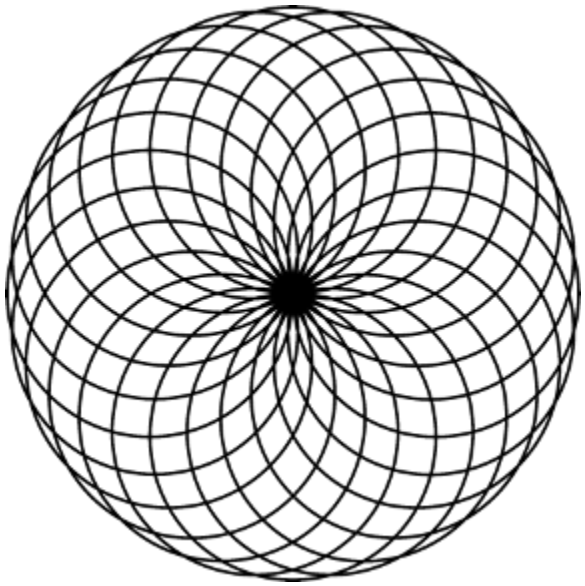
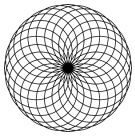
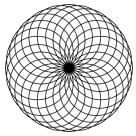


Rosetta

System Software Installation and Setup

Version 0.06
15 January 2025





Overview

This document is for installing and setting up LinuxCNC on the Raspberry Pi 5 with a Mesa FPGA board.

Prerequisites

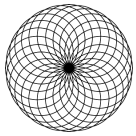
This set of instructions requires you to have the following:

To get the software downloaded for installing and setting up RETAS, you will need:

1. Computer connected to the internet with Windows, macOS, or Linux.
2. microSD card reader/writer on that computer.
3. Authority on that computer to install Raspberry Pi Imager

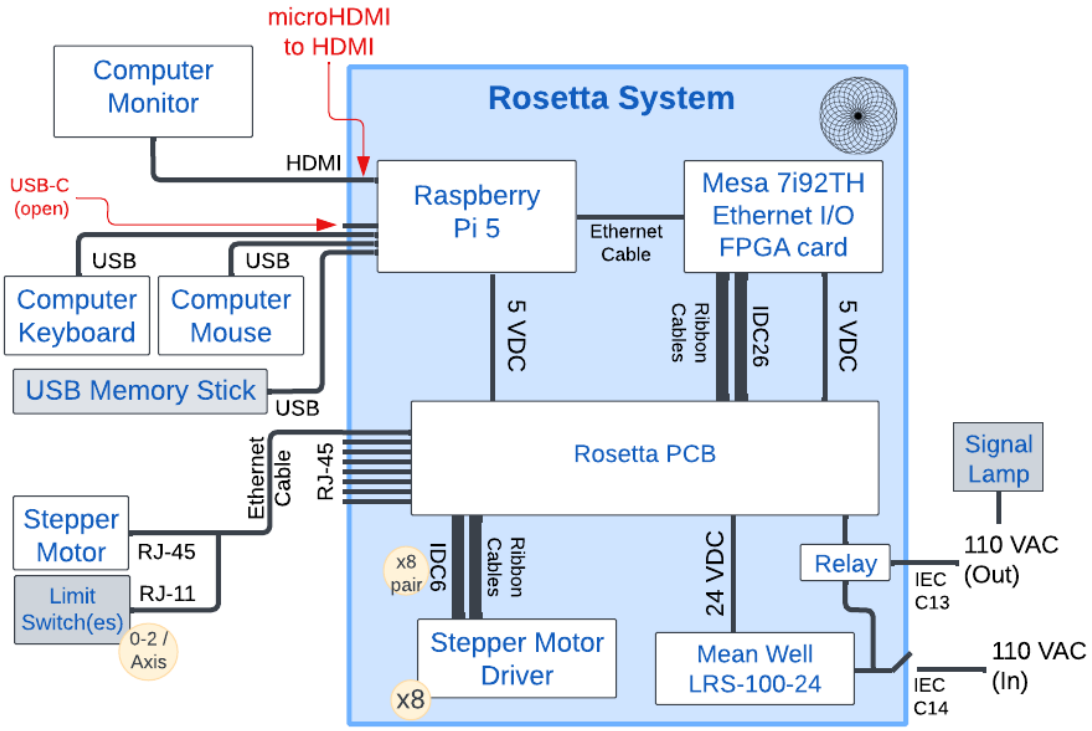
For running RETAS, you will need:

#	Item	Qty	Source	Source P/N
1000	**Case**			
1001	Case			
1100	**Power**			
1101	Power Switch	1	Astrodyne TDI	082M.01001.00-LS
1102	Power Cord	1	Schurter	6009.1214
1103	Power Outfeed Jack	1	Schurter	6600.4315
1111	24 VDC Power Supply	1		MeanWell LRS 100-24
1121	110 VAC power cable, #14			
1122	24 VDC power cable, #26			
1200	**Electronics Inside the Box**			
1201	Raspberry Pi 5 • 8 GB RAM • 128 GB microSD card	1	CanaKit	PI5-8GB-STR128-C 4-BLK

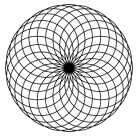


#	Item	Qty	Source	Source P/N
1210	Mesa 7i92TH Anything I/O Ethernet card	1	Mesa US	7i92TH
1220	Stepper Motor Drivers	8	StepperOnline	DM542T
1230	Rosetta PCB	1		
1300	**Panel Mount Parts**			
1400	**Cables within the Box**			
	IDC26-IDC26 Ribon Cable	2		
	IDC6-IDC6 Ribbon Cable	16		
	Ethernet cable	1		
1900	**Other**			
1901	Computer Monitor	1	LG	24MR400-B.AUSQ
1902	Keyboard & Mouse	1	Kensington	K72436AM

The overall connections for this system are as shown below. The items in the blue box are shipped as the Rosetta system.



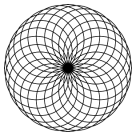
The boxes in gray and the associated cabling are optional.



Instructions

Part 1 - Build the boot drive for LinuxCNC on the Raspberry Pi

Instructions and Comments
1.1 Download and install the latest Raspberry Pi Imager (version 1.8.1 or later). This is available at https://www.raspberrypi.com/software/ The Raspberry Pi Imager is used to create the boot disk for the Raspberry Pi using the image downloaded in the next step.
1.2 Download the LinuxCNC image file, LinuxCNC 2.9.2 Raspberry Pi 5 OS based on Debian Bookworm Raspberry Pi 4 Uspace compatible with Mesa Ethernet and SPI interface boards. This is available at http://linuxcnc.org/downloads. The file which gets downloaded is rpi-5-debian-bookworm-6.1.61-rt15-arm64-ext4-2023-11-17-1520.img.xz Be sure to get the one for the Raspberry Pi 5. It is probably not the 1st one on the list.



Instructions and Comments

1.3 Create the boot disk for the Raspberry Pi using the Raspberry Pi Imager on the computer from step 1 above.

a. Insert the microSD card into the computer, and ensure the computer sees it.

b. Start the **Raspberry Pi Imager**. For the settings, use:

Raspberry Pi Device	Raspberry Pi 5
Operating System	Use custom (the bottom selection) Select the file you just downloaded in step 2.
Storage	This is for the microSD card you just added in step a, above. Be sure to not select your computer's main hard drive.

Click **Next**

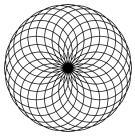
On the pop-up screen which asks,

Use OS customisation?

click **No**.

There is no need to set the options here: they get ignored in the LinuxCNC build anyway.

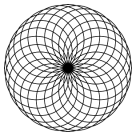
Confirm you wish to continue by clicking **Yes**.



Part 2 - Install and configure LinuxCNC on the Raspberry Pi

Instructions and Comments
2.1 Install the microSD card into the Raspberry Pi and start the Raspberry Pi. When presented with the login screen, login with these credentials: Username = cnc Password = cnc

2.2 Set some system options.
 	
Open a terminal emulator, and enter this command:
 	
`sudo menu-config`
 	
W) Wireless
Wi-Fi is not active by default. Activate it and connect to your network if desired.
 	
2) Hostname
Set the system name to **linuxcnc**
 	
4) Locales
Set the locales to **en_US.UTF-8 UTF-8**
 	
5) Timezone
Set the timezone (for example, US/Eastern). Setting this ensures your clock displays the time correctly.
 	
Enter this command:
 	
`sudo reboot`
 	
After the system restarts, ensure that everything works as expected.



Instructions and Comments

2.3 Update & patch the system.

NOTE: This is an optional step. But, if you choose to not do this now, you can't do it later as that will cause the system to crash and you will have to start again from the beginning.

Open a terminal session, and enter these commands:

```
sudo apt-get update
sudo apt-get upgrade
sudo autoremove
sudo reboot
```

After the system restarts, ensure that everything works as expected.

2.4 Set the system to auto-login at startup.

NOTES:

- *This is an optional step. You can set the system to autologin after it starts (boots up). Whilst this is optional, it does remove the need to login each time you start the system.*
- *However, this setting does not remove the need to enter the user ID and password to unlock the screen after it times out.*
- *Geany is a text editor used for this command and is installed when the system is built.*

Open a terminal session, and enter these commands:

```
cd /etc/lightdm
sudo geany lightdm.conf
```

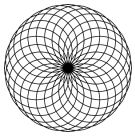
Find the lines below

```
#autologin-user=
#autologin-user-timeout=0
```

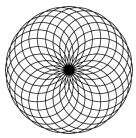
Change them to

```
autologin-user=cnc
autologin-user-timeout=0
```

Save the changes and close the geany editor.



Instructions and Comments
Enter this command: `sudo reboot` After the system restarts, ensure that everything works as expected.
2.5 Ensure the display resolution is correct. Click **Applications**, then **Settings**, and then **Display**. Check to ensure that the display connected supports these values. • Minimum resolution = 1024x768 • Recommended resolution = 1600x900 If it does not, a different display may be needed.



Part 3 - Setup LinuxCNC

Instructions and Comments

3.1 Get the Rosetta files

Open a web browser. Download the files needing using the "Software Library" link from the Rosetta Library (https://rosetta.colvintools.com/).

3.2 Move the downloaded files to the needed locations.

Copy these files to the respective places

Open a terminal emulator, and enter these commands:

```
cd /usr/lib/firmware/hm2/hostmot2
sudo cp /home/cnc/Downloads/7i92t_rosettad.bin .
sudo cp /home/cnc/Downloads/7i92t_rosettad.pin .
sudo cp /home/cnc/Downloads/PIN_RosettaD_34.vhd .
```

On the copy commands (cp), be sure to add the space and then a period. That last "dot" represents the destination location for the copy command (i.e., the directory where you are working now).

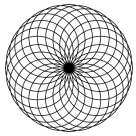
```
cd /home/cnc/Desktop
mkdir Rosetta
cd Rosetta
sudo cp /home/cnc/Downloads/Rosetta.hal .
sudo cp /home/cnc/Downloads/Rosetta.ini .
```

```
cd /usr/share/linuxcnc
sudo cp /home/cnc/Downloads/Rosetta.gif .
```

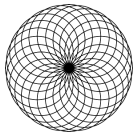
3.3 Upgrade the Mesa card's firmware.

Open a terminal emulator, and enter these commands:

```
cd /usr/lib/firmware/hm2/hostmot2
mesaflash --device 7i92t --addr 192.168.1.121 --write
        7i92t_rosettad.bin --reload
```



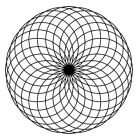
Instructions and Comments



Part 99 - Clean-up Settings no longer needed.

Disable the options no longer needed when the system is deployed for use on the rose engine.

#	Instructions and Comments
1	**Disable Wi-Fi** Open a terminal emulator, and enter this command: `sudo menu-config` **W) Wireless** Set wifi to off



Modification History

Version	Date	Comments