

# Remote Audio PLUS

IR controlled motor driver kit for Elma's type A4, A47 and 04 switches SOFTWARE RELEASE 2.4 or higher

## Features

- IR remote controlled with IR teach-in function
- Adjustable to different switch types
- In/out interface for balance operation
- Relay mute function
- Zero EMI emission when not actuated
- Switch feel virtually not affected by motor (LIN motor option)

## **Possible Customization**

- Software design (including I/Os, I<sup>2</sup>C, SPI or async interfacing)
- RF vs. IR remote control option (on-board UHF module)
- Motor options, including DC motors
- Adaptors for other supplier's switches

## **Applications**

- High-end audio & Pro audio
- Industrial controls





Standard version (with switch)

RoHS (2002/95/EC)

## **Kit Content**



Switch and IR remote unit are not included

# **Dimensions** (in mm, unless otherwise stated)





# Control Module (Pin Allocation, Operating Controls and LED)



### **Relay Function:**



#### IR Receiver:





#### **Specifications**

#### **Control Module**

Operating voltage:	<u>.</u> 8 to 15 VDC (12 VDC nominal)
Current consumption:	_Standard motor; 1.2 A peak <sup>1</sup> max., LIN motor; 2.4 A peak <sup>1</sup> max. (at 12 VDC and max. torque)
	20 mA stand-by max. (at 12 VDC, no motor operation)
+5V output:	_Regulated, 100 mA load max.
Switch torque capacity:	_Standard motor; 6 Ncm max., LIN motor; 10 Ncm max. (adjustable by trim pot, at 12 VDC)
Indexing resolution:	_12, 24 or 48 (47) positions
In/out interface:	Single pulse PPM (low-active); up; 500 µs, down; 1 ms, mute on; 2 ms, mute off; 4 ms (all +/- 20%)
IR input:	NEC protocol (included IR receiver; Sharp GP1UX311QS)

#### **IR Remote Unit**

7 buttons; up, down, left, right, center, menu, play/pause. 38 kHz burst frequency, NEC protocol. Battery type: CR2032

 $^{\rm 1}$  Using a 6'800  $\mu\text{F}$  input buffer capacitor will reduce the peak current requirement to approx. 50%

### Assembling the Kit

- 1. Mount the two 30 mm stand-offs to the stepper motor using the two set screws (do not tighten the set screws).
- 2. Feed the switch drive linkage onto the shaft of the stepper motor (do not tighten). Assemble the stepper motor with its stand-offs and the linkage onto the control module
- using the two M3 screws (be careful when feeding the linkage thru the position sensor in the middle of the control module).
- 4. Twist together the stepper motor's wires (blue with red, green with black) and solder them to the control module (see pin allocation).
- 5. Mount the assembled motor unit onto the rotary switch using the two M2 screws and the plastic spacers (replacing the original M2 screws at the rear end of the switch).
- Position the linkage to the switch and firmly tighten the set screw of the linkage. 6
- 7. Mount the switch/motor unit into your equipment and connect IR remote cables and 12 VDC power supply to the unit (see pin allocation).
- 8 Adjust the trim pot to max. position, follow the below setup procedure and finally adjust the trim pot to the minimum torque level needed.

Soc

8

on

12 pos 12/24 pos mot.

mot 47) 24 pos

Std.

ast Z

#### Setup by DIP Switch

- #1 12 / 24 pos; select between 12 or 24 positions
- #2 12/24 / 48 (47) pos; select between 12/24 or 48 positions (if 48 pos is selected, switch #1 is overridden)
- #3 Std mot. / LIN mot.; select the corresponding stepper motor type in use
- #4 Slow / Fast; chose either slow or fast switching speed

### End-Stop Calibration and IR Teach-In Using the Tact Switch

- 1. Push the tact switch until the LED flashes for approx. 1 sec.
- Turn the switch to the fully left position and guickly push the tact switch. 2.
- The LED flashes for approx. 300 msec. for confirmation. 3. Turn the switch to the fully right position and quickly/long push the tact switch. Quick push; the LED flashes for approx. 300 msec. for confirmation.
- Long push; jumping to #5 (used when no IR receiver connected, e.g. in slave mode). 4. Quickly operate the buttons on the IR remote unit in the exact sequence of volume up, volume down, mute, balance left and right.
- 5. End of procedure (the LED bursts for approx. 1 sec.).

#### Important:

- Avoid fluorescent light exposure during teach-in.
- IR remotes output unique codes; they only work with the originally-paired unit.

## **Balance Operation** (Master/Slave)

When using balance operation, left and right channels have to be attenuated with two independent units. Connect the units in the master/slave configuration as shown. When operating the balance function using the IR remote, the two units switch alternately in order to minimize the balance step size. The balance function needs to be enabled by activating the solder jumper (see picture) of the master unit. The teach-in procedure has to be applied to both, master and slave units, prior to establishing the master/slave configuration.





#### **Orderina Code**

Remote Audio PLUS:	RAPLUS
Remote Audio PLUS (with LIN <sup>2</sup> motor):	RAPLUS-LIN
IR remote unit:	IRREMOTE

Standard motor (spare part): STEPMOT1 LIN motor (spare part): \_\_\_\_\_\_STEPMOT2 Control module (spare part): RAMOD IR receiver (spare part):

<sup>2</sup> The LIN motor virtually does not affect the switch feel due to very little indexing and a high resolution of 400 vs. 200 steps (standard motor). Furthermore the LIN provides a substantially higher torque capacity at a correspondingly higher current requirement (see spec).