STM 18 HD

Compact Meter DVB-S2 + T2 / C with optical measurement

User Manual

Ref 0145256R13

Cahors Digital - CS 60022 - 46003 Cahors Cedex 9 - FRANCE
www.cahors-ced.com/television

CAHORS DIGITAL

SUMMARY

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Please refer to the instruction manual before use of the apparatus

• Read the manual carefully for use and maintain your device.

• The technical specifications and user guides are subject to change without notice.

• Please charge the battery for three hours before the first use.

• Please use the charger provided with this meter. Do not use another charger than the original

• Contact your dealer case question Technical concerning the product.

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1. MAIN FEATURES

- Supports standard DVBS / DVB-S2 / DVB-T / DVBT2 / DVBC/ DVBC2 /MCNS / OPTICAL
- Protection and indicator short circuit of LNB.
- Very fast and accurate with high sensitivity.
- Resolution 320 X 240 with backlit LCD color screen.
- Basic data easily modified by the user.
- Notification signals locking by beep.
- Measuring optical levels.
- Monitoring of signals Disecq emitted by the satellite receivers.
- Software update by USB stick.
- Database can be download on PC and USB port.
- Supply voltage 100 at 240V / 50 / 60Hz 12V @ 1A.
- long standby ultra low consuming energy.
- Fast charging three hours.
- spectrum analyzer real time transponder detection
- Angle calculating the azimuth and elevation.
- Measuring the azimuth and elevation
- satellite system alignment.
- Level, Signal / Noise Report, BER measurement (Bit Error Rate) Modulation Mode Display.
- DiSEqC1.0, DiSEqC1.2, USALS, SCD and SCD2 supported.
- Automatic DiSEqC1.0 identification
- Easy identification of the cables from a Quattro LNB
- Level Display, VBER(DVB-T), BER(DVBT2), Signal / Noise ratio (SNR) and CBER.
- Spectrum analyzer
- Staff display (SCOPE)
- automatic scanning of the channels
- DVB-C (QAM) for cable networks: Level, BER, PER(DVBC / MCNS), LBER (DVBC2), SNR and symbol rate display
- Measure AC and DC voltages
- Viewing angle
- Measuring the optical power high accuracy.
- optical wave measurement from 860 to 1610 nm.

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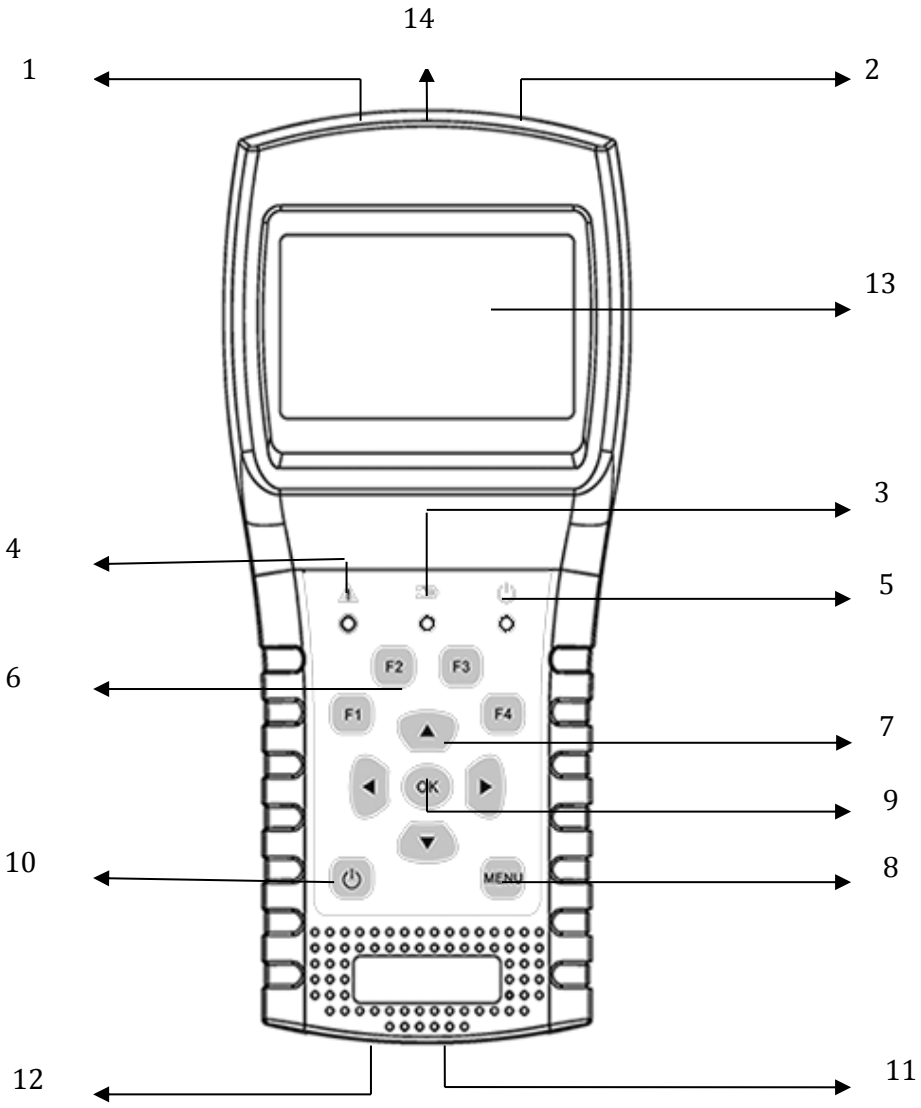
2.BUTTONS, SCREEN AND CONNECTORS



1.RF In (Antenna Input): input signal for standards DVB-T and DVB-C. Connect directly the coaxial cable on this outlet.

2.LNB In: input signal DVB-S/ DVB-S2. Connect the coaxial cable from the LNB.

3. Charging indicator:

Red: The battery is being charged

blhad: The battery is charged.

4.warning indicator: Flashes in case of short circuit on the satellite input

5.Start witness: Green: the meter is in operation

6.Function keys whose value is different or it is

Hereunder an example of operation of the function keys from the Home Menu

F1:Switching on / off of the display screen

F2:Switching on / off beeper

F3:Please research the control menu TP in the satellite measurement menu

F4:Go to the Auto DiSEqC function of the satellite measurement menu.

Note: press on ⏻ to display help on keys function

7. Navigation keys:

◀ / ▶ and ▲ / ▼ : Moving a menu to an other, change value

8. MENU: Go to the main menu or exit the current menu

9. OK: Confirmation

10. ⏻ **1.** Switching on / off the meter. Press and hold for 2 seconds for startup and extinction.

2. Display the menu bar Assistance.

11. USB and load: Login cord for charging the apparatus.

12. Reset: Reset the meter using a pointed object such a trombone.

13. Display screen: Displays menus and meter settings

14. Port Optical: Port of entry for the reception optical fiber

3. MAKE A MEASUREMENT

Put into operation the meter, Select function measure or select setting mode to set the meter settings in the menu "Settings system"

Inside all menus, press buttons [▲ / ▼] to navigate, press buttons [◀ / ▶]to change the value the targeted element, press [OK] to confirm your selection, press the [MENU] button to enter or exit menus.

How to measure the satellite signal:

1. Connect the signal cable to connector socket type F.
2. Get into satellite submenu.
3. Calculate the elevation and azimuth according to your local position in the menu "Angles". Set or adjudt your antenna in the correct position.
4. Set the LNB settings depending on your configuration ground in the menu "LNB Setting". Please ensure that all parameters are correct.

5. Enter the "Measure" menu Satellite menu ,select the right satellite and a transponder this satellite for check if if signal is locked or not.

According to the values such of the input strength, quality, Signal to noise ratio (S / N) and the power level, you can adjust your antenna to get the best signal possible. You can also analyze the signal from the menu "Spectrum" to help you understand le power level as a function of frequency channels.

How to measure the terrestrial signal:

1. Connect the signal cable to the socket connector (ofen IEC type).
2. Ensure that the option "Power Antenna" "ON" in the DVB-T menu / T2 if your antenna is equipped with a mast preamplifier.
3. Check the signal in the menu " DVB-T / T2 " "Measure"

How to measure the cable signal:

1. Connect the cable signal to IEC-Type, Female jack first. Login the signal cable to the socket connector, an IEC.
2. Check the signal cable in Measure menu. Please go to the DVB-C / C2 menu and "Measurement" submenu
3. You can view the slope and the spectrum if required.

How to measure the optical signal:

1. Connect the fiber on the optical input the meter (protected by a red cap)
2. Enter the "Optical Measurement" menu.

3. Press on [▲/ ▼] to change the wavelength. The available wavelengths are the following: 850, 980, 1300, 1310, 1490, 1550 and 1610 nm. Press F3 to switch from one measurement to a measurement in dBm dB and vice versa.

4.Main Menu

After the starting of the meter, It will arrive on the following main menu. Press on [▲/▼] to change the item or [OK] to enter in a submenu.

DVB-S / S2: Submenu, standard DVB-S / S2

DVB-T / T2: Submenu, standard DVB-T / T2

DVB-C / C2 / MCNS: Submenu standard DVB-C / C2 / MCNS

Optical measurement: Submenu for measuring optical signals.

System settings: Submenu for measuring the system settings such as language, automatic sleep, return to factory settings, On / off the beep sound, software and hardware versions.

5. DVB-S / S2

Submenu for DVB-S / S2 functions. The user can read the live signal settings received, Analyze the spectrum, calculate angles for a specific satellite, edit the settings for a specific satellite, monitor DiSEqC commands for other DVB-S / S2 unit.

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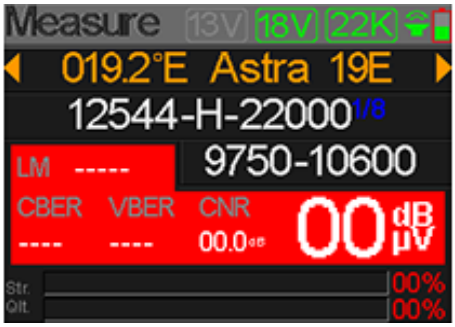
5.1 IDENTIFYING SATELLITE"MEASURE" MENU

The meter displays the strength and quality of the live signal. But also the CBER, VBER, LBER, CNR, The modulation type, FEC and power level received.



- **019.2°E Astra 19E:** You are on the first satellite available. Please press [◄ / ►] to switch Satellites or press [OK] to enter a preprogrammed list and choose the appropriate satellite. [OK] confirm your selection. [MENU] lets get out.
- **12544-H-22000:** When you are on line Astra 19E. Please use the arrow▼ to select the transponder and its associated symbol rate. Press on [◄ / ►] to change transponder and [OK] to edit. To push on [◄ / ►] to move the cursor and [▲/▼] to change the value of each digit. [MENU] to exit the mode edition.

- **9750-10600 (by default):** LNB Type. Press [◄ / ►] to change the LNB type or Press [OK] For a list and choose desired value. [MENU] to quit.
- **22K:** Active Status of 22Khz when displayed on the screen
- **13V:** status active 13 Volts when displayed on the screen
- **18V:** active status 18 Volts when displayed on the screen
- **LM :** link margin in dB: positive difference between the balance calculated and the requested minimum quality.
- **CNR:** Value of the signal / noise dB
- **00 dBµV:** signal level value dBµV
- **CBER:** BER before correction (minimum 10-4)
- **VBER:** BER after correction (minimum 10-8)
- **Str:** Signal strength
- **adj:** Signal Quality Level

These values are highlighted in green when the signal is locked.

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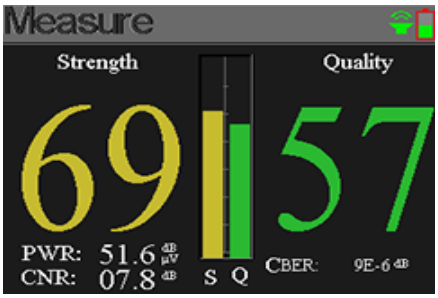
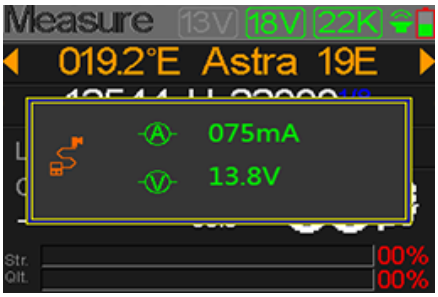
5.1.1 ZOOM

Press F1 for zoom in on the measurement results.



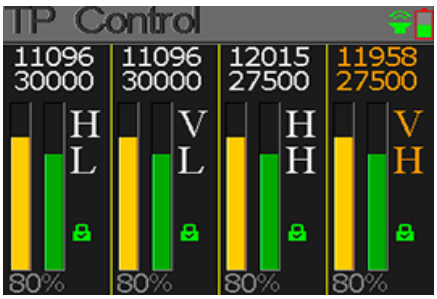
5.1.2 LNB MEASURES

Press F2 to enter the menu showing the voltage LNB and her consomming



5.1.3CONTROL TRANSPONDERS (POINTING MODE)

When you press F3 in the menu Satellite measurement, he is very easy to control the level and quality of the four polarities LNB Quattro. Press [MENU] get out.



5.1.4 AUTO DISEQC

Press F4 to enter the menu automatic DiSEqC 1.0detection

If nothing is found, no Diseqc device is connected, press [MENU] to exit

5.2 SETTINGS LNB

All LNB settingd are defined in this menu whose elements are detailed below:

- **Astra 19E:** Satellite name currently used. Press on [◂ / ▸] for change satellite. You can press [OK] to choose satellite in a list. Press on [OK] for to select and press [MENU] for exit the edit menu. All other menu settings will be updated according to the selected satellite.
- **9750-10600:** Type LNB. Press on [◂ / ▸] s to select different types of LNB or Press on [OK] for call list and choose the value that suits you
- **Auto:** parameter 22Khz. Press sure [◂ / ▸] to switch between Auto, On and Off. Only Auto is available when is set to 9750-10600.
- **Auto:** LNB voltage setting. Push the button [◂ / ▸] to switch between Auto, Off, 13V and 18V.
- **DiSEqC:** settings diSEqC 1.0 and 1.1. Press on[◂ / ▸] for change DiseqC standard. Once the standard is selected, press [OK] to change the port. Example, DiSEqC 1.0 you can choose 1, 2, 3 or 4 (corresponding to A, B, C or D)
- **Fixed:** Select is antenna is fixed or motorized type. Press on [◂ / ▸] to choose between Fixed, USALS and standard diSEqC 1.2.

5.2.1USALS SETTINGS:

Press on [OK] to enter the menu USALS .

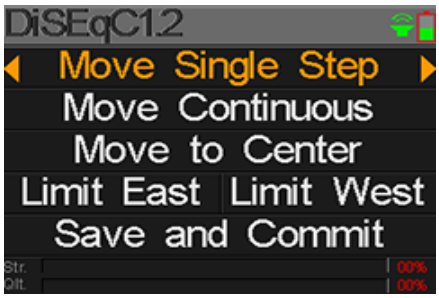
- **019.2°E Astra 19E:** Satellite currently used. Press on [◂ / ▸] to switch Satellites or [OK] to select from the list. Press again [OK] to validate . The key[MENU] allows exit All other menu items will be discounted by the satellite selected.
- **custom:** You can switch from cities predefined coordinate to custom coordinate if your city is not present in the list by pressing on [◂ / ▸] Or [OK] to bring up a list;
- **041.0°E / 02.8°NOT:** You can change value latitude and longitude [OK] if the parameter "Custom" is selected

  Press on [◂ / ▸] To move the cursor and [▲ / ▼] To change the value of each item displayed in the edit menu coordinates.

- **Move Center:** Press [OK] key to move the antenna in the central position
- **Move to the position:** Press [OK] change the position parameters

5.2.2SETTINGS DISEQC 1.2:

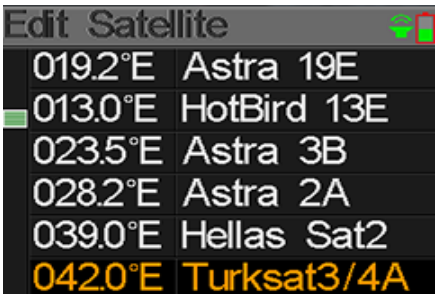
Press [OK] to enter the menu Diseqc 1.2



- **Moving in steps:** not by engine displacement. Press on [◂ / ▸] foryou move west or east
- **continuously move :** Motor displacement continues. Press on [◂ / ▸] To move to the west or to the East.
- **Moving toward the center:** Press [OK] to move to the center point
- **Limite East:** Adjust East limit
- **Limite West:** Adjust the West limit
- **Save and Store:** Press [OK] to save the current position
- **Str .:** Strength signal
- **Qlt .:** Quality signal

5.3CHANGING THE SATELLITE

The satellite parameters, such the orbital position and the transponder can be edited in this menu. The satellites will be listed in this menu.



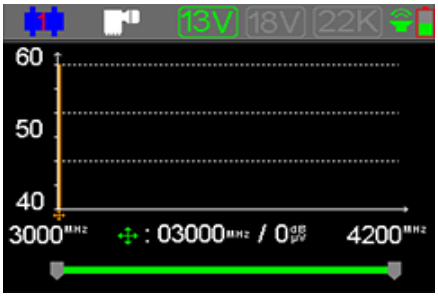
Press on [▲/▼] To move through the list

Press [F2] to edit Name of satellite or the orbital position in a dialog box. press on [◀ / ▶] To move the cursor and [▲/▼] To modify the value of each item displayed in the edit menu.

Press [F3] to add a new satellite. Press [F4] for enter the box satellite suppression dialogue. Please confirm suppression [OK]. To exit, use the [MENU]

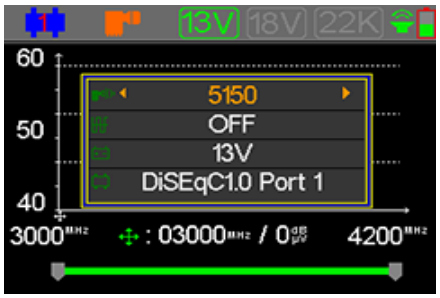
5.4.SPECTRUM GRAPHIC

this menu display the spectrum diagram level depending on the frequency range. Press on[▲/▼] to toggle between the start frequency, end frequency, and parameters the LNB current frequency of marker



- **22K:** Displays 22Khz status, as a visible green icon on the screen.
- **13V:** Displays the current status of 13V, as a visible green icon on the screen
- **24V:** Displays the current status of 24VVIn the form of a visible green icon on the screen.
- **40 ~50 ~60:** Signal level range in dBµV. By pressing F3, you can edit this range enter 40 and 60, 40 and 80, 40 and 100 dBµV.
- **03000 MHz / 0 dBuV:** Display Frequency Current, pressez [◀ / ▶] to change.
- **03000:** Frequency spectrum departure.
- **04000:** Frequency end of the spectrum.

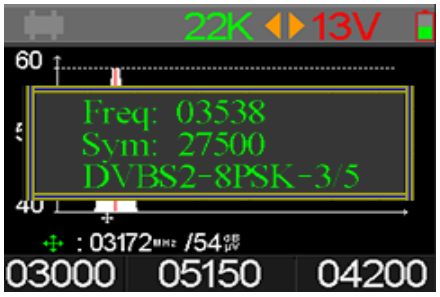
ATress [OK] to display LNB settings window when it is shown by the orange icon on the screen.



Press on [◂ / ▸] to change the current frequency of the LNB (1st line)

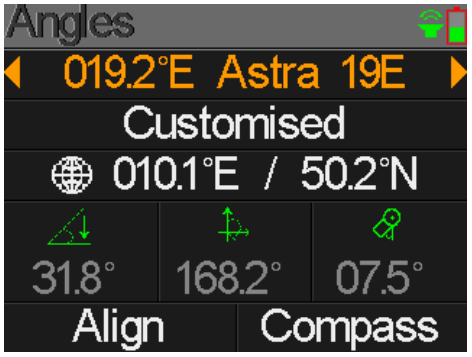
The lines of the following: Activating or not 22Khz / 13 or 18V / Choice of standard Disecq.

Press [OK] to check if the frethis current can be locked or not. A dialogue boxappear if the transponder is locked.



5.5ANGLE CALCULATING

The elevation and azimuth of the antenna will be calculateds in function the latitude and longitude personalized or city sedlectionnée. If the Custom mode is selectYou can change the latitude and longitude which will result automatically calculate the elevation, azimuth and against polarity LNB. ATress [◂ / ▸] for change digit and [▴ / ▾] for change the value the digit in question.



010.1°E: Longitude

50.2°NOT: Latitude

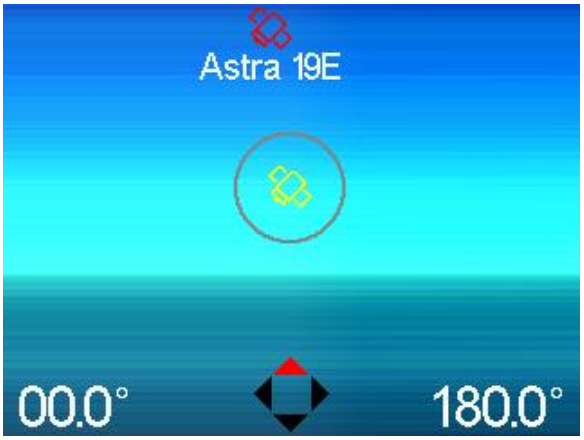
31.8°: Elevation calculated by the meter

168.2°: Azimuth calculated by the meter

07.5°: Polarization of the LNB

Selectedz Align and press [OK] to go to the alignment menu.

Users can simulate the correct position of the antenna as we can see below in the screen shot

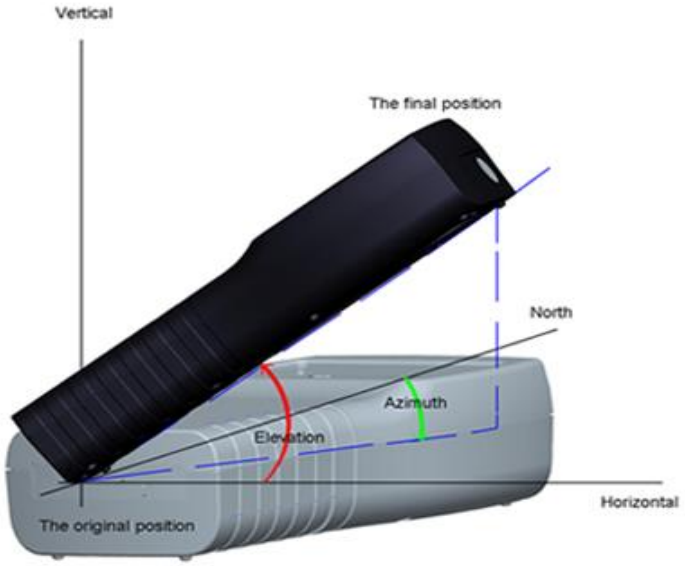


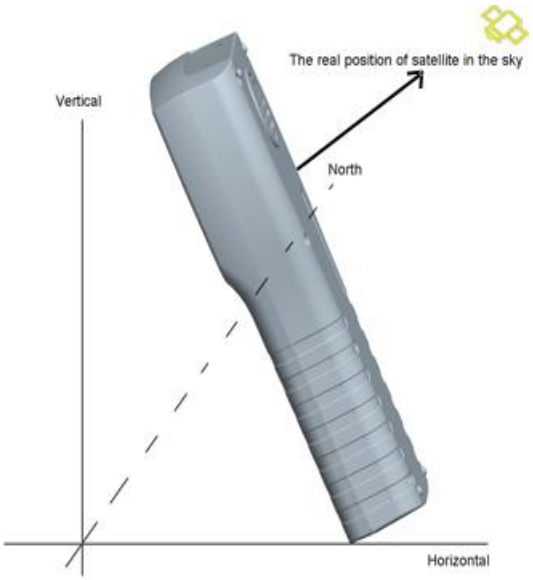
The user needs to adjust the altitude of the meter based on simulation results.

Please move the meter untill the selected satellite in red is bunked to the satellite YELLOW present in the round.

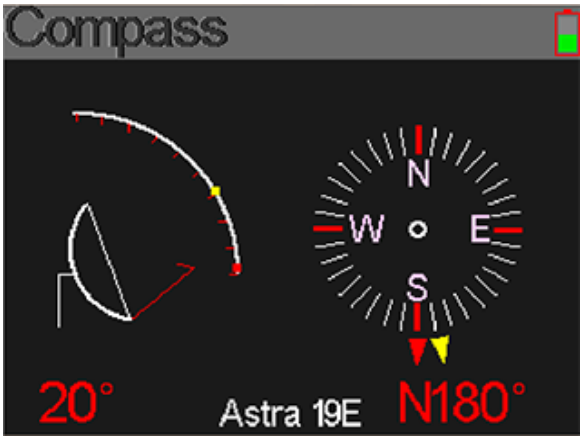
When the pointing is correct, RED GREEN satellite toggle the status.

The elevation and azimuth are automatically updated at the bottom of the screen in real time.





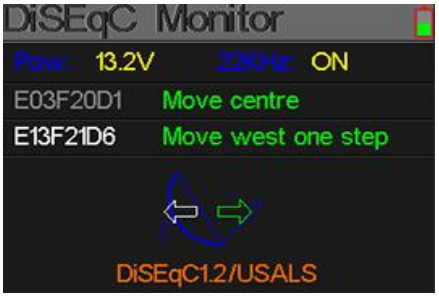
Select Compass, press [OK] to get there. The following menu will appear



5.6MONITOR DISEQC

Connect a device such as a demodulator (DVB-S / S2) the LNB IN input.

The screen below shows the monitoring menu



Pow: Display Power tension on cable from demodulator

22KHz: Status 22 Khz or not active (On / Off)

E03F20D1: DiSEqC received from the demodulator

Move center: Action corresponding the control E03F20D1.

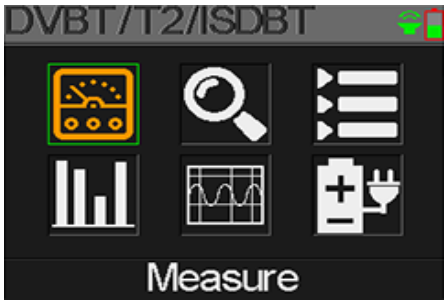
E13F21D6: DiSEqC Command received from the demodulator.

Move west one step: Action corresponding to the command E13F21D6.

DiSEqC1.2 / USALS: type of protocol used.

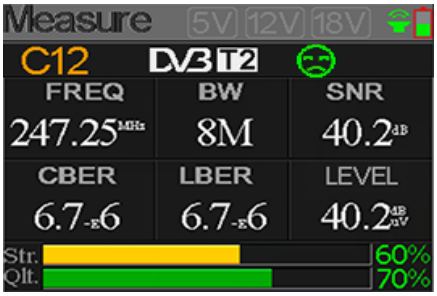
6.DVB-T / T2

The user can measure the DVB-T / T2 in direct, analyzing the spectrum, measure slope enter a plurality of transponders (canals), scanner all stored frequencies, list those locked. Six sub menus present: Measurement, Auto Scan, Channel List, Slope, Spectrum, Antenna Power supply (0V, 5V, 12V, 18V, 24V)



6.1 TERRESTRIAL MEASUREMENT

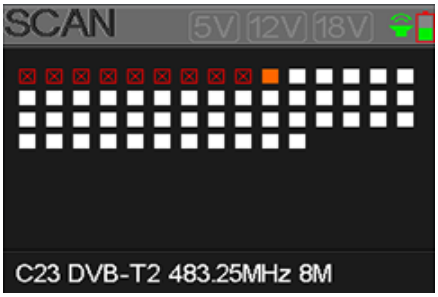
The meter will display the channel number, the corresponding frequency, the bandwidth, the CBER, the LBER, The level, the signal/ Noise ratio SNR.



You can also view the strength and signal quality bars on the two graphs.

-  **:** Lock Status: Smiley green when the signal is locked, otherwise red.
- **C12:** Channel Number.
- **5V, 12V, 24V:** Mast preamplifier supply voltage. Icon showing voltage currently used is displayed top right green.
- **DVB T/ T2:** **T**errestrial reception standards. The values are DVB T and DVB T2. Press on [◂ / ▸] to switch between the two values.
- **FREQ:** Frequency currently used. Press on [◂ / ▸] to change the frequency or [OK] to call the list.
- **BW:** Bandwidth. Press on [◂ / ▸] to switch between 6Mhz, 7Mhz and 8Mhz.
- **CNR:** Carrier to noise ratio.
- **CBER:** Value in real time CBER (BER before correction)
- **LBER:** Value in real time LBER (BER after correction)
- **Level:** real-time value of the level dBµV
- **Str:** Received signal strength
- **adj:** Received signal quality

6.2 AUTOSCAN



The meter automatically scan the stored frequencies and show the status for each of it.

The return to the main menu automatically done once the scan is complete.

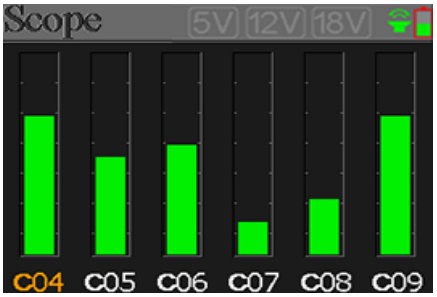
If you want to interrupt the search, press the [MENU]

6.3 CHANNEL LIST

This menu displays the complete list of the channel previously found while Auto Scan.

6.4SLOPE

This screen shows level for 6 channels in dBÁV. Use the arrow [◂ / ▸] to move betweenOne channel to another and then [OK] call list to change the channel number.



6.5 SPECTRUM

Ce menu shows the spectrum fonction of frequency range defined by the user.

Press on [▲ / ▼] to switch the current frequency, to the start frequency and the end frequency.

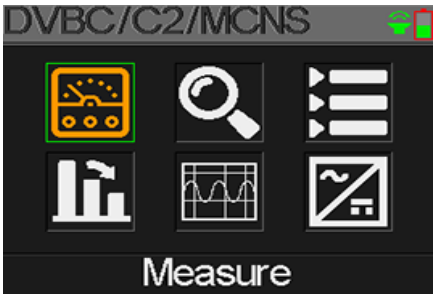
Press on [◂ / ▸] to change the value of each of the above parameters.

- **40 ~50 ~60:** level value range. Press [F3] switch between 40~ 60, 40 ~ 80 40 ~ 100.
- **C6 / 175MHz / 0 dBuV:** Selection of the current frequency and level. Press on [◂ / ▸] to change the value.
- **162:** Start spectrum Frequency.
- **498:** End spectrum Frequency
- **5V, 12V, 24V:** supply voltage mast preamplifier. The icon showing the voltage currently used is displayed in the upper right green.

6.6 ANTENNA POWER

The user can turn on / off the supply voltage of the mast preamplifier. The tensions 5V, 12V, and 24V are supported.

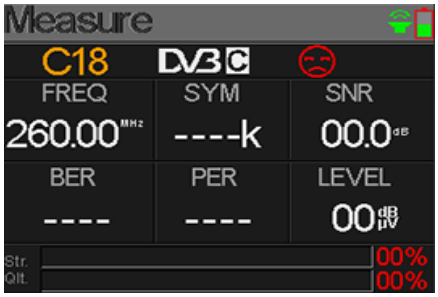
7. DVB-C



The user can measure directly the DVB-C signal received. Six sub-menus are available:

Measured, Auto Scan, channel list, slope (tilt) , spectrum and Trunk Voltage.

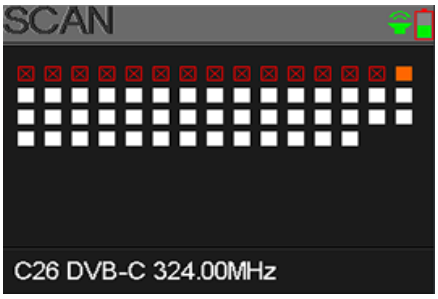
7.1 MEASURING CABLE NETWORK



The user can read the Signal / Noise (SNR), the BER, PER, level, strength and quality of the live signal.

-  : Status function. When the signal is locked, the smiley is green, red otherwise.
- **S08:** Channel Number
- **DVB-C:** Standard wired network. You can choose between DVBC,DVBC2 and MCNS. Press on [◂ / ▸] to change standard.
- **FREQ:** Frequency currently used. Press sure [◂ / ▸] to change the value or press [OK] for modify faster each digit.
- **SYM:** Symbol rate automatically displayed when the frequency is locked.
- **SNR:** value Signal /Noise dB
- **BER:** Error rate before correction of the live signal
- **PER:** error rate after correction of the live signal.
- **LEVEL:** signal level in dBuV.
- **Str:** Signal strength.
- **adj:** Signal quality.

7.2 AUTO SCAN



The meter automatically scan the stored frequencies and show the status for each of them.

The return to the main menu automatically done once the scan is complete.

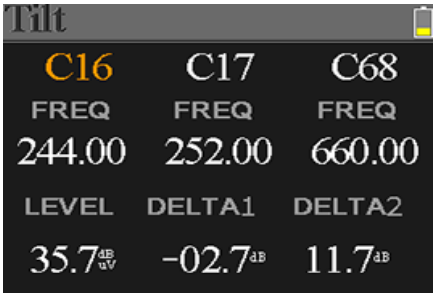
If you want to interrupt the search, press the [MENU]

7.3 CHANNEL LIST

This menu displays the complete list of channels you saved previously when Auto Scan.

7.4 SLOPE

Ce measure the menu slope of the wired network between the different channels.



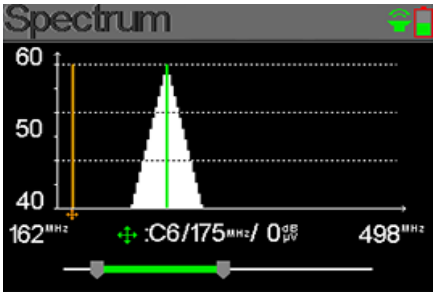
- **S02, S03, S04:** Channel Number. Press on[▲ / ▼] for change number or Press on [OK] for picking it in the list.
- **FREQ:** corresponding frequency for each channel
- **LEVEL:** Level of the first channel
- **Delta1:** The Level difference second channel relative to the first channel
- **DELTA 2:** The Level difference the third channel related to second channel

7.5 SPECTRE

This menu displays the spectrum according to a frequency range defined by the user.

Press on [▲ / ▼] To switch from the current frequency setting, frequency of departure and the end frequency.

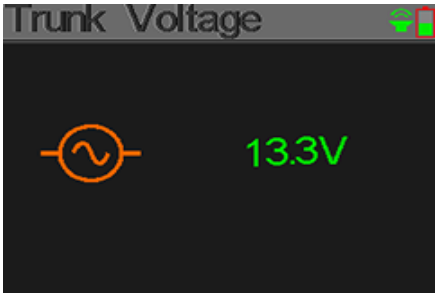
Press on [◀ / ▶] To modify the value of each of the above parameters



- **40 ~50 ~60:** Beach level value. Press [F3] to switch between 40~ 60, 40 ~ 80 40 ~ 100.
- **S02/ 115MHz / 0 dBuV:** Selection of the current frequency and level. Press on [◀ / ▶] To change the value.
- **162:** Start spectrum Frequency of departing
- **498:** End spectrum frequency.

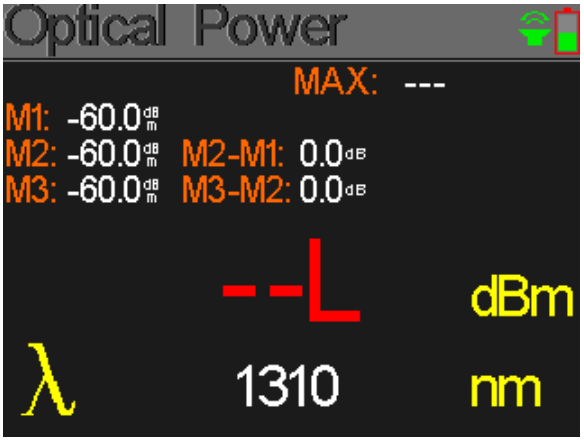
7.6 TRUNK VOLTAGE

This menu measures the voltage present in the cable. Press [OK] to switch between AC and DC.



8.OPTICAL MEASUREMENT

This menu measure the optical input signal. Connect fiber to the central connector at the top of the unit.



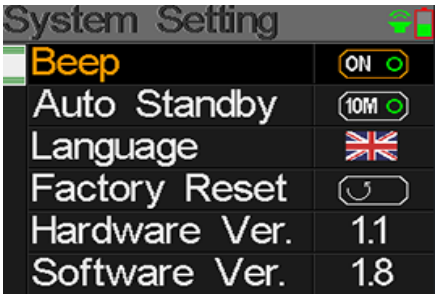
Press on [▲/ ▼] to change the length wave: 850, 980, 1300, 1310, 1490, 1550 and 1610 nm. Press [OK] to save the current value measured. Press on [F3] to switch the measurement mode Optical power in dBm measurement mode attenuation in dB and vice versa.

[F4] allows a discount to zero action.

- **MAX:** maximum value registered by the meter at a measurement time redel.
- **M1:** The first measured recorded by pressing [OK].

- **M2:** The second measure recorded by pressing [OK] again
- **M3:** The third measurement recorded by pressing sur [OK], a third time.
- **M2-M1:** Value of the attenuation in dB between the first and second measurement.
- **M3-M2:** Value of the attenuation in dB between the second and third step.

9 SETTINGS SYSTEMS



- **Beep:** Beep occurring by pressing the touches the meter or when the signal is locked. Activation / Deactivation with [◄/►] .
- **Auto Standby:** Setting standby time when meter turn in stdby mode sleep. Press [◄/►] to set the following parameters: Off, 10 min, 20 min, 30 min or 60 min.
- **Language:** Language of the measurer of menus. Press on [◄/►] for change **reset:** Press on [OK] to display a confirmation dialog. Then select [OK] to confirm or [MENU] to exit.
- **Hardware version:** hardware version number.
- **Software version:** software version number.

10. ACCESSORIES

Power adaptor

2 connectors RF: F- IEC female-female, female-female F-F

Car Charger, Carrying case, belt, CD with user manual

11.TROUBLESHOOTING

1. **No power:** Please charge for three hours the meter.
2. **LED Warning flashing:** Short circuit of the cable of arrival antenna overload. Turn the meter, Check the quality cable then put the meter in operation.
3. **Measuring blocking:** Please reset the meter.
4. **Signal lock Absence:** Please verify that the cable is properly connected and active in the presence of a remote power feed mast preamplifier**.**
5. **For other questions:** Please contact your dealer.

12.TECHNICAL CHARACTERISTICS

DVB-T	
Error rate (BER)	CBER (before Viterbi): 1E-7 - 1E-3VBER (before Reed Solomon): 1E-7 - 1E-3
Frequency range	42-1005MHz
Power Level	30-100 dBuV, +/- 2dB
SNR (Signal / Noise)	5 - 35dB +/- 0.5dB
Bandwidth	6MHz, 7MHz, 8MHz
FFT kind	2k, 8k
Constellation	QPSK, 16QAM, 64QAM
Viterbi rate	1/2, 2/3, 3/4, 5/6, 7/8
Interval garde	car
spectrum inversion	car
DVB-T2 / T2 Lite	
Error rate (BER)	CBER (before LDPC): 1E-7 - 1E-3LBER (before BCH): 1E-9 - 1 E-5
Frequency range	42-1005MHz
Power Level	30-100 dBuV, +/- 2dB
modulation error rate (SEA)	5 - 35dB +/- 0.5dB
Bandwidth	1.7MHz, 5MHz, 6MHz, 7MHz, 8MHz
Fashion	SISO, MISO, or multiple single PLP
FFT type	1k, 2k, 4k, 8k, 16k, 32k + extended bandwidth
Constellation	QPSK, 16QAM, 64QAM, 256QAM
Viterbi rate	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 1/3, 2/5

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Guard interval	auto
spectrum inversion	auto
DVB-C J83A	
Error rate (BER)	BER (before Reed Solomon): 1E-7 - 1E-3PER (Packet Error Rate): 1E-6 - 1E-2
Frequency range	42-1005MHz
Power Level	35-100 dBuV, +/- 2dB
SNR (signal / noise ratio)	20 - 40dB +/- 0.5dB
symbol rate	1.7 to 7.2 Msym / s
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
spectrum inversion	car
MCNS J83B	
Error rate (BER)	BER (before Reed Solomon): 1E-7 - 1E-3PER (Packet Error Rate): 1E-6 - 1E-2
Frequency range	42-1005MHz
Signal strength	35-100 dBuV, +/- 2dB
SNR (Signal / noise ratio)	20 - 40dB +/- 0.5dB
Symbol rate	5.6 Msym / s
Constellation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
spectrum inversion	car
DVB-C2	
Error rate (BER)	CBER (before LDPC): 1E-7 - 1E-3LBER (before BCH): 1E-9 - 1 E-5
Frequency range	42-1005MHz
Power Level	30-100 dBuV, +/- 2dB
SNR (Signal / Noise)	5 - 35dB +/- 0.5dB
Bandwidth	6MHz, 8MHz
FFT kind	4k
Constellation	16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM
Viterbi rate	2/3, 3/4, 4/5, 5/6, 8/9, 9/10
Guard interval	car
spectrum inversion	car
DVB-S	
Error rate (BER)	CBER (before Viterbi): 1E-7 - 1E-3VBER (before Reed Solomon): 1E-7- 1E-3
Frequency range	950-2150MHz
Power Level	35-100 dBuV, +/- 3dB
CNR (Signal / Noise)	0 - 20dB +/- 0.5dB
Symbol rate	333 Ksym / s to 45 Msym / s
Constellation	QPSK
Viterbi rate	1/2, 2/3, 3/4, 5/6, 6/7, 7/8

spectrum inversion	car	
DVB-S2		
Symbol rate (BER)	CBER (before LDPC): 1E-7 - 1E-3LBER (before BCH): 1E-9 - 1 E-5	
fr Rangesequence	950-2150MHz	
Power Level	35-100 dBuV, +/- 3dB	
CNR (Signal / Noise)	0 - 20dB +/- 0.5dB	
Symbol rate	333 Ksym / s to 45 Msym / s	
Constellation	QPSK, 8PSK, 16APSK, 32APSK	
Viterbi rate	2/5, 1/2, 3/5, 2/3, 3/4, 5/6, 8/9, 9/10	
spectrum inversion	car	
Remote supply	**Terrestrial**	**Satellite**
Voltage	5V / 12V / 18V/ 24V 200mA	13V/18V 400 mA max
DiSEqC	-	DiSEqC 1.2control dish of motor switches committed uncommitted &
Mini DiSEqC (22kHz)	-	22 kHz, Tone Burst
SCD IN 50494	-	8 switch max slots committed
SCD2 IN 50607	-	To 32 slots
Inputs / Outputs		
RF input	75 Ohm, F (with adapter)	
interfaces	Mini USB for power input 12V @ 1A	
Display	2.4 Inch LCD	
Battery	Battery Li-ion 1400mAh @ 7 .4V	
Charging time	3hour for 80% of capacity	
Operating temperature	-5 ° C to 45 ° C	
Storage temperature	-10 ° C to 60 ° C	
Dimensions	174 x 82x 35 mm	
Weight	0.54kg	