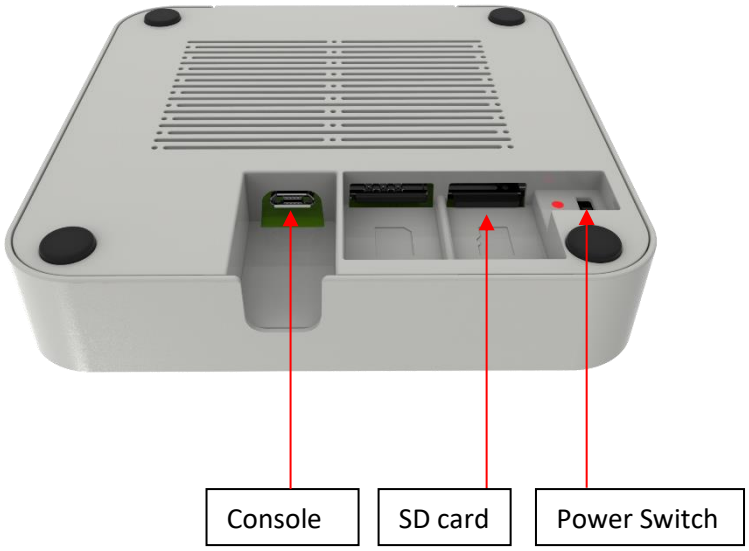
# IoT-Box
# Quick Start Guide

## 1. Quick Start

Follow these instructions to start using your IoT-Box:

1. Download the IoT-Box Debian image from http://www.shiratech-solutions.com/products/iot-box/.
2. Extract the file and flash the image to an SD card (using Win32DiskImager or any other similar tool).
3. Insert the SD card to the IoT-Box.




4. Connect the IoT-Box to your PC using a micro USB cable via the Console micro USB connector and turn the power switch on.
5. Connect to the IoT-Box via the serial interface (using TeraTerm/Putty or any similar tool) with a 115200 baud rate.
6. Type:

   ~$: nmtui

   to launch the Wi-Fi settings and connect to Wi-Fi. Once Wi-Fi connection has been established you may update and upgrade the Debian OS using:

   ~$: sudo apt-get update

   ~$: sudo apt-get upgrade
7. Test Bluetooth connectivity using the following commands:

   ~$: hciconfig

   ~$: hciconfig hci0 up

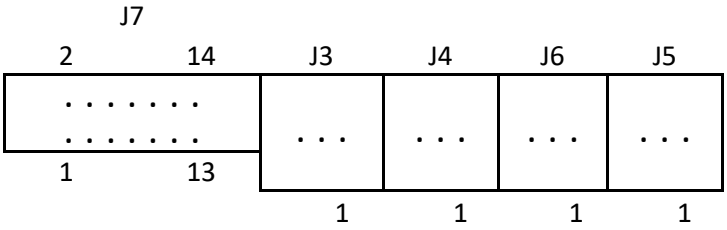
   ~$: hcitool scan

8. To locate Low Energy Bluetooth devices (BLE), use the following command (after executing the first two config commands in the previous step):
   ~$: hcitool lescan
9. In /usr/shiratech/demo/v1.1 folder you will find an Azure IoTC connectivity demo application. In order to run the demo, you may refer to the readme file located in this folder.
10. /usr/shiratech/SPI/ contains the leds.sh test script:
    ./leds.sh red – lights up the LED's in red. (green/blue/off also apply).
    ./leds.sh – (without a parameter) will print the leds.sh script usage instructions.
11. /usr/shiratech/BG96/ contains test scripts for the BG96 modem.

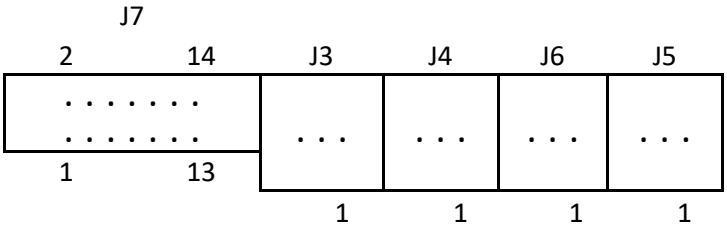
## 2. Power Switch and LED Indication

| LED color status | Power Switch position | Battery status |
|---|---|---|
| | Off | Full |
| | Off | Charging |
| | On | Charging |
| | On | Full |

## 3. Expansion Connectors




| Label | Connector # | Pin # | Pin name | Function | CPU I/O Pin | Voltage Level |
|---|---|---|---|---|---|---|
| DI2-DI1 | J5 | 1 | GND | Ground | | GND |
| | | 2 | DI-1 | Digital Input 1 | PG4 | 5V |
| | | 3 | DI-2 | Digital Input 2 | PG5 | 5V |
| | | | | | | |
| AI1-AI2 | J6 | 1 | GND | Ground | | GND |
| | | 2 | AIN-2 | Analog Input 1 | PC3 | 1.8V |
| | | 3 | AIN-1 | Analog Input 2 | PC0 | 1.8V |
| | | | | | | |
| DO2 | J4 | 1 | DIGO2_CMN2 | Relay 2 common | PB10 | 30VDC, 1A |
| | | 2 | DIGO2_NC | Relay 2 normally close | | |
| | | 3 | DIGO2_NO | Relay 2 normally open | | |
| | | | | | | |
| DO1 | J3 | 1 | DIGO1_CMN1 | Relay 1 common | PI0 | 30VDC, 1A |
| | | 2 | DIGO1_NC | Relay 1 normally close | | |
| | | 3 | DIGO1_NO | Relay 1 normally open | | |




| J7 Pin Number | Connector Pin Name | CPU I/O Pin | Pin Type | Voltage Level |
|---|---|---|---|---|
| 1 | I2C2_SDA | PH5 | Digital | 1.8V |
| 2 | SPI4_SCK | PE12 | Digital | 1.8V |
| 3 | I2C2_SCL | PH4 | Digital | 1.8V |
| 4 | SPI4_MISO | PE13 | Digital | 1.8V |
| 5 | UART8_CTS | PG10 | Digital | 1.8V |
| 6 | SPI4_NSS | PE11 | Digital | 1.8V |
| 7 | UART8_TXD | PE1 | Digital | 1.8V |
| 8 | SPI4_MOSI | PE6 | Digital | 1.8V |
| 9 | UART8_RXD | PE0 | Digital | 1.8V |
| 10 | Vbat_out | | Power | 5V |
| 11 | UART8_RTS | PG7 | Digital | 1.8V |
| 12 | Vbat_out | | Power | 5V |
| 13 | GND | | Ground | GND |
| 14 | GND | | Ground | GND |

## IoT-Box Key Features

- CPU - STM32MP157 MPU
- LTE - Quectel BG96
- WIFI/BT – Murata LBEE5KL1DX RF TXRX MOD BLUETOOTH/WIFI
- Gas sensor – CCS811 – (By AMS) - Ultra-Low Power Digital Gas Sensor
- 2 X Microphones IM69D130 (Infineon) High performance digital XENSIVTM MEMS microphones
- Build in chargeable battery Li-Ion 2AH
- 1 x USB OTG interface (For charging and communication)
- 11 x RGB digital LED line

External GPIO interface

- 2 X DI (OPTOISOLATOR 3.75KV)
- 2 X DO (30VDC – Max 1A)
- 2 X AI (4mA-20mA)

External digital sensor interface

- 1 X I2C
- 1 X SPI
- 1 X UART

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