

# Batman Kit Installation Quick Guide

## mmWave Sensor Evaluation Solution

### Attention:

- This Batman Kit supports Raspberry Pi and NVIDIA Jetson Nano
- Raspberry Pi and / or NVIDIA Jetson Nano not included within this EVM Kit (must be purchased separately).  
Please check their respective websites for purchasing info
- **Make sure you are using the correct power supply of 5 V, >2.0 A with a Micro USB connection**

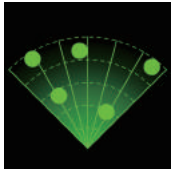
We are offering four different “flavors” of mmWave Sensor Module with pre-programmed Firmware dedicated to the given evaluation application-flavor of your choice:

- Vital Signs Detection (VSD) built-in with Vital Signs Detection (VSD) Firmware; for a contactless and wearableless 30cm ~ 90cm (about 1~3 feet) distance detection of Vital Signs (Heartbeat Rate & Respiration Rate) of a person, a pet, or an animal.
- People Movement Behavior (PMB) built-in with People Movement Behavior (PMB) Trigger Firmware; for detecting People movement in a 4 x 4 meter or 16 meter square area (or about 172 square feet), and with software that could set virtual geo-fence(s) to trigger alert or action when People are moving into the geo-fence(s).
- High Accuracy Measurement (HAM) built-in with High Accuracy Measurement (HAM) Firmware; for measuring object distance from the mmWave Sensor Module with the range of 30cm ~ 3meters (about 1~10 feet) with millimeter resolution.
- Short Range Radar(SRR) built-in with Short Range Radar Firmware; for detecting objects’ distance with the range of 1meters ~ 20meters (about 3 ~ 66 feet) and with viewing angle of 120 degrees, along with Doppler Data to distinguish for whether the objects are moving-towards or moving-away from the mmWave sensor.

### Specification

(VSD) Vital Signs Detection	30cm ~ 90cm (about 1~3 feet)
(HAM) High Accuracy Measurement	30cm ~ 3meters (about 1~10 feet)
(PMB) People Movement Behavior	4 x 4 meter or 16 meter square area (or about 172 square feet)
(SRR) Short Range Radar	For Human:1 meters ~ 20meters (about 3 ~ 66 feet) For Vechile:1 meters ~ 50meters (about 3 ~ 164 feet) and with viewing angle of 120 degrees

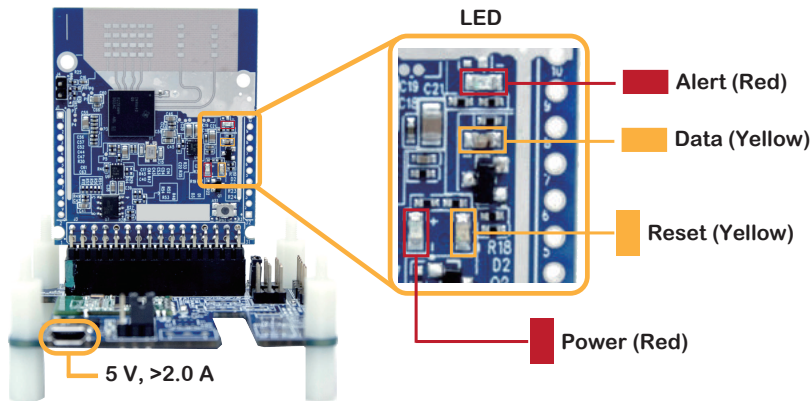



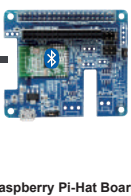


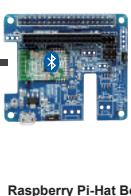



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## mmWave Sensor Evaluation Solution

### 1. Packing List: mmWave Board, Raspberry Pi-Hat Board, Python SDK

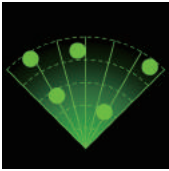


Batman Kit includes	
Vital Signs Detection	 +  +  For VSD,PMB and HAM Python SDK iOS APP
High Accuracy Measurement	
People Movement Behavior	
Short Range Radar	 +  +  For SRR Python SDK

### 2. Develop SDK: Python SDK






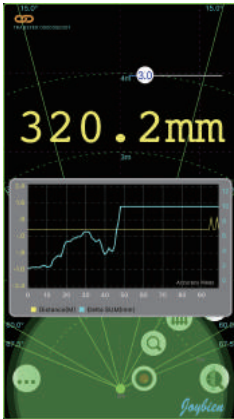

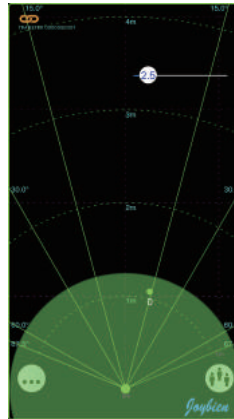
Vital Signs Detection	<ul style="list-style-type: none"> <li>Available on GitHub</li> <li><b>Note: Please refer to README.md file first for proper configuration</b></li> </ul> <div>   </div> <p><a href="https://github.com/bigheadG/mmWave">https://github.com/bigheadG/mmWave</a></p>
High Accuracy Measurement	
People Movement Behavior	
Short Range Radar	





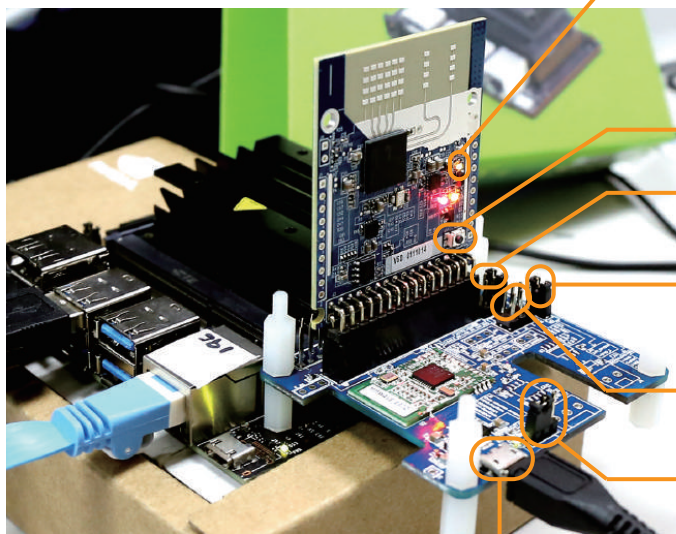
# Batman Kit Installation Quick Guide mmWave Sensor Evaluation Solution

## 3. APP Demos: VSD, HAM and PMB

iOS mmWave Demo App	<ul style="list-style-type: none"> <li>Available on Apple App Store for Vital Signs Detection, High Accuracy Measurement and People Movement Behavior. (Not including Short Range Radar)</li> </ul>
	<div style="display: flex; align-items: center;"> <div style="text-align: center;"> <p><b>mmWaveApi</b></p> <p>Free APP Download</p>  </div>  </div>
	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Vital Signs Detection (VSD)</p>  </div> <div style="text-align: center;">  <p>High Accuracy Measurement (HAM)</p>  </div> <div style="text-align: center;">  <p>People Movement Behavior (PMB)</p>  </div> </div>

## 4. Selection : Key Data Mode or Raw Data Mode Application

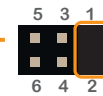
### (A) Raw Data Mode



**DATA LED (Yellow):**

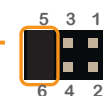
After Pressing the RESET Button, the Yellow LED will be flashing to indicate normal operation

**RESET**



**JUMPER J1 at 1,2 position for Raspberry Pi / Jetson Nano selection**

**JUMPER J12 at 1,2 position for Raspberry Pi / Jetson Nano Interrupt Jumper**



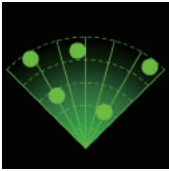
**JUMPER J4 at 5,6 position for RX0**

**JUMPER J9 at 1,2 position for Raw Data Mode (921600/8/n/1)**

INPUT DC POWER: 5VDC, >= 2A



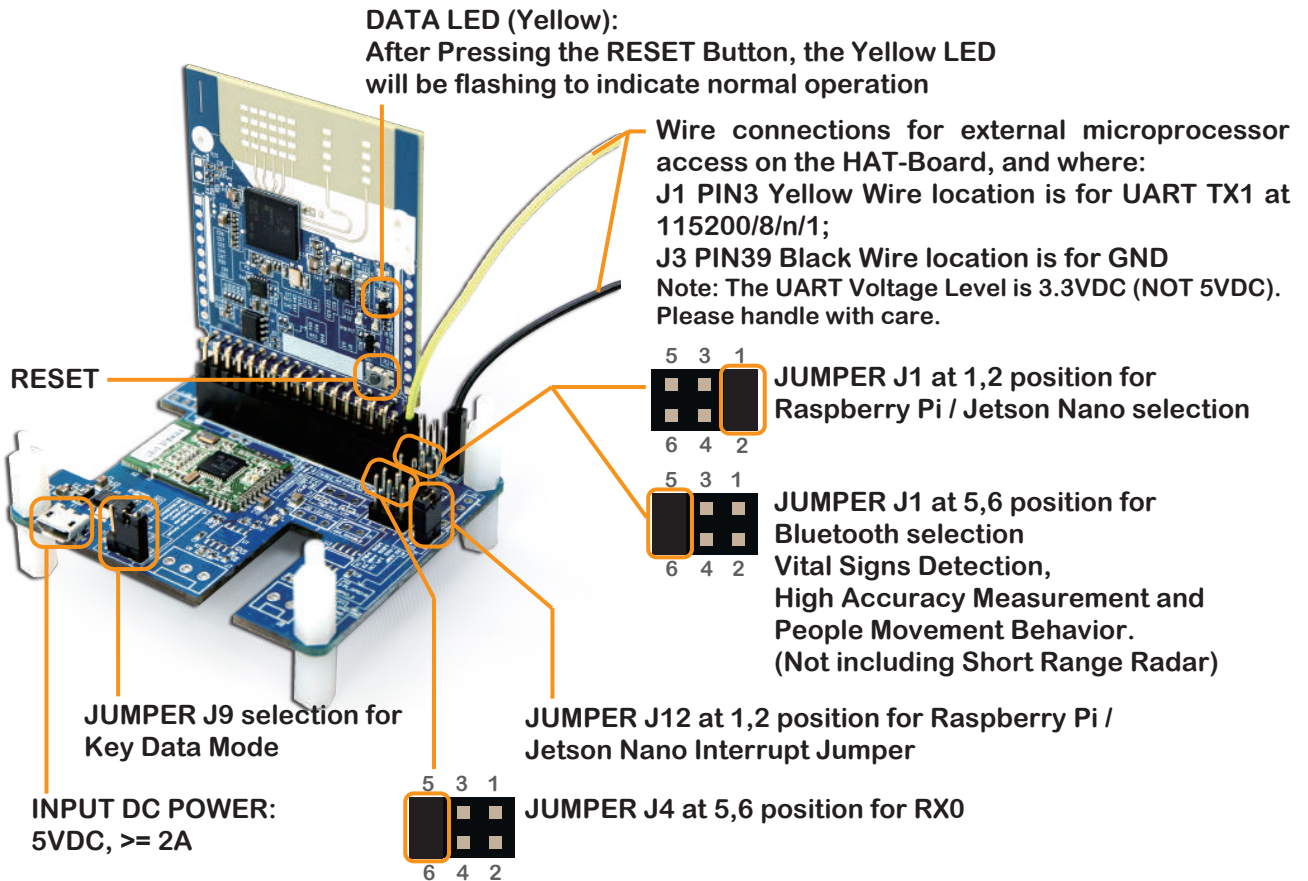




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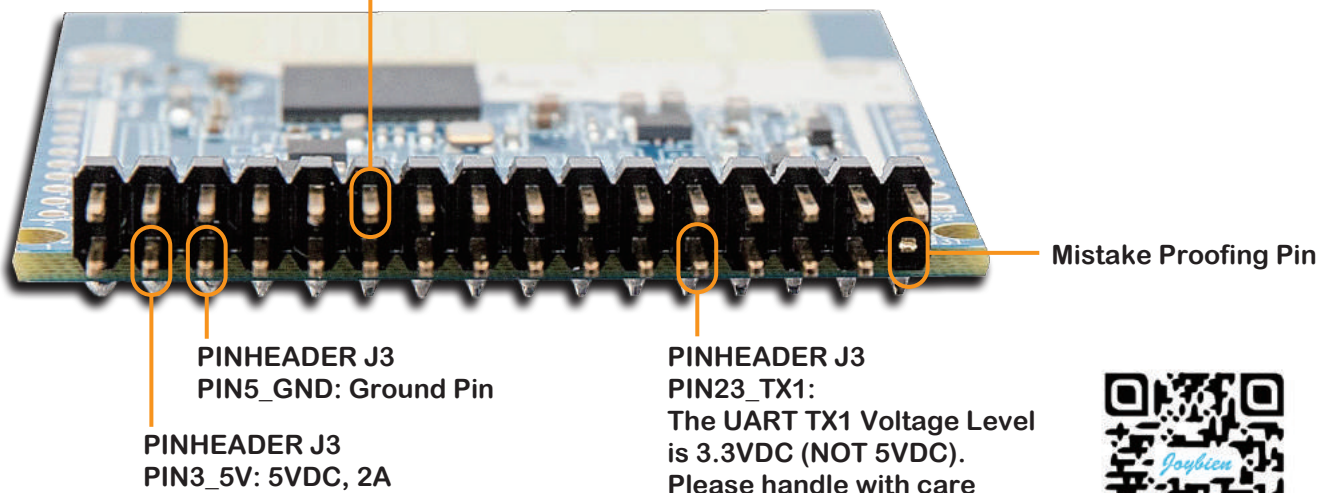
## (B) Key Data Mode

This is for Bluetooth Data Transfer usage, NOT USED if using Raspberry Pi 4 / NVIDIA Jetson Nano / External Microprocessor



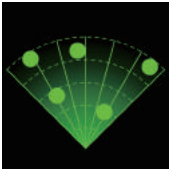
## 5.mmWave Module J3 Pin Assignment Note

PINHEADER J3 PIN12\_GPIO\_0 High: Raw Data Baud Rate 921600/8/n/1 selection  
PINHEADER J3 PIN12\_GPIO\_0 Low : Key Data Baud Rate 115200/8/n/1 selection



Alert : All GPIO Pins base on 3.3V System. Pin23\_TX1 is DC 3.3V system.





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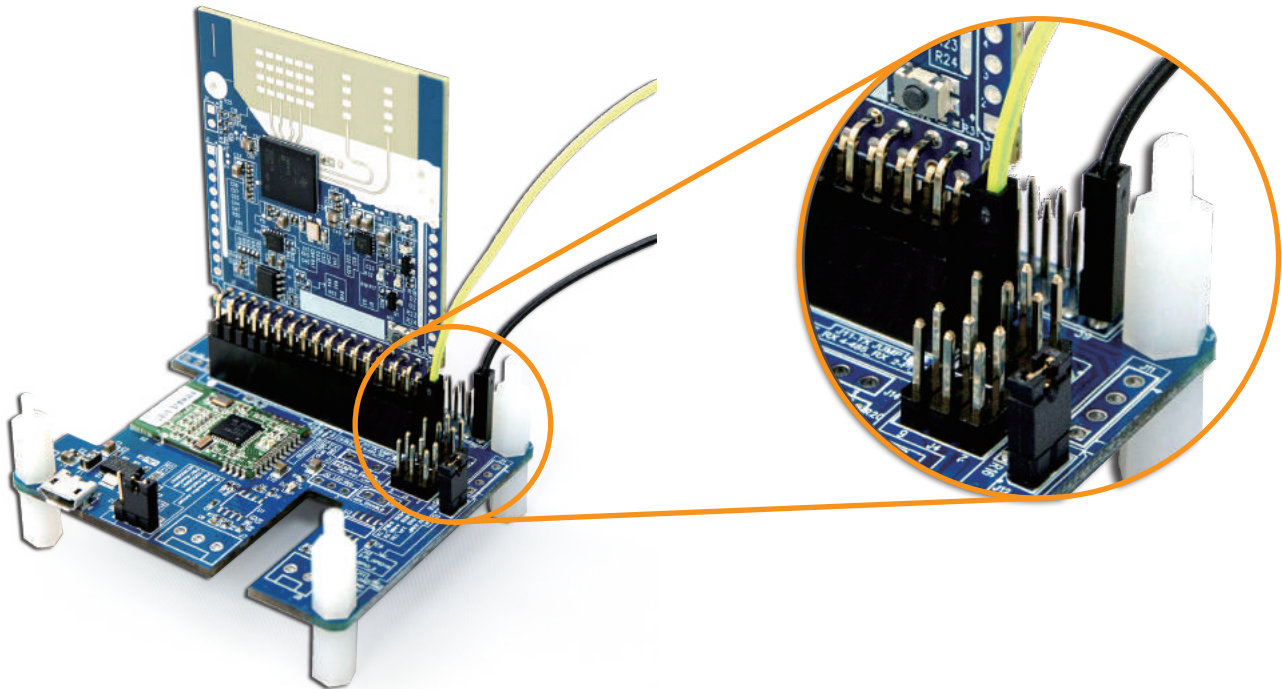
## 6. Batman Kit + External Microprocessor

Wire connections for external microprocessor access on the HAT-Board, and where:

J1 PIN3 Yellow Wire location is for UART TX1 at 115200/8/n/1;

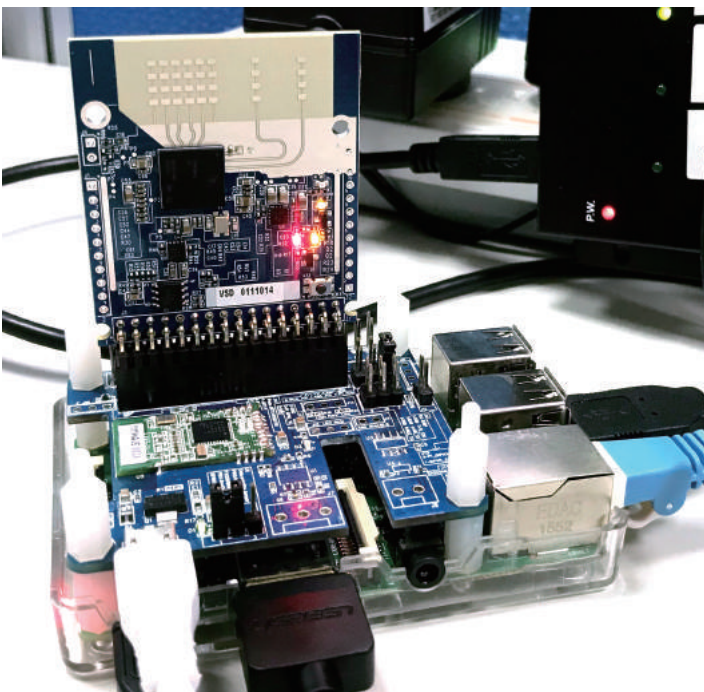
J3 PIN39 Black Wire location is for GND

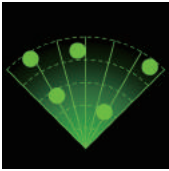
Note: The UART Voltage Level is 3.3VDC (NOT 5VDC). Please handle with care.



## 7. Batman Kit + Raspberry Pi

Please make sure that the JUMPER SETTING is for Raw Data Mode





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## 8. Batman Kit + NVIDIA Jetson Nano

Please make sure that the JUMPER SETTING is for Raw Data Mode

