

CM 4HD-TC

082004

**Digital encoder-modulator
4 HDMI-COFDM/QAM**

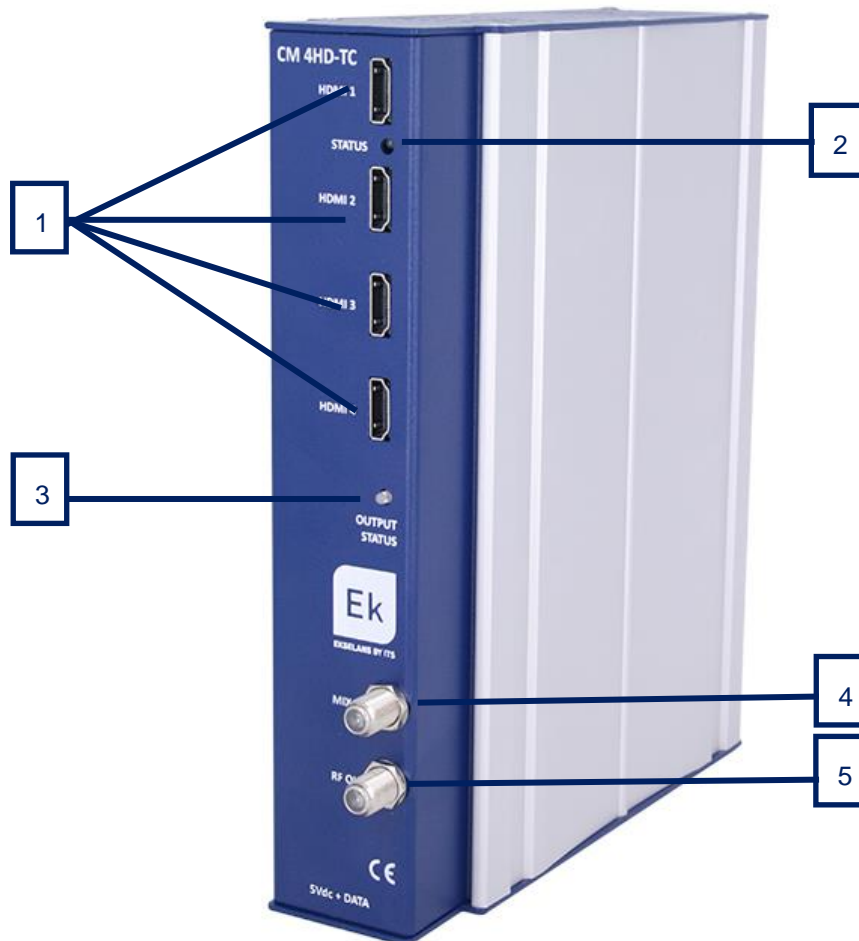
User's Manual



EKSELANS BY ITS

1 CM 4HD-TC – USER MANUAL

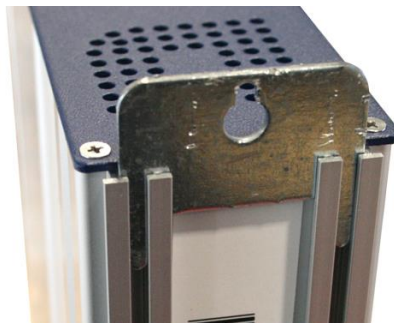
1.1 General Description



| Number | Description |
|--------|--------------------------------------------------------------------------------------------------------------------------------------|
| 1 | HDMI Inputs. Connection to the audio/video power supplies |
| 2 | LED status of the inputs. The lights shall flash in green when the HDMI's 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 are the muxes generated by the module itself, plus those which are entered 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 on 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 “CMManagement” 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).

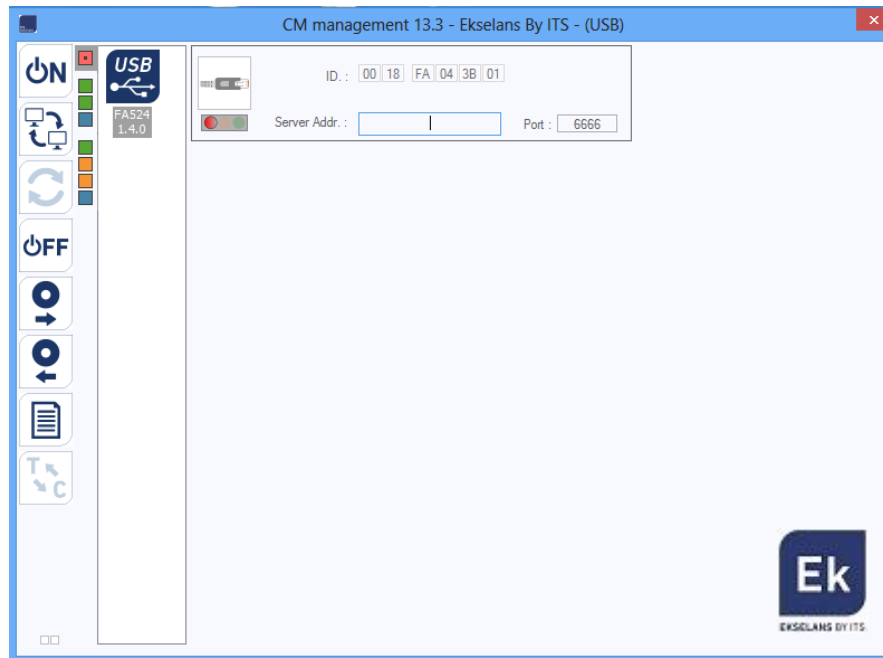
3. Software Programming: CM management

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:

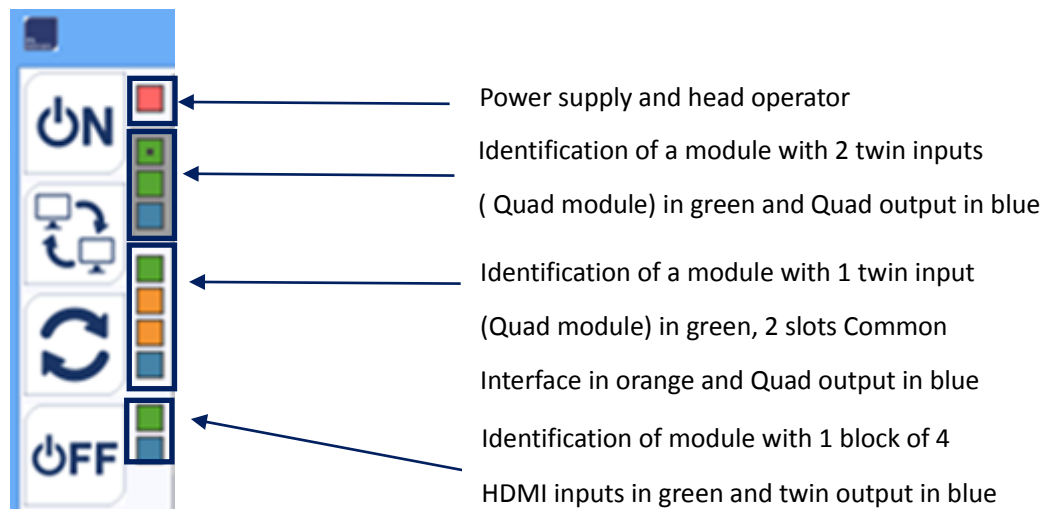


Through this function one can run and program all modules connected to the power supply.
Explained below is the function of each of the options:

| 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 be otherwise 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 .drc |
| 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 .drc 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:



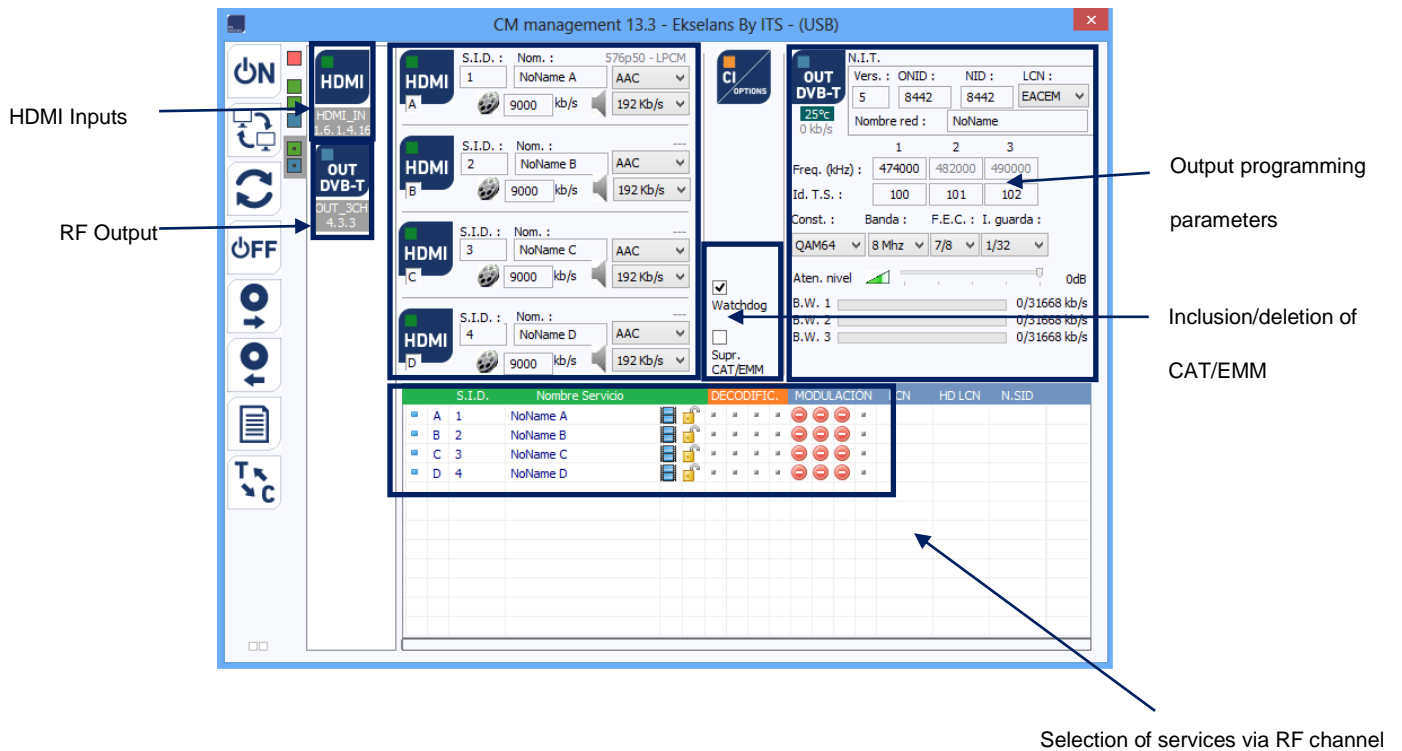
Each module is identified by means of a series of different coloured boxes. Depending on the module, this will be represented by 2, 3 or 4 boxes where the green represents the inputs, the blue the output and the orange the Common Interface slots.

3.2. Programming of the CM 4HD-TC module

Once the CM 4HD-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 4HD-TC which is represented as follows:



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




In order to program the module, connect first the audio/video sources which are wished to be modulated to the HDMI connectors of the CM 4HD-TC module. Each HNMI input can be assigned a set of values, such as:

- SSID: Unique identifier of the program
- Nam.: Software name
- Audio type: to be selected between AAC and MPEG
- Video rate: defined as the default at 9000 Kbps, which can be changed specifying the value
- Audio rate: defined as the default at 192 Kbps, which can be selected from a predefined list

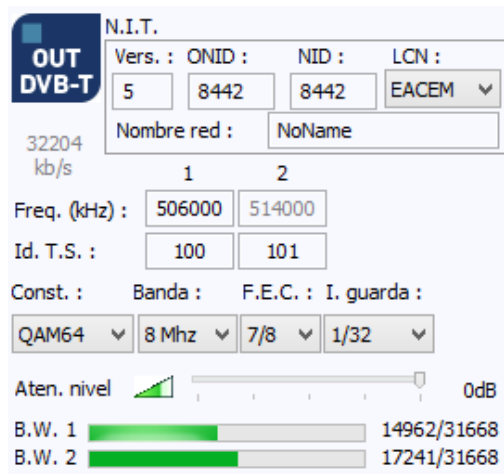
3.2.1 Modulation of the services in the 2 COFDM mux outputs

Once the audio/video sources are connected to the corresponding HDMI input jacks, all these will appear at the bottom of the screen. From here one can make his/her assignation to each of the RF output channels. As shown in the figure below, in the "Modulation" section there are two columns, one of which corresponds to the two COFDM mux outputs.

| S.I.D. | Nombre Servicio | DECODIFIC. | MODULACIÓN | LCN | HD LCN | N.SID |
|--------|-----------------|------------|------------|-----|--------|-------|
| A 1 | Imagenio | | | | | 1 |
| B 2 | NoName B | | | | | |
| C 3 | NoName C | | | | | |
| D 4 | NoName D | | | | | |

Depending on which column is selected the (), the service will appear in either output channel.

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



N.I.T. OUT DVB-T

32204 kb/s

Vers. : 5
 ONID : 8442
 NID : 8442
 LCN : EACEM

Nombre red : NoName

Freq. (kHz) : 1: 506000, 2: 514000
 Id. T.S. : 1: 100, 2: 101

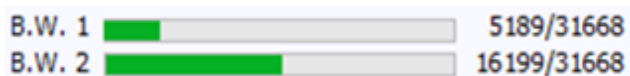
Const. : QAM64
 Banda : 8 Mhz
 F.E.C. : 7/8
 I. guarda : 1/32

Aten. nivel: 0dB

B.W. 1: 14962/31668
 B.W. 2: 17241/31668

- 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 frequencies: in this section the KHz output channels frequency is specified. It is important to note that the two RF mux outputs are adjacent, reason why the value of the first mux is set, the following value will be automatically recalculated
- 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 CM4HD-TC module is 95 dB μ V, 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 each one of the mux outputs:



In the above image the bit rate of each 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 in each mux output. 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 4HD-TC module enables the selection between two output modulations: COFDM –set as the default– and QAM. To change same, click the icon  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 loading a configuration


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

| | |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>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.</p> |
|  | <p>Load a configuration program previously saved on the PC. The configuration file shall have the extension .dtc</p> |

It is important to load onto the CM4HD-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 a headend power supply.

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.

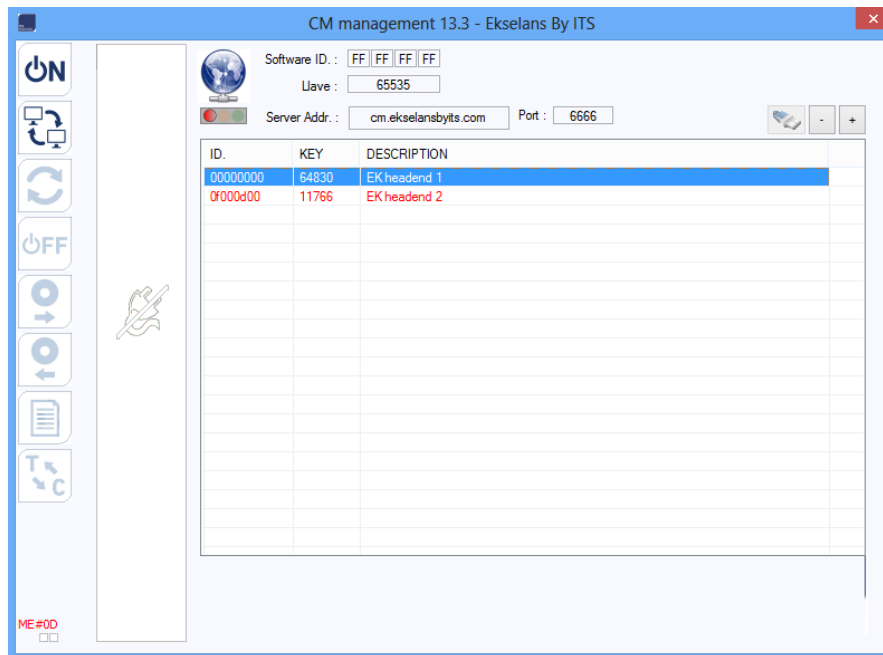
3.3 Remote running of the head

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

3.3.1 Access and remote programming of the CM-TC 4AV 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  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 power 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 4HD-TC |
|---------------------------|---------------------------------------------------------------------------------------|
| Code | 082004 |
| Inputs | |
| Number of inputs | 4 x HDMI |
| Video resolution mode | 720 p - 1080p |
| Video compression | H.264 - BIRATE 5-15 Mb/s |
| Sample rate audio | HDMI (32 kHz / 44.1 kHz / 48 kHz) |
| Audio compression | AAC-LC - bit rate 128-384 Kb/s |
| DVB processing | PAT, PMT, SDT, NIT, EIT |
| Configuration | Program/network name , SID, LCN, TSID, ONID, NID, EIT, versions, audio, video PIDs... |
| Output | |
| Number of outputs | 1 + loop-through (-1.5 dB) |
| Maximum output level | 95 dB μ V |
| Output adjustment | 20 dB (per software) |
| Output frequency | 170-230 MHz + 470-862 MHz |
| MUX Outputs | 2 COFDM or 2 QAM (adjacent) |
| 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 | 5 Vdc |
| Consumption | 15 watts |
| Temperature range | 0 – 40° |

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