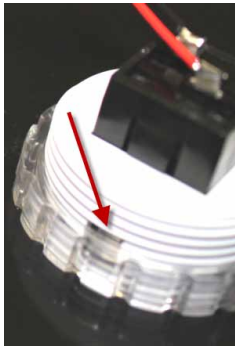


### Inserting Decals Under Tamper-Proof Clear Cap Buttons

Each clear cap button has a pop off clear cap that can be released from the underside of the lid.



To release the tamper-proof clear cap you will need to access the underside of the lid as described above.

Two clear locking tabs hold the cap in place (red arrow). Gently push inwards and downwards on each tab in turn to release the cap.

You will need to use a long thin flat blade screw driver or pick/phone opening toolkit to do this.

Note if you push too hard this could cause the locking tab to snap off. Snapped tabs are not covered by the 12 month warranty.



Once the clear cap has been released (yellow arrow) you can remove the decal disc (red arrow).

Simply place your own decal on top of the decal disc and refit.

When putting the clear cap and decal disc back on to the microswitch ensure that the keyed parts and tabs are located correctly before gently pressing down to reseat (green arrow).

A compass cutter can be used to create decal labels with a diameter of approximately 21mm.

Compass cutters and phone opening toolkits can be sourced cheaply and easily from online market places such as ebay.



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**The Black Box Toolkit**  
Measurement & calibration tools for professionals

## BBTK USB Response Pad (URP48/URPVK)

### 4/8 Button USB Response Pad (URP48)

**Operating Modes:** **1. USB Response Pad:** By default the URP is designed to mimic a standard HID keyboard when connected via USB. **2. USB & BBTK Response Pad:** The URP can be simultaneously connected to an experimental PC/Mac that accepts responses from a keyboard and to a Black Box Toolkit v2 via the 9-way D labelled BBTK. Ensure you connect the USB lead first if running in this mode. **3. BBTK Response Pad:** To run the URP solely as a Black Box Toolkit v2 response pad ensure the USB lead is disconnected and then connect the 9-way D lead.



**Troubleshooting:** Regardless of operating mode you are advised to check functionality at the start of each experimental session before you begin to collect data. If connected to a Black Box Toolkit v2 and the Response Pad LEDs are out of sync, ensure that you connect the USB first if running in mode 2. **USB & BBTK Response Pad.** If using the URP in mode 3. **BBTK Response Pad** ensure the USB remains disconnected. **If you are not using the voice key on the response pad turn the mic sensitivity to zero to avoid false triggering.**

**Default Button Mappings:** In USB, or USB & BBTK Response Pad mode, default keystroke mappings are as follows: 1 = a, 2 = s, 3 = d, 4 = f, 5 = g, 6 = h, 7 = j, 8 = k.

**Button Up Debouncing:** A built in debouncing window means that a button must be cleanly up for 25ms before a button/key up keystroke is sent. This means that button down durations will be elongated by +25ms. Response Times (RTs) are unaffected as they are registered on the leading edge of a button down.

**TTL Event Markers:** A 50ms wide TTL pulse is sent via the 2.5mm stereo socket each time a button is registered as being down (positive and negative marker available). Four primary button TTL lines are provided by the BBTK female 9-way D (pins 1-4 = But 1-4, pin 5 = +5V, pins 6-9 = GND). TTL signals from the four primary buttons will be elongated by +25ms due to button up debouncing.

**Extended TTL Event Markers (TTL):** TTL lines for up to eight buttons are provided by the male 9-way D (pins 1-8 = But 1-8, pins 9 = GND). TTL signals from each button will be elongated by +25ms due to button up debouncing.

**External Response Buttons:** Up to four external push-to-make buttons can be connected via the 3.5mm mono sockets labelled But 1 to But 4. **WARNING:** Use of poor quality external buttons may adversely affect timing accuracy.

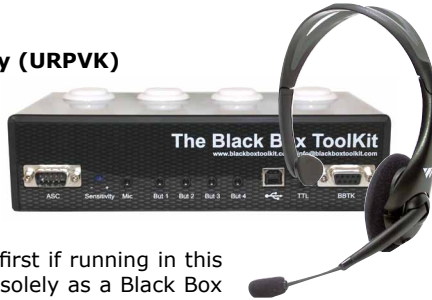
**Firmware Updates:** For firmware updates & support please visit [www.blackboxtoolkit.com](http://www.blackboxtoolkit.com).



## BBTK USB Response Pad (URP48/URPVK)

### 4/8 Button USB Response Pad with Voice Key (URPVK)

**Operating Modes:** **1. USB Response Pad:** By default the URP is designed to mimic a standard HID keyboard when connected via USB. **2. USB & BBTK Response Pad:** The URP can be simultaneously connected to an experimental PC/Mac that accepts responses from a keyboard and to a Black Box Toolkit v2 via the 9-way D labelled BBTK. Ensure you connect the USB lead first if running in this mode. **3. BBTK Response Pad:** To run the URP solely as a Black Box Toolkit v2 response pad ensure the USB lead is disconnected and then connect the 9-way D lead.



**Troubleshooting:** Regardless of operating mode you are advised to check functionality at the start of each experimental session before you begin to collect data. If connected to a Black Box Toolkit v2 and the Response Pad LEDs are out of sync, ensure that you connect the USB first if running in mode 2. *USB & BBTK Response Pad*. If using the URP in mode 3. *BBTK Response Pad* ensure the USB remains disconnected. **If you are not using the voice key on the response pad turn the mic sensitivity to zero to avoid false triggering.**

**Default Button/Voice Key Mappings:** In USB, or USB & BBTK Response Pad mode, default keystroke mappings are as follows: 1 = 1, 2 = 2 .. 8 = 8, Voice Key = 0.

**Button Up/Voice Key Debouncing:** A built in debouncing window means that a button must be cleanly up for 25ms before a button/key up keystroke is sent. This means that button down durations will be elongated by +25ms. Response Times (RTs) are unaffected as they are registered on the leading edge of a button down/vocal response. Voice key responses have a debouncing silence window of +200ms meaning durations will be elongated by +200ms.

**TTL Event Markers:** A 50ms wide TTL pulse is sent via the 2.5mm stereo socket each time a button is registered as being down (positive and negative marker available). Four primary button TTL lines are provided by the BBTK female 9-way D (pins 1-4 = But 1-4, pin 5 = +5V, pins 6-9 = GND). TTL signals from the four primary buttons will be elongated by +25ms due to button up debouncing.

**Extended TTL Event Markers (TTL):** TTL lines for up to eight buttons are provided by the male 9-way D (pins 1-8 = But 1-8, pins 9 = GND). TTL signals from each button will be elongated by +25ms due to button up debouncing.

**External Response Buttons/Microphone:** Up to four external push-to-make buttons can be connected via the 3.5mm mono sockets labelled But 1 to But 4. **WARNING:** Use of poor quality external buttons or microphone may adversely affect timing accuracy.

**Firmware Updates:** For firmware updates & support please visit [www.blackboxtoolkit.com](http://www.blackboxtoolkit.com).

## How to Change Buttons / Inserting Decals Under Tamper-Proof Clear Cap Buttons

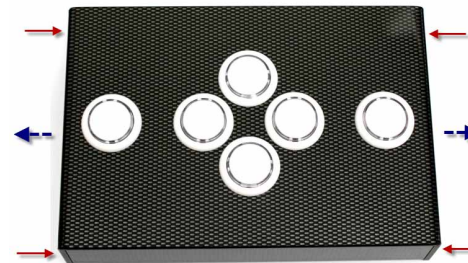


### Notes

Before changing buttons or inserting decals you should ensure that you observe correct anti-static working procedures and wear a grounding wrist strap to avoid any electrostatic damage to the response boxes PCB.

### How to Change Buttons

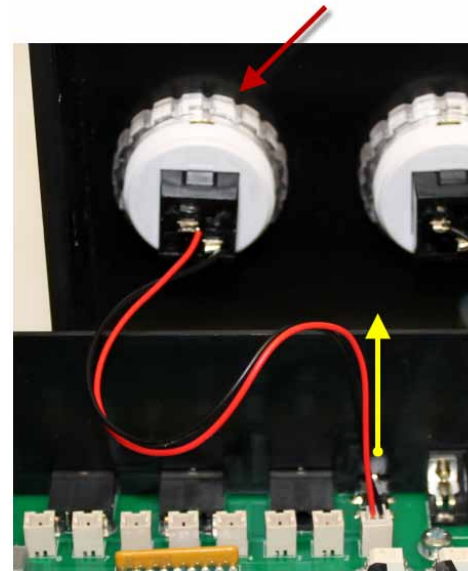
Remove the 4x cross-head screws which are located at each corner (red arrows).



Gently pull apart the response box lid and lift upwards so that it is clear of the base (blue arrows).

Be careful when lifting the lid free as the button wires will still be attached to the PCB.

Remove the spaded button connector by gently pulling it vertically away from the PCB.



This can only be refitted one way as it is keyed. To refit align the keys and gently push down until it clicks into place.

To remove a button, turn the locking ring anticlockwise. You may need to initially unlock it using a suitably sized flat bladed screwdriver and gently pushing in an anticlockwise direction after inserting it into a ridge.



Refitting is a reversal of the above procedure.