

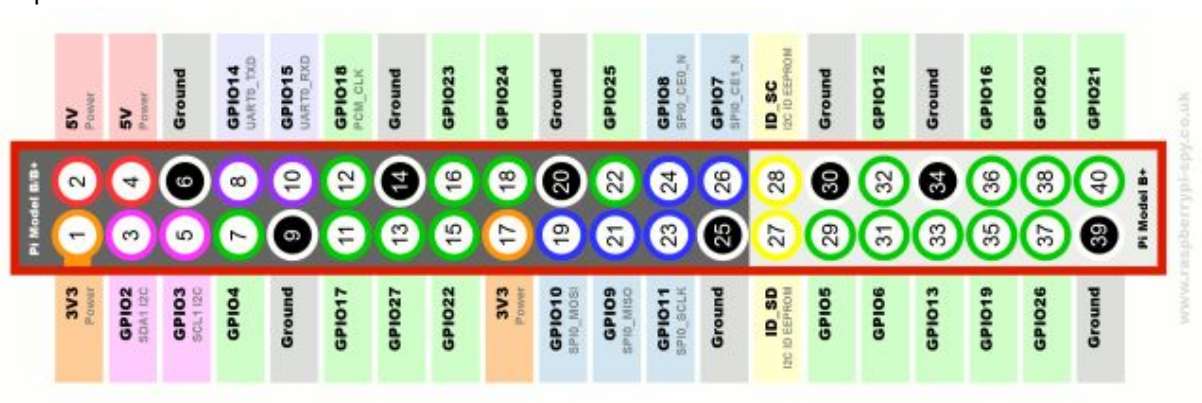
- Step by Step guidance to update the Ultimate 64 CPLD with help of a Raspi -

Disclaimer:

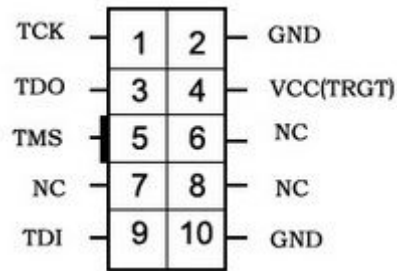
These instructions are only valid for Ultimate 64 boards up to serial number #540, which were shipped with an older version (v1.0) of the CPLD code. This Update fixes an issue with the handling of key presses. To test if your U64 board is affected, run "Bounty Bob Strikes Back" and try to play/start the game. Update on your own risk, your warranty is now void. I am not responsible for bricked devices. If you have any concerns, please do some research before updating your CPLD!

1. Download Raspbian Stretch Lite from raspberrypi.org/downloads/raspbian/ and install it with Etcher to your SD-card
2. Boot your Raspi with the SD-card inserted
3. Log in with username "pi" and password "raspberry"
 - 3.1. Hint: German users watch out, as the keyboard is first set to English, the "Z" and "Y" keys on the keyboard are changed -> password "raspberry" ;) You can change the regional settings after the first login with "raspi-config".
4. Shell-Script:
 - 4.1. `curl https://apt.matrix.one/doc/apt-key.gpg | sudo apt-key add -`
 - 4.2. `echo "deb https://apt.matrix.one/raspbian $(lsb_release -sc) main" | sudo tee /etc/apt/sources.list.d/matrixlabs.list`
 - 4.3. `sudo apt-get update`
 - 4.4. `sudo apt-get upgrade`
 - 4.5. `sudo apt install matrixio-xc3sprog`
5. Now shut down the Raspi with "sudo halt" and disconnect the power
6. While the Raspi is switched off, please wire your Raspis GPIOs to the JTAG connector on the U64 board. You'll find the JTAG connector located right beside the keyboard connector.

Raspi:



U64 JTAG beside the keyboard connector:



Please do the wiring as explained in the following table:

Raspi side	U64 JTAG side
Pin 7 GPIO 4	Pin 5 TMS
Pin 9 GND	Pin 2 oder 10 GND
Pin 11 GPIO 17	Pin 1 TCK
Pin 13 GPIO 27	Pin 3 TDO
Pin 15 GPIO 22	Pin 9 TDI

7. Power up the **Raspi and the U64 board** and log in to the Raspi with the given credentials.
8. Check with "sudo xc3sprog -c sysfsgpio" if the U64 CLPD is recognized.
9. If the above was successful , you now can update the CPLD of the U64 with the following instruction "sudo xc3sprog -v -c sysfsgpio -p 0 cpldupdate.jed:w"
10. Finished!
11. Additional: If you like to use you USB memory stick with the "cpldupdate.jed" file on it, please go on as follows. Copy the file "cpldupdate.jed" to your fat/fat32 usb stick and plug it to one of the USB ports on you Raspi. Execute the following commands to mount it:

```
sudo mkdir -p /mnt/usb
```

```
sudo mount /dev/sda1 /mnt/usb
```

Then just change the programming line of xc3sprog to the following:

```
sudo xc3sprog -v -c sysfsgpio -p 0 /mnt/usb/cpldupdate.jed:w
```

Otherwise, remember to copy the Jedec file version 1.2 to your SD-card, before starting the update. You will find the Jedec file added to the ZIP file where this instruction file also is located.

The original update instruction was written by the user "Storm" from the German Forum64 and translated to English by "Marty" of RADWAR Enterprise 1941. Thank you very much to Gideon, who gave his OK to release this update instruction and the Jedec File to the public!