USER MANUAL

ALR3206T 2 x 0 - 32 V ; 2 x 0 - 6 A, 1 - 15 V ; 3 A ; 15 W

TRIPLE PROGRAMMABLE DC POWER SUPPLY

SYNOPSIS

1 PREFACE

Manufacturer : ELC 59 avenue des Romains 74000 ANNECY - FRANCE

Phone : +33 (0)4 50 57 30 46 Fax : +33 (0)4 50 57 45 19

Website : http://www.elc.fr - email : commercial@elc.fr

Item : TRIPLE DC STABILIZED PROGRAMMABLE POWER SUPPLY

Brand : **elc**

Type : ALR3206T

2 DESCRIPTION

2.1 PRESENTATION

You just bought a TRIPLE DC STABILIZED PROGRAMMABLE POWER SUPPLY type elc ALR3206T. We thank you and congratulate you for your good choice.

elc's company is a specialist manufacturer proposes a wide range of POWER SUPPLIES and many other electronic test instruments : FUNCTION GENERATORS, DECADE BOXES, DIGITAL PANEL METERS...

This item has been conceived according to the European standard EN61010-1 and supplied in good condition. This electrical instrument is intended to professionals, industrials and school users. This instructions manual contains information and notes, which must be respected by the purchaser, in order to ensure a safe working and to maintain the instrument in good condition.

2.2 FUNCTIONAL DESCRIPTION OF THE UNIT

This item is used in laboratories. It is designed with : a large graphic display, a touch keypad, a compact vertical box with : an handle and a cord storage integrated in the rear panel. This item will give you satisfaction by offering many possibilities.

Fully programmable, this power supply can be controlled in several ways :

- via the front panel using the keypad and the "slider"
- via the isolated USB interface
- via the isolated RS485 interface
- via the isolated analogical interface (0 - 10V or the 10K potentiometer)

Two outputs (1 & 2) of this DC power supply is regulated in voltage of 0 to 32V and current of 0 to 6A.

The third channel (3) is regulated in voltage of 1 to 15V -15W max power and current 3A max.

"Parallel" "Series" and "Tracking" modes allowing you to pair inside, the 1 & 2 channels of the power supply to obtain :

Parallel : 0 to 32V and 0 to 12A

Serial : 0 to 64V and 0 to 6A

Tracking : ± 0 to 32V and 0 to 6A (mode coupled) or 2x 0 to 32V 0 to 6A (mode isolated with common adjustment)

Several programmable functions U and I are accessible directly from the keypad and you will make positive or negative ramp, up or down time, or a square, or arbitrary wave on channels 1 & 2.

The channels outputs 1 & 2 with remote control (4 wires) are available on terminal blocks at the rear.

The outputs can be activated or not separately or together (by the keyboard or by a dry contact on a terminal block at the rear panel) and a "Standby" mode allows to put the power supply in energy saving.

All parameters are displayed on the graphic display.

2.3 SAFETY INSTRUCTIONS

Before any operation, read the following safety precautions to avoid injury and prevent damage to this product or another connected.

- ***To avoid all potential hazards, use this product only in the specified limits.***
- ***Do not use the device without its cover. Do not use the item with its housing or any panels removed.***
- ***Any intervention inside the casing, and particularly the fuses replacement, must imperatively be effected by a skilled staff.***
- ***The instrument must be used according to the instructions of this manual.***
- ***Use it in a well ventilated area. The air inlets and the fan outlet must be widely free, do not block them.***
- ***Do not use in wet conditions. Do not use in wet environment to avoid electric shocks or short-circuit inside the product.***
- ***Do not use in an explosive atmosphere. It is very important do not operate the item near an explosive atmosphere, to prevent damage to the device or any personal injuries.***
- ***The power cable is used as a cut system, the product must be connected to a 230V main source, easily accessible, with earth.***
- ***When this unit must be powered via a separate autotransformer for a reduction of voltage, ensure that the common socket is connected to the grounding pole of the circuit of the supply.***
- ***The common mode voltage between ground and the output terminals must not exceed 150VDC. In this case a deemed dangerous voltage (> 70VDC) can be reached between one of the terminals and earth. Therefore, it is imperative to use safety cables to connect the outputs of the device. Also, all connected devices must not have conductive parts accessible.***

2.4 SAFETY TERMS AND SYMBOLS

You will find the following symbols on this equipment :

 **CAUTION REFER TO MANUEL**	 **CAUTION HIGH VOLTAGE RISK**	 **PROTECTIVE GROUND (EARTH) TERMINAL**

2.5 PACKAGING AND REPACKAGING

Your power supply ALR3206T comes with an quickstart guide and its power cable 2 poles + earth type "EUROPE" : CEE7 / 7 - IEC60320 C13.

3 OPERATING

3.1 TECHNICAL FEATURES

The specifications below are given after at least 30 minutes use within the specified operating temperature range.

3.1.1 Power supplies CH1 & CH2 with separated or tracking mode

Operating	Constant voltage	Automatic	
	Current voltage	Automatic	
Mini maxi adjustment	Voltage	0 to 32,00 Volts (0 to ±10mV)	
	Current	0 to 6,000 Amps	
	OVP (voltage limiting)	0 to 32,20 Volts	
	OCP (current limiting)	0 to 6,10 Amps	
Adjustment accuracy ± (%output + offset)	Voltage	0,03% + 10 mV	
	Current	0,03% + 2 mA	
Regulation / Load 10 – 90%	Constant voltage	< 12 mV	
	Constant current	< 1 mA	
Regulation / Source ±10%	Constant voltage	< 1 mV	
	Constant current	< 1 mA	
Ripple (BP 20 MHz)	Constant voltage	≤ 0,7 mV_{RMS} ; ≤ 4 mVp-p noise ≤ 15 mVp-p of commutation	
	Constant current	< 1 mA_{RMS} or 3 mAp-p	
Accuracy measurement (25°C ±5°C) ± (%output + offset)	Voltage	0,03% +10 mV	
	Current	0,03% + 2 mA	
Temperature coefficient ± (% output + offset)	Voltage	0,01% /°C	
	Current	0,05% /°C	
Resolution	Voltage / Current	4 digits	
Time of answer (Load variation)	Load 10 – 90%	≤ 1,5 ms (±20mV)	
	Load 90 – 10%	≤ 0,4 ms (±20mV)	
Hold time	Load 100% CH1 or CH2	> 22 ms	
	Load 100% CH1 & CH2	> 11 ms	
Overvoltage output	ON/OFF source or output	< 0,4 V	
Voltage programming speed to 1% of the total course.		Without load	Load 100%
Rise times	0 – 32 V	35 ms	45 ms
	0 – 5 V	1 ms	2,5 ms
Fall times	32 V – 0 V	670 ms	2,5 ms
	5 V – 0 V	160 ms	1 ms

3.1.2 Power supplies CH1 & CH2 with serial mode

Mini maxi adjustment	Voltage	0 to 64,00 Volts (0 to ±20mV)	
	Current	0 to 6,000 Amps	
	OVP (voltage limiting)	0 to 64,40 Volts	
	OCP (current limiting)	0 to 6,10 Amps	
Adjustment accuracy ± (% output + offset)	Voltage	0,03% + 20 mV	
	Current	0,03% + 2 mA	
Regulation / Load 10 – 90%	Constant voltage	< 24 mV	
	Constant current	< 2 mA	
Regulation / Source ±10%	Constant voltage	< 1 mV	
	Constant current	< 1 mA	
Ripple (BP 20 MHz)	Constant voltage	≤ 1,5 mV_{RMS} ; ≤ 10 mVp-p noise ≤ 30 mVp-p of commutation	
	Constant current	< 1 mA_{RMS} or 3 mApp	
Accuracy measurement (25°C ±5°C) ± (% output + offset)	Voltage	0,03% + 20 mV	
	Current	0,03% + 2 mA	
Time of answer (Load variation)	Load 10 – 90%	≤ 1,5 ms (±20mV)	
	Load 90 – 10%	≤ 0,3 ms (±20mV)	
Overvoltage output	ON/OFF source or output	< 0,3V	
Voltage programming speed to 1% of the total course.		Without load	Load 100%
Rise times	0 – 64 V	36 ms	50 ms
Fall times	64 V – 0 V	510 ms	2,5 ms

3.1.3 Power supplies CH1 & CH2 with parallel mode

Mini maxi adjustment	Voltage	0 to 32,00 Volts (0 to ±10mV)	
	Current	0 to 12,00 Amps	
	OVP (voltage limitation)	0 to 32,20 Volts	
	OCP (current limitation)	0 to 12,20 Amps	
Adjustment accuracy ± (% output + offset)	Voltage	0,03% + 10 mV	
	Current	0,08% + 10 mA	
Regulation / Load 10 – 90%	Constant voltage	< 40 mV	
	Constant current	< 2 mA	
Regulation / Source ±10%	Constant voltage	< 1 mV	
	Constant current	< 1 mA	
Ripple (BP 20 MHz)	Constant voltage	≤ 0,7 mV_{RMS} ; ≤ 4 mVp-p noise ≤ 15 mVp-p of commutation	
	Constant current	< 1 mA_{RMS} or 3mAp-p	
Accuracy measurement (25°C ±5°C) ± (% output + offset)	Voltage	0,03% + 10 mV	
	Current	0,08% + 10 mA	
Time of answer (Load variation)	Load 10 – 90%	≤ 12 ms	
	Load 90 – 10%	≤ 1,2 ms	
Overvoltage output	ON/OFF source or output	< 0,4V	
Voltage programming speed to 1% of the total course.		Without load	Load 100%

Rise times	0 – 32 V	35 ms	46 ms
Fall times	32 V – 0 V	490 ms	2,4 ms

3.1.4 Power supply CH3

Operating	Constant voltage	Automatic	
Mini, maxi adjustment	Voltage	1 to 15,00 Volts (0 to ±10mV)	
	OVP (over voltage programming)	1 to 15,3 Volts	
Adjustment accuracy ± (% output + offset)	Voltage	0,07% + 10 mV	
Régulation / Load 10 – 90%	Constant voltage	< 20 mV	
Regulation / Source ±10%	Constant voltage	< 1 mV	
Ripple (BP 20 MHz)	Constant voltage	≤ 2 mV rms ≤ 15 mVp-p of commutation	
Accuracy measurement (25°C ±5°C)	Current	0,03% + 10 mA	
Résolution	Tension	4 digits	
Time of answer (Load variation)	Load 10 – 90% (15V)	< 5 ms (±20mV)	
	Load 90 – 10% (15V)	< 6 ms (±20mV)	
Overvoltage output	ON/OFF source or output	< 0,1V	
Voltage programming speed to 1% of the total course.		Without load	Load 100%
Rise times	1 – 15 V	20 ms	20 ms
	1 – 5 V	21 ms	21 ms
Rise times	15 V – 1 V	750ms	23 ms
	5 V – 1 V	500 ms	18 ms

3.1.5 Connections

Outputs + and - (CH1 to CH3)	Front panel	Safety terminals Ø4 mm
Outputs + and - (CH1 and CH2)	Rear panel	Screw terminal block for 2mm²
Ground terminal	Rear panel	Earth and safety terminal Ø4 mm

3.1.6 Display

Display	LCD graphic display FSTN N&B 3.2 inch
Resolution	128 x 64 pixels
Backlight	White LED

3.1.7 Protections

Against short-circuits	By current regulation
Against over-temperature	By fan and thermal circuit-braker
Against over-current on main source	By internal fuse (T4A ; 250V ; 5x20)

3.1.8 Memories

Memory	Storage	15 configurations
	Recall	16 (1 no configurable)

3.1.9 Functions on CH1& CH2

Functions accessible by keypad	7 available in Voltage or Current (channel 1 & 2)	SQUARE, RAMPS Periodic or Mono shot
		ARBITRARY Periodic or Multi shot
Time programming (2 Ranges)	Seconde or minute	10 ms to 50 min

3.1.10 Standby

Isolation mode of the output	Enable / disable output(s)
Standby mode	Puts the power supply in standby mode

3.1.11 Remote sensing

Connectors on the rear panel	Mode 4 wires	Lever terminal block for 0.5mm² wires
Correcting the voltage drop	CH1 & CH2	2 Volts

3.1.12 Interfaces

Isolation / output	150 Vdc
Isolation / Earth	150 Vdc
USB & RS485	Serie
Processing time of control	< 20ms
Analog Control for U-CH1 and CH2, or U and I of CH1 (3 operating modes)	0 – 10 V
	Potentiometer 10K
	Variable resistor 10K
Reaction time U interface	< 100 ms
ON/OFF control configurable	Switch or TTL signal

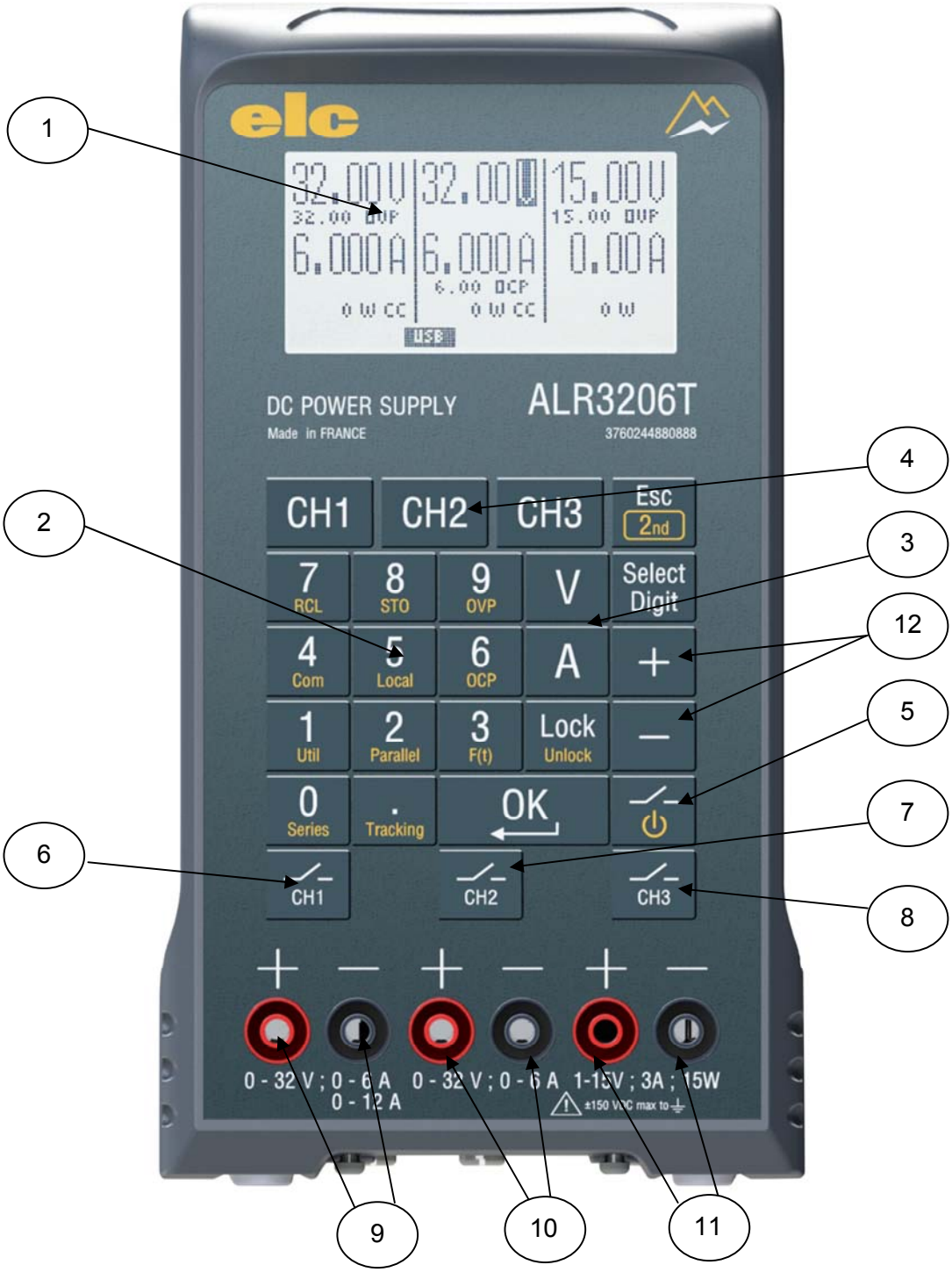
3.1.13 Other caracteristics

Power source	220 – 240 Volts ±10%, 50 – 60 Hz
	EEC socket C14 for cable 2 poles + earth C13 (2P+E)
Maximum power consumption	495W (5W in Standby mode)
Internal fuses (x2) AC input	5 x 20 ; 250V T4A
Efficiency	> 78% to maxi powerful
Safety	Class I, CAT II, degree of pollution 2
	Complies with EN 61010-1, CAT II
EMC	Complies with EN 61326-1 & EN 55011
Voltage on the earth	± 150 Vdc
Operating temperature	0°C to + 40°C
Storage temperature	-20°C to + 60°C
Humidity condition	< 85% to 30°C and decrease to 50% at 40°C
Altitude	< 2000 m
Db level of fan	< 48dB
Presentation	Front panel with soft-touch keypad, back side with handle and storage area, metallic case with epoxy finish
Dimensions	111 mm x 210 mm x 260 mm
Weight	3 kg

4 OVERVIEW

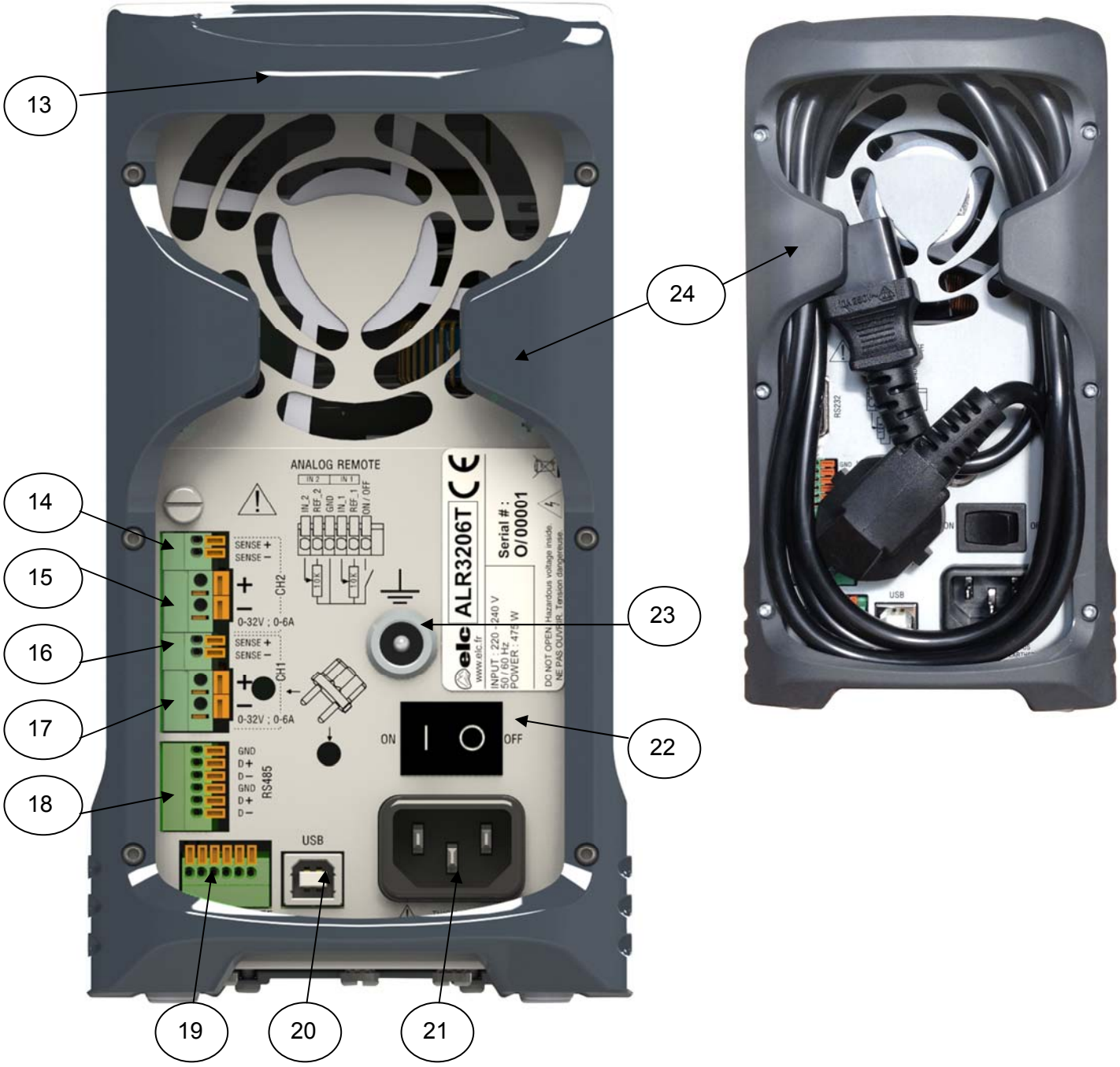
4.1 FRONT PANEL

1	LCD display	2	Keypad double function
3	Functions key	4	Channel selection
5	ON/OFF general and Standby	6	ON/OFF channel 1
7	ON/OFF channel 2	8	ON/OFF channel 3
9	Safety socket output channel 1	10	Safety socket output channel 2
11	Safety socket output channel 3	12	Keys + & - for adjustement



4.2 REAR PANEL

13	Handel	14	Sense connector channel 2
15	Powerful connector channel 2	16	Sense connector channel 1
17	Powerful connector channel 1	18	RS485 connector
19	Analogical control connector	20	USB Connector
21	Power connector	22	ON / OFF
23	Earth safety socket Ø4mm	24	Cord storage



5 SHORT DESCRIPTION OF THE FRONT PANEL

5.1 DISPLAY

The basic mode on the LCD display (**1**) shows the value of the voltage and current setting about two channels ; the output's powerful, the currently regulation mode (CV or CC) and the output's state (ON or OFF). If the OVP and OCP stopped are less than the maximum setting (32.2V and 6.1A or 15.1V for channel 3) they will be displayed.

Basic, the display is in 3 COLUMNS mode.

3 COLUMNS MODE

2 COLUMNS MODE

The measurement (voltage or current) is displayed instead of the set, if different. Simply touch on V or A selection keys, displays the operator instructions.

5.2 KEYPAD AND SHIFT

The keypad (**2**) allow directly modifying the set values voltage or current and getting access to secondary functions.

5.3 KEYS

The keys (**3**) allows the selection of the set to change and the selection of the dual function keyboard with shift.

5.4 CHANNEL SELECTION

The keypad (**4**) allows choosing the channel to set. ‘’V’’ or ‘’A’’ selected indicates the channel you choose and you can set.

5.5 ON/OFF : GENERAL & STANDBY

The keypad (**5**) allows to enable disable all outputs simultaneously. Combined with the function ‘’2nd’’ this is the Standby, which is enabled or disabled.

5.6 ON/OFF : CHANNEL 1 TO CHANNEL 3

The keypad (**6**), (**7**) and (**8**) allow to enable or disable channel 1, 2 and 3.

5.7 KEY SETTING

The keypad + and - (**12**) allow a direct change the set values voltage and current or navigate throught the secondary functions menu.

5.8 FEEDBACK SOUND

A varying frequency tone is activated following the rule below:

Short signal low frequency : keypad detect [0] to [9].

Short signal medium frequency : keypad detect function ([V], [A], [OK], …)

Long signal high frequency : Input value error or safety detect.

5.9 SAFETY SOCKETS CHANNEL 1, CHANNEL 2 & CHANNEL 3

The sockets (**9** to **11**) (safety sockets Ø4mm) allow the connection to the outputs + and – of the channels 1 to channel 3.

5.10 EARTH FUNCTIONAL SOCKET

The socket (**23**) (safety and inversed socked Ø4mm) allow a functional connection to the earth.

6 DESCRIPTION OF CONTROL COMMANDS

6.1 PARAMETERS SETTING

6.1.1 "Esc" Key

	Touch Esc 2nd "**Esc**ape"	Allow to go out without taking the value

6.1.2 "CH1" to "CH3" Key

	Touch CH1 "**Ch**annel 1"	Select the channel 1 to change the values (idem for CH2 or CH3)

6.1.3 Setting Voltage and Current

Two possibilities :

	Action	Description
1.	Touch on CH1	Select the channel to change (idem for CH2 and CH3)
2.	Touch on V or A	Select the voltage or current value to change
3.	Touch on 0 Series to 9 OVP	Enter the value
4.	Touch on OK or V or A	Valid the value
1.	Touch on V or A	Select the value voltage or current to change
2.	Touch on Select Digit	Select digit with key
	Touch on + or −	Change value selected, step by step

6.1.4 Setting the OVP or OCP limits

	Action	Description
1.	Touch on Esc 2nd	Select key "2nd"
2.	Touch on 9 OVP or 6 OCP	Enter the U (OVP) or I (OCP) limit
3.	Touch 0 Series to 9 OVP	Enter the value
4.	Touch OK	Valid the value
CANCEL OVP or OCP		
1.	Touch on Esc 2nd	Select key "2nd"
2.	Touch on 9 OVP or 6 OCP	Enter the U (OVP) or I (OCP) you need to cancel
3.	Touch on OK	Deletes the selected restriction

6.1.5 Isolation of one (or all) outputs

All OFF (3 columns mode)

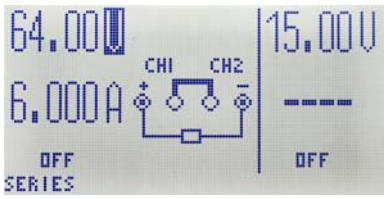
All OFF (2 columns mode)

	Action	Description
1.	Touch on	Touch this key disconnects 2 outputs together. So, the instructions are displayed
1.	Touch on CH1 to CH3	Touch one of this key disconnects the output selected and the instructions are displayed.

6.2 SELECT THE MODE

6.2.1 Serial mode

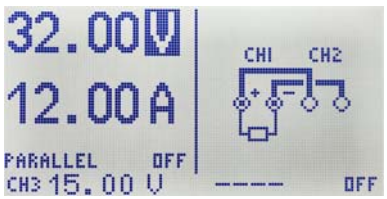
The sockets "– CH1" and "+ CH2" are linked inside.
The load is connected on the sockets "+ CH1" and "- CH2"
Idem on the rear panel, with "sense" connection corresponding.



	Action	Description
1.	Touch on Esc 2nd	Select key “2nd”
2.	Touch on 0 Series	Select the “serial” mode and set the parameters
COME BACK MODE : SEPARATED		
1.	Touch on Esc 2nd	Select key “2nd”
2.	Touch on 0 Series	Deselect the “serial” mode

6.2.2 Parallel mode

The 2 sockets "–" and the 2 sockets "+" are linked inside. On the front panel, the load is connected on "+ & -" of the CH1.On the rear panel, link the two "+", and the two "–" as well as "senses" to the load.



	Action	Description
1.	Touch on Esc 2nd	Select key “2nd”
2.	Touch on 2 Parallel	Select the “parallel” mode and set the parameters
COME BACK MODE : SEPARATED		
1.	Touch on Esc 2nd	Select key “2nd”
2.	Touch on 2 Parallel	Deselect the parallel mode

6.2.3 Tracking mode

Two configurations :

- Tracking isolated : The same setting is sent simultaneously on the two channels, but they're staying independent electrically.

- Tracking linked : The same setting is sent simultaneously on the two channels which are linked (socket "– CH1" & "+ CH2" linked inside) to realize a symmetrical power supply.

	Action	Description
1.	Touch on Esc 2nd	Select key “2nd”
2.	Touch on 1 Util	Select the function “Util”
3.	Touch on 3 F(t) or touch on + or –	Select tracking mode with with the keys
4.	Touch on OK	Valid the choice with “OK”
5.	Touch on 1 Util or 2 Parallel Touch on + or –	Select ISOLATED or COUPLED with the keys.
6.	Touch on OK	Valid the choice with “OK”

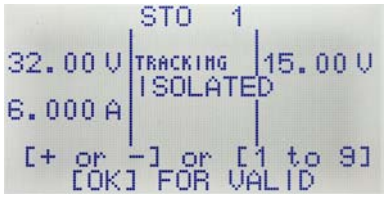
Go to tracking mode

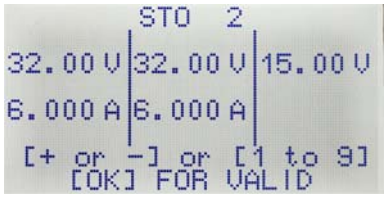
	Action	Description
1.	Touch on Esc 2nd	Select key “2nd”

2.	Touch on Tracking	Select “tracking” mode. Depending on the choice done before, the display shows ISOLATED or COUPLED
COME BACK TO ISOLATED MODE		
1.	Touch on Esc 2nd	Select key “2nd”
2.	Touch on Tracking	Deselect the “tracking” mode

6.3 MEMORIES

6.3.1 Storage setting

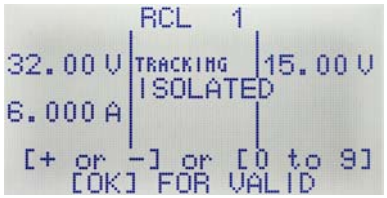


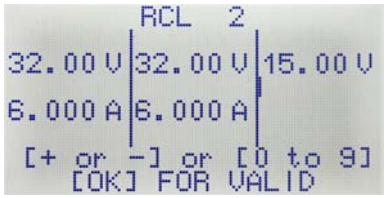


	Action	Description
1.	Touch on Esc 2nd	Select key ““2nd”
2.	Touch on 8 STO	Select the function “Sto” Storage configuration
3.	Touch on 1 Util to 9 OVP Touch on + or −	Select where to save the current configuration (1-15). The display shows the registration number and the current contents.
4.	Touch on OK	Stores the current configuration and display the storage number selected.

6.3.2 Recall setting

The memorie “0” recalls a basic configuration and can’t be erased.





	Action	Description
1.	Touch on Esc / 2nd	Select the key “2nd”
2.	Touch on 7 / RCL	Select the function “RCL” Recall configuration
3.	Touch on 0 / Series to 9 / OVP Touch on + or −	Select the configuration number (0-15). The display shows the contents of the configuration.
4.	Touch on OK	Recall the configuration with the output disconnected

6.4 RS485 CONTROL

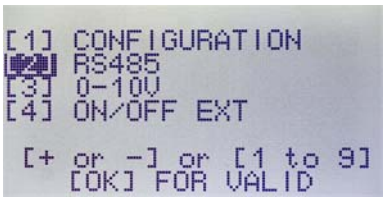
6.4.1 Transmission of parameters

	Action	Description
1.	Touch on Esc / 2nd	Select key “2nd”
2.	Touch on 4 / Com	Select the function “Com”, communication
3.	Touch on 1 / Util or touch on + or −	Select the menu with keys
4.	Touch on OK	Valid the choice with “OK”
5.	Touch on 1 / Util to 3 / F(t)	Select with the keys different configuration choices.

	Touch on + or −	
6.	Touch on OK	Valid each choice with “OK”

6.4.2 Configuration RS485 address

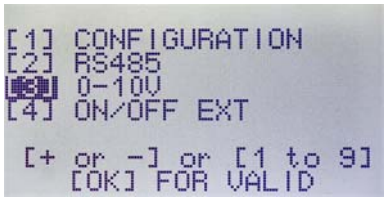
See wiring in Appendix C.



	Action	Description
1.	Touch on Esc 2nd	Select key “2nd”
2.	Touch on 4 Com	Select the function “Com”, communication
3.	Touch on 2 Parallel or touch on + or −	Select the menu with keys
4.	Touch on OK	Valid the choice with “OK”
5.	Touch on 0 Series to 9 OVP Touch on + or −	Select with the keys different configuration choices.
6.	Touch on OK	Valid each choice with “OK”

6.5 0-10V CONTROL

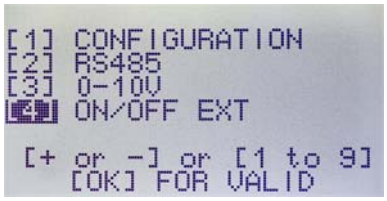
This function changes the voltage setpoints for channels 1 and 2 or voltage / current for channel 1 via an analogical voltage, a potentiometer or resistance.
The maximum setpoint value is the one displayed before activating the function.

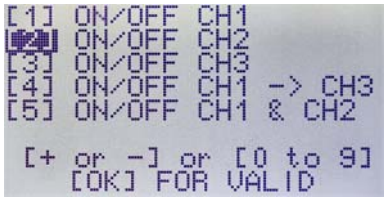


	Action	Description
1.	Touch on Esc / 2nd	Select the key “2nd”
2.	Touch on 4 / Com	Select the function “Com”, communication
3.	Touch on 3 / F(t) or touch on + or −	Select menu “0-10V” with the keys
4.	Touch on OK	Valid the choice with “OK”

6.6 EXTERNAL ON/OFF CONTROL

This function allow control isolation of one, two or all outputs (see wiring Appendix E)





	Action	Description
1.	Touch on Esc / 2nd	Select the key “2nd”
2.	Touch on 4 / Com	Select the function “Com”, communication
3.	Touch on 4 / Com or touch on + or −	Select the choice “ON/OFF EXT”
4.	Touch on 1 / Util to 5 / Local or Touch on + or −	Select the choice.
5.	Touch on OK	Valid the choice with “OK”

6.7 CONTROL UTILITIES

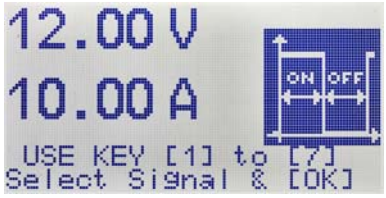
This function control includes the following functions :

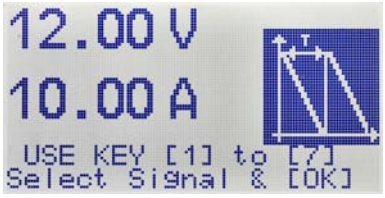
- Langage choice
- Changing the contrast of the display
- Tracking mode
- Clear memories
- ON/OFF sound feedback
- Select display mode (2 or 3 columns)

	Action	Description
1.	Touch on Esc / 2nd	Select the key “2nd”
2.	Touch on 1 / Util	Select the function “Util” Utility
3.	Touch on 1 / Util to 6 / OCP Touch on + or −	Select an follow the choice
4.	Touch on OK	Valid the choice with “OK”

6.8 PROGRAMMED FUNCTIONS

Enabling this key allows to get to the output, multiple periodic wave forms or not, in voltage or current mode (see Appendix G).





	Action	Description
1.	Touch on Esc / 2nd	Select the key “2nd”
2.	Touch on 3 / F(t)	Select the function generator, “F(t)”
3.	Touch on OK	Valid the choice with “OK”
4.	Touch on 0 / Series to 9 / OVP	Follow the choices

	Touch on  or 	
5.	Touch on 	Valid the choice with “OK”

6.9 OTHER FUNCTIONS

6.9.1 Sleep mode

"Standby" mode is available on the front panel. This mode reduces the current consumption if the power supply is ON but not used.

	Action	Description
1.	Touch on 	Select the key “2nd”
2.	Touch on 	Sleep mode ON The backlight is OFF
3.	Touch on 	Go out the sleep mode The backlight comes back after few seconds

6.9.2 Locked and unlocked keyboard

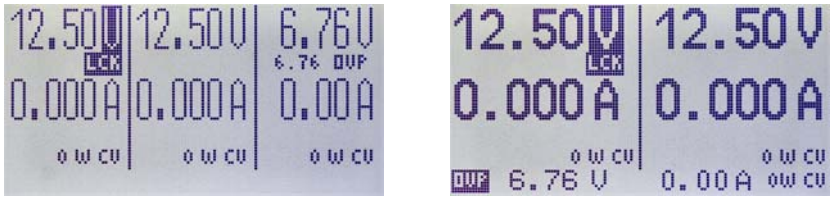
Two possibilities :
Hold on the key "**5**"
Without a connection to a computer, touch on "Local"

	Action	Description
	LOCKED / UNLOCKED	
1.	Touch on  during 4s	Active the locked or unlocked keyboard

	Action	Description
1.	Touch on 	Select the key “2nd”
2.	Touch on 	Active the locked "RMT" or unlocked keyboard. *(control via USB or RS485)*

6.9.3 Locked setting values

A key allows locked (or unlocked) setting voltage or current value.



Locked voltage setting Channel 1

	Action	Description
	LOCKED	
1.	Touch on CH1	Select channel
2.	Touch on V or A	Select Voltage or Current value to locked
3.	Touch on Lock Unlock	Press key until displaying “LCK” for locked setting value
	UNLOCKED	
1.	Touch on CH1	Select channel
2.	Touch on V or A	Select Voltage or Current value to unlocked
3.	Touch on Esc 2nd	Select the key “2nd”
4.	Touch on Lock Unlock	Press key until erase “LCK” on display for unlocked setting value

7 PC control

The activation or deactivation of control via RS485 or USB is done like that :

	Action	Description
1.	Touch on 	Select the key "2nd"
2.	Touch on 	Enable or disable the takeover via the serial RS485 or USB port.

You will find the list of commands in APPENDIX A and drivers to Appendix B, C.

8 MAINTENANCE

No particular maintenance is required for this instrument.
Avoid : dust, humidity, shocks ; your instrument will appreciate it.
For the cleaning, please use a smooth duster.

8.1 TROUBLESHOOTING

If indicators do not light up on switching on, check :

- The mains connection
- The replacement of the cord can be realized only with the model : 3G0.75mm² ; H05VV-F ; CEE7/7 – IEC60320 C13
- The mains voltage
- That the ON switch is pressed

8.2 ERROR MESSAGE

If following messages appear on the display, please contact the after sales service.

Message	Possible cause
"FAULT : FAILURE START-UP VOLTAGE"	Internal auxiliary power doesn't work
"TEMPERATURE SENSOR ERROR"	Internal temperature sensor doesn't work
"UNREGULATED CURRENT/VOLTAGE PROTECTION"	Internal stage power doesn't work
"FAN OUT OFF ORDER"	Fan doesn't work

9 AFTER SALE SERVICE

The after sales service is ensured by the elc company.
During two years, spare parts and workmanship are guaranteed. This guarantee does not apply to instruments presenting defects or faults caused by an improper use (wrong mains voltage, shocks ...) or which have been repaired outside our factory or the repair shops of our authorized agencies.

10 DECLARATION OF CONFORMITY

Manufactuer : **elc**
Address : 59 avenue des Romains 74000 Annecy France

Declares the product

Name : DC POWER SUPPLY
Type : ALR3206T

conformable to the requirements of the directives:

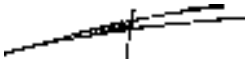
Low voltage 2014/35/UE, Electromagnetic Compatibility 2014/30/UE and RoHs 2017/2102/UE.

The following harmonized standards have been applied :

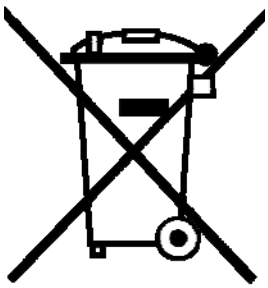
Safety : EN 61010-1:2010
EMC : EN 61326-1:2013

Annecy March 2021

H.CURRI, Manager



ELIMINATION OF MANUFACTURING WASTES BY THE PRIVATE USERS IN THE EU



This symbol written in the product or in its packaging indicates that this product must not be throw in the garbage with your other waste.
Its your responsibility to rid of your manufacturing wastes bringing it to a specialized sorting office for the recycling of electrical and electronic instruments.
Collection and recycling separated of your wastes will contribute to preserve natural resources and guarantee a recycling respectful of the Environment and human health.
For further information concerning the recycling center near your place of residence, contact your town hall, the elimination service
of garbage heap or the store where you bought the instrument.

APPENDIX A – Commands control

Commands control format :
[address] <SP>Parameter<SP>Command<SP>[Value]<CR>

[address] = character ASCII 0 (port USB)
character ASCII 1 to 31 (port RS485)

Parameter = VOLT1 - CURR1 - OVP1 - OCP1 - OUT1 - VOLT2 - CURR2 - OVP2 - OCP2 - OUT2 - VOLT3 - CURR3 - OVP3 - OUT3 - OUT - RCL - STO - REM - MODE - TRACK (ASCII character).

Command = WR - RD - MES (ASCII character).
<SP> = 20h (space).
[Value] = ASCII character.
<CR> = 0Dh (return)

Example 1 : 0 VOLT WR 1250 ↵ ➔ *Writing setpoint 1,25 V on USB port*

Example 2 : 1 CURR MES ↵ ➔ *Current measurement request on address 1 from the RS485 port*

Answer :

[address] <SP>Status<SP>Value<CR>

[address] = character ASCII 0 (USB)
character ASCII 1 to 31 (port RS485)

Status = OK- ERR- Local (ASCII character).

OK	Command valid.
ERR	Syntax error in the command.
LOCAL	Command impossible, the power supply is in local mode.

<SP> = 20h (space).
[Value] = characters ASCII.
<CR> = 0Dh (enter)

Example 3 : 0 OK ↵ ➔ Back of *example 1*

Example 4 : 1 OK 450 ↵ ➔ *Back of example 2 current measurement : 450 mA*

Command & Answers	Description
Command : **[address] VOLT1 WR [0-64400] ↵** Answer : **[address] OK ↵**	Writing the voltage setpoint (mV) channel 1, In double mode. Writing the voltage setpoint (mV) in serial, parallel or tracking mode.
Command : **[address] CURR1 WR [0-12200] ↵** Answer : **[address] OK ↵**	Writing the current setpoint (mA) channel 1, In double mode. Writing the current setpoint (mA) in serial, parallel or tracking mode.

Command & Answers	Description
Command : **[address] OVP1 WR [0-64400] ↵** Answer : **[address] OK ↵**	Writing the limit voltage setpoint (mV) channel 1, In double mode. Writing the voltage setpoint (mV) in serial, parallel or tracking mode.
Command : **[address] OCP1 WR [0-12200] ↵** Answer : **[address] OK ↵**	Writing the limit current setpoint (mA) channel 1, In double mode. Writing the limit current setpoint (mA) in serial, parallel or tracking mode.
Command : **[address] OUT1 WR [0-1] ↵** Answer : **[address] OK ↵**	Disconnect /Connect the output of channel 1, in double mode. 0 -> OFF 1 -> ON
Command : **[address] VOLT2 WR [0-32200] ↵** Answer : **[address] OK ↵**	Writing the voltage setpoint (mV) channel 2, In double mode.
Command : **[address] CURR2 WR [0-6100] ↵** Answer : **[address] OK ↵**	Writing the current setpoint (mA) channel 2, In double mode.
Command : **[address] OVP2 WR [0-32200] ↵** Answer : **[address] OK ↵**	Writing the limit voltage setpoint (mV) channel 2, In double mode.
Command : **[address] OCP2 WR [0-6100] ↵** Answer : **[address] OK ↵**	Writing the limit current setpoint (mA) channel 2, In double mode. .
Command : **[address] OUT2 WR [0-1] ↵** Answer : **[address] OK ↵**	Disconnect /Connect the output of channel 2, in double mode. 0 -> OFF 1 -> ON

Command & Answers	Description
Command : **[address] VOLT3 WR [1000-15300]** ↵ Answer : **[address] OK** ↵	Writing the voltage setpoint (mV) channel 3.
Command : **[address] OVP3 WR [1000-15300]** ↵ Answer : **[address] OK** ↵	Writing the limit voltage setpoint (mV) channel 3.
Command : **[address] OUT3 WR [0-1]** ↵ Answer : **[address] OK** ↵	Disconnect /Connect the output of channel 3 0 -> OFF 1 -> ON
Command : **[address] OUT WR [0-1]** ↵ Answer : **[address] OK** ↵	Disconnect /Connect the output of all outputs 0 -> OFF 1 -> ON
Command : **[address] RCL WR [1-16]** ↵ Answer : **[address] OK** ↵	Recall the configuration stored.
Command : **[address] STO WR [1-16]** ↵ Answer : **[address] OK** ↵	Save the usual configuration.
Command : **[address] REM WR [0-1]** ↵ Answer : **[address] OK** ↵	Control mode's power supply. 0 -> Local 1 -> Remote
Command : **[address] MODE WR [0-3]** ↵ Answer : **[address] OK** ↵	Mode coupling of the outputs. 0 -> Double mode 1 -> Serial mode 2 -> Parallel mode 3 -> Tracking mode

Command & Answers	Description
Command : **[address] TRACK WR [0-1] ↵** Answer : **[address] OK ↵**	Output sockets linked inside in tracking mode. 0 -> coupling OFF (isolated) 1 -> coupling ON (coupled)
Command : **[address] VOLT1 RD ↵** Answer : **[address] OK [0-64400] ↵**	Reading the voltage setpoint (mV) channel 1, In double mode. Reading the voltage setpoint (mV) in serial, parallel or tracking mode.
Command : **[address] CURR1 RD ↵** Answer : **[address] OK [0-12200] ↵**	Reading the current setpoint (mA) channel 1, In double mode. Reading the limit current setpoint (mA) in serial, parallel or tracking mode.
Command : **[address] OVP1 RD ↵** Answer : **[address] OK [0-64400] ↵**	Reading the limit voltage setpoint (mV) channel 1, In double mode. Reading the voltage setpoint (mV) in serial, parallel or tracking mode.
Command : **[address] OCP1 RD ↵** Answer : **[address] OK [0-12200] ↵**	Reading the limit current setpoint (mA) channel 1, In double mode. Reading the limit current setpoint (mA) in serial, parallel or tracking mode.
Command : **[address] OUT1 RD ↵** Answer : **[address] OK [0-1] ↵**	Reading output connection channel 1. 0 -> OFF 1 -> ON
Command : **[address] VOLT2 RD ↵** Answer : **[address] OK [0-32200] ↵**	Reading the voltage setpoint (mV) channel 2, in double mode.
Command : **[address] CURR2 RD ↵** Answer : **[address] OK [0-6100] ↵**	Reading the current setpoint (mA) channel 2, in double mode.

Command & Answers	Description
Command : **[address] OVP2 RD ↵** Answer : **[address] OK [0-32200] ↵**	Reading the limit voltage setpoint (mV) channel 2, in double mode.
Command : **[address] OCP2 RD ↵** Answer : **[address] OK [0-6100] ↵**	Reading the limit current setpoint (mA) channel 2, in double mode.
Command : **[address] OUT2 RD ↵** Answer : **[address] OK [0-1] ↵**	Reading output connection channel 2. 0 -> OFF 1 -> ON
Command : **[address] VOLT3 RD ↵** Answer : **[address] OK [1000-15300] ↵**	Reading the voltage setpoint (mV) channel 3.
Command : **[address] OVP3 RD ↵** Answer : **[address] OK [1000-15300] ↵**	Reading the limit voltage setpoint (mV) channel 3.
Command : **[address] OUT3 RD ↵** Answer : **[address] OK [0-1] ↵**	Reading output connection channel 3. 0 -> OFF 1 -> ON
Command : **[address] OUT RD ↵** Answer : **[address] OK [0-1] ↵**	Reading the two output's connection. 0 -> OFF 1 -> ON
Command : **[address] MODE RD ↵** Answer : **[address] OK [0-1] ↵**	Reading the mode coupling of the outputs. 0 -> Double mode 1 -> Serial mode 2 -> Parallel mode 3 -> Tracking mode

Command & Answers	Description
Command : **[address] TRACK RD ↵** Answer : **[address] OK [0-1] ↵**	Reading sockets coupling of outputs in tracking mode. 0 -> coupling OFF (isolated) 1 -> coupling ON (coupled)
Command : **[address] MODE1 RD ↵** Answer : **[address] OK [0-2] ↵**	0 => not defined mode (output OFF) 1 => voltage regulation mode channel 1. 2 => current regulation mode channel 1
Command : **[address] MODE2 RD ↵** Answer : **[address] OK [0-2] ↵**	0 => not defined mode (output OFF, serial,//) 1 => voltage regulation mode channel 2. 2 => current regulation mode channel 2
Command : **[address] VOLT1 MES ↵** Answer : **[address] OK [0-64400] ↵**	Measuring voltage (mV) channel 1, in double mode. Measuring voltage (mV) in serial, parallel or tracking mode.
Command : **[address] CURR1 MES ↵** Answer : **[address] OK [0-64400] ↵**	Measuring current (mA) channel 1, in double mode. Measuring current (mA) in serial, parallel or tracking mode.
Command : **[address] VOLT2 MES ↵** Answer : **[address] OK [0-32200] ↵**	Measuring voltage (mV) channel 2, in double mode.
Command : **[address] CURR2 MES ↵** Answer : **[address] OK [0-6100] ↵**	Measuring current (mA) channel 2, in double mode.
Command : **[address] CURR3 MES ↵** Answer : **[address] OK [0-3300] ↵**	Measuring current (mA) channel 3.

APPENDIX B –USB connection

Preparation of communication :

Download on our website www.elc.fr the file : ALR32xx.inf

Connect the power supply to the USB2.0 PC port with a USB cable as A / B type USB (its length shouldn't exceed 5 meters).

Install the file.

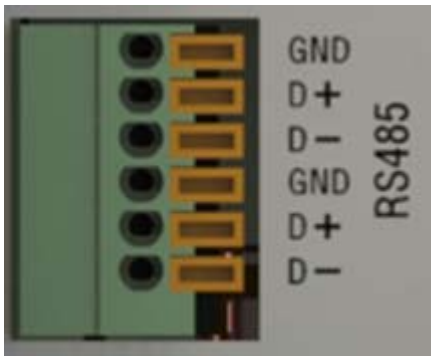
Your PC is ready to communicate with the ALR3206T.

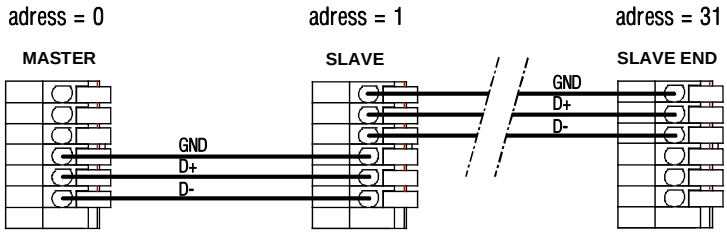
Use "Hyper Terminal ®" simple utility to communicate via the serial port, present on all PCs with Windows 95®, 98®, XP®, Seven®.

You will find on the website www.elc.fr, LabVIEW ® drivers.

The USB connection allows upgrade the Firmware (see website).

APPENDIX C – RS485 connection

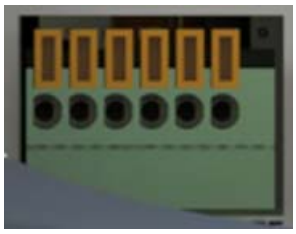


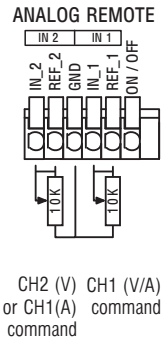
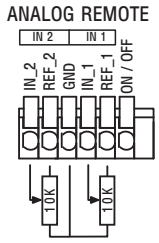
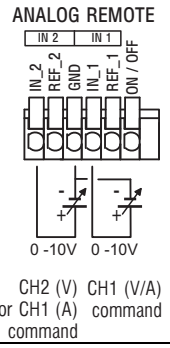


You will find on the website www.elc.fr, LabVIEW ® drivers to drive the master.

APPENDIX D – 0–10V connection

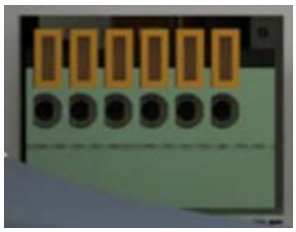
This function changes the voltage setpoints for channels 1 and 2 or voltage / current for channel 1 via an analogical voltage, a potentiometer or resistance.
The maximum setpoint value is the one displayed before activating the function.

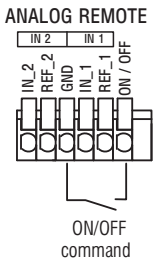


Mode variable resistor (Configuration **R**)	Mode potentiometer (Configuration **U**)	Mode voltage driving (Configuration **U**)
		

APPENDIX E - external ON/OFF control

Use pin ON/OFF to GND (relay contact, manual switch, sensor, ..) allow control isolation of one or all outputs .
Open contact => ON output(s), Closed contact => OFF output(s)**.**

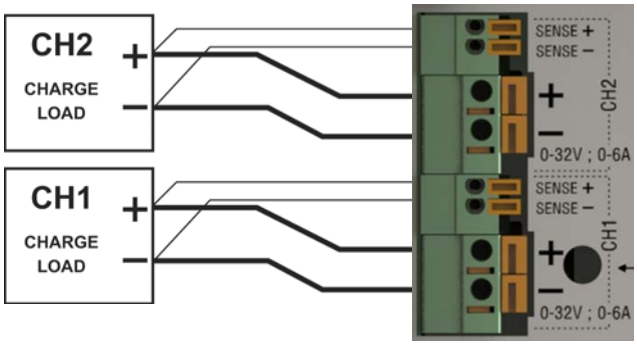


Connection input control


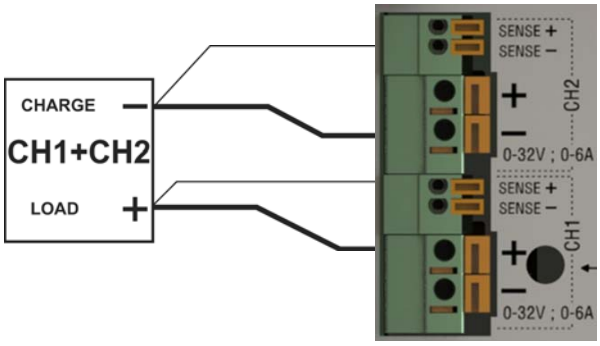
APPENDIX F – sense

Configuration **"sense" 4 wires** for output to terminals on the rear panel of the power supply. Recommended conductors for the power are of 1 to 2 mm² ; those of the "sense" are minimum 0,22 mm².

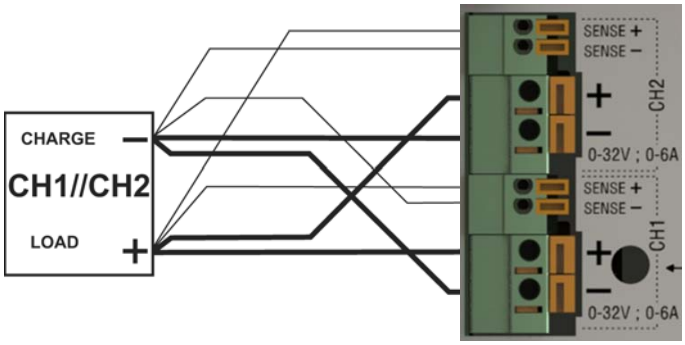
Separated mode or tracking isolated



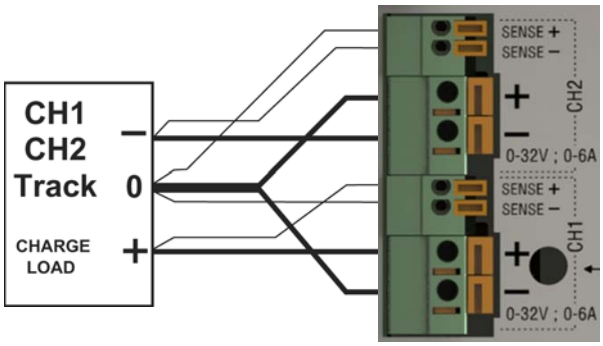
Serial Mode



Parallel Mode



Tracking mode coupling (symetric)



APPENDIX G – Sequencer

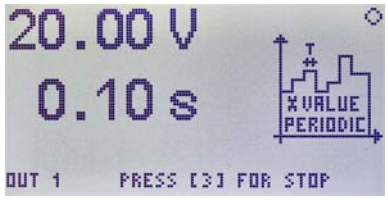
The key 3 F(t) allows to generate the signal function (Voltage or Current) on outputs CH1 or CH2.

Step	Action	Description
Before use sequencer, select channel 1 or 2 and setting value.		
1.	Touch on Esc 2nd	Select key “2nd”
2.	Touch on 3 F(t).	Select sequencer function
3.	Touch on OK	Run signal displayed
		
Setting pre-programmed signal		
1.	Touch on Esc 2nd	Select key “2nd”
2.	Touch on 3 F(t)	Select sequencer function
3.	Touch on 3 F(t)	Enter in setup sequencer mode
4.	Touch on 1 Util to 5 Local or touch on + or −	Select signal.
5.	Touch on 1 Util or 2 Sense or touch on + or −	Select regulation mode (voltage or current)
6.	Touch on 1 Util or 2 Sense or	Select range of timer (seconds or minutes)

Step	Action	Description
	touch on + or −	
7.	Touch on 0 0-10V to 9 OVP	Setting value timer (60 seconds maxi or 50 minutes maxi)
8.	Touch on OK	Valid timer value, sequencer run, for exemple :
		
Setting arbitrary multi-shot signal		
1.	Touch on Esc 2nd	Select key “2nd”
2.	Touch on 3 F(t).	Select sequencer function
3.	Touch on 3 F(t).	Enter in setup sequencer mode
4.	Touch on 7 RCL or touch on + or −	Select multi-shot arbitrary signal.
5.	Touch on 1 Util or 2 Sense or touch on + or −	Select regulation mode (voltage or current)
6.	Touch on 1 Util or 2 Sense or touch on + or −	Select range of timer (seconds or minutes)
7.	Touch on 0 0-10V to 9 OVP	Setting value timer (60 seconds maxi or 50 minutes maxi)
8.	Touch on OK	Timer value is valid when press “OK”

Step	Action	Description
9.	Touch on 0 0-10V to 9 OVP	Setting value in regulation mode selected step 5 (Voltage or current).
10.	Touch on V or A	Valid value by unit selected step 5 (32 values maximum)
11.	Touch on OK	End setting value (Voltage or current)
	 	
12.	Touch on 1 Util to 9 OVP	Enter number of repeat signal (1 to 99).
13.	Touch on OK	Run sequencer with the key "OK"
		
	Displaying at right up repeat value remaining	

Step	Action	Description
	Setting arbitrary periodic signal.	
1.	Touch on Esc 2nd	Select key “2nd”
2.	Touch on 3 F(t)	Select sequencer function
3.	Touch on 3 F(t)	Enter in setup sequencer mode
4	Touch on 6 OCP	Select periodic arbitrary signal.
5	Touch on 1 Util or 2 Sense or	Select regulation mode (voltage or current)

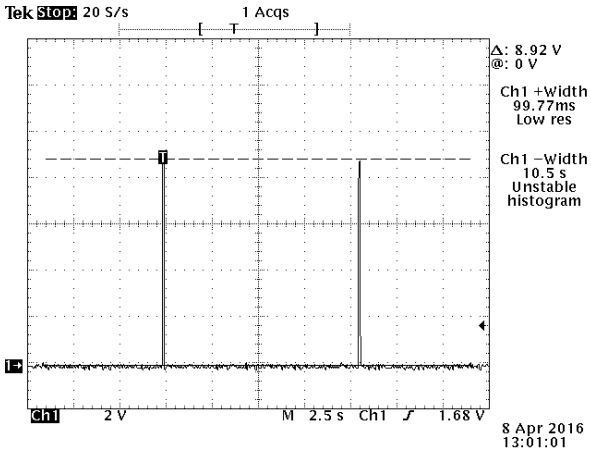
Step	Action	Description
	touch on + or −	
6	Touch on 1 Util or 2 Sense or touch on + or −	Select range of timer (seconds or minutes)
7	Touch on 0 0-10V to 9 OVP	Setting value timer (60 seconds maxi or 50 minutes maxi)
8	Touch on OK	Timer value is valid when press “OK”
9	Touch on 0 0-10V to 9 OVP	Setting value in regulation mode selected step 5 (Voltage or current).
10	Touch on V or A	Confirm the value entered by the unit of the selected control. The number of values recorded in the sequencer is displayed at the top right of the display (32 values maximum)
	 	
11	Touch on OK	Run sequencer with the key "OK"
		

Setting example pulse I = 4A R load = 2,25 Ω

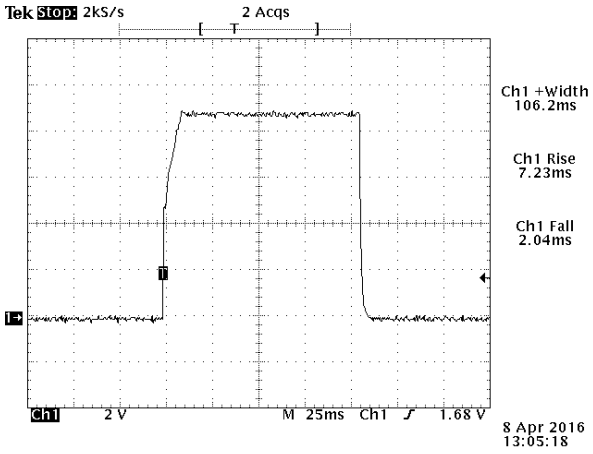
Function : square
Regulation mode : current
Unity : seconde
Ton : 0.1s
Toff :10 s

Display after setting the square signal

Measurement results on a resistive load of 2.25 Ω:



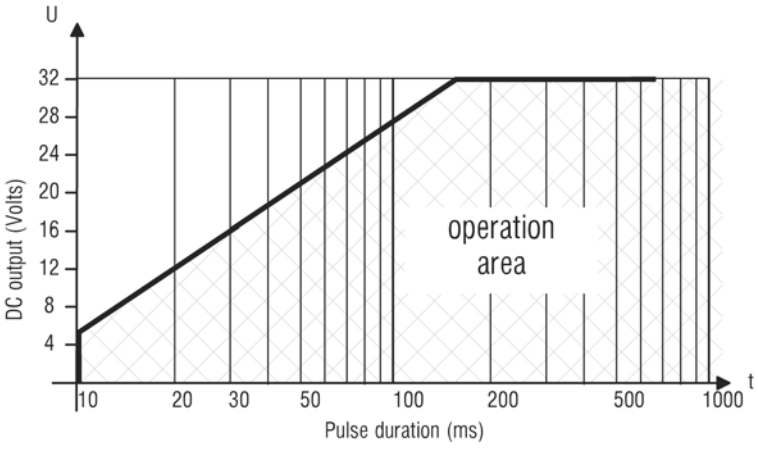
100ms impulse ever 10s ..



Details of the 100ms impulse

Operating area

(pulse width / voltage)



Other form : Ramp of 400ms in parallel mode with U=32V & Imax=12A