CM 4AV-TC

082003

Digital encoder-modulator

4 A/V-COFDM/QAM

User's Manual
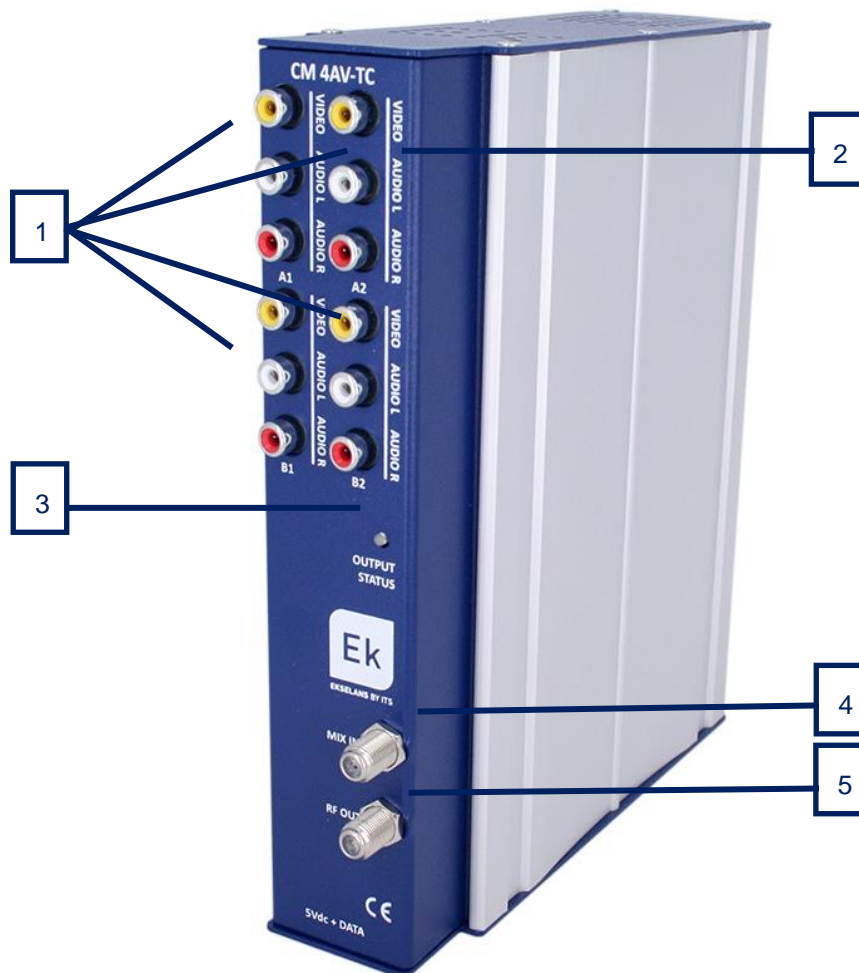
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1 CM 4AV-TC – USER MANUAL

1.1 General Description

Number	Description
1	A/V (CVBS) Inputs. Connection to the audio/video sources
2	LED status of the inputs. Flashes green when the A/V inputs are connected
3	LED status. Displays the status of the modulated output in COFDM / QAM. The RF output is working properly when the LED flashes green
4	RF MIX connector
5	RF OUT connector. In this output there is a mux generated by the module itself, plus those which enter via the connector 4

2. Installation and wiring

1. Fasten the digital encoder-modulator module to a wall frame (CHM TR) or a rack chassis (CHR TR). To this end assemble onto the upper rear part of the module the supplied metal part, as is shown in the diagram
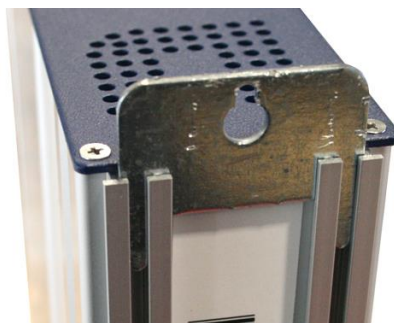
2. Connect the power supply (FA 524) to the module or either connect same to the previous module using the supplied power cable
3. Connect the HD audio/video sources to the HDMI connectors
4. So as to program the module, connect the FA 524 power supply to a PC via a USB-USB cable as follows:

Connect this part to the power supply

Connect this part to the PC

5. Install the "Management" software on the PC. It can be downloaded from the website www.ekselansbyits.com, Documentation >> Software section.

6. Run the programming software on the PC (**Important**: connect the FA 524 power supply to the PC before running the software so that the driver of the PC can correctly detect the software).

3. Software Programming: CM management

The "CM management" programming software enables the programming and running of all modules of the CM headend. The program is available only for Windows operating system (XP version 7 and above).

Once downloaded from the website www.ekselansbyits.com, Documentation >> Software section, having previously run the program with the PC connected to the USB port of the FA 524 power supply. In this fashion, it is ensured that the driver detects the core.

3.1. Main screen

The main screen of the "CM Management" software is as follows:
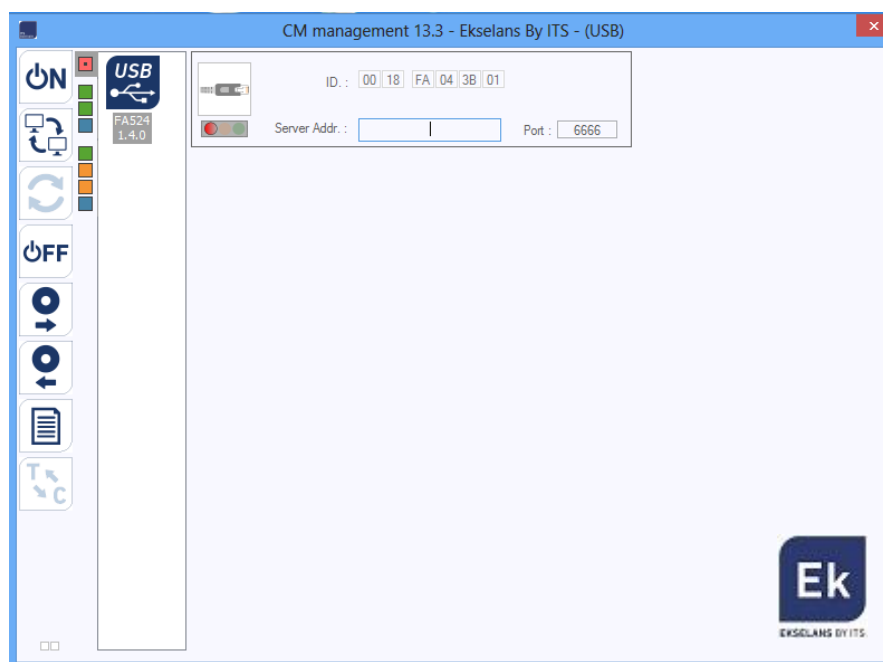
Through this function, one can run and program all modules connected to the power supply. Explained below is the function of each of the options:

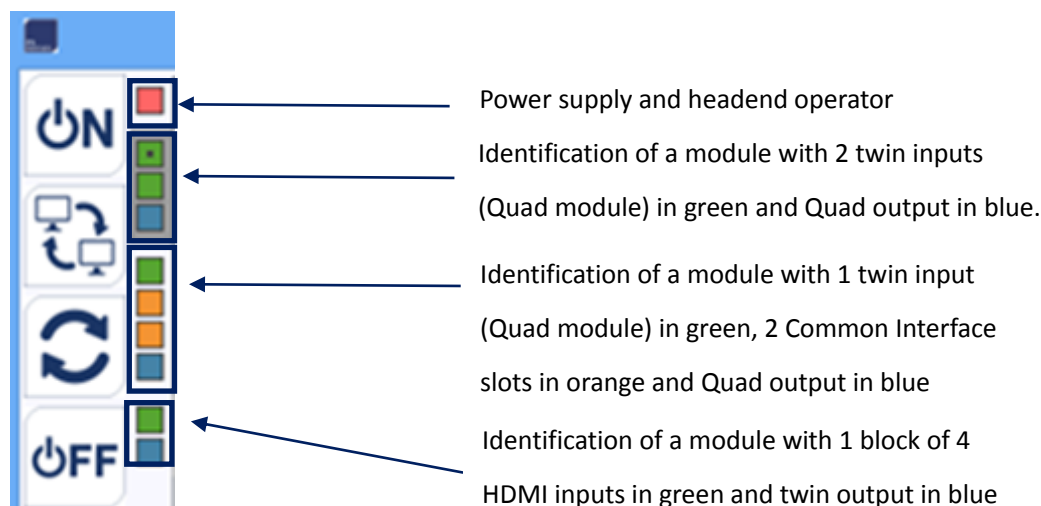| Number	Button	Function
1		Once connected the PC to the FA 524 power supply through the USB-USB cable, press this button in order for the power supply to identify the modules connected to it. Once activated, the blue logo is displayed
2		This icon will be displayed in blue with white lettering once the connection is established with the headend. If not, it will otherwise will be the white logo with blue lettering which will be displayed, making it then necessary to press button 1 again.
3		Through the FA 524 it is possible to carry out a remote connection with a headend and to that end this button is used. The remote connection is explained below. If displayed in blue the remote connection is activated, and if white it is not activated.
4		Firmware updating. Press this button to load a file to update the firmware of the modules.
5		Press this button to switch off the FA 524 power supply of the operation of the various modules of the headend. If it is disconnected, the logo will be displayed in white and blue lettering.
6		This option enables one to load a configuration program previously saved on the PC. The configuration file shall have the extension .dtc
7		This option enables saving on the PC a programming configuration of a module to be subsequently loaded using button 6. A file with the .dtc format will be created.
8		Enables changing the output of the DVB-T (COFDM) modules to DVB-C (QAM).

9	📄	Data-logger. Enables saving the data of the different modules of the headend.

The main screen of the "CM management" enables to easily identify the different modules connected to the power supply, as can be seen in the following screen:

Power supply and headend operator

Identification of a module with 2 twin inputs (Quad module) in green and Quad output in blue.

Identification of a module with 1 twin input (Quad module) in green, 2 Common Interface slots in orange and Quad output in blue

Identification of a module with 1 block of 4 HDMI inputs in green and twin output in blue

Each module is identified by means of a series of different coloured boxes. Depending on the module, this will be represented by 2, 3 or 4 boxes where the green represents the inputs, the blue the output and the orange the Common Interface slots.

3.2. Programming of the CM 4AV-TC module

Once the CM 4AV-TC module is connected to the FA 524 power supply, this in turn to the PC and the "CM management" programme opened, select the CM 4AV-TC which is represented as follows:

Inputs AV 1and 2

Inputs AV and y 4

RF Output

Select the upper green box, the programming interface of the first two AV inputs will appear as is shown below:

A/V Inputs

RF Output

Selection of the services which are

desired to be presented in the output
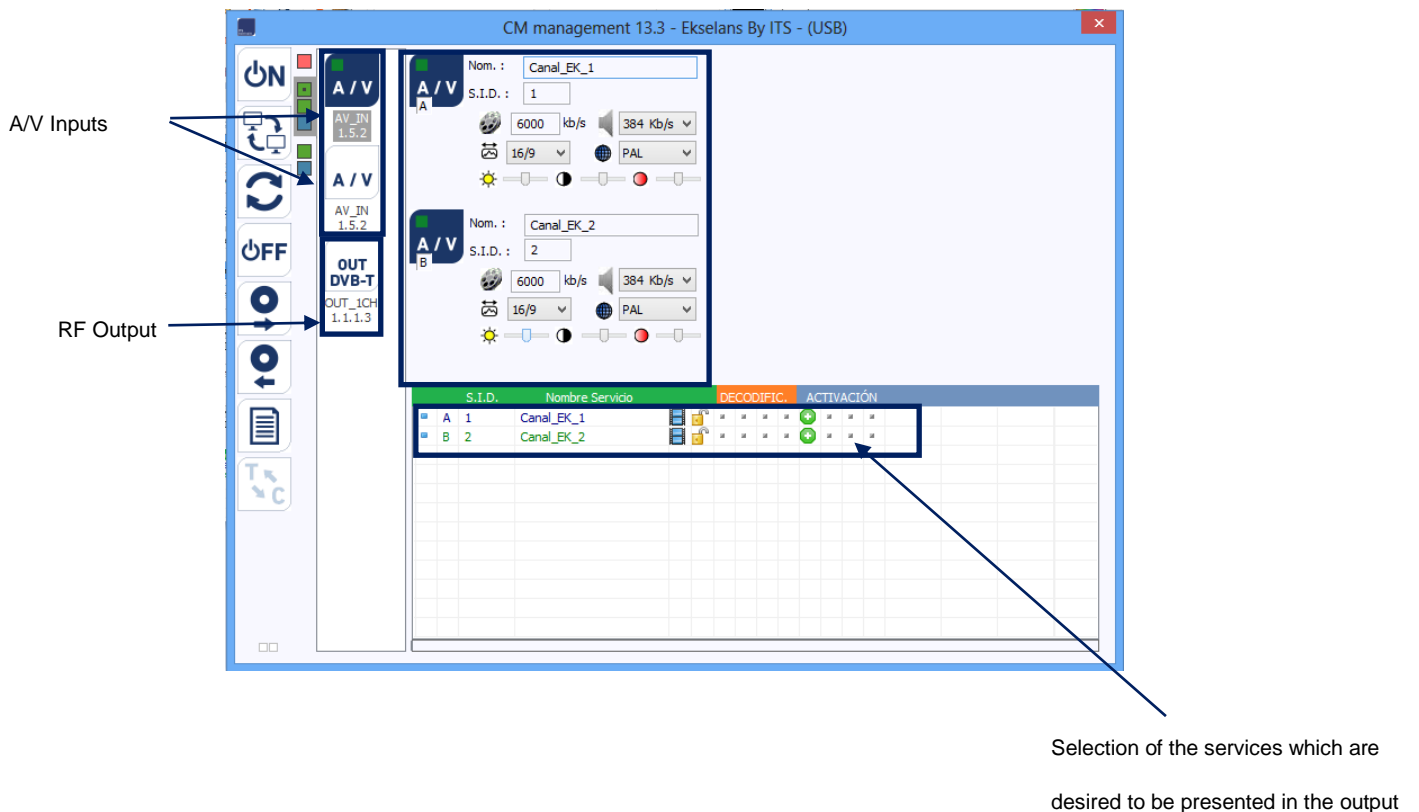
In order to program the module, connect first the audio/video sources which are wished to be modulated to the A/V connectors of the CM 4AV-TC module. Each AV input can be assigned a set of values, such as:

- SID: Unique identifier of the program
- Nam.: Software name
- Aspect ratio: defined as the default in 16:9
- Video Standard: defined as the default in PAL
- Audio rate: defined as the default at 6000 Kbps, which can be selected from a predefined list

It is also possible to adjust the brightness, contrast and saturation settings.

In order to select the services of these two inputs which are wished to be modulated in the output, select the desired input by double-clicking on the negative symbol ( ) which appears in the activation area, in order to turn the inputs into the positive symbol ( ).

In order to program the other two AV3 and AV4 inputs, click the bottom green box which

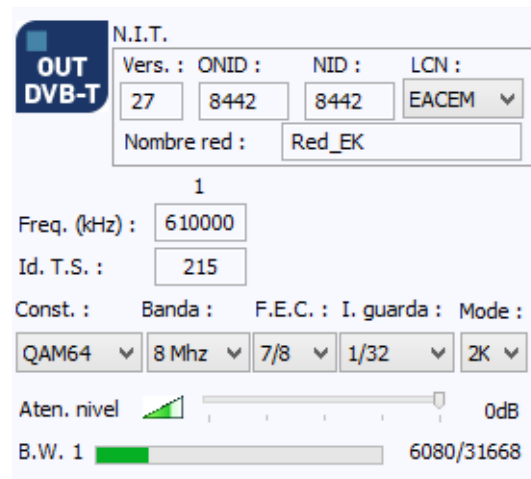identifies the CM4AV-TC module. The following screen then appears:
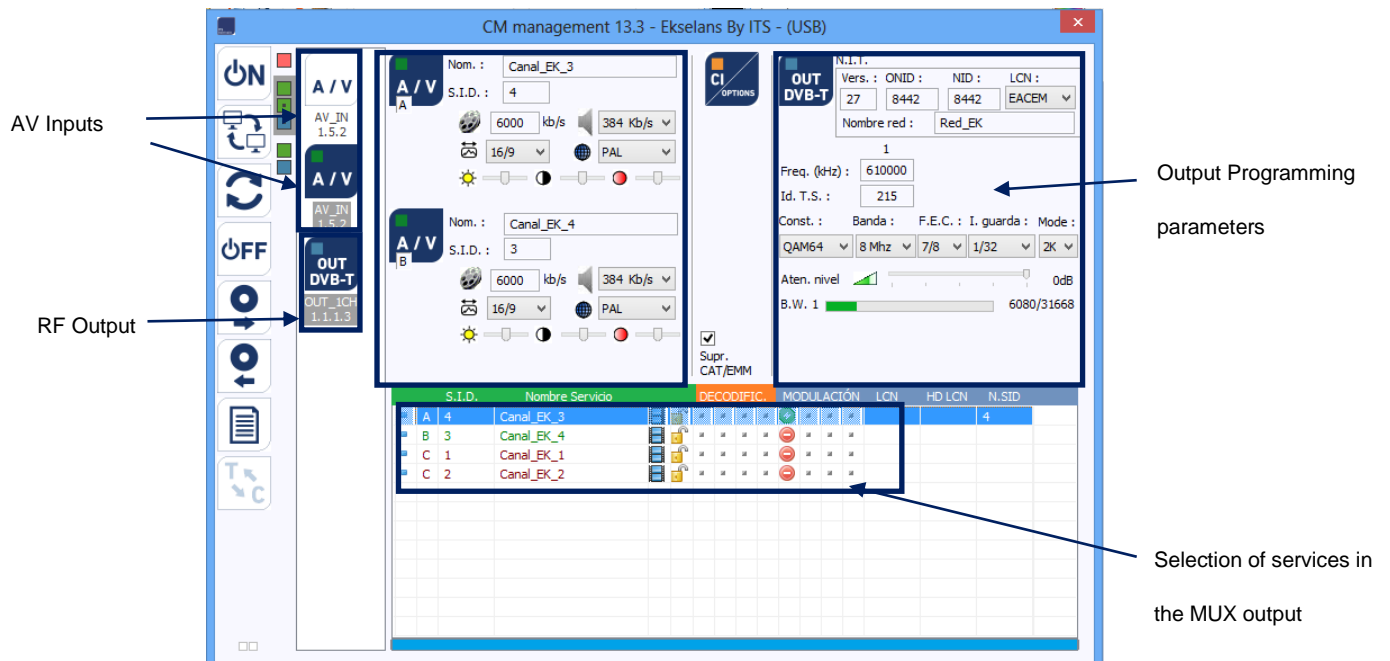
3.2.1 Modulation of the services in the COFDM mux output

Once the audio/video sources are connected to the corresponding input jacks, all these will appear at the bottom of the screen. From here one can make his/her selection so as to locate the inputs in the RF output channel. As shown in the figure below, in the "Modulation" section will appear a column which corresponds to the COFDM mux output.

At the top right of the window one can set the RF output parameters:

N.I.T.

OUT DVB-T

Vers. :	ONID :	NID :	LCN :
27	8442	8442	EACEM ▾

Nombre red :   Red_EK

1

Freq. (kHz) :   610000

Id. T.S. :   215

Const. :	Banda :	F.E.C. :	I. guarda :	Mode :
QAM64 ▾	8 Mhz ▾	7/8 ▾	1/32 ▾	2K ▾

Aten. nivel   ◢   0dB

B.W. 1   6080/31668

- Vers: refers to the NIT version

- ONID: network identifier value (the original network ID), which varies depending on the country

- NID: network identifier

- LCN: selection of the LCN type (EACEM for Europe, ITC for the United Kingdom ...)

- Network Name: identifies the name of the local network

- Output frequency: in this section the KHz output channel frequency is specified.

- Const: selection of the output constellation (64QAM, 16QAM, QPSK)

- Band: bandwidth of the output channel (7 MHz or 8 MHz)

- FEC: selection of different values for error recovery

- Saved I.: selection of the save interval value between symbols

- Atten. level: controller for attenuation of the output level. The maximum output level of the CM4AV-TC module is 95 dBµV, and through this controller can be reduced up to 20 dB.

In this output parameter selection section there also appears information on the bit rate of the mux output:

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In the above image the bit rate of the mux output on the maximum total which it can withstand (31668 Kbps / 31.6 Mbps) is displayed. This diagram will be updated in real time depending on the audio/video services which are included. It is recommended not to exceed 80%

of the maximum in order to avoid subsequent overflow problems.

Important note: if no services are added to the RF output channel, this will not be activated.

3.2.2 Output modulation change

The CM 4AV-TC module enables the selection between two output modulations: COFDM –set as the default– and QAM. To change same, click the icon [T↖ ↙C] of the right panel of the "CM management" software.

This operation may take 3 to 4 minutes. Once the change is made, the output modulation shall be QAM and the available muxes will be 4. The selection and assignment services per mux output process will be exactly the same as explained in the previous section.

3.2.3 Saving and loadinga configuration

The "CM management" software enables saving on the PC the transmodulator configuration for subsequent uploading to another CM 4AV-TC module. Its running is carried out using the following two buttons, available in the vertical menu on the right:

	Save on the PC a programming configuration of a module to be subsequently loaded using button 6. A file with the .dtc format will be created.
	Load a configuration program previously saved on the PC. The configuration file shall have the extension .dtc

It is important to load onto the CM4AV-TC a .dtc file previously created with another similar module. Otherwise, the "CM management" software will display that it is not possible to load it.

3.2.4 Data-logger

The "CM management" software, through the Data-logger option enables one to generate and save to the PC a report containing the data of the various modules connected to the headend.

To that end, click on the icon and specify the file name. A document with the HTML format which can be opened with a browser is created.

Important: in order to generate this report it is necessary that the "CM Management" program be run as the administrator.

3.3 Remote control of the headend

The CM transmodulation headend can be run remotely. This function is integrated into the FA 524 power supply and in each of the headend modules.

3.3.1 Access and remote programming of the CM 4AV-TC module

It is possible access remotely to the module CM 4AV-TC. To do this it must be connected to a power supply FA 524 and this also connected to the Internet.

To remotely access to the headend in which the CM4AV-TC is connectect, press the menu icon [icon] on the left is connected. The following screen then appears:
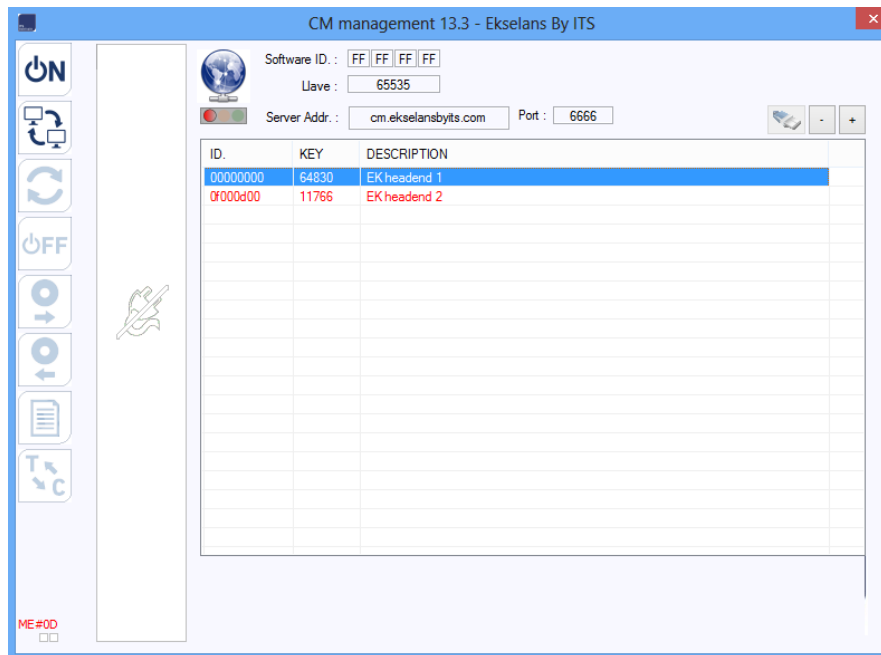
In the first connection, it will ask for the software ID and password. These are personal and not transferable. To receive them, please contact your Ekselans dealer. Once they become available, fill the information at the top (Software ID and Key).

If all parameters are entered correctly, you will be connected to the server cm.ekselansbyits.com, dedicated to the remote management of the CM headend.In this list will be shown all modules connected to the porwer supply FA 524. Remember that each power supply FA 524 includes the management for remote control, so each FA 524 defines a new headend. Each one is identified by an ID. In addition you will need to enter a password in the appropriate field.

If all data are correct, the connection to the server and the corresponding headend will be done.

4 Technical specifications.

Reference	CM 4AV-TC
Code	082003
Inputs	
Number of video inputs	4 x CVBS
Video resolution mode	PAL (720x576) / NTSC (720X480)
Video compression	MPEG 2
Number of audio inputs	4 x audio stereo / 0.5-2.5 Vpp
Sample rate	48 KHz
Audio compression	MPEG1, LAYER II
DVB processing	Inclusion of PAT, PNT, SDT, NIT table
Configuration	Program name, SID, LCN, NETWORK NAME, TSD, ONID, NID, VERSION NIT, LCN, PID, PMT, PID VIDEO, PID AUDIO
Output	
Number of outputs	1 + loop-through (-1.5 dB)
Maximum output level	95 dBµV
Output adjustment	20 dB (per software)
Output frequency	170-230 MHz + 470-862 MHz
Output MUXES	1 COFDM or 1 QAM
Channel width	7 MHz (VHF) / 8 MHz (UHF)
COFDM modulation mode	2K / 8K
Constellation - FEC COFDM	QPSK/16QAM/64QAM - 1/2, 2/3, 3/4, 5/6, 7/8
Save interval	1/4, 1/8, 1/16, 1/32
Constellation – S/R QAM	16, 32, 64, 128, 256 QAM (EN 300 429) – 4,00 - 6.96 Msps
MER	> 35dB
Miscellaneous	
Programming	Software PC "CM management" PC Software via USB connected to a FA 524 power supply
Power Supply / Consumption	5 Vdc / 3 A
Temperature range	0 – 40º