WD Remote Control Board – Technical Data Sheet

1. Introduction

   The WD Remote Control Board (RCB) is a flexible solution for controlling DIY amplifiers. The RCB uses the popular and rugged ATMEGA 328-P micro-controller.

   The RCB provides Infra Red (IR) control of input selection, mute and volume functions. In addition, the board supports a rotary encoder for input selection, LED indication of selection and muting status and off board LCD/OLED displays for indication. Although designed to work with the WD Relay Board (RB), the RCB can be used with other relays as required.

   The RCB can be supplied as a kit or ready built module. Pre-programmed micro-controllers are available to support the various configuration options.

2. Specification

   - IR control – on board sensor
   - Control of up to 5 input relays (open collector outputs; 5V relay coils)
   - Input relay pins sink up to 100 mA
   - H bridge control of motorised potentiometer (drive up to 150 mA)
   - On board LEDs to show input selected
   - On board Mute LED
   - On board Rotary Encoder for input selection
   - Support for 1602 LCD 16 x 2 character displays (see options)
   - Support for Winstar OLED 16 x 2 character displays (see options)
   - Powered from 5V DC or 6.3V DC supplies (up to 200mA required)
   - Board Dimensions 125 x 60mm

3. Connections

   Common Connections (all options)

RCB Pin Name	Pin Function	Notes
+6V3	Power input	Also marked HTR+
GND	Power input	Also marked HTR -
Chassis	Chassis connection	For use with floating power supplies
VCC	Relay board supply	+5V for relays
P1	Open collector output 1	Controls relay 1
P2	Open collector output 2	Controls relay 2
P3	Open collector output 3	Controls relay 3

RCB Pin Name	Pin Function	Notes
P4	Open collector output 4	Controls relay 4
P5	Open collector output 5	Controls relay 5
A	Motor connection A	
B	Motor connection B	
TXD	Serial data port	Not used
RXD	Serial data port	Not used
GND	Serial data ground	

LCD Display Connector (12 pin)

RCB Pin Name	LCD Pin Number	Pin Function	Notes
R/W	5	Read//Write	Set for write (0V)
DB7	14	Data bit 7	Data bits
DB6	13	Data bit 6	Data bits
DB5	12	Data bit 5	Data bits
DB4	11	Data bit 4	Data bits
E	6	Enable	
RS	4	Register select	
VDD	2	+5V power	
GND	1	Ground (0V)	
Vo	3	LCD contrast	R27 sets contrast, may also be marked VEE
LED -	15	Backlight LED -	Connected to 0V
LED +	16	Backlight LED +	R28 sets brightness

OLED Display – uses the LCD connector & PB0

RCB Pin Name	OLED Pin Name	Pin Function	Notes
PB0	R/W	Read//Write	
DB7	DB7	Data bit 7	Data bits
DB6	DB6	Data bit 6	Data bits
DB5	DB5	Data bit 5	Data bits

RCB Pin Name	OLED Pin Name	Pin Function	Notes
DB4	DB4	Data bit 4	Data bits
E	E	Enable	
RS	RS	Register select	
VDD	VDD	+5V power	
GND	GND	Ground (0V)	

Notes about connections

- If powering the board from a 5V supply diodes D1 and D2 should be replaced by wire links.

- The relay connections are current sinks, so the common connection to the relays is VCC.

- Note that the OLED display uses the R/W signal; connected to the PB0 pin on the RCB.

- The serial connector is provided for future expansion and not currently in use.

- Protection diodes are provided on board for the motor connections but not for the relays.

4. Operation

All Options

On power up the board initialises (this takes about 4 seconds) and Input 1 is selected. During initialisation the Mute LED will flicker briefly to confirm the processor is active. When initialisation is complete the remote control and the rotary encoder (input selector) will become operational. The following table shows which keys are active on the remote with the function described.

Key	Function	Comments
1	Selects Input 1 (also lifts Mute if muted)	
2	Selects Input 2 (also lifts Mute if muted)	
3	Selects Input 3 (also lifts Mute if muted)	
4	Selects Input 4 (also lifts Mute if muted)	
5	Selects Input 5 (also lifts Mute if muted)	
+	Volume Up (also lifts Mute if muted)	
-	Volume Down (also lifts Mute if muted)	
🔇	Mute	Toggles mute on/off

Key	Function	Comments
Mode	Turns on blanked display	OLED version only

The rotary encoder selects the next input – clockwise decrements the input selected; anti-clockwise increments the input selected. The input selection wraps around, for example rotating clockwise from Input 1 selects Input 5.

Input selection is shown on the LEDs.

When muted the Mute LED will light and the Input Selection LEDs will be extinguished. Rotating the rotary encoder or pressing any active key on the remote will lift the mute – note that the input selection is not changed whilst muted – for example if Input 1 is selected and then Mute operated, pressing Input 2 (or rotating the encoder in either direction) will not result in a change to the selected input, it remains Input 1 in this case. When the Mute is lifted the Mute LED is extinguished and the relevant Input selection LED will light.

Boards used with a Display

For versions with a display the operation of the rotary encoder is changed. Clockwise rotation increments the selected input.

For OLED versions the display will blank after 15 seconds of no activity if showing an input selection. Pressing any key or Mode will recover the display. If Mute is selected the display will show Mute and blank after 60 seconds if there is no activity. Pressing any key or Mode will recover the display

5. Options

There are a number of standard options available for using the board.

- Basic (no off board display)
- LCD support (display shows input selected (Input 1 – 5) or Mute)
- OLED display support (display shows input selected (Input 1 – 5) or Mute)

In addition, customised input labels (for example: Input 1-Phono, Input 2-CD) can be provided at extra cost to take advantage of the 16 x 2 character display.

If using a display option, the on board input selection LEDs and the Mute LED can be omitted if desired. The rotary encoder, IR sensor and LEDs can be mounted off board if required using flying leads (tested with up to 150mm leads). It is recommended that connections to the IR sensor and the rotary encoder are made using screened leads.

6. Ordering Information

Please e mail Ian Tyldesley at vinylunlocked@gmail.com for details for ordering options other than the basic option or for further information. The basic option is available from World Designs. See www.world-designs.co.uk for details.