SATLOOK Digital

Manual

Emitor AB

Owner's Manual

Thank You for purchasing a Emitor AB SATLOOK Digital-instrument.

This manual covers the operation and maintenance of the Emitor AB SATLOOK Digital-instrument.

All information in this publication is based on the latest product information available at the time of printing.

Emitor AB reserves the right to make changes at any time without notice and without incurring any obligation.

This manual should be considered a permanent part of the instrument and should remain with it if it is resold.
If a problem should arise, or if You have any questions about the instrument, consult an authorized Emitor AB dealer.

! Notice !

Operating a SATLOOK Digital-instrument requires special skills. Please read this Owner's Manual thoroughly before operating the instrument.

Contents:

1. Description:

The Emitor SATLOOK Digital is a Swedish designed Spectrum-analyzer and SAT-TV instrument.
SATLOOK Digital is made for exact alignment and adjustment of satellite-dishes.
The instrumentet is intended for professional use when high accuracy and precise information is needed.

It´s easily operated as it uses new very powerful processor technology -not a lot of unnecessary buttons and knobs.
The basic functions are easy to get a hold on and takes only minutes to learn.

The instrument is provided with a 4.5" B/W-monitor which either shows normal SAT-TV-channel, the frequency spectrum 950-2150 MHz (or parts thereof) alt. Digital data.
Menus/help-displays are shown on the LCD-screen (64x128) beside the monitor.

Analog SAT-TV channels can be tuned in and viewed upon (Multistandard Video –PAL, NTSC and SECAM).
Audiofrequencies between 5.5 – 8.5 MHz can be listened to.

The spectrumfunction shows the frequencyband 920-2150 MHz and satellite-signals are easily discovered .
The spectrum can be expanded (zoom in) for correct adjustment of the polarisation (“cross-polarisation”).
The instrument has very high resolution and accuracy. It presents measured data $\pm$2 dB (at around 20 C).
Tuning of the frequency is done with the main knob in 1 MHz step and the tuned in frequency is displayed either on the monitor or on the LCD.

SATLOOK Digital presents, under one of the sub menus, digital information like BER (bit error rate), constellation-diagram (QPSK) and S/N (signal/noise ratio).

Switching between TV-mode, Spectrum-mode, Digital-mode are easily done by pushing a button on the side of the instrument.

SATLOOK Digital can handle a lot of memory-positions and both spectrum-pictures and certain frequencies can be saved (both analog and digital transponders).
Saved spectrum –positions can be mixed with an actual reading for easy satellite-identification och control of signal-levels.
Measuring on a group of channels can also be done with up to 10 frequencies at the same time.
These can be individually programmed with 13V or 18V, 22 kHz on or off.

The polarisation of the LNB is switchable 13V/18V and the Hi-Lo band with 22 kHz-tone.
Both functions are indicated on top of the LCD.
The instrument is protected from short-circuit when connecting the LNB.

The DiSEqC-function controls all DiSEqC-accessories (like switches and LNB´s). The function is easily implemented and very flexible to use.
Notice that the SATLOOK Digital also can run DiSEqC-actuators. It can be setup for running DiSEqC 1.2 (normal DiSEqC-actuators), SatScan (Nokia) and SatSelect (Triax).

The power of the instrument is supplied by a built in and rechargeable battery.
The battery is recharged from the external battery charger or the car-adaptor.

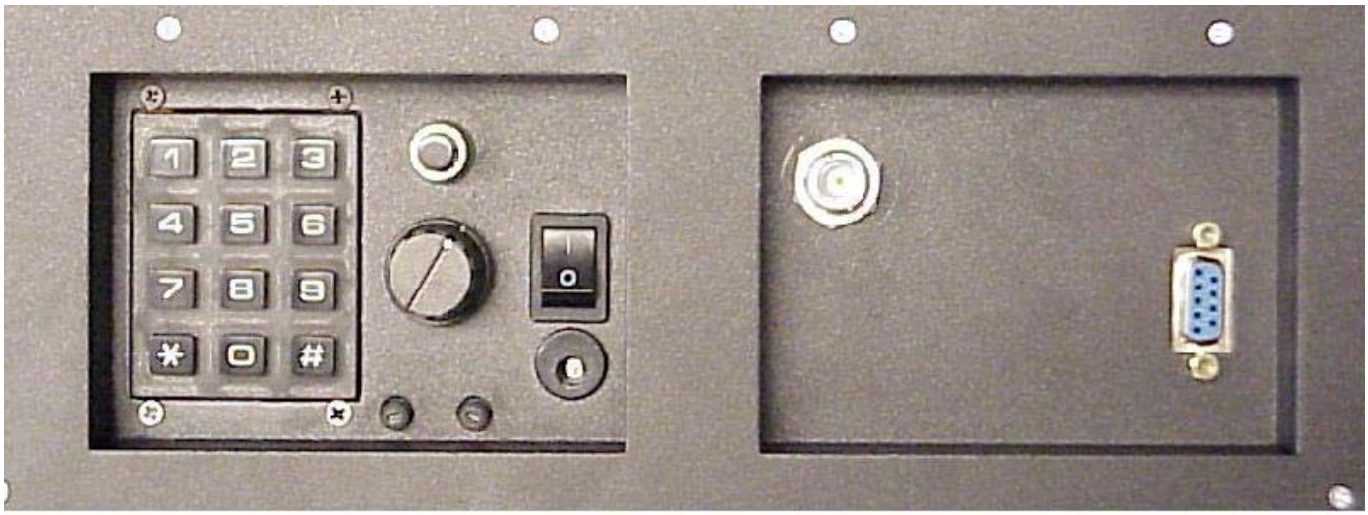
Battery-status is shown on top of the LCD-display (in shape of a battery).

Even though the instrument has a lot of functions it is still very light and flexible.
SATLOOK Mark III DiSEqC weights only about 4 kg incl. the battery and the carrying-case.

II. Operation:

A. Unpacking.
Start with unpacking the instrument and check that the following items are in the cardboard box:
1. SATLOOK Digital-instrument.
2. Nylon carrying case with shoulder strap.
3. Powersupply 220v/13,5v DC.
5. Carcharger 12v.
6. Adapter BNC-male/F-female.

The instruments keypad, knob and control-button is shown on picture A below. These items controls the SATLOOK Digital.
The power-plug is used when charging or running the instrument with the SATLOOK Digital powersupply.
Mainswitch, power On/Off.
RF-input via the F-connector.
The instrument also has a RS232 connector for connection with a computer.



B. Connection:
Use the mainswitch to turn the instrument On and connect an signal-source via the F-connector.
After a few seconds warm-up the SATLOOK Digital starts showing the frequency spectrum of 920-2200 MHz on the picture-screen and the main-menu on the LCD-display.

III. Knob and control-button:
Start by pushing the control-button. The text on the LCD-display (upper row) change from FREQ (frequency) to SPAN (frequency-span). Another push and the display is back in the FREQ-mode.

The control-button handle a few important functions (Should be controlled by this button). It is important to learn how to use the control-button in order to handle the SATLOOK Digital easy and correct.
The functions of the control-button in the different modes.

Spectrum:	**Picture-mode:**	**Digital-mode:**
Frequency	Frequency	Frequency
Bandwidth(span)	Memory	Memory

When the SATLOOK Digital is in Frequency-mode, the cursor is controlled by the knob. Try to move the cursor up/down by turning the knob left/right.

D. Information:
The cursors position (frequency), the spectrums startfrequency (920 MHz), the spectrums stopfrequency (2150 MHz) and bandwidth (1231 MHz) can be read out on the picture-screen.

The most important measured data , the dB-value, is shown in the middle of the monitor. Measuring of the tuned in frequency is done continuos and the presentation is being updated a couple of times per second.

III. Functions MAINMENU

The instrument starts with the MAINMENU where the following functions can be choosed:

1. Picture TV-mode.

After choosen a certain frequency it´s easy to access the TV-mode by pressing button nr 1 "picture" in the Mainemnu.
- The knob controls the frequency-position in this mode but the function change when the control-button is pushed (the function choosed is displayed on top of the LCD).
  The function switch between **Frequency** and **Memory**.

Measuring on a certain frequency can be done in this "**Picture"-mode** (dB-value is shown in the LCD-display).

Other functions in the Picture-mode:

1. Invert — Switch between normal video (KU-band) and inverterad Video (C-band). Selected position is displayed in the LCD-display.

2. Sound — For listening to analog audio. Audio volume and frequency (5.5 – 8.5 MHz) are adjusted with the two small knobs just under the main-knob.

3. Memory — For storing the different analog and digital channels (frequencies). Tune in the ”right” frequency before entering this function (ex. 1720 MHz).
Enter the Memory function (button nr 3) and push Save (button nr 1).
The instrumentet asks: -”SAVE. ARE YOU SURE ?”

   Check that the Memoryposition is the right one (displayed at the right bottom on the LCD-display). If not, chose a new one with the knob (0-99). Free positions are named: Pos free

   After selecting a position, push button nr 1 (YES).
Notice that even the preselected 13V/18V, 22 kHz on/off will be memorized.

   Text-editor:
When the channel (frequency) is saved, the Text-editor appears on the monitor which makes it possible to enter a name for that memory-position (ex. CNN).
Use the knob to select the first letter (ex. C) and save it with the control-button. Move to the next letter (ex. N) and so on.
If a mistake is made and wrong letter is saved, simply correct by pushing button nr 1 (Delete) and the cursor will jump one position backward.

4. Atten: — Attenuation. Manuell attenuation 15dB on/off.
Selected position is displayed in the LCD-display.

0. 13/18V — Selection of 13V alt. 18V. Chosed position is displayed at the top of the LCD-display.

#. 22kHz — 22 kHz on/off. Chosed position is displayed at the top of the LCD-display.

2. Digital

SATLOOK Digtal can easily and very accurate measure at digital transponders (MPEG-streams).
This kind of measuring is very good to do when an installtion is done, to control and verify that the installaion is correct performed (fingerprint of the installation).
It is less accurate when trying to find a satellite and adjusting the cross-polarisation.

Therefore, start with finding the ”right” satellite with the spectrum-function. Check and adjust the cross-polarisation with the “Max zoom in” function.

Chose a suitable transponder (put the cursor on top of a ”peak”) and select function 2 in the Mainmenu (Digital).
The monitor displays, in the left upper corner, the so called, constellationsdiagramme (QPSK).
To the right of it, 4 ”lock-parameters” and a time counter (that shows the “lock-time” on a bit-stream”) are shown.
The other measured data like the S/N-ratio (signal/noise ratio) och BER (bit error rate) are displayed just under the constellationdiagram in the shape of Bar-graph´s (thermometer-scales).

A locked frequency can look like this.

Notice:

- The constellationdiagramme is like ”a shower of hail”. No signal will spread out the noise over the window. The better signal the more concentrated ”hailstorm”.

- SNR. The signal/noise ratio should be as high as possible. A good signal should have at least 8.0 dB S/N-ratio.

- BER. The Bit Error Rate should be as low as possible.
  As the values are really small, on the other side of zero (presented as something raised to minus something), they should be as high as possible.
  A BER at 5.00 –05 is therefore better than 9.00 –04.
  A BER at 4.00 –05 is therefore better than 5.00 –05.

  It can be said, in general, that a signal should be at least x.xx –04 to be accepted.

Other Digital functions:

1. Search + — Automatically search for the next digital transponder higher in frequency. Searching is displayed at the bottom of the monitor.

2. Search – — Automatically search for the next digital transponder lower in frequency. Searching is displayed at the bottom of the monitor.

3. Memory — For storing **digital transponders** (digital channels - frequencies). Tune in the "right" frequency before entering this function (ex. 1650 MHz).

   Enter the Memory function (button nr 3) and push Save (button nr 1). The instrumentet asks: -"SAVE. ARE YOU SURE ?"
   Check that the Memoryposition is the right one (displayed at the right bottom on the monitor). If not, chose a new one with the knob (0-99). Free positions are named: Pos free

   After selecting a position, push button nr 1 (YES).
   Notice that even the preselected 13V/18V, 22 kHz on/off will be memorized.

   - Load a memory-position by pushing the control-button –"Memory" will appear on top of the LCD and a memory-position will be shown in the bottom of the LCD-display.
     Step between the stored memory-positions with the knob.

   Text-editor:
   When the channel (frequency) is saved, the Text-editor appears on the monitor which makes it possible to enter a name for that memory-position (ex. Digital).
   Use the knob to select the first letter (ex. D) and save it with the control-button. Move to the next letter (ex. i) and so on.
   If a mistake is made and wrong letter is saved, simply correct by pushing button nr 1 (Delete) and the cursor will jump one position backward.

4. DiSEqC — Chose between the different DiSEqC commands by using the buttons on the side of the instrument.
   Submenu 7 (SWx) shows the extended DiSEqC-commands (DiSEqC 1.1).
   Submenu 8 (Motor) shows the command-list for DiSEqC actuator-control (DiSEqC 1.2).
   Even 13/18V and 22 kHz can be adjusted under the DiSEqC-menu.

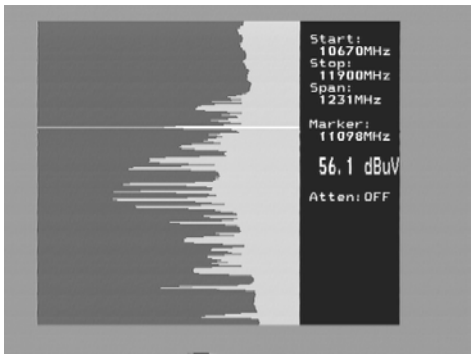
   0. 13/18V — Selection of 13V alt. 18V. Chosed position is displayed at the top of the LCD-display.

   #. 22kHz — 22 kHz on/off. Chosed position is displayed at the top of the LCD-display.

3. Full spectrum - ″Max zoom in″ - Span Min /Span Max.

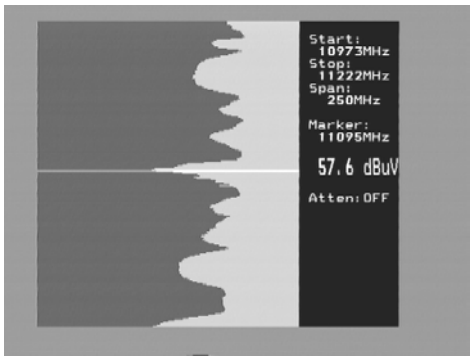
This function makes it easy to ″jump″ between full spectrum (920-2150 MHz) to ″Max zoom in″ (250 MHz bandwidth).

The ″Max zoom in″-function is very good to use when adjusting the cross-polarisation.



- Move the cursor to any desired frequency (peak).

Push the nr 3 button (**span Min**) on the keyboard.
The instrument will ″zoom in″ max. at that selected frequency (250 MHz bandwidth).



Rotate the LNB so that either the Horisontal or Vertical polarisation will be in its max-position –adjusting the **cross-polarisation**.

Pressing the nr 3 button again (span Max), gets You back to ″Max zoom out″.

4. Atten Attenuation 15dB. Manuell on/off with button nr 4.
Selected position is displayed at the right hand side of the monitor.

5. DiSEqC Chose DiSEqC command by using the keyboard on the side of the instrument.
Submenu 7 (SWx) shows the extended DiSEqC 1.1 commands.
Submenu 8 (Motor) shows the DiSEqC actuator-control commands (DiSEqC 1.2).
Even 13/18V and 22 kHz on/off can be adjusted in this mode.

6. Setup Basic-operation setup:

1. **LNB L.O**. Select the LNBs L.O. for showing the correct LNB frequency. Default setting is button nr 9 (IF).

2. **Digital**. Select the satellite-type. Europe uses DVB (DBS). USA and Japan uses DSS.

3. **Analog**. Chose between KU-band and C-band (normal or inverted video).
4. **Motor.** Chose the type of actuator to be used; standard DiSEqC 1.2, SatSelect or SATSCAN.
5. **Display**. submenu **units**: Select dB-presentation: dbuV, Dbm or dBmV.
   Under submenu LCD can contrast (level) and Backlite (on/off) be set.
6. **AutoOff.** Chose between some automatic turn-off alternatives (timer).
7. **Version**. Tells about the units serie-nr and manufactured date.

7. Beeper

It might be tricky to install a Sat-dish and, at the same time, try to watch the signal-level on the instrument.
Therefore the instrument has a very useful ”beeper”-function to help finding the max-strength signal. It works with a pitch tone that gets higher and higher the better the signal gets.

The beeper is turned on and off with button nr 7.

Notice that the function works with a narrow bandwith (one transponder) and not with the full bandwidth.
To use the function: put the cursor on top of a selected ”peak” and align the dish.

8. Spec

Special-functions. Select with button nr 8 in the Mainmenu.

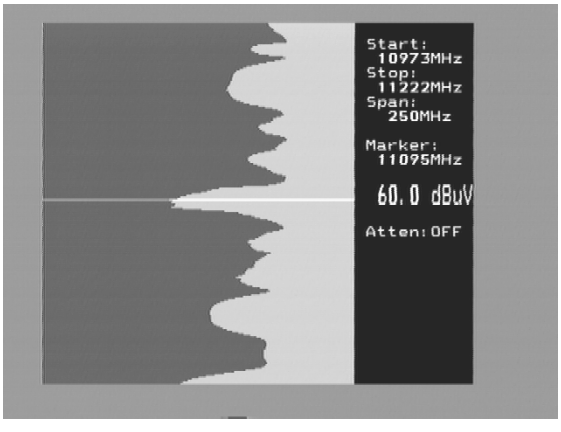
1. Max hold

Max hold is a very good function for, over a longer time period, watch a certain frequency-range. This to see how/if temporary signals/disturbances can affect the picture quality.

Adjust the frequency-bandwidth (see Function 3) and put the cursor on the frequency (peak) to watch. Chose with button nr 1 the ”**Max hold**”-function. The instrument starts to sample all top-values in the shown bandwidth and only updates the presentation if there´s any new measured data with higher dB-values than the previous measured.

Turn off the function by pressing the button nr 1 again (No hold).

Measured data can be stored. Read more about the Memory-function under section 4 below.



2. Reference cursor and signal to noise ratio.

SATLOOK Digital has the capability to perform measuring of the signal/noise alt. Picture-carrier/audio-carrier ratio.

The function is relatively difficult to implement fully automatic and a more simple, manual, tool is used in this instrument.
Do like this:
* Select function 2 Refmrkr
* Tune in the ″right″ frequency with the cursor (so it stands on the ″top″ of the signal to measure on).
* Push button nr 1 (Ref set) and a new cursor appears on top of the earlier.
* Turn the knob and place the cursor on another carrier or on the noise-floor.
* The relation between cursor nr 1 and cursor nr 2 is presented in the lower right hand corner of the picture-screen

Notice that 13/18V and 22 kHz on/off can be adjusted in this mode witht the ″0″ resp. ″#″ buttons.

3. Span Min – Span Max

Thsi function is described under ″Mainmenu″ section 3 above.

Push button nr 3 (**span Min**) on the keypad.
The instrument ″zoom in″ max. at the chosen frequency (250 MHz bandwidth).

Another push on the nr 3 button (span Max) takes the instrument back to ″Max zoom out″.

4. Memory

Memorypositions. Same function as described under Mainmenu section 9, below.

5. Multichannel

Channels (frequencies) that have been memorized under Mainmenu section 1 and 2 are displayed and measured at, together here.
Up to 10 channels can be measured at simultaneous.

Notice that all the channels can have individual setup of 13/18V resp. 22 kHz on/off.

The function is very useful when ″scanning″ a satellite and see that all parameters are right/max values received on both V/H and low/high.

Pg down To step down the pages. 10 pages with 10 frequencies per page can be stored (10 analog + 10 digital = 200 frequencies).

Pg down To step up the pages.

Max hold ″Locks″ the dB-values and will only change when higher values are received.

Turn off the function by pressing the button again (no hold).

Atten Attenuator 15 dB on/off. Indication on/off in the monitors upper right hand corner.

DiSEqC Chose between the different DiSEqC commands by using the buttons on the side of the instrument.
Submenu 7 (SWx) shows the extended DiSEqC-commands (DiSEqC 1.1).
Submenu 8 (Motor) shows the command-list for DiSEqC actuator-control (DiSEqC 1.2).
Even 13/18V and 22 kHz can be adjusted under the DiSEqC-menu.

Memory A multi channel measuring can be stored. Chose button nr 6 (Memory). Select the memory-position where to store the data with the main-knob (pos: 00-99) and push button nr 2 (save). The data is stored.

Load measured data by first choosing the memory position with the knob (pos: 00-99).
Push button nr 1 (load) and the memory is displayed on the monitor.

Delete measured data by first selecting the memory position to be deleted (pos:00-99) Push button nr 3 (delete) and the data is deleted.

Digital – Analog Use this button to step between analogue and digital multi-channel measuring.
Again, 10 pages of both ana/digi-signals with up to 10 frequencies per page can be stored.

0. 13/18V

Adjusting of 13V alt. 18V. Selected position is displayed up to the left in the LCD-display.

#. 22 kHz

Adjusting of 22 kHz on/off. Selected position is displayed up to the left in the LCD-display.

9. Memory Storing spectrum-pictures.

All spectrum-pictures can be stored in the SAT LOOK-Digital.
This is very useful for documentation and to use later on for recognizing/identifying of that satellites characteristic spectrum
The Mix-function helps you to identify and "find the way back" to already known (and previously stored) satellites.
The function places a previous memory in the background of the spectrum.
When the "right" satellite is found it will be like "fitting a hand to a glove"

To store measured-data, do like this:

* Chose the spectrum to store (i.e. exactly as displayed on the monitor) and push button nr 9 in the Main menu (Memory).
* Select "Save" button nr 2.
* The instrument asks: -"SAVE. ARE YOU SURE ?"
* Check that the Memory position is the right one (shown down to the right in the monitor). If not, chose one with the main-knob (Pos free: 00-99).
* Having select a position, press button nr 1 (YES).
* Notice that the set up of 13V/18V, 22 kHz on/off will be stored to.

Text-editor:
When the spectrum is saved, the Text-editor appears on the monitor, which makes it possible to enter a name for that memory-position (ex. ASTRA 1D).
Use the knob to select the first letter (ex. A) and save it with the control-button. Move to the next letter (ex. S) and so on.
If a mistake is made and wrong letter is saved, simply correct by pushing button nr 1 (Delete) and the cursor will jump one position backward.

To collect a stored spectrum:

* Enter the "Memory"-function with button nr 9 in the Main menu.
* Select the spectrum to load (use the main-knob: pos 00-99 displayed down to the right in the monitor).
* Load the spectrum to the monitor with button nr 1.

Notice that the function **Reference cursor,** Ref marker, is enabled when a stored spectrum is loaded.

To mix a stored spectrum with an ongoing measuring, do like this:

* Enter the "Memory"-function with button nr 9 in the Main menu.
* Select the spectrum to load (use the main-knob: pos 00-99 displayed down to the right in the monitor).
* Mix the spectrum with the ongoing measuring with button nr 4.

- Turn off the Mix-memory by pushing the nr 4 button again.

IV. Maintenance.

The instrument is equipped with a rechargeable battery and it is important that the battery is maintained.
Recharging should be done with the, enclosed car-adaptor or external power supply of 220v/13.5v DC, centre-pin -plus and chassis -earth.

Note, the instrument can be operated, for shorter periods of time, by the external power supply. However, the SAT LOOK Digital is not made for permanent operation. Contact your dealer for more information.

Adjustments for vertical hold, brightness and contrast are located under the instrument. Contact Your dealer for proper adjustments.

The battery needs recharging when the battery-symbol at the top of the LCD-display is empty.

Remember that a cold battery has much lower capacity than a warm one.

SAT LOOK Digital is designed for outside use in rough conditions but it should not be exposed for rain or snow as this can damage or shorten the lifetime of the instrument.

Checking/charging the battery.

As the instrument has been stored for some time before transportation it is important to check the battery-condition.
To do this turn the main switch On.

When starting the instrument, the monitor and LCD-display turns On.
There´s a battery symbol at the top of the LCD-display that shows the status of the battery. All black means that the battery is fully charged. If the symbol is empty it means that the battery is empty to.

If the battery needs recharging, use the power-supply attached with the instrument.
A thermometer-scale (0-100%) will lit on the LCD-display as the recharging starts.

Notice. The instrument should be turned of when being recharged.

Recharging from fully discharged battery to about 98% capacity takes aprox.30 hours.

When the battery been recharged, TV LOOK is ready to be used.

V. Technical specification.

Input frequency:	920-2150MHz, easily reduced to 250 MHz (max zoom in).
Frequency display:	Yes, IF default. All standard LNB L.O. can be setup.
Min level in,	About 35 dBuV (noise level).
Max level in,	About 90 dBuV.
Attenuation:	15 dB manual attenuator on/off.
Display of signal level (analog):	dB-level on LCD and monitor. Pitch-tone on loudspeaker.
Accuracy:	±2 dB (at +20 C)
Display of signal level (digital):	S/N (signal/noise-ratio) BER (bit error rate) Constellation diagram (QPSK)
TV/Audio standard:	Multi TV/Audio (PAL, NTSC, SECAM).
KU- C-band:	Yes, selectable.
Audio bandwidth :	Adjustable between 5.5 MHz and 8.5 MHz
Input impedance:	75 Ohm, BNC-connector.
Picture-screen:	4.5”-monitor, black / white.
Menus:	On LCD 64x128 next to the monitor.
Memory:	-100 spectrum pictures can be stored with name. Stored spectrum can be mixed for easy identification of satellite. -“Maxhold”-function.
Favorite channels	Both analog and digital frequencies can be stored (with name). Simultaneous measuring of up to 10 channels at the same time. Each channel with individual setup of 13/18v and 22 kHz on/off.
PC-connection	Yes, RS232-output
Voltage out:	Yes, 13-18V (can be adjusted).
22 kHz tone:	Yes, on/off.
DiSEqC	Yes, all 1.0 and 1.1. Also Tone burst on/off.
DiSEqC actuator:	Built in positioner for DiSEqC 1.2, SatScan and SatSelect.
Battery:	Rechargeable 12v, 3.5 amp/h.
Operational:	About 1.5 hour on a fully charged battery.
Weight:	About 5 kg incl. battery
Accessories:	Nylon carrying-case. Power-supply of 220v/13.5v, 1.7amp Car-charger. BNC-male/F-female adapter. Owners’ manual

Emitor AB
Sjöviksbacken 14
117 43 Stockholm
Sweden
www.emitor.se