LCD-TFT Monitors
LM5000

User Manual
LM5000D11-02

Edition 03

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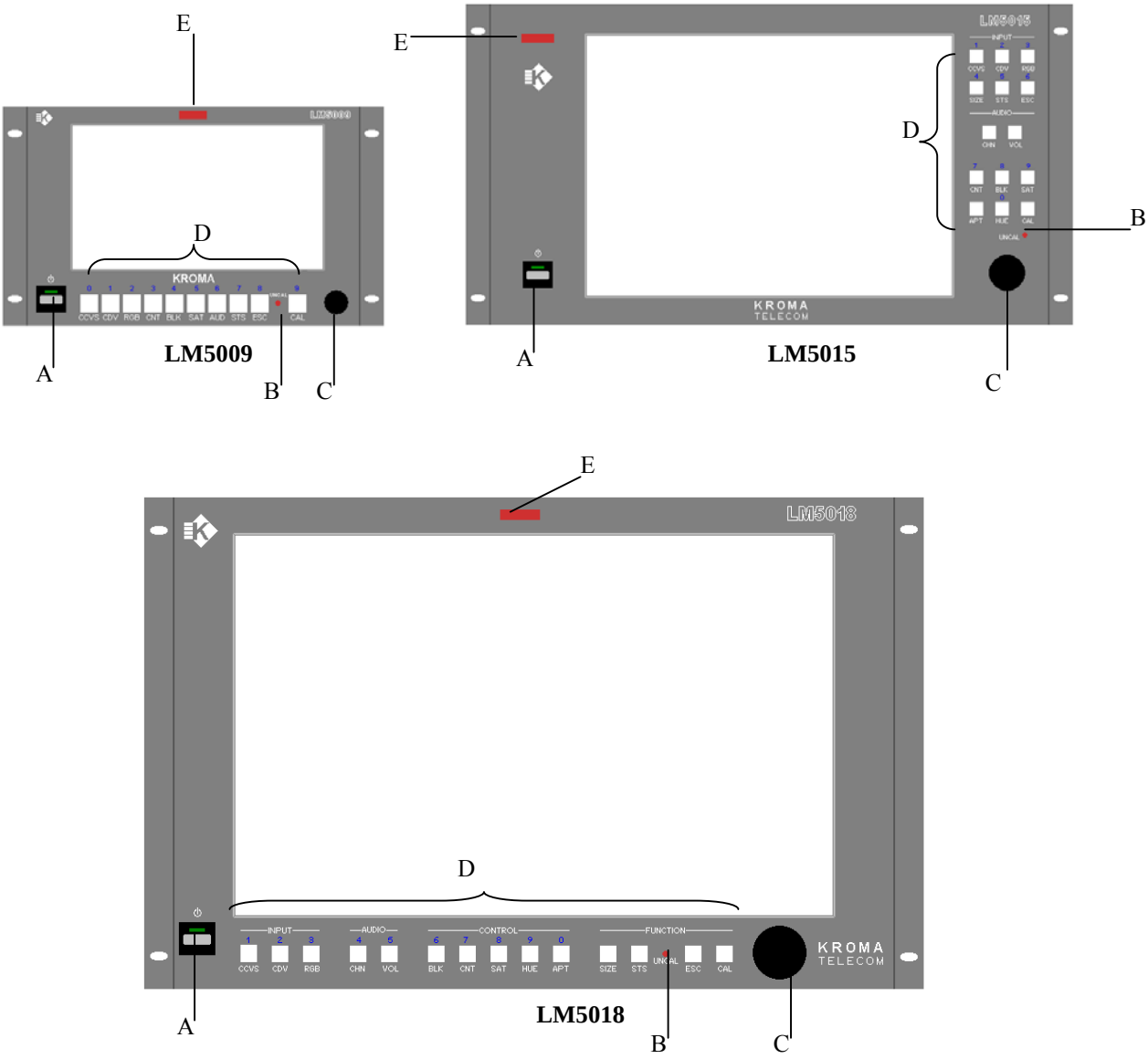
1. FRONT PANEL



A) The equipment Switch on / Switch off.

B) Calibration Diode

C) Optical Encoder

D) Keyboard

E) Tally Led Indicator

1.1 DESCRIPTION AND FUNCTIONS OF EACH PART.

The equipment Switch on / Switch off.

A green led switch on will let us know that the equipment is activated.

Calibration Diode Led.

The calibration diode led will be on in case that the equipment present values and such calibration values do not agree with. In opposite case it will be off.

The values that should be considered in the calibration are based on the inputs that it has selected:

- Brightness, Contrast and Saturation, for composite video signal, PAL and SECAM.
- Brightness, Contrast, Saturation and Hue for composite video signal, NTSC.
- Brightness and Contrast for SDI, RGB (PC) video signal.

Optical Encoder.

The optical encoder serves to move through the different menus that the system offers and to change values of the system. Moving the optical encoder in clock wise direction, a value will be increased or the window of selection in the menus. Moving it in opposite sense, a value will be decreased or the window of selection.

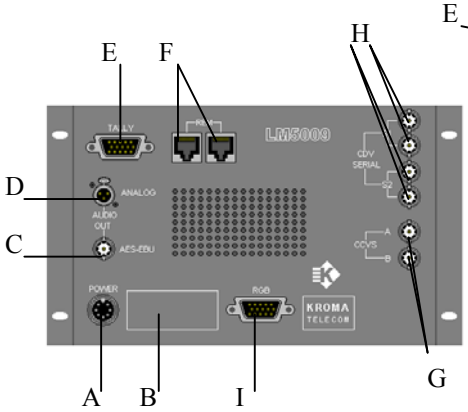
Keyboard.

The keyboard allows to execute operations that the system offers in a direct way, without going to the menus.

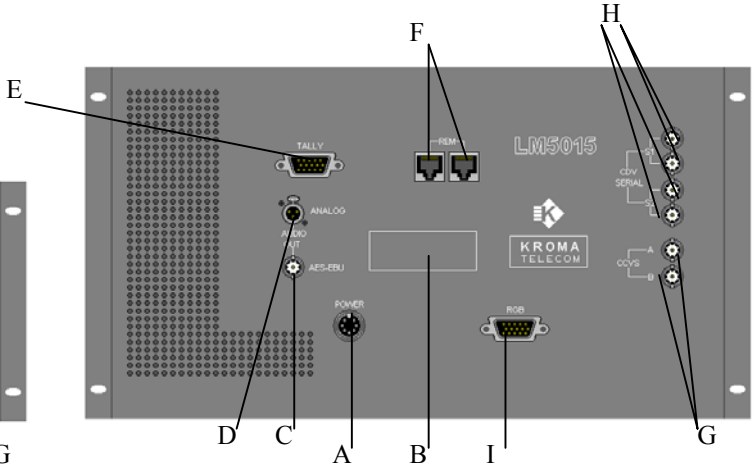
Tally Led Indicator.

Using the Tally connector located at the rear panel, it will allow to select or to indicate the active monitor, in which case it will be activated , in that case it will be swithed on.

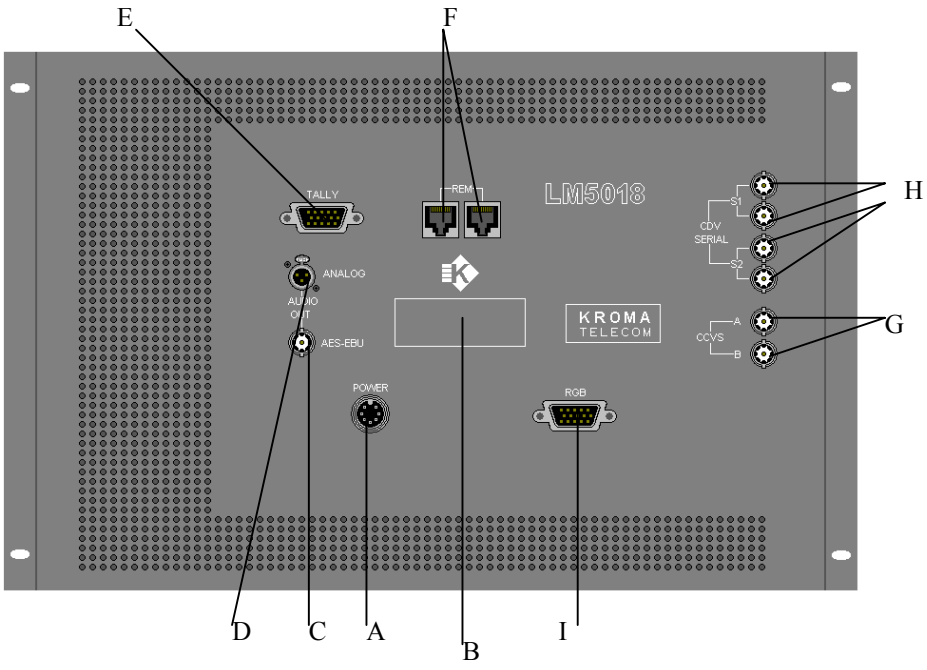
2. REAR PANEL



LM5009



LM5015



LM5018

A) Power

B) Serial Number & Power Supply

C) AES-EBU Audio Output (optional).

D) Analog Audio Output (optional).

E) Tally Input Indicator

F) Connection with the Remote Equipment.

G) Composite Video Inputs (A & B) (optional).

H) SDI Video Inputs (S1 & S2) (optional).

I) RGB (PC) Input (optional).

2.1 DESCRIPTIONS AND FUNCTIONS:

Power.
The power supply characteristics will have to agree with the ones indicated in label B.

Serial Number
This identification card allows to distinguish three basic parts:
- The equipment Serial number.
- Necessary Power supply for the equipment at issue (voltage and power).
- Options installed into the equipment (CCVS, SDI and/or RGB(pc).

AES-EBU Audio Output .
Only it will be available if the SDI option is installed into the equipment.

Analog Audio Output .
Only it will be available if the SDI option is installed into the equipment.

Tally Input Indicator.
It allows to indicate the active screen.

Connection with the Remote Equipment.
Optionally, the TFT Monitors, series LM5000, have a remote equipment (RK5000) that allows to control the screens remotely.

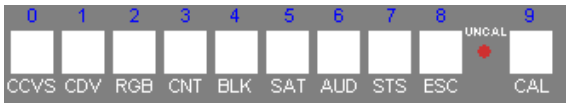
Composite Video Inputs
The equipment can have two inputs (CCVS A and CCVS B) in composite video, it admits video signal in PAL, NTSC or SECAM.

SDI Video Inputs.
The equipment can have two inputs SDI (S1 and S2) with passive loop through (75Ω termination)

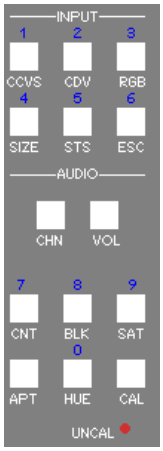
RGB (PC) Input
The equipment can have a RGB(pc) input, depending on the equipment admits the following PC resolutions:

- LM5009A11, LM5015 and LM5018:
- VESA Standard Resolutions:
  - 640x480 60Hz.
  - 800x600 56Hz.
  - 800x600 60Hz.
  - 1024x768 60Hz

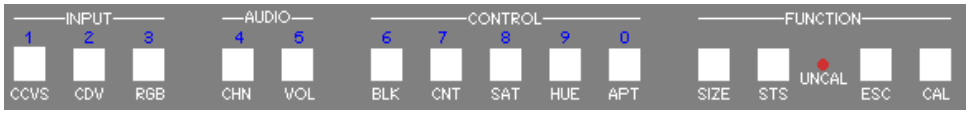
3. KEYBOARD



LM5009



LM5015



LM5018

3.1 COMMON KEYS FOR ALL THE EQUIPMENTS

- **CCVS:** Composite video input selection. The first time that the key is pressed appears the current, and the second and the successive ones will cause a change of video input. If the CCVS option is installed will appear an indicative text on the screen, it will show the input selected in each time, and the presence or absence of signal in the same one. If the CCVS option is not installed, it will appear a message of absence of the CCVS option. After few seconds or pressing the ESC key such message will disappear automatically.

- **CDV:** SDI input selection. The first time that the key is pressed appears the current, and the second and the successive ones will cause a change of video input. If the CDV option is installed will appear an indicative text on the screen, it will show the input selected in each time, and the presence or absence of signal in the same one. If the CDV option is not installed, it will appear a message of absence of the CDV option. After few seconds or pressing the ESC key such message will disappear automatically.

- **RGB:** RGB input selection. In this case, only there will be one key pressing, because there is only one RGB input. If the RGB option is installed will appear an indicative text on the screen, it will show the input in each time, and the presence or absence of signal in the same one. If the RGB option is not installed, it will appear a message of absence of the RGB option. After few seconds or pressing the ESC key such message will disappear automatically. The resolution detection is automatic by the system.

- **CNT:** Contrast Control on the screen. Once this key is pressed, it will show the screen current value of contrast and if it agrees with the calibrated value (CAL), if not (UNCAL). By means of the optical encoder (C in the front part), this value will be able to be changed. Pressing the CAL key the contrast value will be calibrated. After few seconds or pressing the ESC key such message will disappear automatically.

- **BLK:** Brightness Control on the screen. Once this key is pressed, it will show the screen current value of brightness and if it agrees with the calibrated value (CAL), if not (UNCAL). By means of the optical encoder (C in the front part), this value will be able to be changed. Pressing the CAL key the brightness value will be calibrated. After few seconds or pressing the ESC key such message will disappear automatically.

- **SAT:** Saturation Control on the screen. It is only for composite video signal. Once this key is pressed, it will show the screen current value of Saturation and if it agrees with the calibrated value (CAL), if not (UNCAL). By means of the optical encoder (C in the front part), this value will be able to be changed. Pressing the CAL key the saturation value will be calibrated. After few seconds or pressing the ESC key such message will disappear automatically.

- **AUD & CHN:** Compatible keys. Only it is available if the SDI option is installed. They are configurables through *PROGRAM FUNCTION* menu. Depending on how they are configurated, they will be working as the following function/operation:

- Access to EMBEDDED AUDIO menu.

- Audio channels output selection: It will allow to select the Audio channels output in Analog or AES-EBU Digital. In this case, the Analog output has priority, so, the output will be selected based on the same one.

  The first time that this key is pressed it will indicate the last Audio channels outputs selected and the second and successive ones will do an output channels change.

After few seconds or pressing the ESC key such message will disappear automatically.

- AES-EBU Audio output channels selection: It will allow to select the AES-EBU audio output channels.The first key pressing will indicate the last AES-EBU Audio output channels selected and the second and successive ones will do an output channels change. After few seconds or pressing the ESC key such message will disappear automatically.

  Analog Audio output channels selection: It will allow to select the Analog Audio output channels. The first key pressing will indicate the last Analog Audio output channels selected and the second and successive ones will do an output channels change. After few seconds or pressing the ESC key such message will disappear automatically.

  - Volume control (only key AUD): Only it is allowed to change the analog audio volume. Pressing this key it will show the current value for the volume. By means of the optical encoder (C in the front part), this value will be able to be changed. After few seconds or pressing the ESC key such message will disappear automatically.

The only difference between the two keys, is that key AUD can be configurated as volume control, while the CHN can not, due to on LM5015 and LM5018 equipments there is an associated key for this function (VOL).

- **STS:** Access to the system menus.

- **ESC:** To cancel an operation or to abandon a certain operation.

- **CAL:** It allows to return to the calibrated value or to select an option from the system menus.

3.2 SPECIFIC KEYS FOR LM5015 & LM5018 Equipments

- **SIZE:** Screen aspect ratio (4:3 or 16:9). The first key pressing will indicate the current aspect ratio on the screen, and the second and the successive ones will cause a change of format. This is only for Composite and SDI video signals. After few seconds or pressing the ESC key such message will disappear automatically.

- **VOL:** Only it is allowed to change the analog audio volume. With this keystroke it will show the current volume value that the equipment has. By means of the optical encoder (C in the front part), this value will be able to be changed. After few seconds or pressing the ESC key such message will disappear automatically.

- **APT:** Aperture selection. This is only for composite video signals.When this key is pressed, it will appear a menu, moving with the optical encoder (C in the front part) and by means of the CAL key, we will be able to choose one of the available options. In order to leave the menu we will press the ESC key.

- **HUE:** Hue control on the screen. This is only for NTSC video signals. When this key is pressed, it will appear the current screen Hue value, and if it agrees with the calibrated value (CAL) , if not (UNCAL). By means of the optical encoder (C in the front part), this value will be able to be changed. Pressing the CAL key the Hue value will be calibrated. After few seconds or pressing the ESC key such message will disappear automatically.

3.3 EXPLANATIONS ABOUT THE KEYBOARD

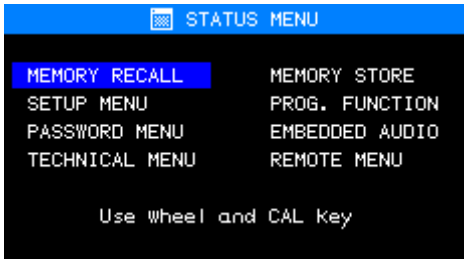
- The numbers that appear upon the keys, serve to introduce user passwords or to introduce numeric data.
  (For example the equipment network identifier" ID").

- It is not neccesary to wait a text disappear for pressing another key. Automatically the associated operation will be executed to the second pressed key.

4. MENUS

The access to the menus is made through STS key, located in the front panel.

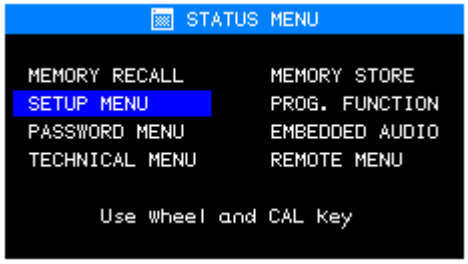
4.1 STATUS MENU



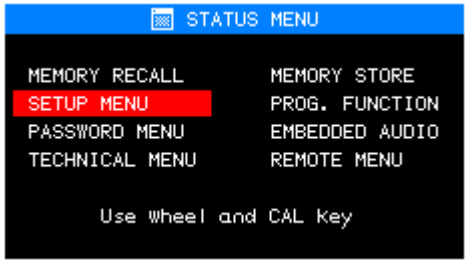
The STATUS menu is the main one of the system. From this status menu it is possible to access to the different operations that it offers.

In order to accede to a menu, as it is indicated, the optical encoder must be used (C in the front part) to move the selection window until you reach the wished menu. In order to select it, the CAL key must be pressed.

For example, if we want to accede to SETUP menu, we must vary the optical encoder in clock wise direction (positive sense) to increase the position of the selection window:



Next, press CAL key, then it will accede to this menu



If the user wants to leave from the menus application, the ESC key will be pressed, and then, it will disappear.

Pressing for one second time STS key, it appears a submenu denominated **CONFIGURATION VALUES**, with the following aspect:

This menu shows the equipmetn current configuration. It can be distinguished the following parts:

- **BOARDS**: it indicates the options installed into the equipment.
  - CCVS: It has available two composite video inputs (CCVS A & B).
  - CDV: : It has available two SDI video inputs with passive loop-through (S1 & S2).
  - RGB: It has available one RGB(PC) video input.

- **VERSION**: It shows the equipment software version installed. The software versions could be updated. For that reason, contact your supplier.

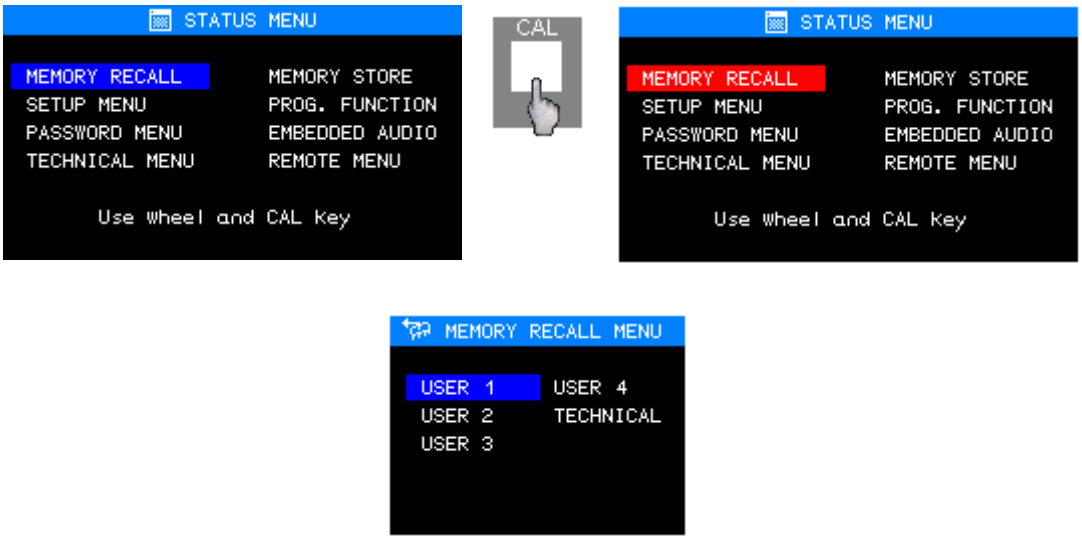
- **SYSTEM**: It indicates if there is any Hardware error. If there is not any error, it will appear an OK. In the opposite case, it will appear an error code. In this case, you must contact your supplier in order to solve the possible problems and to avoid the non-operation system.

- **FPGA VERSION:** It indicates the system FPGA configuration version, this configuration version can be also updated. For that reason, contact your supplier.

- **THE EQUIPMENT VALUES:** as follow we can find the (***ACT***), and (***CAL***) values.

In order to leave this menu, press STS or ESC key.

4.2 MEMORY RECALL MENU

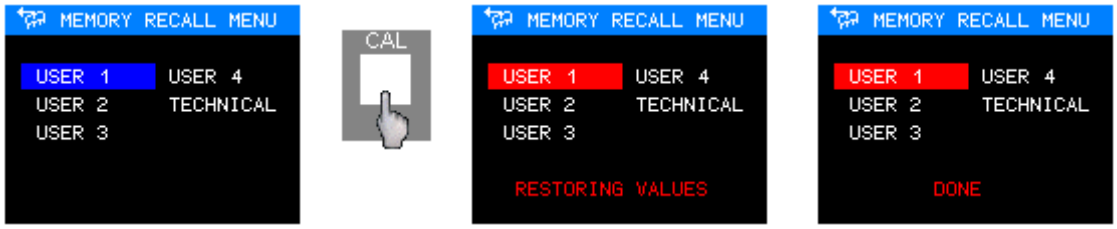


Access Sequence

The **MEMORY RECALL** menu allows to recall the values of the equipment, all the values stored by an user or by the technicians, existing values in different memories (user 1-user 4 and technical). The values that will recall are:

- Control Values (Brightness, Contrast, Saturation, etc.) and the calibration ones.
- Audio Values (volume, Group and analog channels output, groups and AES-EBU channels output).
- Geometry Values (h-shift, v-shift, h-soc, etc.).
- Menu Values "PROGRAM FUNCTION".

In order to recall a memory, it will be enough locating the selection window in the wished one by means of the optical encoder (C in the front part) and pressing the CAL key. Then, it will appear a text showing the recally progress and if this has been made successfully or not. (*DONE /ERROR*).



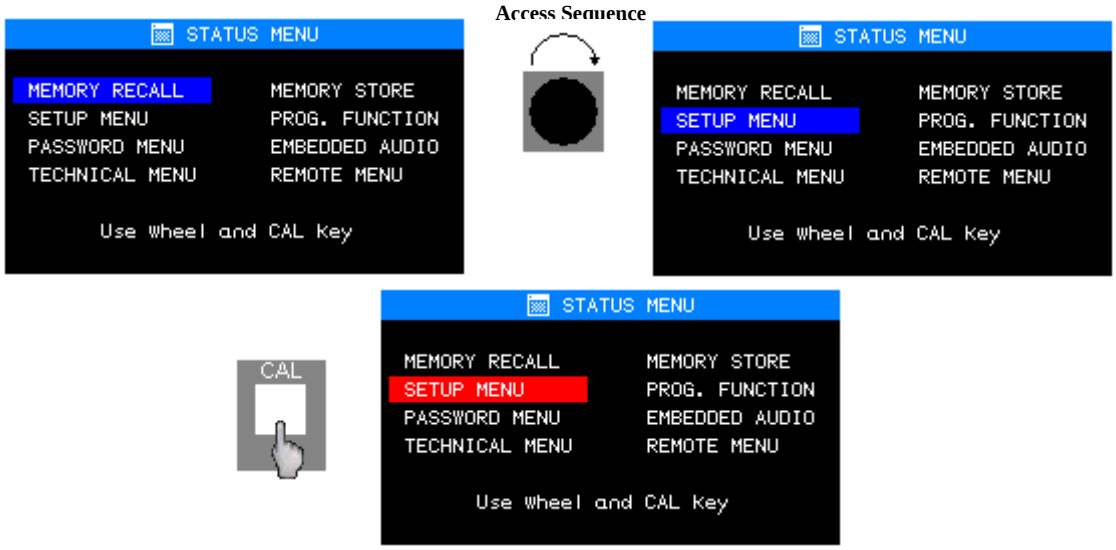
User 1 Recall Memory Sequence

In order to leave this menu, press ESC key.

Observations:

All the user memories are at first initialized with the technical values.

4.3 SETUP MENU

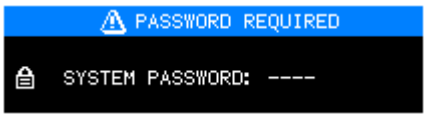


The SETUP menu allows to change the equipment values , as they are:

- Calibration Values (**CALIBRATION VALUES MENU**).
- Geometry Values (**GEOMETRY SETUP MENU**).
- Colorimetry Values (***COLOUR SETTINGS***).
- To calibrate the equipment with the current values (**CAL WITH ACTIVE DATA**).
- To configure the options installed in the equipment(***CONFIG. OPTIONS***).

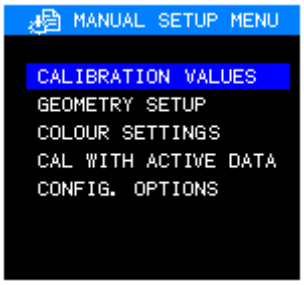
In order to accede to them, it is necessary to introduce a password. In this way, it is avoided that the screen values can be modified by a nonauthorized user.

The password that is requested for, as can be verified, is the one from the SYSTEM, which one, will be introduced after pressing the CAL key by means of the keyboard (Remember that upon each key exist the equivalent of each one in numerical format).



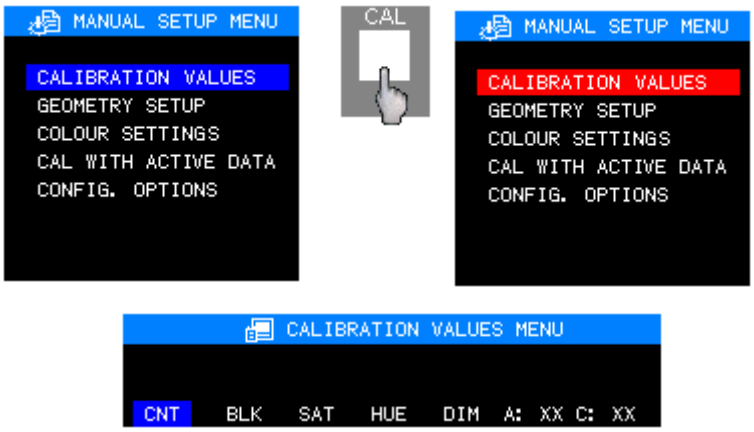
If the password is correct, it will be acceded directly to the MANUAL SETUP menu. In the opposite case, it will be returned to STATUS menu.

4.3.1. SETUP MENU MANUAL



From this menu, it is possible to be acceded to the equipment values in order to edit them and/or to modify them.

4.3.1.1.CALIBRATION VALUES MENU

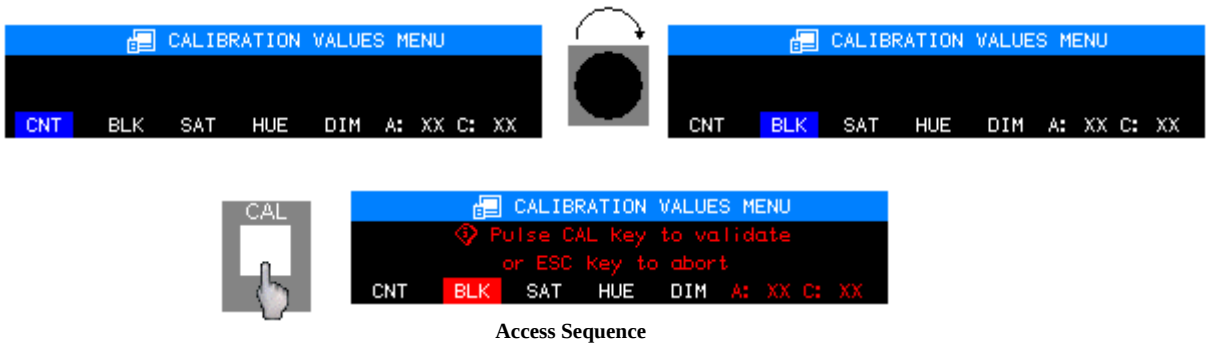


Access Sequence

The **CALIBRATION VALUES** menu, allows to modify the contrast , brightness, saturation values (only for CCVS signal), Hue (only for NTSC signal) and Dimmer.

In this menu we can observe that in each moment it is showed the current value (A) and the calibration value (C) of the control that is desired to modify.

In order to change a value, in the first place we will select by means of the optical encoder (C in the front panel) and after to press the CAL key.



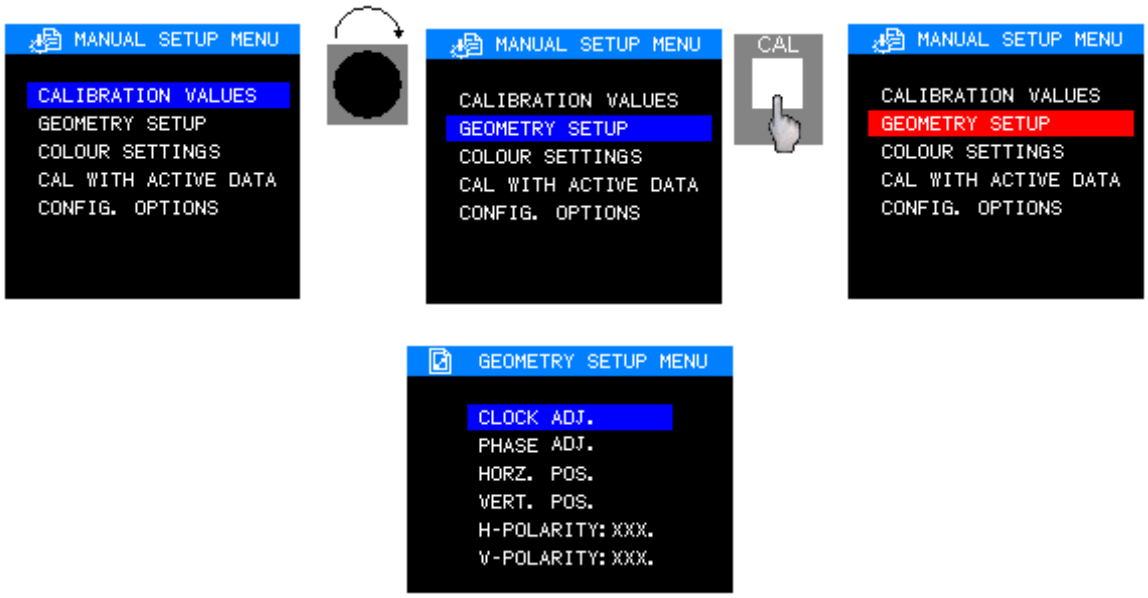
Access Sequence

The selection will be marked in red. By means of the optical encoder, the value is varied.

Pressing CAL key once again the new value will be validated. Pressing ESC key it will be recalled the initial value and the changes will not be stored.

In order to return to the MANUAL SETUP menu, press ESC key.

4.3.1.2.GEOMETRY SETUP MENU (ONLY FOR RGB VIDEO SIGNAL)



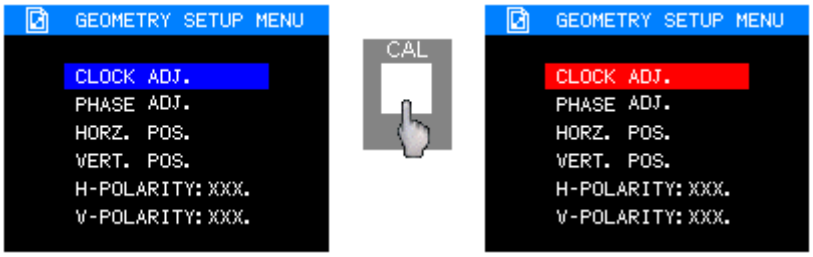
Access Sequence

The **GEOMETRY SETUP** menu allows to change:

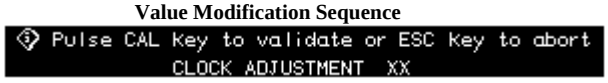
- ***CLOCK ADJ.:*** Sample clock frecuency of the analog signal.
- ***PHASE ADJ.:*** Sample clock phase of the analog signal.
- ***HORZ. POS.:*** Horizontal position of the image.
- ***VERT. POS.:*** Vertical position of the image.
- ***H-POLARITY:*** Horizontal Sync of the RGB signal.
- ***V-POLARITY:*** Vertical Sync of the RGB signal.

Each option of the menu, is independent for each type RGB resolution, so, we can have defined a horizontal position a resolution of 640x480 @ 60Hz and another one of 800x600 @ 60Hz.

In order to adjust a value, it must be selected by means of the optical encoder (C in the front panel) and finally press the CAL key.



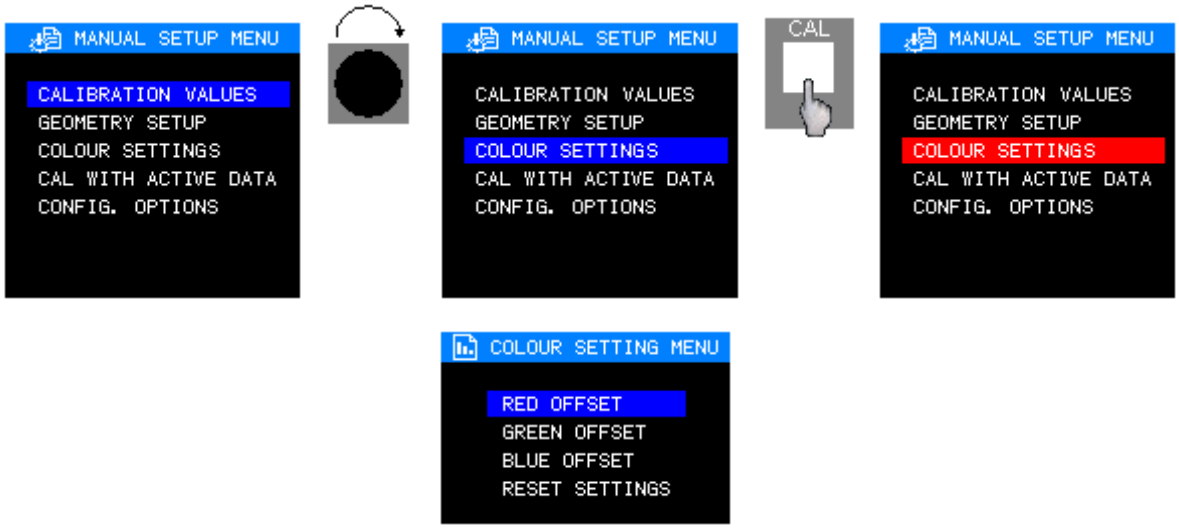
Value Modification Sequence



By means of the optical encoder, if we press again CAL key the new value will be validated. The H-POLARITY and V-POLARITY options are changed/varied by

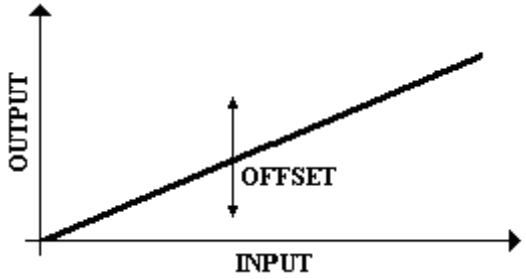
pressing CAL key (Negative or Positive). By pressing ESC key, it will recall the initial value without storing any change.

4.3.1.3. COLOUR SETTING MENU



Access Sequence

The COLOUR SETTING Menu allows to shift each RGB colour component.



In order to adjust one of these values, it must be selected by means of the optical encoder (C in the frontal panel) and then press CAL key.

Value Modification Sequence

By means of the optical encoder, this value could be changed. Pressing the CAL key the new value will be validated or approved.

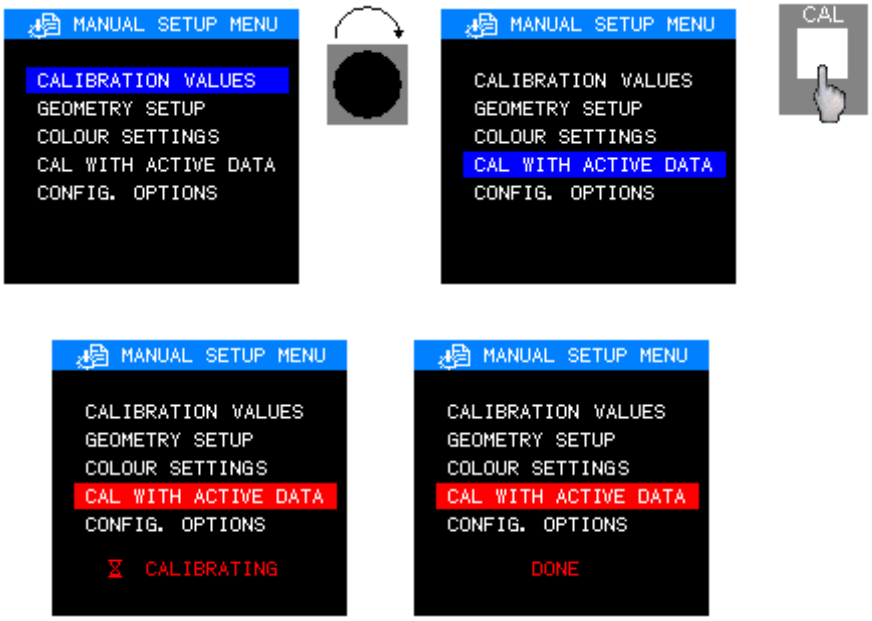
By pressing ESC key, it will recall the initial value without storing any change.

The **RESET SETTINGS** option will recall the values to its normal value.

In order to leave the menu, press the ESC key.

4.3.1.4. CAL WITH ACTIVE DATA

The option CAL WITH ACTIVE DATA, allows to calibrate the equipment with the current values. For that, it is neccesary to select the option by means of optical encoder (C in the front panel) and to press the CAL key.

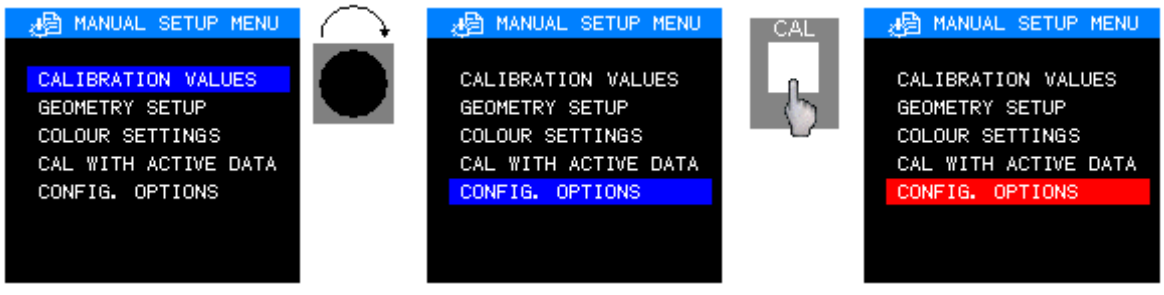


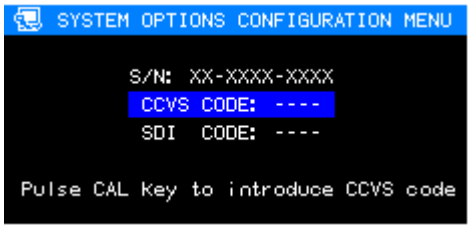
Secuencia de calibración del equipo

Then, it will appear a text showing the recally progress and if this has been made successfully or not. (*DONE or ERROR*).

Pressing the ESC key, it will return to the ***STATUS*** menu.

4.3.1.5. SYSTEM OPTIONS CONFIGURATIONS MENU





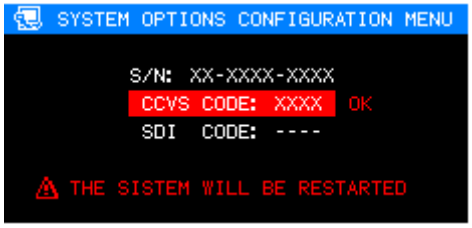
Access Sequence

The ***SYSTEM OPTIONS CONFIGURATIONS*** menu allows to activate options in the equipment that it have not been in its origin. For it, a code of 4 numbers is requested for, that will activate the option. This code, is facilitated by your distributor and is unique for each equipment.

If you want to activate an option of the equipment, the steps to follow are:

1) Contact your distribuitor and let him know the equipment serial number. Then, the activation code will be facilitated/provided.

2) Once you know such code, it is acceded to the menu and by pressing CAL key it will be introduced.

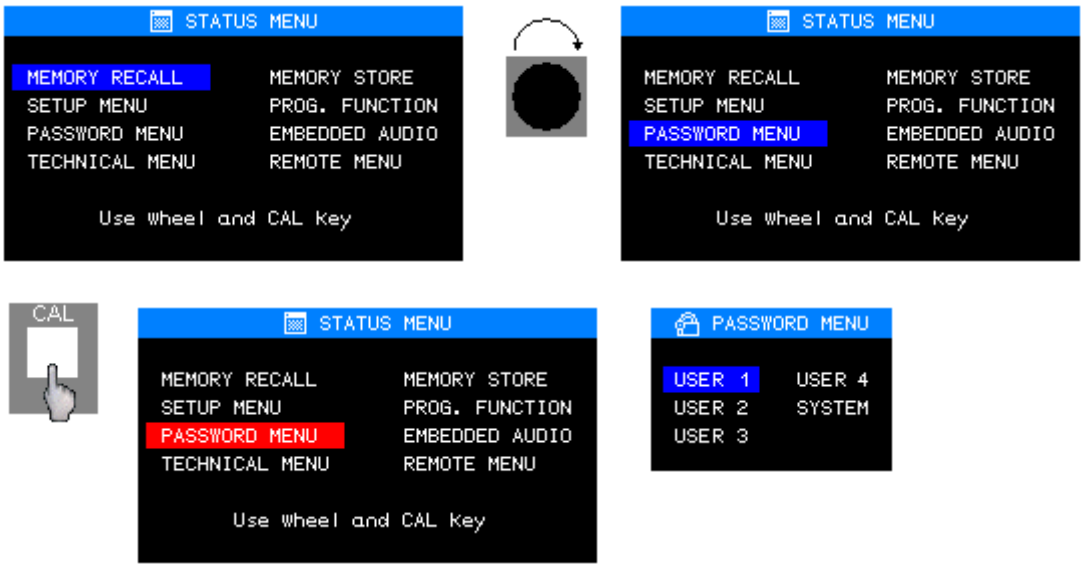


3) If the introduced code is correct, the equipment will be reinitiated automatically,so, the option will be activated. In opposite case, it will give an error message.

4) There is a different code for each option and for each equipment according to its serial number.

   By pressing the ESC key, it will return to ***MANUAL SETUP*** menu.

4.4. PASSWORD MENU



Access Sequence

The **PASSWORD** menu allows to modify the passwords from (user 1 to user 4) and the one from the system.

In order to modify a password, you must be located on it and press CAL key:

Password Change

First of all, the old password is requested for, to assure that it cannot be changed by any other person:

Old Password Request

As it is possible to be observed, in the menu headline (above), it appears the user who is going to change the password.

If the introduced old password is correct, it will become to change the password. In the opposite case, it will give an error message,and it will become to the initial state of **PASSWORD** menu. In the password change, the new code is requested for:

New Password Request

Once introduced, confirmation of the password is requested for, so that the change is effective.

Password Confirmation

If the password confirmation is correct, the old password will have been modified. In the opposite case, the old one will stay.

Finished the process, automatically it will become to the PASSWORD menu.

In order to leave this **PASSWORD** menu, and return to the **STATUS** menu it will be necessary to press the ESC key.

4.4.1. EXPLANATION ON THE PASSWORDS

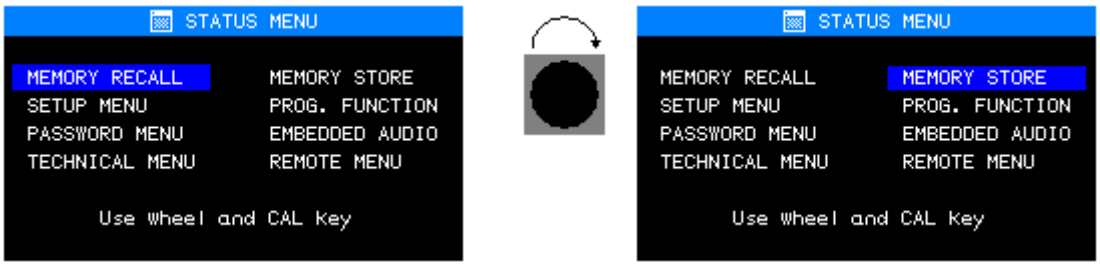
Initially, all the codes passwords are initialized with values 1234 (from factory).

4.5 TECHNICAL MENU

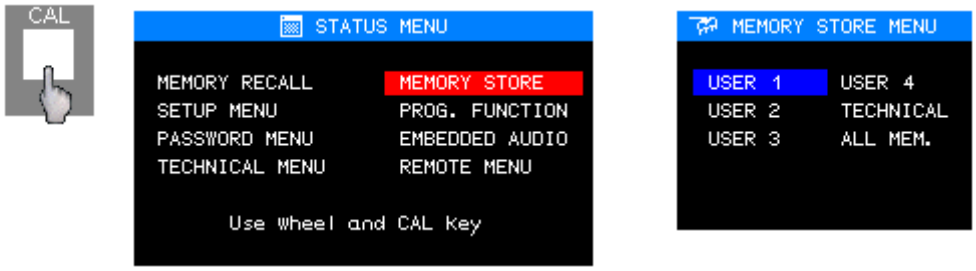
Access Sequence

The TECHNICAL menu is of restricted access. The KROMA TELECOM technicians will be only able to accede to this menu by introducing its password.

4.6 MEMORY STORE MENU



Access Sequence



The MEMORY STORE Menu, allows to store the current values of the equipment in the different memories from user (user 1 to user 4 and technical). These values will be those that will recover in MEMORY RECALL menu in case of being necessary.

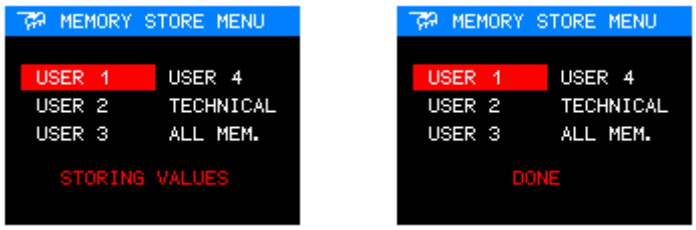
- Control Values (Brightness, Contrast, Saturation, etc.) and the calibration ones.
- Audio Values (volume, Group and analog channels output, groups and AES-EBU channels output).
- Geometry Values (h-shift, v-shift, h-soc, etc.).
- Menu Values “PROGRAM FUNCTION”.

It is necessary to remark that the technical memory cannot be modified. In this way, the technical values in the equipment will be able to be always recovered. On the other hand, the option “all memories”. (ALL MEM.) only can be used by the technicians.

In order to store the values in a memory, in the first place we must be located with the selection window in the memory wished by means of the optical encoder (C in the front part) and press the CAL key.

In order to avoid the writing of the memories by a nonauthorized user, the password of the memory is asked for in which it is desired to store. If the introduced password is correct, it will become to store the values that the system has at the moment in the memory of corresponding user. In the opposite case, it will become to the initial state of **MEMORY STORE** menu.

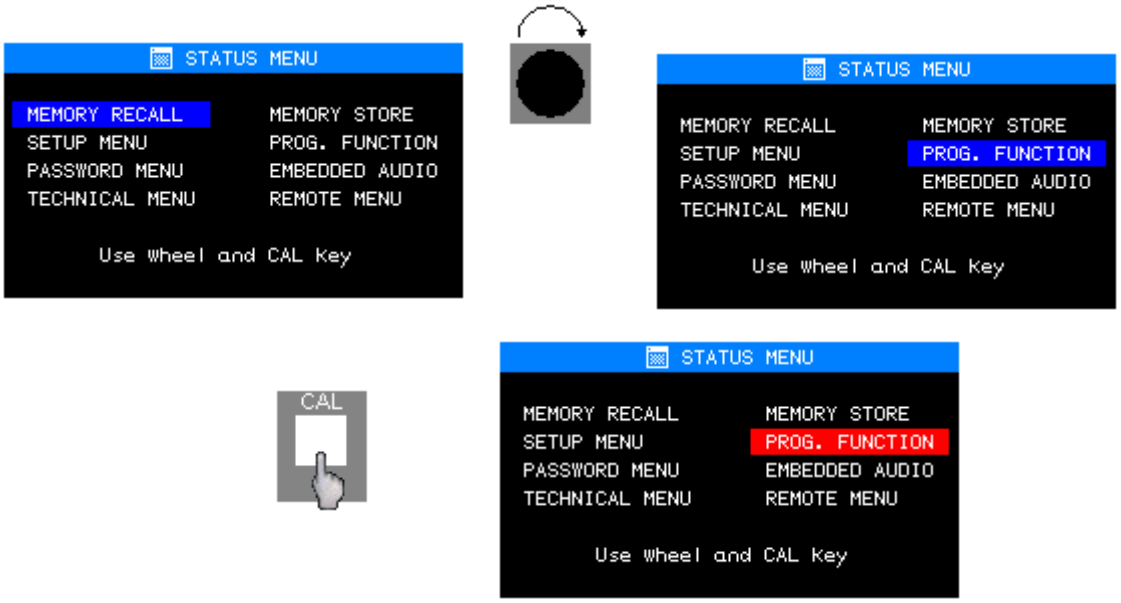
Then, it will appear a text showing the recally progress and if this has been made successfully or not. (*DONE or ERROR*).



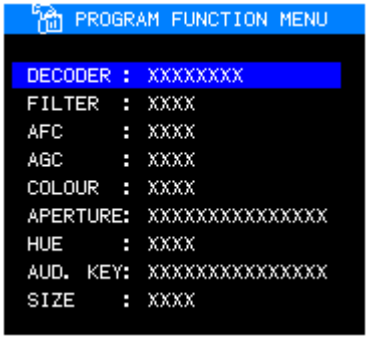
Storing Sequence

In order to leave the MEMORY STORE menu, the ESC key will be pressed.

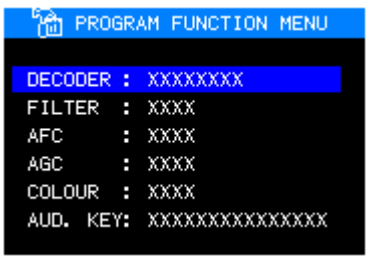
4.7 PROGRAM FUNCTION MENU



Access Sequence



LM5009



LM5015 y LM5018

The **PROGRAM FUNCTION** Menu, allows to program diverse aspects of the system, as they are:

- **DECODER**: it configures the decoder for PAL/NTSC or SECAM signal. It is only for composite video signal. In order to change the decoder function press the CAL key.

- **FILTER**: Decoder output filter. It can be a COMB or NOTCH filter. It is only for composite video signal. In order to change the output filter,we will be located upon the windows selection and we press the CAL key.

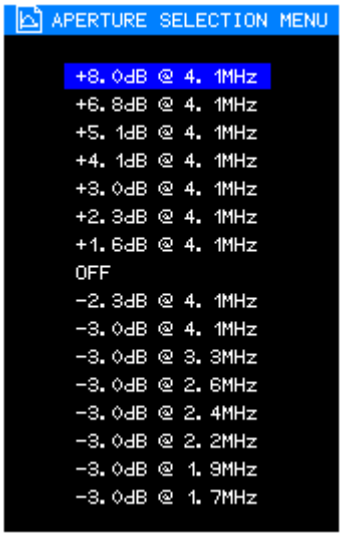
- **AFC**: it allows to syncronize composite video signals coming from VTR in FAST way. It is only for composite video signal. In order to modify the AFC press the CAL key.

- **AGC**: Automatic Gain Control. If it is configurated in ON mode, independently of the origin signal, it will establish nominal values for the signal when it is presenting/displaying on the screen. It is only for composite video signal. In order to modify the AGC press the CAL key.

- **COLOUR**: Colour of the picture. It is only for composite video signal. It can have the AUTO value, so, such picture would have the colour adjusted in the saturation, or it could be MONO, so, the picture would be displayed in black and white. It is necessary to consider, if the MONO option is active, the equipment saturation will not be able to be changed. In order to change the colour press the CAL key.

- **APERTURE:** Aperture Control. This function only appears in LM5009 equipments, since they do not have associated key to such function as equipment LM5015 and LM5018 (APT key). This option is only for composite video signals.

  In order to change the image aperture we will be located in this option and we will press the CAL key, then, it will appear a new menu:

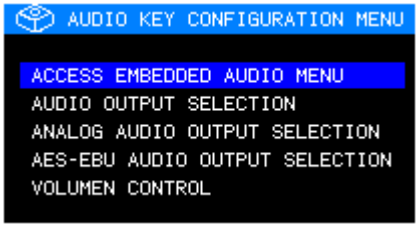


A value of aperture will be chosen raises upon and pressing the CAL key. If we do not wish to modify the current aperture, the ESC key will be pressed and it will become to the **PROGRAM FUNCTION** menu.

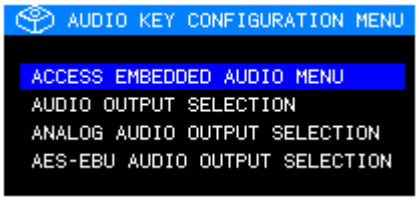
HUE: Hue Control. This function only appears in LM5009 equipments, since they do not have associated key to such function as equipment LM5015 and LM5018 (HUE key). This option is only for video signals in NTSC. It makes to simulate the pressing of the HUE key.

AUD KEY (LM5009) or **CHN KEY** (LM5015 & LM5018): it allows to configure key AUD or CHN, depending on the equipment. In order to change the function of key AUD or CHN we will be located upon in this option and we will press the CAL key, then, it will appear a new menu ':

-



LM5009



LM5015 and LM5018

A function will be chosen from AUD or CHN key, upon in one of them, the CAL key will be pressed, so, it will be returned to PROGRAM FUNCTION menu. If we do not want to modify the current function, then, the ESC key. In both cases it will return to **PROGRAM FUNCTION** menu.

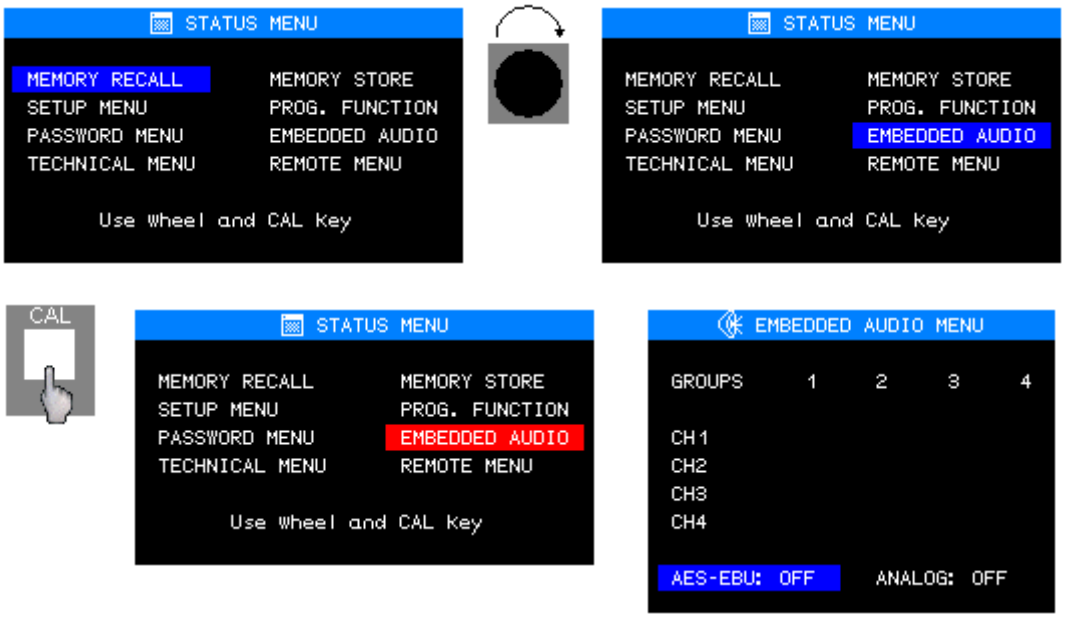
In LM5015 & LM5018 equipments do not appear the volume control option, because they have a key associated to such function (VOL key).

In order to know more information about the AUD or CHN key operation , you could see the explanation about the keyboard (point 3).

SIZE: Screen aspect ratio (4:3 or 16:9). This function only appears in LM5009 equipments, since they do not have associated key to such function as equipment LM5015 and LM5018 (SIZE key). This is only for composite video signals and SDI video signals. In order to change the format, we will locate upon SIZE option, and we will press CAL key.

In order to leave this menu, press the ESC key.

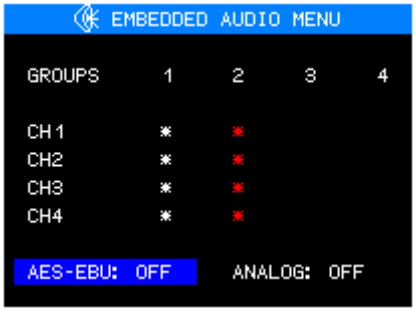
4.8. EMBEDDED AUDIO MENU (ONLY FOR SDI VIDEO SIGNAL)



Acces Sequence

The **EMBEDDED AUDIO** menu shows information on the audio of the signal and allows to make the audio selection output in Analog and AES-EBU.

The menu shows the groups and their corresponding audio channels. The presence of an asterisk wants to indicate that such group and channel have audio. On the other hand, the absence of such asterisk, will indicate absence of audio in that group and channel.



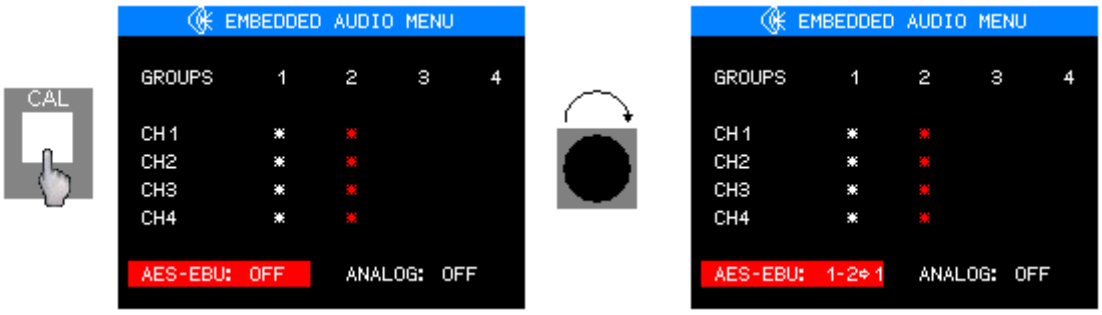
Example

A red asterisk indicates presence of STEREO audio, and a white asterisk indicates presence of MONO audio .

The output audio selection in Analog and AES-EBU case is made by pairs of channels (1-2 and 3-4), selecting the wished group.

In the example we can see that there are audio in channels 1, 2, 3 & 4 and groups 1 & 2. This audio is MONO in group 1, and STEREO in group 2. For example, if we want the output AES-EBU audio connector (C in the rear panel) to have the audio in channels1 & 2 of group 1, we will be located on it with the selection window and then,

we press CAL key. Moving the optical encoder we will select the desired output and we must press the CAL key to validate it.

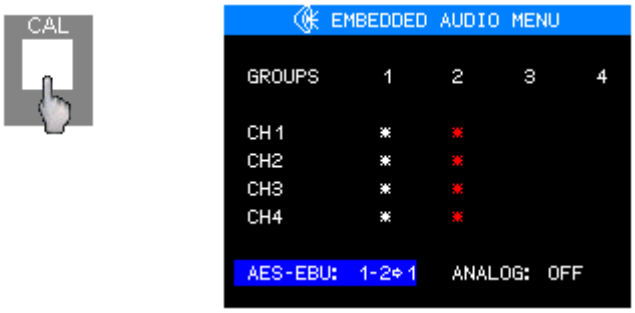


Application Example

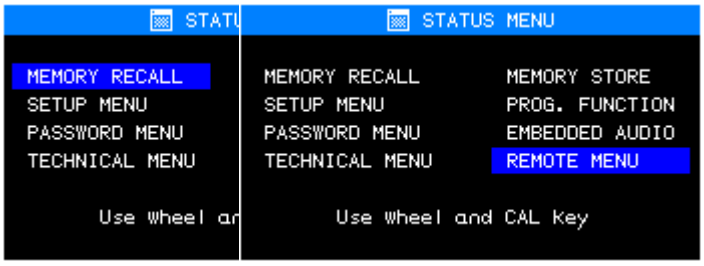
In this case, we have selected channels 1 and 2 (1-2) belong to group 1 (→) for the AES-EBU output. The process would be exactly the same one to make a selection of analog audio output (D in the rear panel) and for any audio group and pair of channels

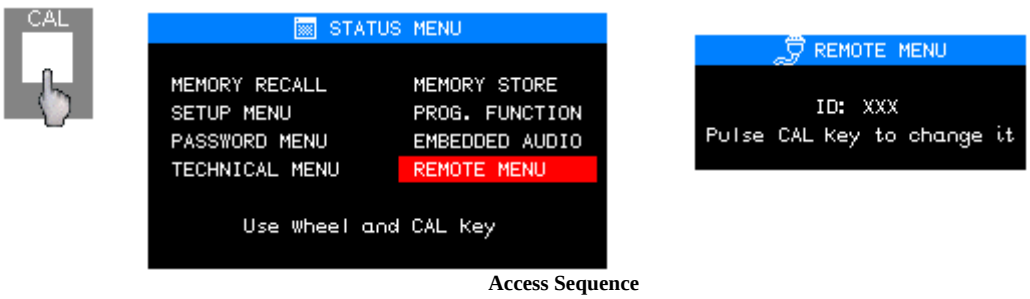
The audio update in this menu is done in a continuous way.

In order to leave this menu, press the ESC key.



4.9 MENU REMOTE





Access Sequence

The REMOTE menu, allows to define a of network identifier in case such equipment needs to be controlled remotely (through RK5000 equipment).

The network identifier must be located in the range from 0 to 254, allowing to have up to 255 equipment simultaneously controlled by only one remote equipment.
In order to modify the network identifier of the equipment, the CAL key must be pressed, and then, to introduce the new identifier by means of the keyboard.

ID Network Modification

If the modification is correct will appear the message: OK. In opposite case, an error has been generated.

The operations that the remote equipment allows to make on series LM50XX are the same ones that allows each equipment through its keyboard.

4.9.1. EXPLANATIONS ABOUT THE NETWORK IDENTIFIER

By defect, the network identifier will be initialized to 001[1].

[1] In order to find more information about the equipment operation in remote way, check the RK5000 equipment User Manual