

SEFRAM 7861 – 7862 – 7861HD – 7862HD field strength meters enable the configuration of a terrestrial or satellite TV reception system. This application note is dedicated for people who use the field strength meter for the first time. This manual provides an application to setup a TV satellite (DVB-S) reception system correctly with a universal LNB-equipped satellite dish.

1) Configuration

Antenna

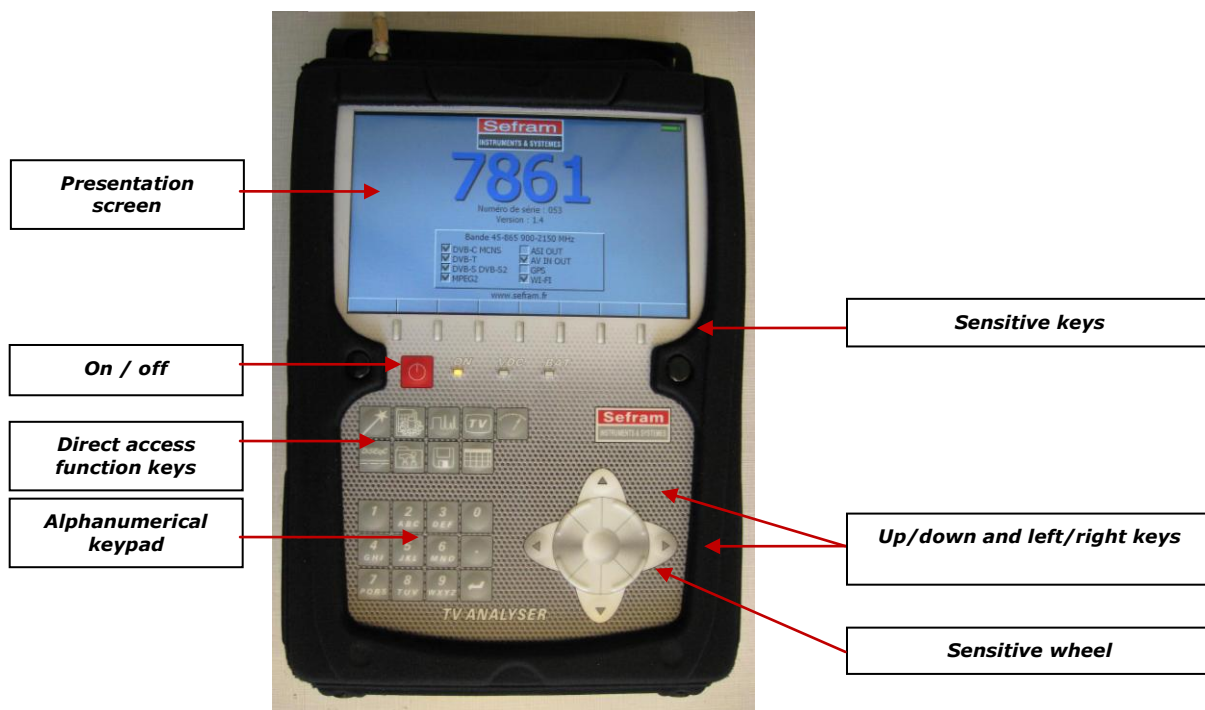


Satellite dish


BNC input



Meter front panel



Operating the instrument step by step

- Plug the LNB cable into the appliance.
- Switch the field strength meter on by pressing the  key and wait that the presentation screen appears (screen with the product reference number and its serial number).
- Press the Parameter key :  , the following window appears on the display.



SEFRAM Instruments & Systèmes
32, rue E. MARTEL – BP 55 E-Mail : sales@sefram.fr
42009 SAINT-ETIENNE cedex 2 Web : www.sefram.fr

0.15€ TTC/mn **0 825 56 50 50**

Fax : (33) 04 77 57 23 23

Parameter windows

Highlight line →

Menu for sensitive keys →

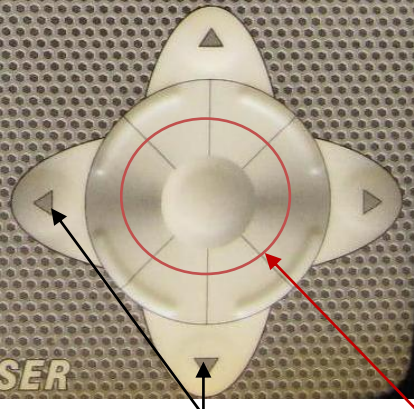
Sensitives keys →

Parameters 0 (0123456789)

Place # : 0 (0123456789)
 Frequency band : 45-865 MHz
 Frequency map : Europe
 Thresholds
 Messages


#	name	freq.	chan.	standard	const.	rate
0	----					
1	----					
2	----					
3	----					
4	----					
5	----					
6	----					
7	----					
8	----					


Navigation



Direction keys **Sensitive wheel**

Sensitive keys



 **The menu for sensitive keys changes according to the line which is highlight. It enables modifying the selected parameter.**

This window enables defining the field strength meter parameters to receive a satellite signal. In Europe, the most used satellites have already pre-recorded places(locations). As an example, this application has to allow the ASTRA 19.2°E satellite reception.

- Highlight the « Place » line with the up and down keys.
- Put the field strength meter on the 3rd place, named « ASTRA NUM », with the right and left keys or with the sensitive wheel.

ASTRA NUM place

Satellite frequency band →

Table with programs contained in the place →

Parameters 3 (ASTRA NUM)

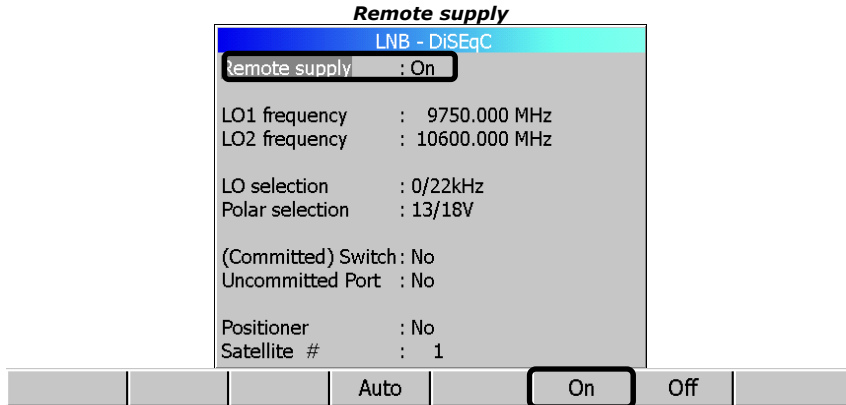
Place # : 3 (ASTRA NUM) ← **Pre-loaded place (satellite)**
 Frequency band : 900-2150 MHz
 Thresholds
 Messages

#	name	freq.	standard	rate	band	pol.
0	----					
1	----					
2	----					
3	----					
4	DAS ERST	11836.000	DVB-S	27.500	High	Hor.
5	CAN ALG	11568.000	DVB-S	22.000	Low	Vert.
6	DW-TV	11597.000	DVB-S	22.000	Low	Vert.
7	BIBEL-TV	10832.000	DVB-S	22.000	Low	Hor.
8	EURONEWS	11817.000	DVB-S	27.500	High	Vert.

- Check that the field strength meter is in the same setup as in the previous example. This place contains enough programs of the ASTRA 19.2°E satellite for this application (digital channels, horizontal/vertical polarity, high/low band).
- The « Thresholds » allow defining the limits for the level measurement. Their setups have already been installed but it is possible to modify them (reserved to advanced users).

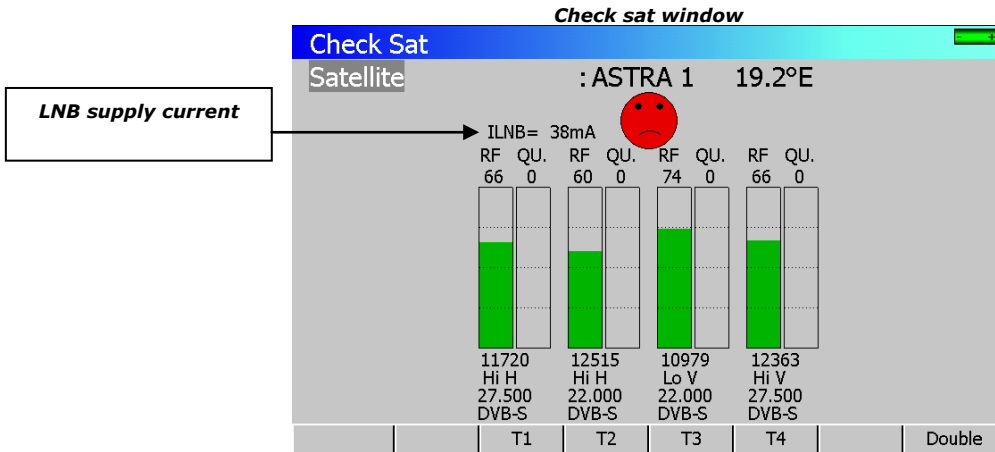
2) Adjust the satellite antenna
 Now, you have to adjust the dish on the ASTRA 19.2°E satellite.


- First, switch the remote supply on (LNB supply). Press the « DiSeqC » key, the following window appears, go to the « Remote supply » line with the up and down keys and choose ON in the menu with the sensitive keys. The « VDC » warning light in the front panel flashes when the remote supply is switched on.






- Press twice the Spectrum key:  to open the check sat mode.

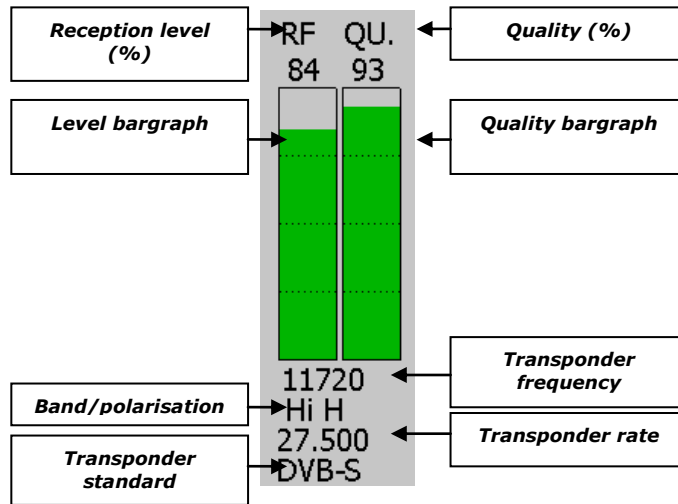
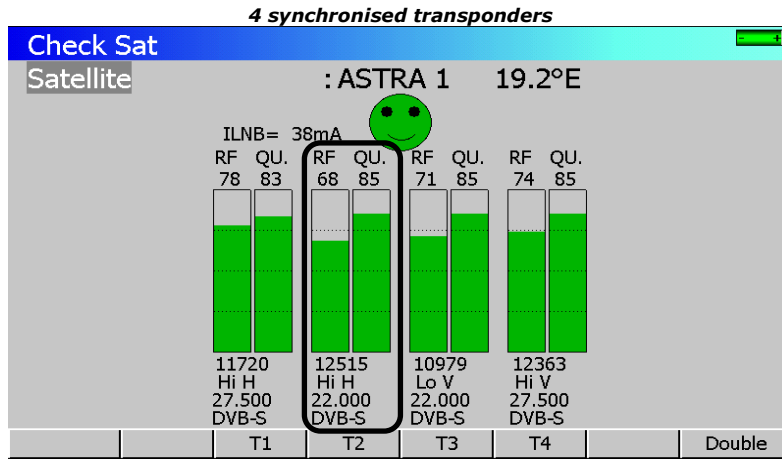
- Choose the satellite to receive. Highlight the « Satellite » menu and press the direction keys or turn the sensitive wheel to choose « ASTRA1 19.2°E ». The field strength meter has to synchronise on the 4 satellite transponders so that the satellite dish is correctly adjusted.



 **If the current consumption of the LNB is null (although the remote supply is activated), the head is not supplied and no reception is possible. In this case, it is possible that the LNB is defective. Also check the cables and adapters that connect the LNB to the field strength meter.**

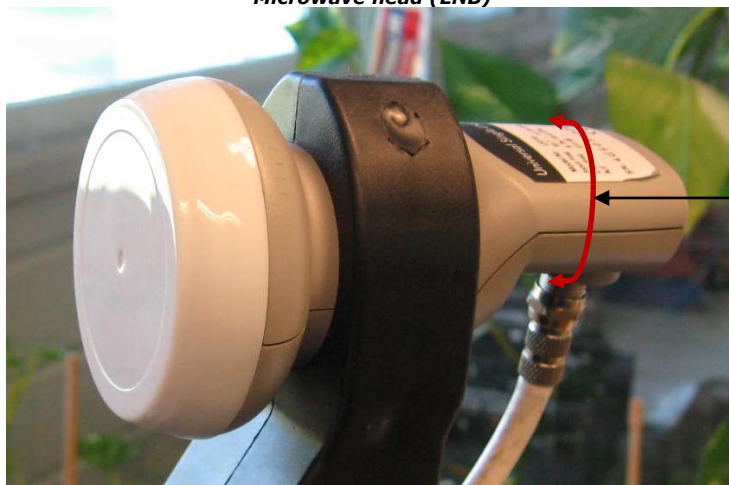
- Adjust the satellite dish until you hear the locking melody. This melody is audible as soon as a first transponder is locked. At the end of the melody, beeps ring out. The more they are closer, the more the reception quality is good. Perfect the adjustment of the satellite dish to obtain the best quality.

- If the appliance is not synchronised on any transponder, the smiley is red. 
- If the appliance is synchronised and if the reception quality is average (<50%), it is orange. 
- If the appliance is synchronised and if the reception quality is good (>50%), it is green. 



- Adjust the LNB counter-polarisation. This operation consists in adapting precisely the LNB angle in order to reach a maximum reception quality for a polarity, without interference with the opposite polarity. Observe the quality bargraph. Adjust the head until you obtain a maximum quality.

Microwave head (LNB)



Lightly turn the microwave head

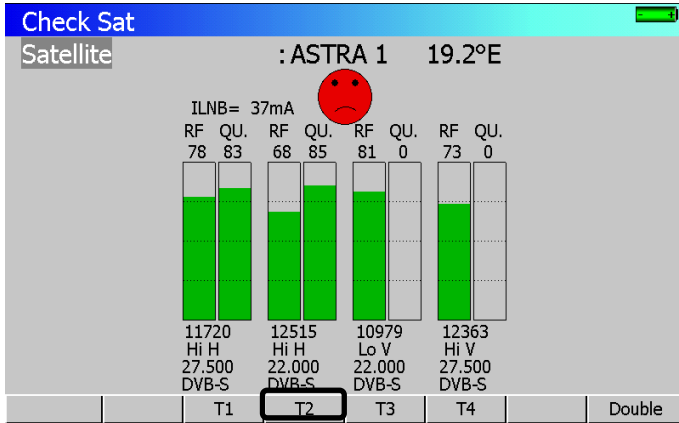


If a single transponder doesn't synchronise (quality=0), it is possible that its frequency is not valid anymore (in satellite, the used frequencies are regularly modified). Use the following sensitive keys to replace the non valid transponders by active transponders.

T1 T2 T3 T4

The transponders of the different satellites are listed on websites that are regularly updated, like <http://en.kingofsat.net/>. For the example with ASTRA 19.2°E : <http://en.kingofsat.net/pos-19.2E.php>.

Inactive transponder



Check Sat	
Frequency	: 12515 MHz
Polar.	: Horizontal
Standard	: DVB-S
Symbol rate	: 22.000 Ms/s
Active	: Yes

Transponder menu access

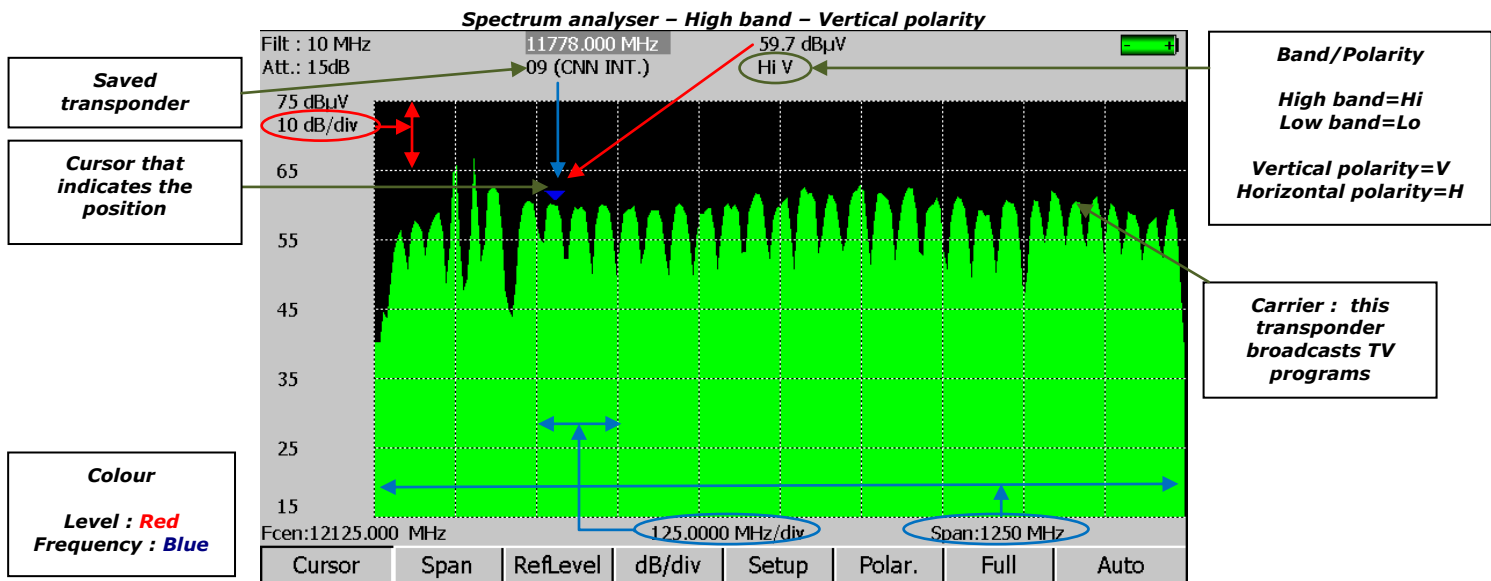
Transponder setting

Once the satellite adjusted, it is possible to see its spectrum.

- Press the Spectrum key : . The abscissa axis represents the frequencies and the ordinate axis the reception levels (in dBµV). The spectrum displayed depends on the selected band and polarity.

Band	Low : 10 650MHz - 11 700MHz	High : 11 700MHz - 12 750MHz
Polarity	Horizontal	Vertical

- Notes :
- A transponder contains several.
 - The transponder width changes : it can be 27MHz, 36MHz or 72MHz.



- As programs have already been saved in the ASTRA NUM place, it is possible to put the cursor directly on the corresponding carriers. To do it, press the sensitive key « Setup », then change the transponder with the direction keys or the sensitive wheel. Here, the blue cursor is put on the carrier that broadcasts « CNN INT. ».

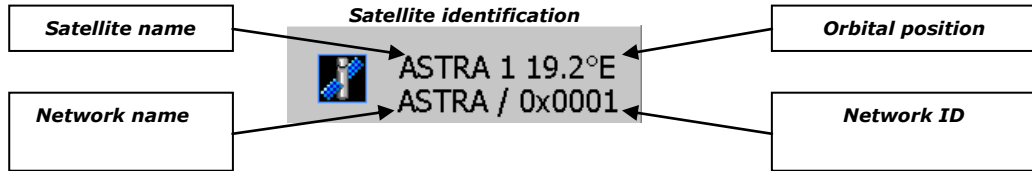
- To identify the satellite from the spectrum :



Press the « Autoset » key : .Then, a MPEG2 NIT table search is operating on the transponder that is currently selected. The automatic recognition of the satellite is made in many steps :

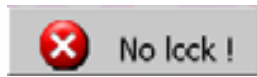
- digital transponder search around the cursor position ;
- digital decoder locking ;
- MPEG NIT table reception waiting ;
- display : satellite name, orbital position, Network name and Network ID.

These instructions can take a few minutes. Once this process is finished, the following window appears in the middle of the spectrum:

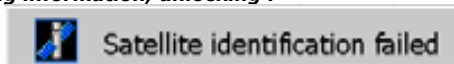


Some broadcasters don't give information (or badly) to the MPEG2 NIT table. The informations displayed at the acquisition end can be erroneous. The following error messages can also appear.

- Impossibility locking on the transponder :



- Satellite identification failed : no NIT or wrong information, unlocking :

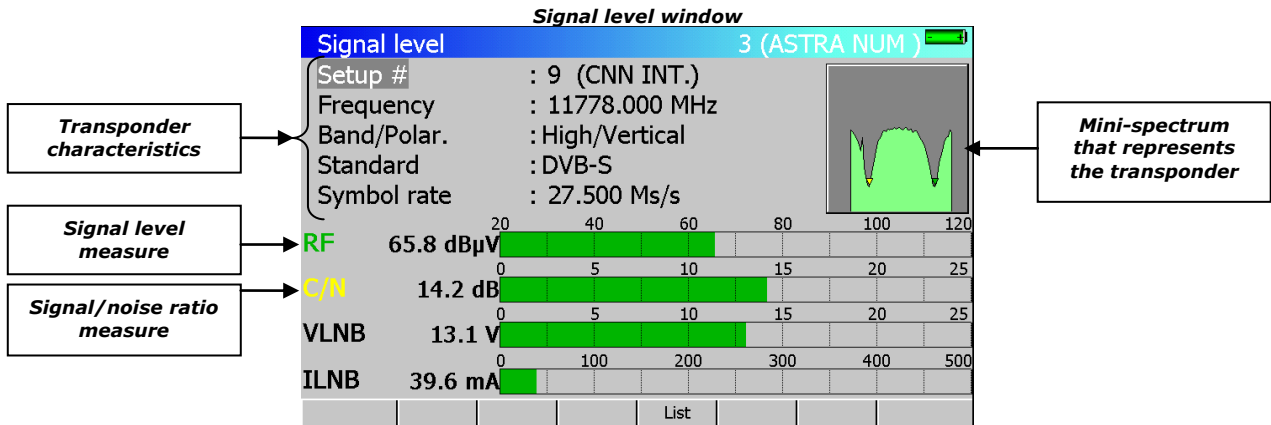


3) Measurements

- Press the « Measurements » key :



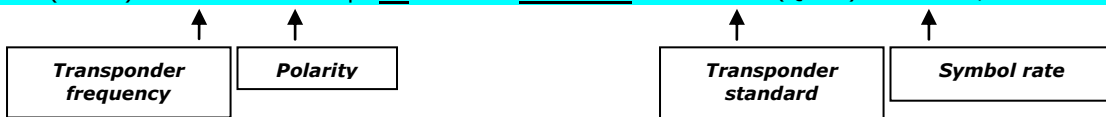
A new window appears on the display « Signal level ». The first measures displayed correspond to the program previously selected on the spectrum (here CNN INT). By selecting the « Setup # » line, then turning the sensitive wheel, it is possible to recall the other saved programs (in the ASTRA NUM place) to operate the measurements.



- If necessary, check the transponder characteristics (frequency, band, polarity, standard, symbol rate) on the website <http://en.kingofsat.net/satellites.php>.

Example : transponder broadcasting CNN INT.

Astra 1M (19.2E) - 11778.00 V - Txp: 68 - Beam: Astra 1M - DVB-S (QPSK) - 27500 3/4 - NID:1 - TID:1068



- Analyse the measures :

> Signal level

- V : represents the received signal level
- VLNB : LNB supply voltage (13V =vertical polarisation and 18 V = horizontal polarisation)
- C/N : means carrier/noise ratio
- ILNB : LNB supply current

Thanks to different colours, a threshold system enables seeing the signal quality easily. On the display digital values and bargraphs appear.



The thresholds are set up according to reference values. For an digital signal, the transponder measures have to correspond to the next data.

Signal level at the antenna plug
47dBμV < V < 77dBμV

Signal / noise ratio
DVB-S standard : C/N > 11dB

For a digital signal, the V and C/N measures don't guarantee the signal quality by themselves. It is imperative to measure the error rates (BER/MER) to fully characterise the reception quality.

> Error rates

To operate the error rate measurements :

- Press for the second time the « Measurements » key:



A new window appears on the display : « DVB-S : BER/MER ».

DVB-S : BER/MER window

DVB-S : BER / MER		3 (ASTRA NUM)																																																	
Setup #	: 9 (CNN INT.)																																																		
Frequency	: 11778.000 MHz																																																		
Band/Polar.	: High/Vertical																																																		
Standard	: DVB-S																																																		
Symbol rate	: 27.500 Ms/s																																																		
Modulation	: QPSK 3/4																																																		
<table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <tr> <td style="width: 20%;"></td> <td style="width: 10%; text-align: center;">1E-1</td> <td style="width: 10%; text-align: center;">1E-3</td> <td style="width: 10%; text-align: center;">1E-5</td> <td style="width: 10%; text-align: center;">1E-7</td> <td style="width: 10%; text-align: center;">1E-9</td> </tr> <tr> <td>CBER < 1E-7</td> <td colspan="5" style="text-align: center;">[Progress bar]</td> </tr> <tr> <td>VBER < 9E-10</td> <td colspan="5" style="text-align: center;">[Progress bar]</td> </tr> <tr> <td>UNC < 1E-6</td> <td colspan="5" style="text-align: center;">[Progress bar]</td> </tr> <tr> <td>MER 15.1dB</td> <td colspan="5" style="text-align: center;">[Progress bar]</td> </tr> <tr> <td colspan="6" style="text-align: center;"> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <tr> <td style="width: 20%;"></td> <td style="width: 10%; text-align: center;">0</td> <td style="width: 10%; text-align: center;">5</td> <td style="width: 10%; text-align: center;">10</td> <td style="width: 10%; text-align: center;">15</td> <td style="width: 10%; text-align: center;">20</td> <td style="width: 10%; text-align: center;">25</td> </tr> </table> </td> </tr> <tr> <td colspan="6" style="text-align: center;">List</td> </tr> </table>				1E-1	1E-3	1E-5	1E-7	1E-9	CBER < 1E-7	[Progress bar]					VBER < 9E-10	[Progress bar]					UNC < 1E-6	[Progress bar]					MER 15.1dB	[Progress bar]					<table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <tr> <td style="width: 20%;"></td> <td style="width: 10%; text-align: center;">0</td> <td style="width: 10%; text-align: center;">5</td> <td style="width: 10%; text-align: center;">10</td> <td style="width: 10%; text-align: center;">15</td> <td style="width: 10%; text-align: center;">20</td> <td style="width: 10%; text-align: center;">25</td> </tr> </table>							0	5	10	15	20	25	List					
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List																																																			

Transponder characteristics

Setup # : 9 (CNN INT.)

Frequency : 11778.000 MHz

Band/Polar. : High/Vertical

Standard : DVB-S

Symbol rate : 27.500 Ms/s

Modulation : QPSK 3/4

Error ratio measure

CBER < 1E-7

VBER < 9E-10

UNC < 1E-6

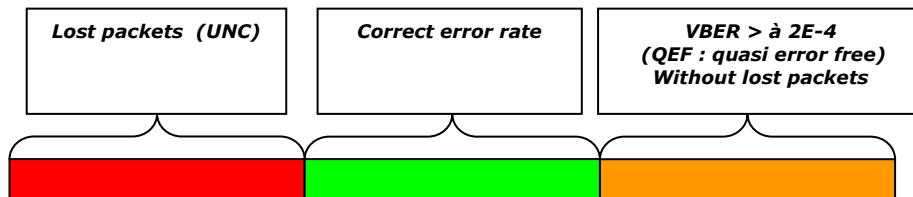
MER 15.1dB

- Analyse the measures :

The BER (Bit Error Ratio) et MER (Modulation Error Ratio) measures are very important to qualify a DVB-S digital signal.

- CBER : error rate before the Viterbi correction ;
- VBER : error rate after the Viterbi correction ;
- UNC : lost packet number after the Reed Salomon decoder ;
- MER : modulation error rate (generally equivalent to the C/N measure).

The bargraphs appears in colour according to the measures error :



For an installation of quality, follow the next reference values. Check that the measurements operated on the transponder correspond to them.

➤ **Error ratios**

Measure s	BER	M E R (C E)
DVB-S	VBER < 2E-4	> 1 1



The sign « < » before an error ratio value shows that there has not been any error (for example « <1E-8 » indicates an error rate less than 1E-8).

4) **TV display**

Caution : if you rely only on the picture, without taking the measures into account, you won't have a correct system adjustment.



Press the key to display the transponder that corresponds to current measures.

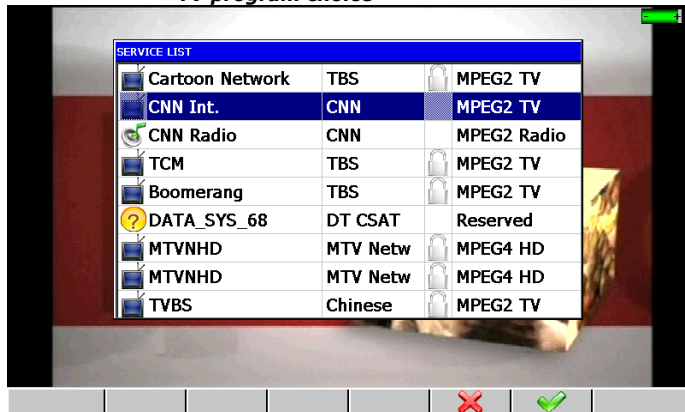
If, in TV mode, the screen remains black but the NIT appears in the top right-hand corner of the screen, it means that the transponder is well synchronised. Nevertheless, a subscription is necessary to see this not free TV program. The term « Conditional access » indicates that the program can't appear.

NIT – Conditional access

ASTRA 1
TCM
Conditional access

A transponder contains many TV programs. To access to a channel that is broadcasting in clear on the transponder, press the sensitive key « Serv ». This button enables selecting the TV program to see. Choose a TV program with the direction keys and validate it with the green validation key in the sensitive menu.

TV program choice



TV window



Transponder
NIT

Transponder change
(among those that are
saved in the place)

Program change
(in the current
transponder)

Different application notes can be downloaded on our website ; they allow understanding more in details some functions of the field strength meters (http://www.sefram.com/wwwFR/F_download.asp).

Product link : http://www.sefram.com/wwwFR/F_quick_search.asp?st=7861



SEFRAM Instruments & Systèmes
32, rue E. MARTEL – BP 55 E-Mail : sales@sefram.fr
42009 SAINT-ETIENNE cedex 2 Web : www.sefram.fr



Fax : (33) 04 77 57 23 23