Installing WebControl on a Rock64

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These instructions detail how to use the Rock64 single board computer instead of a Pi type board to run a Maslow CNC lathe using WebControl from a browser. The instructions are for Linux systems.

WebControl is a browser based control panel for the Maslow CNC large scale router. The Maslow can mill gcode described cuts in flat stock as large as 4' x 8'. It is not a fast mill, nor can it manage deep cuts.

The Rock64 is a small ARM 64 bit computer with a GB of RAM, a bootable SD card slot, 3 USB ports and a LAN port. This installation expects the Rock64 to have neither keyboard nor monitor. The first steps use an Ethernet LAN cable, the latter with WiFi . Rock64s are no longer in production but are available on Ebay and the like. Prices run $12 to $24, roughly. You will also need an SD card (16GB+), a DC power supply for the Rock64, and a USB WiFi device.

In order to use the pi based version of WebControl, use **armhf** images built for the Rock64. I found success with an Ubuntu Bionic minimal img:
https://github.com/ayufan-rock64/linux-build/releases/download/0.9.14/bionic-minimal-rock64-0.9.14-1159-armhf.img.xz

Use pixz to decompress the xz file:
pixz -d bionic-minimal-rock64-0.9.14-1159-armhf.img.xz

From a laptop/PC that supports writing to SD cards, copy the img to the Rock64's SD card:
dd status=progress if=bionic-minimal-rock64-0.9.14-1159-armhf.img of=/dev/mmcblk0
NB: the above uses the default **bs**. You may adjust be block size (**bs**) setting, but do so carefully: fast transfers can fail. Adjust the **mmcblk0** to fit your device assignment.

Insert the SD card in the Rock64, attach a gateway network LAN cable and power up the Rock64 to boot Ubuntu. Once the boot has finished, find the DHCP assigned IP and SSH to that IP and login as **rock64** with the password **rock64**. You will be prompted to set a new rock64 password, when done, logout and then log in again.

Open a console and invoke:
sudo passwd root
to assign a new root password.

Next:
su -l
with that new root pw.

Then invoke the following commands:
    adduser pi
    usermod -aG sudo pi

```
        groupadd plugdev
        groupadd dialout
        usermod -a -G tty pi
        usermod -a -G dialout pi
        usermod -a -G uucp pi
        usermod -a -G plugdev pi
        apt-get update
        apt-get installpython3-dev python3-pip python3-virtualenv mc lxde lrzip lzip lzop ncompress
unzip pixz unar zip zstd  tightvncserver xfonts-base sshfs firefox synaptic
        reboot;exit
```

NB: the **lxde** package installed above can be changed to the GUI desktop of your choice (XFCE, KDE,Gnome, etc).

When the Rock64 reboots, **ssh** to the Rock64 as user **pi**

From a console, use **mc** (or another tool of your choice) to:
  open a **shell link** and copy the **webcontrol-0.94-rpi-singledirectory.tar.gz** to **/home/pi**
  add the directory **/home/pi/webcontrol**
  extract and copy **webcontrol-0.94-rpi-singledirectory.tar.gz** to /**home/pi/webcontrol**

Quit **mc** and from the console login as root:
  su -l
Then:
  nmcli device wifi list
  nmcli device wifi connect "$SSID" password "$PASSWORD"   <= assign your own SSID & PASSWORD
NB: this presumes you have a wireless AP gateway in range and credentials to attach to it. Running the WebControl Rock64 as the AP wasn't tested, though it should work.

  cd /etc/systemd/system/
  touch webcontrol.service

Invoke **mc** and edit **/etc/systemd/system/webcontrol.service**
Insert the following text:
```
[Unit]
Description=WebControl
After=network.target

[Service]
ExecStart=/home/pi/webcontrol/webcontrol
WorkingDirectory=/home/pi/webcontrol
StandardOutput=inherit
StandardError=inherit
Restart=always
User=pi

[Install]
WantedBy=multi-user.target
```

Save the file and quit **mc**

To test the webcontrol service:
  systemctl start webcontrol.service
Once working, enable the persistent service:
  systemctl enable webcontrol.service

Remove the LAN cable and reboot or logout of the Rock64 and power cycle the device. Your wifi's IP address should show up at the DHCP server, use that IP to connect to the device. The WebControl web page is available at that IP on port 5000, ie: "192.168.0.100:5000"

To VNC to the GUI desktop, SSH login as the user pi and invoke **tightvncserver** to offer the LXDE GUI desktop Note the display # reported by tightvncserver, e.g.:
`New 'X' desktop is pi:1`
where the display # is the **:1**. Pass the display number to your VNC viewer along with the IP, e.g.:
vncviewer 192.168.0.100:1 to use the GUI desktop remotely**.**

The Rock64 WebControl installation is complete. Follow the standard instructions to configure and operate the Maslow CNC.