– 7806-7807-7808-7809-7846-7847 –

Sefram

7806-7807-7808
7809-7846-7847
FIELD STRENGTH METERS

USER MANUAL

Versions

Version and date of issue	Modified chapter	**Nature of the change**
1.0 / October 4th 2010	All	Creation of the document
2.0 / November 8th 2010	3.1, 3.2.9, 5, 8, 10.1, 10.2, 10.3, 10.4, 12, 16.1, 16.2, 17.7, 20	Lists and setups spreadsheet dimmed. Add setup number in lists. Adding 7806, 7807 and 7808 for specific functions and measures. Noise margin. 48Vrms input protection.
3.0 / April 12th 2011	2 2.1, 3.1, 3.2.3, 3.2.8.3, 3.2.9, 4.2, 4.5, 4.5.1, 5, 6, 7, 8, 9.1, 10, 10.1, 10.3, 10.4 11, 12, 13, 14.1, 16, 17.7, 17.9, 20.1, 20.4, 20.5, 20.6, 20.7, 20.9	Quick start modification. Adding 7846. LNB screen modified. Setup modification screen modified. Satellite technical data modified. Chapter 4.5 and 4.5.1 deleted.
4.0 / March 12th 2012	1, 19, 20, 32, 43, 43, 46, 47, 54, 57, §10, §11, §12, §16, §17, §20 §17.6 §17.7 §20.10	Adding 7809 and 7847 Adding wheel threshold and backlight brightness Battery discharge correction
5.0 / April 2015	 § 4 § 5 § 14 § 17 § 15-20 numbers	New function added : One Touch Software update Measurement List parameters : OneTouch select One Touch function description Configuration-Adjustments : MEASURES key

– 7806-7807-7808-7809-7846-7847 –

Thank you for purchasing this SEFRAM product and therefore trusting our company. Our different teams (research department, production, sales department, after-sales service…) are aiming at satisfying your wishes by designing and updating very advanced appliances.

To obtain the best performance from this product please read this manual carefully.

For more information please contact our different services:

0 825 56 50 50

Sales department	e-mail: sales@sefram.fr
After-sales service	e-mail: sav@sefram.fr
Technical support	e-mail: support@sefram.fr

Fax: +33 (0)4 77 57 23 23

Website: www.sefram.fr

Sefram
INSTRUMENTS & SYSTEMES

GARANTEE

Your instrument is guaranteed for one year in parts and work time against any default of manufacture and/or contingencies in the functioning. This guaranty starts at the date of delivery and ends 365 calendar days later.

If the appliance is subject to a guaranty contract, this contract cancels and replaces the above mentioned conditions of guaranty.

This guaranty does not include any fault of use and/or error of handling.

In case of use of the guaranty, the user must send back, with its expenses, the concerned appliance to our factory:

SEFRAM Instruments & Systèmes

Service Après-vente

32, rue Edouard MARTEL

BP 55

42009 SAINT-ETIENNE CEDEX 2

The accessory items furnished as standard with the appliance (cables, plugs…), consumable items (battery…) and the optional accessory items (bag, case…) are guaranteed for 3 months against any default of manufacture.

The warranty does not apply to LCD, pouch, keypad, etc. Please check our warranty conditions with our sales department. The warranty does not apply when the instrument is shocked.

The factory options in the appliance are guaranteed for the same time as the appliance.

Customer is responsible of shipping back the instrument to the factory. Special care must be taken in the packaging of the instrument to be sure that it will not be damaged during transportation. All necessary insurance must be taken by the customer.

SEFRAM can reject any instrument damaged.

What to do in case of malfunction?

In case of malfunction or for any problem of use, please join the technical assistance by SEFRAM Instruments & Systems.

A technician will take your call in charge and will give you any necessary information to solve your problem.

What to do in case of crash?

In case of crash of the appliance, please join our after-sales service.

Some advice?

Some technical help required?

SEFRAM Instruments & Systems commits itself to help you by phone for the use of your appliance.

Please phone:

(00 33) 825 56 50 50   Technical help for products

or send an e- mail to: support@sefram.fr

1   Important information

Please read cautiously the following instructions before using this appliance

1.1   Special precautions

- Do not use the product for any purpose else that scheduled.
- Use the battery charger provided to prevent any damage to the appliance and guarantee its measurement characteristics.
- Do not use in a wet environment.
- Do not use in an explosive environment.
- Only a qualified personal should be allowed to work on the appliance in case of failure or for maintenance. In such a case, it is necessary to use Sefram spare parts.
- Do not open the appliance: risk of electrical shock.
- You must use only the provided BNC/F convertor furnished with your appliance. Using any other convertor may damage your appliance and invalidates the guarantee.

1.2   Security instructions

For a good use of the appliance, you must respect the security and use instructions as described in this manual.

Some specific warnings are specified all along this manual.

In case of need, warning symbols are stamped in the appliance:

1.3   Symbols and definitions

Symbols that appear in this user manual:

Remark: important information

Symbols that appear on the appliance:

Caution: Refer to the user manual. Risk of damage to any material connected to the instrument or to the instrument itself.

Grounding: Easily reached parts linked to the grounding.

Product to recycle.

1.4   Conformity and restrictions of the appliance

See chapter "CE Declaration".

2   Quick start

Important keys:

 Toolbox: For the set-up of the satellite remote supply

 Spectrum: For fast identification of a signal

 Measurement: For a fine adjustment of the parameters

 TV: For the complete validation of the reception

 Validation: To select a value to modify

 KNOB: To adjust this value

2.1 Catching of the terrestrial signal

Push the Spectrum key
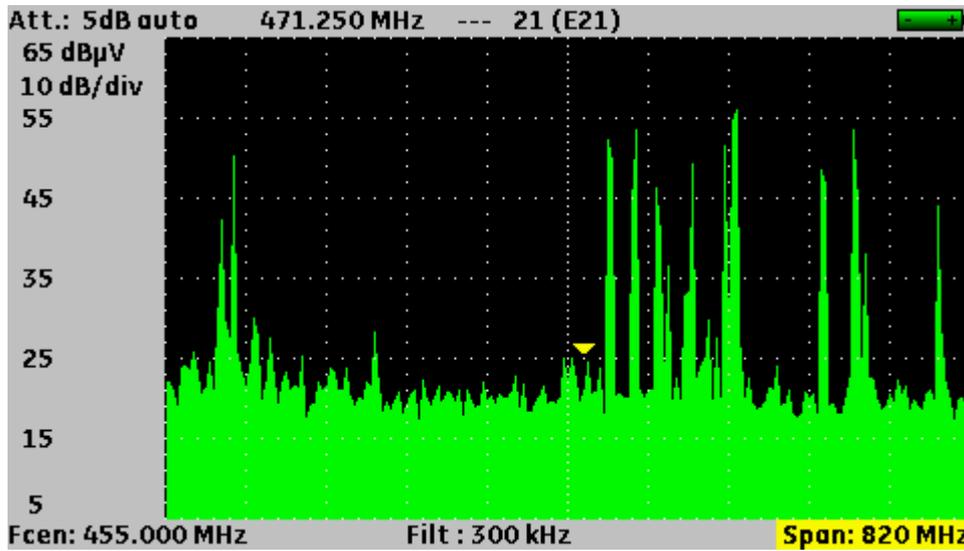
Push several times on the Validation key to select the Span: 820MHz parameter
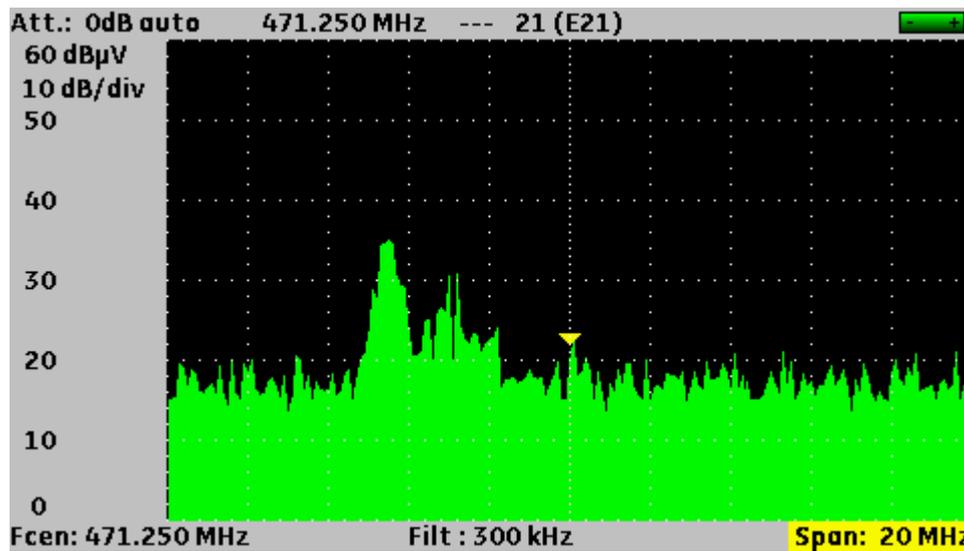
Rotate the knob to display Span: 20 MHz
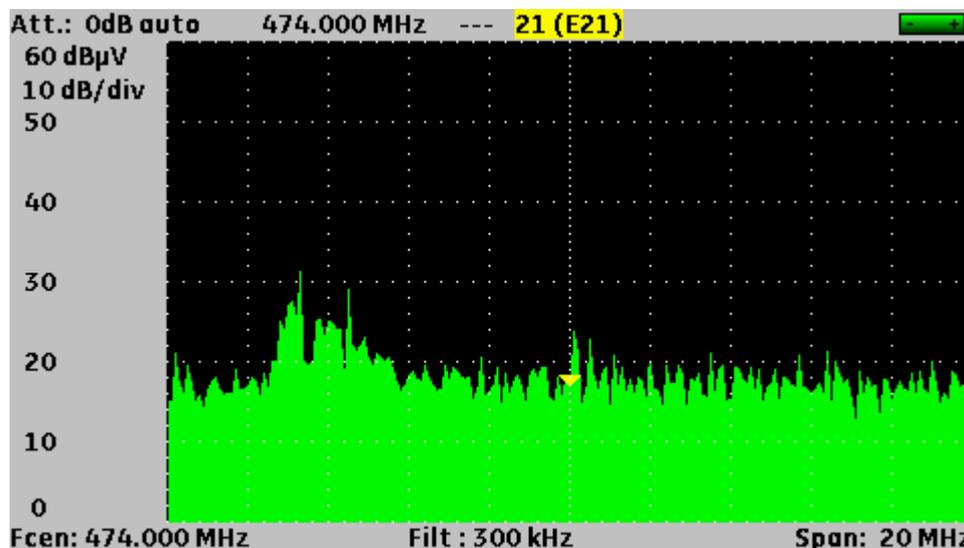
Push several times on the Validation key to select the Channel 21 (E21) parameter

Att.: 5dB auto   703.250 MHz   --- 50 (E50)
65 dBµV
10 dB/div
55

45

35

25

15

5
Fcen: 706.250 MHz   Filt : 300 kHz   Span: 20 MHz
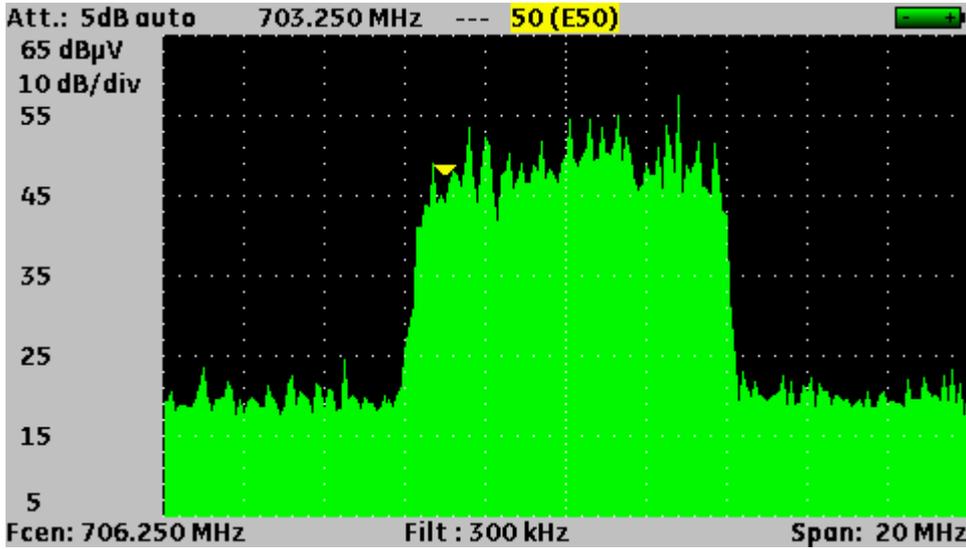
Rotate the knob to get an active channel in the 50 (E50) screen

2.2   Adjustment of the parameters in the Measurement screen

Push the MEASUREMENT key

Signal level

Setup	: ---
Channel	: E50 (Eu)
Frequency	: 703.250 MHz
Standard	: I
Audio	: 6.0 MHz Mono

	20	40	60	80	100	120
V	59.3 dBµV					

	0	10	20	30	40	50
C/N	> 52.8 dB					

	-10	0	10	20	30	40
V/A	19.4 dB					

Signal level

Setup	: ---
Channel	: E50 (Eu)
Frequency	: 703.250 MHz
Standard	: I
Audio	: 6.0 MHz Mono

	20	40	60	80	100	120
V	59.5 dBµV					

	0	10	20	30	40	50
C/N	> 50.2 dB					

	-10	0	10	20	30	40
V/A	19.6 dB					
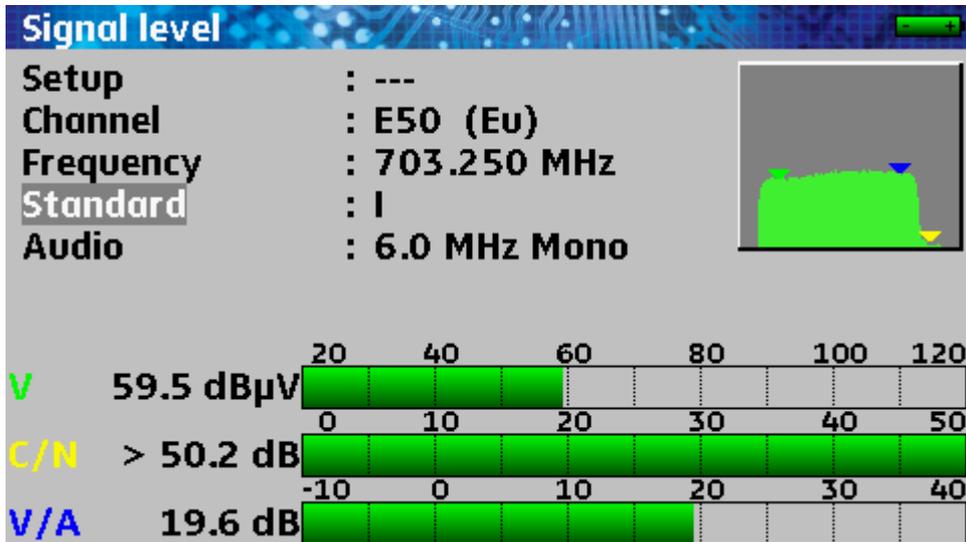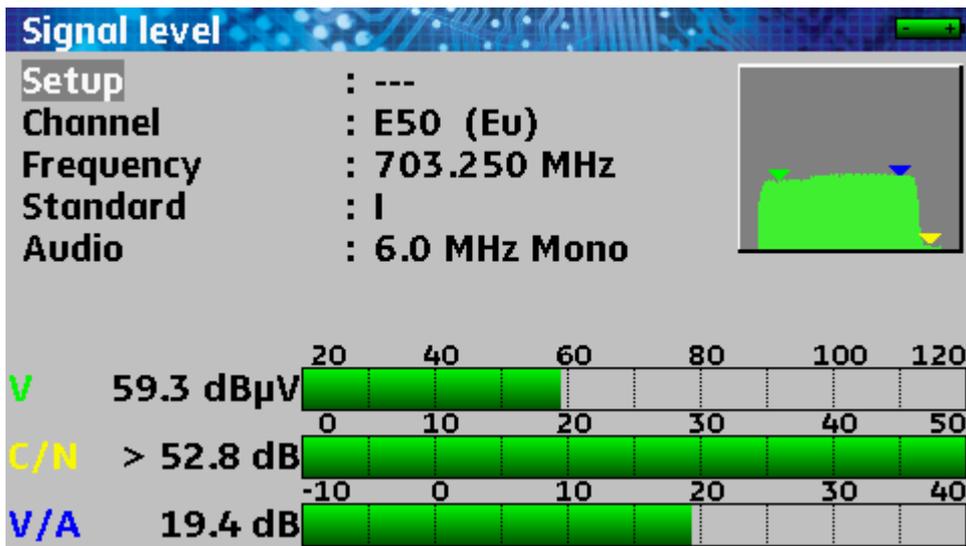
Rotate the knob to select the standard

Signal level

Setup	: ---
Channel	: E50 (Eu)
Frequency	: 703.250 MHz
Standard	: I
Audio	: 6.0 MHz Mono

		20	40	60	80	100	120
V	59.4 dBµV						

		0	10	20	30	40	50
C/N	> 50.9 dB						

		-10	0	10	20	30	40
V/A	20.0 dB						

Push the Validation key to select

Signal level

Setup	: ---
Channel	: E50 (Eu)
Frequency	: 706.000 MHz
Standard	: DVB-T/H 8 MHz

		20	40	60	80	100	120
V	56.0 dBµV						

		0	10	20	30	40	50
C/N	> 47.7 dB						
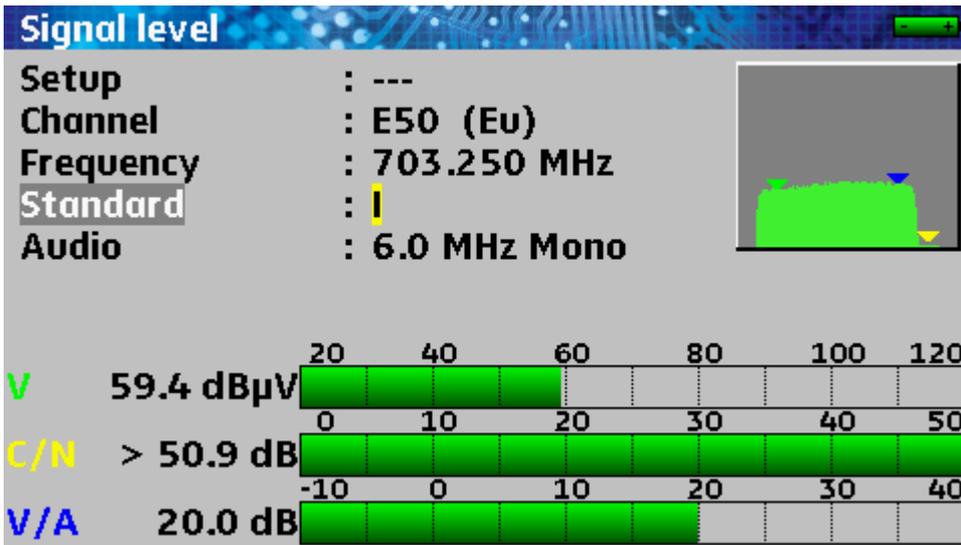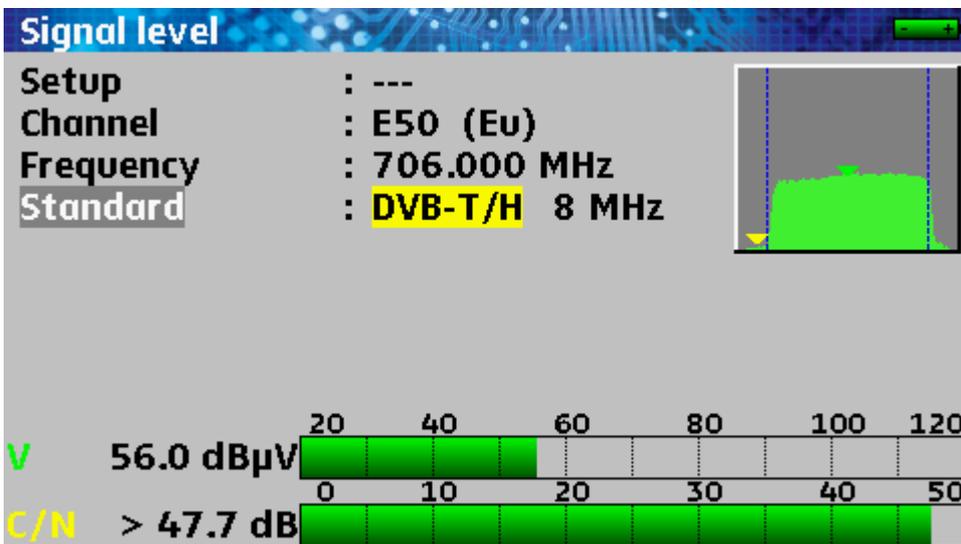
Rotate the knob to modify the standard

Signal level

Setup	: ---
Channel	: E50 (Eu)
Frequency	: 706.000 MHz
Standard	: DVB-T/H 8 MHz

		20	40	60	80	100	120
V	55.8 dBµV						

		0	10	20	30	40	50
C/N	> 49.8 dB						
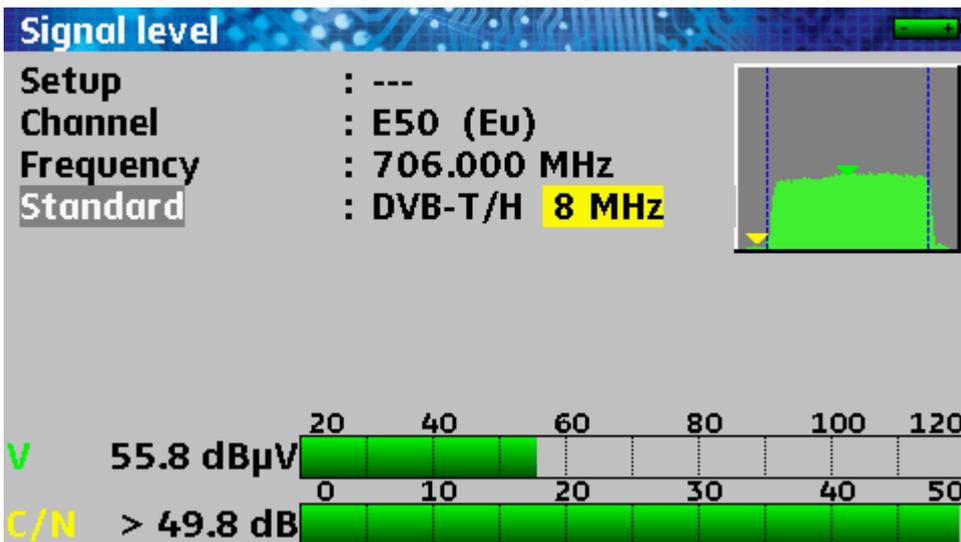
Push the Validation key to select the bandwidth

Rotate the knob for modification if required

2.3 Validation on TV

Push on the TV key

2.4 Set-up of the remote supply
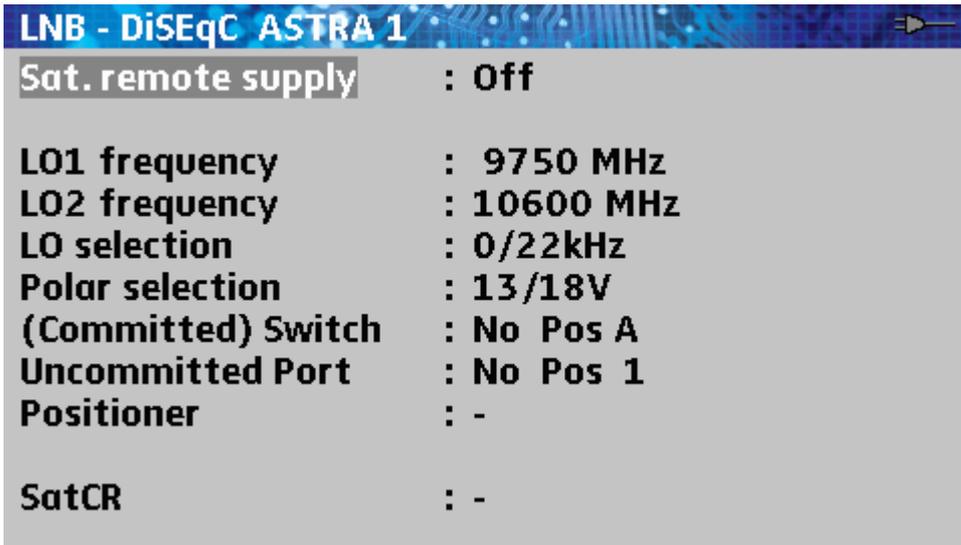
LNB - DiSEqC ASTRA 1

Sat. remote supply	: Off
LO1 frequency	: 9750 MHz
LO2 frequency	: 10600 MHz
LO selection	: 0/22kHz
Polar selection	: 13/18V
(Committed) Switch	: No Pos A
Uncommitted Port	: No Pos 1
Positioner	: -
SatCR	: -

Multiple push on the Toolbox key give you access to the Remote supply screen
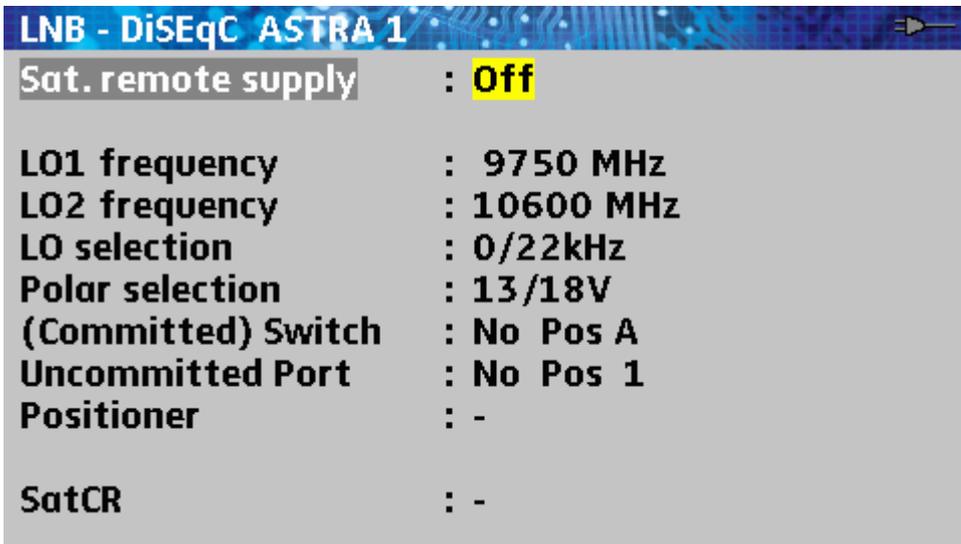
LNB - DiSEqC ASTRA 1

Sat. remote supply	: Off
LO1 frequency	: 9750 MHz
LO2 frequency	: 10600 MHz
LO selection	: 0/22kHz
Polar selection	: 13/18V
(Committed) Switch	: No Pos A
Uncommitted Port	: No Pos 1
Positioner	: -
SatCR	: -

Push the Validation key to select the Remote supply parameter
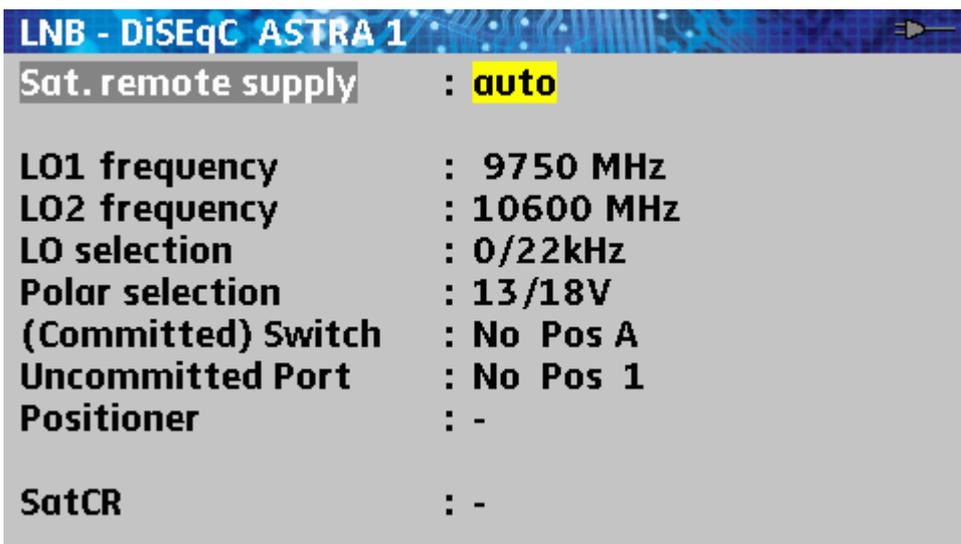
LNB - DiSEqC ASTRA 1

Sat. remote supply	: auto
LO1 frequency	: 9750 MHz
LO2 frequency	: 10600 MHz
LO selection	: 0/22kHz
Polar selection	: 13/18V
(Committed) Switch	: No Pos A
Uncommitted Port	: No Pos 1
Positioner	: -
SatCR	: -

Rotate the knob to display On or auto

Push the Validation key

2.5   Dish adjustment

1/ Connect the dish to the appliance.

2/ Set up the remote supply (see Set-up of the remote supply)

3/ Push twice on the **Spectrum** key to access the pointing mode.
   (The appliance already has a list of satellites included)
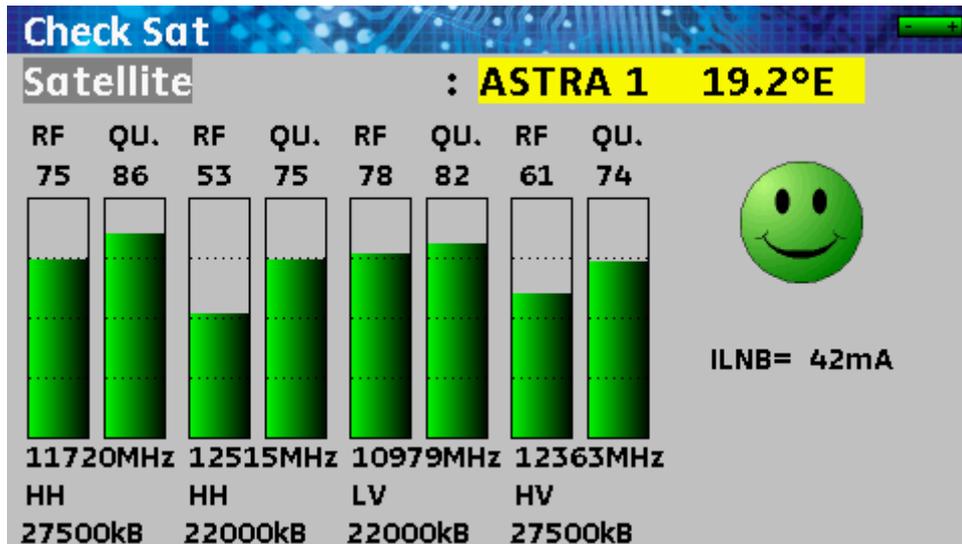
4/ Choose the satellite to plot (see Pointing)

5/ Slowly direct the dish until you hear the locking signal and get the best quality.

No transponder found → red smiley

Medium reception quality (< 50%) → orange smiley

Good reception quality (> 50%) → green smiley

Remember: transponder = satellite channel

Caution:

To accurately identify a satellite, you have to « catch » it on all 4 transponders (Quality > 0)

However, some transponders are regularly modified. Consult the frequency plan of the satellite if the transponder does not seem to work.

Some switches or LNB only work with DiSEqC commands. In this case, set the band (OL) and the polarization on DiSEqC at the LNB-DiSEqC configuration page (Caution: the pointing is slower when you use the DiSEqC command).

For any additional information, our technical support is available:

0.15€ TTC/mn   0 825 56 50 50

E-mail: support@sefram.fr

3   Presentation

3.1   General

The field measurement appliances **7806**, **7807, 7808, 7809, 7846 and 7847** are portable appliances designed for the installation and the maintenance of any device for the broadcasting and reception of analogical, terrestrial digital, satellite television or cable network.

The frequency band ranges **from 5MHz to 2150MHz**; they allow accurate measurements on all standards of analogical televisions, the FM carrier waves and the various digital standards NICAM, DVB-C, MCNS, DVB-T/H, DVB-T2, DVB-S, DSS and DVB-S2.

They make **Level** measurements as average measurements, peak measurements or power according to the selected standard, on the video carrier wave and the audio carrier waves if they exist.

In **Measurement Plan** mode, they scan up to 50 setups simultaneously and compare them to decision thresholds (min. / max.)

With their effective measurement of **Error rate** (various BER, MER); they enable the complete validation of the digital transmissions DVB-T/H, DVB-T2, DVB-C, MCNS, DVB-S, DSS and DVB-S2.

The graphic display of the **Constellation** in DVB-T/H, DVB-T2, DVB-C, MCNS, DVB-S, DSS and DVB-S2 and the display of echoes in DVB-T/H and DVB-T2 allow the fulfilment of this analysis.

The quick and accurate **Spectrum** analysis shows the interference waves...

You can visualize the unencrypted image of **terrestrial digital or satellite TV** in SD and HD.

You can hear digital sound with an incorporated loudspeaker.

The large amount of FLASH memory allows the storage of many measurements and spectrum curves.

Designed for a use on field, they are compact (less than 1.5kg, battery included), unattended (pack battery and quick charger), equipped with a back lighted colour LCD display for a better visibility.

The capabilities of your appliance are summed-up below.

7806 model:

- **Compatible with terrestrial signals**
- **Analogical and digital measurements**
- **DVB-T/H**
- **unencrypted SD/HD digital images and sounds**
- **5, 13, 18 and 24Volt remote supply**

7807 model:

- **Compatible with cable signals**
- **Analogical and digital measurements**
- **DVB-C, MCNS**
- **unencrypted SD/HD digital images and sounds**
- **5, 13, 18 and 24Volt remote supply**

7808 model:

- **Compatible with satellite signals**
- **Analogical and digital measurements**
- **DVB-S, DSS and DVB-S2**
- **unencrypted SD/HD digital images and sounds**
- **13/18Volt remote supply, ToneBurst, DiSEqC 1.2 and SatCR**

7809 model:

- **Compatible with cable and terrestrial signals**
- **Analogical and digital measurements**
- **DVB-C, DVB-T and DVB-T2**
- **unencrypted SD/HD digital images and sounds**
- **5, 13, 18 and 24Volt remote supply**

7846 model:

- **Compatible with terrestrial and satellite signals**
- **Analogical and digital measurements**
- **DVB-T/H, DVB-S, DSS and DVB-S2**
- **unencrypted SD/HD digital images and sounds**
- **5, 13, 18 and 24Volt terrestrial remote supply**
- **13/18Volt satellite remote supply, ToneBurst, DiSEqC 1.2 and SatCR**

7847 model:

- **Compatible with cable, terrestrial and satellite signals**
- **Analogical and digital measurements**
- **DVB-T/H, DVB-T2, DVB-S, DSS and DVB-S2**
- **unencrypted SD/HD digital images and sounds**
- **5, 13, 18 and 24Volt terrestrial remote supply**
- **13/18Volt satellite remote supply, ToneBurst, DiSEqC 1.2 and SatCR**

3.2   Description

3.2.1   Front side

- Color screen 16/9
- Remote supply lamp
- Toolbox key
- ON/OFF key
- Validation key
- Knob
- Back key
- Function keys
- Battery charge lamp
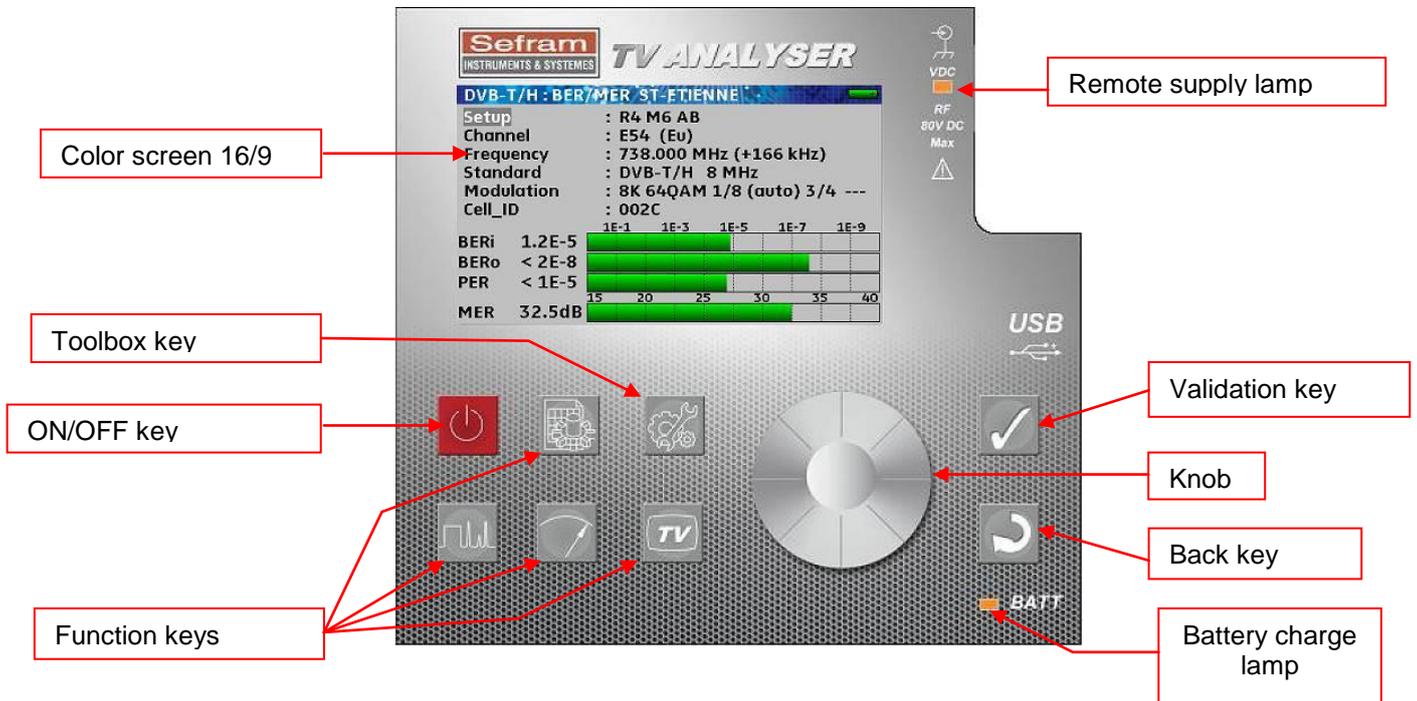
3.2.2   ON/OFF key

This key turns the appliance on and off.

The appliance will stop automatically after ten minutes on the splash page.

If the appliance gets locked, push it about ten seconds to stop it.

3.2.3   Function keys

PARAMETERS: selection and change of the measurement lists; pushing it twice gives you access to the library of the 1000 software listings available and to their modification

SPECTRUM: spectrum analysis; pushing it twice gives you access to the satellite adjustment mode; pushing it three times gives you access to the display of the identification of the satellite (according to the type of the appliance).

MEASUREMENT: level measurement (peak, average and power)

Pushing twice: measurement of BER and MER (according to the selected standard)

Pushing three times: display of the satellite constellation (according to the selected standard)

Pushing four times: display of the echoes (according to the selected standard and the type of the appliance)

Pushing five times: display of the measurement plan

TV: display of the digital image; the knob enables you to set the sound volume

Pushing twice: display of the list of services

Pushing three times: display of the pending setup

3.2.4   Toolbox key

According to the context, this key gives you access to secondary functions of the appliance.

If no parameter has been selected (yellow colour) and a measurement or a spectrum is displayed, it gives you access to the storage of this measurement or this spectrum.

Pushing it twice gives you access to the remote supply.

Pushing it three times gives you access to the configuration of the appliance

If a parameter has been selected, this key can give you access to a list of selections.

3.2.5   Validation and Back keys

Validation: this key enables the selection of parameters and the validation of your choice

Back: this key enables the de-selection of parameters, the cancellation of a choice and the closing of a list.

3.2.6   Connectors

All connectors are located together on the right side of the appliance.

Power supply connector
Functioning with the mains
or loading of the battery

Measurement input
Interchangeable BNC or F plug

Mini-B type USB connector
Connection to the computer

Type A USB connector
USB key for configuration
or updating of the software

BNC or F plug
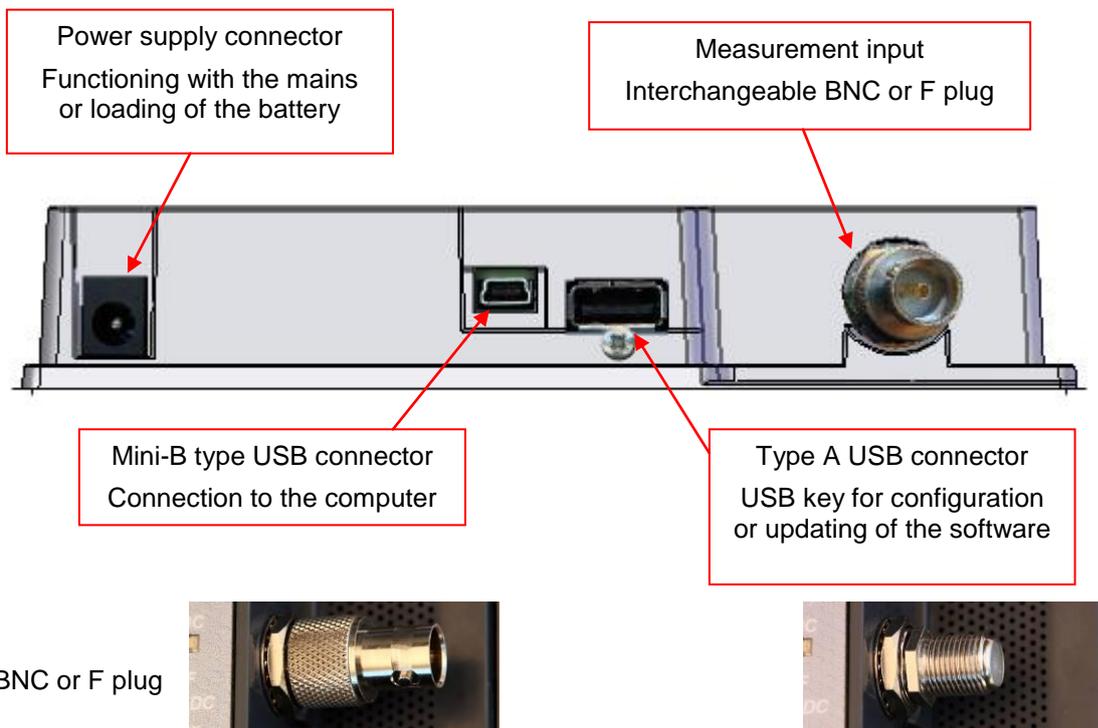
3.2.7   Contents of the screen

All useful information is gathered on the same screen.

Example: Measurement of the level-power of the satellite.

| Title of the page | Name of the site | DiSEqC / SatCR information | Charge status of the battery |

Signal level ASTRA 1   Pos A

Setup	: ANIXE HD
Frequency	: 11303 (1553) MHz
Polar./Band	: Horizontal Low
Standard	: DVB-S2
Symbol rate	: 22000 kBd

Mini spectrum

Signal width

Cursors

Measurement parameters

Measurements

RF   76.3 dBµV

C/N   13.0 dB

VLNB   17.9 V

ILNB   45.5 mA

Bargraphs
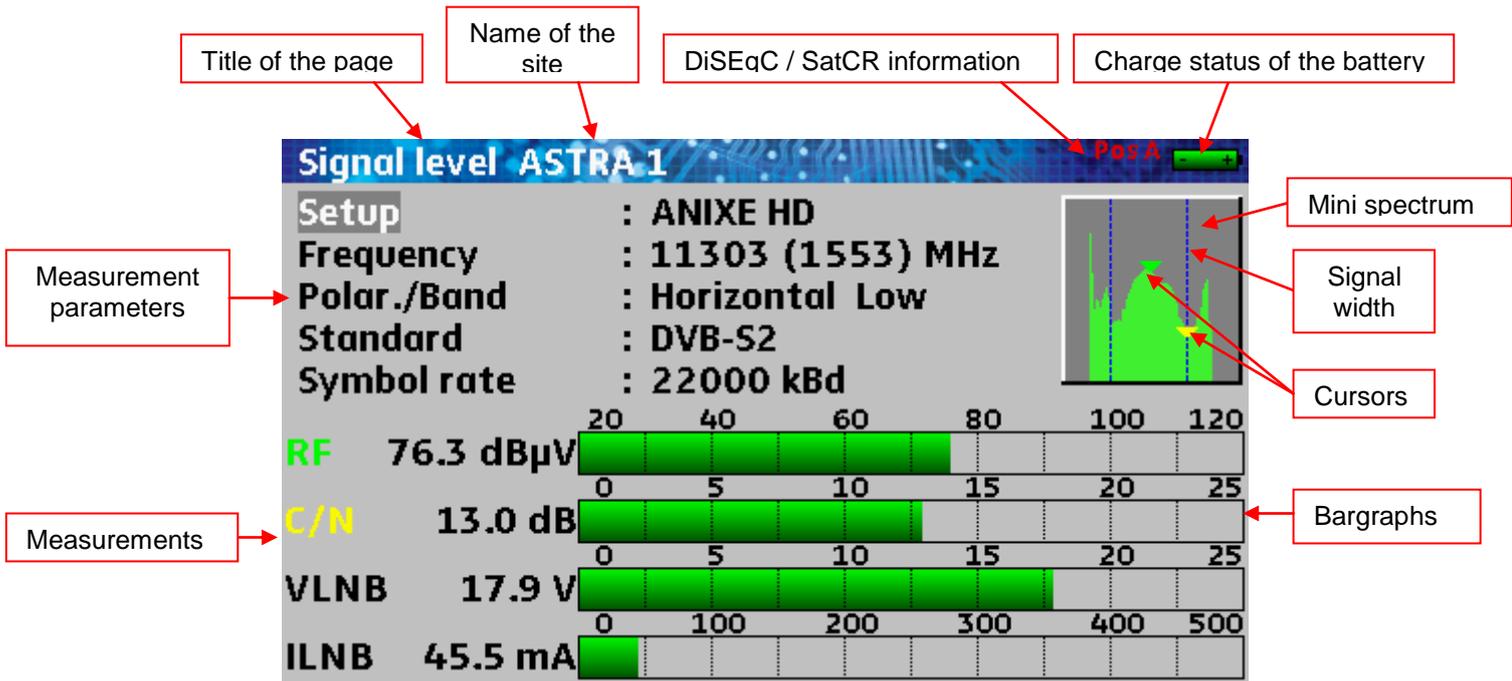
3.2.8   Man-machine interface

3.2.8.1   Modification of a parameter with the knob
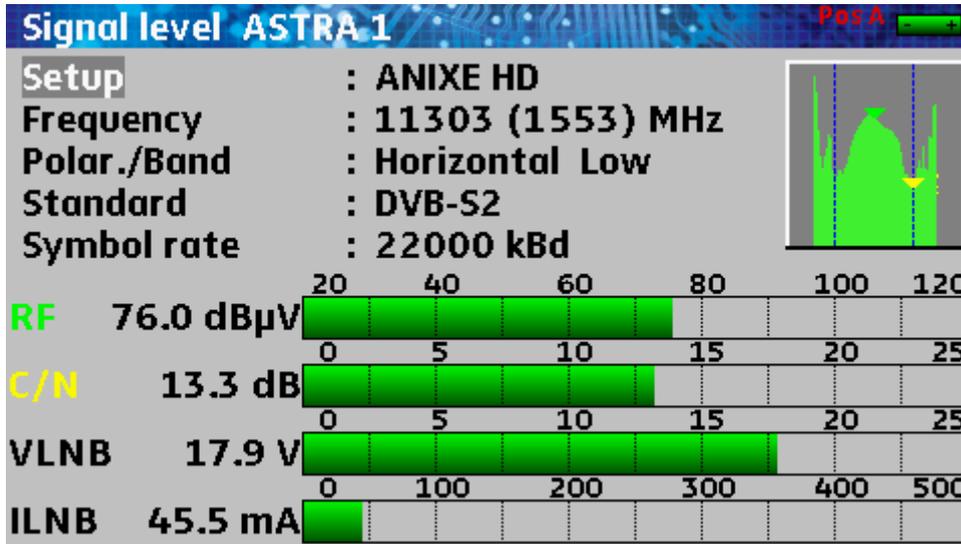
Push the Measurement key

The Measurement page appears

With the knob, select the Setup line (white on grey)
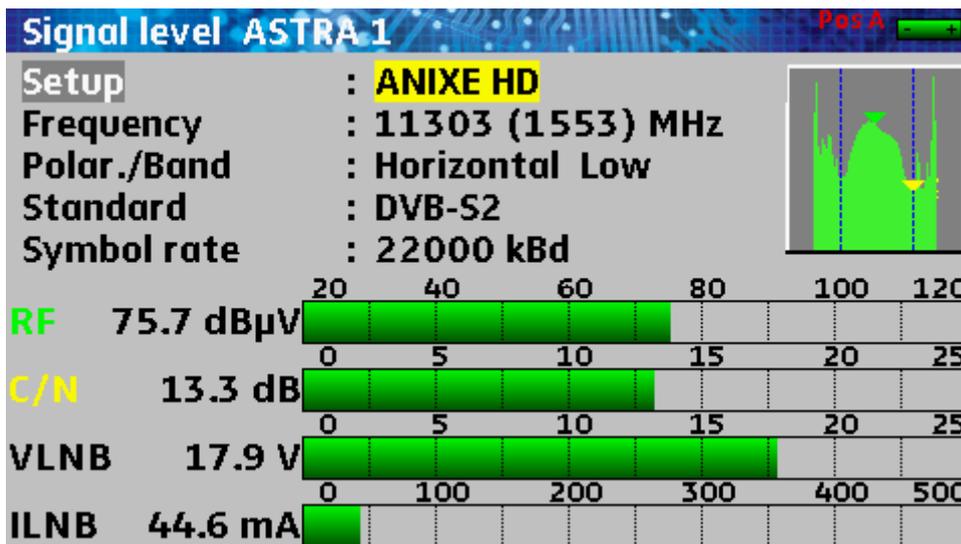
Push the Validation key

The name of the setup is selected (**black on yellow**): now you can change it
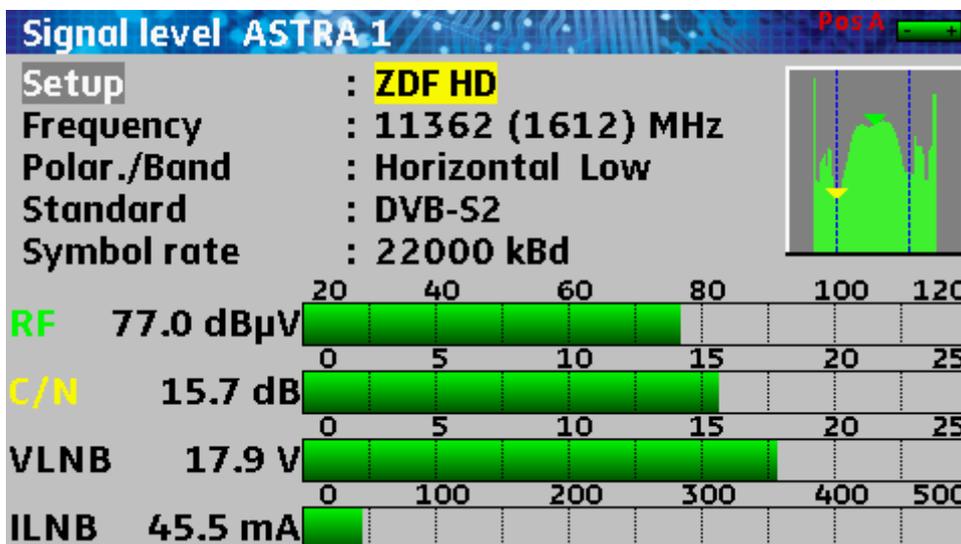
Rotate the knob to change the name of the setup; the parameters of the new setup are automatically recalled
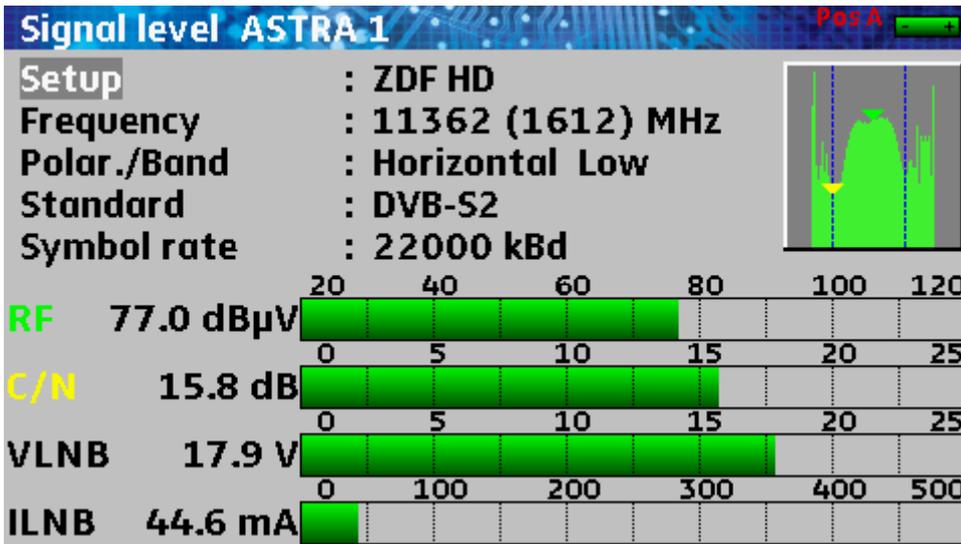
Push the Back key

The name of the setup is no more selected; turning the knob will change the line but no more the setup

3.2.8.2 Modification of a parameter with a list
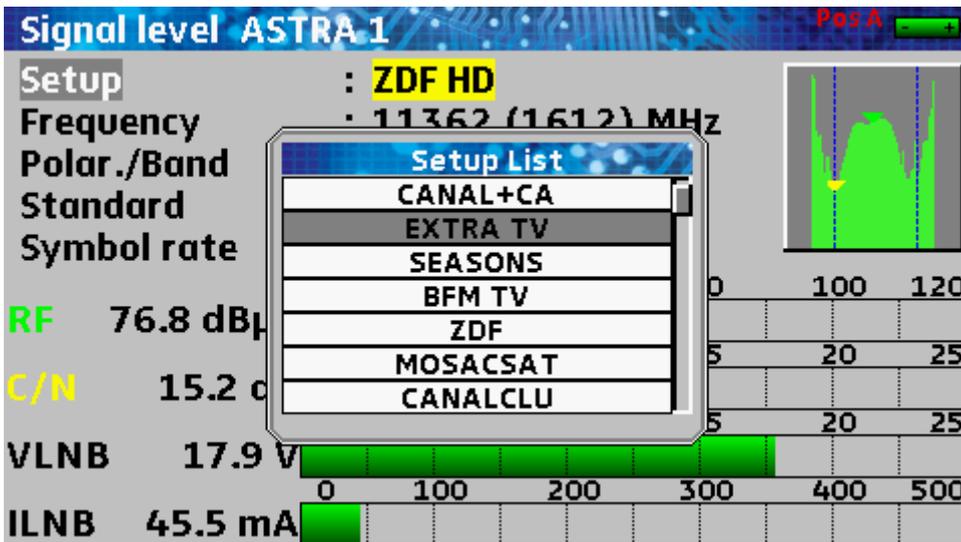
Push the Validation key,

then push the Toolbox key

The list of the available setups appears.
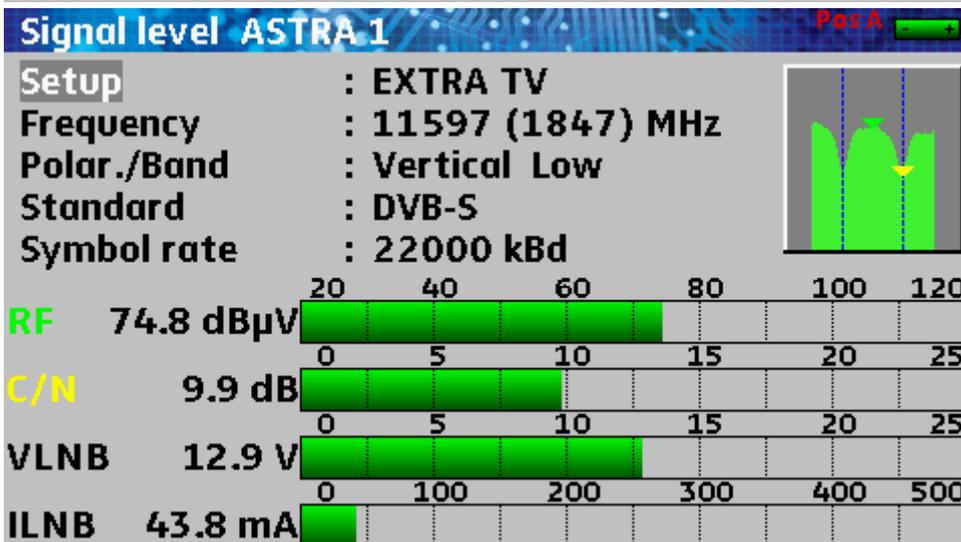
The knob enables you to move along the list

Push the Validation key

The setup is recalled, the name of the setup is no more selected

3.2.8.3   Line with several parameters

LNB - DiSEqC ASTRA 1	
Sat. remote supply	: auto
LO1 frequency	: 9750 MHz
LO2 frequency	: 10600 MHz
LO selection	: 0/22kHz
Polar selection	: 13/18V
(Committed) Switch	: No Pos A
Uncommitted Port	: No Pos 1
Positioner	: -
SatCR	: **Slot 1** 1092 MHz Pos A

Push the Validation key

The first parameter is selected; you can change it with the knob.

LNB - DiSEqC ASTRA 1	
Sat. remote supply	: auto
LO1 frequency	: 9750 MHz
LO2 frequency	: 10600 MHz
LO selection	: 0/22kHz
Polar selection	: 13/18V
(Committed) Switch	: No Pos A
Uncommitted Port	: No Pos 1
Positioner	: -
SatCR	: Slot 1 **1092 MHz** Pos A

Push the Validation key once again

The second parameter is selected; you can change it with the knob.

LNB - DiSEqC ASTRA 1	
Sat. remote supply	: auto
LO1 frequency	: 9750 MHz
LO2 frequency	: 10600 MHz
LO selection	: 0/22kHz
Polar selection	: 13/18V
(Committed) Switch	: No Pos A
Uncommitted Port	: No Pos 1
Positioner	: -
SatCR	: Slot 1 1092 MHz **Pos A**

Push the Validation key for the third time

The third parameter is selected; you can change it with the knob.

Push the Validation key for the fourth time; no parameter is selected any more

Pushing the Back key deselects the active parameter at any time

3.2.8.4   Entering a name
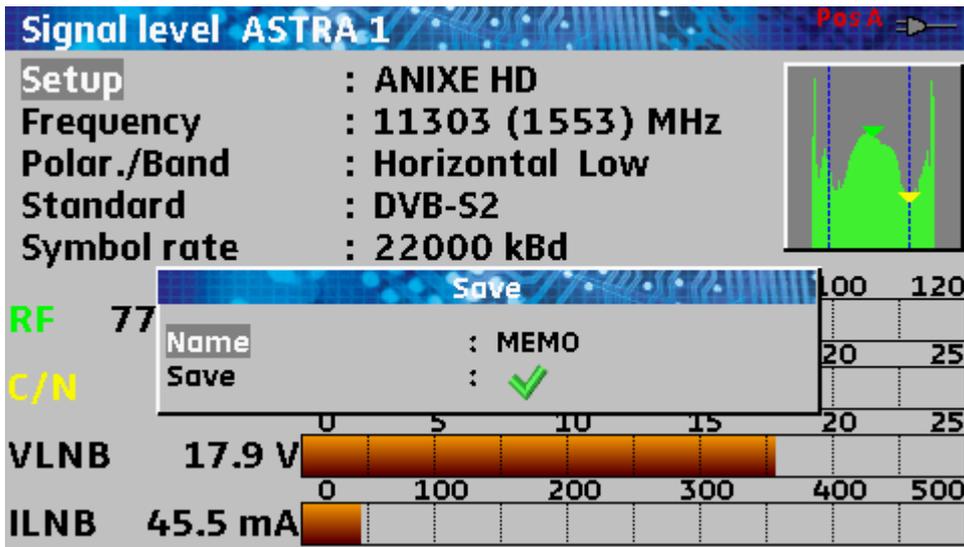
Push the Toolbox key

The Save window appears.
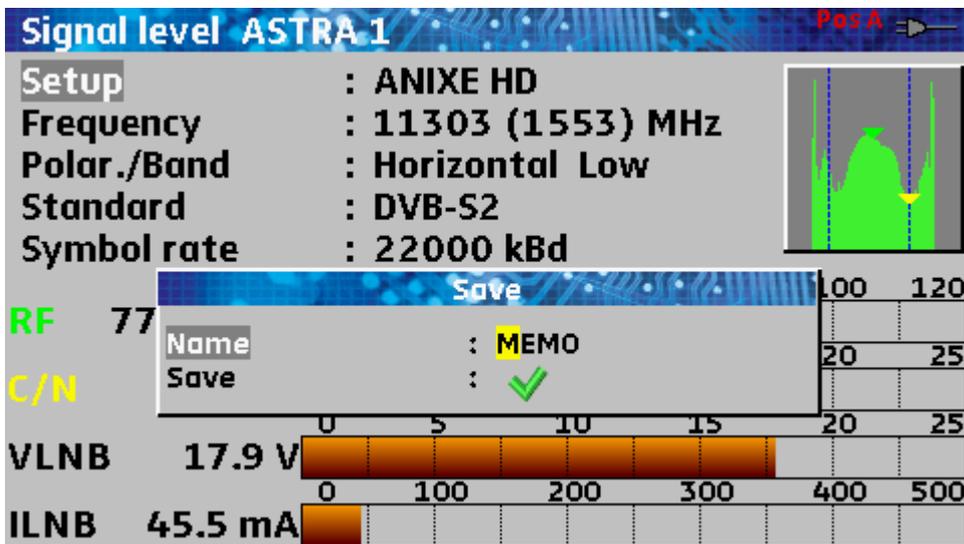
Push the Validation key

The first character of the name is selected

Turning the knob makes you change the character
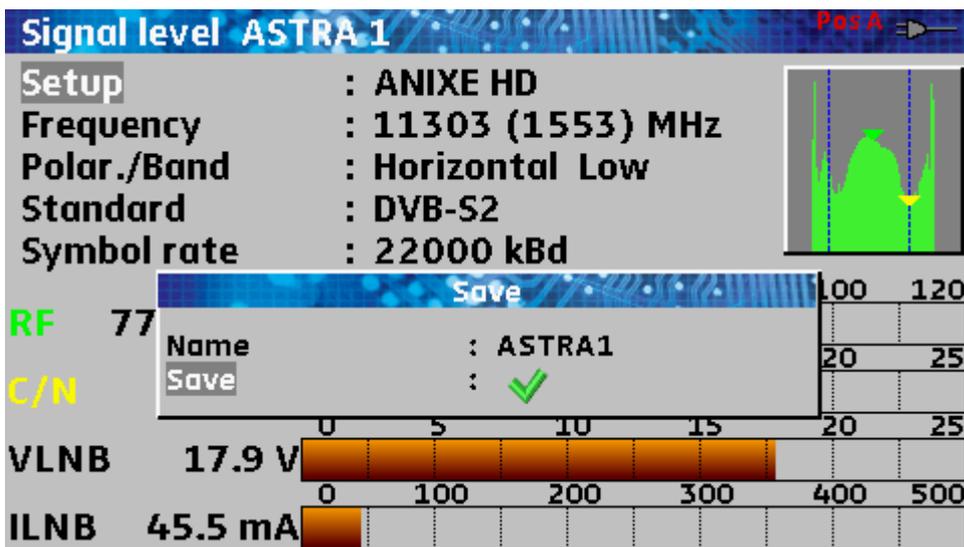
Pushing the Validation key leads to the following character

After eight characters, you can save the name by pushing the Validation key.

Pushing the Back key cancels the save procedure at any time.

If the end of the name is a series of numbers, they will be automatically incremented at the next save.

The last used name is saved even at the shutdown of the appliance.

3.2.8.5 Specific case of the spectrum analyzer
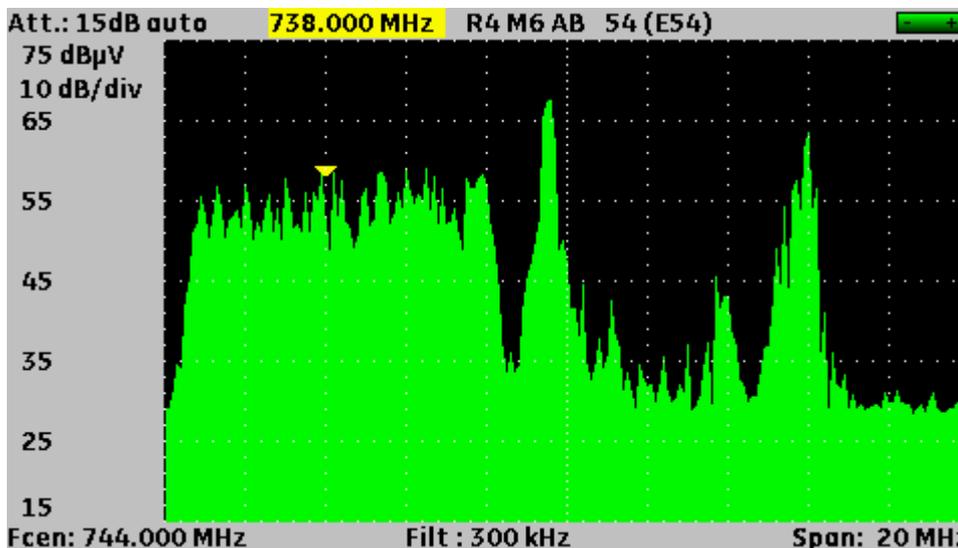
Pushing the Validation or Back key leads you to the next/previous parameter

Frequency of the cursor

Setup

Channel or polarization

Reference level

Number of dB/division

Central frequency

Span width
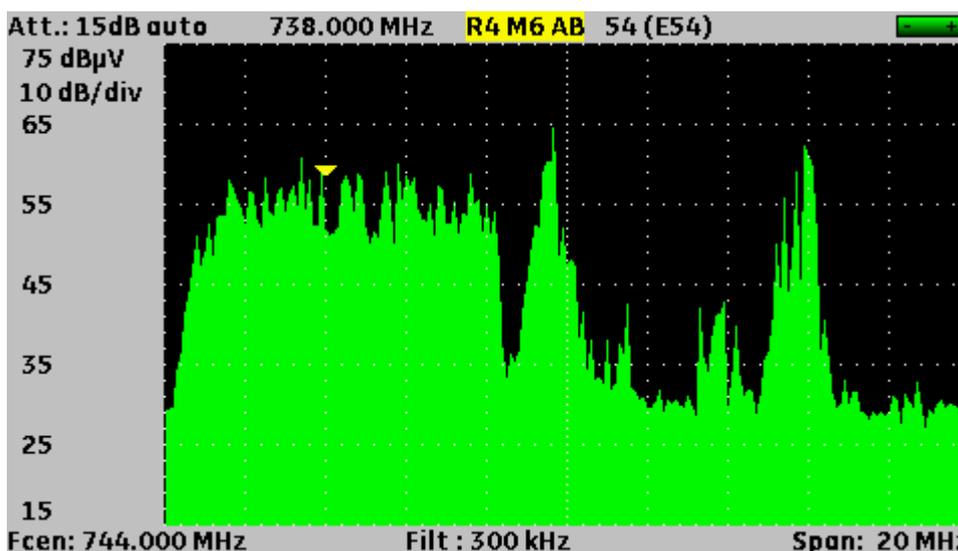
You can change the selected parameter with the knob (black on yellow).

3.2.9   List of measurements and setups

In order to make the call of information easier on the field, the appliance uses 20 lists of measurements, 50 lines each, 1000 setups each.

A setup corresponds with a terrestrial, cable or satellite emission.

A list of measurements corresponds with a specific installation: presence of several dishes, of various switches…

The same setup can be used in several measurement lists.

An installation can use two dishes:

> ASTRA 19.2 in DiSEqC position A
>
> HOT BIRD 13 in DiSEqC position B

Another installation can use three dishes:

> ATLANTIC BIRD 3 in DiSEqC position A
>
> ASTRA 1 in DiSEqC position B
>
> HOT BIRD in DiSEqC position C

The same setup can be used several times in the same list of measurements:

> ZDF SatCR slot 0
>
> ZDF SatCR slot 1
>
> ZDF SatCR slot 2
>
> ZDF SatCR slot 3…

If a parameter of a setup is changed, by example a change of the bandwidth or a change from DVB-S to DVB-S2, only the setup in the library has to be updated.

You can create these lists and setups with a computer on spreadsheet software and upload them into the appliance thanks to an USB key.

A measurement list includes:

- the name of the list on 10 characters
- the lower frequency of the LNB (OL1)
- the higher frequency of the LNB (OL2)
- the selection mode lower band / higher band of the LNB
- the selection mode of the polarisation
- the presence and the position number of the position finder (for motorized dishes)
- 50 lines, each including:
    - a setup number corresponding with the list of setups
    - the presence and the functioning mode of a switch of the committed type
    - the position of the switch of the committed type
    - the presence and the functioning mode of a switch of the uncommitted type
    - the position of the switch of the uncommitted type
    - the presence of a SatCR item

- the number of the SatCR slot
- the position of the SatCR switch.

Some of these parameters are specific to the satellite band and have no influence on the terrestrial and cable modes.

Push the Parameters key

Rotate the knob to select a line in the list

Push the Validation key to open the modification page

Display of a list of measurements in spreadsheet software:

A setup is made of:

- a setup name in 8 characters
- a site name in 10 characters
- a frequency
- a channel number for terrestrial band or cable
- a frequency plan for terrestrial band or cable
- a vertical or horizontal polarisation for satellite band
- a lower and higher LNB band for satellite band
- a standard
- an analogical audio mode mono/stereo/NICAM for terrestrial band or cable
- a type of constellation 64QAM 256QAM in DVB-C or MCNS
- a bandwidth 5, 6, 7 or 8 MHz in DVB-T and DVB-T2
- a symbol output in DVB-C, MCNS, DVB-S, DVB-S2 or DSS
- a value for the guard interval in DVB-T and DVB-T2
- the inversion or not of the spectrum in DVB-T

A few parameters have no influence according to the terrestrial, cable or satellite band or according to the standard.

The name of the site allows you to distinguish two different emitters, ex. TF1 Fourvière and TF1 Chambéry.

Frequency and channel number are equivalent: valid channel numbers take priority over frequencies.

The frequency plan parameter associated with the setup enable users close to boundaries to keep on using their channel numbers.

👆	Selecting a List on the **Measurement Lists** page calls back automatically all information assigned to this list.

👆	Selecting a **Setup** on one of these measurement pages calls back automatically all information assigned to this setup.

Push twice on the Parameters key

Rotate the knob to select a setup in the list

Push the Validation key to open the modification page

Display of a list of setups in spreadsheet software:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1		Nom du programme Setup name	Nom du site Place name	Fréquence Frequency	N° de canal Channel #	Plan de fréquences Frequencies map	Polarisation Polarization	Bande LNB LNB band	Standard	Mode audio Audio mode	Constellation	Largeur de bande Bandwidth	Débit symbole Symbol rate	Intervalle de garde Guard interval	Inversion du spectre Spectrum inversion
2	0	DIGITAL+	ASTRA 1	10729,000			V		DVB-S2				22000		
3	1	ARD	ASTRA 1	10743,000			H		DVB-S				22000		
4	2	SKY D	ASTRA 1	10773,000			H		DVB-S2				22000		
5	3	DIGITAL+	ASTRA 1	10788,000			V		DVB-S				22000		
6	4	DIGITAL+	ASTRA 1	10817,000			V		DVB-S2				22000		
7	5	ANIXE HD	ASTRA 1	10832,000			H		DVB-S2				22000		
8	6	DIGITAL+	ASTRA 1	10847,000			V		DVB-S				22000		
9	7	TVP HD	ASTRA 1	10861,000			H		DVB-S				22000		
10	8	DIGITAL+	ASTRA 1	10876,000			V		DVB-S				22000		
11	9	UPC	ASTRA 1	10920,000			H		DVB-S				22000		
12	10	DIGITAL+	ASTRA 1	10979,000			V		DVB-S				22000		
13	11	SKY D	ASTRA 1	11023,000			H		DVB-S2				22000		
14	12	DIGITAL+	ASTRA 1	11038,000			V		DVB-S				22000		
15	13	DIGITAL+	ASTRA 1	11097,000			V		DVB-S				22000		
16	14	DIGITAL+	ASTRA 1	11156,000			V		DVB-S				22000		
17	15	ORANGE	ASTRA 1	11170,000			H		DVB-S2				22000		
18	16	ORF	ASTRA 1	11302,000			H		DVB-S2				22000		
19	17	DIGITAL+	ASTRA 1	11317,000			V		DVB-S				22000		
20	18	DASERSTE	ASTRA 1	11361,000			H		DVB-S2				22000		
21	19	DIGITAL+	ASTRA 1	11435,000			V		DVB-S2				22000		
22	20	HD+	ASTRA 1	11464,000			H		DVB-S2				22000		
23	21	CANALSAT	ASTRA 1	11479,000			V		DVB-S				22000		
24	22	GLOBECAS	ASTRA 1	11508,000			V		DVB-S				22000		
25	23	GLOBECAS	ASTRA 1	11538,000			V		DVB-S				22000		
26	24	CANALSAT	ASTRA 1	11567,000			V		DVB-S2				22000		
27	25	ASTRA	ASTRA 1	11597,000			V		DVB-S				22000		
28	26	DIGITAL+	ASTRA 1	11626,000			V		DVB-S2				22000		
29	27	UPC	ASTRA 1	11670,000			H		DVB-S				22000		
30	28	DIGITAL+	ASTRA 1	11685,000			V		DVB-S				22000		
31	29	SKY D	ASTRA 1	11719,000			H		DVB-S				27500		
32	30	VIACOM	ASTRA 1	11739,000			V		DVB-S				27500		
33	31	SKY D	ASTRA 1	11758,000			H		DVB-S				27500		
34	32	CANALSAT	ASTRA 1	11778,000			V		DVB-S				27500		
35	33	SKY D	ASTRA 1	11797,000			H		DVB-S				27500		
36	34	CANALSAT	ASTRA 1	11817,000			V		DVB-S				27500		
37	35	ARD	ASTRA 1	11836,000			H		DVB-S				27500		
38	36	CANALSAT	ASTRA 1	11856,000			V		DVB-S				27500		
39	37	SKY D	ASTRA 1	11875,000			H		DVB-S				27500		
40	38	CANALSAT	ASTRA 1	11895,000			V		DVB-S				27500		
41	39	SKY D	ASTRA 1	11914,000			H		DVB-S2				27500		
42	40	CANALSAT	ASTRA 1	11934,000			V		DVB-S				27500		

Prog / Lst00 / Lst01 / Lst02 / Lst03 / Lst04 / Lst05 / Lst06 / Lst07 / Lst08 / Lst09 / Lst10 / Lst11 / Lst12 / Lst13 / Lst14 / Lst15 / Lst16 / Lst17 / Lst18 / Lst19

With 7846 and 7847 models, you can create a list with satellite and terrestrial setups:

4   Set-up

All the material is proofed and checked before shipping and furnished in an adapted package. There are no particular instructions about unpacking.

The appliance is equipped with a lithium-ion battery (Li-ion). It is shipped with a loaded battery.

However, if the appliance has not worked for more than a month, you should check the status of charge of the battery and reload it if necessary.

4.1   Battery

	Caution: You need to dismantle the appliance for any intervention on the battery. Only a SEFRAM technician must operate such dismantlement. Only use batteries provided by SEFRAM.

Security advice:
➔ Do not throw the pack battery into the fire; do not heat it
➔ Do not shunt the elements of the battery: risk of explosion!
➔ Do not pierce it
➔ Do not disassemble the pack battery
➔ Do not reverse the polarities of the battery
➔ The pack battery includes a protection item that should not be damaged or removed
➔ Do not stock the pack in a hot place
➔ Do not damage the protection casing of the pack
➔ Do not stock the pack in a vehicle that may be exposed to direct sunlight.

The life of the battery is 200 loading/unloading cycles or 2 years.

Advice for a longer life of your battery:
➔ Do not unload it too much
➔ Do not stock the batteries too long without using them
➔ Stock the battery with ca. 40% loading
➔ Do not load or unload completely the battery before shelf.

When the battery is nearly completely unloaded, the appliance shows a "**Battery unloaded**" message, then turns off automatically after a few minutes.

4.2   Loading the battery

To load the battery in the appliance:
● Connect the external power supply provided on the jack plug of the appliance (on the right)
● Connect the power supply to the mains.

The internal charger starts loading the battery; the orange light **BAT** turns on.

The appliance must be off during this loading. When the battery is loaded, the BAT light will turn off.

It takes 1 hour 30 minutes to load the battery up to 80%. The total loading requires 2 hours 15 minutes.

The typical working capacity is 3 hours 30 minutes for a 7806, 3 hours 50 minutes for a 7807, 2 hours 15 minutes for a 7808 with working remote supply (display of a HD picture), 3 hours 15 minutes for a 7809, 2 hours 10 minutes for 7846 with working remote supply (display of a HD picture) and 1 hour 50 minutes for 7847 with working remote supply (display of a HD picture)

4.3 External power supply

You can supply the appliance with an external power source under continuous voltage. The appliance works under 15V (1A). The charger block provided when you bought the appliance is also an external power supply.

4.4 Start-up

Push the ON/OFF key on the front keyboard.

The introduction window appears on screen.

The message "**Self test: in progress**" is shortly displayed before clearing.

4.5 Updating the software

You can easily update the software to get new functions. The update process requires an USB key.

Download the update file **FIRM_vX.X.BIN** on our website (www.sefram.fr):
http://www.sefram.com/www/NP_D_SOFTWARE.asp

Insert an USB key in your PC.

Copy this file on the home directory of the key.

Pull out the USB key.

Turn the appliance on: Check that the battery status is sufficient (> 30%). You'd better connect the appliance to the mains with the provided adapter.

Push the Toolbox key to get the Configuration page.

Check that the active USB port is the USB port A and that nothing is connected to the USB port mini B.
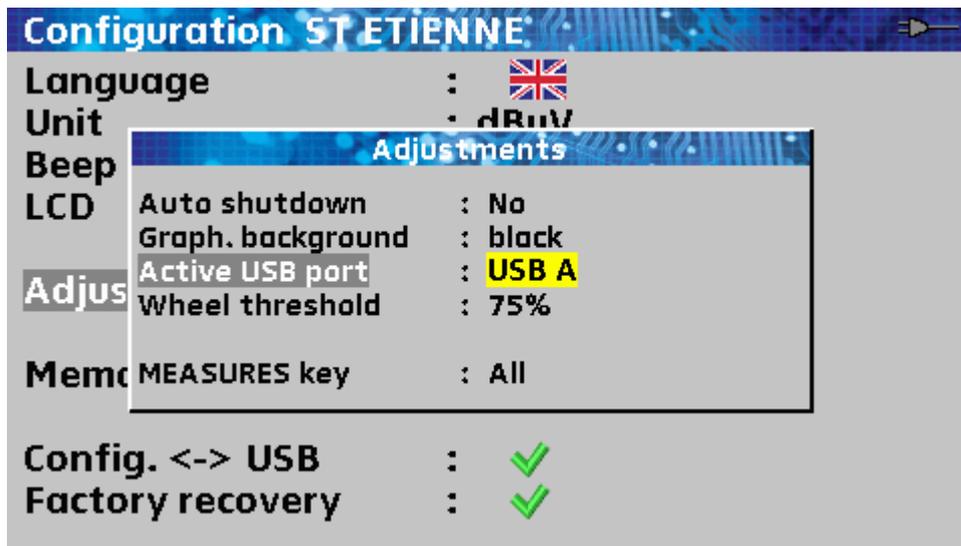
Insert the USB key into the connector of the appliance.

The update start after 10 seconds : don not remove USB key during this time.

<u>Caution: Do not turn the appliance off during the updating process</u>

The updating process lasts ca. 3 minutes 30 seconds.

At the end of the updating process, the appliance invites you to push the ON/OFF key.

The software is now uploaded into your appliance.
A few error messages may appear: Do not take them into account.

5 Setting the parameters of the measurement lists

Pushing the PARAMETERS   key gives you access to the **Parameters** function:

#	name	place	frequency	configuration
---	---	---	---	---
1	R1 CH PU	ST-ETIENNE	E50	---
2	R2 L P B	ST-ETIENNE	E23	---
3	R3 CANAL	ST-ETIENNE	E39	---
4	R4 M6 AB	ST-ETIENNE	E54	---
5	R5 HD	ST-ETIENNE	E29	---
6	R6 TF1 N	ST-ETIENNE	E26	---
---	---	---	---	---
8	T F 1	ST-ETIENNE	E35	---
9	FR 2	ST-ETIENNE	E30	---
10	FR 3	ST-ETIENNE	E33	---

In this page, you can change of measurement list, modify the name of the list, modify the parameters of a line, erase the data of a line and erase all data in the measurement list.

- Selection of an active measurement list among the twenty available ones

#	name	place	frequency	configuration
---	---	---	---	---
1	R1 CH PU	ST-ETIENNE	E50	---
2	R2 L P B	ST-ETIENNE	E23	---
3	R3 CANAL	ST-ETIENNE	E39	---
4	R4 M6 AB	ST-ETIENNE	E54	---
5	R5 HD	ST-ETIENNE	E29	---
6	R6 TF1 N	ST-ETIENNE	E26	---
---	---	---	---	---
8	T F 1	ST-ETIENNE	E35	---
9	FR 2	ST-ETIENNE	E30	---
10	FR 3	ST-ETIENNE	E33	---

Push the Validation key

Rotate the knob to change of list

Push the Back key

When the list number is selected, you can also use the Toolbox key to display a selection list

- **Modification of the name of the list**

Lists ST ETIENNE				
List #			: 0 **ST** ETIENNE ✔	
#	name	place	frequency	configuration
---	---	---	---	---
1	R1 CH PU	ST-ETIENNE	E50	---
2	R2 L P B	ST-ETIENNE	E23	---
3	R3 CANAL	ST-ETIENNE	E39	---
4	R4 M6 AB	ST-ETIENNE	E54	---
5	R5 HD	ST-ETIENNE	E29	---
6	R6 TF1 N	ST-ETIENNE	E26	---
---	---	---	---	---
8	T F 1	ST-ETIENNE	E35	---
9	FR 2	ST-ETIENNE	E30	---
10	FR 3	ST-ETIENNE	E33	---

Push the Validation key to select the character to modify.

Rotate the knob to change the character

Push the Validation key to select the following character.

Lists ST ETIENNE				
List #			: 0 ST ETIENNE ✔	
#	name	place	frequency	configuration
---	---	---	---	---
1	R1 CH PU	ST-ETIENNE	E50	---
2	R2 L P B	ST-ETIENNE	E23	---
3	R3 CANAL	ST-ETIENNE	E39	---
4	R4 M6 AB	ST-ETIENNE	E54	---
5	R5 HD	ST-ETIENNE	E29	---
6	R6 TF1 N	ST-ETIENNE	E26	---
---	---	---	---	---
8	T F 1	ST-ETIENNE	E35	---
9	FR 2	ST-ETIENNE	E30	---
10	FR 3	ST-ETIENNE	E33	---

Push the Validation key to validate the new name

- **Modification of data**

Lists ST ETIENNE				
List #			: 0 ST ETIENNE ✔	
#	name	place	frequency	configuration
---	---	---	---	---

List modification

Setup : #375 TNT-HD (ST-ETIENNE)
Delete : ✔

OneTouch selection : No

Delete all : ✔

| 9 | FR 2 | ST-ETIENNE | E30 | --- |
| 10 | FR 3 | ST-ETIENNE | E33 | --- |

Rotate the knob to reach the line to modify

Push the Validation key to open the List modification page

You can change data after selection of the affected line thanks to the knob and after pushing the Validation key

The Delete line cancels all data in the current line.

The Delete all line cancels all data in the current line (confirmation required).

In terrestrial band or cable band, only the number of the setup matters. In satellite band, there are also switches of committed and uncommitted type and the SatCR mode.

With 7846 and 7847 models, you can create a list with satellite and terrestrial setup:

6 Library setups

Pushing twice on the Parameters key   gives you access to the **Setup list** function:

#	name	place	frequency	standard
4	DIGITAL+	ASTRA 1	10817 VL	DVB-S2 22000
5	ANIXE HD	ASTRA 1	10832 HL	DVB-S2 22000
6	DIGITAL+	ASTRA 1	10847 VL	DVB-S 22000
7	TVP HD	ASTRA 1	10861 HL	DVB-S 22000
8	DIGITAL+	ASTRA 1	10876 VL	DVB-S 22000
9	UPC	ASTRA 1	10920 HL	DVB-S 22000
10	DIGITAL+	ASTRA 1	10979 VL	DVB-S 22000
11	SKY D	ASTRA 1	11023 HL	DVB-S2 22000
12	DIGITAL+	ASTRA 1	11038 VL	DVB-S 22000
13	DIGITAL+	ASTRA 1	11097 VL	DVB-S 22000
14	DIGITAL+	ASTRA 1	11156 VL	DVB-S 22000
15	ORANGE	ASTRA 1	11170 HL	DVB-S2 22000

In this page, you can create a new setup, change the parameters of a setup, erase data in a setup and erase the data of all setups.

- **Modification of the data in a setup**

Setup modification

Band	: Sat. Ku
Name	: DIGITAL+ ✓
Place	: ASTRA 1 ✓
Frequency	: 10729 (979) MHz
Polar./Band	: Vertical Low
Standard	: DVB-S2
Symbol rate	: 22000 kBd
Delete	: ✓
Delete all	: ✓

Rotate the knob to reach the setup to modify

Push the Validation key to open the Setup modification page

You can modify data after selection of the line to change with the knob and the Validation key

The band line allows choosing the frequency band.

The Delete line cancels all data in the current line.

The Delete all line cancels all data in the current line (confirmation required).

According to the terrestrial, cable or satellite band and to the selected standard, the content of the page is different.

Bibliothèque des programmes

n°	nom				
4					auto
5					auto
6					auto
7					
8					
9					
10					
11					
12	AF				
13					
14					
15	FR				

Modification programme

Bande	: Ter.	
Nom	: ARTE/5	✔
Site	: ST-ETIENNE	✔
Canal	: E65 (Fr)	
Fréquence	: 823.250 MHz	
Standard	: L	
Audio	: 6.5 MHz NICAM	
Supprime	: ✔	
Supprime tout	: ✔	

Bibliothèque des programmes

n°	nom				
0	CA				6875
1	FR				6875
2	N				6875
3	OD				6875
4	EU				6875
5	C				6875
6					6875
7	INT				6875
8	AI				6875
9	C				6875
10	N				6875
11	DI				6875

Modification programme

Bande	: Ter.	
Nom	: FR2 HD	✔
Site	: DIGITAL	✔
Canal	: 1 (Fr C)	
Fréquence	: 147.125 MHz	
Standard	: DVB-C	
Modulation	: 64QAM	
Débit symbole	: 6875 kBd	
Supprime	: ✔	
Supprime tout	: ✔	

Library setups

#	nam				
4	DIG				000
5	ANI				000
6	DIG				000
7	TV				000
8	DIG				000
9					000
10	DIG				000
11	S				000
12	DIG				000
13	DIG				000
14	DIG				000
15	OR				000

Setup modification

Band	: Sat. Ku	
Name	: DIGITAL+	✔
Place	: ASTRA 1	✔
Frequency	: 10817 (1067) MHz	
Polar./Band	: Vertical Low	
Standard	: DVB-S2	
Symbol rate	: 22000 kBd	
Delete	: ✔	
Delete all	: ✔	

The « band » parameter allows choosing between these frequencies ranges:

```
Library setups                                    ⇒▷━
#   nam                                          000
0   DIG ┌──── Setup modification ──────┐
1    A  │ Band         : Sat.Ku        │        000
2    S  │ Name         : DIGITAL+    ✓ │        000
3   DIG │ Place        : ASTRA 1     ✓ │        000
4   DIG │ Frequency    : 10729 ( 979) MHz│      000
5   AN  │ Polar./Band  : Vertical  Low │        000
6   DIG │ Standard     : DVB-S2        │        000
7   TV  │ Symbol rate  : 22000 kBd     │        000
8   DIG │ Delete       : ✓             │        000
9       │ Delete all   : ✓             │
10  DIG └──────────────────────────────┘        000
11
```
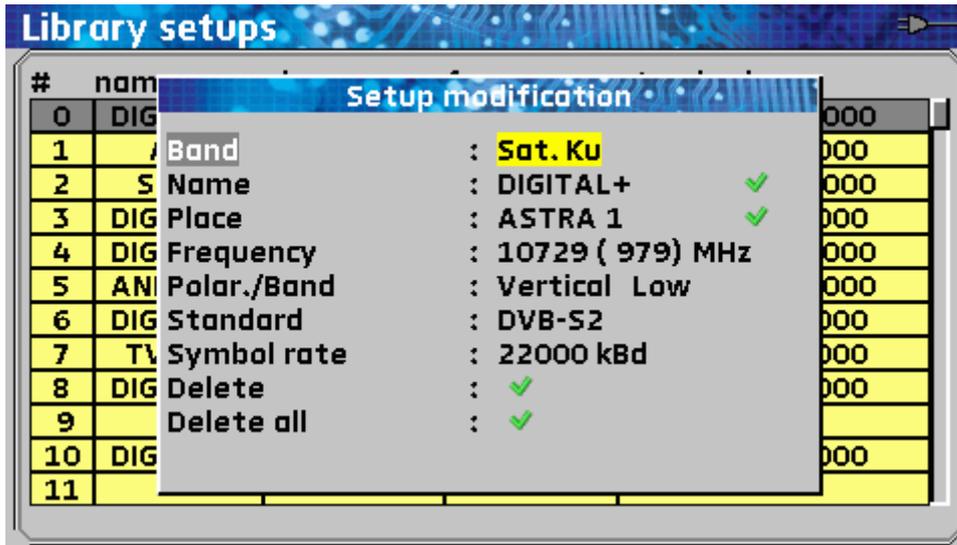
Ter.:   Terrestrial

⬇

Sat. L: Satellite L band (950 MHz-2150MHz)

⬇

Sat. Ku: Satellite Ku band (10700-12750MHz)

⬇

Sat. C: Satellite C band (3000-4200MHz)

☞	7806, 7807: Terrestrial band only. (This parameter can't be modified) 7808: Satellite C band + L band + Ku band. 7846, 7847: Terrestrial band + Satellite C band + L band + Ku band.

☞	For 7846 and 7847 models, (allowing terrestrial or satellite setups) it's possible to change from terrestrial to satellite by: - changing the frequency band - changing the frequency - changing the standard

7   Spectrum analyzer

Pushing the Spectrum key [icon] gives you access to the **Spectrum analyzer** function:

In terrestrial band or cable band, the analysis filter is 300 kHz wide.

Att.: 15dB auto   738.000 MHz   R4 M6 AB   54 (E54)
75 dBµV
10 dB/div
65
55
45
35
25
15
Fcen: 738.000 MHz   Filt : 300 kHz   Span: 20 MHz
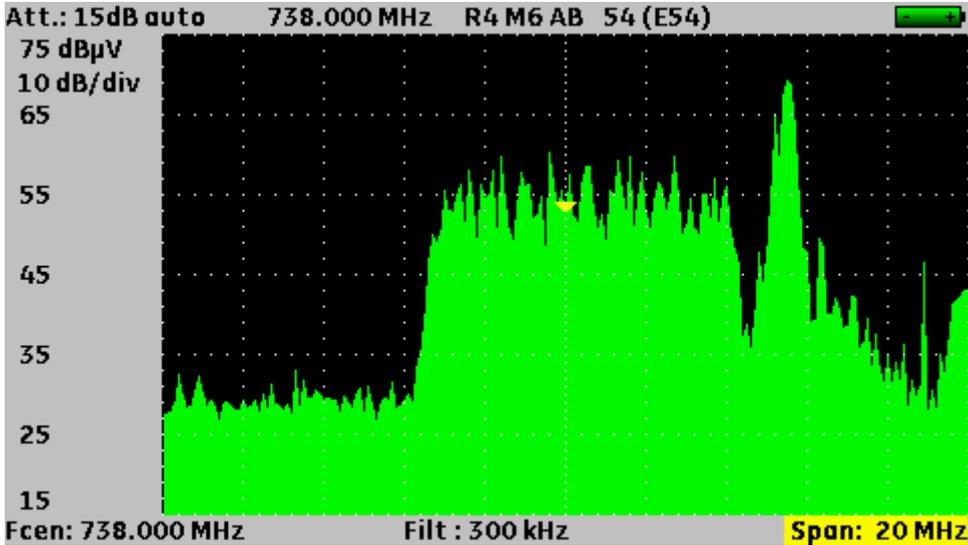
You can move the cursor along the frequency range, channel per channel or setup per setup.

[icon] You access the various setups with the Validation key; you change them with the knob.

Att.: 5dB   11303 MHz   ANIXE HD   HL
65 dBµV
5 dB/div
60
55
50
45
40
35
Fcen: 11303 MHz   Filt : 1 MHz   Span: 100 MHz
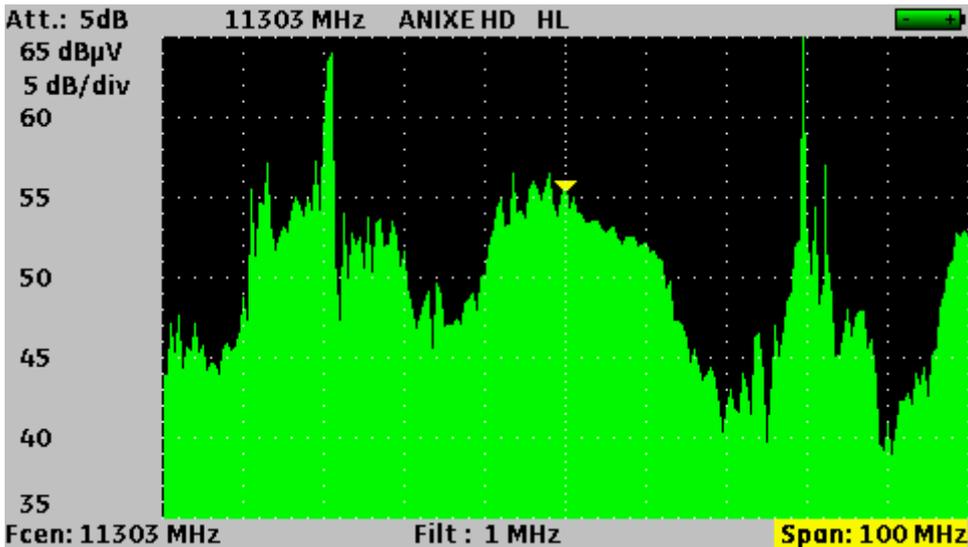
In satellite band, the analysis filter is 1MHz wide. You can directly change the polarization and the band, hence an easier adjustment of the counter-polarization.

Att.: 5dB   11954 MHz   ---   HH   SatCR Slot 2
65 dBµV
5 dB/div
60
55
50
45
40
35
Fcen: 1282 MHz   Filt : 1 MHz   Span: 100 MHz
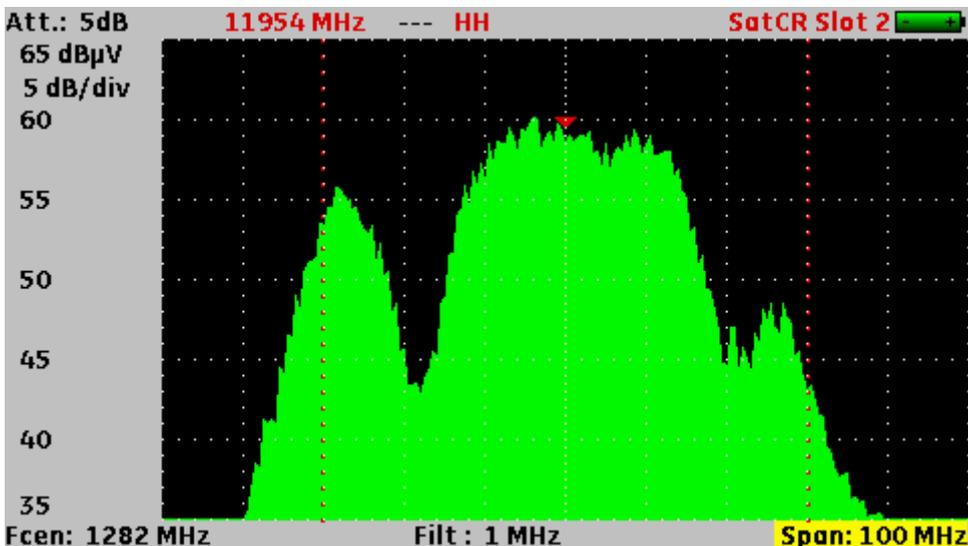
In SatCR mode, two red-dotted lines indicate the width of the slot.

If the measurement list includes setups with all possible slots, you can display them very easily by simply changing of setup.

The current slot number is displayed on the upper right of the screen.

You can change the following parameters:

- The frequency of the cursor
- The number of the setup
- The number of the channel or the polarization and the band
- The reference level
- The number of dB/division
- The central frequency
- The span width (span)

👆	The default position of the input pad is in automatic mode. Any change of the reference level stops the automatic mode. Only a return to the Spectrum page will re-launch it.

👆	In manual input pad mode, the input level must be lower than Att + 50 dBµV to prevent any saturation of the input and any false representation. Example: To correctly display an 110dBµV signal, you need a 60dB pad.

👆	For 7846 and 7847 models, (allowing terrestrial and satellite setups) it's possible to change from terrestrial to satellite in spectrum by:
	     - changing frequency with the knob
	     - changing the setup

8 Dish adjustment (7808-7846-7847)

	Only in Satellite band
	The dish adjustment mode enables you to quickly orientate the dish with the initial selection of the satellite to receive.

Push the Spectrum key [ ] twice to access to the **Dish adjustment** function.
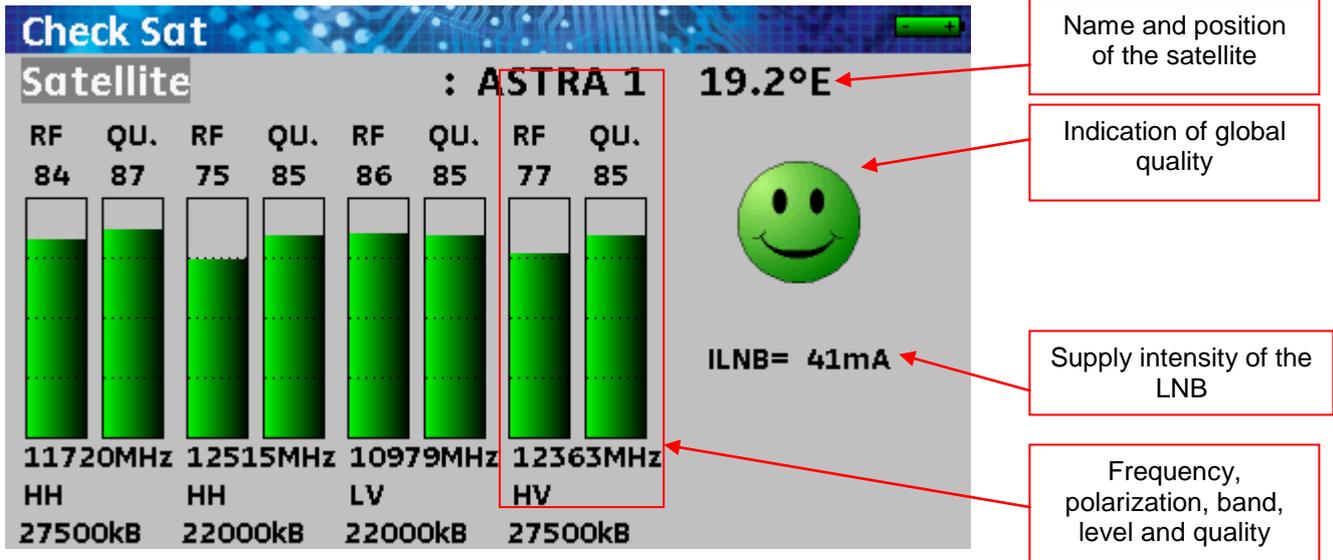
Name and position of the satellite

Indication of global quality

Supply intensity of the LNB

Frequency, polarization, band, level and quality

The appliance has 32 orbital positions available for satellites. About 10 satellites are specified at delivery.

4 transponders are associated to each satellite.

Use the Validation key [✓] and the knob [ ] to change of satellite.

8.1 Updating the satellites

You can now add new satellites and update or erase old ones with a computer and a USB key.

Open the Sat.xls file with a spreadsheet software (the file is available on our website)
http://www.sefram.com/www/NP_D_SOFTWARE.asp

Change the values as required.

☝	The locking time depends on the transponder rate. The lower the rate, the longer the locking time. Thus, you'd better choose high rate transponders to align the dish.

Save the file.

Save the file once again under CSV format; call it Sat.csv.

There is a CSV macro-command that does it all: Ctrl + Shift + C on keyboard. (Office 2007 2010 only)

Copy the Sat.csv file on the home directory of the USB key.

Push the Toolbox key [icon] until reaching the Configuration page.

Check that the active USB port is the port USB A, and that nothing is connected to the USB port mini B.

Insert the USB key into the connector of the appliance.

Turn the knob to select the line Config. <-> USB.
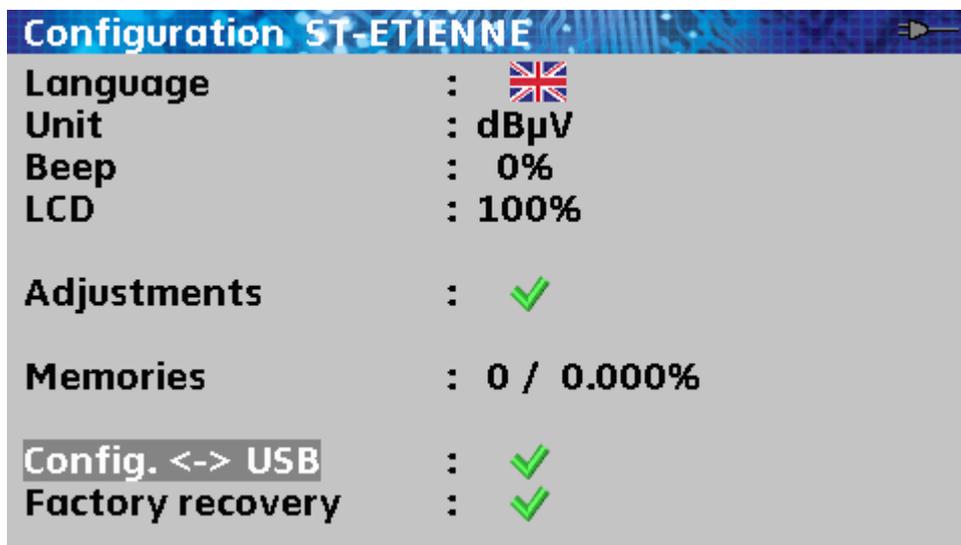
  Push the Validation key

The previous configuration is saved on the key; the new one is transferred to the appliance.

8.2   Dish adjustment process

Procedure:

1/ Connect the dish to the appliance; turn it on.

2/ Validate the remote supply:
- The VDC light turns on the front side.
- Check the supply intensity of the LNB (about 50 to 200 mA).

3/ Select the satellite for alignment in the list (with the knob).

4/ Slowly turn the dish until you get the highest level and hearing the locking signal.

5/ Slightly turn the LNB to get the highest quality (counter-polarization).

You can hear a melody as soon as the first transponder has been found; then, you will hear beeps.

The higher the quality, the more frequent these beeps.

If the appliance has not been synchronized on all four transponders, the quality indicator is **red**.

If the appliance is synchronized on all four transponders but the reception quality is medium, it is **orange**.

If the appliance is synchronized on all four transponders and if the reception quality is good, it is **green**.

	Caution: **To identify a satellite, the appliance must be synchronized on all 4 transponders.** **However, some transponders are regularly modified.** **Consult the frequency plan of the satellite when the transponder does not seem to work.** **Some switches or LNB only work with DiSEqC commands. In this case, position the OL and the polarization on DiSEqC at the LNB-DiSEqC configuration page (Caution: the orientation will be slower if you use the DiSEqC command).**

8.3 Control of the satellite

To check if the selected satellite is the one you want: push the Spectrum key

Then, the appliance looks for the MPEG NIT table on one of the 4 transponders and displays the name of the satellite:
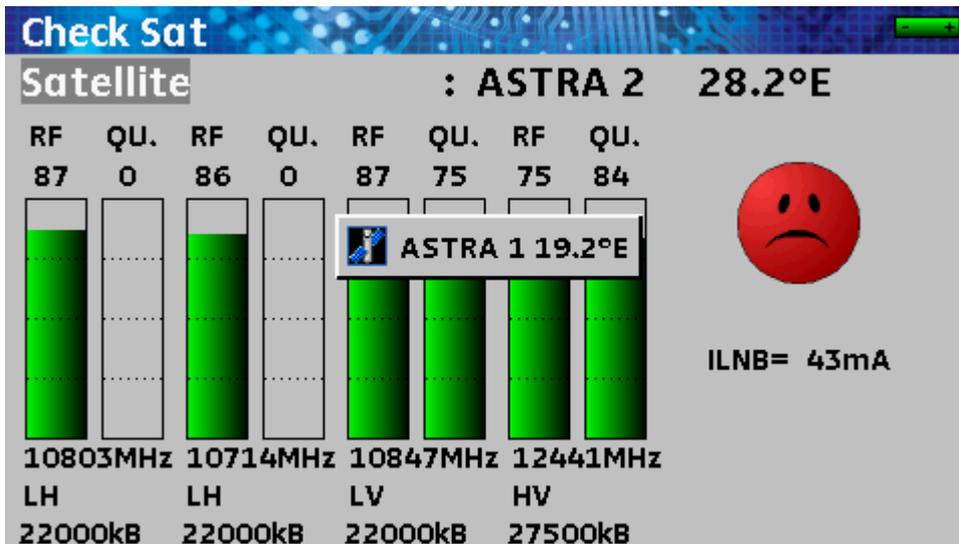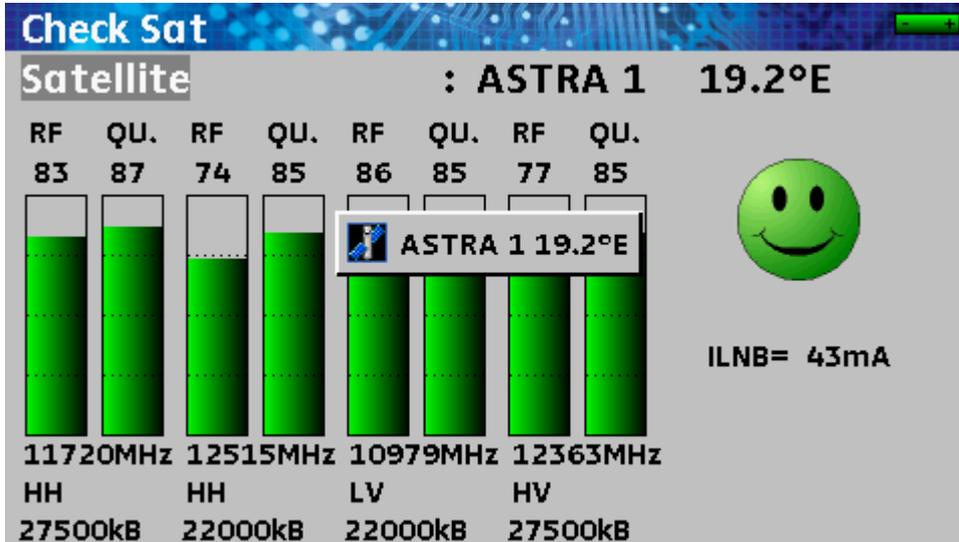
☝	**Caution:** **The displayed name depends on the content of the MPEG NIT table.** **Some providers do not (or badly) furnish this table.** **The displayed information may be wrong.**

9 Level / Power Measurement

Pushing the Measurement key ⌗ gives you access to the **Level measurement** function.

It is thus possible to make a level measurement at a specified frequency with a detection mode adapted to the standard.

You can either make measurements on a saved setup (see chapter) or modify each parameter manually.

✊ | **In terrestrial band, for a user plug, the level should be:**
   | - **between 50 and 66 dBµV in FM**
   | - **between 35 and 70 dBµV in DVB-T/H and DVB-T2**
   | - **between 57 and 74 dBµV in any other case.**

✊ | **In satellite band, for a user plug, the level should be:**
   | - **between 47 and 77 dBµV.**

Terrestrial band

Signal level ST-ETIENNE

Setup	: FR 3
Channel	: E33 (Fr)
Frequency	: 567.250 MHz
Standard	: L
Audio	: 6.5 MHz NICAM

V   69.5 dBµV

C/N   > 58.3 dB

V/A1 21.2 dB

V/A2 31.3 dB

Satellite band

Signal level ASTRA 1

Setup	: BFM TV
Frequency	: 12552 (1952) MHz
Polar./Band	: Vertical High
Standard	: DVB-S
Symbol rate	: 22000 kBd

RF   71.7 dBµV

C/N   11.2 dB

VLNB 12.9 V

ILNB 42.1 mA

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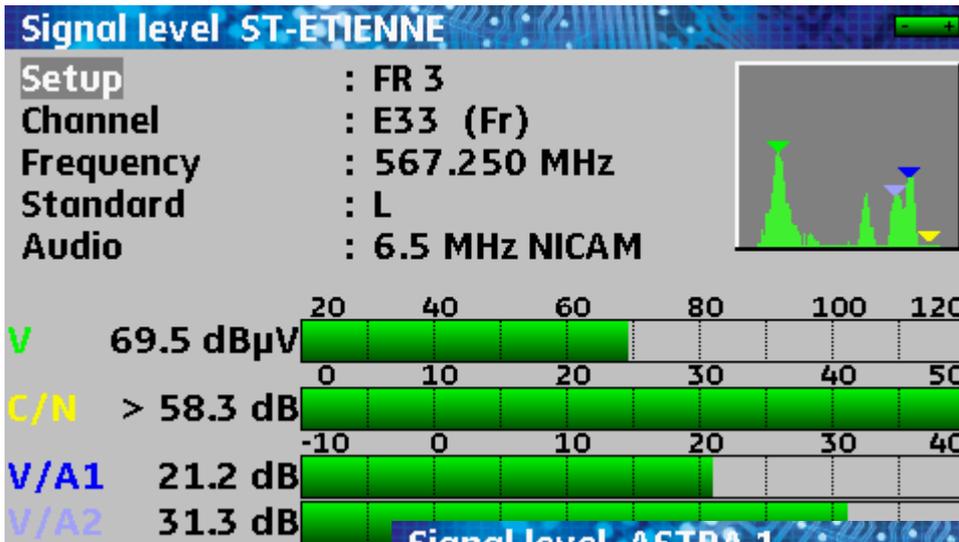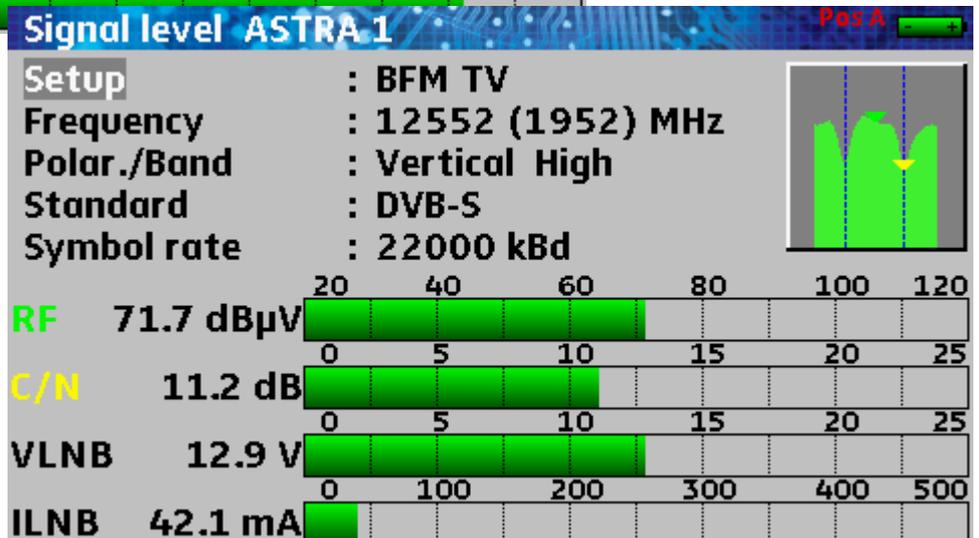
9.1   Modification of the parameters

The various parameters are:

- The number of the setup
- The number of the channel and the corresponding frequency plan for the terrestrial and cable band
  or
  the polarization and the band for the satellite.

Caution: The vector of these commutations is the remote supply; the 22kHz modulation or DiSEqC is superimposed on the continuous voltage generated by the appliance.

- The frequency of the emitter or the transponder (and the real frequency in satellite)
- The standard and the bandwidth for the DVB-T/H and DVB-T2
- The audio mode for the analogical TV
- The symbol rate for the digital TV.

For 7846 and 7847 models, (allowing terrestrial and satellite setups) it's possible to change from terrestrial to satellite in level/power measurement by:

- changing frequency
- changing standard
- changing the setup (from terrestrial to satellite setup)

See chapter Man-machine interface for any modification.

9.2   Measurements according to the standard

The appliance makes various measurements according to the valid **standard**.

The available measurements are **Average**, **Peak** and **Power**.

9.2.1   Terrestrial band

The appliance automatically makes level measurements on the **Video carrier wave** and on **1 or 2 Sound carrier waves** according to the selected Audio mode.

The table below lists the measurement types and the frequencies of the audio carrier waves of each standard:

Standard	Video carrier wave	Measure	Sound carrier waves		
			Mono	Stereo	NICAM
BG	negative, AM	Peak	FM 5.5 MHz	FM 5.74 MHz	DQPSK 5.85 MHz
DK	negative, AM	Peak	FM 6.5 MHz	FM 6.258 MHz	DQPSK 5.85 MHz
I	positive, AM	Peak	FM 6.0 MHz		DQPSK 6.552 MHz
L	positive, AM	Peak	AM 6.5 MHz		DQPSK 5.85 MHz
MN	negative, AM	Peak	FM 4.5 MHz	FM 4.72 MHz	
DVB-C	Digital	Power			
MCNS	Digital	Power			
DVB-T/H	Digital	Power			
DVB-T2	Digital	Power			
FM	FM	Average			
Carrier	Non modulated	Average			

The appliance displays the level of the **Video** carrier wave, the ratio(s) **Video/Audio** and the ratio **C/N**.

The display is made of one to four measures and bar graphs.

The measurement of the **Audio** carrier waves is always an **Average** measurement.

9.2.2   Satellite band

Standard	Video carrier wave	Measurement
PAL	FM	Peak
SECAM	FM	Peak
NTSC	FM	Peak
DVB-S	Digital	Power
DSS	Digital	Power
DVB-S2	Digital	Power

9.3   Thresholds

Predefined thresholds are used to specify if the measurement is pertinent.

Standard	Min.	Max.
Analogue TV	57	74
DVB-C, MCNS	57	74
DVB-T/H, DVB-T2	35	70
FM, carrier wave	50	66
Satellite analogical TV	47	77
DVB-S, DSS	47	77
DVB-S2	47	77

Decision thresholds are used for the display of the measurements « Power Level » and « Measurement Plan »:
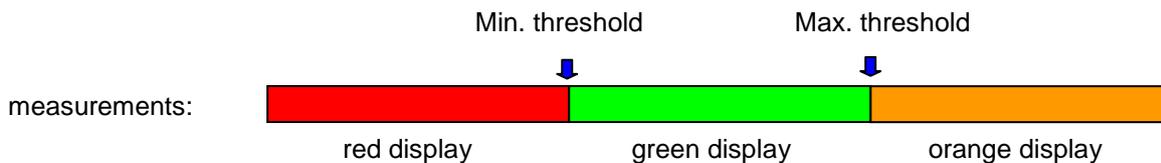
10 Measurement of error rates

Pushing several times on the Measurement key   gives you access to the **Measurement of error rates** function.

The displayed values are the different **BER** (Bit Error Rate), the **PER** (Packet Error Rate) and the **MER** (Modulation Error Ratio) in **DVB-T/H, DVB-T2, MCNS, DVB-C, DVB-S, DVB-S2** or **DSS.**

☞	The bar graphs are displayed in colours according to the measurement values for the error rates:
	
	   - GREEN: right error rates
	   - ORANGE: BERo > **1-4** (QEF: Quasi Error Free) without lost packet
	   - RED: lost packets (PER)
	
	The Automatic Frequency Control (AFC) is automatically activated in case of measurement of error rates.

These measures are available if one of these standards is in process in the **Level measurement** page:

- DVB-T/H (7806, 7809, 7846, 7847)
- DVB-T2 (7809, 7847)
- DVB-C (7807, 7809), MCNS (7807 only)
- DVB-S, DSS, DVB-S2 (7808, 7846, 7847)

The parameters on this page are the same as on the page Level measurement with additional parameters specific to each modulation.

☞	The **"Sync ?"** message specifies that the signal is absent or not locked; check its presence, the modulation parameters, the remote supply and the LNB and DiSEqC parameters in satellite band.

☞	The sign **<** before an error rate value means that there were no error but 10^X bits have been tested (ex. $<1^{E-8}$ means 1^{E8} bits have been tested).

☞	For 7846 and 7847 models, (allowing terrestrial and satellite setups) it's possible to change from terrestrial to satellite in measurement of error rate by:
	
	   - changing frequency
	   - changing standard
	   - changing the setup (from terrestrial to satellite setup)

10.1   DVB-T/H (7806-7809-7846-7847)
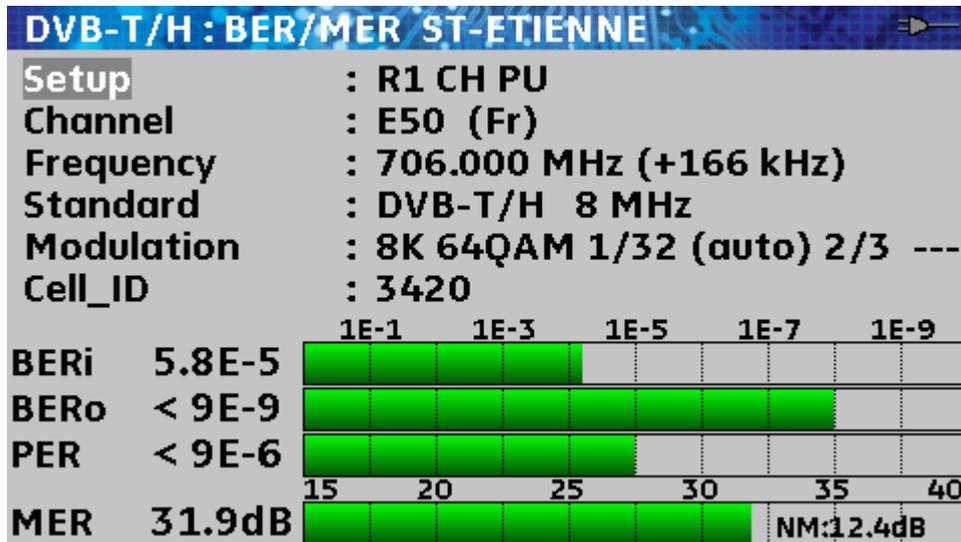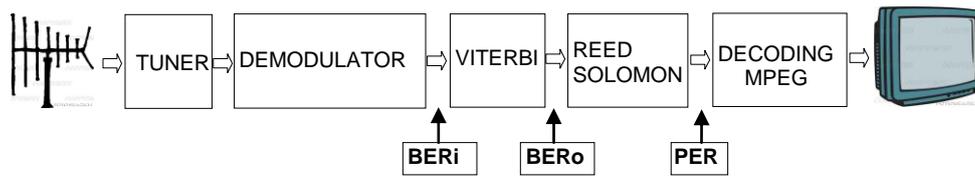
Display of the values:

- **BERi**:   error rate before Viterbi

- **BERo**:   error rate after Viterbi

- **PER**:   error rate after Reed Solomon (packet error rate)

- **MER**:   modulation error rate

- **NM**:   noise margin

BERx: 'bits' error rate

   Ratio of the number of erroneous bits / number of transmitted bits during the measuring time

PER: 'packets' error rate

   Ratio of the number of erroneous packets / number of transmitted packets during the measuring time

Remember: a packet in DVB-T/H is made of 204 bytes; a packet is 'wrong' if it includes more than 8 wrong bytes (correction by Reed Solomon coding).

Display of the detected **Modulation** type:

- number of carrier waves (8 K)

- constellation (64QAM)

- guard interval (1/32 auto)

- Viterbi rate (2/3)

- spectrum inversion.

In case of poor quality signal or co-frequent analogical signal, you'd better choose the manual front guard interval mode. To do this, you had to change the "Modulation" parameter by choosing the good guard interval.

The display of the value of Cell_ID indicated by the provider and specific to the emitter.

10.2   DVB-T2 (7809-7847)
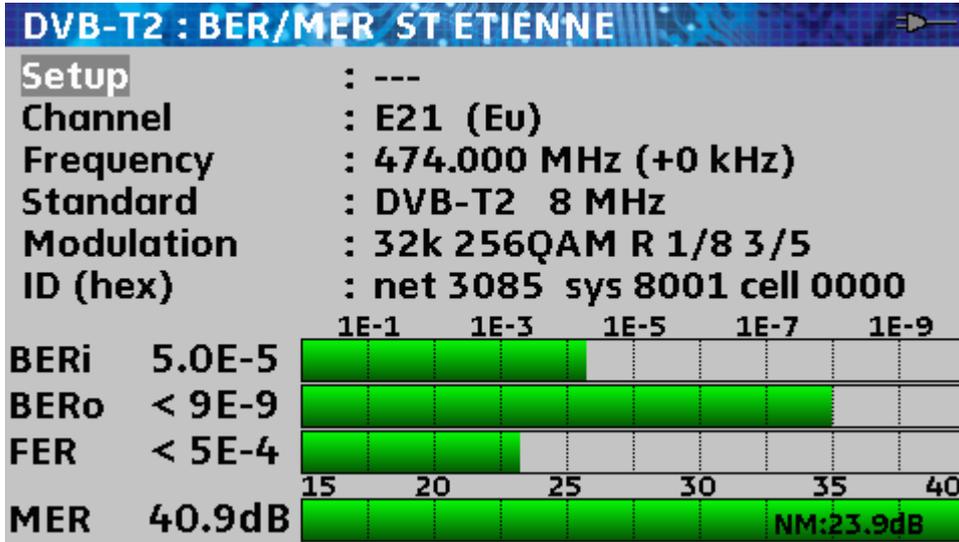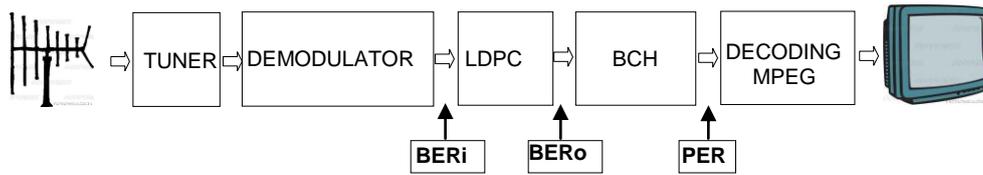
Display of the values:

- **BERi** :   error rate before LDPC
- **BERo** :   error rate after LDPC
- **PER** :   error rate after BCH (lost packets)
- **MER** :   modulation error rate
- **LKM**:   link margin

Remember:

LDPC: Low Density Parity Check

BCH: Bose Chauhuri Houquenohem

In DVB-S2, the concatenation LDPC + BCH has replaced the concatenation Viterbi + Reed Solomon of the correction of the DVB-S.

Display of the detected **Modulation** type:

- number of carrier waves (32 K)
- constellation (256QAM R)
- guard interval (1/8)
- rate (3/5)

The display of the values of Network_ID, System_ID and Cell_ID indicated by the provider and specific to the emitter

10.3   DVB-C (7807-7809) and MCNS (7807)
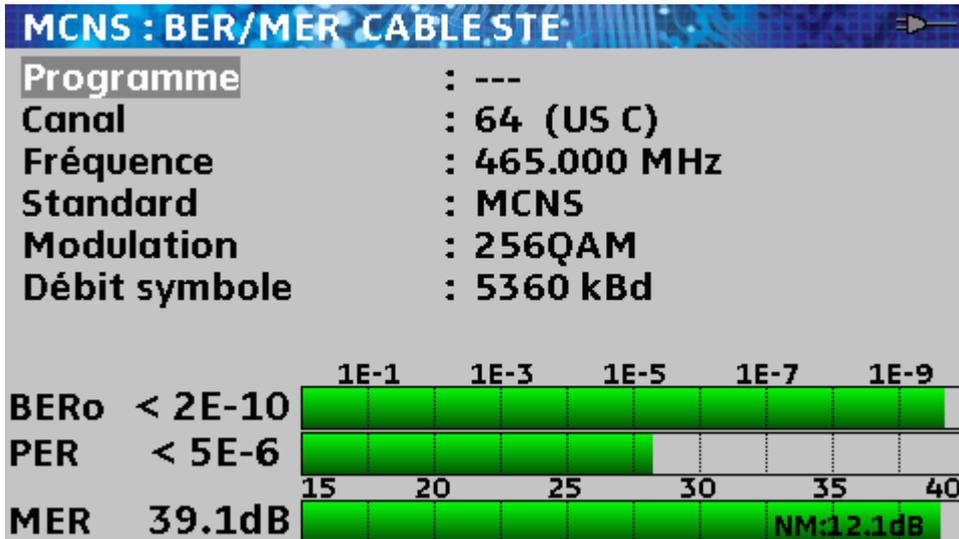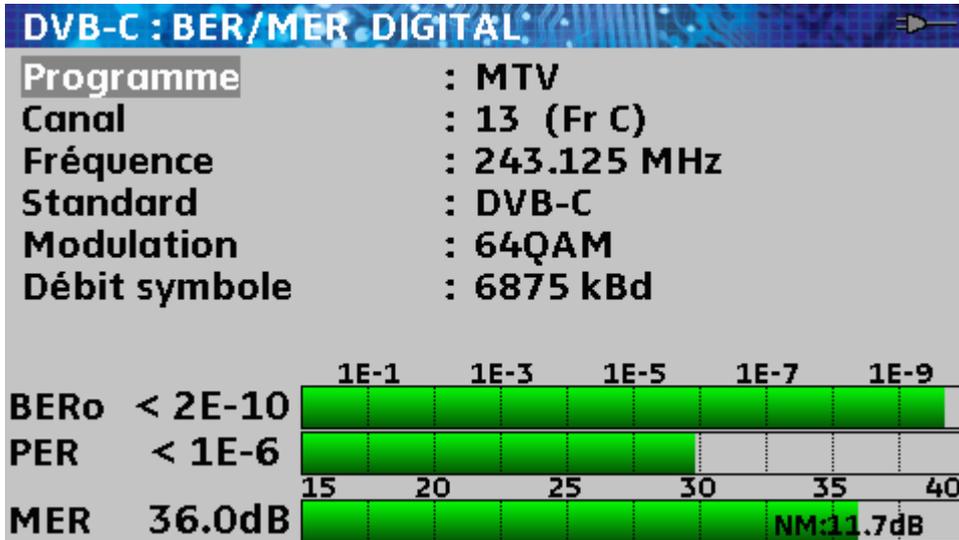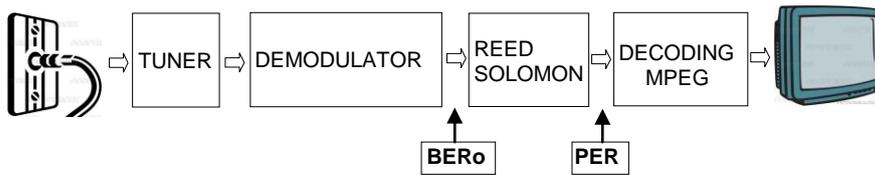
Display of the values:

- **BERo** :   error rate before Reed Solomon
- **PER** :   error rate after Reed Solomon (packet error rate)
- **MER** :   modulation error rate
- **NM**:   noise margin

BERo: 'bits' error rate

   Ratio of the number of erroneous bits / number of transmitted bits during the measuring time

PER: 'packets' error rate

   Ratio of the number of erroneous packets / number of transmitted packets during the measuring time

Remember: a packet in DVB-C is made of 204 bytes; a packet is 'wrong' if it includes more than 8 wrong bytes (correction by Reed Solomon coding).

10.4   DVB-S and DSS (7808-7846-7847)
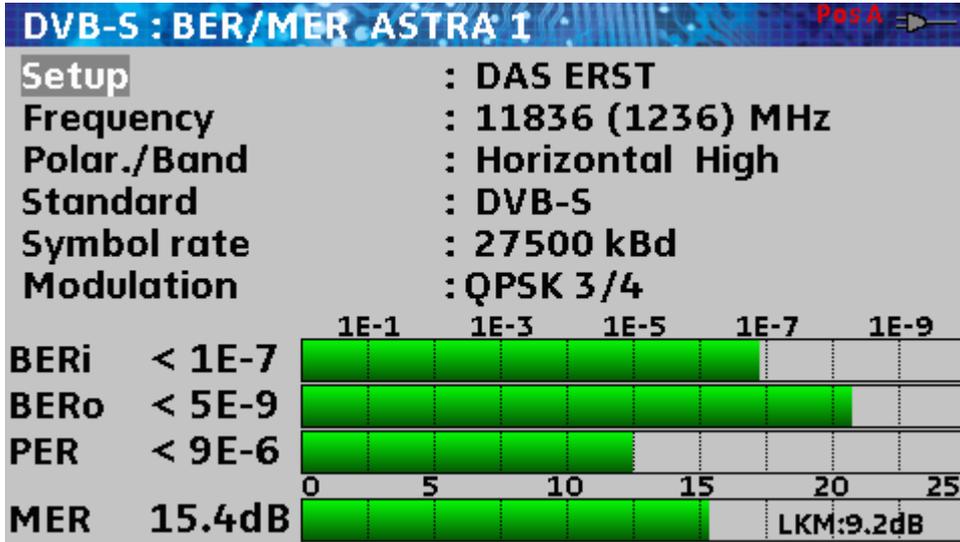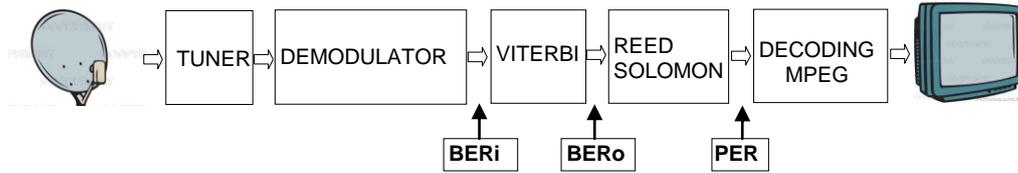
Display of the values:

- **BERi** :   error rate before Viterbi
- **BERo** :   error rate after Viterbi
- **PER** :   error rate after Reed Solomon (packet error rate)
- **MER** :   modulation error rate
- **LKM**:   link margin

BERx: 'bits' error rate

   Ratio of the number of erroneous bits / number of transmitted bits during the measuring time

PER: 'packets' error rate

   Ratio of the number of erroneous packets / number of transmitted packets during the measuring time

Remember: a packet in QPSK (DVB-S) is made of 204 bytes; a packet is 'wrong' if it includes more than 8 wrong bytes (correction by Reed Solomon coding). In DSS, a packet is made of 146 bytes.

Display of the detected **Modulation** type:

- •   the constellation (QPSK)
- •   the Viterbi rate (3/4)

10.5   DVB-S2 (7808-7846-7847)
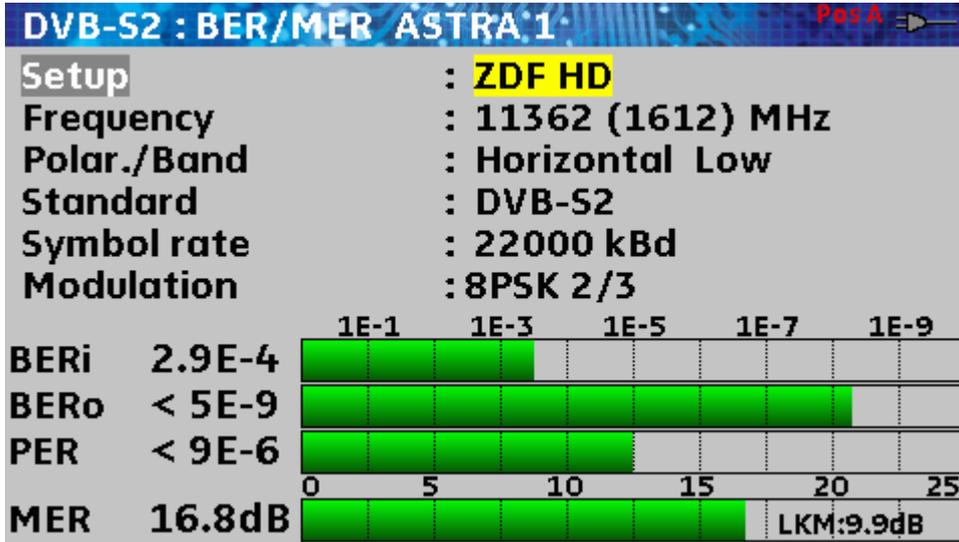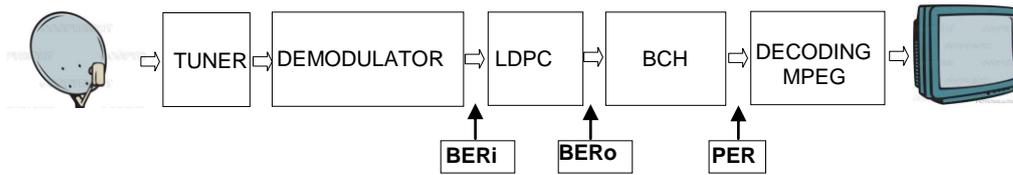
Display of the values:

- **BERi** : error rate before LDPC
- **BERo** : error rate after LDPC
- **PER** : error rate after BCH (lost packets)
- **MER** : modulation error rate
- **LKM**: link margin

Remember:

LDPC: Low Density Parity Check

BCH: Bose Chauhuri Houquenohem

In DVB-S2, the concatenation LDPC + BCH has replaced the concatenation Viterbi + Reed Solomon of the correction of the DVB-S.

Display of the detected **Modulation** type:

- the constellation (8PSK)
- the Viterbi rate (2/3)

11 Constellation

Pushing several times of the Measurement key   give you access to the **Constellation** function.

These measurements are available if one of these standards is running in the **Level measurement** page.

- DVB-T/H (7806, 7809, 7846, 7847)
- DVB-T2 (7809, 7847)
- DVB-C (7807, 7809), MCNS (7807 only)
- DVB-S, DSS, DVB-S2 (7808, 7846, 7847)

The appliance displays the **Constellation** of the current signal.

8K 64QAM 1/32 2/3
BERi : 2.8E-5
BERo : < 9E-11
PER : < 5E-8
MER : 32.8dB

474.000 MHz
32k 256QAM R 1/8 3/5
BERi : 4.5E-5
BERo : < 2E-10
FER : < 9E-6
MER : 40.9dB

474.000 MHz
256QAM
BERo : < 2E-10
PER : < 9E-7
MER : 37.1dB

11362 (1612) MHz
8PSK 2/3
BERi : 1.0E-3
BERo : < 5E-10
PER : < 9E-7
MER : 16.0dB
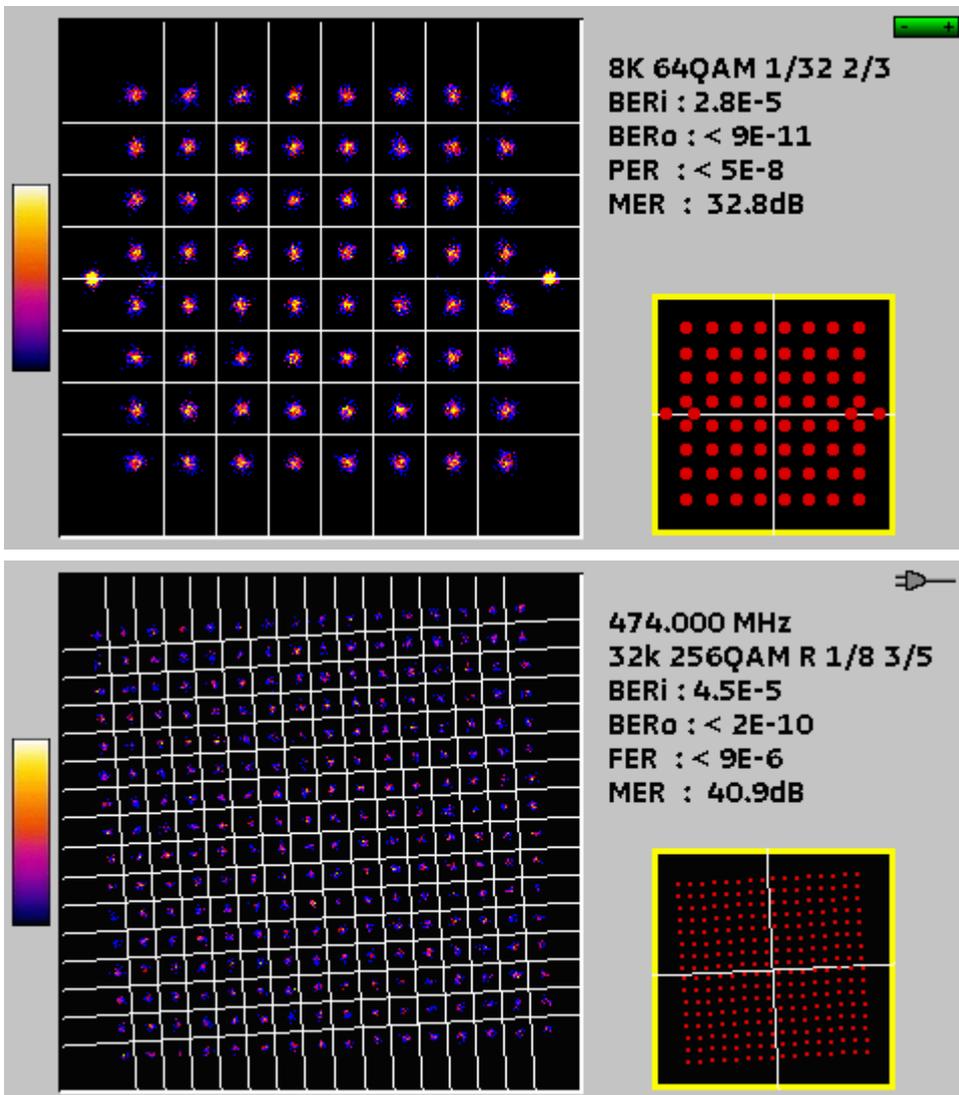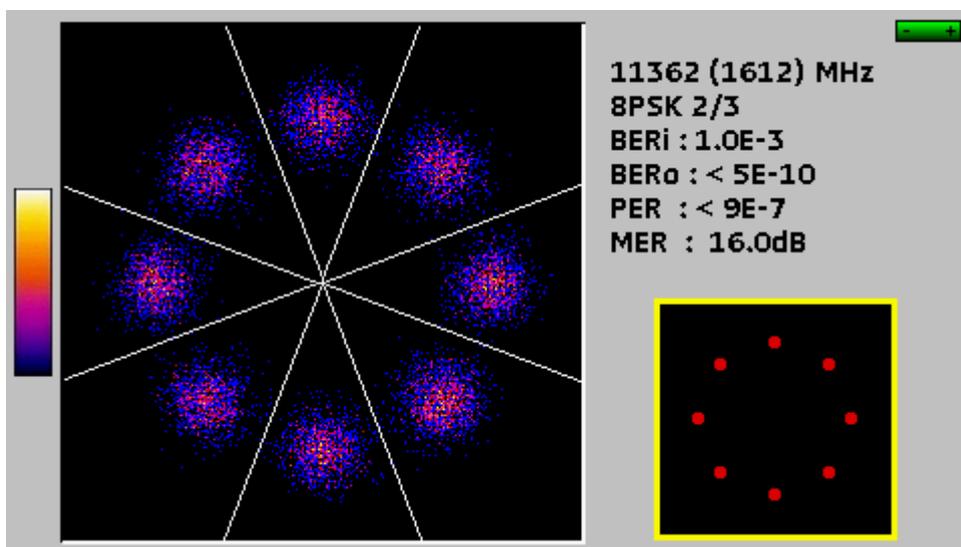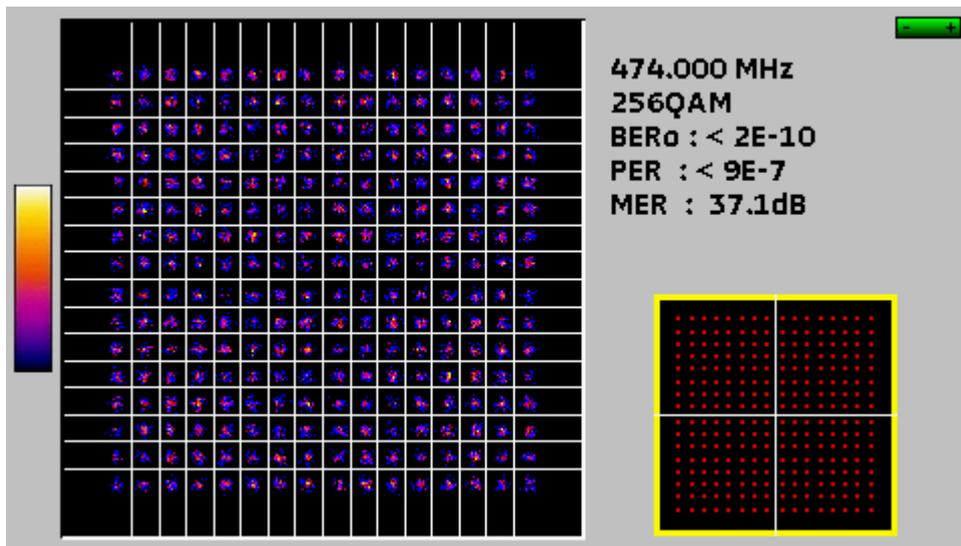
Informations on the right of the **Constellation** diagram are the same as in the **Error rate** function:

- current frequency
- constellation
- symbol rate
- error rate and MER.

12 Echo - Guard interval (7806-7809-7846-7847)

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☞	Only available if the current standard is DVBT/H or DVB-T2 and if the appliance is 7806, 7809, 7846 or 7847

Pushing several times on the Measurement key ⌾ give you access to the **ECHO** function.
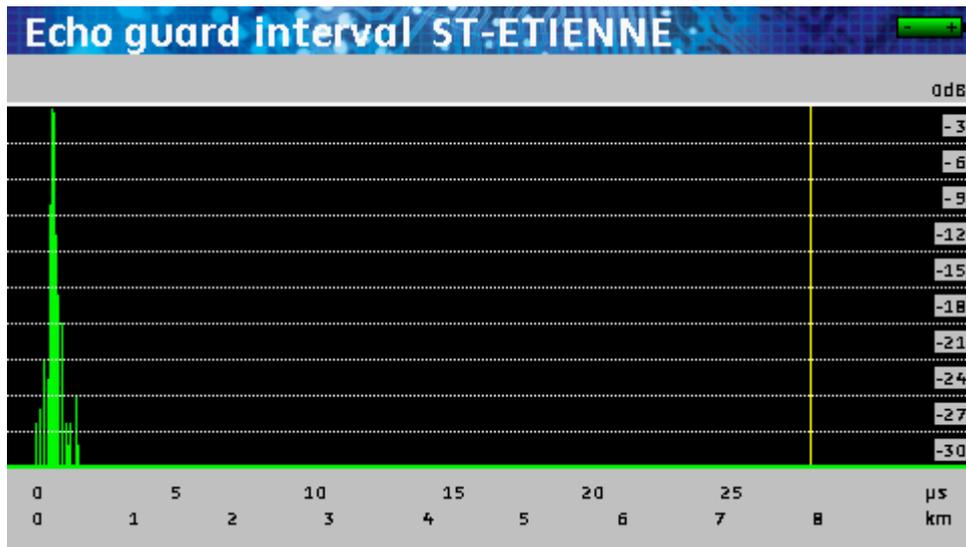
The 7809 and 7847 models display pre-echoes.
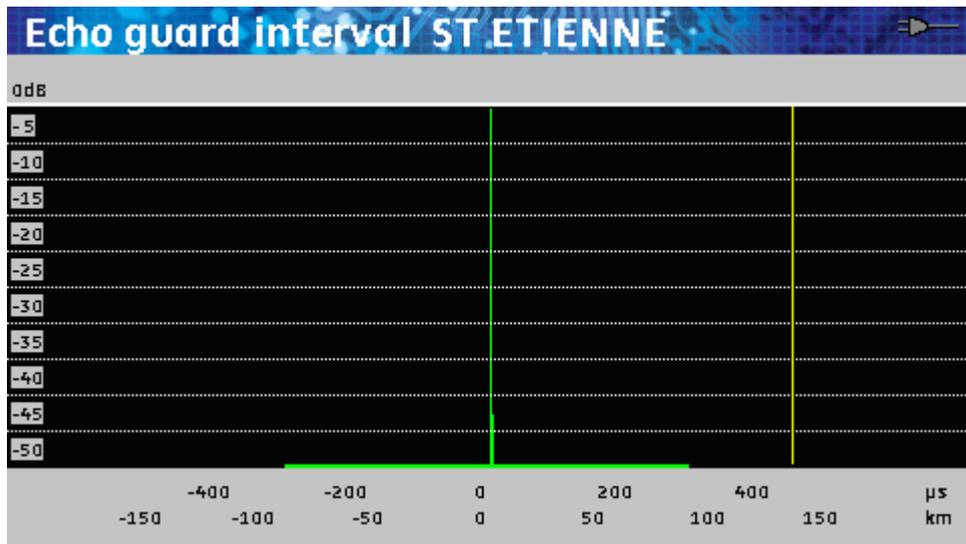
The Validation key enables you to change the horizontal scale. ✓

A yellow line marks the end of the guard interval.

Remember: In terrestrial TV broadcasting, the received signal on the antenna comes from several possible ways: the **echoes**.
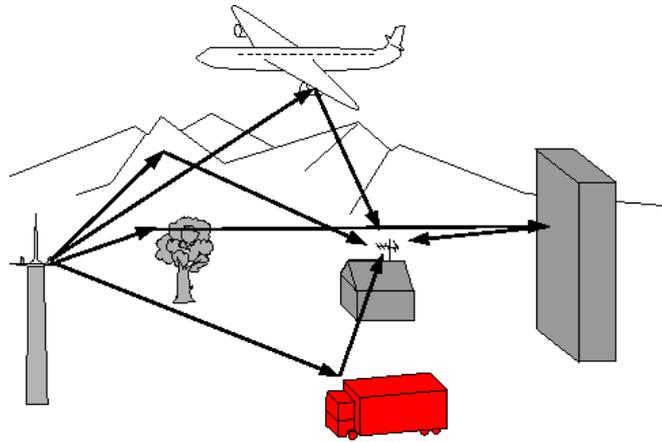
In analogical TV, these echoes disturb the reception and degrade the image.

In digital TV DVB-T/H and DVB-T2, these echoes may help or degrade the image according to the time delay between the various signals that reach the antenna.

The broadcasting norms DVB-T and DVB-T2 define a modulation parameter called "**guard interval**" where echoes won't disturb the reception.

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

A delayed (or advanced) symbol of any **shorter** duration than the guard interval will not disturb the reception.

A delayed (or advanced) symbol of any **longer** duration than the guard interval will disturb the reception.
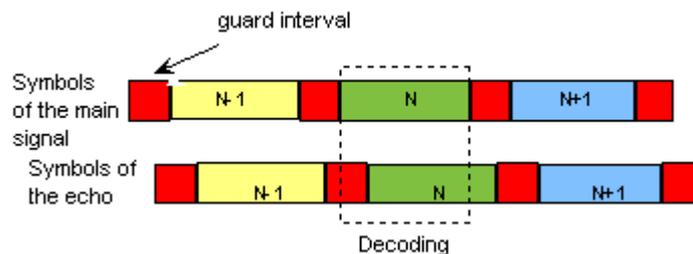
You have to reduce the level of reception of the echoes by orienting the antenna or by selecting a more directive antenna.

The **Echo** function of the appliance enables you to display possible **echoes** that disturb the received signal.

You can assess the relative amplitude in dB and the delay in µs (distance in km) in comparison with the main signal (0 pulse).

The yellow line shows the end of the interval guard.

The echoes (rays) beyond this line disturb the reception and must be as weak as possible.

13 Measurement map

Pushing several times on the Measurement key give you access to the **Measurement map** function.

This is an automatic measurement of the level and of the error rate of the setups in the list of measurements with an indication of the levels out of tolerance.

Measurement map ST-ETIENNE

freq.	std	RF	C/N	BERi	BERo	PER	MER
E50	DVB-T/H	56.6	>45.9	4.3E-5	<9E-8	<9E-5	33.0
E23	DVB-T/H	56.4	>42.0	5.4E-5	<9E-8	<9E-5	28.5
E39	DVB-T/H	60.1	>43.6	1.0E-4	<9E-8	<9E-5	32.8
E54	DVB-T/H	58.8	>44.4	2.5E-5	<9E-8	<9E-5	32.7
E29	DVB-T/H	51.0	>38.6	3.4E-4	<9E-8	<9E-5	27.8
E26	DVB-T/H	54.0	>46.6	1.6E-4	<9E-8	<9E-5	27.8
E35	L	69.6	>57.1				
E30	L	62.8	>55.3				
E33	L	68.0	>57.1				

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Measurement map ASTRA NUM

freq.	std	RF	C/N	BERi	BERo	PER	MER
11836 HL	DVB-S	72.0	12.4	8.2E-6	<5E-9	<9E-6	14.1
11568 VL	DVB-S	74.7	10.0	Sync?	Sync?	Sync?	--.-
11597 VL	DVB-S	74.2	10.0	<1E-7	<5E-9	<9E-6	15.7
11817 VH	DVB-S	74.4	12.7	1.6E-7	<5E-9	<9E-6	15.0
12552 VH	DVB-S	71.1	11.0	<1E-7	<5E-9	<9E-6	15.9
11954 HH	DVB-S	74.7	13.1	3.8E-5	<5E-9	<9E-6	13.1
12324 VH	DVB-S	72.9	10.3	3.6E-5	<5E-9	<9E-6	13.1

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BERi, **BERo** and **PER** are generic acronyms (frequently used)

BERi = BER in = inner BER

first BER treated by the demodulator (BER channel, CBER, LDPC)

BERo = BER out = outer BER

last BER treated by the demodulator (BER Viterbi, VBER, BCH)

PER = packet error rate

uncorrected packet, lost packet, erroneous packet (UNC, PER)

	Important
	A bar graph below the Measurement map allows you to observe the progression of the scan.
	The **background** colour of this bar graph tells you that a complete scan has been made (for example for a save):
	- **red**: the Measurement plan has not been totally scanned
	- **green**: the Measurement plan has been totally scanned

For a quick view, only the levels and C/N of each Setup are measured at the first scan.

Measurement map ST ETIENNE

freq.	std	RF	C/N	BERi	BERo	PER	MER
E50	DVB-T/H	56.1	>49.7				--.-
E23	DVB-T/H	52.3	>45.9				--.-
E39	DVB-T/H	49.7	>41.7				--.-
E54	DVB-T/H	59.6	>47.7				--.-
E29	DVB-T/H	52.3	>40.4				--.-
E26	DVB-T/H	51.6	>45.2				--.-
E35	L	69.0	>56.5				
E30	L	69.2	>56.7				
E33	L	71.5	>54.0				

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Then, the error rates of the Setups under the digital standards are measured.

Measurement map ST ETIENNE

freq.	std	RF	C/N	BERi	BERo	PER	MER
E50	DVB-T/H	56.1	>44.2	1.6E-5	<9E-8	<9E-5	33.2
E23	DVB-T/H	52.3	>40.9	7.6E-5	<9E-8	<9E-5	29.2
E39	DVB-T/H	49.7	>41.7				--.-
E54	DVB-T/H	59.6	>47.7				--.-
E29	DVB-T/H	52.3	>40.4				--.-
E26	DVB-T/H	51.6	>45.2				--.-
E35	L	69.0	>56.5				
E30	L	69.2	>56.7				
E33	L	71.5	>54.0				

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7846 and 7847 models allow mixing satellite and terrestrial setups:

Measurement map AST+ST-ET

freq.	std	RF	C/N	BERi	BERo	PER	MER
E50	DVB-T/H	56.5	>50.1	4.4E-5	<2E-8	<1E-5	32.3
E23	DVB-T/H	52.3	>45.9	7.5E-5	<2E-8	<1E-5	30.7
E39	DVB-T/H	54.9	>48.5	5.3E-6	<2E-8	<1E-5	31.6
E54	DVB-T/H	57.1	>50.7	3.8E-8	<2E-8	<1E-5	32.8
E26	DVB-T/H	52.3	>45.9	7.1E-6	<2E-8	<1E-5	32.1
10729 VL	DVB-S2	72.3	11.3	2.6E-3	<9E-9	<9E-6	13.4
10743 HL	DVB-S	72.3	11.4	2.1E-5	<9E-9	<1E-5	13.4
10773 HL	DVB-S2	73.6	12.7	3.9E-3	<9E-9	<9E-6	12.5
10788 VL	DVB-S	76.1	12.1	1.4E-5	<9E-9	<1E-5	13.8

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In this case, satellite remote supply has the first priority. (Terrestrial remote supply is ignored)

13.1   Values out of tolerance

A coloured frame around the values changes according to the decision **Thresholds**:

- **red** for values below the **min**. **Threshold**
- **orange** for values above the **max. Threshold**

Measurement map ST ETIENNE

freq.	std	RF	C/N	BERi	BERo	PER	MER
E50	DVB-T/H	39.9	>33.5	9.0E-3	9.0E-3	<9E-5	19.2
E23	DVB-T/H	36.4	>30.0	Sync?	Sync?	Sync?	18.8
E39	DVB-T/H	37.4	>32.6	1.8E-2	1.8E-2	<9E-5	17.5
E54	DVB-T/H	41.8	>35.4	3.5E-3	<2E-7	<9E-5	22.4
E29	DVB-T/H	35.3	>30.5	Sync?	Sync?	Sync?	19.2
E26	DVB-T/H	34.7	>28.3	Sync?	Sync?	Sync?	17.9
E35	L	49.0	>48.1				
E30	L	51.3	>48.8				
E33	L	52.8	>50.3				

6/15   ......

14 One Touch function

Pushing several times on the Measurement key give you access to the **One Touch** function.

It's a graphical drawing of Setup's level from the Measurement List; only setups which have been selected for this function (see Measurement List parameters) are measured.

2 methods available : **Tapp** and **Customer** to record a level slope over the entire bandwidth, located on 2 points of signal distribution (Tapp=dispatcher, and Customer=socket).

Setup cursor and measurements Level and MER display

LEVEL scale

MER tag

Upper and Lower limit indication

Tapp slope

Customer slope

Parameters
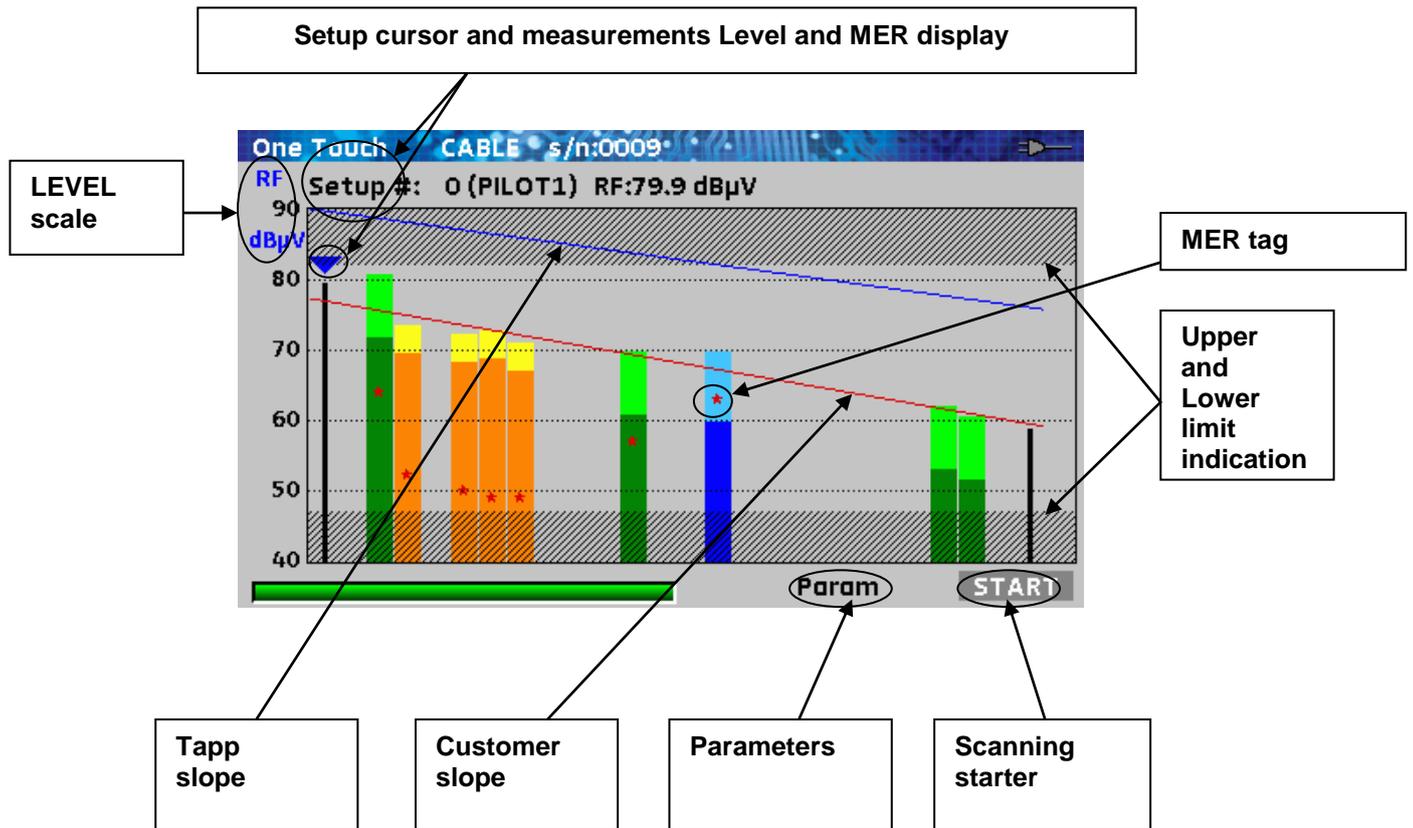
Scanning starter

➔ 3 commands available by the knob , then the VALID key :

1-Setup **Cursor** :
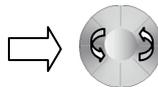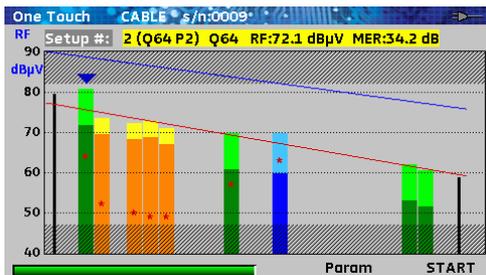
cursor moving

display infos and measurements of Setup

2- **Parameters** : Method, Scales and corrections

⟹
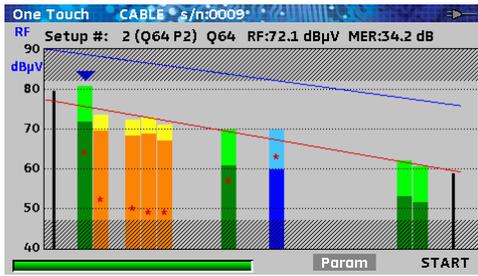
access to Parameters of the function

3- **START** : scanning starter

⟹
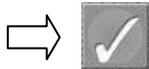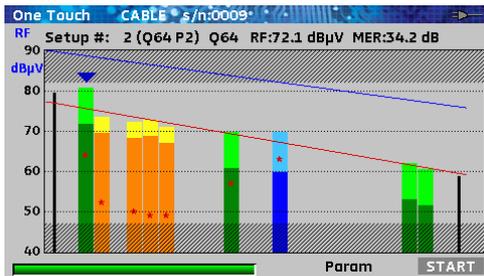
start scanning

➔ Colors code :
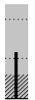
 black : pilot carrier or analog carrier

 green : level DVB-C 64QAM   light green : added correction

 orange : level DVB-C 256QAM   yellow : added correction
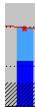
 blue : level DVB-T   light blue : added correction

 blue line : Tapp slope

 red line : Customer slope

 red star : MER value

14.1   Function ONE TOUCH parameters
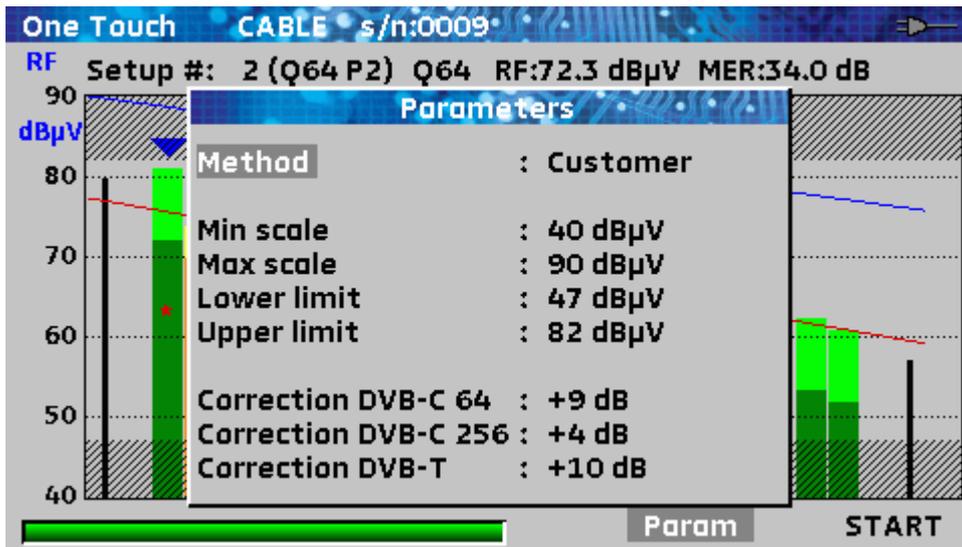
- **Method** :   Tapp or Customer

- **Min scale** :   minimum RF level scale

- **Max scale** :   maximum RF level scale

- **Lower limit** :   lower limit (gray area)

- **Upper limit** :   upper limit (gray area)

- **Correction DVB-C 64** :   level adjustment added to setups DVB-C, 64QAM

- **Correction DVB-C 256** :   level adjustment added to setups DVB-C, 256QAM

- **Correction DVB-T** :   level adjustment added to setups DVB-T

Remark :

-   **Scale and Limit parameters are dedicated to each Method Tapp and Customer.**

-   **Correction parameters are the same for each Method Tapp or Customer**

Corrections values added to level measurements are useful for displaying quite the same bargraph for all level setup, whatever standards and modulations.

So, global slope can be easily measured.

14.2   Method Tapp, scan and processing

Selec **START** by knob, then press VALID

The scan is going on (bargraph and hourglass) ; at the end of scanning, the instrument proceed the **Tapp**'s slope line.
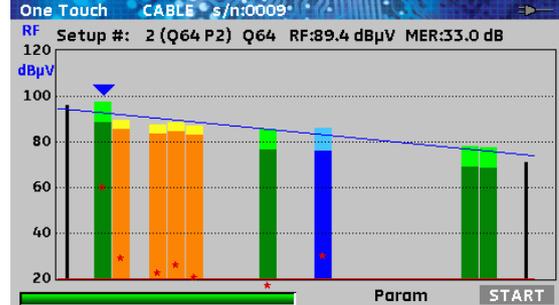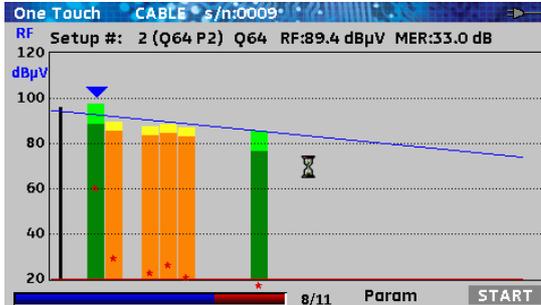
14.3   Method Customer, scan and processing

Select **START** by knob, then press VALID

The scan is going on (bargraph and hourglass) ; at the end of scanning, the instrument proceed the **Customer**'s slope line.

Then the instrument also display results : **Passive loss and Cable Length**
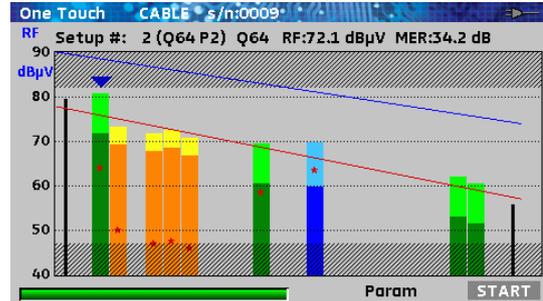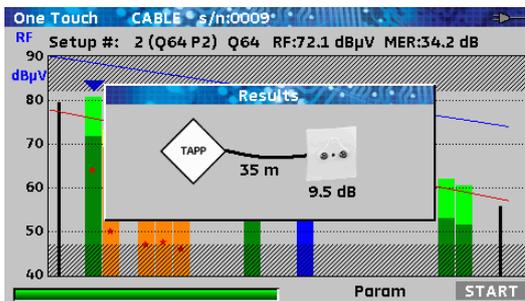
Passive loss :   3/5 of slope's difference at the beginning of the bandwidth

Cable length: cable loss over a standard cable with 20dB/100meters loss

(cable loss : slope's difference at the end of the bandwidth – Passive loss)

15 Image and Sound

Pushing the TV key ⟦TV⟧ gives you access to the **Image and Sound** function.

15.1   Digital TV

The name of the service and its main characteristics are displayed on the right top of the screen.

- 1440x1080i : resolution of the picture 1440 pixels / line, 1080 lines, interlace scan
- 25 Hz : frame frequency
- H.264 : picture compression
- Video Rate 7.455 MBits/s : snapshot binary rate of the service
- Audio MPEG Layer II : sound compression

15.2   Service list

Pushing twice on the TV key ![TV] gives you access to the list of services

Use the knob ![knob] and the Validation key ![check] to change of service

The provider and the type of service are specified

![TV icon]   TV

![Radio icon]   Radio

![Data icon]   Data

![Encrypted icon]   Encrypted service

15.3   Setup change

Pushing three times on the TV key `TV` enables you to change the setup.

Use the Validation key, ✓ then use the knob to change of setup

15.4   Audio

The appliance can decode the following digital sounds:

MPEG-1 L1/L2

AAC	Advanced Audio Coding	License Via Licensing
HE-AAC	High Efficiency AAC	License Via Licensing
Dolby Digital		License Dolby$^{®}$
Dolby Digital Plus		License Dolby$^{®}$

Produced under **licence** of **Dolby** Laboratories.

Dolby and the double-D symbol are trademarks of **Dolby Laboratories**.

16 Saving

Pushing the Toolbox key enables you to **Save** the measurement values.
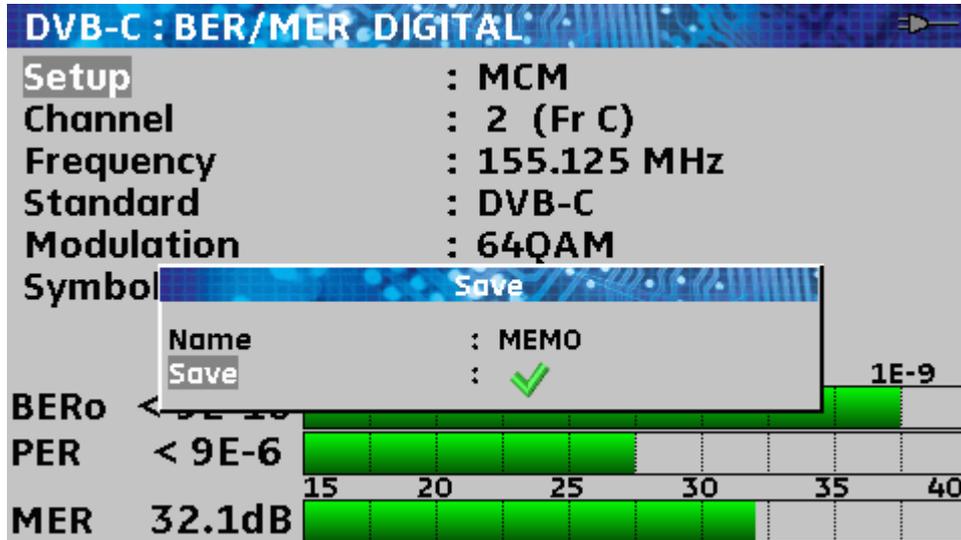
☞	You will be able to use the saved values, after transfer, to create measurement reports on your computer (see the Memories paragraph for more details).

A window opens on the current screen and suggests a file name.

You can directly **Save** a file using the suggested name or change it.

After changing the file name, move to the Save line and push the Validation key.

See the Acquisition of a name paragraph for more details.

☞	When you turn off the appliance, the complete shut-off will last a few seconds because of a saving on a flash memory.

17 Remote supply / LNB – DiSEqC

Pushing several times on the Toolbox key [icon] give you access to the configuration of the remote supply:

17.1 Terrestrial band (7806, 7807 & 7809)

Remote supply: on / off

Selection of the voltage of the remote supply among the values: 5V, 13V, 18V and 24V

See the Man-machine interface chapter for any modification.

17.2 Satellite band (7808)
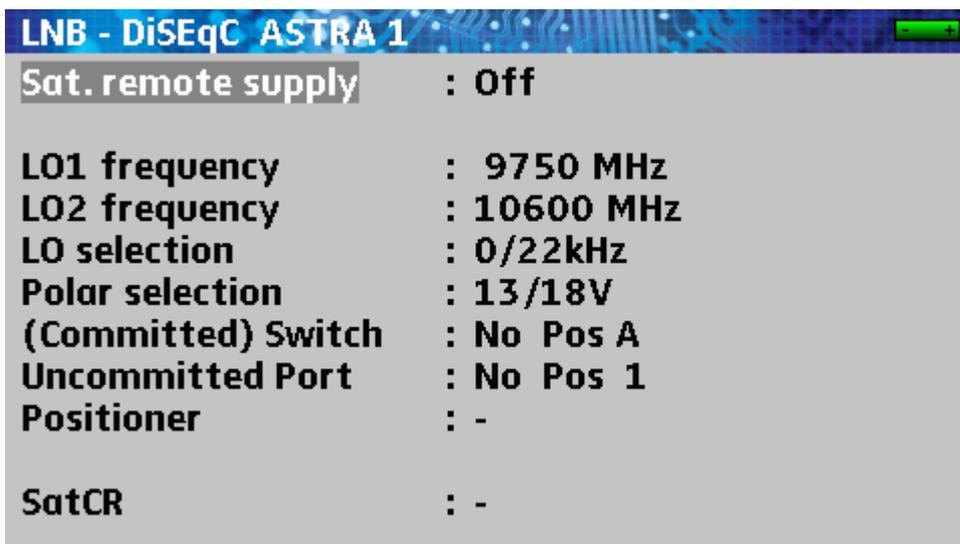
Configuration lines:

- Remote supply :   turns on/off the remote supply or automatic mode
- OL1 frequency :   OL frequency lower band of the LNB
- OL2 frequency :   OL frequency higher band of the LNB
- OL selection :   band commutation on the LNB (22kHz, ToneBurst or DiSEqC)
- Polar selection :   polarization commutation on the LNB (13/18V or DiSEqC)
- Switch :   switch, type and position (Name, ToneBurst, 22 kHz, DiSEqC, Pos A, B, C or D)
- Uncommitted :   "uncommitted" switch, type et position (No, DiSEqC, Pos 1 to 16)
- Positioner :   Presence of a positioner (Yes / No)
- Satellite # :   Current position (from 1 up to 127 pre-loaded positions in the positioner)
- SatCR :   SatCR mode (single cable distribution)

See the Man-machine interface chapter for any modification.

17.2.1   Switches
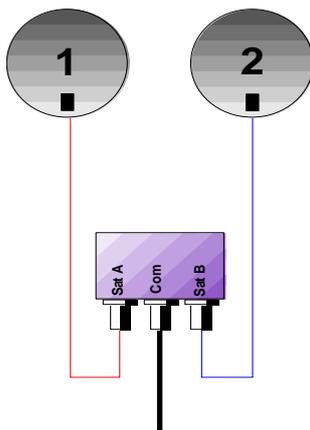
2-satellite switch

* 22 kHz

* ToneBurst (MiniDiSEqC)

 *DiSEqC Committed or Uncommitted
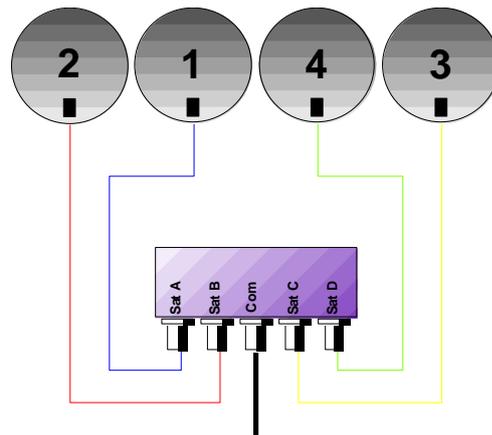
4-satellite switch

* DiSEqC Committed or Uncommitted

– 7806-7807-7808-7809-7846-7847 –
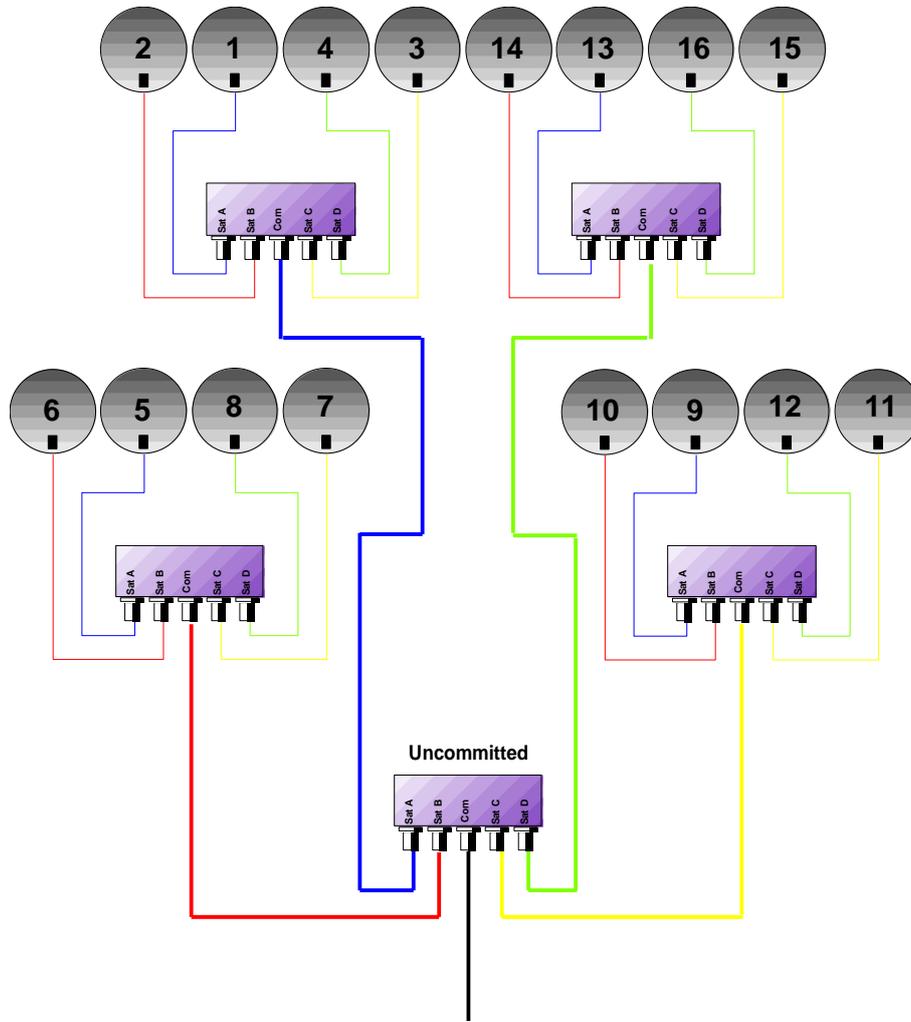
16-satellite switches

* DiSEqC Committed + Uncommitted

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

17.2.2   Positioner

The appliance produces a DiSEqC command that orders the rotation of a motorized dish.

```
LNB - DiSEqC ASTRA 1                              - +
Sat. remote supply       : auto

LO1 frequency            :  9750 MHz
LO2 frequency            : 10600 MHz
LO selection             : 0/22kHz
Polar selection          : 13/18V
(Committed) Switch       : No Pos A
Uncommitted Port         : No Pos 1
Positioner               : 8

SatCR                    : -
```
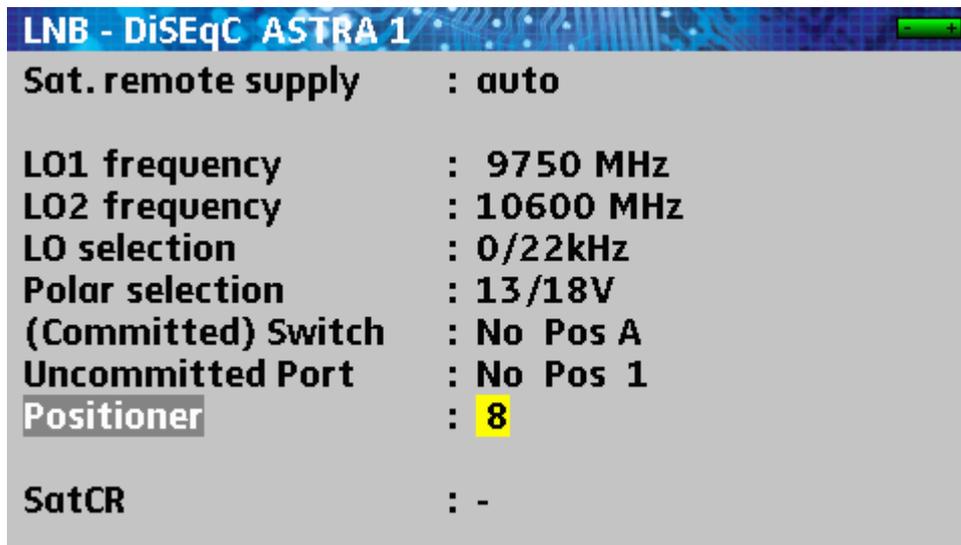
Current position (from 1 up to 127 pre-loaded positions in the positioner): if the window shows a "–", the positioner is deactivated

See the Man-machine interface chapter for any modification.

17.2.3   SatCR mode

Description:

SatCR: Satellite Channel Router or Single Cable Distribution

Distribution of the satellite signal with only one coaxial cable in one-family house to 2, 4 or 8 different receptors.

You need a **coaxial cable per receptor** and a suitable installation (multiple LNB, Quattro and multi-switches) to give access to the whole spectrum and all polarizations to several receptors.

The SatCR mode is an extension of the DiSEqC protocol that enables the connection of several receptors on **only one coaxial cable**, no matter the band (H/L) and the polarization (H/V).

There is a norm for the European industry for the broadcasting of the satellite signals on only one cable - **EN50494**.

Functioning:

Each satellite receptor uses a fixed frequency band (**Slot** or **Port**), whose width is (more or less) equal to the transponder frequency bandwidth.

The receptor requires a specific transponder frequency (Ku frequency) via a DiSEqC command.

Some equipment at the dish (LNB or switch SatCR) moves the requested signal to the middle of the selected band (**Slot**). Then, the mixing equipment adds each user band (**Slot**) on only one output (up to 8 user bands).
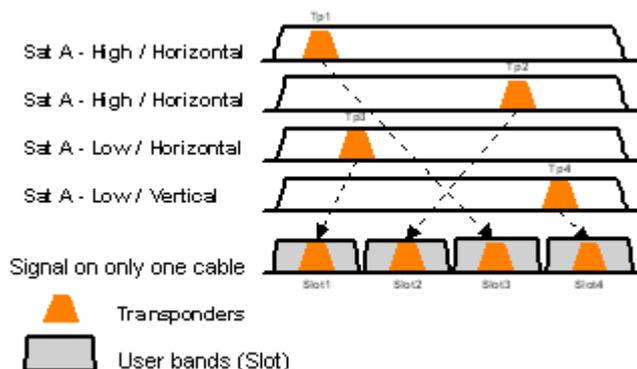
Use:
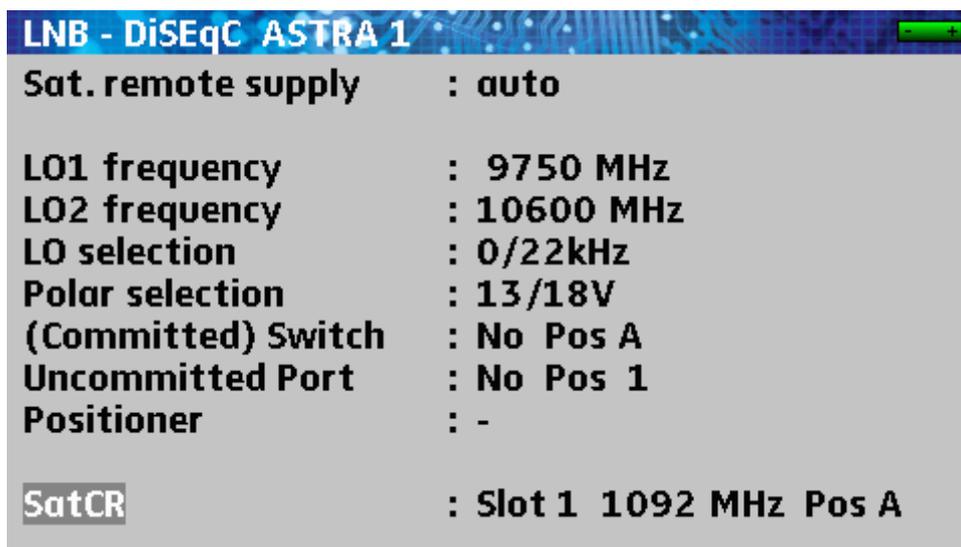
SatCR line:

- Slot 1 : selection of the SatCR slot; if the window shows a "–", the positioner is deactivated
- 1180 MHz : access to the adjustment of the frequency of the slots
- Pos A : selection of switch Pos A / Pos B

See the Man-machine interface chapter for any modification.

The SatCR mode has priority over any other mode: polarization selection, OL selection, committed switches, uncommitted switches and positioner.

17.2.3.1 Automatic research of the frequencies of slots

LNB - DiSEqC ASTRA 1

Sat. remote supply : auto

LO1 frequency
LO2 frequency
LO selection
Polar selection
(Committed) S
Uncommitted F
Positioner

Slot frequencies	
Slot 1	1092 MHz
Slot 2	1178 MHz
Slot 3	1279 MHz
Slot 4	1382 MHz
Slot 5	1484 MHz
Slot 6	1586 MHz
Slot 7	1688 MHz
Slot 8	1790 MHz

SatCR : **Slot 1** 1092 MHz Pos A

Push the Toolbox key: the list of all slot frequencies appears

Push the Toolbox key twice: an automatic research of these frequencies starts; the list is automatically completed

17.2.3.2 Influence of the SatCR mode on the spectrum analyzer

Frequency of the transponder visible in the middle of the active slot

Polarization and current band in the active slot

SatCR mode and active slot

Att.: 5dB   11856 MHz   ---   VH   SatCR Slot 0

65 dBµV
5 dB/div
60

55

50

45

40

35

Fcen: 1093 MHz   Filt : 1 MHz   Span: 200 MHz

Frequency of the active slot

Marks of the user band (slot)
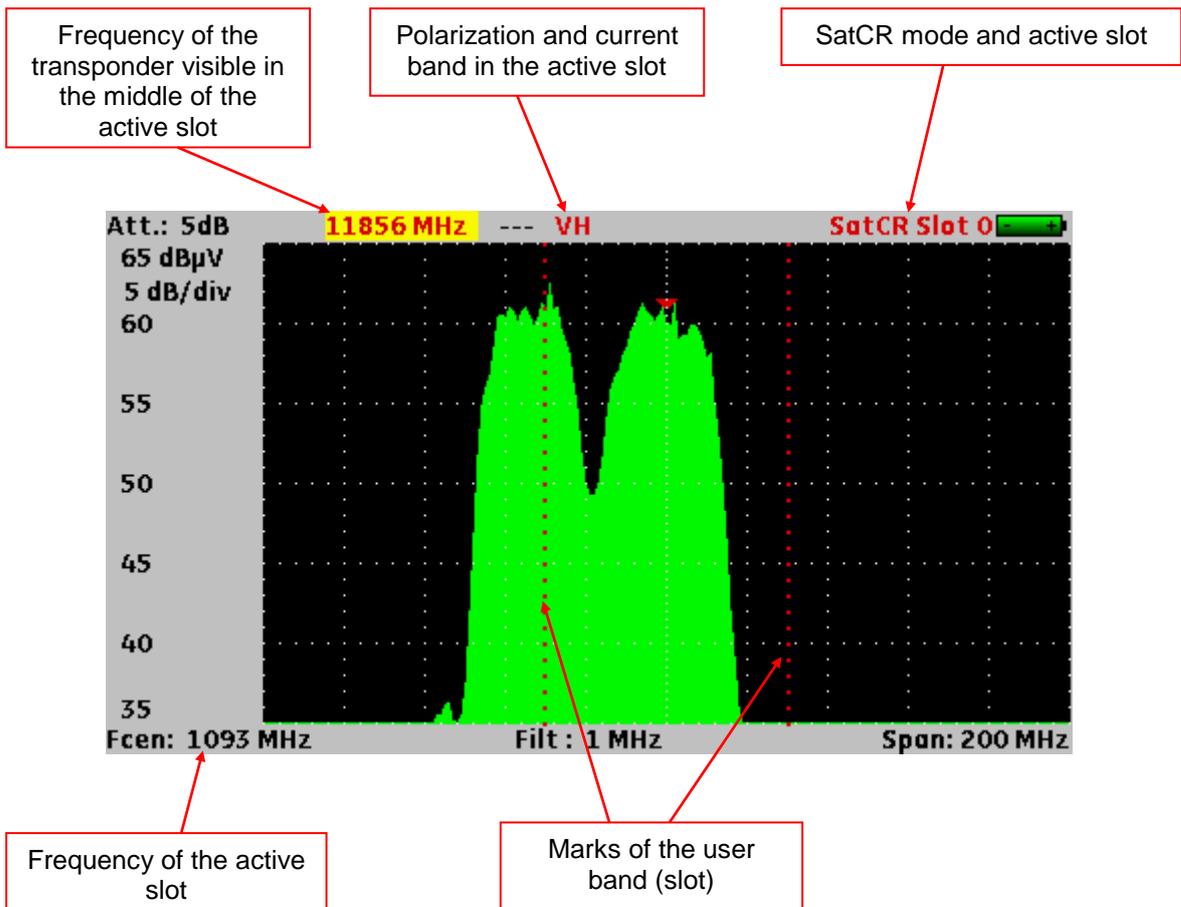
17.3   Terrestrial + satellite band (7846-7847)

```
LNB - DiSEqC ST-ETIENNE                    =▶—
Ter. remote supply      : Off

Sat. remote supply      : Off
LO1 frequency           :  9750 MHz
LO2 frequency           : 10600 MHz
LO selection            : 0/22kHz
Polar selection         : 13/18V
(Committed) Switch      : No  Pos A
Uncommitted Port        : No  Pos 1
Positioner              : -
SatCR                   : -
```

7846 and 7847 have the same functionalities than chapter 16.1 and 16.2.

	In measurement map mode (with satellite and terrestrial setups at the same time), satellite remote supply has the first priority (Terrestrial remote supply is ignored).

– 7806-7807-7808-7809-7846-7847 –

18 Configuration

Pushing several times on the Toolbox key ![icon] give you access to the general **Configuration** of the appliance:
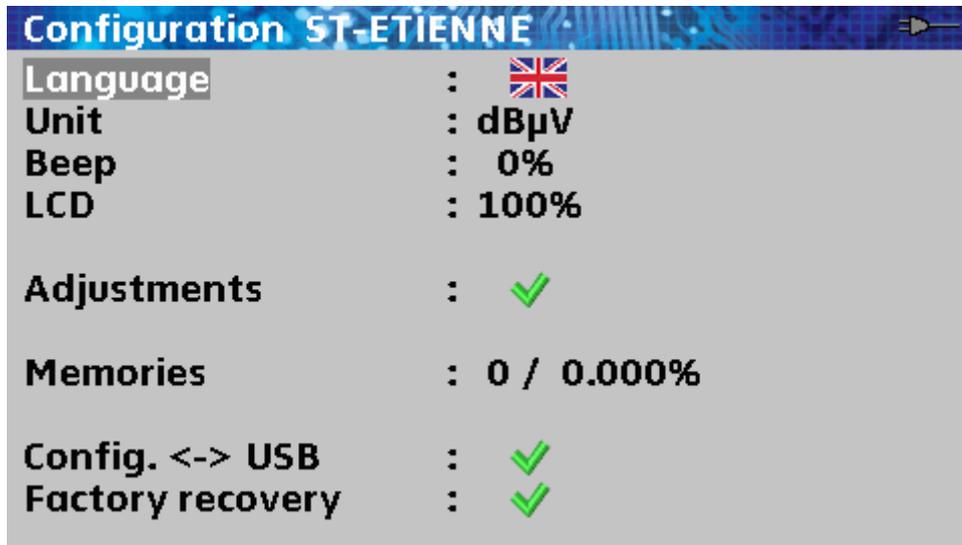
18.1 Language

Use the knob to change it.

18.2 Measurement unit

Use the knob to change it:

- **dBµV**: 0 dBµV matches 1 µV
- **dBmV**: 0 dBmV matches à 1 mV
- **dBm**: 0 dBm matches 274 mV : 1 mW in case of 75Ω impedance
- **V**: value in V, mV and µV according to the level

18.3 Sound level of the beep for the keys and the plotting

Use the knob to change it.

18.4 LCD backlight

Use the knob to change the brightness of the screen 25%, 50%, 75% and 100%.

18.5 Adjustments
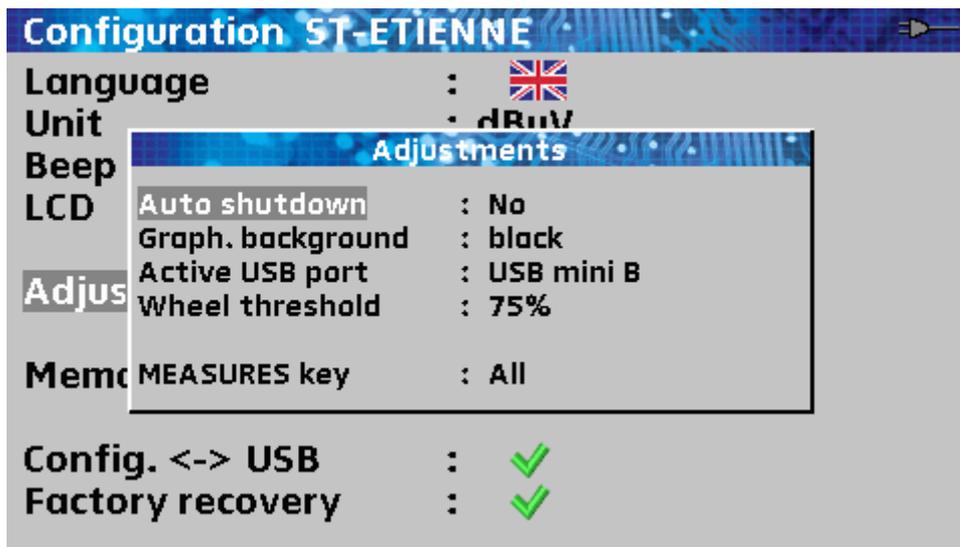
Several adjustments :

➔ Auto switch-off :

Automatic switch-off delay 10mn without using instrument

➔ Couleur du fond des graphiques (spectre, constellation, …)

Use the knob to change the background colour of the graphs: **black**, **white** or **grey** (spectrum, constellation…)

This function spares ink from the printer when editing the reports.

➔ Active USB port :

USB A: connection with an USB key for updating, configuration loading or memory issue.

USB mini B: connection with a computer via an adapted cable; the computer will recognize the appliance as an USB key: no driver is required.

➔ Wheel threshold :

Use the knob to change the threshold (sensitivity) 25%, 50%, 75% and 100%.

➔ MEASURES key :

MEASURES key adjustment : all measurements or **One Touch** function only

18.6   Memories

Display of the number of recorded files and their place in memory.
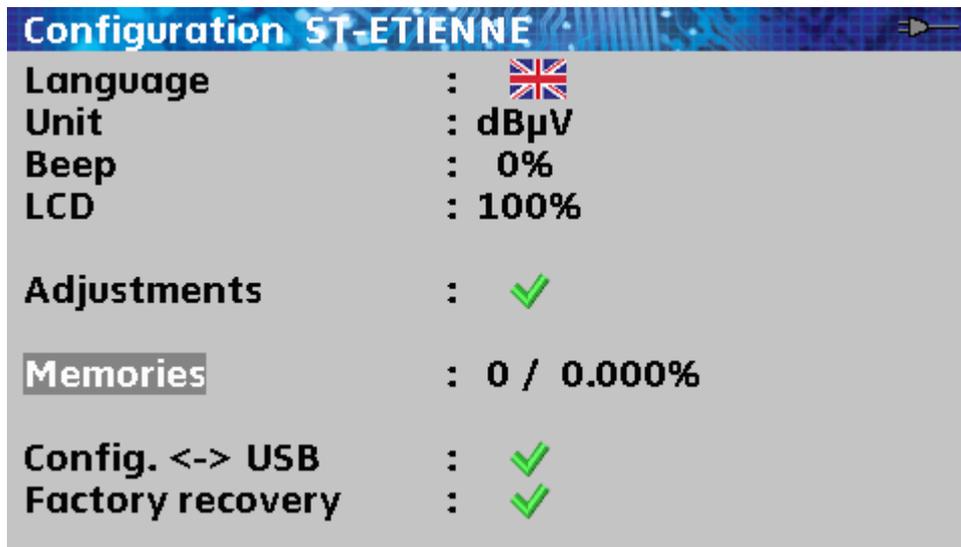
Pushing the Validation key unfolds the list of the previously recorded files.

The first column specifies the sequence number of the file; the second file specifies the name of the file; the third column specifies the TER terrestrial/cable measurement band or SAT satellite; the last column specifies the type of file: level, spectrum, measurement plan…

Rotate the knob to point at the file to work on. Pushing the Validation key
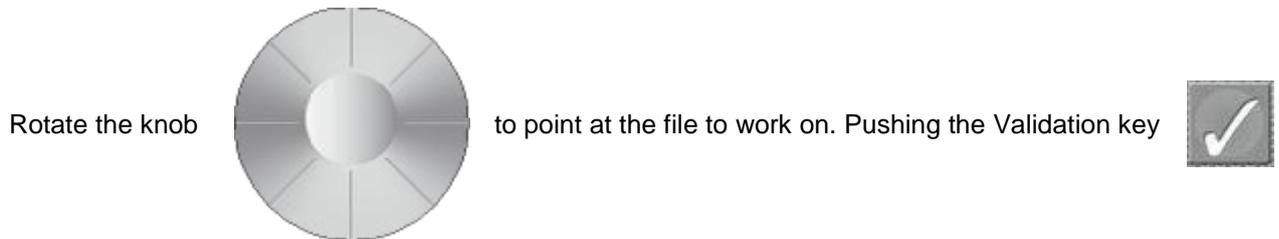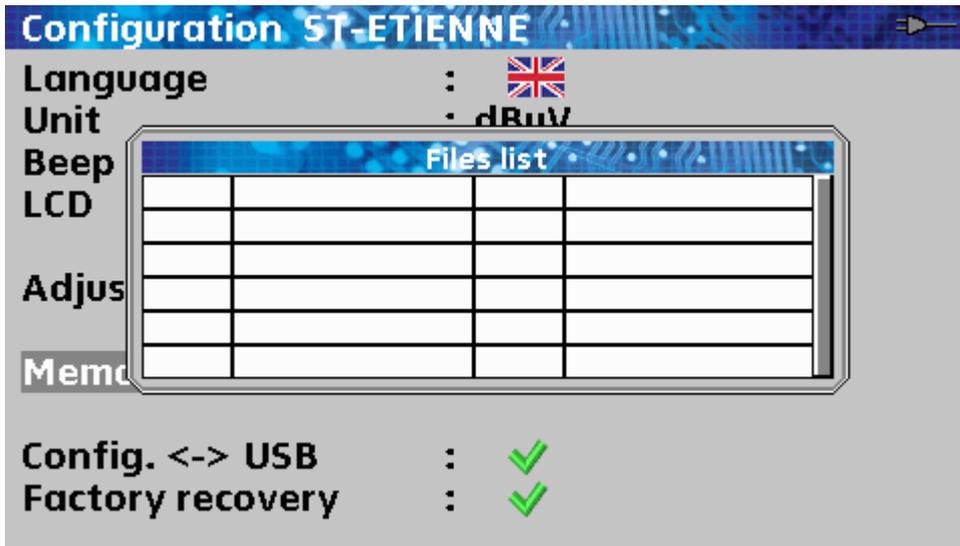
will display a list of possible actions.
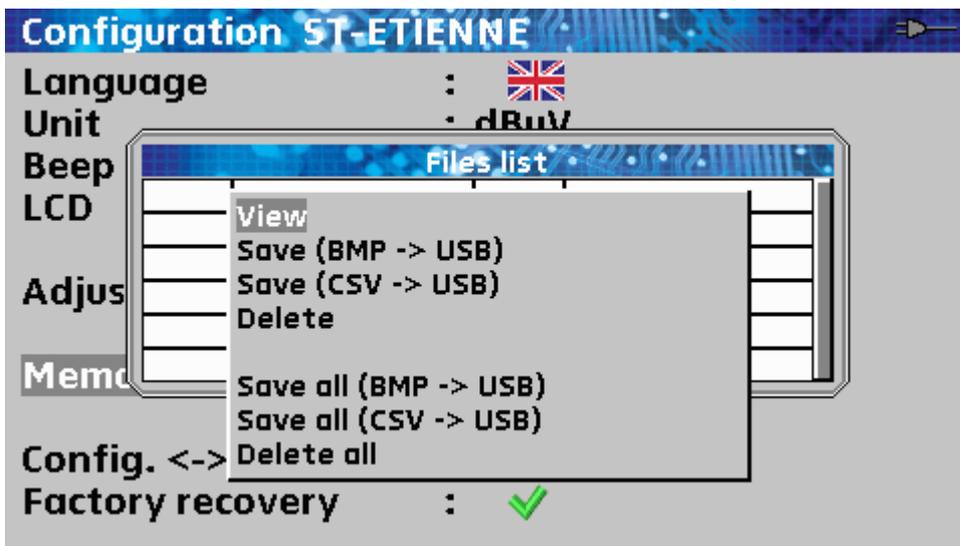
View: Display of the content of the file
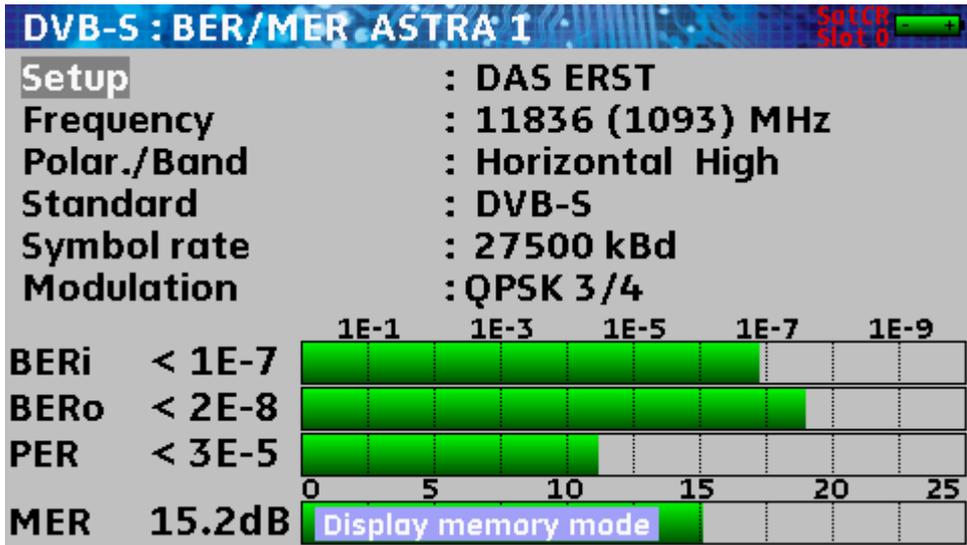
Save (-> USB BMP): exportation of the file to the USB key under BMP format (uncompressed graphical format) useful to import graphs into a report.
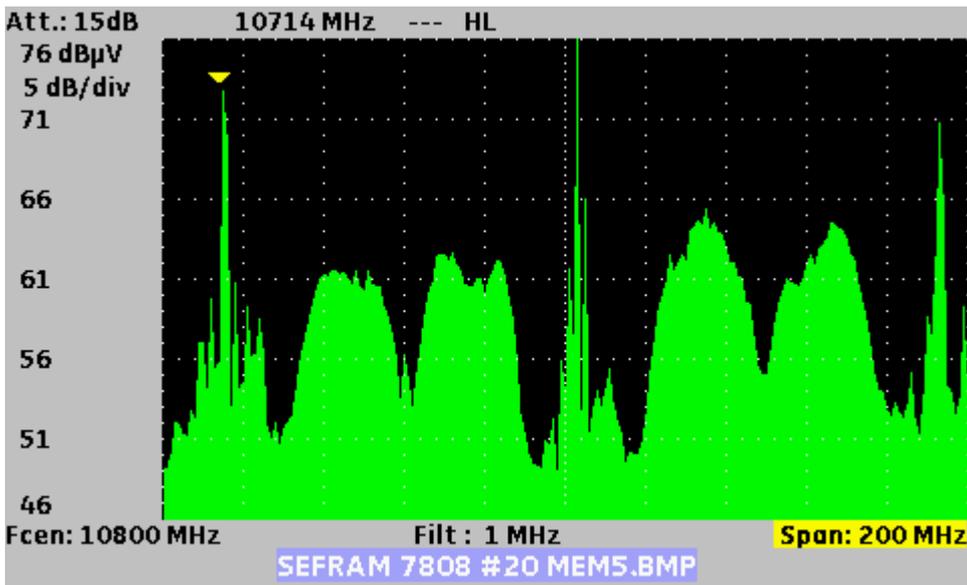
Save (-> USB CSV): exportation of the file to the USB key under CSV format (text file in columns separated with semicolons) useful to analyse values in a spreadsheet software.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	SEFRAM 7808 #20 MEM5.CSV																		
2																			
3	0 ASTRA 1 LO1 frequency: 9750 MHz LO2 frequency:10600 MHz LO selection:DiSEqC Polar selection:13/18V (Committed) Switch:DiSEqC Pos A Uncommitted Port:No Positioner:-																		
4																			
5	Spectrum																		
6																			
7	#3 EXTRA TV ASTRA 1 10714 (964) MHz HL DVB-S 22000 kBd																		
8																			
9	Fcen:	10800 MHz																	
10	Filt :	1 MHz																	
11	Span :	200 MHz																	
12	Att. :	15dB																	
13	Fcurs :	10714 MHz																	
14																			
15	Fr : (MHz)	dBµV																	
16	10700	49.1																	
17	10701	49.1																	
18	10702	50																	
19	10703	50																	
20	10704	51.9																	
21	10705	51.9																	
22	10706	51.8																	
23	10707	51.8																	
24	10708	51.2																	
25	10709	51.2																	
26	10710	51.1																	
27	10711	51.1																	
28	10712	52.7																	
29	10713	52.7																	
30	10714	52.2																	
31	10715	52.2																	
32	10716	56.9																	
33	10717	56.9																	
34	10718	57																	
35	10719	57																	
36	10720	54.1																	
37	10721	54.1																	
38	10722	59.7																	
39	10723	59.7																	
40	10724	55.3																	
41	10725	55.3																	
42	10726	55.7																	
43	10727	55.7																	
44	10728	72.7																	
45	10729	72.7																	
46	10730	70																	

Save all (BMP -> USB): records all present files under BMP format into separated directories:

- LEVEL for level measurements
- MAP for measurement plans
- SPECTRUM for spectrum measurements
- BER-MER for measurements of error rates
- CONST for constellations
- ECHO for echoes.

Save all (CSV -> USB): as previously, all files are recorded into directories, but under CSV format.

Delete: to erase the selected file
Delete all: to clean up the memory (with confirmation)
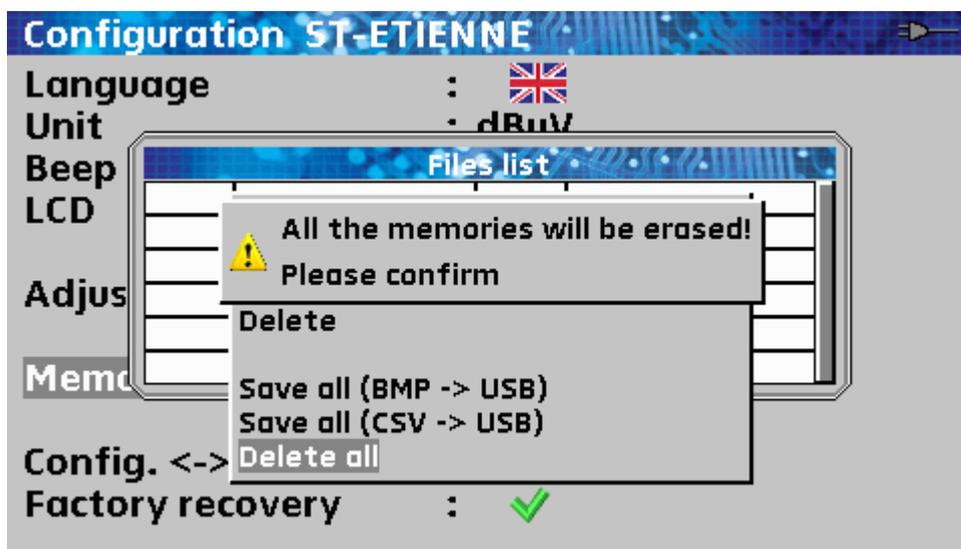
18.7   Configuration with USB key

You can update all or a part of the configuration of the appliance with a spreadsheet software and an USB key.
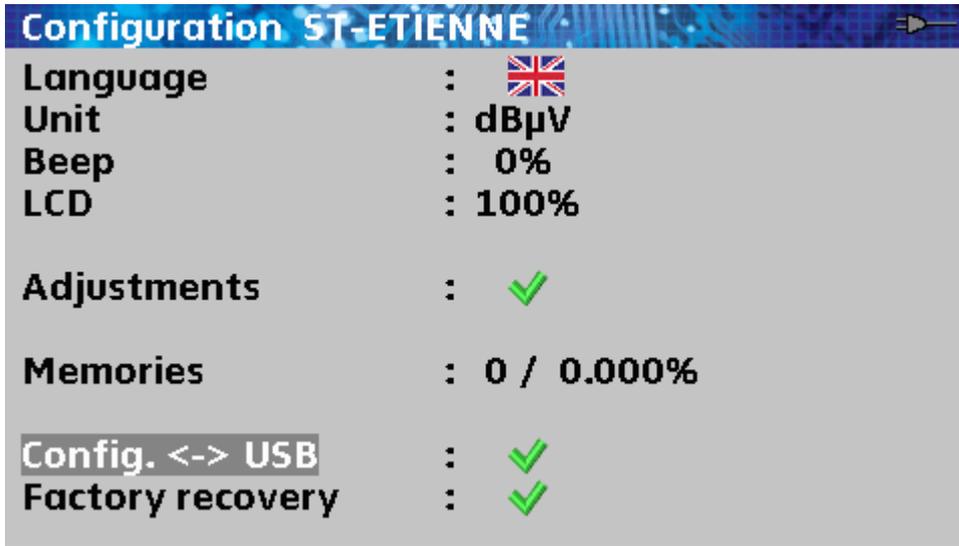
The configuration of the appliance is made of three different kinds of files:

- A satellite file for the plotting (see Dish adjustment)

- A library setup file containing 1000 setups (see Library setups)

- Twenty files of measurement lists, fifty lines each (see Measurement lists)

	A	B	C	D	E	F	G	H	I
1	Nom de la liste / List name	ASTRA1+HOT							
2	Fréquence OL1 / LO1 frequency	9750							
3	Fréquence OL2 / LO2 frequency	10600							
4	Sélection OL / LO setup	DiSEqC							
5	Sélection polarisation / Polarization setup	DiSEqC							
6	Positionneur / Positioner								
7									
8		Numéro de programme Setup number	Switch committed Committed switch	Position Switch committed Committed switch position	Switch uncommited Uncommitted switch	Position switch uncommited Uncommitted switch position	Activation SatCR SatCR enabled	Numéro de slot Slot number	Switch SatCR SatCR switch
9	0								
10	1	1	DiSEqC	Pos A					
11	2	2	DiSEqC	Pos A					
12	3	3	DiSEqC	Pos A					
13	4	4	DiSEqC	Pos A					
14	5	5	DiSEqC	Pos A					
15	6	6	DiSEqC	Pos A					
16	7	7	DiSEqC	Pos A					
17	8	8	DiSEqC	Pos A					
18	9	9	DiSEqC	Pos A					
19	10	10	DiSEqC	Pos A					
20	11	11	DiSEqC	Pos A					
21	12								
22	13	18	DiSEqC	Pos B					
23	14	19	DiSEqC	Pos B					
24	15	20	DiSEqC	Pos B					
25	16	21	DiSEqC	Pos B					
26	17	22	DiSEqC	Pos B					
27	18	23	DiSEqC	Pos B					
28	19	24	DiSEqC	Pos B					
29	20	25	DiSEqC	Pos B					

Prog / Lst00 / Lst01 / **Lst02** / Lst03 / Lst04 / Lst05 / Lst06 / Lst07 / Lst08 / Lst09 / Lst10 / Lst11 / Lst12 / Lst13 / Lst14 / Lst15 / Lst16 / Lst17 / Lst18 / Lst19

Prêt   Moyenne : 10175   Nb (non vides) : 4   Somme : 20350   100 %

These files correspond with the tabs of the Sat.xls files (for the plotting), TConf.xls (for the terrestrial band), CConf.xls (for the cable) and SConf.xls (for the satellite). These files are available on SEFRAM website: http://www.sefram.com/www/NP_D_SOFTWARE.asp

The appliance is not directly compatible with these files. Anyway, you must save each tab as a CSV file (text file in columns separated with semicolons):

- One file S**at.csv** for the plotting
- One file TP**rog.csv, CProg.csv, SProg.csv** or STProg.csv for the setups
- Files TL**st00.csv, TLst01.csv, TLst02.csv…CLst00.csv…** for each measurement list.

There is a CSV macro-command that does it all: Ctrl + Shift + C on keyboard. (Office 2007 2010 only)

These CSV files must be copied to the root directory of an USB key.

Then, the USB key must be connected to the appliance.

Eventually, you only have to validate the transfer with the Validation key on the Config.<-> USB line.

During the transfer, the previous configuration of the appliance will be saved into the Conf directory:

- One file S**at.csv** for the plotting
- One file TP**rog.csv** for the setups
- Twenty files TL**st00.csv, TLst01.csv, TLst02.csv**…

	Terrestrial files for the 7806and 7809 have names beginning with T; ex.: TConf.xls, TProg.csv…
	Cable files for the 7807 have names beginning with C.
	Satellite files for the 7808 have names beginning with S.
	Satellite + terrestrial files for the 7846 and 7847 have names beginning with ST.

	If there is no CSV file on the USB key, only the previous configuration of the appliance will be saved.

	You don't need to copy all the files into the USB key.
	ex.: if only the memory list #5 has changed, you only have to copy TLst05.csv.

	You can open the old CSV files with spreadsheet software. You can copy and paste values with the corresponding XLS.

	You can move the old CSV files from the Conf directory to the home directory of the USB key to transfer the configuration from an appliance to another.

18.8   Filling library setups with ini file

There is also an INI macro-command: Ctrl + Shift + I to insert setups to a selected cell from an ini file

When the macro command is executed, a Windows Explorer window opens and allows the selected file to import. Just click on the file you want to immediately incorporate into the setup library.

What is an « *.ini » file?
An « *.ini » file contains satellite's parameters in ACII format.

These files are available:

- on King of Sat website http://en.kingofsat.net/satellites.php for satellite

European satellite « *.ini » files can be downloaded. These files are updated regularly: So it's advised to go on this website to get the latest information.

It's advised to fill this tick box to get a better accuracy of the frequencies

Orbital position ▾	News	.ini	Total Ku	Total C	Free To Air only	TV	Radios	Data	Satellite	Longitude Now	Declination Now - Max		Total	Free To Air only	Last updated
75.0°E			92	0	38	86	6	0	ABS-1	74.99°E	0.02°	0.04°	92	38	2010-09-17 22:46
70.5°E			0	0	0	0	0	0	Eutelsat W5	70.6°E	-0.05°	0.05°	-	-	2010-08-31 21:15
68.5°E			76	260	175	226	94	16	Intelsat 7 (IS-7)	68.73°E	0.00°	0.01°	-	-	2010-08-31 21:15
									Intelsat 10 (IS-10)	68.5°E	0.00°	0.00°	336	175	2010-10-05 13:54
66.0°E			0	0	0	0	0	0	Intelsat 702	66.04°E	-0.01°	0.02°	-	-	2010-08-31 21:15
64.2°E			0	28	15	28	0	0	Intelsat 906	64.2°E	0.01°	0.01°	28	15	2010-09-12 19:44
62.0°E			0	3	2	2	1	0	Intelsat 902	62.05°E	0.00°	0.01°	3	2	2010-09-24 21:41
60.0°E			3	0	3	3	0	0	Intelsat 904	60.1°E	0.01°	0.01°	3	3	2010-08-31 21:15
57.0°E			1	72	53	34	35	4	NSS 12	57.05°E	0.03°	0.05°	73	53	2010-09-17 22:47
53.0°E			62	0	43	43	17	2	Express AM22	53.03°E	-0.04°	0.04°	62	43	2010-10-02 22:49
49.0°E			0	52	44	30	22	0	Yamal 202	48.99°E	-0.04°	0.04°	52	44	2010-09-13 01:05
48.2°E			0	0	0	0	0	0	Eutelsat W48	48.33°E	1.08	1.43°	-	-	2010-08-31 21:15
45.0°E			98	0	25	85	12	1	Intelsat 12 (IS-12)	45.02°E	0.00°	0.00°	98	25	2010-10-03 23:26
42.0°E			531	0	448	307	148	76	Turksat 2A	42.02°E	-0.05°	0.05°	224	177	2010-10-05 13:27
									Turksat 3A	42.02°E	0.02°	0.02°	307	271	2010-10-06 10:08
40.0°E			28	29	46	31	25	1	Express AM1	40.06°E	0.32	0.38°	57	46	2010-10-05 20:29
39.0°E			330	0	122	246	68	16	Hellas Sat 2	39.01°E	-0.01°	0.02°	330	122	2010-10-04 15:38
38.0°E			0	17	17	17	0	0	Paksat 1	38.11°E	0.03°	0.03°	17	17	2010-09-25 19:39
36.0°E			278	0	66	206	56	16	Eutelsat W4	36.11°E	-0.03°	0.07°	9	8	2010-08-31 21:15
									Eutelsat W7	35.93°E	-0.03°	0.06°	269	58	2010-10-05 22:53
33.0°E			33	0	25	15	6	12	Eurobird 3	33.19°E	-0.01°	0.05°	33	25	2010-10-04 15:26
31.5°E			23	0	22	19	3	1	Astra 2C	31.75°E	0.01°	0.03°	-	-	2010-08-31 21:15
									Astra 1G	31.63°E	0.06°	0.07°	23	22	2010-10-05 20:28
30.5°E			19	12	29	30	1	0	Arabsat 5A	30.63°E	-0.01°	0.04°	31	29	2010-09-30 21:43
28.2°E			974	0	528	787	139	48	Eurobird 1	28.51°E	-0.02°	0.07°	430	291	2010-10-05 12:42
									Astra 2A	28.33°E	0.01°	0.04°	204	56	2010-10-04 17:02
									Astra 2B	28.25°E	-0.03°	0.04°	171	50	2010-10-05 20:15
									Astra 2D	28.25°E	-0.02°	0.05°	169	131	2010-10-01 23:08
									Turksat 1C Moving 0.2°W/day	28.19°E	2.12	2.33°	-	-	2010-09-25 16:35
26.0°E			478	0	405	365	100	13	Badr 4	26.02°E	0.01°	0.06°	268	266	2010-10-05 12:06
									Badr 5	26.02°E	0.00°	0.00°	51	13	2010-10-05 12:06
									Badr 6	25.98°E	-0.05°	0.06°	159	126	2010-09-11 09:33
25.5°E			80	0	44	71	8	1	Eurobird 2	25.57°E	-0.01°	0.07°	80	44	2010-10-05 21:07
23.5°E			480	0	170	307	152	21	Astra 3A	23.64°E	-0.04°	0.05°	310	111	2010-10-03 14:34
									Astra 3B	23.54°E	0.05°	0.06°	170	59	2010-10-05 21:49

http://en.kingofsat.net/sat-arabsat5a.php

For example, to download Astra 235°E « *.ini » file, click here.

Then click on « *Save* ».

Select the destination directory and then, click on « *Save* ».

File Download

Do you want to open or save this file?

Name: 0192.ini
Type: Configuration Settings, 2.29KB
From: en.kingofsat.net

[Open] [Save] [Cancel]

☑ Always ask before opening this type of file

While files from the Internet can be useful, some files can potentially harm your computer. If you do not trust the source, do not open or save this file. What's the risk?

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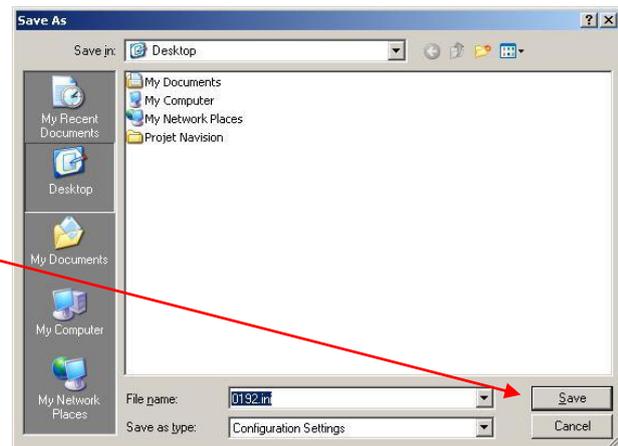
18.9   Factory reset

Complete reset of the appliance under default factory configuration with confirmation.
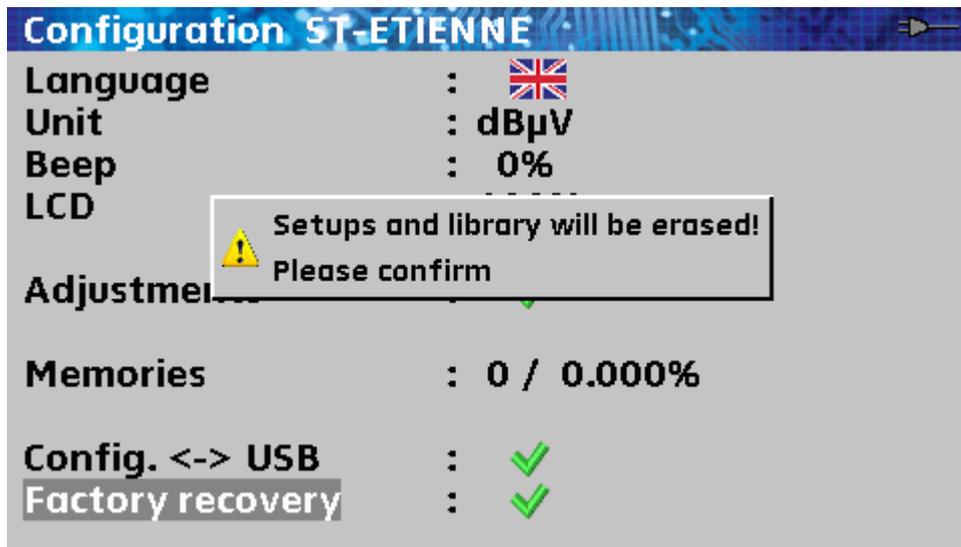
	Factory recovery erase :
	  - The library of setups
	  - The lists of measurements

18.10 Update

Update of the software of the appliance with a USB key.
See the paragraph <u>Updating the software</u> for more details.

19 Displayed messages

The appliance can display messages while running.

19.1 Alert messages
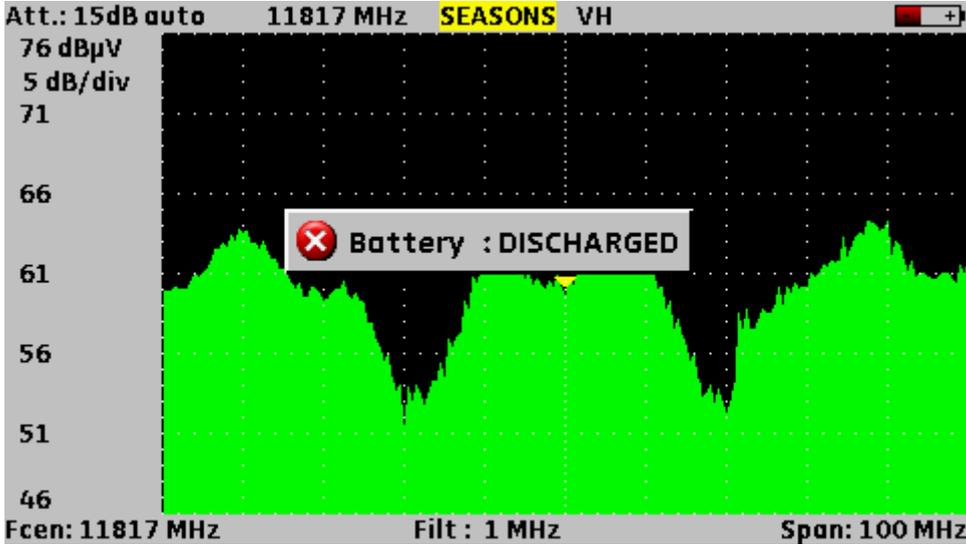
The battery is running out of power: the appliance will shut down in a few minutes.

Confirmation request for some important action.

Fault of the remote supply: there is voltage on the cable or the max. authorized current has been exceeded.

19.2 Impossibility messages
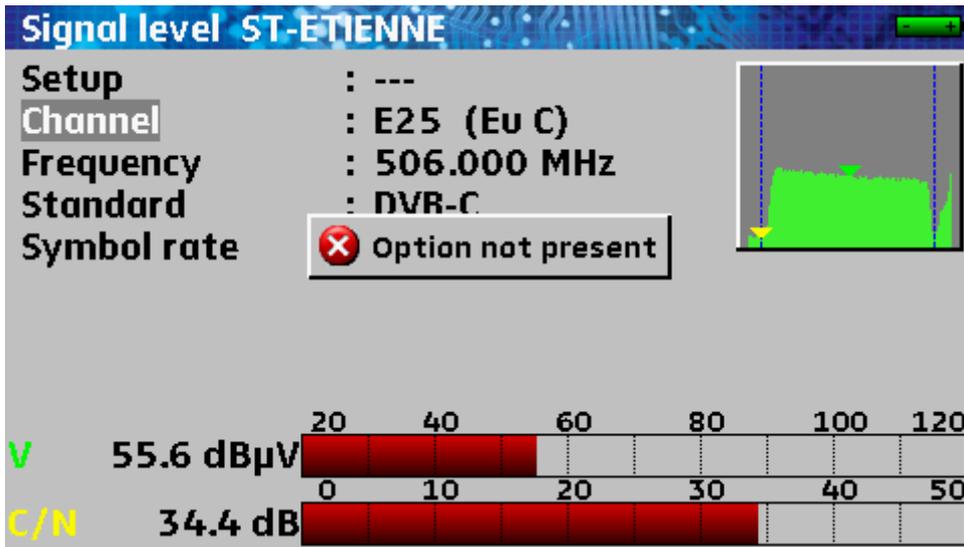
No DVB-C decoder on the 7806, thus no TV image
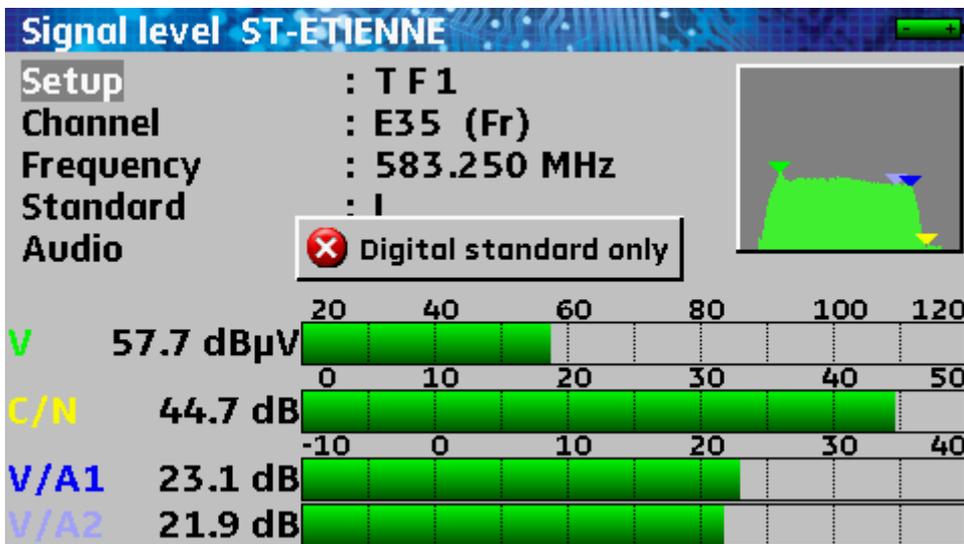
No analogical TV image
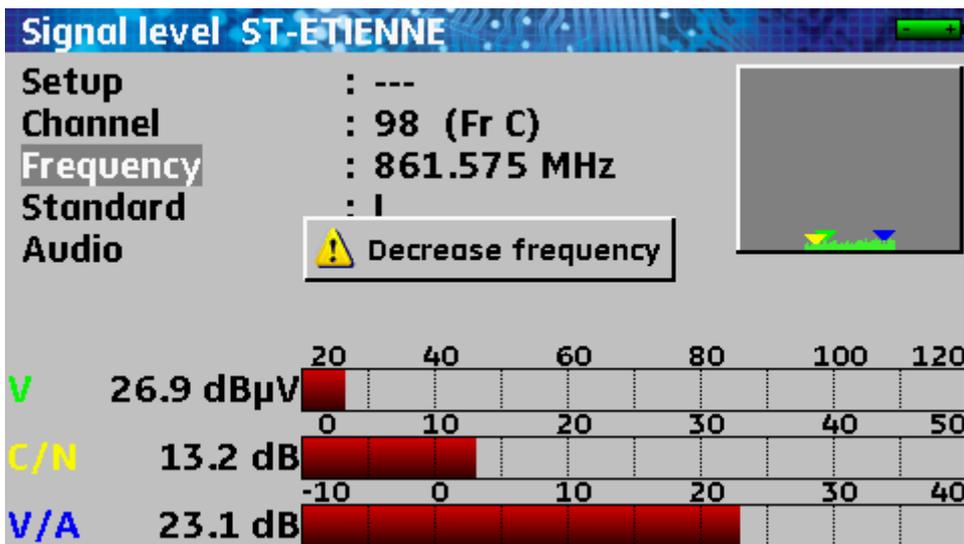
The appliance is trying to make a level measurement out of range (ex.: V/A measurement with a video carrier wave beyond channel 69)

19.3　Error messages
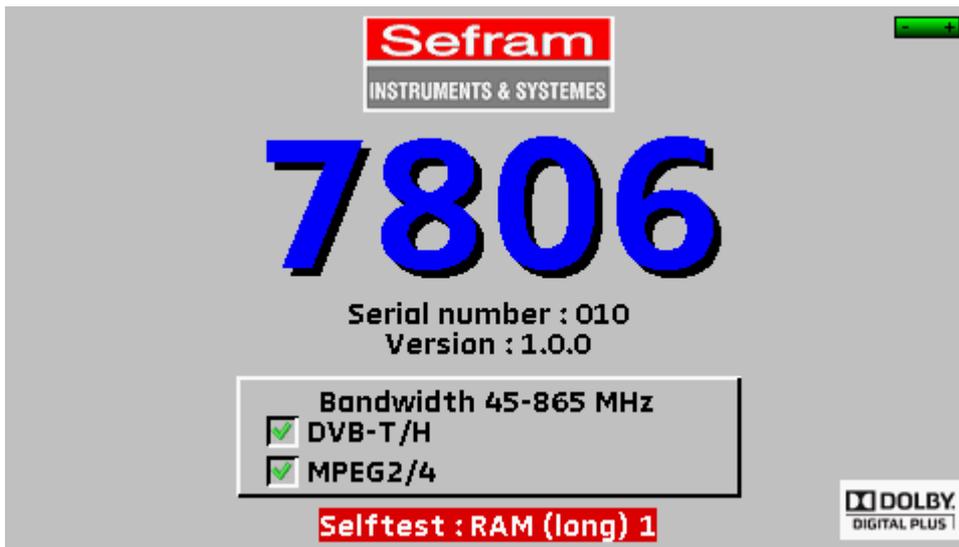
Message at the bottom of the screen.

It may appear after updating the software, else:

Contact the SEFRAM technical support:

E-mail: support@sefram.fr

20 Maintenance

This appliance needs some maintenance in order to meet the requirements of use and maintain its characteristics.

	Consequence	Suggested check period	Suggested using time limit
BATTERY	Shorter autonomy		200 load/unload cycles or 2 years
STRAPS	Damage to the appliance	At each use: checking the holding of the straps	
Back Light SCREEN	Lesser vision		2 years
Measurement device Adjustment / Check	Wrong values	Once a year	18 months
CONNECTIONS	Wrong values	At each measurement	

These are manufacturer suggestions: SEFRAM I.S. should not be taken as responsible for them. They guarantee the best possible use and the preservation of the characteristics of the product.

Routine maintenance:

The routine maintenance is only to clean the casing of the appliance. Any other procedure requires some qualified personal.

Unplug the appliance before any maintenance procedure.
Do not let water flow into the appliance in order to prevent any risk of electrical shock.

Periodically clean the appliance; follow these instructions:
- use water and soap
- never use any product based on gasoline, benzene, or alcohol: they would damage the screen printings
- wipe with a soft lint-free cloth
- use an antistatic solvent-free product to clean the screen.

For the casing:
- Wipe with a clean cloth without using water
- Do not use solvents.

INFORMATION LCD COLOUR ACTIVE MATRIX SCREEN

Your Field Strength Meter SEFRAM is equipped with a colour LCD screen with active matrix.

This screen is furnished by famous manufacturers. In the current technical conditions of production, these manufacturers cannot guarantee 100% good functioning pixels in the display area. They specify a number of defective pixels on screen.

The quality service SEFRAM has conditioned the mounting of the display of your instrument to the respect of the manufacturer's acceptation conditions.

```
┌─────────────────────────────────────────────┐
│               B ZONE                         │
│                                              │
│         ┌──────────────────────┐             │
│         │      A ZONE           │            │
│         │  (60% of the diagonal │            │
│         │    line of B zone)    │            │
│         │                       │            │
│         │                       │            │
│         └──────────────────────┘             │
│                                              │
└─────────────────────────────────────────────┘
```
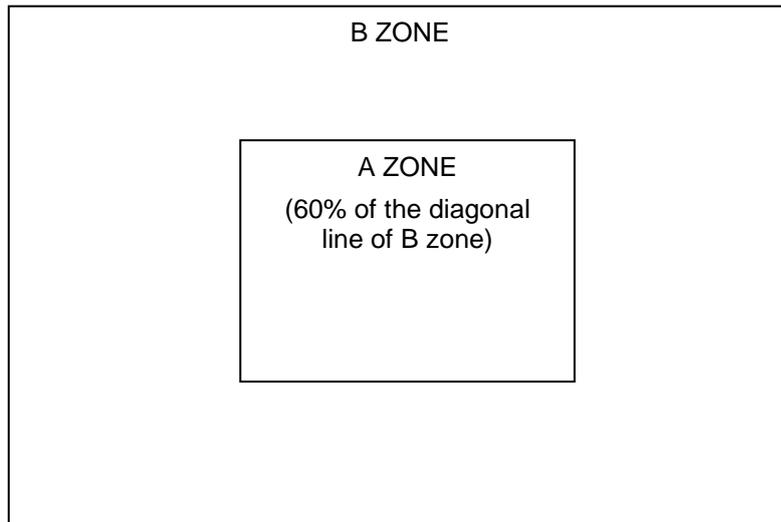
Acceptation criteria

A zone (central area): total less than 5 defective pixels, less than 3 adjacent defective pixels.

B zone (total surface of the screen): less than 9 defective pixels on the whole surface of the screen, with respect of the conditions for the A zone.

A defective pixel is a dot on screen that remains off at power on or whose colour is different than expected.

The contract guaranty applies to you field meter only if the above defined criteria are not fulfilled, either at delivery or during the guaranty period.

21 Technical data

21.1 Common technical characteristics

Frequency:

Ranges:	45MHz to 865MHz, terrestrial band 7806-7809
	5MHz to 865MHz, cable band 7807
	950MHz to 2150MHz, satellite band 7808
	45MHz to 865MHz, terrestrial band ⎤ 7846-7847
	950MHz to 2150MHz, satellite band ⎦

Resolution:	terrestrial: 50 kHz in measurement
	satellite: 1MHz in measurement

Level measurement:

Frequencies	5-45MHz	45-865MHz	950-2150MHz
Dynamics	25-120dBµV	20-120dBµV	40-110 dBµV (120 dBµV typical)
Accuracy @ 23°C ±5°C	± 1dB typical ± 2dB max.	± 1dB typical ± 2dB max.	± 1dB typical ± 2dB max.
Accuracy from -5°C to +45°C	± 4dB max.	± 4dB max.	± 4dB max.

Units:	dBµV, dBmV, dBm or Volt
Resolution:	0.1dB
Measurement filters:	terrestrial 300 kHz
	satellite 1MHz
Input:	75Ω BNC
Max. allowable level:	80VDC, 48Vrms / 50Hz
Standards:	terrestrial B,G,D,K,I,L,M,N,FM,DVB-T/H,DVB-T2,DVB-C,MCNS
	satellite PAL, SECAM, NTSC, DVB-S2, DVB-S, DSS
Measurements:	peak, average or effective power
Display:	digital and bar graphs

Spectrum analysis:

Filters:	terrestrial 300 kHz
	satellite 1MHz
Attenuator:	0 to 60dB (in 10dB-steps)
Dynamics (display):	60dB
Span:	0, 5, 10, 20, 50, 100, 200, 500, 1000MHz and full
Number of dots:	400

Scan speed:	terrestrial 150ms
	satellite 350ms

Measurement plan (data logger):

Capacity:	polling max. 50 setups
Display:	digital
Measurements:	level/power, C/N and error rates
	threshold detection

Memorization:

Saving:	internal on flash memory
Data:	frequency plans, measurements, spectrums, measurement plans, constellations, echoes
Capacity:	312 kBytes, max. 1000 files

Auxiliary inputs and outputs:

USB interface:	USB A and USB mini B
Input power supply:	jack 5.5mm, 15V max., 1A

21.2 DVB-C (7807-7809)

According to UIT-J.83 APPENDIX A

Frequency:	45MHz to 865MHz
Error rate:	before Reed Solomon (BERo)
	after Reed Solomon (PER) (lost packets)
Modulation error rate:	20 to 40dB (MER)
Rate:	1 to 7.224Ms/s (auto 7809)
Constellation:	16, 32, 64, 128, 256 (auto 7809)

Graphical display of constellation.

21.3 MCNS (7807)

According to UIT-J.83 APPENDIX B
IDEM DVB-C except:

Constellation:	64, 256
Rate:	1 to 5.563Ms/s

Graphical display of constellation.

21.4 DVB-S, DSS (7808-7846-7847)

According to ETS 300-421

Frequencies:	950MHz to 2150MHz
Error rate:	before Viterbi (BERi)

	after Viterbi (BERo)
	after Reed Solomon (PER) (lost packets)
Modulation error rate:	0 to 20dB (MER)
Rate:	1 to 45 Ms/s
Modulation:	QPSK
Viterbi rate:	1/2, 2/3, 3/4, 5/6, 6/7, 7/8 (automatic)

Graphical display of constellation.

21.5   DVB-S2 (7808-7846-7847)

Following ETS 302-307

Frequencies:	950MHz to 2150MHz
Error rate:	before LDPC (BERi)
	after LDPC (BERo)
	after BCH (PER) (lost packets)
Modulation error rate:	0 to 20dB (MER)
Rate:	QPSK 1 to 45Ms/s, 8PSK 1 to 45Ms/s
Modulation:	QPSK, 8PSK (automatic)
Punctuation:	QPSK: 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 (automatic)
	8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 (automatic)

Graphical display of constellation.

21.6   DVB-T/H (7806-7809-7846-7847)

According to ETS 301-701

Frequencies:	45MHz to 865MHz
AFC:	± 167 kHz, ± 333 kHz, ± 500 kHz
Error rate:	before Viterbi (BERi)
	after Viterbi (BERo)
	after Reed Solomon (PER) (lost packets)
Modulation error rate:	0 to 35dB (MER)
Bandwidth:	5, 6, 7 or 8MHz
Carrier waves:	2k / 8k (automatic)
Constellation:	16QAM, 64QAM, QPSK (automatic)
Viterbi rate:	1/2, 2/3, 3/4, 5/6, 7/8 (automatic)

Graphical display of constellation.
Graphical display of echoes.

21.7   DVB-T2 (7809-7847)

According to ETS 302-755

Frequencies:	45 MHz to 865 MHz
AFC:	+/- 167 kHz, +/- 333 kHz, +/- 500 kHz
Error rate:	before LDPC
	after LDPC (BCH)
	after BCH (FER) (lost packets)
Modulation error rate:	0 to 35 dB (MER)
Bandwidth:	5, 6, 7 or 8 MHz
Carriers:	1k, 2k, 4k, 8k, 16k, 32k (automatic)
Constellation:	QPSK, 16QAM, 64QAM, 256QAM (automatic)
Viterbi rate:	1/2, 3/5, 2/3, 3/4, 4/5, 5/6 (automatic)
Guard rate:	¼, 19/256, 1/8, 19/128, 1/16, 1/32, 1/128

Constellation graphic display.

Graphic display of the Channel Pulse Response. (echoes)

21.8   Demodulation image and sound

Audio:	digital TV sound AAC, HE-AAC, Dolby Digital, Dolby Digital Plus
Video:	digital TV image MPEG2, MPEG4 576i, 720p, unencrypted 1080i

21.9   Remote supply

Voltage:	5V, 13V, 18V and 24V
Current:	500mA max, 300mA max under 24V short-cut protection
Mini DiSEqC:	22 kHz ± 2 kHz, 0.6V peak to peak ± 0.1V
DiSEqC generator:	standard 1.2, motorized dish, committed and uncommitted switches
SatCR:	extension of protocol DiSEqC, 8 slots maximum

21.10 Power supply - Battery

External power supply:	mains block 100/240VAC, cable according to the country,
	jack 5.5mm, hole 2.1mm
	output 15V 1A max.
Non-removable battery:	Lithium-Ion 10.8V, 2.25 A.h (9V at the end of discharging)
	200 load/unload cycles
Autonomy:	3h30 7806
	3h50 7807
	2h15 7808 after complete loading (2h30 with shut-off appliance)
	3h15 7809
	2h10 7846
	1h50 7847

7808, 7846 and 7847 with working remote supply (display of HD pictures).

21.11 Environment

Screen:	TFT colour 4.3 in. (16/9), back-lighted
Operating temperature:	-5°C to +45°C
Storing temperature:	-10°C to +60°C
CEM and security:	conformity CE
	NF-EN 61326 July 1997 + A1 October 98 + A2 edit September 2001
	EN 55022 A2 version 2003 class B for autonomous appliance
	Immunity according to EN 61326-1 2006
	NF-EN 61010-1 June 2001
Dimensions and weight:	ca. 192 x 200 x 102
	1.5kg (battery included)

21.12 Accessories

Furnished with: a battery, a mains transducer, a F/F adapter, a F/BNC adapter and a user's manual on a CD-ROM.

Optional accessories:
- power supply from the cigar-lighter: ref. 978361000
- F/F adapter: ref. 213200014
- F/BNC adapter: ref. 213200015
- USB cable type A to mini B: ref. 978551100

Contact the SEFRAM customer service.

http://www.sefram.com/www/np_contactus.asp

21.13 Equivalence between V, dBµV, dBmV and dBm

dBµV (dBmV) is the logarithmic ratio between a measured voltage U_d and a reference voltage U_r.

The reference voltage is U_r = 1µV (1mV)

N = 20 log (U_d/U_r)

dBm is the logarithmic ratio between a measured power P_d and a reference power P_r.

The reference power is P_r = 1mW @ 75Ω

N = 10 log (P_d / P_r) with $P_d = Ud^2 / 75$

U_d = 1µV	N = 0dBµV	N = -60dBmV	N = -108.75dBm
U_d = 1mV	N = 60dBµV	N = 0dBmV	N = -48.75dBm
U_d = 1V	N = 120dBµV	N = 60dBmV	N = 11.25dBm

21.14 Values to measure

Minimum and maximum values for a good quality of signal.

Measurements	Level, power (dBµV)		C/N (dB)	BER	MER (dB)	modulation
	mini	maxi				
Terrestrial						
Analogical TV	57	74	> 45	-	-	-
FM	50	66	> 38	-	-	-
DVB-T	35	70	> 26	BERo < 2^E-4	> 26	8K, 64QAM, 1/32, 2/3
DVB-T2	35	70	> 22	PER < 1^E-7	> 22	32k, 256QAM, 1/8, 3/4
DVB-C, MCNS	57	74	> 31	BERo < 2^E-4	> 31	64QAM
Satellite						
Analogical TV	47	77	> 15	-	-	-
DVB-S, DSS	47	77	> 11	BERo < 2^E-4	> 11	QPSK, 3/4
DVB-S2	47	77	> 8	PER < 1^E-7	> 8	8PSK, 2/3

22 Terminology

2K/8K: The number of carrier waves of the DTT channel
The **8K** mode (6817 carrier waves in the channel, including 6048 carrying useful data)
The **2K** mode (1705 carrier waves in the channel, including 1512 carrying useful data)
For the same purpose, the 8K mode allows the selection of a larger guard interval than the 2K mode, thus a better resistance to echoes

8PSK:
A type of modulation identical to QPSK, but with an 8-possibility (3-bit) coding. This kind of modulation enables higher rates than QPSK and is compatible with DVB-S2.

BCH: Bose Chauhuri Houquenohem
Algorithm used to correct errors in transmissions of digital satellite DVB-S2 signals.

CHANNEL: Assignment of a number to the transmission frequency of an audio video signal. TV channels receive numbers. Specific to each country.

Example: from 21 to 69 for the UHF band

channel 21 = frequency 471.25MHz

CELL ID: Cell identification
Identification of the DVB-T emitter with 4 digits in hexadecimal format, which means 65536 possibilities.

C/N: Carrier to Noise ratio
A good C/N ratio helps the quality of the pictures on the TV screen. Ratio in dB.

Caution: You have to take the ratio analysis filter width / channel into account.
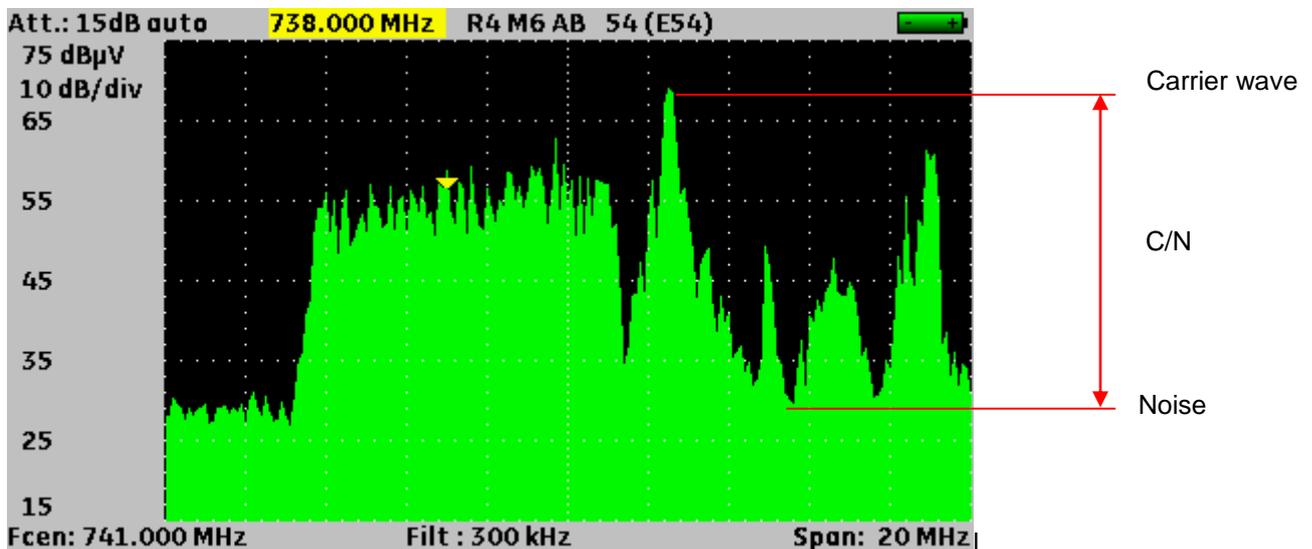
COFDM: Coded Orthogonal Frequency Division Multiplex.
Digital coding used for the DTT. Its principle is to transmit information via many carrier waves (2K or 8K mode)

CONSTELLATION**:** Control mean for the quality of the signal by a group of points making spots on the screen of the field meter. **The more circular and distinct the spots of the constellation, the better the quality of the signal.** In addition, according to the shape of the spots, you can evaluate the kind of error. This function is available on field meters that enable the display of the constellation for any type of digital signal QAM, QPSK and COFDM.

Typically:
QAM (cable): 64 spots (16 spots per quarter)
COFDM (DTT): 64 spots (16 spots per quarter)
QPSK (Satellite) : 4 spots (1 spot per quarter)
8PSK (Satellite): 8 spots (on a circle)
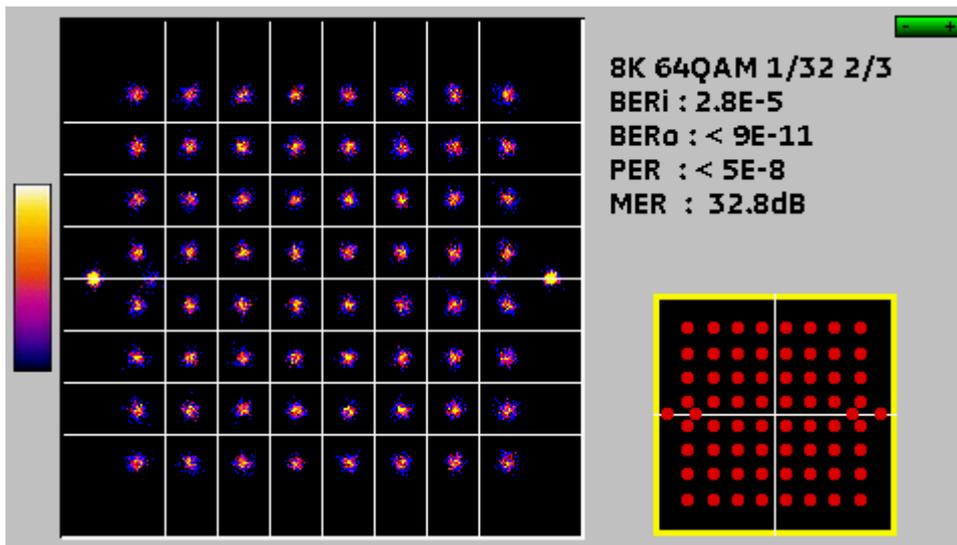
COUNTER-POLARIZATION**:** Ratio between the levels received from the desired polarization and the opposed polarization (it should be as high as possible). To adjust the counter-polarization, you have to turn the head of the dish.

DAB**:** Digital Audio Broadcasting.
The Digital Audio Broadcasting is a standardized audio broadcasting system (coded in COFDM).

It exists on the following bands:

    L band: 1452-1492MHz

    3 band: 223-230MHz

DVB-T**:** Broadcasting norm for the terrestrial digital television, COFDM modulation

DVB-C**:** Broadcasting norm for the cable digital television, QAM modulation

DVB-S**:** Broadcasting norm for the satellite digital television, QPSK modulation

DVB-S2**:** Broadcasting norm for the satellite digital television, QPSK or 8PSK modulation

DISEQC**: Di**gital **S**atellite **Eq**uipment **C**ontrol.
Control norm for the equipment of reception for satellite signals. Uses a 22kHz signal superimposed to the remote supply voltage of the satellite dish.

FREQUENCY**:** Parameter that characterizes the radio-electrical wave. It is measured in "Hertz". We usually use some multiples of this unit: kilohertz (kHz), megahertz (MHz), gigahertz (GHz).

ex.: At Saint Etienne (Guizay), the TF1 frequency is 583.25 MHz

FREQUENCY BAND**:** Continuous part of the hertzian spectrum with a specific assignment (telecommunications, television, internal security...)

Example: UHF band → 470 to 860MHz

FREQUENCY PLAN**:** There are various Frequency Plans according to places and standards. In the SEFRAM field meters, the frequency plans are pre-programmed: they gather the most frequently used frequency bands.

GUARD INTERVAL**:** The guard interval is the time when the signal is not emitted: all signals carrying the same information but coming from different sources (various emitters or through multiple reflections) won't disturb each other.

Value for DTT: 1/32 (28µs), that permits echoes lower than 8.4km

HIGH-DEFINITION TELEVISION**:**
In standard television, the number of lines of the picture ranges from 480 (NTSC) to 576 (PAL and SECAM). Each line is made of 720 pixels. In comparison to computer science, a television matches a SVGA 800 x 600 resolution. The proportion of the image is 4/3 (width / height ratio).
In HD television, the image is made of 1080 lines, each made of 1920 pixels – which means 2M pixels.
HD-ready TV sets have a 1280 x 720 minimal resolution
Full HD TV sets have a 1920 x 1080 minimal resolution

HP/LP**:** high/low priority → possibility to transmit 2 multiplexes under the same channel in digital format (ex.: in COFDM, we have a very robust high priority flow in QPSK; secondary flow in 16QAM)

ISOFREQUENCY**:** (or SFN: Single Frequency Network)
A DVB-T emitter network that emits on a whole region or a country at the same frequency.

→ risk of echoes outside the guard interval
→ moving reception
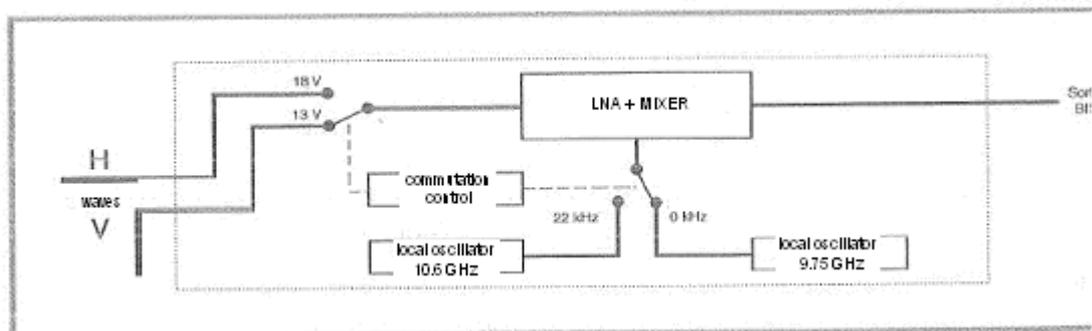
LNB**:** Low Noise Block-converter
A LNB (or universal head) is a standard converter for the analogical and digital reception of a satellite.

The reception is made on 2 low/high frequency band and 2 horizontal/vertical polarizations of the received wave.
The commutation of the band is made by a 13/18Volt voltage. The commutation of the polarization is made by a 22kHz signal superimposed to this voltage (you can also use the DiSEqC commutation for some LNB).

LDPC**:** Low Density Parity Checker
An algorithm used to correct errors in transmissions of digital satellite transmissions DVB-S2 signals.

NOISE MARGIN**:** Difference between the measured and the theoretical noise level before incorrigible errors.

Difference in dB between the measured C/N and the minimum C/N for error-free transmission.

MEASUREMENT MAP**:** Enables the simultaneous view of the characteristics (frequency, channel, standard…) of several setups (TF1, France2…) with identification of values out of range. Enables measurements of level and BER for a setup list.

Measurement map CABLE

freq.	std	RF	C/N	BERi	BERo	PER	MER
139.125	DVB-C	65.0	29.9		<1E-9	<9E-6	34.4
195.125	DVB-C	64.5	39.8		<1E-9	<9E-6	35.2
267.125	DVB-C	62.8	30.2		<1E-9	<9E-6	36.2
275.125	DVB-C	64.3	32.5		<1E-9	<9E-6	34.3
S18	DVB-C	64.1	33.7		<1E-9	<9E-6	34.5
315.125	DVB-C	63.4	32.5		<1E-9	<9E-6	34.4
323.125	DVB-C	61.9	31.1		<1E-9	<9E-6	35.8
347.125	DVB-C	61.8	29.7		<1E-9	<9E-6	34.8

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MER**:** Modulation Error Ratio
Ratio in dB measuring the distance between the theoretical dot and the observed dot on a constellation quarter. You can use it to control the reception: **the higher this value, the better the image**.

Observed dot

Scattergram

Ideal (theoretical) dot

Q

I
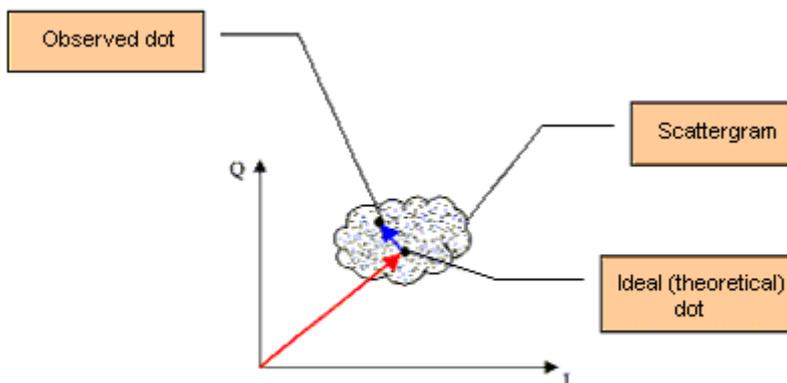
Error vector

Magnitude vector (from the reference dot to the ideal dot)

MODULATION**:** Once the signal has been coded, it is modulated with a carrier wave for transmission.

AM (Amplitude Modulation): analogical modulation of the amplitude of the carrier wave
FM (Frequency Modulation): analogical modulation of the frequency of the carrier wave
QPSK (Quadrature Phase Shift Keying): phase digital modulation
QAM (Quadrature Amplitude Modulation): phase and amplitude digital modulation
COFDM (Coded Orthogonal Frequency Division Multiplex): phase and amplitude digital modulation on multiple carrier waves; for DTT.

MPEG: Motion Picture Expert Group

MPEG is a family of compressed digital coding formats for audio / video. The aim of MPEG coding is to hugely reduce the amount of transmitted information with as little loss as possible thanks to very complex compression algorithms.

The MPEG 2 option on the SEFRAM field meters allows you to view and control TV programs (coded under MPEG) directly on the meters.

ex.: On the Astra satellite, the EURONEWS and SPORT + channels are non-crypted and visible on the field meters.

MULTIPLEX: Set of channels broadcasted by the same operator (smaller set than a package). In DTT, a multiplex has a 24.5Mbits/s flow rate. A multiplex enables the diffusion of 6 programs in standard definition

NIT: Network Information Table – Information about the network/package

Enables the display of a description of the measured transponder. The information is sent non-coded in the data flow from the QAM, COFDM or QPSK decoder. The information items are:

- Name of the operator

- List of the transponders of the package

- Orbital position of the satellite (in Satellite mode).

OFFSET: The central frequency of a DTT channel may be shifted by ± 166.7 kHz in case of adjacent analogical channel to prevent disturbances

OL: A local oscillator that converts the frequency received from the satellite, in GHz, into an intermediary frequency that the demodulator can use, in MHz.

ex.: a 11.778 GHz frequency from the satellite passing through a 10.6 GHz OL LNB becomes a 11.778-10.600=1.178 MHz

See LNB scheme.

PACKAGE**:** Set of digital channels broadcasted and marketed by the same operator (TPS, Canal Satellite…)

AUDIO AND VIDEO PID**:** Packet Identifier. MPEG service information.
In the digital MPEG flow, the (audio or video) packets all include a PID to get binary data from each service.

POLARIZATION**:** Polarization of a signal from the satellite. It can be either:

linearly polarized, horizontally or vertically:
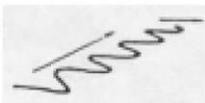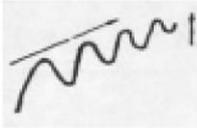
Circularly polarized to the right or the left
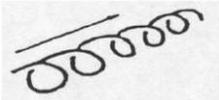
POSITIONER**:** A motorized system for the rotation of a satellite dish. Positioners are operated by DiSEqC commands

QAM**:** Quadrature Amplitude Modulation.
This kind of modulation is used for digital transmissions (cable networks and DTT).

QPSK**:** Quadrature Phase Shift Keying (or 4PSK)
A kind of modulation mostly used for satellites.

REED-S**OLOMON**:** An algorithm used to correct errors in digital transmissions

SPECTRAL ANALYSIS**:** Procedure to display to characteristics of a signal. This analysis has the advantage of showing the interference waves and the shape of the signal. Spectral analysis shows the amplitude-frequency curve.
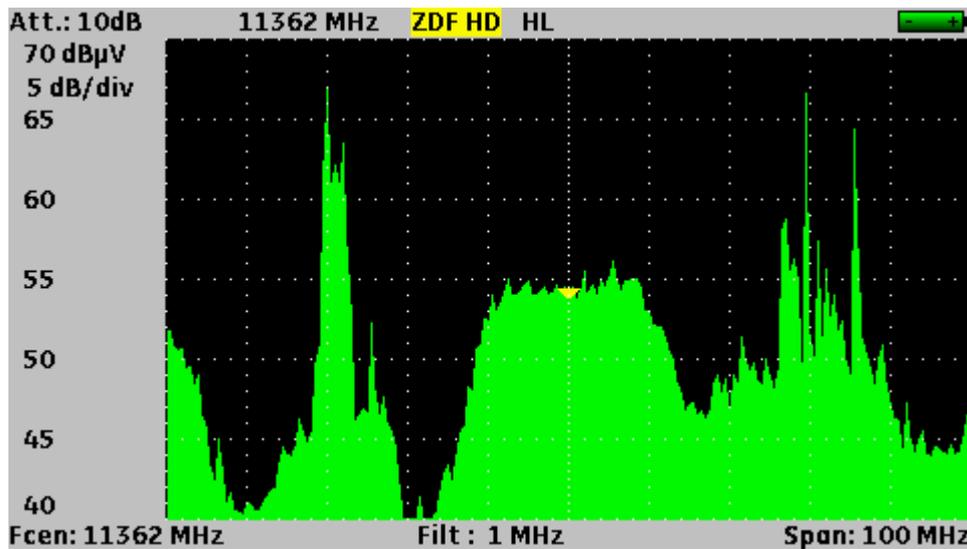
STANDARD: Any norm that defines the characteristics of a modulation.

Analogical standards: L, BG, DK, etc.

Digital standards:

QAM for **cable television**

QPSK, 8PSK for **satellite television**

COFDM for **terrestrial digital television**

SYNCHRONIZING PULSE: A square signal showing the start of a frame or a line.

T-DMB: A digital broadcasting system based on the DAB.

This very robust broadcasting mode for mobile applications thanks to the modulation used (DQPSK=differential QPSK). Allows the reception of digital television but also of television programs on small-size appliances like mobile telephones or PDA

UNC: un-corrected packets

VIACCESS - MEDIAGUARD: Decryption systems used in Europe by many operators (TPS, Canal Satellite…).

With the Viaccess and Mediaguard options in a SEFRAM field meter and your subscription card, you will be able to view encrypted programs on the meter.

VITERBI: An algorithm used to correct errors in digital transmissions

DECLARATION OF CE CONFORMITY
according to EEC directives and NF EN 45014 norm
DECLARATION DE CONFORMITE CE
suivant directives CEE et norme NF EN 45014

C E

SEFRAM INSTRUMENTS & SYSTEMES
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42009 SAINT-ETIENNE Cedex 2 (FRANCE)

Declares, that the below mentionned product complies with :
Déclare que le produit désigné ci-après est conforme à :

The European low voltage directive 2006/95/EEC :
La directive Européenne basse tension 2006/95/CE
NF EN 61010-1 Safety requirements for electrical equipement for measurement, control and laboratory use. Règles de sécurité pour les appareils électriques de mesurage, de régulation et de laboratoire.

The European EMC directive 2004/108/EEC :
Emission standard EN 61326-1.
Immunity standard EN 61326-1.
La directive Européenne CEM 2004/108/CE :
En émission selon NF EN 61326-1.
En immunité selon NF EN 61326-1.

Product name *Désignation* **: Field Strengh Meter** *Mesureur de champ*

Model *Type* **: 7806 - 7807 - 7808 - 7809 - 7845 - 7846 - 7847**

Compliance was demonstrated in listed laboratory and record in test report number
La conformité à été démontrée dans un laboratoire reconnu et enregistrée dans le rapport numéro **RC 7806**

SAINT-ETIENNE the :
March 22, 2012

Name/Position :
CLERJON/ Quality Manager