

ANKARO®

HSCT 100

User's manual (English)





NOTE: This user's guide is adapted to software version 0.0.15 of HSCT 100 dated 11/05/2010, v.5.116 of MDX 500, v.1.96 of MDX 600, v.1.76 of MDL and v.1.8.13 of HPR 100

For future software updates, you can download the user's guide from the following website:
<http://www.ankaro.com/>

Chapter 1. Installation.

1.1. Safety Measures

- 1.- Never place the device next to hot sources.
- 2.- Never undergo the device to temperatures that exceed its level of operation.
- 3.- Never expose the device to leakings nor splatterings.
- 4.- Never place objects that contain liquids over the device.
- 5.- Respect the ventilation slots of the device, do not cover them with any kind of object.
- 6.- The space around the device must be free of objects, in a minimum radius of 40cm.
- 7.- Avoid locations with possibilities of spilling liquids on the inside of the device, and with important changes of temperature.
- 8.- Never open the device by yourself due to electric risk. In case of problems, go always to qualified technicians
- 9.- Never, under no circumstances, open the device when connected to the electrical net.
- 10.- During the handling it is better to disconnect the device from the electrical net.
- 11.- Obey the electricity security rules during the assembling. Use materials that obey the current law.
- 12.- The connecting plug must be accessible in a fast and simple way to have a fast disconnection.
- 13.- Never touch the plug with wet hands. Also, disconnect always the device before handling the connections.
- 14.- Never put any heavy object over the device, since it could get damaged.
- 15.- If the device is going to remain some time without use, it is recommendable to disconnect it from the electrical net.
- 16.- The repairmen and the maintenance of the device must be done by TV and radio specialised technicians.

1.2. Box content



User's guide



2 x Bridge F male – F female



DC Cable



HSCT 100



Cable 12 cm PIN to PIN RJ45 – RJ45

1.3. Description and connections

The module HSCT 100 is used for the reception of free channels that obey the DVB-S standards. Each module allows the reception of a complete transponder in DVB-S (QPSK), and the subsequent modulation in DVB-C (QAM) of it.

A feature of this equipment is its modulator in Vestigial Side Band (or VSB). This modulation can be used to distribute adjacent channels in one distribution without any intermodulation problem.

Each module has one Loop connector to cascade several modules at input and a Mix connector to do same in output channels. The output channel is selectable between C2 and C69.

All parameters are programmed by the means of HPR 100 or the MDX or MDL series of field strength meter, and they are monitored in the display of programmer or in the 5" TFT screen of field strength meter.

HSCT 100



1. Two-colored led*: It indicates the different states of the device.
2. OUT: This connector supplies the modulated channel according to the selected standard in the module and mixes it with all the signals that it receives through the MIX connector
3. MIX: Input of mixing of the module.
4. LNC IN: To connect to the LNC or to the LOOP OUT output of the previous module
5. LOOP OUT: To connect to the ANT IN input of the next module.
6. RS 232: Ethernet connector to cascade modules with the telecontrol unit with the RJ45/RJ45 cable provided.
7. HPR 100: Ethernet connector to make the programming with the programmer.
8. DC connectors: It has two connectors for input/output.

*States of two-colored leds

1. Initialization mode

- Green: main application charged.
- Blinking Green: Completing the initial sequence, at the moment when the module gets initialized, the led will turn into one of the states the operating mode.
- Red: Phase of initializing the module.

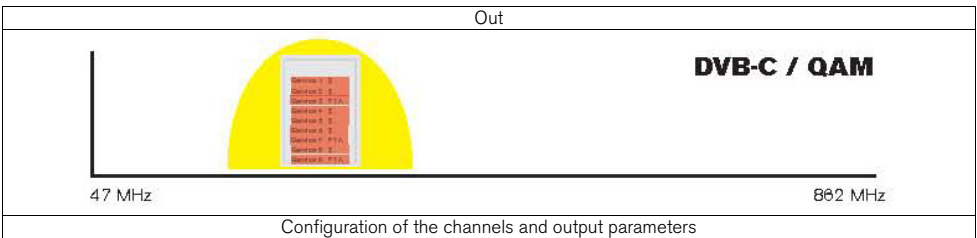
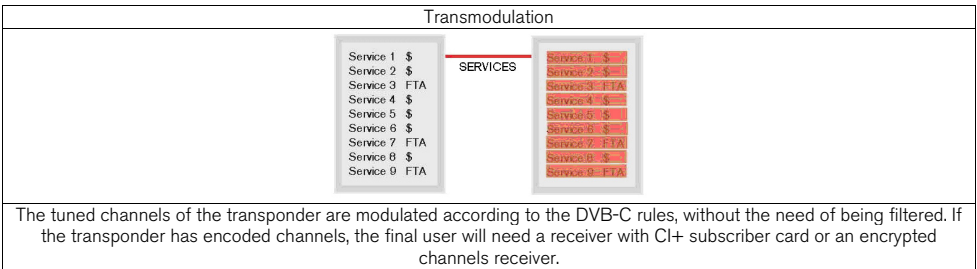
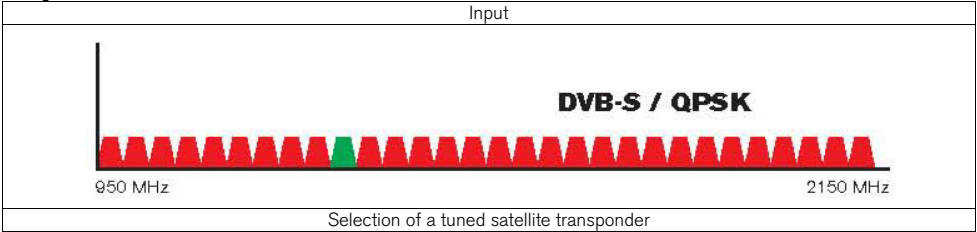
2. Operative Mode

- Green: The system is working properly.
- Orange: At least one critical event has been recorded in the module. The led will only change into green when the registration of events has been read by the programmer.
- Red: Error or alert detected in the running of the device, the led will be on only as long as the error/alert is present. Once the error or the alert disappears, the led will change into orange because the error/alert is stored in the registration of events.

3. Programming mode

- When the module detects an external programmer, the led will blink in the next sequence: green-orange-red.
- Once you leave the programming mode, the led will turn into the corresponding operating mode.

Stages of transmodulator HSCT 100



1.4. Programming

HSCT 100 has two ethernet connectors. In order to make the programming of the module you have to connect the corresponding programmer to HPR 100 connector. You can make the programming through the HPR 100 programmer and also through the MDX and MDL field strength meter.

1.4.1. Programming modes

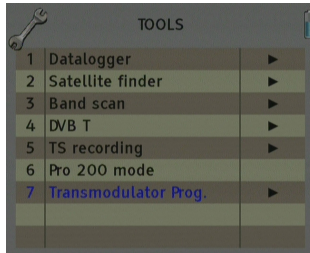
<p>With MDX / MDL field strength meter you can carry out the programming of all the modules consecutively as long as they are interconnected with each other through the RJ-45 cable supplied with each unit.</p>	<p>Through HPR 100, the programming is made module by module.</p>

1.4.2. Programming

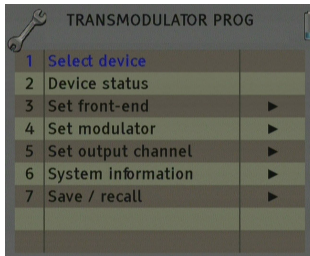
Below you will find the steps to follow in order to make the programming both from corresponding MDX and MDL field strength meter as well as from HPR 100.

MDX / MDL

In order to start programming the HSCT 100 transmodulator, you will have to go to "Tools" option through the key 8 of your field strength meter and to select the "Prog Transmodulators" option.

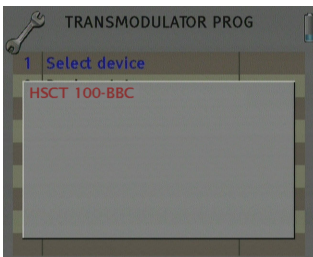


Then, it will proceed to recognize the module and to show the main menu. In the "Prog. Transmodulators" are shown the different configuration options that this tool offers:

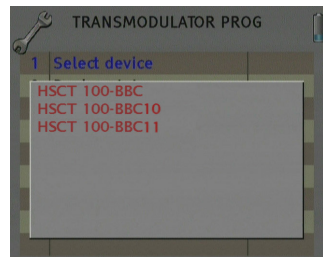


1. Module selection

The field strength meter allows carrying out the programming of one or several transmodulators from an only transmodulator.



Without interconnection of modules.
An only module connected

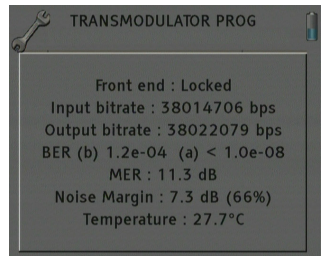


Interconnection of several modules, you can select which modules you wish to program.

2. State of the module

In the option "State of the module" are specified the main parameters of the module at this moment.

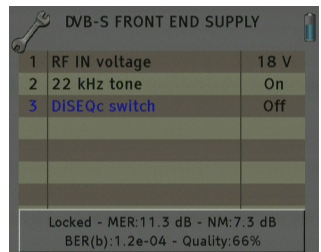
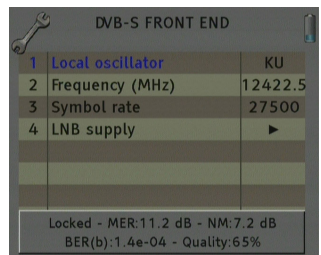
- Transmodulator input: It indicates whether the module is hooked or without signal.
- Input bit rate: Transfers of data in the satellite tuner input.
- Output bit rate: Transfer of data in the module output.
- BER before and after Viterbi: It indicates the error rate of bits of the input signal before and after the correction produced by Viterbi algorithm.
- MER: Parameter that indicates the quality of the input modulated digital signal, expressed in dB.
- Noise Margin: It indicates the difference between the value of current C/N and the value of C/N at the point of pixilation of the signal, that is, the quantity of dBs of C/N measure that are needed to lose the input signal.
- Temperature: It indicates the current temperature of the module in °C.



3. Input configuration

In this option you will be able to configure the input parameters of the satellite signal:

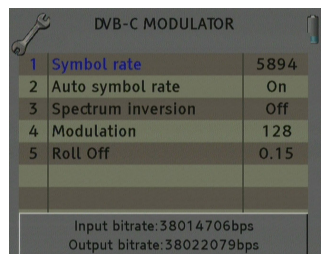
- Local oscillator: Selection of the local oscillator that you wish to use: FI, KU, C, K9750, K10000, K10600, K10700, K10750, K11250, K11300, K11325.
- Frequency (MHz): Transponder frequency that you wish to tune.
- Symbol speed: Symbol speed required by the transponder.
- LNB Feeding: In this option you can set the parameters concerning the LNB:
 - Voltage RF IN: 13V, 18V and Off.
 - Tone 22 kHz: Off, and Auto. In the
 - Switch DiseqC: A, B, C, D and Off.



4. Modulator configuration

This option allows you to configure the DVB-C modulator that the device has.

- Symbol speed: The available symbol speed ranges from 1 to 6.96 MS/s.
- Symbol rate auto: It establishes an automatic symbol rate or on the contrary you can make the configuration manually.
 - Auto: If you select automatic mode the output symbol speed will be calculated according to the selected modulation and the tuned input signal.
 - Manual: In order to estimate manually the output symbol speed you have to take into account the following parameters: input modulation, input symbol speed, input FEC, output modulation.



For example, for a QPSK signal with 22000 MS/s and a FEC 5/6, the output symbol speed should be calculated according to the chosen QAM modulation.

$$V_{SYMBOL.OUT} = \frac{V_{SYMBOL.IN} \cdot FEC \cdot (n^{bit} \cdot symbol(QPSK))}{n^{bit} \cdot symbol(QAM)} = \frac{22000 \cdot \frac{5}{6} \cdot 2}{n^{bit} \cdot symbol(QAM)}$$

Modulation	QPSK	16 QAM	32 QAM	64 QAM	128 QAM	256 QAM
Number of bits per symbol	2	4	5	6	7	8

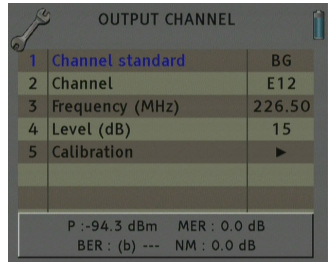
Modulation	16 QAM	32 QAM	64 QAM	128 QAM	256 QAM
Symbol speed (MS/s)	9166	7333	6111	5238	4583

- Spectrum inversion: Activate or deactivate the spectrum inversion in the modulation.
- Modulation: Modulation Format. Options: 16 QAM, 32 QAM, 64 QAM, 128 QAM, 256 QAM.
- Roll-off factor: Roll-off factor reduces the interference between symbols thanks to the raised cosine filtering, the bigger this value is, the less interference between symbols that will be caused. Typical Value according to rules DVB-C =15 %. Options: 15 %,13%.

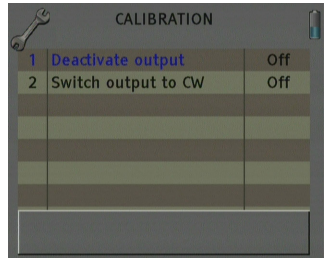
5. Output configuration

In this option you can configure the different parameters of the cable signal.

- Channel standard: It allows you to select the channelling of the cable signal standards. Options: BG, BG, PAL BG IT, 11, M NTSC, PAL M, PAL N, PAL DK , PAL I, BB_AU, DK PAL, L PAL.
- Channel: Output channel of the cable modulation. When you select the output channel, the field "Frequency (MHz)" will be modified automatically, adapting itself to the selected channel. Options: C2-C69.
- Frequency (MHz): Output frequency of cable modulation. When you modify this field, the field "Channel" will be also modified, indicating the channel equivalent to the selected frequency in the case that this frequency corresponds to the frequency of a channel. Options: 47-862 MHz.
- Level: Regulation of the output level of the modulated signal. Options: 0-15dB.
- Calibration: Allows the realization of two tests in order to verify the correct running of the device.



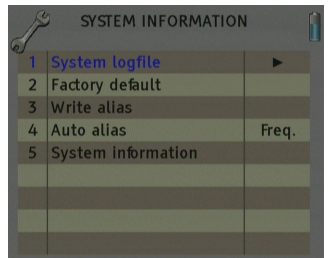
- Output deactivate: It allows activating or deactivating the output of transmodulator.
- Pure carries output: It allows activating or deactivating the DVB-C modulation, allowing visualizing the carrier without modulation in the selected frequency.



6. System information

This option provides information of the transmodulator.

- Stored events: In this field are indicated the registered events in the module.
 - Saved events reading: It allows reading the registered events in the module.
 - Delete the events: It allows deleting all events stored until this moment.
 - Export the events to USB: It allows you to export all events registered to the connected USB device.
 - NM (dB) low Limit: An event of error will be recorded when the value of Noise Margin is lower than the set value.
 - NM (dB) high limit: Once the event of error is recorded (Noise Margin<Limit Lower NM), this will be Noise Margin value that will have to be exceed so the module stops being in error.



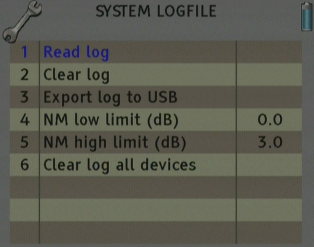
- Delete the events of all the modules. It allows deleting the events report of all the interconnected modules.

- Values by default: This option restores the values by default of the transmodulator.

- Modifying the alias: It allows you to assign a name/alias to the module you are programming. Option only available when the Alias Auto option is configured as "none" (manual mode).

- Alias Auto: It allows configuring the name/alias of the modules automatically. Options: Channel, Frequency, None.

- System information: It allows you to visualize the basic information of the module: model, no of series, firmware version, etc.



SYSTEM LOGFILE	
1	Read log
2	Clear log
3	Export log to USB
4	NM low limit (dB) 0.0
5	NM high limit (dB) 3.0
6	Clear log all devices

7. Save and recall

This option allows saving and loading the configuration of the module, carrying out firmware update or making an adjustment of the time and date of the module.

- Program management:

- New program: This option allows creating a program with the current configuration of a module or group of modules.

- Load program: It allows loading a previously created program on a module or group of modules.

- Delete program: It allows deleting a program.

- Device to process:

- Current: The creation or loading of a program will be applied only in the module that is currently connected.

- All: The creation or loading of a program will be applied to the whole group of connected modules.

- Working disk: With this option we have the possibility of choosing if we want to work into the internal disk or in the external storage device USB 2.0.

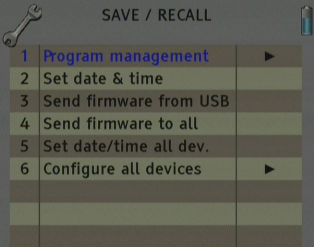
Once the option is selected, a dialog box will appear and we will be able to choose among three different options.

- Auto: The Meter decides where the data will be stored. If there is external memory connected, the Meter will store the data in it. If not, it will use the internal memory.

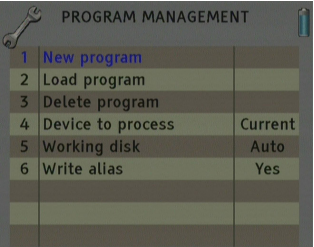
- USB: The Meter always will try to use the external memory connected to the USB port. If this memory has not been connected an error message will be shown, reminding that there was an error storing the data and it will be not stored.

- Internal: Always the internal memory is used to store the data.

- Write Alias: It allows saving the alias of the module in the program. Options: Yes/No



SAVE / RECALL	
1	Program management ▶
2	Set date & time
3	Send firmware from USB
4	Send firmware to all
5	Set date/time all dev.
6	Configure all devices ▶



PROGRAM MANAGEMENT	
1	New program
2	Load program
3	Delete program
4	Device to process Current
5	Working disk Auto
6	Write alias Yes

- Set Date and time: Setting of the date and time of transmodulator. It is appropriate to maintain these parameters set in order to have the registration of errors linked to the current time and date.

- Send Firmware from USB: It allows carrying out the firmware update from the USB device.

- Send firmware to all: It allows carrying out the update of all the modules that are interconnected at the same time.

- Set date/time all devices: Loading the current date and time of the module in the rest of interconnected modules.

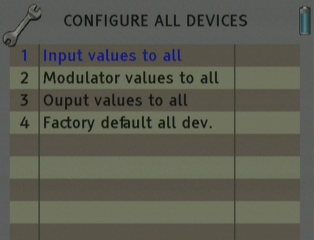
- Configure all devices:

- Input values to all devices: It allows copying the current input configuration in all the interconnected modules.

- Modulator values to all devices: It allows copying the configuration of the current modulator in all the interconnected modules.

- Output values to all devices: It allows copying the current output configuration in all the interconnected modules.

- Factory default to all devices: It allows making values by default to all the interconnected modules.



CONFIGURE ALL DEVICES	
1	Input values to all
2	Modulator values to all
3	Output values to all
4	Factory default all dev.

HPR 100



Note: From HPR 100 programmer you can only carry out the programming of a single module, in order to carry out the programming of several modules at the same time you have to use a MDX or MDL series field strength meter.

When you connect the HPR 100 programmer, it will proceed to recognize the module and to show the main menu. In the main menu are shown the different options for configuring the transmodulator.

```

HSCT 100
>Manual<      Config
Auto
    
```



Note: The programming parameters used in the programming through HPR 100 are not detailed, since all these parameters are detailed in the section MDX/MDL.

1. Manual

In this section are specified the different options for setting up the input, output and modulation parameters.

1. This field shows the type of parameter that is selected at the moment. Options: Input Sat, check out cable, TV output.
2. This field shows the parameter that is selected. Click on OK to edit the selected parameter and Right/Left for changing it. Once it is configured press Cancel.

```

HSCT 100 Input Sat → 1
RF level: 013
>LO Freq: LO KU → 2
Freq: 11509
    
```

Satellite input	Cable output	TV output
- L.O. frequency - Input frequency - Input symbol speed - Antenna - DiseqC	- QAM Mode - Investment - Roll Off - Auto SR (Symbol Rate) - Output symbol speed	- RF Channel - RF Level

2. Auto

This option allows saving and loading the configuration of the module in the HPR 100 programmer.

- Module reading: It stores the current configuration of the module in the memory of the programmer.
- Configuration of module: It loads in the module one of the configurations previously saved in the field strength meter.

```

HSCT 100
> * Module reading *
* Config. Module *
    
```

3. Config

In "Config" option the information concerning the transmodulator is given.

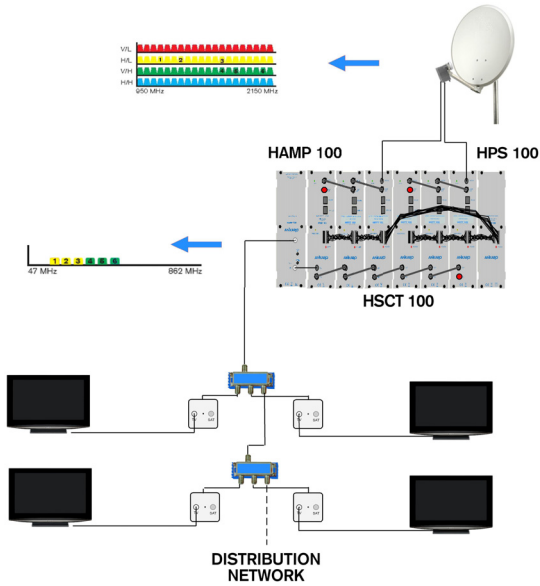
- Read Log file
- Delete Log file
- Values by default
- Update firmware
- Date / Time
- Software version
- Global update

```

HSCT 100
SW info. version
>Read LOG file
Delete LOG file
    
```

1.5. Accessories and example of installation

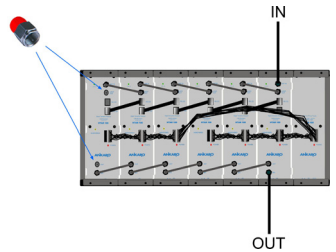
Example of installation



Installation that consist of 6 HSCT 100 and that will allow tuning channels up to 6 different transponders and to distribute them through a network of modulated cable in DVB-C. The distributed channels need a cable receiver in order to be decoded.



In order to guarantee the right running of the different equipments of the installation, we recommend you to provide the inputs and outputs which are not used with a 75Ω load.



Accessories



Programmer
Mod. HPR 100
Code 20018.11



Field strength meter
Mod. MDX 600
Code 0001006



Field strength meter
Mod. MDL 400
Code 0001003



Wide band amplifier 47-862MHz
Mod. HAMP 100
Code 20042.11



Mixer
Mod. HAM 100
Code 20012.11

Chapter 2. Technical features

Ref.	HSCT 100
Code	20020.11
Input frequency margin	950-2150 MHz
Input level	-30 a -60 dBm
Input impedance	75Ω
LNB (feeding/commutation)	13V-18V / 0-22kHz
Input connector	Female F connector
Input LOOP losses	<1 dB
FEC	1/2, 2/3, 3/4, 5/6, 7/8, 8/9, 9/10, 1/4, 1/3, 1/5, 2/5, 3/5, 4/5 DVB, RS 204,188
Input modulation	QPSK
Input Symbol Rate	4-30 MS/s
Modulation Error Ratio (MER)	Typ. 40 / Min. 36
Selectable format of output modulation	16 QAM, 32 QAM, 64 QAM, 128 QAM, 256 QAM
Output symbol Rate	1-6,96 MS/s
Roll-Off Factor	13 %,15%
Output channels	C2-C69
Output connectores	Female F connector
Output Level	80 dBuV
Regulation margin	15 dB
MIX Losses	<1 dB
Band spurious	-60 dBc
Programming Interface	RJ-45
Programmer	HPR 100, MDX and MDL
Operating temperature	0°C-45°C
Consumption 5V (mA)	650
Consumption 12V (mA)	300
Consumption 24V (mA)	15
Consumption 30V (mA)	2
Dimensions	75x265x150 mm
Weight	1,4Kg

Chapter 3. Declaration of conformity



CONFORMITY DECLARATION

"WE , ANKARO, DECLARE THAT THE PRODUCT
HSCT 100
IS IN CONFORMITY WITH FOLLOWING DIRECTIVES
Low Voltage Directive 2006/95/EC
EMC Directive 2004/108/EC"

If you wish a copy of the conformity declaration, please contact to the company

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