LIBERTY

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A BIG FAMILY OF DIGITAL DIMMERS

6Ch x 2,5Kw / 6Ch x 5 Kw / 12Ch x 2,5 Kw

USER MANUAL

Version 1.1

INDEX

DIMMERS LIBERTY, a big family

The most competitive dimmers, completely digital and high quality.

The **LIBERTY** dimmers have a new design concept that they permit us different configurations of the base unit.

These dimmers are perfects to fixed installations and like tours dimmers. Designed for standard cabinets of 19". These dimmers are the ideal for Theatres, Auditoriums, Orchestras and Discotheques, Television studios and others events.

LIBERTY dimmer models: 6 channels x 2,5 kW
12 channels x 2,5 kW
6 channels x 5 kW

This user manual is based mainly in the dimmer of 6 channels x 2,5 kW, the most functions are exportable to the other models.

TECHNICALS CHARACTERISTICS

- **Channels – Power:**

LIBERTY **6 channels x 2,5 kW** (2U):

LIBERTY **12 channels x 2,5 kW** (3U):

LIBERTY **6 channels x 5 kW** (3U):

- Slow rearm at switch on (≈ 2 s).
- Frequency automatic adjust between 40Hz & 70Hz.
- Microprocessor dimming control, by input phase. Software control of the main supply noise, avoiding flickering.
- The last valid DMX signal is maintained in the outputs when the digital communication faults.
- One backup memory.
- 3 phases.
- Circuit breaker (one pole) by channel. Optional – It is possible to install DPN circuit breakers. In the 5kW dimmer the circuit breaker, always, is of 2 DPN.
- Fan forced ventilation.
- Noise suppression: minimum 100 μs AMECON chokes. Efficiency between 25% & 100% of the nominal channel load.
- Power control: Triac 25 A, for 2500 W. Triac 40 A for 5000 W.
- Digital control: DMX-512 (1990).
- Analogy control: 0 +10V.
- 1 LEDs per channel, give us the channel output level.
- 1 information LED for DMX input.
- 1 information LED for correct electronic power supply.
- Numerical display of 4 digits for general information & menus.
- 3 function keys for menus.
- Dimming curves: Lineal, square, invert square, on/off & park. These curves are adjusted with the input frequency.
- Preheat level. This function is lineal for all dimmers channels.
- **Menus**:
    - DMX direction (lineal patch).
    - Preheat level.
    - Curve by dimmer pack or by channel.
    - Test functions: DMX, 0 +10 & software.
    - Back Up: One backup memory is possible.

- **Size** in mm (width x depth x height):

6 x 2,5 kW:	483 (19") x 400 x 88 (2U). Weight: 10,5 Kg.
6 x 2,5 kW (Schukos):	483 (19") x 400 x 132 (3U). Weight: 12 Kg.
12 x 2,5 kW:	483 (19") x 400 x 132 (3U). Weight: 15 Kg.
6 x 5 kW:	483 (19") x 400 x 132 (3U). Weight: 15 Kg.

Electrical characteristics:

- Power input: 3 phases + neutral + ground
    - 230V~ / 5kW 50/60Hz. (1 phase connection).
    - 230/400V_3~ /15kW 50/60Hz. (3 phases connection).
- Temperature: -10ºC a 35ºC.
- Humidity (without condensation): 80%.
- Installation category: CAT II.

CONNECTIONS

Options of configurations for mains power input and regulated power outputs:

Model	Main Power Input			Regulated Power Output		
	Bornes	*Housing*	*Cable*	*Bornes*	*Harting*	*Schukos*
6 ch x 2,5kW	**Standard**	Option	Option	**Standard**	Option	-
6 ch x 2,5kW (Schukos)	-	**Standard**	Option	-	-	**Standard**
12 ch x 2,5kW	**Standard**	Option	Option	Option	**Standard**	**-**
6 ch x 5kW	**Standard**	Option	Option	**Standard**	Option	-

CONTROL SIGNALS

DMX-IN & DMX-THRU.

In the frontal panel: 2 XLR-3 connectors. Code:

GND. Pin 1
Data - Pin 2
Data+. Pin 3

Use a cable with twister pairs and shield. Characteristic impedance: 120 Ω, and low capacitance. Connect the shield to the pin number 1. Data - & Data + cables have to be in the same twister pair. Don't use audio cables.

OPTION: The dimmer can have 2 XLR-5 connectors. The connection code is the same (the 4 & 5 pins are NC).

0 +10V.

In the frontal panel: SUBD-15 male. Code by dimmer type:

SUBD-15/ Nº PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	**14**	15
6 x 2,5kW / Channel	1	2	3	4	5	6	NC	NC	NC	NC	NC	NC	NC	**GND**	NC
12 x 2,5kW / Channel	1	2	3	4	5	6	7	8	9	10	11	12	NC	**GND**	NC
6 x 5kW / Channel	1	2	3	4	5	6	NC	NC	NC	NC	NC	NC	NC	**GND**	NC

NC is "no connected".

POWER SIGNAL

POWER INPUT: INNER SCREW TERMINALS.

The dimmer has 4 screw terminals and 1 ground screw in the inner of the unit for 4 mm cable (6 Ch x 2,5 kW) or 6 mm cable (6 Ch x 5 kW & 12 Ch x 2,5 kW). In the rear panel there is housing like access for the input cables. Code:

Neutral N (blue)
Phase R (brown)
Phase S (grey)
Phase T (black)
And a ground screw for Ground.

POWER INPUT: EXTERNAL SCREW TERMINALS.

The dimmer has 5 screw terminals for 4 mm cable (6 Ch x 2,5 kW) or 6 mm cable (6 Ch x 5 kW & 12 Ch x 2,5 kW). Code:

Neutral N (blue)
Phase R (brown)
Phase S (grey)
Phase T (black)
Ground (Yellow-green).

¡Always connect the input ground in the LIBERTY! ⏚

REGULATED POWER OUTPUT

Bornes (screw terminals).

- Dimmer - 6 channels x 2,5 kW: 12 screw terminals/ 2,5 mm, labelled in the dimmer rear.
- Dimmer - 12 channels x 2,5 kW: 24 screw terminal/ 2,5 mm, labelled in the dimmer rear.
- Dimmer - 6 channels x 5 kW: 12 screw terminals/ 4 mm, labelled in the dimmer rear.
- Ground screw.

Harting.

- 6 channels x 2,5 kW Liberty: 1 Harting - 16 x 16A
- 12 channels x 2,5 kW Liberty: 1 Harting - 24 x 16A.
- 6 channels x 5 kW Liberty: 2 Harting - 6 x 35A.

LIBERTY models and their codes					
6ch x 2,5kW / HTS 16 x 16A		**12ch x 2,5kW / HTS 24 x 16A**		**6ch x 5kW / 2 HTS 6 x 35A**	
Channel 1	PIN 1	Channel 1	PIN 1	Channel 1	PIN 1 of **1**
Neutral 1	PIN 9	Neutral 1	PIN 13	Neutral 1	PIN 4 of **1**
Channel 2	PIN 2	Channel 2	PIN 2	Channel 2	PIN 2 of **1**
Neutral 2	PIN 10	Neutral 2	PIN 14	Neutral 2	PIN 5 of **1**
Channel 3	PIN 3	Channel 3	PIN 3	Channel 3	PIN 3 of **1**
Neutral 3	PIN 11	Neutral 3	PIN 15	Neutral 3	PIN 6 of **1**
Channel 4	PIN 4	Channel 4	PIN 4	Channel 4	PIN 1 of **2**
Neutral 4	PIN 12	Neutral 4	PIN 16	Neutral 4	PIN 4 of **2**
...	**...**	Channel 5	PIN 5	Channel 5	PIN 2 of **2**
Channel 6	PIN 6	**...**	**...**	Neutral 5	PIN 5 of **2**
Neutral 6	PIN 14	Channel 12	PIN 12	Channel 6	PIN 3 of **2**
N.C. PINES 7, 8, 15 & 16.		Neutral 12	PIN 24	Neutral 6	PIN 6 of **2**

Doubles - Schukos.

- Only for the special model of 6 channels x 2,5 kW (3U): 12 Schukos doubled, for the 6 regulated channels, numbered in the rear panel.

¡Always connect the protection ground for the load!

The load terminals have 230V~.
Maximum load.- 2,5kW (3 phases) or 850W (1 phase)
Don't connect equipment with accessible parts with voltage & without double isolation respect to its powered.

GENERAL

The LIBERTY dimmer, has software functions like:

Automatic adjust with the input frequency.
Zero cross detection controlled by the microprocessor.
Slow rearm in the switch on…

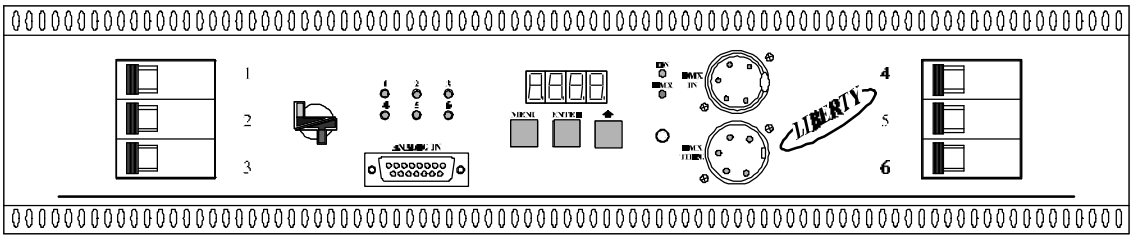
These functions do that the LIBERTY dimmer can work in the most hard conditions, with power generators, in noise ambient, etc.

The dimmer can detect and isolate noise in the power input and avoids the flickering.

Slow rearm in the switch on.- If switch on the loaded dimmer, the dimmer takes 2 seconds fading up to the current output level. Avoid a great consumption in the switch on process.
Automatic adjust with the input frequency.- This functions is to avoid flickering in their outputs. No adjust is needed for 50 Hz or 60 Hz power input.
Zero cross detection controlled by the microprocessor. To detect power input noise & avoid flickering in their outputs.

FRONTAL PANEL & INFORMATION

The frontal panel of the LIBERTY dimmers is:



- 6 circuit breakers (12 for 12 channels dimmers).
- 6 green LEDs to show us the output levels, one by channel (12 for 12 channels dimmers).
- 1 Hole to access at the inner Reset button.
- 1 red LED: DMX reception information. (DMX)
- 1 green LED: Correct inner power supply. (ON)
- 3 Function keys, MENU, ENTER & UP to use the dimmer menus.
- 1 Numerical Display with 4 digits, for general information & menus.
- The DMX-IN & DMX-THRU connectors.
- The analogy input connector, 0+10V.

The dimmer can work with 0+10V signal & DMX-512 signal at the same time, under HTP control. (High level Take the Priority).

DMX ADDRESS - DIR

To work with DMX-512 signal control the dimmer needs one DMX address. This address is the address of the channel number 1, or starting address. The LIBERTY dimmer has a lineal patch. The DMX address is between 1 & 512.

When we switch on the dimmer, in the display, normally we can see the DMX address.

Example: Suppose that one LIBERTY dimmer (of 6 channels) has to respond to the DMX 13 to 18. In the DIR menu, edit the DMX address to 13.

MENU	Access to the dimmer menus. The display show us the first menu: **dir**.	**dir** PrHt Cur TESt bACP
ENTER	Select the display menu. This menu permit us to change the DMX starting address. The cursor is in the canteens digit, you can edit this number with the ↑ key. For this example, don't edit this number.	**001**
ENTER	Accept the precedent date and to pass to edit the tens, now the cursor is in the tens digit. Press ↑ one time, to edit this number.	**001** **011**
ENTER	Accept the precedent date and to pass to edit the units. Press ↑ two times (up to see the 3 in this units digit).	**011** **013**
ENTER ó MENU	Press **ENTER**, to accept the DMX address and exit to the menu DIR. Ó Press **MENU**, to exit & don't accept the DMX edited address.	**13** ó **1**

Notes: If the DMX address is incorrect (for example: 000) the dimmer show us the message: **ºErº.** Edit one correct DMX address.
At any time we can exit to this menu pressing **MENU** key.

In normal mode, in the display we can see:

1

The DMX address of the dimmer, in this case DMX 1. Display by default.

DIMMER RESPONSE

The LIBERTY dimmer has a response time of **30 ms**, minimum time needed to pass for 0% to 100%.

A this basic time response we can added the curve response (see the CURVE menu).

INFORMATION LEDS

These LEDs are located in the frontal panel of the LIBERTY dimmer, these LEDs are:

- **LED ON**: At "On" if the inner power supply for the electronic is correct: 5Vdc.
- **LED DATA**: At "On" and flickering always that in the DMX-INPUT connector exits a digital signal type RS485.
- **LED 1..6**: Green LEDs, one by channel. These LED show us the output level of its channel. For the 12 channels dimmers, there are 12 green LEDs.

PREHEAT FUNCTION - PRHT

The LIBERTY dimmer permits us to set up a level for preheating, these level is applied to all dimmer channels. The level of preheating is between 0% - 99%.

By default this function is at 0% for all channels dimmers. To change the preheat level:

MENU	Access to dimmer menus. The display show us the first menu.	**dir**
↑	Scroll the main menu options. Press this key up to the display show us the option: PrHt. This is the second option in the list.	dir **PrHt** Cur TESt bACP
ENTER	Access to he preheat menu (PrHt). The first level digit is blinking (cursor), this digit can be edited wit the ↑ key. Edited this digit and press ENTER to accept the numeric data. Now the cursor is in the units digit. Edit the units digit with the ↑ key. Press **ENTER** to accept the edited preheat level. The System return at the PRHT menu and **the preheating level is activated fading in 2 sec**.	**00** **10** **PrHt**

CURVE MENU

The LIBERTY dimmer permits us to assign different response curves to its channels.

By default the assigned curve, for all channels, is the **lineal curve** (lineal in power). The curves are:

Lineal.- (Li)
Lineal in power.

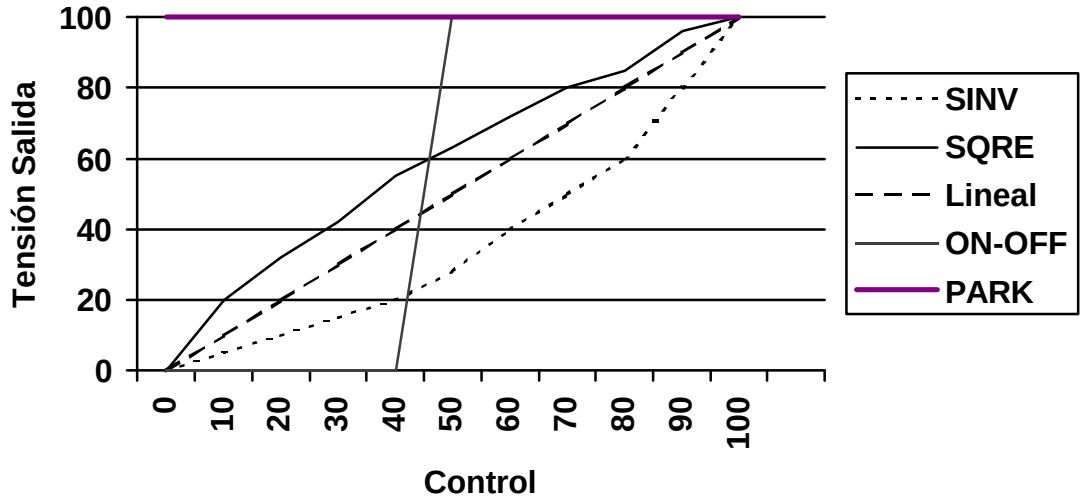
Square -Television .- (SQ)
Quick starting. Used in television studies. More precision between the 70% and the 100% of the output voltages.

Invert Square.- (in)
Slow starting. More precision between the 30% and the 50% of the output voltages. Used with fluorescence.

ON/OFF.- (On)
Non dim curve. Used with HMI lamps.

PARK.- (PA)
This curve forces the channel at 100%, always at 100%, used for working lights...

The curves in graphic mode:



The curve menu, (Cur):

MENU	Access to the dimmer menus. The display shows us the first menu.	**dir**
↑	Press this key up to the display shows us the Cur (Curves) menu.	dir PrHt **Cur** TESt bACP
ENTER	Access to the Cur menu. The display has 2 parts: The 2 firsts digits, now blinking, show us the number channel, and the **gn** (generic) option to edit the same curve in all channels. Now, pressing ↑, we can select the desired channel in the display, the channels to edit its curve. Example: Change the channel 2 curve. Select the channel 2 in the display (2 Lº). The 2 last digits show us the current selected curve for this channel.	gnLº 1 Lº **2 Lº** ... 6 Lº
ENTER	To edit the curve for the showed channel option. Now, the 2 last digits are blinking, and we can edit pressing ↑. Example: Select the On-Off curve (Option: On). The 2 last digits are: Li: Lineal curve SQ: Square curve. In: Invert square curve. On: ON/OFF curve PA: Park curve.	2 Li 2 SQ 2 in **2 On** 2 PA
ENTER	Accept the edited data and return to the previous display. The curve is activated immediately. Note that the current curve is marked with the symbol **º**.	**2 Oº**

If all channels have the same curve, at the beginning of this menu, in the generic option (**gn**) we can see the curve marked with the symbol **º**.

TEST MENU

The tests are:

- **d i g** . DMX test or digital input test. We can see the input DMX signal by dimmer channel.
- **AnLg**. ANALOGY test. We can see the 0+10V input for dimmer channel.
- **SOFt**. Show us the current software version.

tESt menu:

MENU	Access to the dimmer menus. The display show us the first menu.	**dir**
↑	Select the tESt option, pressing ↑ up to see this option in the display.	**tESt**
ENTER	Access to tESt menu. The display shows us the first option test. Note: The symbol (—) appears when the dimmer hasn't DMX input.	**dig**
↑	To select others TEST options.	**dig** AnLg SOFt
ENTER	Select the showed option. The options **Dig** & **AnLg:** The display shows us a 4 digits number, the first 2 digits are the channels number and the 2 last digits are the input level for this channel. To see the different channels press ↑. The **SOFt** options, the display shows us the number of the current software version.	**1 50** (chan 1 @ 50%) **2 FF** (chan 2 @ 100%) **1.00**
MENU	Return to the previous menu. Return to the main display pressing this key as many times as be necessary.	**dig**

DMX-512 COMUNICATION FAULT

When the DMX512 communication faults, the dimmer maintains in scene the last DMX information. This signal is in scene up to the DMX512 communication fault is solved or up to the dimmer is switched off.
The LIBERTY dimmer has a second option: one backup memory. To this backup memory is accessed in the BACP menu.

BACK-UP MENU, bACP

When the DMX communication faults, the dimmer can force the scene with a backup memory, this memory is recorded in the bACP menu. This memory outs fading in scene in 2 seconds after a communication fault.

In this menu we can record the backup memory (REC) and activate this function (PLAY). When this function is deactivated, when the DMX communication faults, the dimmer maintained the last DMX information.

MENU	Access to the dimmer menus. The display shows us the first menu.	**dir**
↑	Select the bACp options in the display pressing ↑ as many times as be necessary.	**bACP**
ENTER	Access to the bACp menu. The display shows us the first option: PLAY, this option permits us activated the backup memory function. To activate/deactivate this function press **ENTER**. The active function is marked with the symbol **º**, in the display: **PlAº.** When this function is deactivated, when the DMX communication faults, the dimmer maintained the last DMX information.	**PlAY** rEC
↑	Access to the rEC option to red the backup memory with the desired information. Select the desired "picture" (by DMX or 0+10V) and press **ENTER**. The memory is recorded with the current dimmer outputs status. Note: After a Cold Reset the backup memory is a blackout memory (all its channels @ 0%). The backup memory is recorded each time that you press **ENTER** here.	**rEC**
MENU	Return to the previous menu. Return to the main display pressing this key as many time as be necessary.	**BACP**

COLD RESET

The dimmer has a Reset pushbutton (accessible by the small hole located under DATA LED).
Warm Reset:

- Press the Reset pushbutton.

After a Warm Reset the dimmer maintain the recorded data, and initialise the output buffer.

Cold Reset:

- Press and hold down the Reset pushbutton, press and hold down the **MENU** key and release the Reset pushbutton. Release the **MENU** key.

After a Cold Reset, the dimmer is configured with:

- DMX address: 001.
- Preheat: 0%
- Lineal curve for all channels. gnL°
- Backup memory with all channels at 0%. Backup memory deactivated.

Do it a Cold Reset occasionally!

After a Cold Reset in the display you can see: **1**

INSTALLATION AND START UP

WHEN YOU RECEIVE THE NEW LIBERTY DIMMER:

- Unpack with careful the LIBERTY dimmer.
- If any transport problem is observed, follow the process for this problem type of your company.
- The dimmer is packed with the user manual, the control sheet and the guaranty sheet.
- Preserve the original pack if you need transport the dimmer.
- Reed the user manual, specially the section CONNECTIONS.
- The main supply has to be protected with a general protection to disconnect the equipment, near of the unit and visibly labelled. If the equipment is connected only at one phase, the connector can be considered the way of disconnection of this unit. Maximum 3 meters long for the mains supply cable.
- Protect the connection (mains connection) of this unit following the current normative (circuit-breaker and magneto-thermal).
- Connect the mains supply to the unit, WITHOUT SERVICES, 3 phase at 380V + neutral + ground in its corresponded screw terminal:
  - Place the unit in a plane surface.
  - Remove the upper cover by unscrew the 6 screws.
  - Insert the mains cable by the hole in the rear of the unit.
  - Connect the 3 phases terminals, the neutral terminal and the ground screw.
  - Close the upper cover.
- Connect the unit outputs and their protection ground.
- Connect the control signal: DMX and/or 0 +10V.
- Observe that the ventilation's holes are free.
- Put all circuits barkers in their OFF position.
- Give services to the mains supply.
- Your LIBERTY dimmer is working. Press the RESET button. Set the DMX address.
- Put all circuits barkers in their ON position.
- Switch on the control source (DMX and/or 0+10V).
- Compliment the guaranty.

NORMAL FUNCTIONING:

- After the first installation is enough disconnect and connect the dimmer using the protection general (circuit breaker & magneto-thermal).

If this unit is used in no manufacture specific mode, the unit protection can be compromised.

MAINTENANCE AND TECHNICAL SERVICE

To manipulate the dimmer, **disconnect it!**.

CLEANING

External surfaces: Cleanliness with a soft cloth wetted in water.
Internal surfaces: Cleanliness through aspiration or air jet to pressure.

MAINTENANCE

Internal cleanliness: Annual. In ambient especially "dirty" (powder accumulation, smoke, confetti…) this cleanliness period must be quarterly.

Adjustment of the pressure or screw connections. Triennial. In tour equipment, submitted to the vibrations of the in a way continued transportation, this period must be reduced to one year.

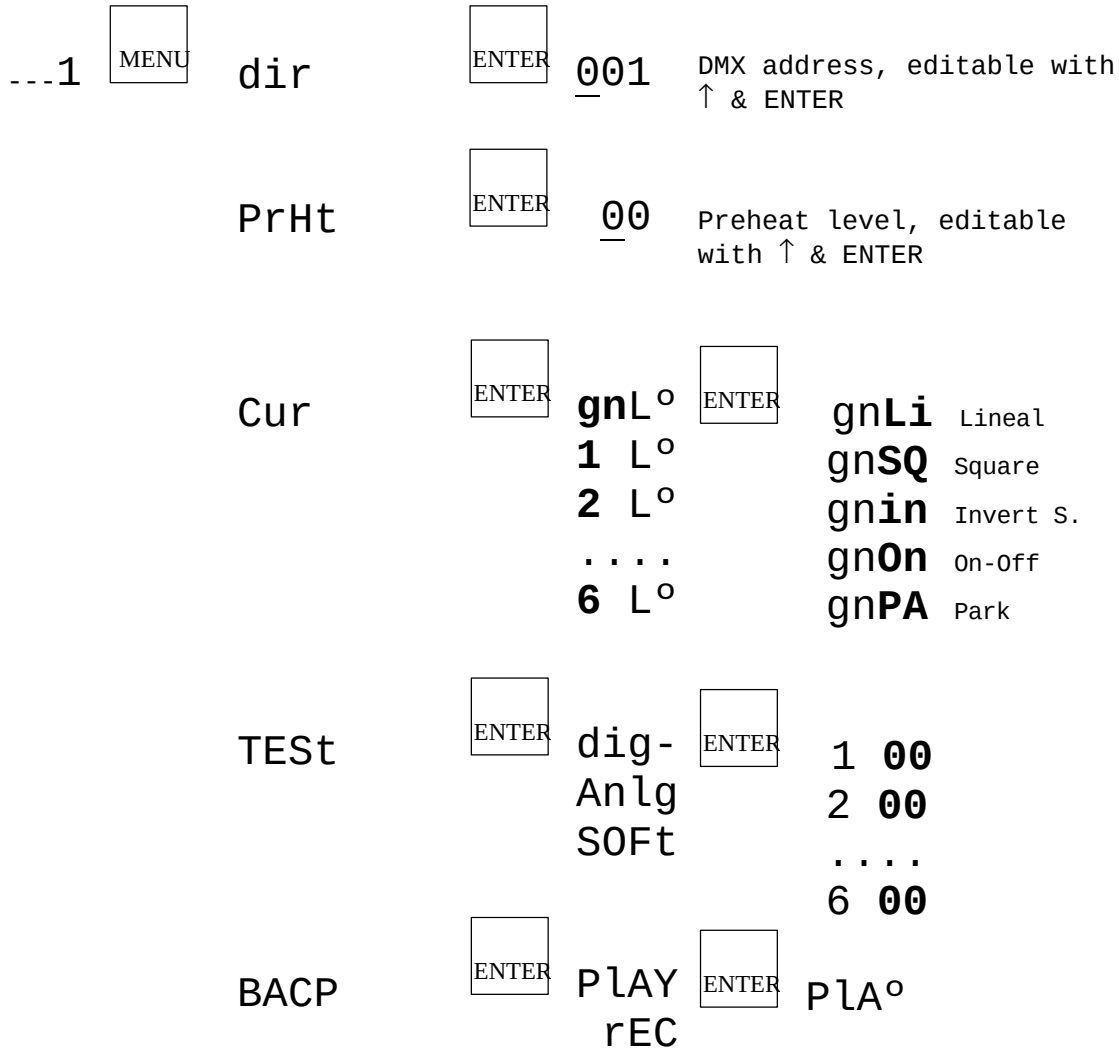
TECHNICAL SERVICE:

The rest of the LIBERTY parts have to be checked by the official technical Service.

POINTS OF SERVICE:

MADRID **BEN-RI Electrónica S.A.**	C/ Matilde Hernández Nº 31- 3ºC Edificio JAEN 28019 MADRID Tel: (91) 472 06 66
ZARAGOZA **BEN-RI Electrónica S.A.**	Pol. Ind. Malpica-Alfinden C/ Los Almendros, 61 50171 - La Puebla de Alfinden -ZARAGOZA Tel: (976) 10 89 59

Miscellaneous



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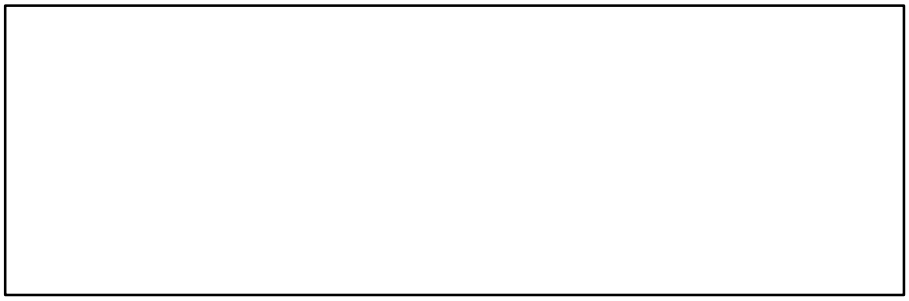

Specifications can be changed without previous notice.