

Item specifications

Go-IoT Item Id:	OPTION	DINGO-PI-HAT-01
Raspberry PI		Raspberry PI 3 Model , B+ , B , A+ or PI 2 Model B
Serial Interface		1 x TTL Serial Debug Connector
Real Time Clock		DS1339 with Battery Backup
EEPROM		24LC32 – 4K x 8
I2C Ports		1
Serial Port		1
Expansion Connectors		1 x 40way header to PI3 21 x GPIO
OS		Linux Raspian – DINGo Stack
DC Input	A	+12V @ 0.6A
DC Input	B	+15V DC - +42V DC
Battery Backup	C	1 x Intelligent UPS and DC Supply Monitoring
Chilli Module	D	Cascoda 8211 Thread Transceiver
wMBUS	E	Wireless MBus Transceiver
DINGo PlugIn	F	
Pulse Meter	G	Connects to Optical Pulse Meter via 8way RJ45
Size (L x W x H)		101 x 60 x 19 mm
Temperature		-20degree C to +85degree C
Country of Manufacture:		EU
Drivers		Linux

Feature List

- 12V DC Input (Standard)
- 16V – 48V DC Input (Enhanced)
- Raspberry Pi HAT Compliant
- Smart Uninterruptible Power Supply (UPS)
- 3200mAh LiPO Battery (120 Minutes of Power Back-Up)
- Intelligent Automatic Charger w/ Power Tracking
- No Additional External Power Required
- 5V 4A Power Supply for even the most demanding Pi 3 set ups.
- Integrated Hardware Real Time Clock (RTC) with Battery Back-Up
- Integrated EEPROM – I2C Bus #1
- Integrated Trusted Platform Module – I2C Bus #1
- 1 User Defined LEDs - Enhanced
- Status Monitoring - Powering Voltage, UPS Battery Voltage/Current
- RS232 Raspberry Pi Interface for Control and Monitoring
- 2 Level Watch-dog Functionality with FSSD and Hardware Reset
- Integrated DINgo Plug In Module Connection System
- Connects to LED Pulse Meter
-

Modifying config.txt on Raspberry PI for I2C and SPI Devices

Edit config.txt to add / uncomment the following: -

```
sudo nano /boot/config.txt
```

```
dtparam=i2c_arm=on  
dtparam=i2c_vc=on  
#dtparam=i2s=on  
dtparam=spi=on
```

Save file and reboot

Modifying config.txt on Raspberry PI for the Real Time Clock

Edit config.txt to add the following: -

```
sudo nano /boot/config.txt
```

At the end of the file add

```
dtoverlay=i2c-rtc,ds1307
```

If the Raspberry Pi is connected to the internet the correct date and time should be set automatically otherwise you can set the current date and time using:

```
date -s "19 AUG 2016 09:00:00"
```

DO THIS! You can check the current Linux date with the command (date). To save the date onto the RTC Pi use the following command:

```
sudo hwclock -w
```

Verify the date has been saved onto the RTC Pi with:

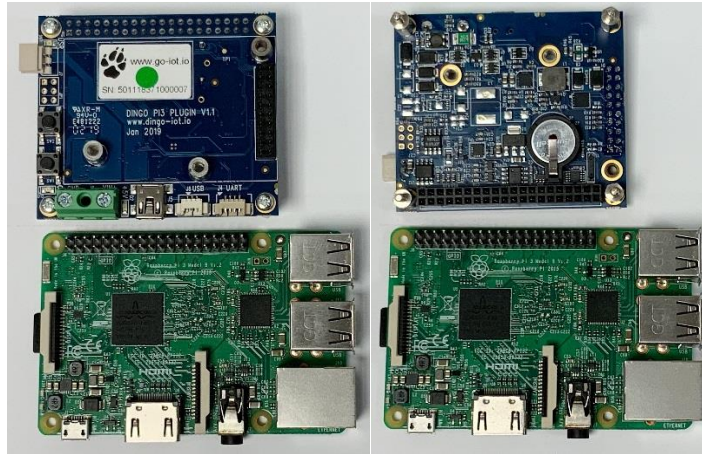
```
sudo hwclock -r
```

If everything worked correctly the RTC Pi should be initialized on boot and the current date and time will be loaded into Linux.

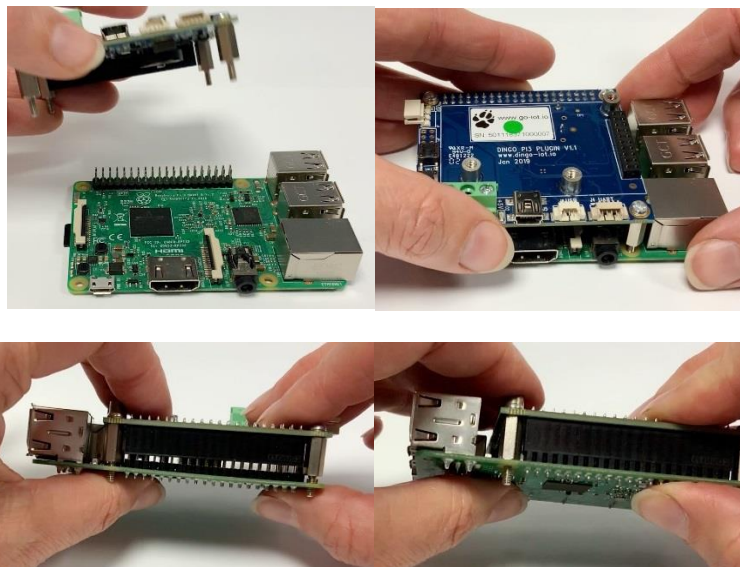
Save file and reboot

Assembling the PI3 Base along with the PCI Modem – OLD IMAGES

PI3 Board with 4 Spacers / Standoffs fitted



Plug the HAT onto the Raspberry PI



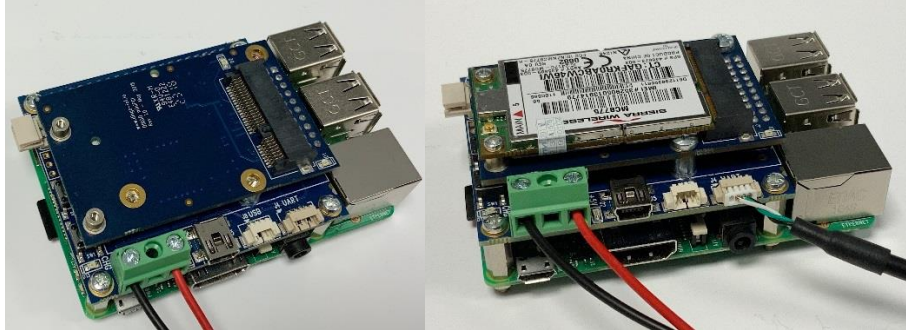
Add 4 x 2.5mm Nuts and Tighten



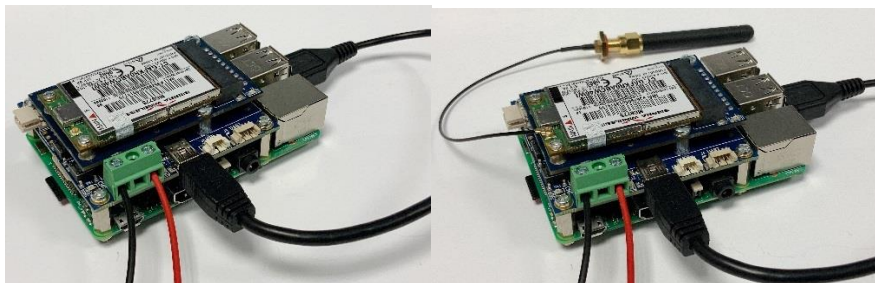
Add +12V DC to HAT

Red +12V to +VE – Black 0V to GND

Add Serial to USB Console Debug Cable



Connect USB Cable and GSM Antenna



Note: USB Cable will be changing on production units

Battery Backup Information

2 x 3.7V Lithium Ion Batteries (7.4V) is total are used for the battery backup.

The +12V Input is used for charging the battery pack. Initially the charge is set to 50mA but this can be changed depending on the DC Current available.

http://www.farnell.com/datasheets/1806913.pdf?_ga=2.19634171.273157309.1556613498-1943431808.1506950410&_gac=1.79900389.1556783764.CjwKCAjwqqrmbRAAEiwAdpDXtIz0ul7q1zGLO9tLGHpF5G7-UtBprBEmWVK9xCu27bZBYNRh49412hoCyRIQAvD_BwE

This company have a good range

<https://www.genstattu.com/2s-7-4v-lipo-battery.html>

Battery Connector

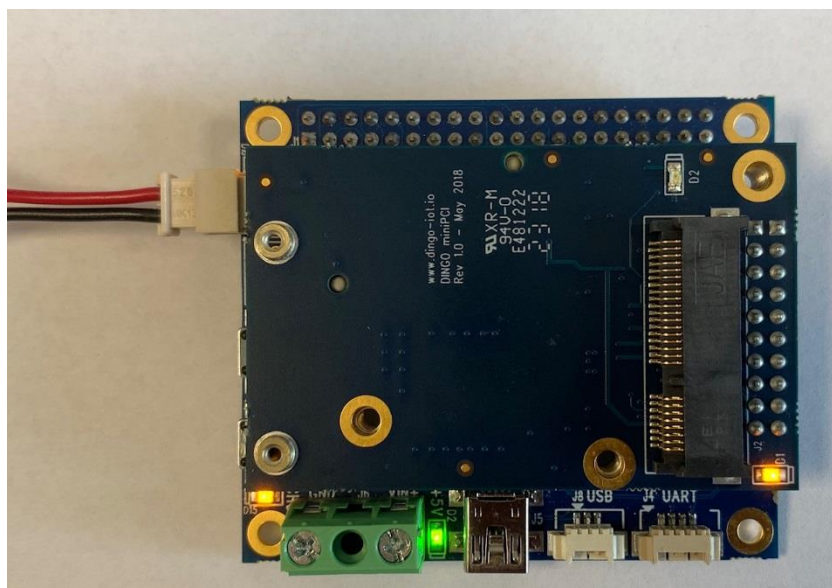
Molex Housing 0050375023 – Digikey WM18873-ND

Molex Crimp 0039000160 – Digikey WM9661CT-ND

BEWARE – CONNECTION TO BOARD

RED – Battery Positive +

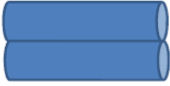
BLACK – Batter Negative -



LIP-F2Sx18650-3100-CHMOL50R2 Lithium Ion Battery Pack

7.4V 3100 mAh with charger and protection circuit module

Specification

Battery Pack Model Number		LIP-F2Sx18650-3100-CHMOL50R2
Packaging		Two pieces of NCR18650 lithium ion cylindrical cells in series with PCM & PTC Protection 
nominal Voltage		7.4V
Maximum Voltage		8.4V
Minimum Voltage		4.8V
Capacity	Typical	3100 mAh (0.2C discharge)
	Minimum	2950 mAh
Max. Current	Charge	1500mA
	Discharge	3000mA (limited by PCM)
Ambient temperature	Charge	0 deg C to 45 deg C
	Discharge	-20 deg C to 60 deg C
	Storage	-5 deg C to 35 deg C
Discharge Cut-Off Voltage		4.8V
Nominal Weight		Approx. 92g
Dimensions		approx. 70mm H x 38mm W x 23mm T

J1 - 40WAY GPIO TO RASPBERRY PI

Pin	Port	Dir	Function	Description
1	+3.3V	OUT	OUT	Main Power OUT +3.3VDC – Powers the Raspberry PI
2	+5.0V	OUT	POWER	Main Power OUT +5.0VDC – Powers the Raspberry PI
3	GPIO02 – SDA1	BI	I2C	Connected to I2C Devices
4	+5.0V	OUT	POWER	Main Power OUT +5.0VDC – Powers the Raspberry PI
5	GPIO02 – SCL1	OUT	I2C	Connected to I2C Devices
6	GND		POWER	GROUND
7	GPIO4	OUT		CONNECTED TO DINGO MODULE
8	GPIO14 – UART0_TX	IN	OPTO	Serial Debug
9	GND		POWER	GROUND
10	GPIO15 – UART0_RX	OUT	OPTO	Serial Debug
11				
12				
13				
14	GND		POWER	GROUND
15				
16				
17	+3.3V	OUT	OUT	Main Power OUT +3.3VDC – Powers the Raspberry PI
18				
19	GPIO10 – SPI0_MOSI	IN	SPI	CONNECTED TO DINGO MODULE
20	GND		POWER	GROUND
21	GPIO9 – SPI0_MISO	IN	SPI	CONNECTED TO DINGO MODULE
22				GROUND
23	GPIO11 – SPI0_CLK	OUT	SPI	CONNECTED TO DINGO MODULE
24	GPIO8 – SPI0_CE0	OUT	SPI	CONNECTED TO DINGO MODULE
25	GND		POWER	GROUND
26	GPIO7 – SPI0_CE1	OUT	SPI	CONNECTED TO DINGO MODULE

27				
28				
29				
30	GND		POWER	GROUND
31				
32				
33				
34	GND		POWER	GROUND
35				
36				
37				
38	GPIO20			CONNECTED TO DINGO MODULE
39	GND		POWER	GROUND
40	GND		POWER	GROUND

J6 - 2WAY DC Input

Pin	Port	Dir	Function	Description
1	VIN +	IN	POWER	+12V DC Input
2	GND	IN	POWER	GROUND

J7 - Lithium Battery Input

Pin	Port	Dir	Function	Description
1	Battery +	IN	POWER	Battery Positive – 2 x Lithium Ion Battery Pack
2	Battery -	IN	POWER	Battery Negative -

J3 - 20WAY Plug In Interface

Pin	Port	Dir	Function	Description
1	+12V	OUT	POWER	Power to Plug In Module
2	SPI_CLK	OUT	SPI	SPI Clock - From Raspberry Pi
3	+3.3V	OUT	POWER	Power to Plug In Module
4	SPI_MOSI	OUT	SPI	SPI Master Out SLAVE In – From Raspberry Pi
5	TXD2	OUT	Serial TX Data	Serial TTL Data to Plug In Module - From Raspberry Pi
6	SPI_MISO	IN	SPI	SPI Master In SLAVE Out – To Raspberry Pi
7	RXD2	IN	Serial RX Data	Serial TTL Data from Plug In Module
8	SPI_SS0	OUT	SPI	SPI Slave Select SPIO_CE0 – From Raspberry Pi
9	GPIO20	BI	IO	GPIO
10			NC	
11	GND		POWER	
12			NC	
13			NC	
14	I2C_SCL	IN	I2C CLOCK	I2C – Channel 1 Clock
15			NC	
16	I2C_SDA	BI	I2C DATA	I2C – Channel 1 Data
17	GPIO4	BI	IO	GPIO
18	USB +	BI	USB Data	USB Positive Channel 1 – From Raspberry Pi – via USB Cable
19	+5.0V	IN	POWER	Power to Plug In Module
20	USB -	BI	USB Data	USB Negative Channel 1 – From Raspberry Pi – via USB Cable

J4 - 4WAY Debug Connector

Pin	Port	Dir	Function	Description
1			NC	
2	UART0_TX	OUT	TTL Serial	From Raspberry Pi to Debug Port
3	UART0_RX	IN	TTL Serial	To Raspberry Pi from Debug Port
4	GND		POWER	

