ELB 400

Service manual

elinchrom
creative image lighting technology

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1. SAFETY NOTICE

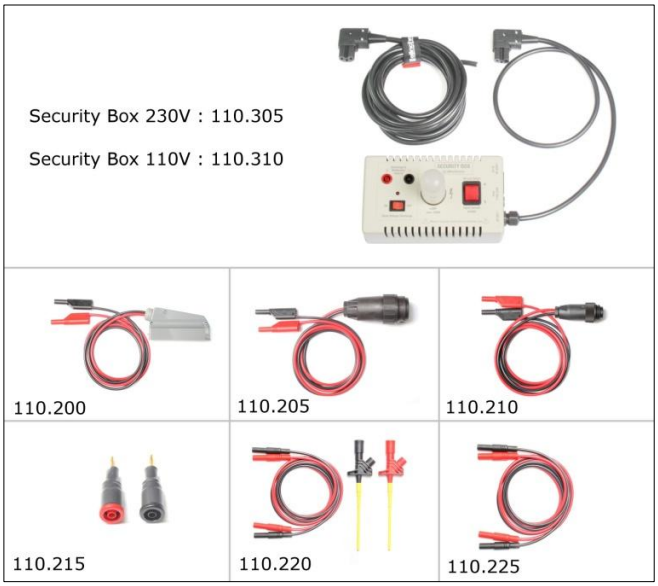
The interior of the Elinchrom devices contain components carrying dangerous levels of electric charge, even though the unit has been disconnected from the mains or without supply battery. **Before all servicing operations or repairs, you must execute the following discharge process:**

ELB 400 DISCHARGE PROCESS BEFORE SERVICING

Note: *The discharge process is best achieved with a suitable Elinchrom Security Box (discharging box)*

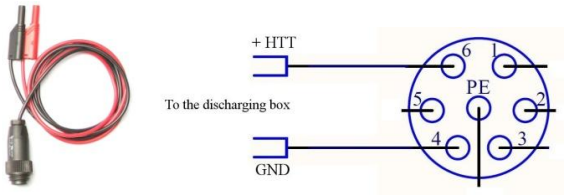
Code numbers:
110.305 Security Box 230V
110.310 Security Box 110V

110.200 Adaptor EL
110.205 Adaptor Ranger RX
110.210 Adaptor Quadra/ELB 400
110.215 Adaptor Style RX
110.220 Set of hook type test probe clip
110.225 Multimeter cables



1. Set the device at minimum power ***Note:*** *One head must be connected to the device to activate the auto-discharge.*	
2. Switch off the unit, remove the head cables and the battery.	
3. Discharge the UBAT voltage on the X100 and X101 connectors of the unit.	

4. Discharge HHT A and HTT B of the outlet A and B by using the ELB 400 discharge cable



Note: *Always use the ELB 400 discharge cable alone on the discharging box.*

5. Remove the rubber and the housing of the unit.

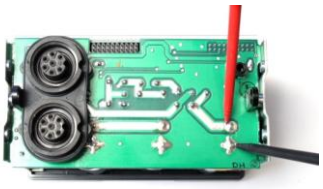
Note: *do not touch the circuit boards and use insulated gloves until the end of this process*

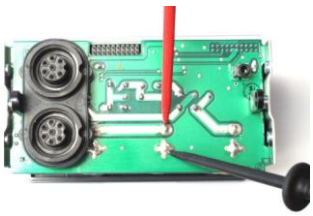
6. Remove the keyboard.

Note: *do not touch the circuit boards and use insulated gloves until the end of this process*

7. Discharge the HTD and HTD A on the following points: Across C404 and C405

Note: *do not touch the circuit boards and use insulated gloves until the end of this process*





8. Now you can disassembling, repairing and servicing safely.

2. SPARE PARTS

The following spare parts list is only an overview of some spare parts.
This list is not updated and only the spare parts present in the Elinchrom Agent Web Shop are orderable and available.

	Image	Item number	Part description	note	min qty	package
ELB 400 Generator		**230.057.ADJ**	Power Control Board ELB 400 (Adjusted)		1	1
		**660.064.SAV**	Flash Board RQ/ELB 400		1	1
		**230.300**	PCB Synchro Socket Jack 3.5mm	J403 on 660.064.SAV	5	5
		**660.260.SAV**	Keyboard ELB 400 (with Front Panel)		1	1
		**660.261**	Base frame ELB 400		1	1
		**230.007**	Housing Ranger ELB 400		1	1
		**230.021**	Rubber Top Housing ELB 400		5	5
		**660.065**	Side frame RQ/ELB 400		2	2
		**660.062**	Foam base frame RQ/ELB 400		100	100
		**211.893**	Screw truss head 6 lobe M3x10 black		100	100
		**211.892**	Screw countersunk head 6 lobes M3x6 ZgBl		100	100

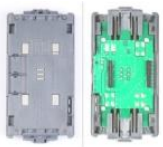
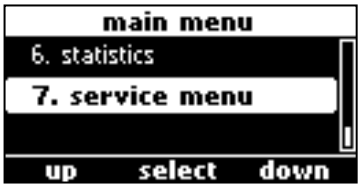
	Image	Item number	Part description	note	min qty	package
Battery Li-Ion		**19295**	RQ Lithium-Ion Battery 16.8V-3.3Ah		1	1
		**230.160**	Car Fuse 20A/32V		25	25
		**660.166**	Li-Ion complete battery cover RQ/ELB 400		1	1
		**260.020**	Li-Ion Battery top plate RQ/ELB 400		5	1
		**230.126**	Rubber battery box ELB 400		5	5
		**19279**	RQ Lithium-Ion Charger		1	1
		**11037**	RQ Li-ion Car Charger		1	1
Cables		**11000**	RQ Flash Head Cable 1.5m		1	1
		**11001**	RQ Flash Head Cable 2.5m		1	1
		**11002**	RQ Flash Head Cable 3.5m		1	1
		**11003**	RQ Extension Flash Head Cable/5m		1	1
		**11004**	RQ Extension Flash Head Cable/10m		1	1

	Image	Item number	Part description	note	min qty	package
Quadra Heads		**24086**	Flashtube Plug-in Action 400		1	1
		**24087**	Flashtube Plug-in Pro 400		1	1
		**226.025**	Trigger Fork		20	1
		**660.269.A.SAV**	Body Head Quadra Action		1	1
		**660.269.S.SAV**	Body Head Quadra Pro		1	1
		**660.167.SAV**	Reflector-LED Quadra Action Head (Tested)		1	1
		**660.168.SAV**	Reflector-LED Quadra Pro Head (Tested)		1	1
		**211.819**	Screw pan head Zgbl KA30x8		100	100
		**230.206**	Tilt Bracket Base		2	1
		**230.207**	Tilt bracket locking part		10	10
		**230.208**	Tilt bracket spring Ø 7mm		10	10
		**226.011**	Tilt Bracket Handle		10	10
		**206.036**	Clamp Screw M6		25	25
		**230.210**	Rubber Ranger Quadra Tilthead		50	50
		**210.009**	Washer 8x20x0.2mm		50	50
		**26145**	RQ Reflector 13.5cm 70°		1	1
		25100	RQ Multifunction Cap for 26145		10	10
		**26056**	RQ Grid Reflector 18cm 56°		1	1

3. SERVICE MENU

3.1. Activate Service Menu

1. Unit ON 2. Press and hold the **Modelling lamp button** 3. Press and hold the **Left button** 4. Press and hold the **Right button**	
5. Press **Menu button** 6. Select “service menu”	

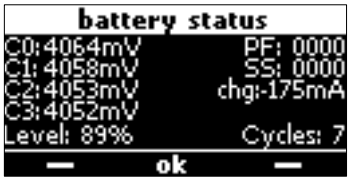
3.2. Menus overview

3.2.1. Recharge delay

Select “recharge delay” in the service menu	
You can modify the Recharge delay value. Default value = 150ms	

3.2.2. Li-Ion battery status

Select “Li-Ion batt. status” in the service menu	

Battery and cells status	

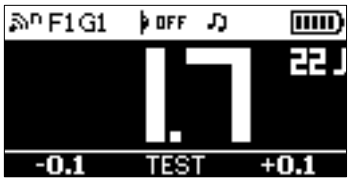
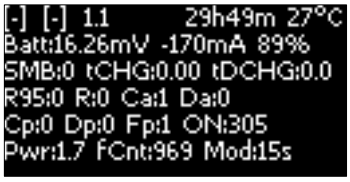
3.2.3. Plugmatic bypass

The Plugmatic bypass is use to simulate the presence of a connected head, without a physical head.
The ELB 400 charge the flash capacitors, even if no heads are plugged on the generator.

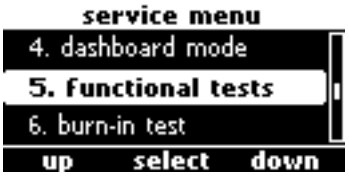
Select “plugmatic bypass” in the service menu	
You can enable or disable the plugmatic bypass	

3.2.4. Dashboard mode

The Dashboard mode is mainly use for the developers to display an internal data (debug) overview.

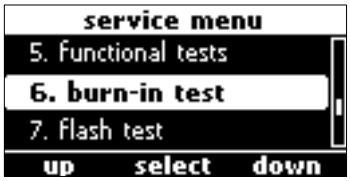
Select “dashboard mode” in the service menu	
Select the dashboard mode User mode : Debug mode: [A] [B] Hours of use, Temperature [°C] Batt: Battery voltage [V], Current flow [mA], Level [%] SMB: Errors communication counter between ELB and Battery tCHG: Time of charge [s] tDCHG: Time of discharge [s] R95: Ready 95% flag R0: Ready 100% flag Ca: Charge Algorithm flag Da: Discharge Algorithm flag Cp: Charge pin flag Dp: Discharge pin flag Fp: Fast pin flag (0 = slow , 1 = fast) ON: Boot ON counter Pwr: Power [F-stop] fCnt: Flash counter Mod: Modelling lamp timer [s]	  

3.2.5. Functional tests

Select “functional tests” in the service menu	
Functional tests 1. **All pixel OFF** [Check that all pixel are OFF (black) on the display] 2. **All pixel ON** [Check that all pixel are ON (white) on the display] 3. **All LED ON** [check that the Test button is white and red] 4. **White** [check that the Test button is white] 5. **Red** [check that the Test button is red] 6. **All LED OFF** [check that the Test button is OFF] 7. **Push ON** [Push ON/OFF button] 8. **Push Menu** [Push Menu button] 9. **Push ModLamp** [Push Modelling Lamp button] 10. **Push Left** [Push Left function button] 11. **Push Center** [Push Test button] 12. **Push Right** [Push Right function button] 13. **Cell trigger** [Check the cell trigger by flashing the cell] 14. **Synchro trigger** [Check the Synchro socket by a synchro triggering]	

3.2.6. Burn-in test

The Burn-in test is mandatory after every replacement of flash capacitors or flash board.

Select “burn-in test” in the service menu	
Burn-in test Press “Start” Step 1/7 [30 minutes at Pwr: 2.0] Step 2/7 [30 minutes at Pwr: 3.0] Step 3/7 [30 minutes at Pwr: 4.0] Step 4/7 [30 minutes at Pwr: 5.0] Step 5/7 [120 minutes at Pwr: 6.0] Step 6/7 [Discharge] Step 7/7 [End Test]	

3.2.7. Flash test

Select “flash test” in the service menu	
Flash test Count [Choose the number of flashes and press Next] tWait [Choose the time between flashes and press Next] Power [Choose the Power [f-stop] of flashes and press Start] *Flash test in progress...* *Results*	

3.2.8. Booster test

Select “booster test” in the service menu	
Booster test Count [Choose the number of triggers and press Next] tWait [Choose the time between flashes and press Start] *Booster test in progress...* *Results*	

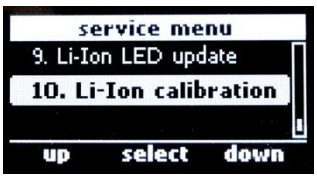
3.2.9. Li-Ion LED update

This option activates the LED battery status on the Li-Ion battery mounted on the ELB400 unit.

Select “Li-Ion LED update” in the service menu. (available since ELB400 firmware version 1.8)	

3.2.10. Li-Ion calibration

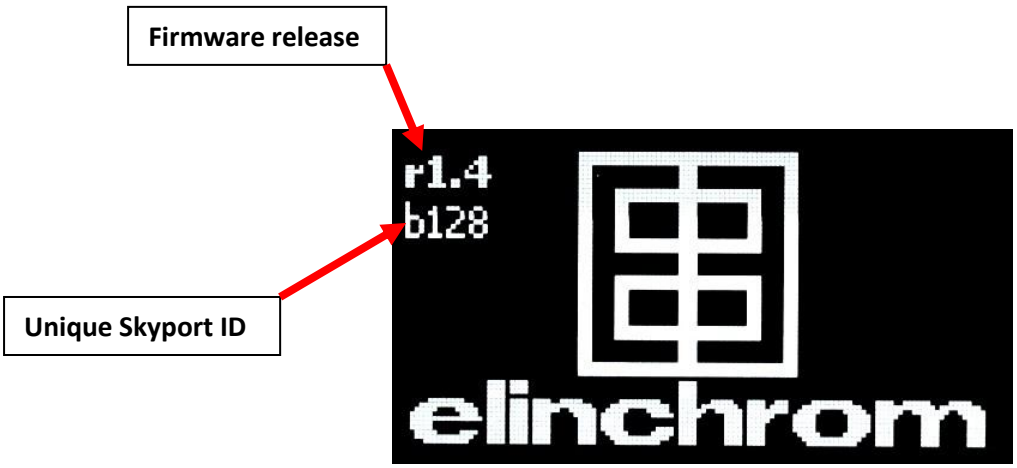
This option calibrates the voltage references of the Li-Ion battery mounted on the ELB400 unit.

Select “Li-Ion calibration” in the service menu. (available since ELB400 firmware version 1.8)	
Li-Ion calibration *Select Li-Ion calibration* *After calibration, the unit shut down.* *Wait minimum 10 seconds before power ON the unit.*	

4. FIRMWARE

4.1. Release

Power ON display



4.2. USB firmware update

ELB firmware update could be only done by USB cable and the EL-Updater software.

Activate Firmware update mode 1. Unit off (not standby) 2. Press and hold the **Menu button** 3. Press and hold the **On/Off button** 4. Wait until Firmware update display	

5. SOFTWARE RESET

1. Unit ON. 2. Press and hold the **Left button** and the **Right button** together. 3. Wait until unit reboot.	

6. LI-ION BATTERY AUTO-RECOVERY PROCESS

ELB-400 has intelligent software that could recovery some battery faults like, for example, deeply discharged battery pack.

If there's some faults, software automatically starts a recovery process showing in real time to the customer the status of recovery process.

Note: Recovery process needs to be done plugging charging adapter. Usually, if battery has some critical faults, unit won't switch on and customer tends to plug charger and try to "activate" battery.
It's necessary to plug charger adapter **without** any heads connected!

By the way, a typical recovery process starts showing following picture:

Once the battery has been restarted, voltage level of cells is checked and sometimes a pre-charge process is started. Customer will be warned with following picture:

The pre-charging process takes a while, sometimes up to one hour or more. So, customer should be warned that this process, since it is not a usual state, perform a soft charge in order to avoid to alter Li-Ion chemistry.
If the pre-charging process takes more than 45 minutes, remove the mains from the charger during 2 minutes and reconnected to the mains.
Once pre-charge process has been finished, battery pack will be charged in fast mode using maximum current coming from the charger. Customer will be informed with this picture:

During charging, we will show to customer the actual charge level of battery compared to "30%". This 30% level is in some words the minimal charge level to exit from this recovery process starting normal usage. Let's say, we don't block our valued customer to 100% but we try to guarantee a reasonable margin of charge before using battery.
Finally, customer will see something like this:

7. UNIT CHECK

7.1. Thermal behaviour (error-2)

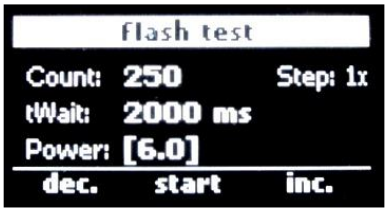
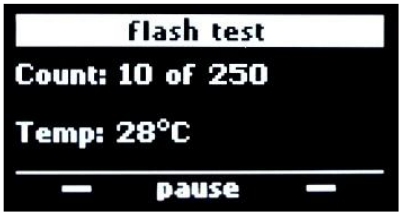
The following test is performed to know if the error-2 displayed by the unit is due to a normal overheat caused by an intensive use of the unit or by a technical problem of the unit.

This following test consist to use the “Flash test” available in the Service Menu of the unit and check the minimal quantity of flash done by the unit before the activation of the error -2.

Note : The overheat protection (error-2) is activated when the temperature inside the unit is higher than 54°C

Test conditions

Unit : ELB 400	Flash heads : 2x Quadra Action
Unit position : Vertical	Ambient temperature : 20°C
Firmware : r1.8	Initial internal temperature : 25°C

Select “flash test” in the Service menu and set the following values : Count 250 tWait 2000 ms Power 6.0	
Press “start” and check the temperature value on the unit display after the first flash. This temperature must be lower to **26°C**. Check the display of the unit, the overheat protection mode (error -2) will be activated at **55°C** Read the value of the flash counter just before the overheat protection mode (error -2)	 

Results :
The numbers of flash done before the error-2 will define a normal behaviour or not of the unit. ELB 400 units may have different results due to the electronic and assembly tolerances.

We consider a median value of 165 flash or more for a correct behaviour but at least 120 flash by starting with an initial temperature of 25°C

If the result is lower than 120 flash, you can suspect a technical problem in the unit. In this case we recommend to replace first the Power Board 230.057.ADJ

8. Repair Assistance

8.1. Error management

ELB-400 informs the user of some system errors due to system fault caused by the user itself or electronic problem. A sample picture of an error could be a system overheat caused by intensive use of the flash (typically this error is caused by the user).

Generally, a warning signal on left side is shown. On top there's the error code (error -2 in this case) and a short description of error itself (in this case, user should wait until the system temperature decrease to acceptable levels).

The following table describes the possible errors, which could be shown on the display if the unit micro controller detects them:

Error number	Description	Solution for user (User manual)	Error number	Solution for Service
1	Capacitor over voltage	Switch the unit off, wait 2 minutes and switch the unit on again. If the error shows up again the unit requires a check up at an authorized Elinchrom service centre.	1	Replace Control board 230.057.ADJ
3	Discharge error		3	Replace flash board 660.064.SAV
4	Charge timeout error		4	Replace Control board 230.057.ADJ
15	Temperature sensor error		15	Replace Control board 230.057.ADJ
60	Communication bus error		60	Replace Battery, if the battery is not the cause, try to replace the Keyboard 660.260.SAV or the Control board 230.057.ADJ
90	Safety stop system (generic error)		90	Check all boards
2	System over heat	Wait until the unit has cooled down. The unit will switch back to the normal operation as soon as the temperature decreases to a normal working level.	2	User error
11	Battery low	The unit has detected a mains supply fault. Please check the mains/battery supply. It could be not working correctly.	11	Recharge or replace the battery
61	Battery unseal error	Switch the unit off, wait 2 minutes and switch the unit on again. If the error shows up again the battery requires a check up at an authorized Elinchrom service centre.	61	Replace the battery

8.2. Failures management

Failure Description	Solution for Service
Skyport disturbances	Replace the Keyboard 660.260.SAV
Unit always on	Replace the Keyboard 660.260.SAV or the Control board 230.057.ADJ
Photocell defective	Replace the Keyboard 660.260.SAV
Keyboard touch defective	Replace the Keyboard 660.260.SAV
Heads not detected	Check the Heads cable or replace the Flash board 660.064.SAV
No Booster	Replace the Control board 230.057.ADJ
No flash at low power	Replace: Control board 230.056.ADJ or the Flash board 660.064.SAV
No Trigger	Replace the Control board 230.057.ADJ
Flash misfiring	Replace the flashtube or the Control board 230.057.ADJ
Triggering by sync cable fails sporadically	Replace the sync socket 230.300 on the flashboard 660.064.SAV
No modelling LED	Replace reflector assembly A-Head: 660.167.SAV or S-Head: 660.168.SAV or replace the Flash board 660.064.SAV
Modelling LED always ON	Replace Flash board 660.064.SAV
Noise during charge or at high power	Replace Flash board 660.064.SAV

9. KNOWN PROBLEMS

All known problems have a corresponding Technical Note available in the online **Technical Centre**. (Distributors Center) www.elinchrom.ch/agent