plans, Data Loggers and spectrums.

Activate the DEFRAG function using the  keys and press .




With the  keys select:

YES To defragment the memory

NO If you do not want to defragment the memory

Press  to confirm.

To return to the visualization of the all the files, highlight FILE and press .

N.B.: When the instrument is turned on, or is being used, it will send a message, which appears on the monitor suggesting when it may be necessary to carry out the DEFRAG operation.

APPENDICES

A1 - TECHNICAL SPECIFICATIONS

ANALOG TV

- **Frequency band:** 4–878 MHz including IF 38.0/38.9/45.75 MHz which can be measured, seen and heard on the TV monitor
- **Direct selection of:** memory plan, program, chan., dc at RF IN, freq., with numeric keyboard
- **Memorization of:** memory plan, program, channel, dc at RF IN, frequency, audio carrier, standard, frequency offset
- **Frequency resolution:** 62 KHz
- **Input impedance:** 75 ohm
- **Interchangeable input connector:** "F" or "IEC" or "BNC" ("N" optional)
- **Power supply at RF IN:** in the TV band for pream.: OFF, +5, +12, +15, +18, +24 V (0.3 A)
- **RF IN automatic preamplifier:** this is automatically inserted when the RF input level is less than the set thresholds, it is automatically calculated from the measurement and the activation is shown by the relative LED on the front panel near the RF input
- **Analog measurement dynamic range at RF input:** from 20 to 130 dBuV, from –40 to + 70 dBmV (selectable), with limit indication: level too low, level too high
- **Measurement resolution:** 0.1 dB
- **Level measurement accuracy:** 1 dB typ. (1,5 max) with SW correction (after 5 minutes' warm-up)
- **A/V ratio measurement accuracy:** 1.5 dB typ. (2 dB max)
- **Measurement filter bandwidth:** 130 KHz at –3 dB
- **Measurement stability versus temperature between –10 and 50°C:** 0.03 dB/°C
- **Multi-standard:** M–N–B–G–I–D–K (audio L opt.)
- **TXT:** teletext

FM RADIO

- **Frequency band:** tunable from 4 to 878 MHz (default 88–108)
- **Direct selection of:** memory plan, program, dc at RF IN, frequency, with numerical keyboard
- **Memorization of:** memory plan, program, channel, dc at RF IN, frequency, audio carrier, standard
- **Frequency resolution:** 62 KHz
- **Audio demodulation:** FM
- **Demodulation filter bandwidth:**
100 KHz @ –3 dB.
Audio heard with built-in loudspeaker: 0.5 W adjustable volume

ANALOG SAT

- **Frequency band:** 930–2250 MHz
- **Direct selection of:** memory plan, program, frequency, LNB voltage, DiSEqC, with numerical keyboard
- **Memorization of:** memory plan, program, LNB, DiSEqC, local oscillator frequency, transponder frequency, audio carrier, video polarity
- **Frequency resolution:** 0.1 MHz
- **Input impedance:** 75 ohm
- **Interchangeable input connector:** "F" or "IEC" or "BNC" ("N" optional)
- **Power supply at RF input:** in the SAT band for LNB: OFF, +13, +18, 22 KHz (0.3 A)
- **DiSEqC:** 4, 8, 12 or 16 polarizations, DiSEqC "a.b.c.d" already pre-programmed in sequence and very easy to use. It can power any type of LNB (analog or DiSEqC, single or dual feed) and any type of multiswitch and SAT router (analog or DiSEqC with 4, 8, 12, 16 inputs)
- **LNB current measurement:** from 1 to 300 mA
- **RF IN automatic preamplifier:** this is automatically inserted when the RF input level is less than the set thresholds, it is automatically calculated from the measurement and the activation is shown by the relative LED on the front panel near the RF input
- **Analog measurement dynamic range at the RF input:** from 25 to 120 dBuV, from –35 to +60 dBmV (selectable) with limit indications: level too low, level too high
- **Measurement resolution:** 0.1 dB
- **Level measurement accuracy:** 1.5 dB typ. (2.5 dB max.) with software correction (after 5 minutes warm-up)
- **Measurement filter bandwidth in SAT mode:** 4 MHz at –3 dB
- **Measurement filter bandwidth in V.SAT mode:** 0.2 MHz at –3 dB (opt.)
- **Picture demodulation filter bandwidth:** 27 MHz
- **Measurement stability versus temperature between –10 and 50°C:** 0.03 dB/°C
- **LNB L.O. frequency selection:** continuous from 0 to 20.000 MHz, for "L" bands (direct IF–SAT reading), "S", "C", "KU", "KA";
- **Audio demodulation:** from 4.5 to 8.5 MHz
- **TXT:** teletext

QAM & 8VSB (Emulated)

(supplied when optional DEMODULATED QAM & 8VSB board is not inserted)

- **QAM frequency band:** 4–878 MHz
- **Direct selection of:** memory plan, program, chan., dc at RF IN, freq., with numeric keyboard
- **Memorization of:** memory plan, program, channel, dc at RF IN, frequency, symbol rate, frequency offset
- **Frequency resolution:** 62 KHz
- **Input impedance:** 75 ohm
- **Interchangeable input connector:**
"F" or "IEC" or "BNC" ("N" optional)
- **Power supply at RF IN:** in the TV band for pream.: OFF, +5, +12, +15, +18, +24 V (0.3 A)
- **RF IN automatic preamplifier:** this is automatically inserted when the RF input level is less than the set thresholds, it is automatically calculated from the measurement and the activation is shown by the relative LED on the front panel near the RF input
- **Power measurement dynamic range at the RF input:** from 30 to 126 dBuV, from –30 to + 66 dBmV (selectable) with limit indications: level too low, level too high
- **Power measurement resolution:** 0.1 dB
- **Power measurement accuracy:** 1 dB typ. (2 dB max.) with software correction (after 5 minutes' warm-up)
- **C/N ratio measurement accuracy:** 1.5 dB typ. (2,5 max.) with noise measurement on the adjacent first free channel, selectable
- **Measurement filter bandwidth:** 130 KHz a –3 dB
- **Measurement stability versus temperature between –10 and 50°C:** 0.03 dB/°C
- **BER evaluation:** up to 1×10^{-8} (emulated)
- **TEST PASS–MARG–FAIL:** digital signal evaluation (exclusive ROVER algorithm)
 - "C/N NEAR" (with measurement of "N" noise on adjacent channel)
 - "C/N FAR" (with measurement of "N" noise on first free channel) selectable and storable
- **Multiplex flatness measurement:** from 0 to > 20 dB. 1 dB typ. (1.5 max)

QAM (Demodulated Annex A–B–C)

(optional)

- **QAM frequency band:** 47–878 MHz
- **Direct selection of:** memory plan, prog., chan., dc at RF IN, freq., with numerical keyboard
- **Memorization of:** memory plan, program, channel, dc at RF IN, frequency, constellation, symbol rate, frequency offset
- **Frequency resolution:** 62 KHz
- **Input impedance:** 75 ohm
- **Interchangeable input connector:** "F" or "IEC" or "BNC" ("N" optional)
- **RF input power supply:** in the TV band for preamp.: OFF, +5, +12, +15, +18, +24 V (0.3 A)
- **RF IN automatic preamplifier:** this is automatically inserted when the RF input level is less than the set thresholds, it is automatically calculated from the measurement and the activation is shown by the relative LED on the front panel near the RF input
- **Power measurement dynamic range at the RF input:** from 30 to 126 dBuV, from –30 to + 66 dBmV (selectable) with limit indications: level too low, level too high
- **Power measurement resolution:** 0.1 dB
- **Power meas.accuracy:** 1 dB typ. (2 dB max.) with SW correction (after 5 minutes' warm-up)
- **Measurement filter BW:** 130 KHz at –3 dB
- **Measurement stability versus temperature between –10 and 50°C:** 0.03 dB/°C
- **Symbol rate selection:** from 1000 to 9000 KS/s in 1 KS/s steps
- **Min. power to lock the QAM demodulator:**
 - at 64QAM = 34 dBuV ± 2
 - at 128QAM = 36 dBuV ± 2
 - at 256QAM = 38 dBuV ± 2
- **MER ratio measurement accuracy:**
 - 64 QAM up to 34 dB, ± 1 dB typ. (2 dB max) with power > 45 dBuV
 - 128 QAM up to 36 dB, ± 1 dB typ (2 dB max) with power > 47 dBuV
 - 256 QAM up to 38 dB ± 1 dB typ (2 dB max) with power > 49 dBuV
- **BER measurement:**
 - bBER up to 1×10^{-8}
 - aBER (after R.S.) at 1×10^{-8}
 - Error counter, per sec.
 - Severe total error counter
- **Automatic digital signal quality TEST:** PASS–MARG–FAIL
- **Spectrum inversion:** automatic
- **Constellation picture:** 64–128–256 with zooms x1, x2, x4
- **TXT:** teletext

8VSB (Demodulated)

- **8VSB frequency band:** 47–878 MHz
- **Direct selection of:** memory plan, program, chan., dc at RF IN, freq., with numerical keyboard
- **Memorization of:** memory plan, program, channel, dc at RF IN, frequency, constellation, symbol rate, frequency offset
- **Frequency resolution:** 62 KHz
- **Input impedance:** 75 ohm
- **Interchangeable input connector:** "F" or "IEC" or "BNC" ("N" optional)
- **Power supply at RF IN:** in the TV band for preamp.: OFF, +5, +12, +15, +18, +24 V (0.3A)
- **RF IN automatic preamplifier:** this is automatically inserted when the RF input level is less than the set thresholds, it is automatically calculated from the measurement and the activation is shown by the relative LED on the front panel near the RF input
- **Power measurement dynamic range at the RF input:** from 35 to 126 dBuV, from –25 to + 66 dBmV (selectable) with limit indications: level too low, level too high
- **Power measurement resolution:** 0.1 dB
- **Power meas.accuracy:** 1 dB typ. (2 dB max.) with SW correction (after 5 minutes' warm-up)
- **Measurement filter BW:** 130 KHz at –3 dB
- **Measurement stability versus temperature between –10 and 50°C:** 0.03 dB/°C
- **MER & BER measurement**
- **Constellation vision**
- **8VSB symbol rate selection:**
from 1000 to 8000 MS/s (1 KS/s steps)
(bit rate from 2000 to 6000 Mb/s)

COFDM (Emulated)

(supplied, selectable and storable)

- **COFDM frequency band:** 4–878 MHz
- **Direct selection of:** memory plan, program, chan., dc at RF IN, freq., with numerical keyboard
- **Memorization of:** memory plan, program, channel, dc at RF IN, frequency, number of carriers, constellation, channel width, offset freq.
- **Frequency resolution:** 62 KHz
- **Storable offset frequency:** in 62 KHz steps
- **Input impedance:** 75 ohm
- **Interchangeable input connector:** "F" or "IEC" or "BNC" ("N" optional)
- **Power supply at RF IN:** in TV band for pream.: OFF, +5, +12, +15, +18, +24 V (0.3 A)
- **RF IN automatic preamplifier:** this is automatically inserted when the RF input level is less than the set thresholds, it is automatically calculated from the measurement and the activation is shown by the relative LED on the front panel near the RF input
- **Power measurement dynamic range at the RF input:** from 35 to 126 dBuV, from –25 to + 66 dBmV (selectable) with limit indications: level too low, level too high
- **Power measurement resolution:** 0.1 dB
- **Power measurement accuracy:** 1 dB typ. (2 dB max.) with software correction (after 5 minutes' warm-up)
- **C/N ratio measurement accuracy:** 1.5 dB typ. (2,5 max.) with noise measurement on the nearest adjacent free channel
- **Measurement filter bandwidth:** 130 KHz at –3 dB
- **Measurement stability versus temperature between –10 and 50°C:** 0.03 dB/°C
- **aBER measurement:** up to 1×10^{-8} (emulated)
- **TEST PASS–MARG–FAIL:** digital signal evaluation (exclusive ROVER algorithm)
 - "C/N NEAR" (with measurement of "N" noise on adjacent channel)
 - "C/N FAR" (with measurement of "N" noise on the first free channel) select.and storable
- **Multiplex flatness measurement:** from 0 to > 20 dB. 1 dB typ. (1.5 max)

COFDM (Demodulated)

(supplied, special for MFN & SFN networks with ECO and PREECO at 0 dB)

- **COFDM frequency band:** 47–878 MHz
- **Direct selection of:** memory plan, program, chan, dc at RF IN , freq, with numerical keyboard
- **Memorization of:** memory plan, prog., channel, dc at RF IN , frequency, number of carriers, channel width, offset–frequency
- **Frequency resolution:** 62 KHz
- **Storable offset frequency:** in 62 KHz steps
- **Input impedance:** 75 ohm
- **Interchangeable input connector:** "F" or "IEC" or "BNC" ("N" optional)
- **Power supply at RF IN:** in TV band for preamp.: OFF, +5, +12, +15, +18, +24 V (0.3 A)
- **RF IN automatic preamplifier:** this is automatically inserted when the RF input level is less than the set thresholds, it is automatically calculated from the measurement and the activation is shown by the relative LED on the front panel near the RF input
- **Power measurement dynamic range at the RF input:** from 30 to 126 dBuV, from –30 to + 66 dBmV (selectable) with limit indications: level too low, level too high
- **Power measurement resolution:** 0.1 dB

- **Power measurement accuracy:** 1 dB typ. (2 dB max.) with SW corr. (after 5 mins' warm-up)
- **MER measurement accuracy:** up to 30/32 dB accuracy, 1 dB typ. (1.5 dB max), with > 40 dBuV power
- **Measurement filter BW:** 130 KHz at -3 dB
- **Measurement stability versus temperature between -10 and 50°C:** 0.03 dB/°C
- **BER measurement before and after Viterbi:**
 - bBER up to 1 x 10⁻⁵
 - aBER up to 1 x 10⁻⁸
- **Automatic recognition & visualization of:** HP/LP rate, guard interval, constellation
 - Rate: 1/2, 2/3, 3/4, 5/6, 7/8
 - Guard interval: 1/4, 1/8, 1/16, 1/32
 - Constellation: QPSK, 16 QAM, 64 QAM
- **Automatic digital signal quality TEST:** PASS-MARG-FAIL
- **CSI measurement:** percentage of non-valid carriers 0-100%
- **Spectrum inversion:** automatic
- **Constellation picture:** QPSK-16 QAM- 64 QAM with x1, x2, x4 zooms.
- **TXT:** teletext

QPSK (Demodulated)

- **Frequency band:** 930-2250 MHz
- **Direct selection of:** memory plan, prog., LNB, DiSEqC, transponder freq, with numerical keyboard
- **Memorization of:** memory plan, program, LNB, DiSEqC, local oscillator frequency, transponder frequency, standard, Symbol Rate
- **Frequency resolution:** 0.1 MHz
- **Input impedance:** 75 ohm
- **Interchangeable input connector:** "F" or "IEC" or "BNC" ("N" optional)
- **Power supply at RF IN:** in the SAT band for LNB: OFF, +13V, +18V, 22 KHz (0.3 A)
- **DiSEqC:** 4, 8, 12 or 16 polarizations, DiSEqC "a.b.c.d" already pre-programmed in sequence and very easy to use. It can power any type of LNB (analog or DiSEqC, single or dual feed) and any type of multiswitch and SAT Router (analog or DiSEqC with 4, 8, 12, 16 inputs)
- **LNB current or preamp meas.:** 1 to 300 mA
- **RF IN automatic preamplifier:** this is automatically inserted when the RF input level is less than the set thresholds, it is automatically calculated from the measurement and the activation is shown by the relative LED on the front panel near the RF input
- **Digital power measurement dynamic range at the RF input:** from 30 to 123 typ. (126 max.) dBuV, from -30 to +63 typ. (66 max.) dBmV (selectable) with limit indications: level too low, level too high
- **Power measurement resolution:** 0.1 dB
- **Power measurement accuracy:** 1.5 dB typ. (2.5 dB max.) with software correction (after 5 minutes' warm-up)
- **MER and Noise Margin measurement accuracy:** 0.5 dB typ. (1 dB max) with SW corr.
- **Measurement filter bandwidth in SAT mode:** 4 MHz at -3 dB
- **Measurement stability versus temperature between -10 and 50°C:** 0,1 dB/°C
- **QPSK Symbol Rate setting:** 2-45 MS/s, in 1 KS/s steps
- **BER measurement before and after Viterbi:**
 - bBER up to 1 x10⁻⁶
 - aBER up to 1 x10⁻⁸
- **FEC, automatic recognition & visualiz. of value:** FEC 1/2, 2/3, 3/4, 4/5, 5/6, 6/7, 7/8, 8/9
- **Automatic Quality TEST:** FAIL- MARG - PASS
- **Noise margin measurement:** from -2 to 12 dB with special algorithm which automatically considers the FEC value
- **LNB local oscillator frequency:** continuous from 0 to 20.000 MHz, for bands, "L" (direct IF-SAT reading), "S", "C", "KU", "KA";
- **QPSK standard selection:** DVB/DSS
- **LNB frequency measurement:** 0 to 3 MHz
- **TXT:** teletext

CONSTELLATION

Constellation visualization of COFDM, QAM and 8VSB digital programmes, with x1, x2 and x4 zooms, and automatic refreshment.

MPEG2 F.T.A. & NET. ID.

Mod. DL-14 provides all the same information with the images (audio and video) of all the F.T.A. digital programmes.

- **MPEG signal format:** ETS 300 421
- **Video resolution:** 720x576, 704x574, 544x576, 480x576, 352x576
- **Video decompression type:** MPEG1, MPEG2@ML (I, P & B frame decoding)
- **Out TV stand.:** PAL, NTSC, SECAM (select.)
- **Audio decompression:** MPEG layer II (MUSICAM)

VIDEO ANALYSIS & MEASUREMENTS *(SYNCHRO & I.T.S. VIDEO LINES)*

- **Visualization of the synchro and burst**, according to time and amplitude
- **Selection and visualization of all the video lines** and ITS expandible with Zoom
- **S/N-W measurement**

TV SPECTRUM ANALYSIS

- **Frequency band:** 4–878 MHz
- **Span in TV band:** 2–5–7–10–20–50–100–200–500–FULL–VHF–UHF
- **Span in RP band:** 2–5–7–10–20–50–RP (4–65 MHz)
- **dB/div:** 1–2–5–10
- **Dynamic range:** >60 dB
- **Measurement resolution:** 0.1 dB
- **Measurement filter bandwidth:** TV 130 KHz at –3 dB
- **Reference level:** from 0 to 130 dB μ V, from –60 dBmV to +70 dBmV
- **Spectrum setting:** automatic or manual, selectable
- **In automatic spectrum mode:** Passing from measurement (MEAS) to spectrum (SPECT) you can immediately see only the spectrum of the program/channel received perfectly centred and automatically aligned to the reference level
- **Spectrum parameters set automatically:**– Ref level/power indication at the top of the display (corresponding to the attenuator in old instruments)
 - Span: 10 MHz
 - dB/division: 10 dB/
- **Frequency/level marker position:**
 - For digital signals in channel centre
 - For analog signals on video carrier
- **Measurement band selection & correlation of analog or digital signals:** shown on display
- **Other spectrum selections:**
 - MARKER: OFF, ON, C/N per segnali analogici (2 markers to measure BW power)
 - MARKER BW: OFF, ON, BW POWER (1+2 markers for chan. filter calibration)
 - MAX HOLD: OFF, ON
 - PICTURE: only contours or full
 - DEFINITION: high 320 points, medium 160 points, low 80 points
 - BUZZER: OFF, MRK LEVEL
- **Possibility of storing 99 spectrum pictures** (Data Logger)

SAT SPECTRUM ANALYSIS

- **Frequency band:** 930–2250 MHz
- **Span:** 5–10–20–50–100–200–500–FULL
- **dB/div:** 1–2–5
- **Dynamic range:** >30 dB
- **Measurement resolution:** 0.1 dB
- **Measurement filter bandwidth:** SAT 4 MHz at –3 dB, VSAT 0.2 MHz at –3 dB
- **Reference level:** from 0 to 126 dB μ V, from –60 dBmV to +66 dBmV
- **Spectrum settings:** automatic or manual, selectable
- **Automatic spectrum mode:** Passing from measurement (MEAS) to spectrum (SPECT) you can immediately see only the spectrum of the program/channel received perfectly and automatically aligned to the reference level
- **Spectrum parameters set automatically:** – Ref level/power indication at the top of the display (corresponding to the attenuator in old instruments)
 - Span: 50MHz
 - dB/division: 5 dB
 - Freq./level marker position: in centre band
 - Measurement band selection and correlation of analog or dig. signals: shown on the display
- **Other selectable spectrum parameters:**
 - MARKER: OFF, ON, C/N for analog signals (2 markers to measure bandwidth)
 - MARKER BW: OFF, ON, BW POWER (1+2 markers to measure the power/bandwidth)
 - MAX HOLD: OFF/ON (peak memory)
 - PICTURE: contours or full white
 - DEFINITION: high 320 points, medium 160 points, low 80 points, selectable
 - V.S.A.T (very small aperture terminal) spect.
 - SAT POINTING: automatic optimum setting for satellite dish pointing
 - BUZZER: OFF, MRK POWER
- **Possibility of storing 99 spectrums** (Data Logger)

OTHERS

- **RF input power feed:**
 - In the TV band for preamplifier: OFF, +5, +12, +15, +18, +24 V (0.3 A)
 - In the SAT band for LNB: OFF, +13 V, +18V, 22 KHz (0.3 A)
- **DiSEqC:** 4, 8, 12 or 16 polarizations, DiSEqC "a.b.c.d" already pre-programmed in sequence and very easy to use. It can power any type of LNB (analog or DiSEqC, single or dual feed) and any type of multiswitch (analog or DiSEqC with 5, 9, 13, 17 cables)
- **RF IN automatic preamplifier:** this is automatically inserted when the RF input level is less than the set thresholds, it is automatically calculated from the measurement and the activation is shown by the relative LED on the front panel near the RF input
- **Power supply:**
 - Built-in rechargeable batteries: 12 V x 7 A (LEAD GEL)
 - Voltage load: 17/20 Vac or 20/24 Vdc (1.1 A), (connector: Ø 5,5 x 2,2)
 - AC/AC adapter: 230 Vac (117V opt.), output: 17 Vac (supplied)
- **LNB current or Preampl meas.:** 1 to 300 mA
- **Buzzer:** level or quality parameter selection
- **Battery duration at 25°C:** 5 hours in TV AN at 20°, 4 hours in digital SAT depending on LNB consumption.
- **low battery indicator:** with acoustic signalling and shown on TFT and auto turn-off from micro-controller
- **Indication of battery load charge:** when instrument is turned on
- **Battery recharge time:** 3 hours for approx 50% capacity, 6/8 hours for complete charge (12 hrs. advisable), with automatic switching on slow maintenance charge and LED charge and FULL charge indication
- **Instrument size:** H 135 x L 330 x D 380 mm
- **Instrument weight:** 6.5 Kg including battery, (bag and accessories 1 Kg approx.)
- **Casing structure:** plastic-coated aluminium and silicon rubber, rain-, dust- and shock-proof
- **RS232 interface:** for communications with PC; possibility of SW up-grades downloaded from Internet, (memory plan configuration control, print-outs, Data Logger etc. optional)
- **USB interface:** with optional adaptor
- **Audio/video input/output:** Scart (Peritel) socket (demod. video outputs/with OSD + spect PIN 19)
- **Picture display:** 5.5" TFT color for DM-14C, CRT 5.5" B/W for DM-14B PAL (encased and antishock) (encased and anti-shock). Please note that for 5,5" TFT monitors if Pixel are turned off the tolerance, according to the manufacturer, is 1 pixel in the centre and 2 pixels around the perimeter.
- **Auto-off timer:** after 5 mins without use (select-able on/off, always starts up from last fuction)
- **Auto-test menu:** Self-test of main internal digital circuits
- **RF input overload protection:** electronic up to 60 Vac, or total with manual side safety switch
- **DC AT RF IN (LNB) current measurement:** 0–300 mA accuracy, 3 mA typ. (5 max)
- **TXT (teletext) selection and visualization**
- **Measurement voltmeter:** AC 110 V max, DC +110 V max applied to RF input
- **Video test generator:** to check CRT linearity and for modular an CCT network tests. Available at scart socket, on pin 19
- **File manager:** to maintain internal data files (canalizations, memory plans, saved spectrums), data logger, etc.
- **Defrag function:** for memories defrag

BATTERY

- **Battery duration at 25°C:** 5 hours in TV, 2 hours in digital SAT according to LNB consumption.
- **Low battery indicator:** with acoustic signalling and shown on the CRT and auto turn-off from micro-controller
- **Indication of battery load charge:** when instrument is turned on
- **Battery recharge time:** 1 hour for 50% capacity, 4/6 hours for complete charge, with automatic switching on slow maintenance charge and LED charge and FULL charge indication.

STRUCTURE

- **Instrument size:** H 160 x L 280 x D 370 mm
- **Instrument weight:** 6,5 Kg with battery, bag and accessories 1 Kg approximately
- **Casing structure:** plastic-coated aluminium and silicon rubber, rain-, dust- and shock-proof.

INPUTS

- **RS232 interface:** for communications with PC; possibility of SW up-grades downloaded from Internet, (memory plan configuration control, print-outs, Data Logger etc. optional)
- **USB interface:** with optional adaptor
- **Audio/video input/output:** with Scart socket 19 (Demodulator video output./with OSD + spectrum)

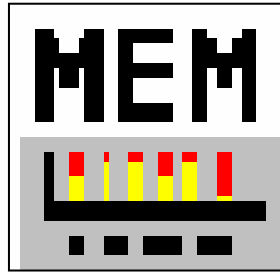
MEASUREMENTS

- **DC AT RF IN (LNB) current measurement:** 0–300 mA, precision ± 3 mA typ. (5 max)
- **TXT selection and visualisation**
- **Voltmeter measurement:** AC 110V max, DC +110V max, applied at the RF input, precision ± 1 V typ. (2 V max)

IMPORTANT:

Please kindly note that if there are pixels turned off on the 5.5" TFT Monitor, fitted in ROVER instruments, the tolerance indicated by the manufacturer is 1 pixel in the centre area and 2 pixels around the parameter.

A2 – SMART PROGRAM



HOW TO INSTALL THE SMART PRO PROGRAM IN YOUR PC.

- a) Download the S.M.A.R.T. program from the ROVER website (www.roverinstruments.it) on the product support page, to your computer desktop. The file containing the SMART program is zipped and can be unzipped using the Unzip® or Winzip® computer programs.
- b) The unzip program will ask for a password, which can be obtained by contacting ROVER by telephone or e-mail info@roverlaboratories.it. You will be asked to supply your instrument's serial number.
- c) Open the SETUP file in the Kit Installation Smart folder.
- d) Follow the automatic procedure which will guide you through the installation: you can modify the installation folder; if the name of this folder is not modified, the program creates a folder called SmSw.
- e) The SMART program inserts an icon in the program list of your computer and an icon connecting to your desktop. By clicking on this icon, the SMART program starts up automatically.

HOW TO DOWNLOAD THE EXACT UPGRADE FROM INTERNET


- Download the upgrade from internet (www.roverinstruments.it), by going to the product support page and selecting the upgrade relative to your instrument. Save it on your computer desktop.
- The file containing the upgrade firmware is zipped and must be unzipped using computer programs Unzip® or Winzip®.
- The unzip program will ask for a password, which can be obtained by contacting ROVER by telephone or e-mail info@roverlaboratories.it. You will be asked to supply your instrument's serial number.
- Expand the upgrade file and save it on your PC (for example on your desktop).

1.0 HOW TO CONNECT YOUR MEASURING INSTRUMENT TO A PC

This procedure allows the SMART program to recognise the instrument connected to the PC.

1.1 SIMPLE PROCEDURE

INSTRUMENT – PC CONNECTION

1. Connect your instrument to the PC
2. Turn on your instrument
3. Start the Smart program
4. Click  (See Instrument Bar Description) (also see 1.4 warning paragraph)
5. Follow the instructions shown on the screen until it is complete.

1.2 DETAILED PROCEDURE

1.2.1 CONNECTION BETWEEN INSTRUMENT & PC

- a) Connect the instrument to the PC using the Null Modem cable
- b) Turn on your instrument.
- c) Start the SMART program.
- d) From the instrument bar, click on the words “Instrument” and “Connect Instrument”, (Figure 1.1) (see **paragraph 1.4 “Warning”**)
- e) In the “Instrument Type” window, select your instrument’s model and confirm your selection using the key “OK”.
- f) The “Port Setting” window will open (serial port configuration) where you can select the port number (COM) to which your instrument is connected. The other settings can be changed, but it is best not to use the preselected ones. Confirm by pressing the “OK” key to activate instrument connection.

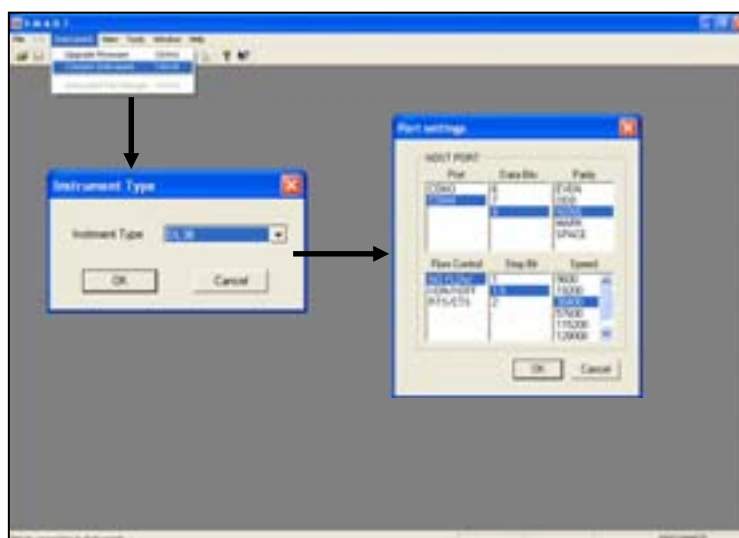


Figure 1.1

1.3 NOTES

- a) If the procedure is carried out correctly, the bar below will show the instrument data (instrument model, serial number and firmware version).

1.4 WARNINGS


- a) If the up-grade procedure does not work, check connections and repeat the operation.
- b) If this operation continues to fail, contact Ro.Ve.R Laboratories SpA (info@roverinstruments.it).

2.0 FIRMWARE UPGRADES

This procedure allows you to upgrade your meter with the last Firmware version available on our website.

2.1 SIMPLIFIED PROCEDURE

FIRMWARE UP-GRADE

1. Download the internet up-grade.
3. Connect your instrument to a PC.
4. Start the SMART program.
5. Click on  (See instrument bar description) (**also see paragraph 2.4 WARNINGS**).
6. Follow the instructions on the screen until the procedure has been completed.

2.2 DETAILED PROCEDURE

2.2.1 HOW TO DOWNLOAD FIRMWARE UP-GRADES FROM INTERNET

- a) Download from internet web site www.roverinstruments.it, in the Technical support section, the up-grade regarding your instrument and save it on the desktop of your PC,
- b) The file containing the firmware is zipped; un-zip it using computer programs **Unzip**®* or **Winzip**®*,
- c) The unzip program will ask for a password which is provided directly by Ro.Ve.R Laboratories SpA, by telephone or e-mail (info@roverinstruments.it); remember to provide your meter's serial number,
- d) Unzip the up-grade file and save it on your PC (for example on your desktop).

2.2.2 HOW TO PREPARE YOUR INSTRUMENT FOR AN UP-GRADE

- a) Connect your instrument to the PC's serial port using the RS 232 Null Modem cable
- b) Turn on your instrument and connect it to the mains.

2.2.3 HOW TO UP-GRADE YOUR INSTRUMENT USING A PC

- a) Start up the Smart Pro program,
- b) Click on "Instrument" and "Up grade Firmware" in the instrument bar, (Figure 2.1) (**Also see paragraph 2.4 WARNINGS**)
- c) In the "Open" window, select the file you want to use for the up-grade and confirm your selection by pressing the "open" key,
- d) The "Upgrade Firmware" window will open where you can select the instrument model and the port (COM) to which it is connected,
- e) Press "Command Upgrade" to start the up-grade.

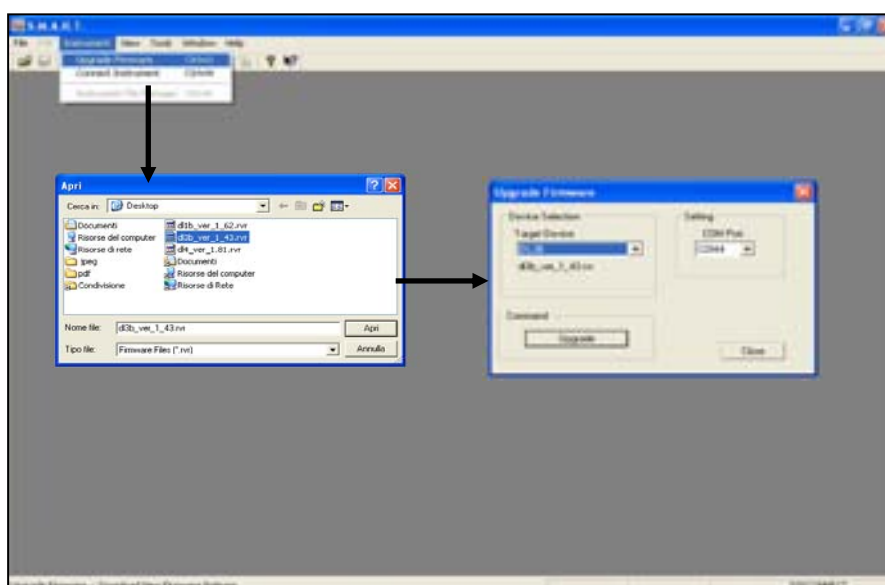


Figure 2.1

2.3 NOTES

- When the up-grade has been correctly completed the PC screen will show the words “Program Successful” and a summary window showing the instrument settings.
- Check the new firmware version number in the Start Up screen or self-test windows.

2.4 WARNINGS

- Do not use the instrument during the up-grade procedure.
- If the up-grade procedure does not work check connections and repeat the operation
- If the operation continues to fail, contact Ro.Ve.R Laboratories SpA (info@roverinstruments.it).




**All logos are registered by their owners.*

3.0 GET SCREEN

This function allows you to transfer any data display from your instrument to a PC.

3.1 SIMPLIFIED PROCEDURE

GET SCREEN

1. Carry out all the necessary connections (see paragraph 1.0)
1. Click on  (See instrument bar description)
2. Wait for the display to appear on the PC monitor.
3. Select one of two options:
 - Print from the PC by pressing  from the instrument bar (see 3.2.2);
 - Save it on the PC by pressing  from the instrument bar (see 3.2.3) (a bitmap file is generated).

3.2 DETAILED PROCEDURE

3.2.1 HOW TO TRANSFER A DISPLAY FROM INSTRUMENT TO PC

- a) Connect your instrument to a PC by following the procedure described in paragraph 1.0.
- b) Click on “Tools” and “Get Screen” on the instrument bar.
- c) Wait for the display to appear on the PC monitor.

3.2.2 HOW TO PRINT THE DISPLAY

- a) Click on “File” on the instrument bar and select “Print Setup”.
- b) Configure the print settings and press “OK” to confirm.

3.2.3 HOW TO SAVE THE DISPLAY

- a) Click on “File” on the instrument bar and select “Save As”.
- b) Chose a location where you want to save the file and press “Save”.
SMART will save the display obtained from the meter in bitmap format.

3.3 NOTES

- a) Pictures are saved with file type .bmp (Bitmap),
- b) Only the spectrums and measurements graphics, generated by the instrument, can be transferred to the PC; demodulated television pictures can not be transferred.

3.4 WARNINGS





- a) If this operation continues to fail, contact Ro.Ve.R Laboratories SpA (info@roverinstruments.it).

4.0 “INSTRUMENT FILE MANAGER” (DATA LOGGER TRANSFER)

This operation allows you to transfer a Data Logger from your measuring instrument to a PC and then print it or save it in a file.

4.1 SIMPLIFIED PROCEDURE

HOW TO TRANSFER A DATA LOGGER FROM AN INSTRUMENT TO A PC

1. Carry out all the necessary connections (see paragraph 1.0)
2. Click on  (See instrument bar description)
3. Wait for the complete file list to download on your instrument
4. Click on the Logger folder and open the Logger file
5. Select one of the following options:
 - Print a logger file by pressing  on the instrument bar (see 4.2.2)
 - Save a data logger in your PC by pressing  in the instrument bar (see 4.2.3)
 - Delete a data logger by pressing  in the “Instrument File Manager” window (see 4.2.4)
 - Export a Data Logger in an Excel or Word file (see 4.2.5).

4.2 DETAILED PROCEDURE

4.2.1 HOW TO TRANSFER A DATA LOGGER

- a) Connect your instrument to a PC by following the procedure described in paragraph 1.0,
- b) Click on “Instrument” on the instrument bar and select “Instrument file manager”,
- c) Wait for the file list to download on the PC,
- d) The folder Read File will be shown on the screen. Open the Logger folder (Fig. 4.1),
- e) All logger files will be listed (Fig. 4.2).
- f) Click twice on a file logger to visualise it (fig. 4.2)

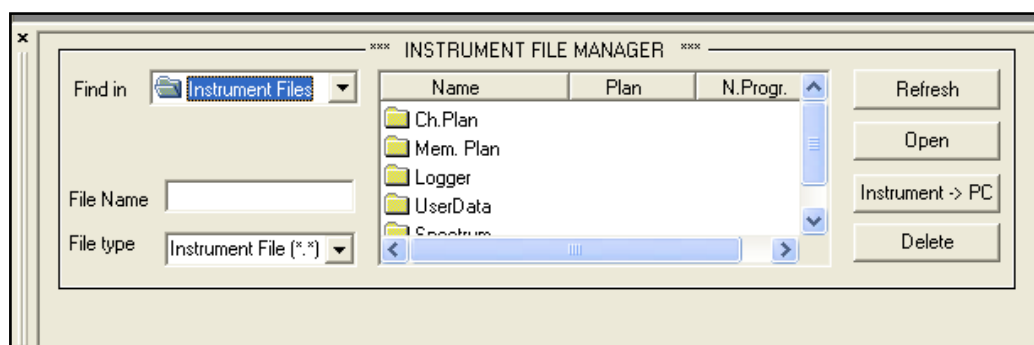


Figure 4.1

4.2.2 HOW TO PRINT A FILE LOGGER

- a) Open the Logger folder, (See Fig. 4.1)
- b) Select and open the Logger file you want to print,
- c) Click on “File” on the instrument bar and select “Print”,
- d) Configure the print settings and press “OK” to confirm.

4.2.3 HOW TO SAVE A DATA LOGGER ON A PC

- a) Open a Logger file, (See Fig. 4.1)
- b) Select and open the Logger file you want to save,
- c) Click on “File” on the instrument bar and select “Save as”,
- d) Chose the location where you want to save the file and press “Save”.

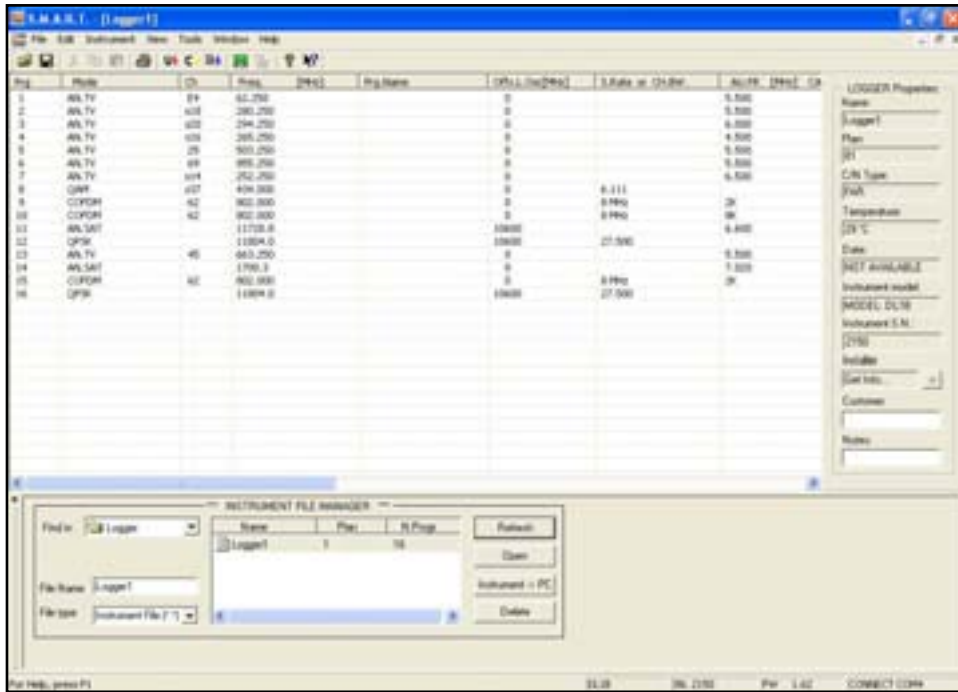


Figure 4.2

4.2.4 HOW TO DELETE A DATA LOGGER

- a) Open the Logger folder (See Fig. 4.1),
- b) Select from the “Instrument File Manager” window the logger file you want to delete,
- c) Press the “Delete” key in the “Instrument File Manager” window,
- d) The file will be cancelled on instrument.

4.2.5 HOW TO EXPORT A DATA LOGGER IN AN EXCEL SPREADSHEET

- a) Open the logger folder (See Fig. 4.1 and 4.2),
- b) Select and open the logger file you want to export,
- c) Click on “File” on the instrument bar and select “Export”,
- d) In the open window, name the file and chose the location where you want to save it,
- e) Chose file type .XLS (See Fig. 5.2),
- f) Select “save”,
- g) The logger file will be saved in Excel format in the form of a table.

4.3 NOTES

- a) None


4.4 WARNINGS




- a) If this operation continues to fail, contact Ro.Ve.R Laboratories SpA (info@roverinstruments.it).

5.0 INSTRUMENT FILE MANAGER

This allows you to transfer a spectrum, saved previously on your meter, to a PC in order to be able to print it or save it on your PC.

HOW TO TRANSFER A SPECTRUM

1. Carry out all the necessary connections (see paragraph 1.0)
2. Click on  (See instrument bar description)
3. Wait for the complete file list to download on your instrument
4. Open the Spectrum folder and open the Spectrum file (See Fig. 4.1)
5. Select one of the following options:

- Print a spectrum by pressing  on the instrument bar (see 5.2.2)
- Save a spectrum in your PC by pressing  on the instrument bar (see 5.2.3)
- Delete a spectrum by pressing  in the “Instrument File Manager” window (see 5.2.4)
- Export a spectrum in Excel form by selecting “file – export” in the instrument bar (see 5.2.5)

5.2 DETAILED PROCEDURE

5.2.1 HOW TO TRANSFER A SPECTRUM

- a) Connect your instrument to a PC as described in paragraph 1.0
- b) Click on “Instrument” on the instrument bar and select “Instrument File manager”.
- c) Wait for the file list to be downloaded from your meter to the PC,
- d) Your monitor will show the Instrument File manager folder; open the Spectrum folder by clicking twice (Fig. 4.1)
- e) All the spectrum files transferred to the instrument will be listed,
- f) Click twice on the spectrum file to show it on the screen (Fig. 5.1)

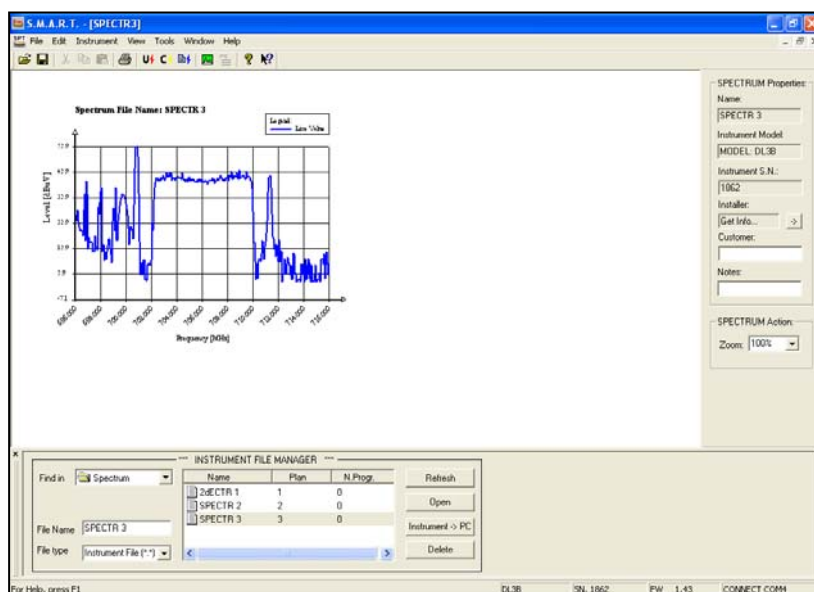


Figure 5.1

5.2.2 HOW TO PRINT A PICTURE

- a) Open a spectrum file (See 5.1),
- b) Click on “File” on the instrument bar and select “Print”,
- c) Configure the print settings and press “OK” to confirm.

5.2.3 HOW TO SAVE A SPECTRUM ON TO A PC

- a) Open a spectrum file (See 5.1),
- b) Click on “File” on the instrument bar and select “save As”,
- c) Chose the location where you want to save the file, give it a name and press “Save”.

5.2.4 HOW TO DELETE A SPECTRUM

- a) Open a spectrum file,
- b) Select from the “Instrument File Manager” window the spectrum file you want to delete
- c) Press the “Delete” key from the “Instrument File Manager” window,
- d) The file will also be cancelled in the instrument.

5.2.5 HOW TO EXPORT A SPECTRUM IN EXCEL FORMAT

- a) Open a spectrum file (See 5.1),
- b) Click on “File” on the instrument bar and select “Export”,
- c) Name the file in the open window and chose the location where you want to save the file,
- d) Chose the file type .XLS (See Fig. 5.2),
- e) Select “save”,
- f) The spectrum file will be transferred to an Excel spreadsheet in graphics form.

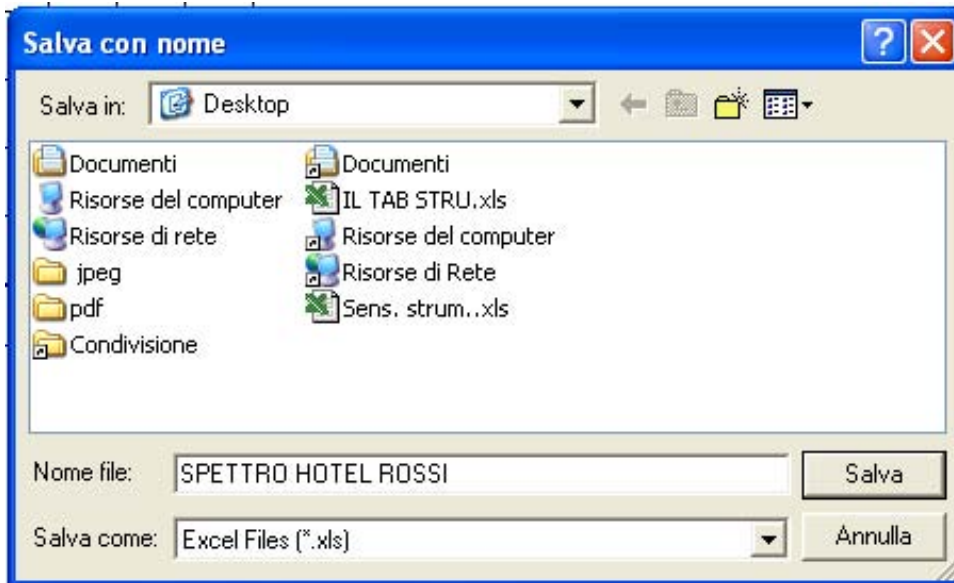


Figure 5.2

5.3 NOTES

- a) None.

5.4 WARNINGS


- a) If this operation continues to fail, contact Ro.Ve.R Laboratories SpA (info@roverinstruments.it)

6.0 HOW TO INSERT USER DATA

This function allows you to insert user data in your meter (for example: company name, address, telephone number, etc.). This data is shown in documents during printing (for example: logger file, memory and channel plan, spectrums, etc.).

6.1 SIMPLIFIED PROCEDURE

HOW TO INSERT USER DATA

1. Carry out all the necessary connections (see paragraph 1.0)
2. Click on  (See instrument bar description)
3. Wait for the complete file list to download from your meter
4. Open the "User Data" folder
5. Open and modify the User Data file
6. Select one of the following options:
 - Insert the user data (see 6.2.2)
 - Save the file in the instrument (see 6.2.3)
 - Save the file in the PC (see 6.2.4)
 - Delete a file (see 6.2.5)

6.2 DETAILED PROCEDURE

6.2.1 HOW TO INSERT USER DATA

- a) Connect your instrument to a PC as described in paragraph 1.0
- b) Click on "Instrument" on the instrument bar and select "Instrument File Manager".
- c) Wait for the file list to download on to your PC.
- d) The Instrument File Manager window will appear on your screen; open the User Data file by clicking twice (Fig. 4.1)
- e) The User Data files will be shown.
- f) Click twice on the name to open the file (fig. 6.1)

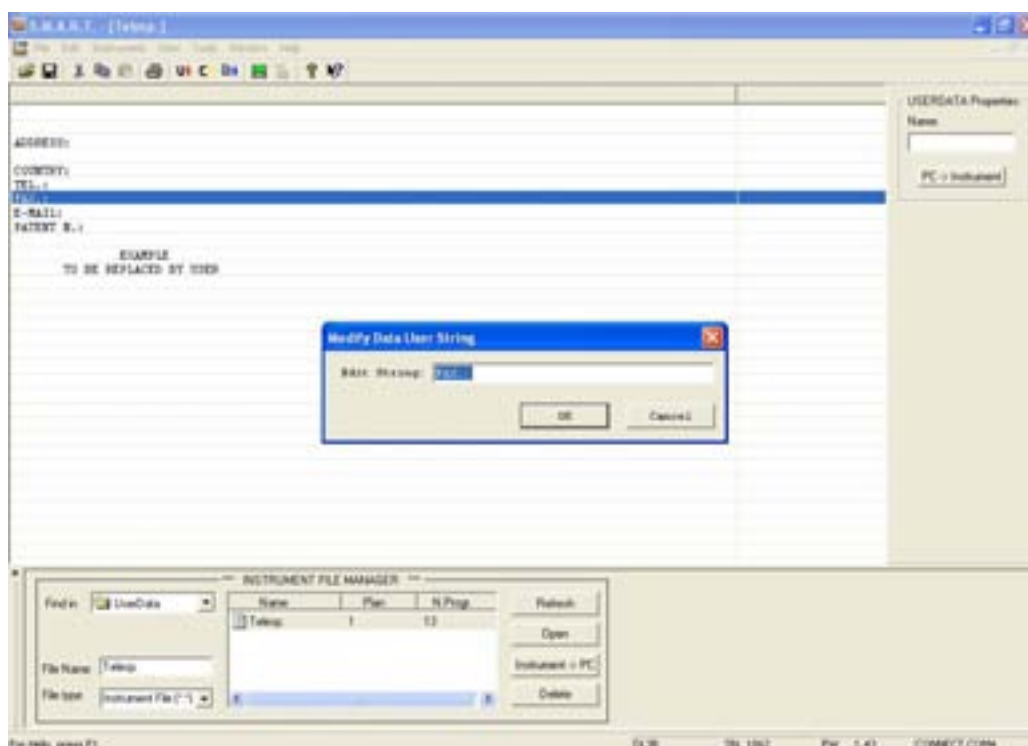


Figure 6.1

6.2.2 HOW TO INSERT USER DATA

- a) Once the file opens (Fig. 6.1) you can write by clicking twice on the line required,
- b) The compilation window opens; insert the text required and confirm by pressing "OK",
- c) Fill in and/or modify the 13 lines one at a time following the same procedure.

6.2.3 HOW TO SAVE A FILE IN YOUR INSTRUMENT

- a) Fill in the table.
- b) On the right-hand side of the window, shown in Fig. 6.1, name the file in the USERdata Properties sections.
- c) Click on the "PC-Instrument" (Fig. 6.1) key in the USERdata properties section (to the right of the window) to transfer the data to your meter.
- d) Confirm the file overwrite in your meter.

6.2.4 HOW TO SAVE A FILE IN YOUR PC

- a) Fill in the User Data file,
- b) Click on "File" and "Save As" on the instrument bar,
- c) Chose a location where you want to save the file and press "Save".

6.2.5 HOW TO DELETE A FILE

- a) Open the folder containing the file to be deleted,
- b) Select the file you want to delete from the "Instrument File Manager" window,
- c) In the "Instrument File Manager" window, press the "Delete" key,
- d) The file will be deleted from the instrument.

6.3 NOTES

- a) To visualise the file in the instrument:
 - a. Press the SPECIAL key on the instrument and select FILE MANAGER.
 - b. Select USER DATA from the file list and press INFO.

6.4 WARNINGS





- a) If this operation continues to fail, contact Ro.Ve.R Laboratories SpA (info@roverinstruments.it).

7.0 INSTRUMENT FILE MANAGER (MEMORY PLAN MANAGEMENT)

This function allows you to transfer and manage a Memory Plan on your PC in order to be able to modify and print it.

7.1 SIMPLIFIED PROCEDURE

MEMORY PLAN MANAGEMENT

1. Carry out all the necessary connections (see paragraph 1.0)
2. Click on  (See instrument bar description)
3. Wait for the complete file list to download from your meter
4. Open the Mem. Plan folder (see Fig. 7.1)
5. Select the file you want to open
6. Select one of the following options:
 - a. Modify a Memory Plan (See 7.2.2)
 - b. Download a Memory Plan from a PC to your meter (See 7.2.3)
 - Print a Memory Plan by pressing  on the instrument bar (See 7.2.4)
 - Save a Memory Plan by pressing  on the instrument bar (7.2.5)
 - Delete a Memory Plan by pressing  in the “Instrument File Manager” window (See 7.2.6)

7.2 DETAILED PROCEDURE

7.2.1 HOW TO TRANSFER A MEMORY PLAN FROM YOUR METER TO A PC

- a) Connect your instrument to a PC as described in paragraph 1.0
- b) Click on “Instrument” on the instrument bar and select “Instrument File Manager”.
- c) Wait for the complete file list to download on to your PC.
- d) The “Instrument File Manager” will appear on the screen. Open the Mem. Plan folder required by clicking twice.
- e) All memory files will be listed.

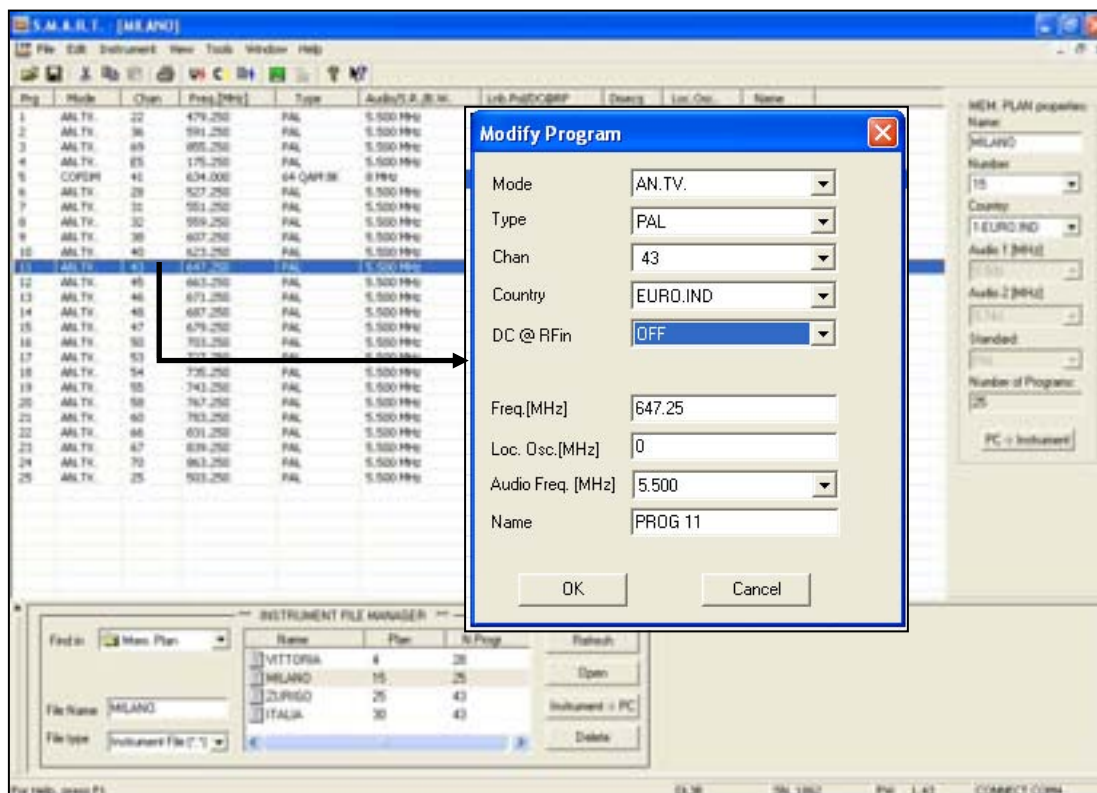


Figure 7.1

7.2.2 HOW TO MODIFY A MEMORY PLAN

HOW TO MODIFY AN EXISTING PROGRAM

- a) Select and open the Memory file you want to edit,
- b) Click twice on the line relative to the program you want to edit,
- c) The program opens a window where you can modify all the parameters of the chosen program (see fig. 7.1)

HOW TO ADD A PROGRAM

- a) Using the right-hand key on your mouse, click on the line you want to modify and select "Add",
- b) Carry out the settings of the new program in the window that opens (see fig. 7.1),
- c) Press "Ok" to confirm the addition of a program.

7.2.3 HOW TO TRANSFER A MEMORY PLAN FROM A PC TO AN INSTRUMENT

- a) Once you have carried out the modification, following the procedure described in paragraph 7.2.2, click on the "Instrument-PC" key in the MEM. PLAN properties section (on the right of the screen) to transfer a memory plan from a PC to your instrument,
- b) The memory plan will load in the instrument.

7.2.4 HOW TO PRINT A MEMORY PLAN

- a) Select and open the Memory file you want to print (See 7.2.1),
- b) Click on "Instrument" on the instrument bar and select "Print",
- c) Configure the print settings and press "OK" to confirm.

7.2.5 HOW TO SAVE A MEMORY PLAN

- a) Open a Memory Plan file (See 7.2.1),
- b) Click on "File" on the instrument bar and select "save As",
- c) Chose a location where you want to save the file, give it a name and press "Save".

7.2.6 HOW TO DELETE A MEMORY PLAN

- a) Select and open the Mem. Plan file you want to delete,
- b) Press the "Delete" key in the "Instrument File Manager" window,
- c) The file will also be deleted from the instrument.

7.3 NOTES

- a) None

7.4 WARNINGS





- a) When new memory plans are inserted, cancelled or modified and transferred to the instrument, we suggest you carry out a Defrag in your meter. (Please refer to the instrument's user guide)
- b) If this operation continues to fail, contact Ro.Ve.R Laboratories SpA (info@roverinstruments.it).

8.0 INSTRUMENT FILE MANAGER (STANDARD CHANNEL PLAN MANAGEMENT)

This function allows you to transfer and manage the Channel Plan on a PC so that it can be modified and printed.

8.1 SIMPLIFIED PROCEDURE

CHANNEL PLAN MANAGEMENT

1. Carry out all the necessary connections (See paragraph 1.0)
2. Click on  (See instrument bar description)
3. Wait for the complete file list to download on your instrument
4. Open the Ch. Plan folder (See Fig. 4.1)
5. Select the file you want to open
6. Select one of the following options:
 - a. Modify a Channel Plan (See 8.2.2)
 - b. Download a Channel Plan from a PC to your meter (See 8.2.3)
 - c. Print a Channel Plan by pressing  on the instrument bar (8.2.4)
 - d. Save a Channel Plan by pressing  on the instrument bar (8.2.5)
 - e. Delete a Channel Plan by pressing  in the “Instrument File Manager” window (See 8.2.6)

8.2 DETAILED PROCEDURE

8.2.1 HOW TO TRANSFER A CHANNEL PLAN FROM YOUR METER TO A PC

- a) Connect your instrument to a PC as described in paragraph 1.0,
- b) Click on “Instrument” on the instrument bar and select “Instrument File Manager”,
- c) Wait for the file list to download on to your PC,
- d) The “Instrument File Manager” window will appear on your screen (Fig. 4.1), open the Ch. Plan folder required by clicking twice,
- e) All Channel Plan files will be listed.

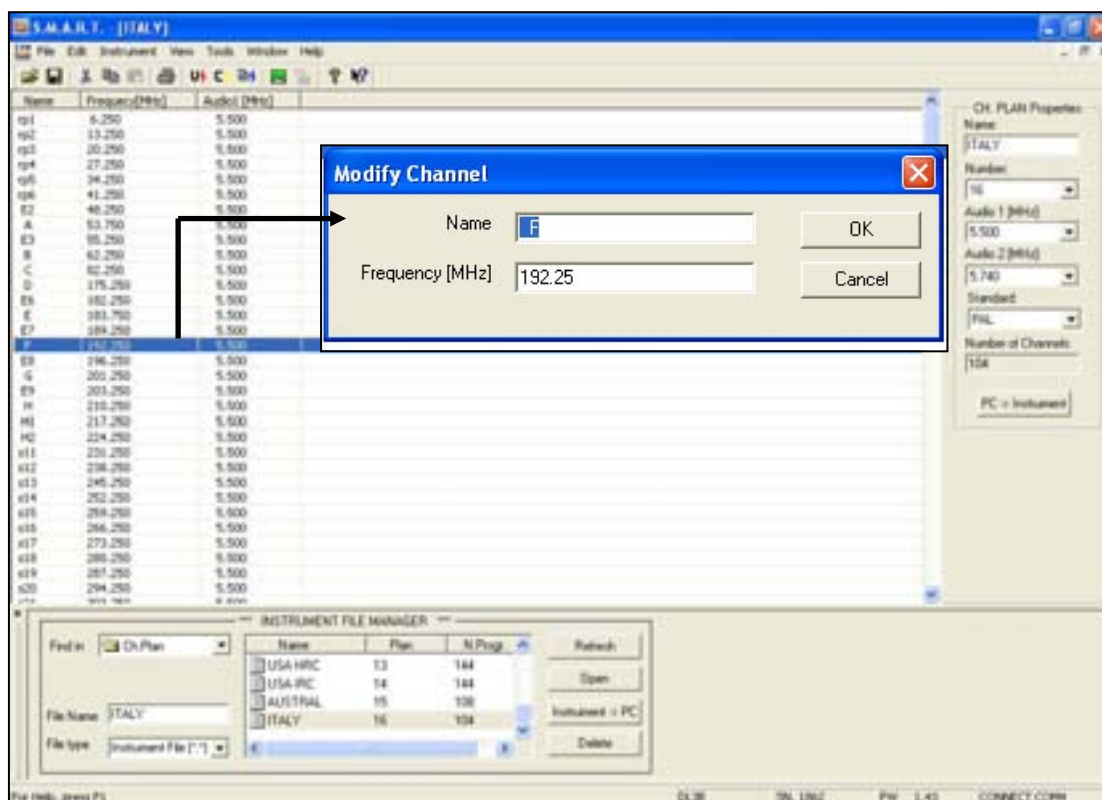


Figure 9.1

8.2.2 HOW TO CHANGE A CHANNEL PLAN

HOW TO CHANGE AN EXISTING CHANNEL

- a) Select and open the Channel file you want to edit,
- b) Click twice on the line relative to the channel you want to edit,
- c) The program opens a window where it is possible to modify all the parameters.

HOW TO ADD A CHANNEL

- a) Using the right-hand key on the mouse, click on the line to be modified and select "Add",
- b) A window will open where it is possible to set the new channel's parameters (See fig. 8.1),
- c) Press "Ok" to confirm the addition of a new channel.

8.2.3 HOW TO TRANSFER A CHANNEL PLAN FROM A PC TO YOUR INSTRUMENT

- a) Once the modification has finished, following the procedure described in paragraph 8.2.2) click on the "Instrument – PC" key in the CH. PLAN properties section (to the right of the screen) to transfer the channel plan from the PC to your instrument,
- b) The channel plan will be loaded in your instrument.

8.2.4 HOW TO PRINT A CHANNEL PLAN

- a) Select and open the Channel file you want to print, (See 8.2.1)
- b) Click on the word "Instrument" on the instrument bar and select "Print",
- c) Configure the print settings and press "OK"

8.2.5 HOW TO SAVE A CHANNEL PLAN

- a) Open a Memory Plan file (See 8.2.1),
- b) Click on "File" on the instrument bar and select "save As",
- c) Chose a location where you want to save the file, give it a name and press "Save".

8.2.6 HOW TO DELETE A CHANNEL PLAN

- a) Open a plan folder (see fig. 4.1)
- b) Select and open the Ch. Plan you want to delete,
- c) Press the "Delete" key in the "Instrument File Manager" window,
- d) The file will also be cancelled in the instrument.

8.3 NOTES

- a) None.

8.4 WARNINGS

- a) We strongly suggest NOT to cancel the existing channel plans because the channel plans generated based on the eliminated ones may be distorted.
- b) If this operation continues to fail, contact Ro.Ve.R Laboratories SpA (info@roverinstruments.it).

9.0 LICENCE INFORMATION

This function allows you to insert a licence number to activate the Smart Professional program, 30 days after the installation date.

9.1 SIMPLIFIED PROCEDURE

LICENCE INFORMATION	
<ol style="list-style-type: none"> 1. Start up the SMART program 2. Click on “Help” in the instrument bar 3. Select “Licence Information” - See Fig. 9.1 4. Insert the licence number in the appropriate window 5. Press Add to include the licence number 6. Press “Ok” to close the “Licence Information” window 	

9.2 DETAILED PROCEDURE

9.2.1 LICENCE INFORMATION

- a) Start up the SMART program
- b) Click on “Help” in the instrument bar
- c) Select “Licence Information” – See Fig. 9.1
- d) Insert the licence number, issued by Ro.Ve.R Laboratories S.p.A in the appropriate window
- e) Press Add to include the licence number
- f) Press “Ok” to close the “Licence Information” window

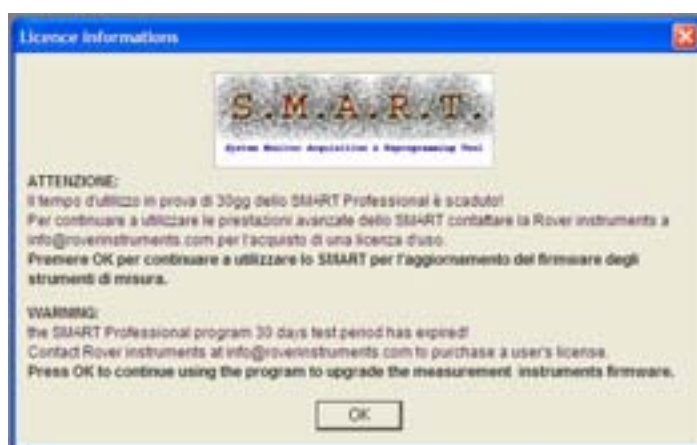


FIG. 1 This indication appears 30 days after the installation date



FIG. 2 This window allows you to insert the Smart program licence number

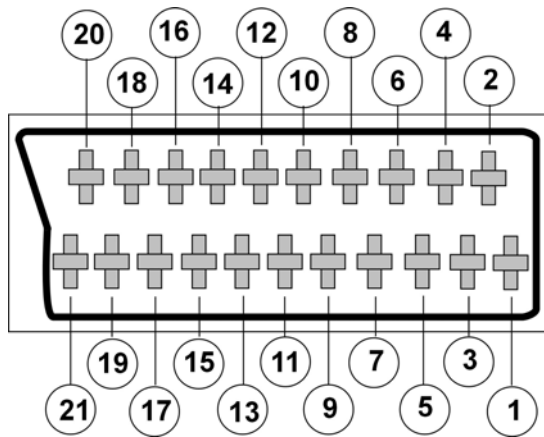
9.3 NOTES

- a) *The Smart Professional expires 30 days after the installation date. You can, however, use the Smart program only to carry out firmware upgrades on your meter.*
- b) Once you have inserted your licence number, the program is activated to carry out all the functions.

9.4 WARNING

- a) *For information regarding the licence number for the Smart Professional program, contact Ro.Ve.R. Laboratories S.p.A. info@roverinstruments.it.*

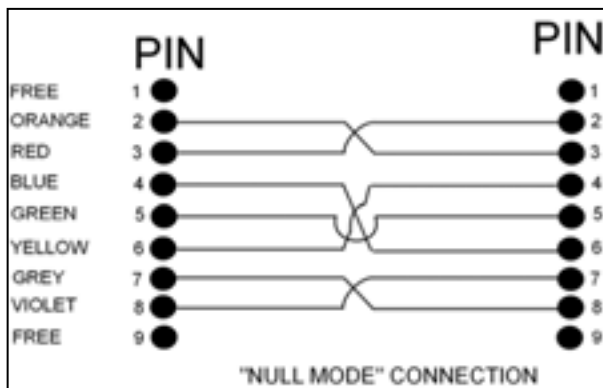
A3 - SCART SOCKET CONNECTION



12. The following signals are featured on this SCART socket:

Pin no.	Signal
1.	Audio output
2.	Audio input
3.	Audio output
4.	Audio ground
5.	Audio output
6.	Audio input
7.	+5V output
8.	+12V output
9.	Ground (GND)
10.	Not connected
11.	Not connected
12.	Not connected
13.	Ground (GND)
14.	Not connected
15.	Video output (Ter. + Sat. + Digital)
16.	Not connected
17.	Ground (GND)
18.	Ground (GND)
19.	Special video output (Picture + OSD)
20.	Video input
21.	Ground (GND)

NULL MODEM INTERFACE CABLE



Pin no.	Signal
1.	Not connected
2.	TXD
3.	RXD
4.	DSR
5.	GND
6.	DTR
7.	CTS
8.	RTS
9.	Not connected

Null Modem cable connection diagram

A5 - TROUBLE SHOOTING

For all faults always call the manufacture or the authorized service centre in your country. Never return an analyzer directly to the manufacturer before consulting them first and obtaining their specific instructions. Please find below the most common problems that could occur and which can be easily solved:

PROBLEMS & SOLUTIONS:

P: The analyzer does not work or is working incorrectly even if it is connected to the mains:

S: Verify that the "MAINS" [24] green LED is on. If it is not on control the ac/ac adapter supplied with your analyzer.

P: The batteries can not be charged:

S: Verify that when the meter is off the "MAINS" [24] and "BAT CHRG" [15a/b] LED's are on. Verify the internal battery status.

P: There is poor picture quality or the picture does not appear:

S: Check that the "BRIGHT" [33] and "CONTRAST" [32] trimmers, found on the left side of the instrument, are adjusted correctly (see page 73).

P: The analyzer does not respond to the commands:

S: In the rare cases that the analyzer no longer responds to the front panel commands, keep the **ON/RESET** [24] button pressed for 10 seconds. No information is lost during this operation (e.g. memory plans, data logger, etc.)

P: During battery charging the **BAT FULL** [15a] LED turns on immediately:

S: There could be a problem with the batteries, contact the service for further information.

P: With weak TV signals or signals with lots of interferences, the TV pictures can not be tuned:

S: Exclude the OSD and reactivate it; it should lock


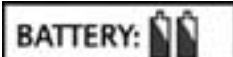

P: The graphics (words) do not tune during the frequency tuning of analog and SAT & TV programmes:

S: Disconnect the RF input signal for a few seconds and the words should become stable.

NOTES:

- *To report any faults, photocopy and fill-in the attached "FAULT IDENTIFICATION FORM" and send it to the manufacturer.*
- *As the meter is very complex, we strongly advise that repairs should only be carried out by expert staff, authorized by the manufacturer.*
- *The analyzer is built almost completely using SMD components and it is therefore not easy to repair; for this reason the manufacturer does not provide any circuit diagrams.*
- *If the manufacturer considers that the analyzer has to be returned for repair, photocopy and fill-in the "EQUIPMENT REPAIR and/or Service Form" and attach it to the meter when returning it.*

A6 - LEAD BATTERY MAINTENANCE AND RECHARGE

- The analyzer has a + 12 V, 7 A built-in power supply with lead batteries.
- Low battery indications:
 -  + **1 beep:** will appear 30 minutes before switch off.
 -  + **2 beeps:** will appear 20 minutes before switch off
 -  + **3 beeps:** will appear 5 minutes before switch off.

All the messages are repeated every 30 seconds and are accompanied by an audible tone, even if the volume is low.

Recharging procedure of the lead batteries provided with the analyzer:

- a) Connect the adapter to the mains and insert the plug into the connector socket [27] (or in a vehicle using the optional cigarette lighter adapter).
- b) Turn off the DM14B/C and the BATTERY CHRG [15a] LED will light up (if the instrument is turned on, the batteries will not recharge).
- c) Keep the batteries under charge until the FULL BATTERY LED lights up [15b] together with the BATTERY CHRG [15a] (batteries which are completely discharged require approximately 4 hours).
- d) 50% of the charge can be achieved in about an hour.

Battery replacement procedure:

- a) Open the upper cover of the instrument (not indispensable).
- b) Unscrew the eight external screws in the back battery box.
- c) Pull out the battery box, remove the two Faston clips, remove the four screws in the battery holder metal cage. Replace the normal batteries with 12 V, 7 A Lead batteries, guaranteed for at least 200/500 loads.

NOTES:

- The "BATTERY CHRG" LED on the front of the DM14B/C lights up when the meter is recharging.
- The fully charged battery capacity is 4 hours at 25°C, and decreases considerably if the working temperature is higher than 35°C or less than 10°C.
- The batteries do not recharge if the DM14B/C is on.
- Once the recharging procedure has been completed the BATTERY CHRG LED turns off and the FULL BATTERY LED turns on.
- Once the battery is charged the battery charge automatically stabilizes and the meter can be connected to the mains for as long as you like.
- As you know, lead batteries usually have overload problems. The batteries can be damaged indefinitely if they are left discharged for more than 24 hours.
- In the DM-14 the battery discharge is controlled by a microprocessor, which turns off the instrument in order to maintain the battery residual charge. This residual charge means that the batteries do not degrade without recharge for a maximum of 3 months.

BATTERIES NOT UNDER GUARANTEE:

The batteries are a standard format: 12V 7 A Lead. They can be easily purchased from all distributors of electronic components and electrical supplies, at a cost of approximately 5 Euros / \$.

N.B. RO.VE.R. does not supply replacement batteries because the transport costs exceed the cost of the batteries.



View of back panel

A7 - ACCESSORIES

SUPPLIED

- **TRASF-MKA57**
AC/AC adapter
– 230 V input
– 17 Vac, 1.6 A output
- **BORSA-D142**
Instrument protective bag with side pocket for tools and accessories, light shield and transparent document holder, shoulder strap for transport purposes
- **CNN-F-0150**
Interchangeable double female F/F input connector
- **TRA-FFEM-CEIFEM**
Interchangeable double female F/IEC input connector
- **TRA-BNCF-FFEM**
Interchangeable double female BNC/F input connector
- **MAN-HP3-01**
Spare contrast and brightness control knob (spare)
- **CAVO-DD-FF-2000**
RS 232 female/female (Null modem) cable to connect Your meter to a PC for SW up-grades via internet

OPTIONAL

- **TSI-CNG**
Calibrated noise generator, 0.5–2150 MHz, 70 dB μ V/10 dBmV with "F" and "BNC" cable for the calibration and test of filters, amplifiers, cables, etc.
- **TRASF-PSU40B-6**
AC/DC electronic adaptor, ultra light, input: 110–240 V, output: 24 Vdc, 2 A
- **VCA-1224**
Vehicle cigarette lighter, charger, adapter (input 12 V, output 24 Vdc)
- **DL1B-AML-OPT**
Amplitude modulation Audio TV for France only ("L" standard) (components added to mother board)
- **DL2-QAM-OPT**
QAM and 8VSB demodulator board
- **TRA-FFEM-NFEM**
Interchangeable double female F/N input connector



A8 - FRONT & SIDE PANEL DESCRIPTIONS

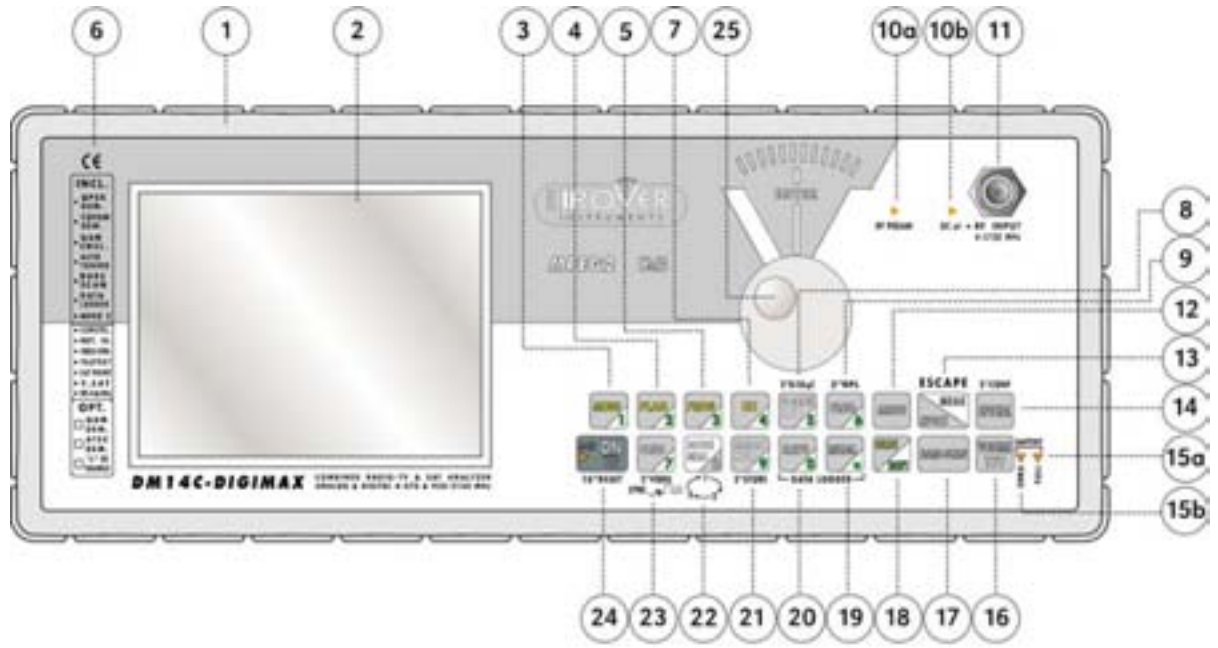
(Fold out this page for easy consultation when using the manual)

- [1] Protective rubber
- [2] Anti shock, encased TV display
- [3] MODE selection key (direct function) and No. 1 with SHIFT,
- [4] PLAN selection key (direct function) and No. 2 with SHIFT
- [5] PROGRAM selection key (direct function) and No. 3 with SHIFT
- [6] Options label
- [7] CHANNEL selection key (direct function) and No. 4 using SHIFT
- [8] RF input voltage selection (direct function) & DiSEqC key (keep pressed it for 2") and No. 5 with SHIFT
- [9] Frequency selection key (direct function) and No. 6 with SHIFT (keep pressed for 2" to activate RPL spectrum function).
- [10a] LED indicating internal RF preamplifier operation
- [10b] LED indicating the presence of voltage at the RF input connector
- [11] RF input connector (interchangeable "F" connector)
- [12] MENU key
- [13] Measurement or spectrum mode selection key and ESCAPE
- [14] Special menu functions key (keep pressed for 2 seconds to activate the CONFIGURATION MENU)
- [15a] Complete battery charge indication LED
- [15b] Battery charging indication LED
- [16] Volume adjustment key (with the DM-14Color this also adjusts the TFT's contrast and brightness)
- [17] Bars Scan function key
- [18] SHIFT key to access the numerical keyboard from 0 to 9 and ●
- [19] Data Logger Recall key and comma with SHIFT
- [20] Data Logger Save key and No. 0 with SHIFT
- [21] Memory menu key and No. 9 using SHIFT (keep pressed for 2 sec. to activate MEMORY STORE)
- [22] MORE MEAS key and No. 8 with SHIFT
- [23] OSD setting key (keep pressed for 2 sec. to activate H-SYNC function) and No. 7 with SHIFT
- [24] ON/OFF key and MAINS LED (press for 10 seconds to reset the instrument if the meter blocks)
- [25] Rotating Encoder selection knob (Press the encoder and the cursor to confirm a selection)

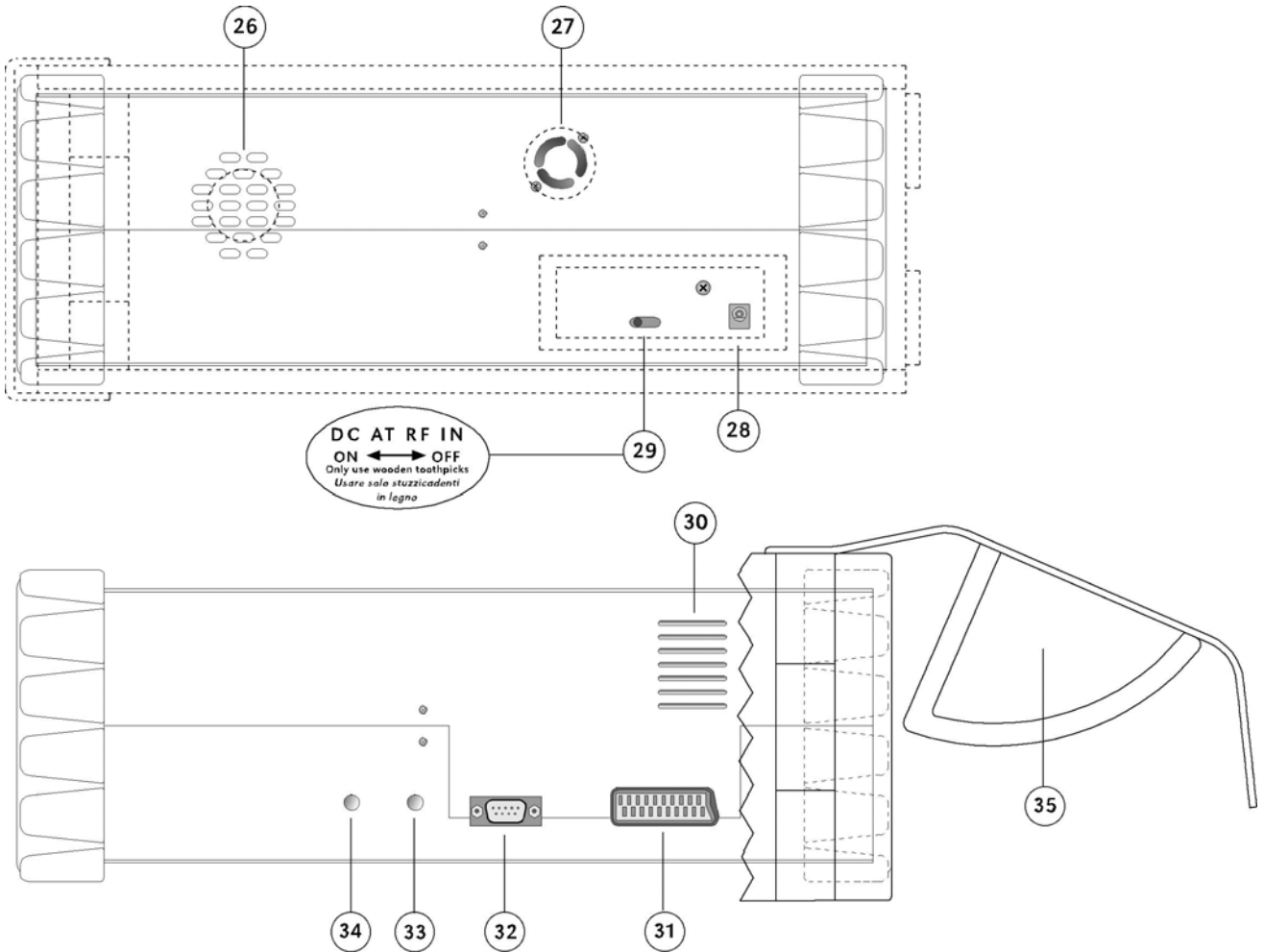
Side panel

- [26] Loud speaker
- [27] Cooling fan
- [28] Connector for external power supply and/or battery charge, Ø 5.5 x 2.5 mm
- [29] DC at RF IN switch (turn off when working with CATV networks with 66 VAC voltages in coax cables)
- [30] Cooling grid
- [31] AUDIO/VIDEO SCART socket
- [32] RS232 serial interface port
- [33] TV display contrast adjustment knob (only for DM-14B meter)
- [34] TV display brightness adjustment knob (only for DM-14B meter)
- [35] Light shield, rain cover and transparent document pocket

FRONT PANEL

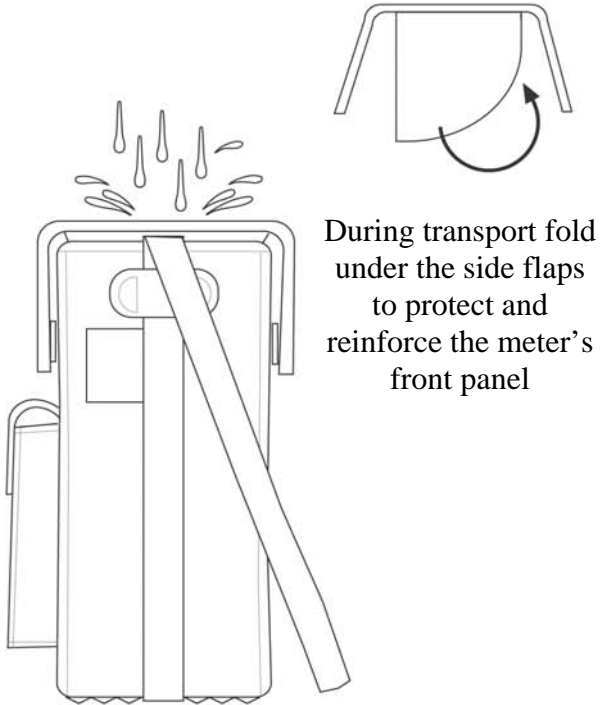


SIDE VIEWS

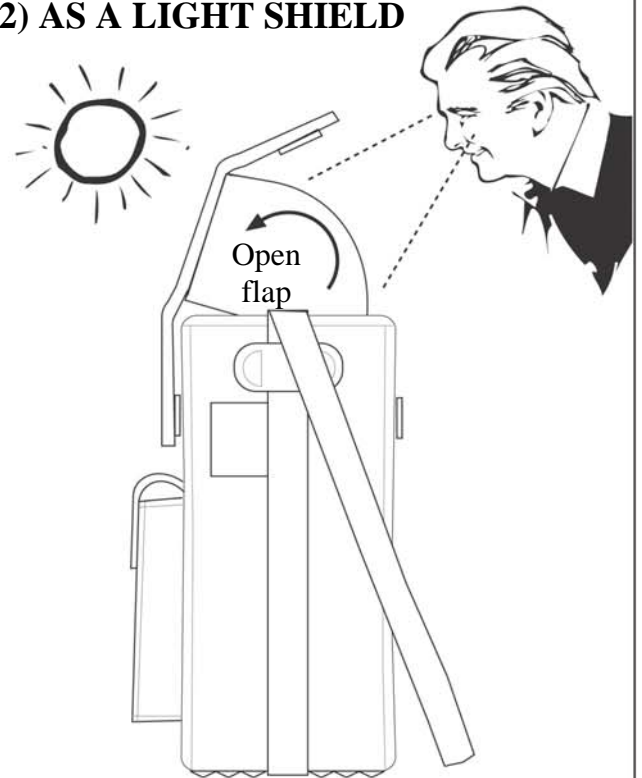


A9 - HOW TO USE THE BAG'S FRONT PANEL PROTECTION FLAP IN "DIGIMAX" INSTRUMENTS

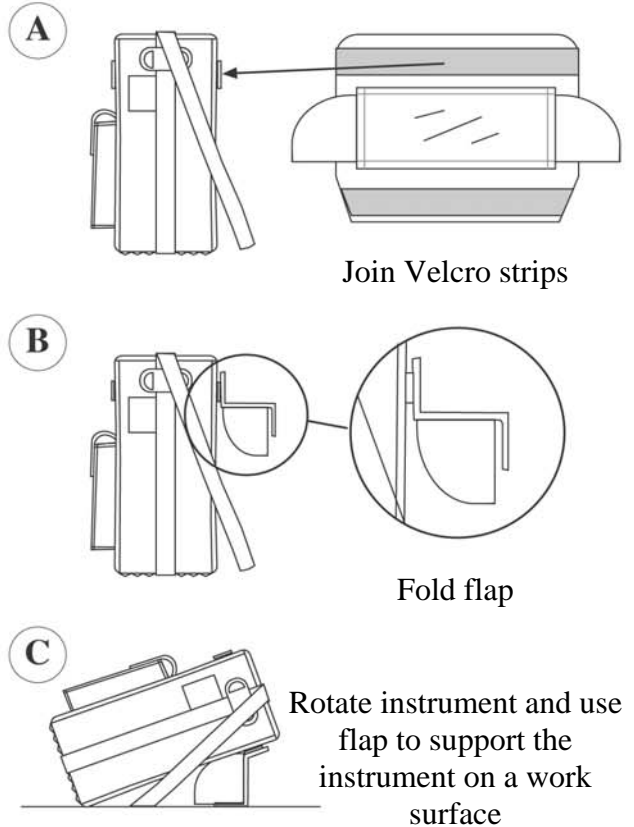
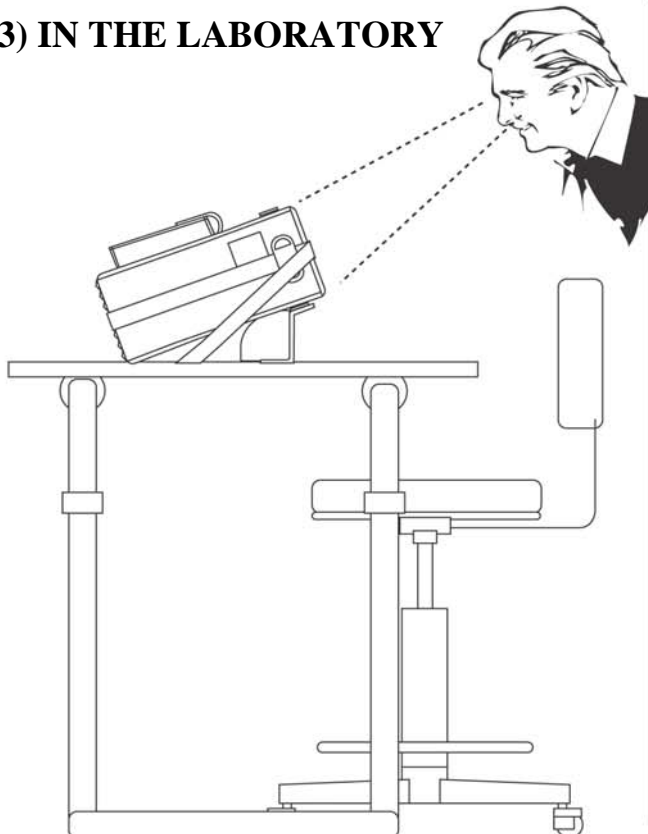
1) FOR TRANSPORT PURPOSES



2) AS A LIGHT SHIELD



3) IN THE LABORATORY



A10 - SERVICE NOTES AND GUARANTEE REGULATIONS

- 1) Rover Laboratories. S.p.A. guarantees the repair of its manufactured equipment for a period of 24 months.
- 2) **IMPORTANT:** the guarantee becomes valid when Rover Laboratories S.p.A. receives the correctly compiled warranty coupon, or alternatively, on presentation of an invoice or receipt, clearly showing the date of purchase.
- 3) The guarantee covers the replacement, free of charge, of all parts, which are not functioning correctly due to manufacturing faults.
- 4) **The guarantee is considered 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;
 - c. damage is found caused by the use of the equipment in unsuitable working environments.
- 5) **The following parts are not covered by the guarantee:**
 - a. Parts subject to wear, such as aesthetics ones;
 - b. Batteries;
 - c. Bags.
- 6) The equipment can only be repaired by the manufacturer or by an authorised Rover Laboratories service centre.
 - a. Before returning the meter for repair, always contact Rover Laboratories S.p.A. or an authorised service centre to obtain the return procedure for your analyzer.
 - b. When returning the meter, always send it with the following documentation attached: the fully-compiled **FAULT IDENTIFICATION FORM**, a transport document and the eventual request for an estimate of repair costs.
 - d. Please note that the request for an estimate of repair costs must be submitted upon return of the analyser with a written note. If the repair cost estimate is not accepted, Rover Laboratories reserves the right to charge the customer for the estimate analysis costs.
- 7) 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 in the invoice.
- 8) The equipment can not be replaced and the guarantee extended after the repair of a fault.
- 9) 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.
- 10) Rover 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.
- 11) Rover Laboratories instruments mod. "DL" are recognised and are fully compliant with DVB regulations and specifications (ETS 300 421 – 12 / 94) and are consequently marked with the DVB logo and registered with id. N. 3088.

A11 – FAULT IDENTIFICATION FORM

RO.VE.R.[®]
INSTRUMENTS

FAULT IDENTIFICATION FORM

Only for digital models in the **TDA-CDA-SDA-DL** series

Customer:..... Contact person:

Tel No.:..... Fax No.:

Instrument mod.: Serial No.:

Software version: *(shown on the display when the instrument is turned on)*

Please would you kindly answer the following questions to facilitate fault identification (tick the appropriate boxes)

● IN WHICH CONDITION DID THE FAULT OCCUR?

- | | | |
|--|---|---|
| <input type="checkbox"/> Instrument turned off & being recharged | <input type="checkbox"/> When the instrument was cold | <input type="checkbox"/> After an accidental fall |
| <input type="checkbox"/> Whilst tuning on the instrument | <input type="checkbox"/> When the instrument was hot | <input type="checkbox"/> Other..... |

● IS THE FAULT ALWAYS PRESENT OR DOES IT ONLY OCCUR IN THE FOLLOWING CONDITIONS?

- | | | |
|--|--|--|
| <input type="checkbox"/> When tapping on the casing | <input type="checkbox"/> When the instr. is powered using internal batteries | <input type="checkbox"/> When the instrument is cold |
| <input type="checkbox"/> When the instrum. is powered using the AC adapter | <input type="checkbox"/> When the instrument has just been turned on | <input type="checkbox"/> When the instrument is hot |

● HAS THE INSTRUMENT HAD ANY MECHANICAL BREAKAGES?

- | | | |
|---|--|--|
| <input type="checkbox"/> To the front panel | <input type="checkbox"/> To the back panel | <input type="checkbox"/> Dents in the casing |
|---|--|--|

● TURN OFF THE INSTRUMENT & POWER IT USING THE AC/AC ADAPTER, WHICH OF THE FOLLOWING LEDS ARE ON?

- | | |
|---|----------------------------------|
| <input type="checkbox"/> The "MAINS" LED on the front panel | <input type="checkbox"/> No LEDs |
|---|----------------------------------|

● TURN ON THE INSTRUMENT & POWER IT USING THE AC/AC ADAPTER, WHICH OF THE FOLLOWING FAULTS OCCUR?

- | | |
|---|--|
| <input type="checkbox"/> The keys do not push down well | <input type="checkbox"/> The LEDs do not light up with the correct luminosity, etc. <i>(Please specify fault in the space below)</i> |
|---|--|

● WHEN DOES THE FAULT OCCUR?

- | | | | | |
|---|---|---|--|--|
| <input type="checkbox"/> During the analog C/N measurement | <input type="checkbox"/> During the analog level measurement | <input type="checkbox"/> In spectrum mode | <input type="checkbox"/> With all the channels | <input type="checkbox"/> With only some channels, e.g..... |
| <input type="checkbox"/> During the digital C/N measurement | <input type="checkbox"/> During the digital power measurement | <input type="checkbox"/> During the A/V ratio measurement | | |

● PLEASE INDICATE IN THE SPACE PROVIDED WHAT IS SHOWN ON THE ALPHANUMERICAL DISPLAY:!

- | | |
|---|---|
| <input type="checkbox"/> If the error occurs when turning on the instrument | <input type="checkbox"/> If the error occurs at another stage |
|---|---|

● DO THE KNOBS FUNCTION CORRECTLY WHEN ADJUSTING THE PARAMETERS?
 YES NO

(If "NO" please clearly specify the fault in the space provided below)
● ARE THERE PROBLEMS WITH THE LOUDSPEAKER?

- | | | |
|--|---|---|
| <input type="checkbox"/> There is no sound | <input type="checkbox"/> The sound is distorted | <input type="checkbox"/> The sound is disturbed |
|--|---|---|

● ARE THERE ANY OF THE FOLLOWING PROBLEMS WITH THE MONITOR SCREEN (if present)?

- | | | |
|---|--|---|
| <input type="checkbox"/> There is no picture | <input type="checkbox"/> The monitor screen is white | <input type="checkbox"/> There is a lot of interference on the picture |
| <input type="checkbox"/> The picture is distorted | <input type="checkbox"/> The monitor screen is black | <input type="checkbox"/> Other <i>(clearly specify in the space provided below)</i> |

● ARE THERE ANY OF THE FOLLOWING PROBLEMS WITH THE SCART SOCKET (if present)?

- | | |
|---|---|
| <input type="checkbox"/> The video or audio outputs are not present | <input type="checkbox"/> The video and audio inputs are not functioning |
|---|---|

● ARE THERE PROBLEMS WITH THE RS 232 SOCKET (if present)?

- | | |
|--|--|
| <input type="checkbox"/> It does not print | <input type="checkbox"/> It does not connect to the PC |
|--|--|

IMPORTANT: Please clearly describe any further information which may be useful to us in order to identify the fault:

.....

.....

.....

.....

Return to: **RO.VE.R.[®]**
LABORATORIES S.p.A. ITALY • Instrument Service Laboratory • Fax #++39.030.9906894
(Photocopy this page and keep the original copy. Attach a copy to the instrument in need of repair)

A12 - STANDARD ROVER EQUIPMENT REPAIR and/or SERVICE FORM

STANDARD ROVER EQUIPMENT REPAIR and/or SERVICE FORM

- **BEFORE** returning any goods for repair contact RO.VE.R. S.p.A. Italy to receive all relevant shipment modalities; the goods will be refused if not shipped according to our instructions.
- Photocopy this form and keep the original copy. Fill in only **SECTION A** of the photocopy and attach it to the faulty equipment which you are returning to RO.VE.R for repair. This will facilitate the repair and/or service of your equipment, board or spare part. RO.VE.R. will complete **SECTION B** and return this form to you with the repaired equipment.

SECTION A: TO BE COMPLETED BY THE CUSTOMER		● Invoice N.: _____	Date ____/____/____
● NAME OF DISTRIBUTOR or INSTALLER: ● Company: _____ ● Contact Name: _____ <small>(to whom the repaired equipment will be returned)</small>			
● Road: _____ ● N.: _____ ● City: _____ ● ZIP Code: _____			
● VAT No.: _____ ● Tel: _____ ● Fax: _____			
● Equipment model and/or code (in the case of a single board): ● Mod. _____ ● Description _____ ● Serial N.: _____			
● Accessories included in the delivery, please list: ● Q.ty: _____ ● Description: _____			
● If you are sending a single board or part of a piece of equipment, please indicate with a tick (✓) in the relative box, whether it is a:		<input type="checkbox"/> Board/module or sub-section NOT to be returned to the customer and therefore RO.VE.R. property (because it has already been replaced previously)	
		<input type="checkbox"/> Board/module or sub-section to be returned to the customer (to maintain a perfect compatibility with the product from which it was removed and it must not be re-calibrated)	
● Description of fault or problem encountered by the customer: _____			

N.B. If you are sending more than one board, please include a separate "Repair and/or Service Form" for each board			

SECTION B: TO BE FILLED IN BY RO.VE.R. S.p.A. (ITALY)	
● Model or code: _____	● Arrival date at RO.VE.R.: ____/____/____ ● Invoice N. _____
● Repair technician: _____	● Repair date: ____/____/____
● Item repaired under guarantee: <input type="checkbox"/> YES <input type="checkbox"/> NO: because guarantee has expired <input type="checkbox"/> NO: because product was tampered with	
● Description of fault or problem found by the RO.VE.R. technician: _____	

● Probable cause of the fault: _____	

● Measures taken by RO.VE.R. to avoid repetition of the fault: _____	

● Product out of production: <input type="checkbox"/> YES <input type="checkbox"/> NO ● Fault experienced before: <input type="checkbox"/> YES <input type="checkbox"/> NO	

LIST OF COMPONENTS / PARTS REPLACED AND DESCRIPTION OF REPAIR WORK UNDERTAKEN		
Q.TY	RO.VE.R. CODE	DESCRIPTION


A13 - Memory Plan Table

Photocopy front and back, cut out and insert in the transparent pocket under the cover of the bag


PLAN 1 =	PLAN 17 =	PLAN 34 =	FM RADIO - PLAN PRG
PLAN 2 =	PLAN 18 =	PLAN 35 =	FM RADIO - PLAN PRG
PLAN 3 =	PLAN 19 =	PLAN 36 =	FM RADIO - PLAN PRG
PLAN 4 =	PLAN 20 =	PLAN 37 =	ANALOG TV - PLAN PRG
PLAN 5 =	PLAN 21 =	PLAN 38 =	ANALOG TV - PLAN PRG
PLAN 6 =	PLAN 22 =	PLAN 39 =	ANALOG TV - PLAN PRG
PLAN 7 =	PLAN 23 =	PLAN 40 =	QAM - PLAN PRG
PLAN 8 =	PLAN 24 =	PLAN 41 =	QAM - PLAN PRG
PLAN 9 =	PLAN 25 =	PLAN 42 =	QAM - PLAN PRG
PLAN 10 =	PLAN 26 =	PLAN 43 =	COFDM - PLAN PRG
PLAN 11 =	PLAN 27 =	PLAN 44 =	COFDM - PLAN PRG
PLAN 12 =	PLAN 28 =	PLAN 45 =	COFDM - PLAN PRG
PLAN 13 =	PLAN 29 =	PLAN 46 =	AN-SAT - PLAN PRG
PLAN 14 =	PLAN 30 =	PLAN 47 =	AN-SAT - PLAN PRG
PLAN 15 =	PLAN 31 =	PLAN 48 =	AN-SAT - PLAN PRG
PLAN 16 =	PLAN 32 =	PLAN 49 =	QPSK - PLAN PRG
	PLAN 33 =		QPSK - PLAN PRG
		SEGUE RETRO - SEE BACK	



Photocopy front and back, cut out and insert in the transparent pocket under the cover of the bag.



PLAN 50 = _____	PLAN 66 = _____	PLAN 82 = _____	FM RADIO – PLAN _____ PRG _____
PLAN 51 = _____	PLAN 67 = _____	PLAN 83 = _____	FM RADIO – PLAN _____ PRG _____
PLAN 52 = _____	PLAN 68 = _____	PLAN 84 = _____	FM RADIO – PLAN _____ PRG _____
PLAN 53 = _____	PLAN 69 = _____	PLAN 85 = _____	ANALOG TV – PLAN _____ PRG _____
PLAN 54 = _____	PLAN 70 = _____	PLAN 86 = _____	ANALOG TV – PLAN _____ PRG _____
PLAN 55 = _____	PLAN 71 = _____	PLAN 87 = _____	ANALOG TV – PLAN _____ PRG _____
PLAN 56 = _____	PLAN 72 = _____	PLAN 88 = _____	QAM – PLAN _____ PRG _____
PLAN 57 = _____	PLAN 73 = _____	PLAN 89 = _____	QAM – PLAN _____ PRG _____
PLAN 58 = _____	PLAN 74 = _____	PLAN 90 = _____	QAM – PLAN _____ PRG _____
PLAN 59 = _____	PLAN 75 = _____	PLAN 91 = _____	COFDM – PLAN _____ PRG _____
PLAN 60 = _____	PLAN 76 = _____	PLAN 92 = _____	COFDM – PLAN _____ PRG _____
PLAN 61 = _____	PLAN 77 = _____	PLAN 93 = _____	COFDM – PLAN _____ PRG _____
PLAN 62 = _____	PLAN 78 = _____	PLAN 94 = _____	AN-SAT – PLAN _____ PRG _____
PLAN 63 = _____	PLAN 79 = _____	PLAN 95 = _____	AN-SAT – PLAN _____ PRG _____
PLAN 64 = _____	PLAN 80 = _____	PLAN 96 = _____	AN-SAT – PLAN _____ PRG _____
PLAN 65 = _____	PLAN 81 = _____	PLAN 97 = _____	QPSK – PLAN _____ PRG _____
		PLAN 98 = _____	QPSK – PLAN _____ PRG _____
		PLAN 99 = _____	QPSK – PLAN _____ PRG _____





English



Disposal of Old Electrical & Electronic Equipment (Applicable in the European Union and other European countries with separate collection systems)

This symbol on the product or on its packaging indicates that this product shall not be treated as household waste. Instead it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources. For more detailed information about recycling of this product, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

Français



Traitement des appareils électriques et électroniques en fin de vie (Applicable dans les pays de l'Union Européenne et aux autres pays européens disposant de systèmes de collecte sélective)

Ce symbole, apposé sur le produit ou sur son emballage, indique que ce produit ne doit pas être traité avec les déchets ménagers. Il doit être remis à un point de collecte approprié pour le recyclage des équipements électriques et électroniques. En s'assurant que ce produit est bien mis au rebut de manière appropriée, vous aiderez à prévenir les conséquences négatives potentielles pour l'environnement et la santé humaine. Le recyclage des matériaux aidera à conserver les ressources naturelles. Pour toute information supplémentaire au sujet du recyclage de ce produit, vous pouvez contacter votre municipalité, votre déchetterie ou le magasin où vous avez acheté le produit.

Deutsch



Entsorgung von gebrauchten elektrischen und elektronischen Geräten (Anzuwenden in den Ländern der Europäischen Union und anderen europäischen Ländern mit einem separaten Sammelsystem für diese Geräte)

Das Symbol auf dem Produkt oder seiner Verpackung weist darauf hin, dass dieses Produkt nicht als normaler Haushaltsabfall zu behandeln ist, sondern an einer Annahmestelle für das Recycling von elektrischen und elektronischen Geräten abgegeben werden muss. Durch Ihren Beitrag zum korrekten Entsorgen dieses Produkts schützen Sie die Umwelt und die Gesundheit Ihrer Mitmenschen. Umwelt und Gesundheit werden durch falsches Entsorgen gefährdet. Materialrecycling hilft den Verbrauch von Rohstoffen zu verringern. Weitere Informationen über das Recycling dieses Produkts erhalten Sie von Ihrer Gemeinde, den kommunalen Entsorgungsbetrieben oder dem Geschäft, in dem Sie das Produkt gekauft haben.

Español



Tratamiento de los equipos eléctricos y electrónicos al final de su vida útil (Aplicable en la Unión Europea y en países europeos con sistemas de recogida selectiva de residuos)

Este símbolo en su equipo o su embalaje indica que el presente producto no puede ser tratado como residuos domésticos normales, sino que deben entregarse en el correspondiente punto de recogida de equipos eléctricos y electrónicos. Asegurándose de que este producto es desechado correctamente. Ud. está ayudando a prevenir las consecuencias negativas para el medio ambiente y la salud humana que podrían derivarse de la incorrecta manipulación de este producto. El reciclaje de materiales ayuda a conservar las reservas naturales. Para recibir información detallada sobre el reciclaje de este producto, por favor, contacte con su ayuntamiento, su punto de recogida más cercano o el distribuidor donde adquirió el producto.

Nederlands



Verwijdering van Oude Elektrische en Elektronische Apparaten (Toepasbaar in de Europese Unie en andere Europese landen met gescheiden opzamsystemen)

Het symbool op het product of op de verpakking wijst erop dat dit product niet als huishoudafval mag worden behandeld. Het moet echter naar een plaats worden gebracht waar elektrische en elektronische apparatuur wordt gerecycled. Als u ervoor zorgt dat dit product op de correcte manier wordt verwijderd, voorkomt u mogelijk voor mens en milieu negatieve gevolgen die zich zouden kunnen voordoen in geval van verkeerde afvalbehandeling. De recyclage van materialen draagt bij tot het vrijwaren van natuurlijke bronnen. Voor meer details in verband met het recyclen van dit product, neemt u het best contact op met de gemeentelijke instanties, het bedrijf of de dienst belast met de verwijdering van huishoudafval of de winkel waar u het product hebt gekocht.

Svenska



Omhändertagande av gamla elektriska och elektroniska produkter (Användbar i den Europeiska Unionen och andra Europeiska länder med separata insamlingsystem)

Symbolen på produkten eller emballaget anger att produkten inte får hanteras som hushållsavfall. Den skall i stället lämnas in på uppsamlingsplats för återvinning av el- och elektronikkomponenter. Genom att säkerställa att produkten hanteras på rätt sätt bidrar du till att förebygga eventuellt negativa miljö- och hälsoeffekter som kan uppstå om produkten kasseras som vanligt avfall. Återvinning av material hjälper till att bibehålla naturens resurser. För ytterligare upplysningar om återvinning bör du kontakta lokala myndigheter eller sophämtningstjänst eller affären där du köpte varan.

Italiano



Trattamento del dispositivo elettrico od elettronico a fine vita (Applicabile in tutti i paesi dell'Unione Europea e in quelli con sistema di raccolta differenziata)

Questo simbolo sul prodotto o sulla confezione indica che il prodotto non deve essere considerato come un normale rifiuto domestico, ma deve invece essere consegnato ad un punto di raccolta appropriato per il riciclo di apparecchi elettrici ed elettronici. Assicurandovi che questo prodotto sia smaltito correttamente, voi contribuirete a prevenire potenziali conseguenze negative per l'ambiente e per la salute che potrebbero altrimenti essere causate dal suo smaltimento inadeguato. Il riciclaggio dei materiali aiuta a conservare le risorse naturali. Per informazioni più dettagliate circa il riciclaggio di questo prodotto, potete contattare l'ufficio comunale, il servizio locale di smaltimento rifiuti oppure il negozio dove l'avete acquistato.

Polski



Pozbycie się Zużytego Sprzętu (Stosowane w krajach Unii Europejskiej i w pozostałych krajach europejskich mających własne systemy zbiórki)

Taki symbol na produkcie lub jego opakowaniu oznacza, że produkt nie może być traktowany jako odpad komunalny, lecz powinno się go dostarczyć do odpowiedniego punktu zbiórki sprzętu elektrycznego i elektronicznego, w celu recyklingu. Poprzez upewnienie się, że dyspozycja dotycząca produktu jest poprawna, zapobiega się potencjalnym negatywnym wpływom na środowisko oraz zdrowie ludzi, jakie mogłyby wystąpić w przypadku niewłaściwego postępowania. Recykling materiałów pomoże w ochronie naturalnych źródeł. W celu uzyskania bardziej szczegółowych informacji na temat recyklingu tego produktu, należy skontaktować się z naszym lokalnym biurem, ze służbami oczyszczania miasta lub ze sklepem, w którym zakupiony został ten produkt.

Suomi



Käytöstä poistetun sähkö- ja elektronikkalaitteen hävitys (Euroopan Unioni ja muiden Euroopan maiden keräysjärjestelmät)

Symboli, joka on merkitty Tuotteeseen tai sen pakkaukseen, osoittaa, että tätä tuotetta ei saa käsitellä talousjätteenä. Tuote on sen sijaan luovutettava sopivaan sähkö- ja elektronikkalaitteiden kierrätyksestä huolehtivaan keräyspisteeseen. Tämän tuotteen asianmukaisen hävittämisen varmistamisella autetaan estämään sen mahdolliset ympäristöön ja terveyteen kohdistuvat haittavaikutukset, joita voi aiheutua muussa tapauksessa tämän tuotteen epäasianmukaisesta jättekäsittelystä. Materiaalien kierrätys säästää luonnonvaroja. Tarkempia tietoja tämän tuotteen kierrättämisestä saa paikallisesta kunnantontimistosta.

Dansk



Håndtering af udtjente elektriske og elektroniske produkter (Gælder for den Europæiske Union og andre europæiske lande med separate indsamlingssystemer)

Dette symbol på produktet eller emballagen angiver, at produktet ikke må behandles som husholdningsaffald. Det skal i stedet indleveres på en deponeringsplads specielt indrettet til modtagelse og opbejldning af elektriske og elektroniske produkter. Ved at sikre at produktet bortskaffes korrekt, forebygges de eventuelle negative miljø- og sundhedsskadelige påvirkninger, som en ukorrekt affaldshåndtering af produktet kan forårsage. Genindvinding af materialer vil medvirke til at bevare naturens ressourcer. Yderligere information om genindvindingen af dette produkt kan fås hos myndighederne, det lokale renovationselskab eller butikken, hvor produktet blev købt.

Português



Tratamento de Equipamentos Eléctricos e Electrónicos no final da sua vida útil (Aplicável na União Europeia e em países Europeus com sistemas de recolha selectiva de resíduos)

Este símbolo, colocado no produto ou na sua embalagem, indica que este não deve ser tratado como residuo urbano indiferenciado. Deve sim ser colocado num ponto de recolha destinado a resíduos de equipamentos eléctricos e electrónicos. Assegurando-se que este produto é correctamente depositado, irá prevenir potenciais consequências negativas para o ambiente bem como para a saúde, que de outra forma poderiam ocorrer pelo mau manuseamento destes produtos. A reciclagem dos materiais contribuirá para a conservação dos recursos naturais. Para obter informação mais detalhada sobre a reciclagem deste produto, por favor contacte o município onde reside, os serviços de recolha de resíduos da sua área ou a loja onde adquiriu o produto.

Ελληνικά



Αποκομιδή Παλαιού Ηλεκτρικού & Ηλεκτρονικού Εξοπλισμού(Ισχύει στην Ευρωπαϊκή Ένωση και άλλες Ευρωπαϊκές χώρες με ξεχωριστά συστήματα περιουλογής)

Το σύμβολο αυτό επάνω στο προϊόν ή στη συσκευασία του σημαίνει ότι το προϊόν δεν πρέπει να πεταχτεί μαζί με τα οικιακά απορρίμματα αλλά πρέπει να παραδοθεί σε ένα κατάλληλο σημείο συλλογής ηλεκτρολογικού και ηλεκτρονικού υλικού προς ανακύκλωση. Με το να βεβαιωθείτε ότι το προϊόν πετάχτηκε σωστά, βοηθάτε στην πρόληψη πιθανών αρνητικών επιπτώσεων στο περιβάλλον και την υγεία. Η ανακύκλωση των υλικών θα βοηθήσει στην εξοικονόμηση φυσικών πόρων. Για περισσότερες πληροφορίες σχετικά με την ανακύκλωση αυτού του προϊόντος, παρακαλούμε επικοινωνήστε με τις υπηρεσίες καθαριότητας του δήμου σας ή το κατάστημα όπου αγοράσατε το προϊόν.

Magyar



Feleslegessé vált elektromos és elektronikus készülékek hulladéként való eltávolítása (Használható az Európai Unió és egyéb európai országok szelektív hulladékgyűjtési rendszereiben)

Ez a szimbólum a készüléken vagy a csomagolásán azt jelzi, hogy a terméket ne kezelje háztartási hulladékként. Kérjük, hogy az elektromos és elektronikai hulladék gyűjtésére kijelölt gyűjtőhelyen adja le. A feleslegessé vált termékének helyes kezelésével segít megelőzni a környezet és az emberi egészség károsodását, mely bekövetkezhetne, ha nem követi a hulladék kezelés helyes módját. Az anyagok, újrahasznosítása segít a természeti erőforrások megőrzésében. A termék újrahasznosítása érdekében további információért forduljon a lakóhelyén az illetékesekhez, a helyi hulladékgyűjtő szolgáltatóhoz vagy ahhoz az üzlethez, ahol a terméket megvásárolta.

Česky



Nakládání s nepotřebným elektrickým a elektronickým zařízením (platné v Evropské unii a dalších evropských státech uplatňujících oddělený systém sběru)

Tento symbol umístěný na výrobku nebo jeho balení upozorňuje, že s výrobkem po ukončení jeho životnosti by nemělo být nakládáno jako s běžným odpadem z domácnosti. Místo toho by měl být odložen do sběrného místa, určeného k recyklaci elektronických výrobků a zařízení. Dodržením této instrukce zabráníte negativním dopadům na životní prostředí a zdraví lidí, které naopak může být ohroženo nesprávným nakládáním s výrobkem při jeho likvidaci. Recyklováním materiálů, z nichž je vyroben, pomůžete zachovat přírodní zdroje. Pro získání dalších informací o recyklaci tohoto výrobku kontaktujte, prosím, místní orgány státní správy, místní firmu zabezpečující likvidaci a sběr odpadů nebo prodejnu, v níž jste výrobek zakoupili.

Slovensky



Likvidácia starých elektrických a elektronických zariadení (Platí v Európskej únii a ostatných európskych krajinách so zavedeným separovaným zberom)

Tento symbol na výrobku alebo obale znamená, že s výrobkom nemôže byť nakladané ako s domovým odpadom. Miesto toho je potrebné ho doručiť do vyhradeného zberného miesta na recykláciu elektrozariadení. Tým, že zaistíte správne zneškodnenie, pomôžete zabrániť potenciálnemu negatívne mu vplyvu na životné prostredie a ľudské zdravie, ktoré by v opačnom prípade hrozil pri nesprávnom nakladaní s týmto výrobkom. Recyklácia materiálov pomáha uchovávať prírodné zdroje. Pre získanie ďalších podrobných informácií o recyklácii tohoto výrobku kontaktujte prosím váš miestny alebo obecný úrad, miestnu službu pre zber domového odpadu alebo predajňu, kde ste výrobok zakúpili.

Türkçe



Eski Elektrikli & Elektronik Ekipmanların Atılması (Avrupa Birliği'nde ve ayrı toplama sistemlerine sahip diğer Avrupa ülkelerinde uygulanır)

Ürünün veya ambalajın üzerinde bulunan bu sembol, bu ürünün bir ev atığı olarak muamele görmemesi gerektiğini gösterir. Bunun yerine, elektrikli ve elektronik ekipmanların geri dönüştürme için mevcut olan uygun toplama noktasına teslim edilmelidir. Bu ürünün doğru şekilde atılmasını sağlayarak, bu ürüne yanlış müdahale edilmesi sonucunda ortaya çıkabilecek ve çevre ile insan sağlığı üzerinde olumsuz etkiye bulunabilecek durumların önlenmesine yardımcı olursunuz. Malzemelerin geri dönüştürülmesi, doğal kaynakların korunmasına yardımcı olacaktır. Bu ürünün geri dönüştürülmesi için daha fazla bilgi için, lütfen şehrinizde bulunan yerel ofise, evsel atıklar toplama servisinde veya bu ürünü satın aldığınız mağazaya temas geçin.

Русский



Утилизация электрического и электронного оборудования (директива применяется в странах Евросоюза и других европейских странах, где действуют системы раздельного сбора отходов)

Данный знак на устройстве или его упаковке обозначает, что данное устройство нельзя утилизировать вместе с прочими бытовыми отходами. Его следует сдать в соответствующий приемный пункт переработки электрического и электронного оборудования. Неправильная утилизация данного изделия может привести к потенциально негативному влиянию на окружающую среду и здоровье людей, поэтому для предотвращения подобных последствий необходимо выполнять специальные требования по утилизации этого изделия. Переработка данных материалов поможет сохранить природные ресурсы. Для получения более подробной информации о переработке этого изделия обратитесь в местные органы городского управления, службы сбора бытовых отходов или в магазин, где было приобретено изделие.

ROVER S.p.A. HEADQUARTERS



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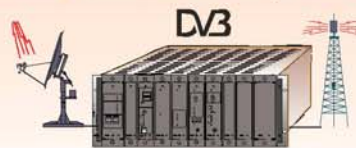


4 meter Cassegrain dish with
De-icing System for Broadcasting
installation at the RAI transmitting
centre in Portofino (near Genoa)

DVB - QPSK - COFDM/C.I.



Triple MPEG-2 Professional Digital
Satellite & Terrestrial receiver/Monitoring



Equipment for Satellite Television
digital to analog Re-broadcasting