NovTech User Guide
Chameleon96®

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Revision History

Revision Number	Date	Changes Notes
1.0	10/2017	Initial Release

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Registering Chameleon96®

Please register your Chameleon96® at http://www.novtech.com/registration
Provide the serial # from the back side of the Chameleon96® board.
Provide the requested information and select "Chameleon" from the version drop down.
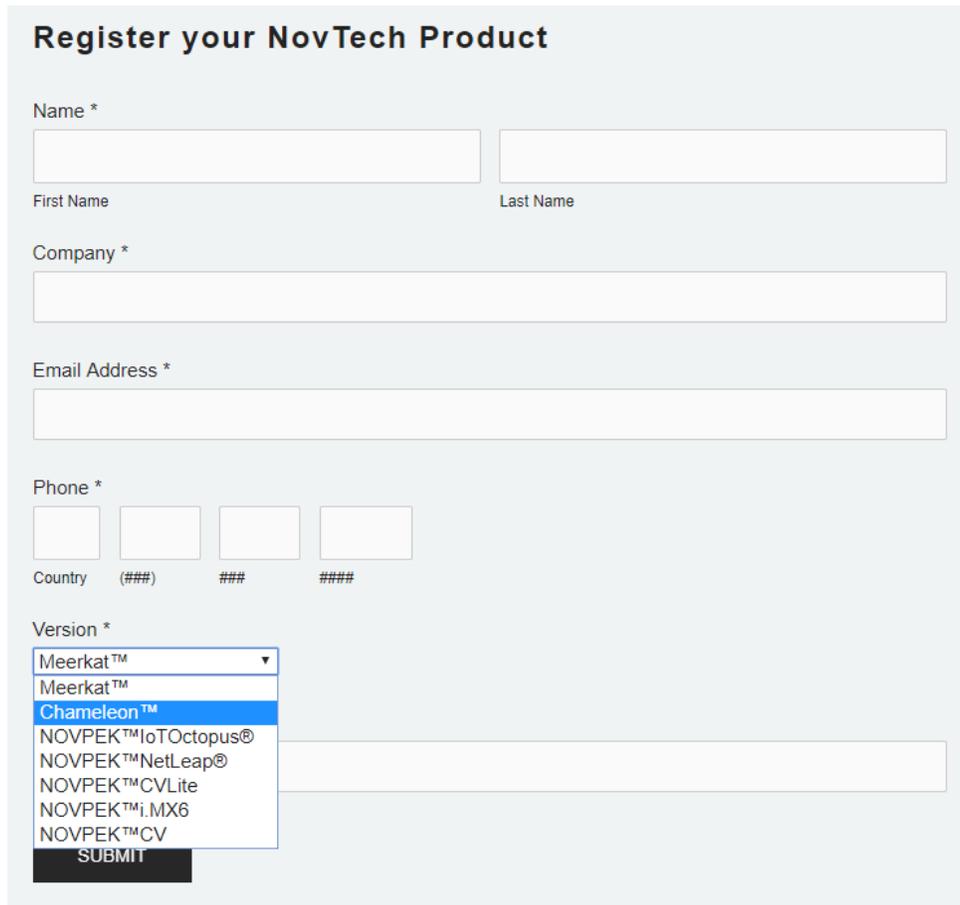
Download support files

Support files can be downloaded from: https://novtech.sharefile.com

This location contains documents, schematics, installable tools and a Virtual Machine pre-configured with tools to speed application development.

See the "Read Me First.txt" file located there for additional information.

Installing the Tools

Introduction and Prerequisites

The following prerequisites are required:
- PC with VMware Player 12 or higher
- PC with ability to open .7z zip files, i.e. 7Zip
- PC with 50G+ available hard drive space.
- PC with sufficient RAM to allocate 4GB to the VM.
- Chameleon96® VMware® virtual machine, .7z compressed file provided by NovTech
- SD/MMC card programming software, such as Win32DiskImager, "dd" or equivalent.

Creating boot cards from pre-compiled images

Pre-compiled boot images are provided on the ShareFile site. To program one of these images to a card for use in the system, use a program like Win32DiskImager.

To create a card with Win32DiskImager:

Download and decompress the desired image from the "03 - Compiled SD Images -> 03.01 Card Images" directory on the ShareFile site.

Insert a SD/MMC card of at least 4GB size. The contents of this card will be destroyed in the programming process, so be sure to back up any important data.

Run the Win32 Disk Imager software, and within the "Image File" block of the tool, browse to the decompressed disk image.

Select the drive letter which corresponds to the SD/MMC card inserted on your PC.

If you are satisfied with your selections, select "Write" from the bottom center of the Win32 Disk Imager window. Writing the card will take several minutes, refer to the progress bar on the window for status.
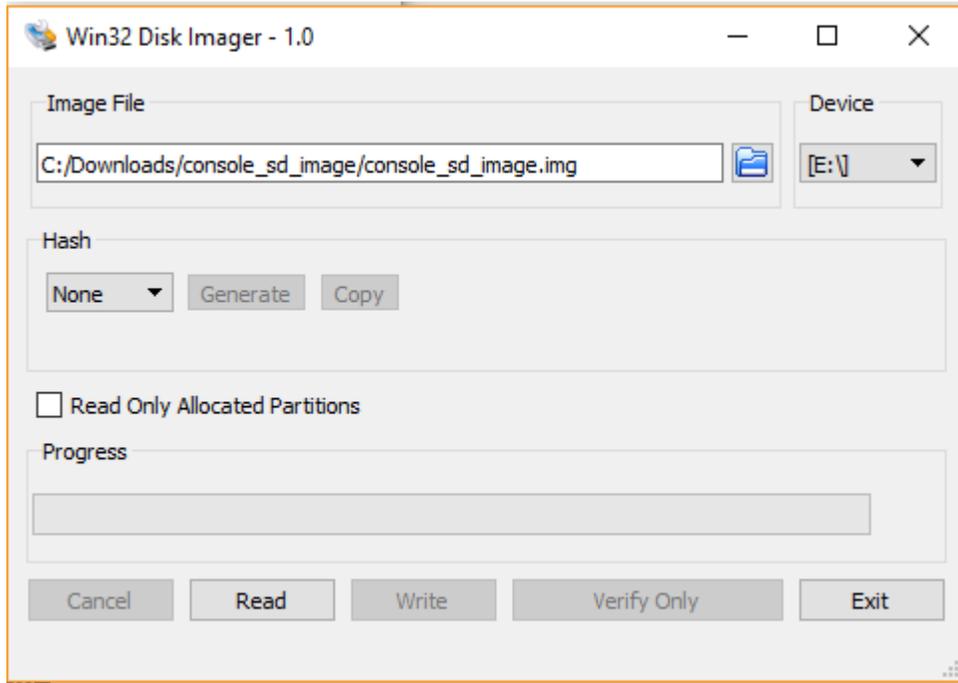
Figure 2 - Win32 Disk Imager

Installing Chameleon96® Virtual Machine

Updating and recompiling the images will require access to a properly configured Linux machine. A virtual machine has been provided with the Chameleon96® to speed your development. Refer to the Software Guide for the Chameleon96® (Document number 001-127-04-07-01) for further information on compilation.

Once all prerequisites are met, using 7Zip or any acceptable unzip program, unzip the **NovTech_VM_Chameleon96v1.7z** file located on ShareFile in **05 - Linux VM** folder to your PC hard drive. After unzipping, navigate to the created folder '**NovTech_VM_Chameleon96v1**'. Double Click on the file '**NovTech_VM_Chameleon96v1**'. VMware® Player should load the virtual machine.

Another method could be to open VMware Player and click on 'Open a Virtual Machine' then navigate to the '**NovTech_VM_Chameleon96v1**' folder to find the virtual machine setup file.
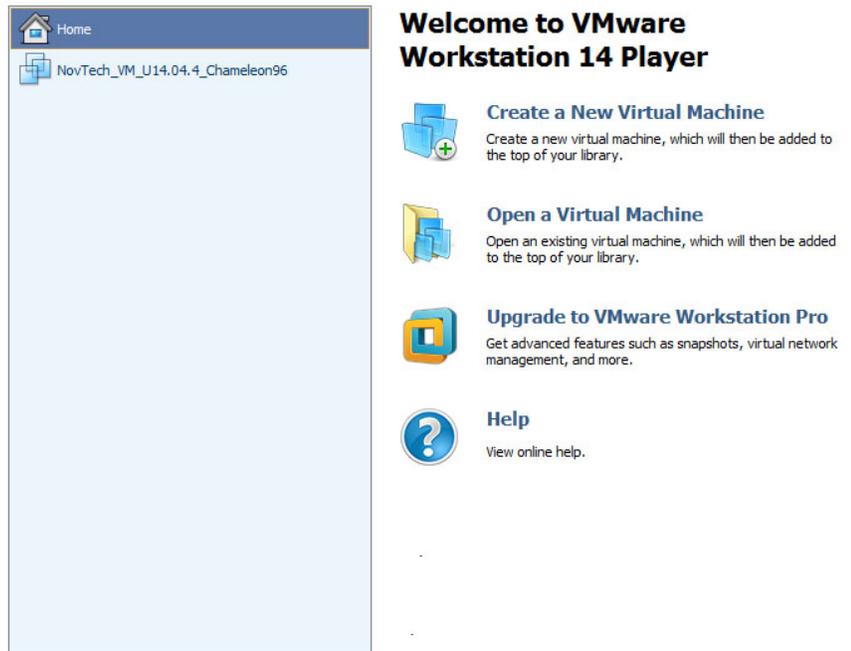
Figure 3 - VMware® Player Open Virtual Machine
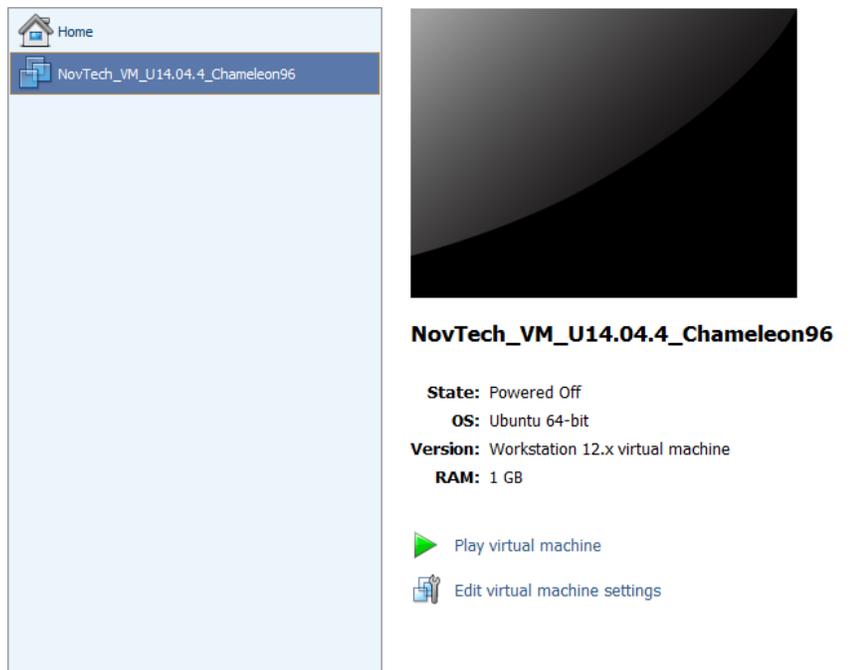
Figure 4 - VMware® Player Select Virtual Machine

NOTE

To save on storage and transmission, the Chameleon96® virtual machine is preconfigured to use 1G of RAM. NovTech recommends increasing this value to a minimum of 2GB. You can edit this value to increase or decrease the amount of RAM assigned to the VM. After opening VMware® Player, click on 'Edit Virtual Machine Settings', navigate to 'Hardware' tab and select Memory. Adjust memory to the desired size.

Configure the RAM dedicated to your VM.

To minimize the size of the VM image in storage and transit, the VM has been limited to 1GB of RAM. For optimal performance, increase the amount of RAM allocated to the VM. NovTech recommends allocating a minimum of 2GB of memory to the machine, and optimally 6GB of RAM.

This setting is under **Virtual machine->virtual machine settings->hardware**, and can be modified when the virtual machine has been powered off.
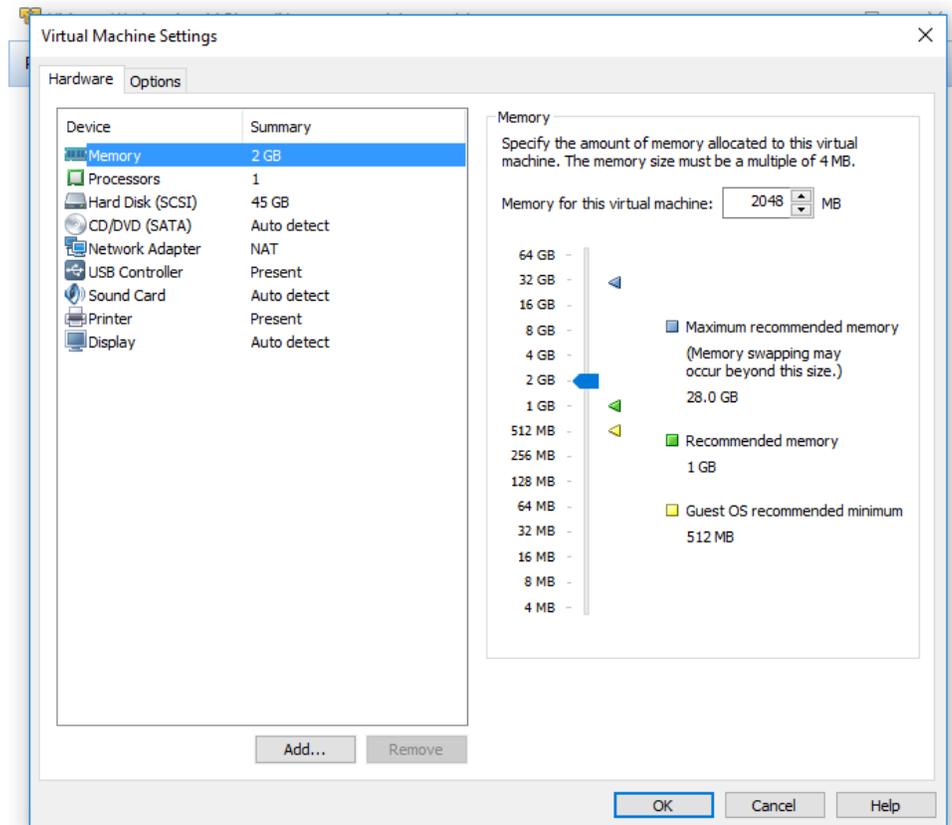
Figure 5 - Virtual Machine settings window

NOTE

Allocating more than ¼ of the physical ram on your machine to the VM will degrade overall performance and may cause issues.

You can modify other settings from this window. Once the Virtual Machine starts for the first time, you will be asked to choose whether you 'Moved it' or 'Copied it'. Please select the '**Moved it**' option.

Logging into the VM

To log into the virtual machine please type 'novtech' for the password.
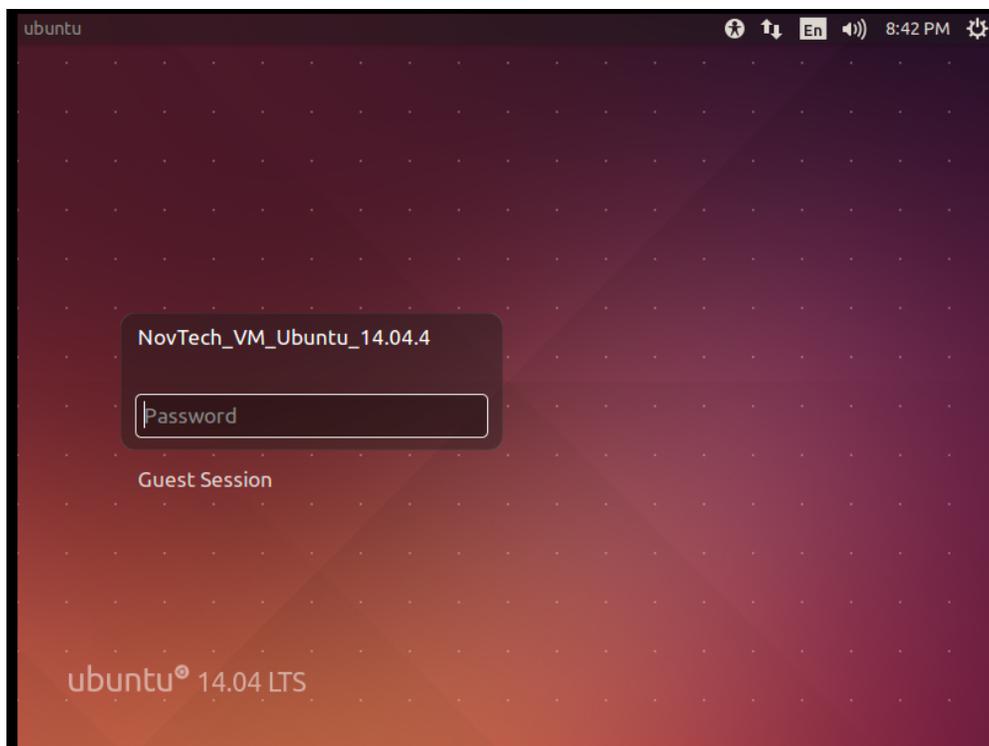
A pop-up window may ask you to update the VMware® Linux Tools. It is not necessary to do so, but if you wish to stop seeing the message tab on the bottom of the VM, click 'Install' button when asked. VMware® will then mount a CD drive and open the mounted folder with the install files contained in that folder. Copy all the files in that folder and paste them in your home folder. Open a Terminal window where you placed the files. Run these two commands:

> *'sudo chmod 777 auto*.sh', enter the 'novtech' password when prompted.*
> *'sudo ./autorun.sh' to install the tools.*

After installation is complete you can delete the files from the folder and eject the CD drive that VMware® auto mounted. This should remove the tab on the bottom of the VM, notifying you about the VMware Linux Tools install.

Figure 7 – Chameleon96® Virtual Machine Desktop Screen

Contents of the Virtual Machine Desktop

Along the left side of desktop there are multiple icons:

- Search for software on computer and online

- File Manager

- Terminal

- Putty – Serial Terminal tool

- GHex – Hex Editor

- Meld – Code comparison tool

- FireFox

- Libre Office Writer

- Libre Office Calc

- Libre Office Impress

- Ubuntu Software Center – update and install Ubuntu software packages

- System Settings

Chameleon96® overview

Overview of Components

LOW SPEED
EXPANSION PORT

CONSOLE

8-18V DC
POWER IN

BLASTER II

POWER
SWITCH

WI-FI

HIGH SPEED
EXPANSION PORT

USER LEDs

SD/MMC   HDMI   USB OTG   HOST USB
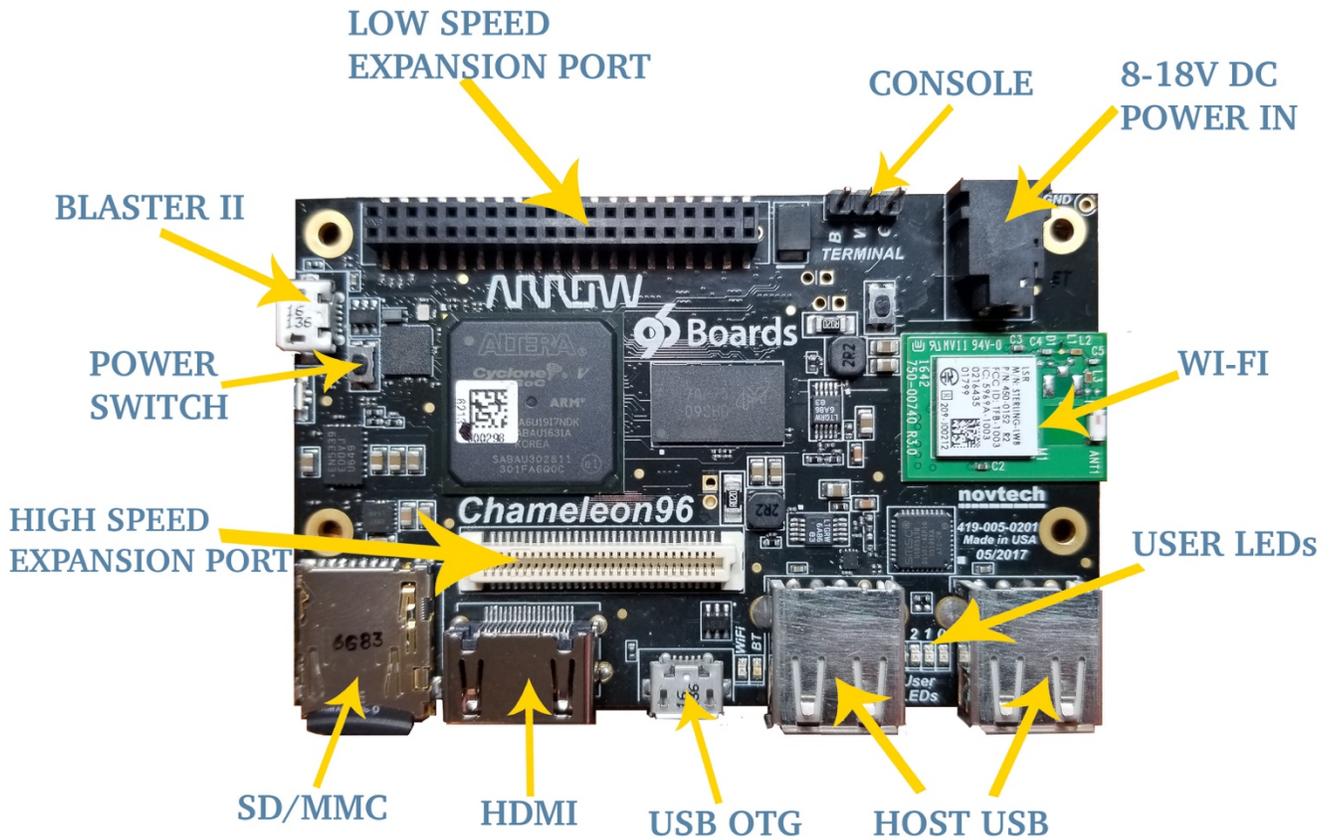
Figure 8 – Chameleon96® Top
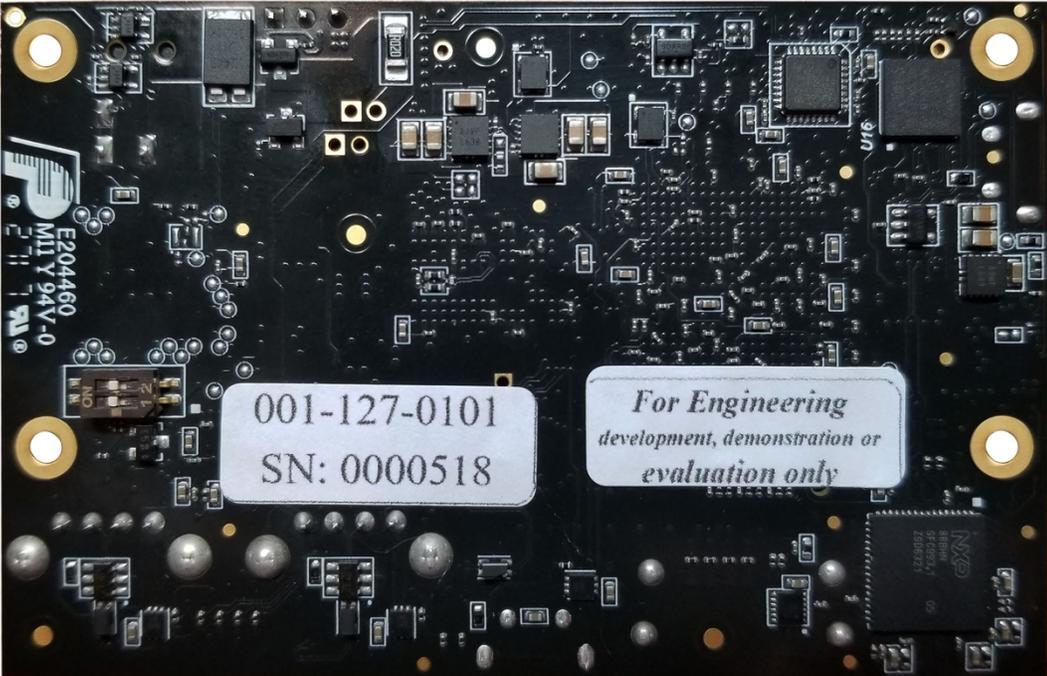
Figure 9 – Chameleon96® bottom

Serial Connections

The supplied cable connects to the Chameleon96® as follows:
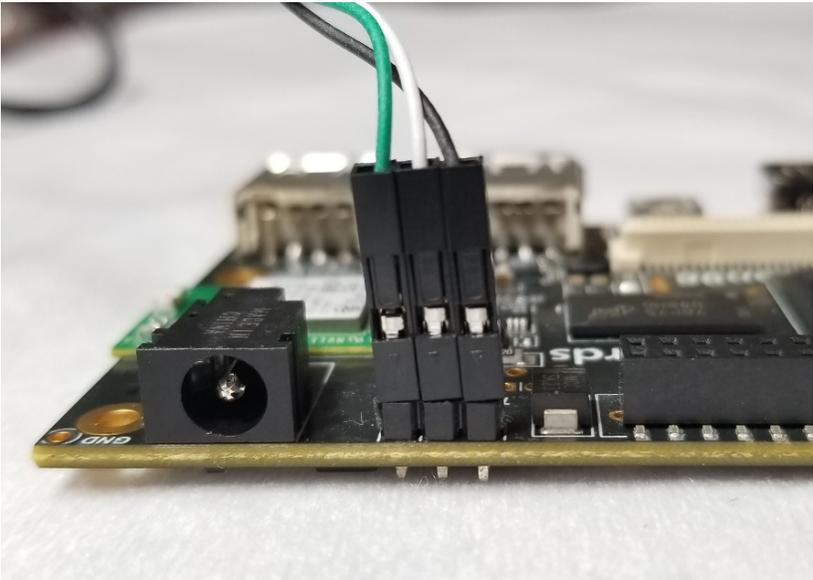
Figure 10 - Connecting supplied cable

Booting Chameleon96®

Hardware Setup

To setup the Chameleon96® board for booting, follow these steps:

1. Plug in the supplied USB cable to the UART port on the board and connect to PC. Verify the USB serial driver is found.

2. Insert the SD card into the SD slot.

Serial Console Setup

Open a Serial Terminal like Hyper-Terminal, PuTTY or UConn, with settings of 115200, 8, N, 1.

For convenience, putty and a preconfigured settings file are provided in the supplied Virtual Machine (available from the download link as indicated in section 0).

The VM provides a preinstalled environment with tools to speed development.

A link to PuTTY can be found on the desktop

Configure PuTTY to use an 8n1 UART at 115200 bps.

For convenience, a preconfigured setting called "USB to TTL UART" is also provided in the virtual machine.
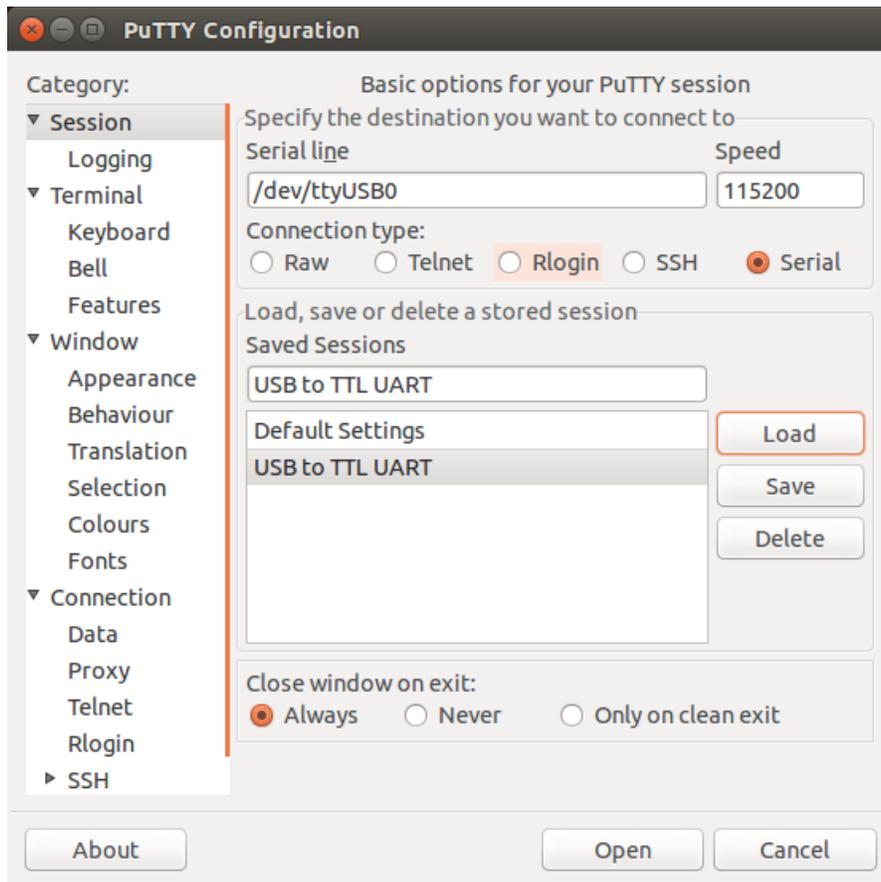
Figure 11 - Configuring PuTTY

Power the board

Using the provided power adaptor apply +8 to 18V power to the NovTech Chameleon96®
Monitoring the serial terminal, you can stop at u-boot or boot all the way into Linux.

Note that for the graphical image, a terminal console is not available and all system control
must be done through the graphical interface.

Figure 12 - Initial Boot of Chameleon96®

Initial network configuration

The Chameleon96® will need to be configured for your specific wireless network. Once configured, the network will start automatically when the board is powered up.

Graphical image networking

The SD card delivered with your Chameleon96® has a graphical desktop based on xfce. This desktop will require a mouse and keyboard to navigate. Those can be connected to the USB ports on the Chameleon96®.

The networking on this image is managed by connman, but is not enabled by default. If you want wireless networking on your Chameleon96®, the connman applet will need to be enabled to start at boot, and configured for your network.

After booting the Chameleon96® image per the instructions above, select "Applications" from the upper left corner of the screen.

Click on:
Applications->Settings->Settings Manager

Then select:
System->Session and Startup->Application Autostart->Connection Manager.

There should now be a black checkmark next to "Connection Manager".

Select "Close" (close all open settings manager windows).

Power cycle or reset your Chameleon96®, the connman applet should be running and visible on the upper right of your screen on your next power up.

When the board comes back up, click on the Applet in the upper and select "Preferences", then select your wireless network and click "Connect" on the right-hand side of the menu. Note that "Connect" does not look like a button, but text.

If you network requires additional configuration for security, the applet will prompt you for your authentication information.

Console image networking

The console image ships with a network configuration that automatically connects to open (unsecure) networks that it finds. If successful, you will see the board retrieve an IP address via DHCP and will be able to ping to an IP address from the command line.

If your network requires additional configuration for security, you will need to provide the credentials for your network. This is accomplished from the Chameleon96® console with the "wpa_passphrase" tool as follows:

wpa_passphrase YOURNET yourpassphrase >> /etc/wpa_supplicant.conf

which will append an entry similar to the following to your /etc/wpa_supplicant.conf file:

```
network={
    ssid="YOURNET"
    #psk="yourpassphrase"
    psk=0d0992b62e7ce466b47aef8ea26fcd77421f6498f225419b40364c1b4441d08d
}
```

Remember to replace *YOURNET* and *yourpassphrase* with the information specific to your network.