

Draft 03/20/18

Requirements

Draft 03/20/18

- Quick Boot time
- Rapid updates transfer the kernel7.img or kernel.img
- Max uptime
- Gbit Ethernet Rpi3B+
 - 1.4G 4 core instead 1.2G 4 core RP3B
 - 100 MB Rpi3B
- Systems with 1 or 2 Displays
- Displays with touch support
 - Up to 30 in.

Systems Required

- Development
 - Lazarus IDE (Ultibo Edition)
 - Compilers
 - Linkers
 - Git Tools revision control
 - WebBrowser
 - Office Tools
 - Telnet
 - TFTP
- Testing Deployment
 - Executables
 - kernel7.img or kernel.img
 - Firmware
 - bootcode.bin
 - fixup_x.dat
 - start_x.elf
 - config.txt

Linux Distros

- Redhat Centos & Fedora
- Debian Ubuntu RaspBian
- Distros
 - Create packages from source in either rpm or deb formats.
 - Provide Repositories on the Internet.

Package Managers

- Red Hat Fedora Centos
 - yum
 - rpm
- Debian Ubuntu RaspBian
 - apt-get
 - dpkg

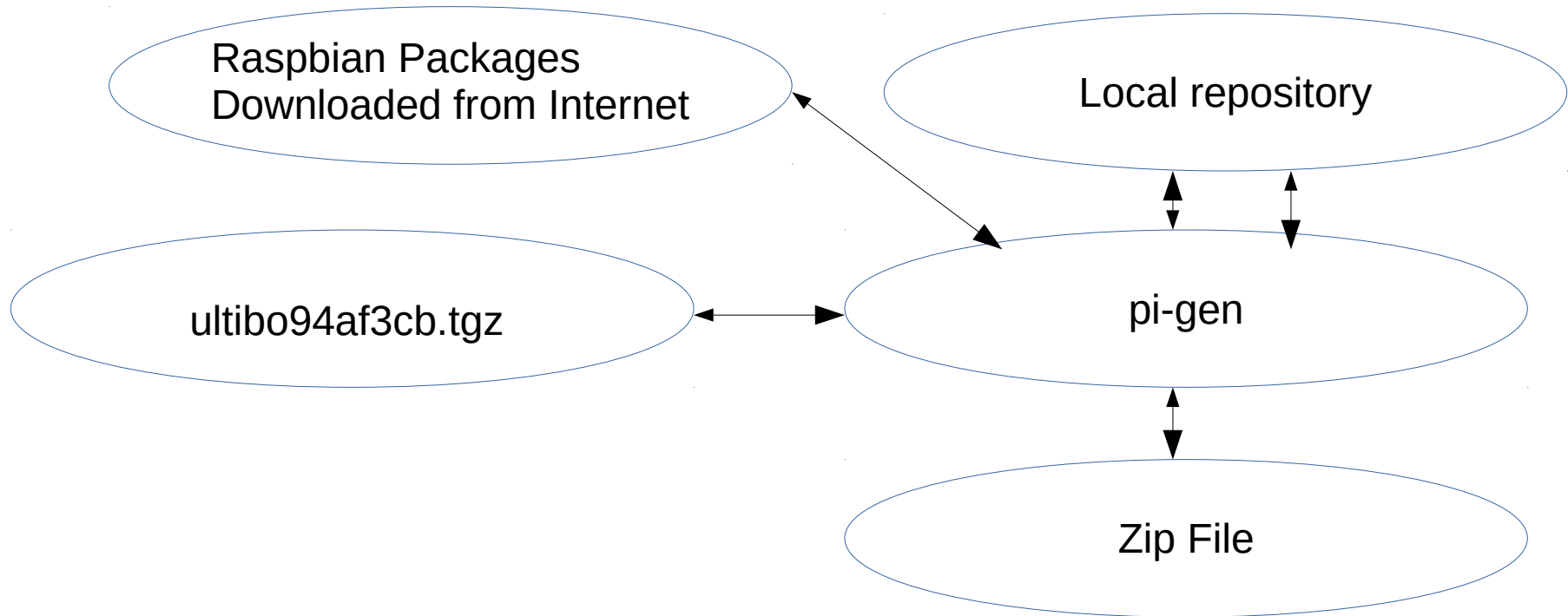
Packages

- Dependancies
 - Libc
 - Libm
 - Source code

Package Installers

- Manual ISO install plus additional packages then cloned
- Cobbler
- LiveDVD creator
- Satellite Server Spacewalk
- pi-gen this is the method that will be used to create the Raspbian with Lazarus IDE (Ultibo Edition)

Pi-gen installer

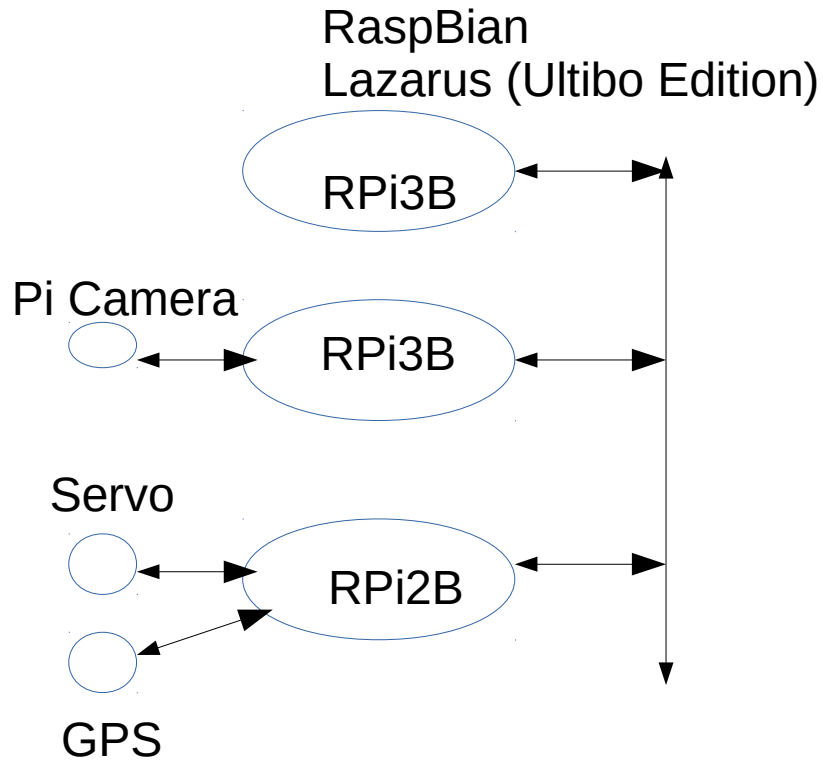


Configuration Files

- Adding new users.
- Adding application software.
- Changing services that were set by default.
- Locking down system.

DEMO SYSTEM REQUIREMENTS

- 3 RASPBERRY Pi 2B or Pi 3B.
- 3 HDMI monitors
- 1 Logitech wireless keyboard & mouse.
- 1 D-Link 4 port hub
- 1 32 GB mirco sd card Lazarus IDE (Ultibo Edition)
- 2 4 GB mirco sd card or > for Ultibo systems
- 1 RASPBERRY Pi Camera
- 1 Micro Servo - High Powered, High Torque Metal Gear[ID:2307] = \$11.95
- ADAFRUIT ULTIMATE GPS FEATHERW \$39.99



RaspBian

Lazarus (Ultibo Edition)

https://github.com/develone/Ultibo_Projects.git

```

pi@raspberrypi:~ $ git clone https://github.com/develone/Ultibo_Projects.git
Cloning into 'Ultibo_Projects'...
remote: Counting objects: 153, done.
remote: Compressing objects: 100% (120/120), done.
remote: Total 153 (delta 58), reused 114 (delta 22), pack-reused 0
Receiving objects: 100% (153/153), 2.71 MiB | 1.60 MiB/s, done.
Resolving deltas: 100% (58/58), done.
  
```

Compile UltiboDemoRPi2_TFTP.lpi using Lazarus (Ultibo Edition)
cd Ultibo_Projects

```

./run_demos.sh 185 jpeg
tftping DWT_LIFT_RPi2 kernel7.img
to ultibo system 192.168.1.185
tftp> tftp> Sent 3111876 bytes in 10.7 seconds
  
```

```

./run_demos.sh 200 jpeg
tftping DWT_LIFT_RPi2 kernel7.img
to ultibo system 192.168.1.200
tftp> tftp> Sent 3111876 bytes in 11.1 seconds
  
```

Compile RaspiVid_TFTP.lpi using Lazarus (Ultibo Edition)

```

./run_demos.sh 200 video
tftping RaspiVid_TFTP kernel7.img
to ultibo system 192.168.1.200
tftp> tftp> Sent 3145892 bytes in 15.5 seconds
  
```

Compile PWM_TFTP_SERVO.lpi using Lazarus (Ultibo Edition)

```

./run_demos.sh 185 servo
tftping PWM_TFTP_SERVO kernel7.img
to ultibo system 192.168.1.185
tftp> tftp> Sent 2743472 bytes in 10.8 seconds
  
```

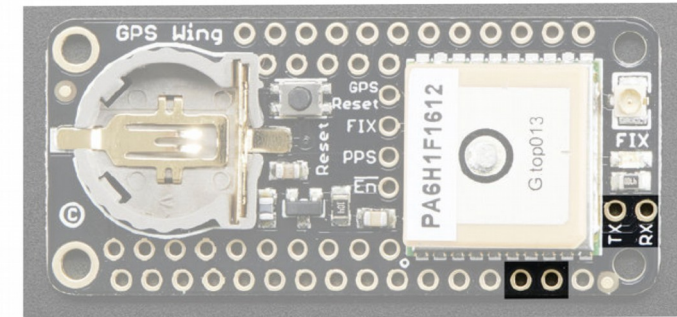
```

./run_demos.sh 200 servo
no servo 192.168.1.200
  
```

Pin 6 grd from Rpi2B to brown servo
Pin 2 +5 from Rpi2B to orange servo
Pin 12 PWM0 from Rpi2B to yellow servo



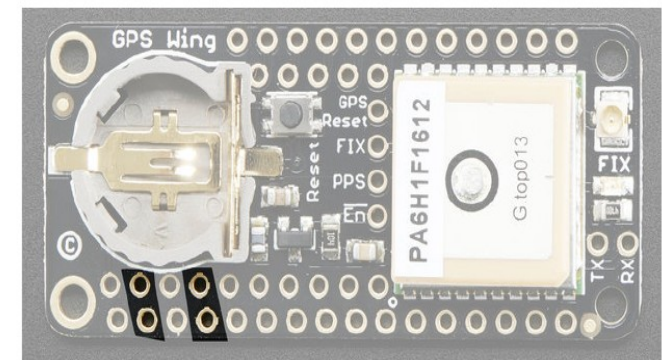
Serial Data Pins



The GPS module, like pretty much all GPS's, communicates over UART serial. It sends ASCII NMEA sentences from the GPS TX pin to the microcontroller RX pin and can be controlled to change its data output from the GPS RX pin. Logic level is 3.3V for both.

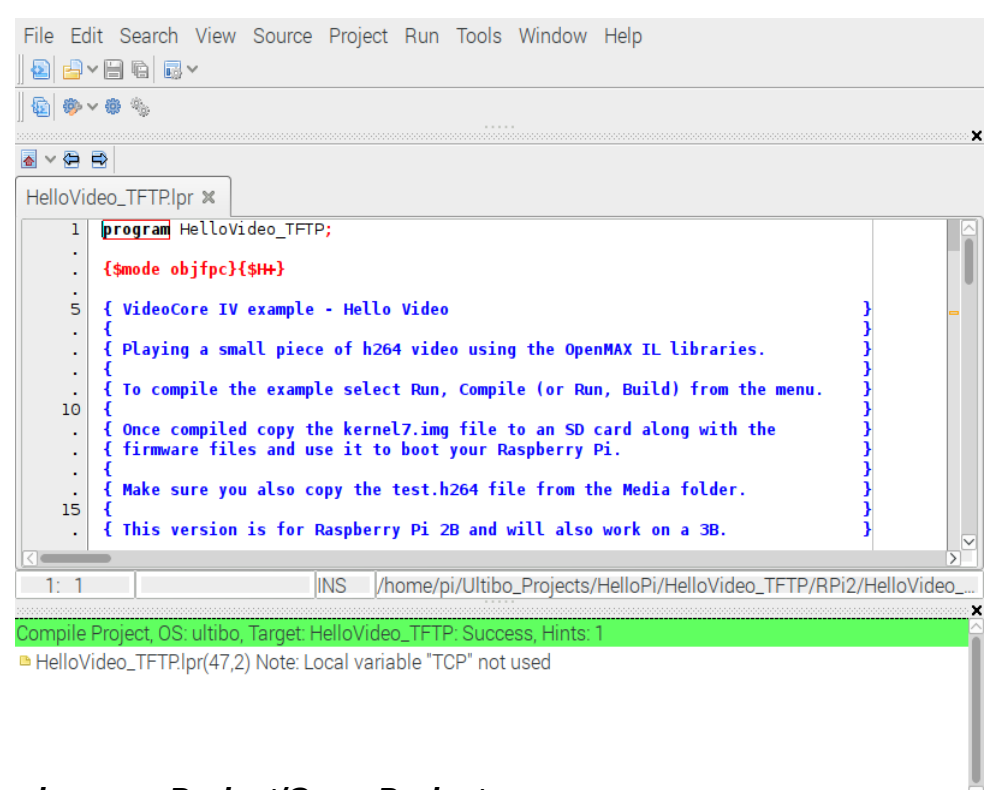
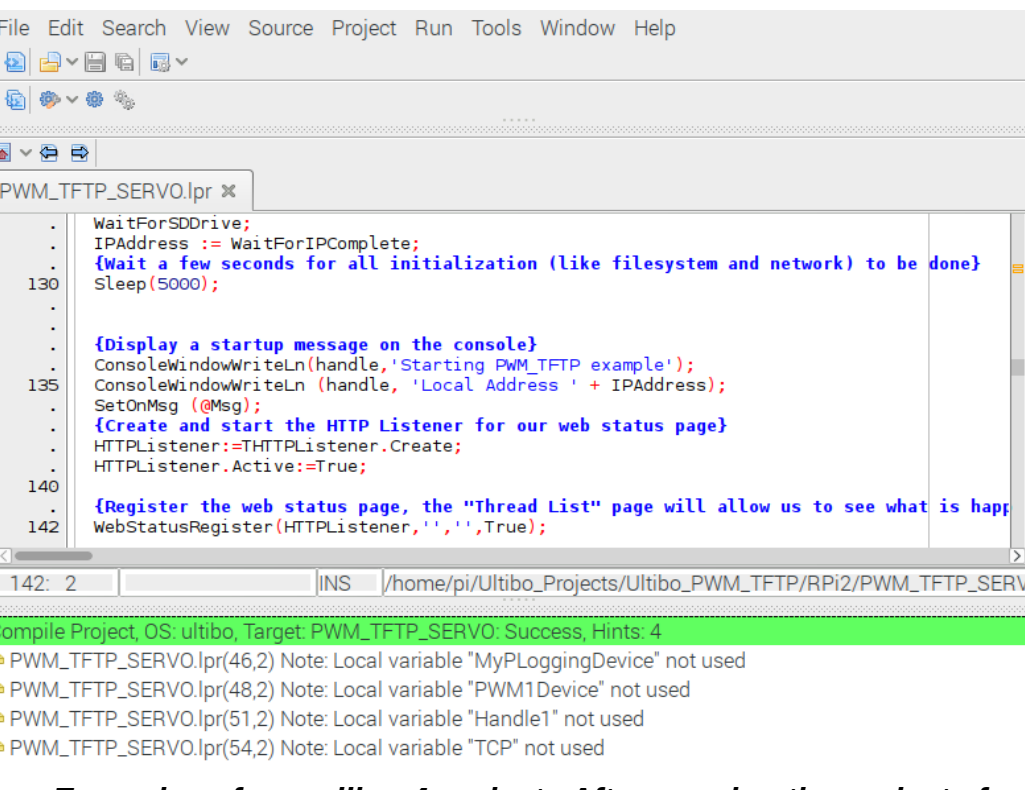
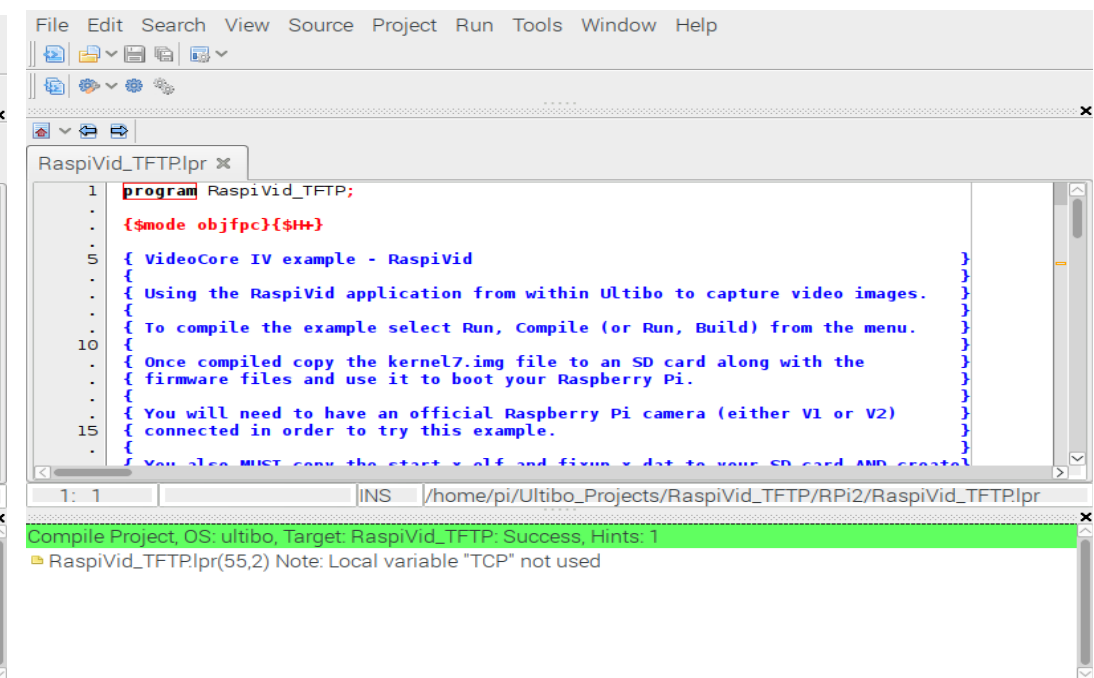
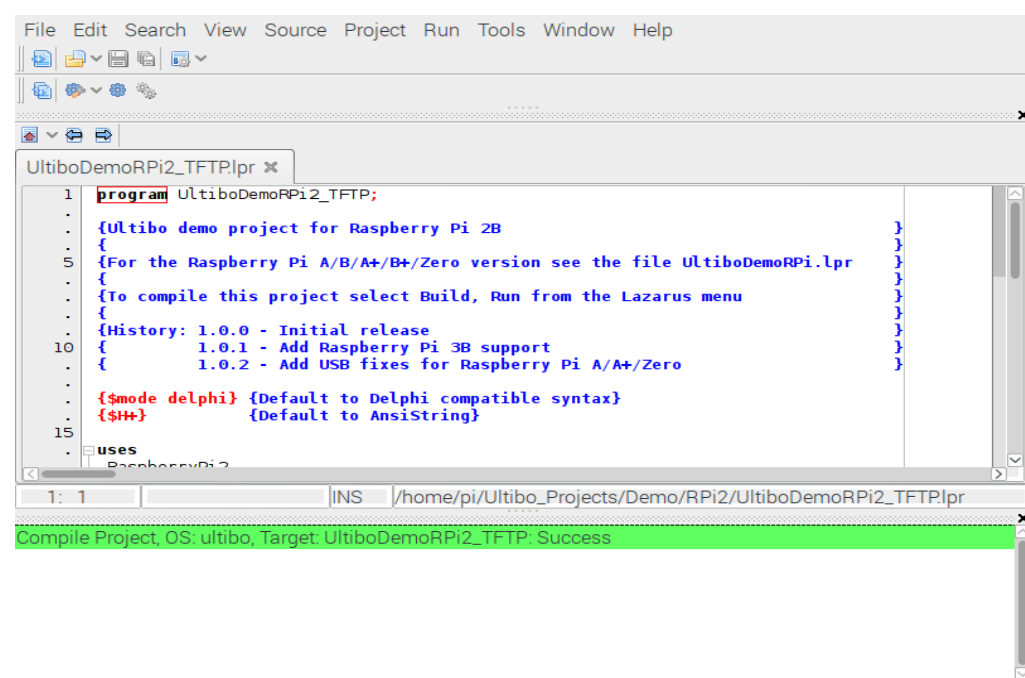
Pin 10 Rx from Rpi2B to GPS

Power Pins



The GPS module runs from +3.3V power and uses 3V logic. the GPS is powered directly from the **3V** and **GND** pins on the bottom left of the Feather. Each Feather has a regulator to provide clean 3V power from USB or battery power.

Pin 1 +3.3 from Rpi2B to GPS pin 2
Pin 9 grd from Rpi2B to GPS pin 4



Examples of compiling 4 projects After opening the projects from main menu Project/Open Project
Green bar indicates that the code compiled & linked successfully with main menu Run/Compile