

## Guardian UWB RADAR SERIES OPERATION DESCRIPTION

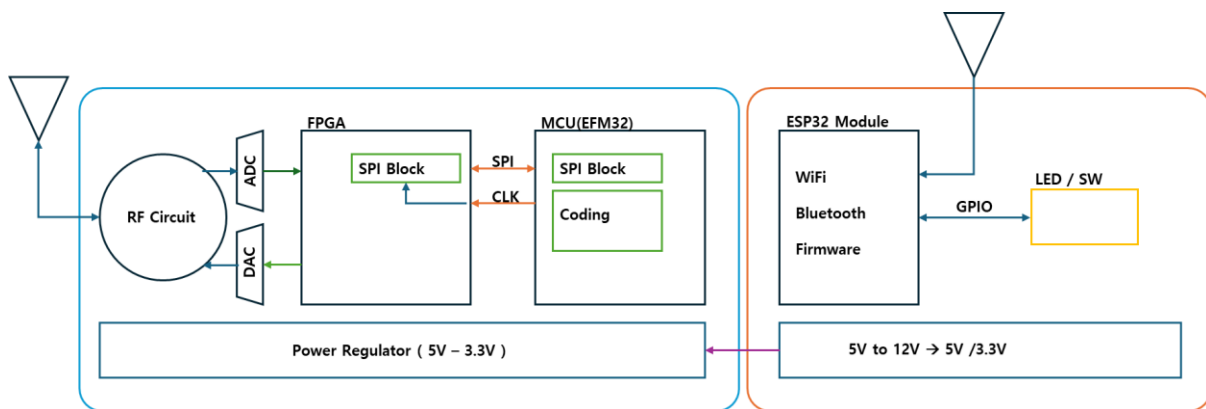
This detector is Impulse Radar based on the Ultra Wide Band technology at hi-band (7GHz-9GHz) with advanced digital signal processing, used for remote detection presence of peoples or/and animals inside of covering area.

Detector are designed to ensure reliable catch performance of vital signs of human presence and false alarm immunity in commercial application.

For this purpose, sensor contain two fields in detection solution: Doppler detector and Vital Sign detector.

Doppler detector allows to detect movements of peoples inside of area, Vital Sign catch signals when body is unmoved (sleeping, reading book or watch tv etc.).

This device complies with Part 15.517 of the FCC Rules. This equipment may only be operated indoors. Operation outdoors is in violation of 47 U.S.C. 301 and could subject the operator to serious penalties.



The Guardian A1(M1) is largely composed of two blocks as shown in the above block diagram, and one is divided into an Rf Radar sensor (sky blue block) and a WiFi controller (orange block).

In the case of an RF sensor, it is supposed to operate with a clock generated using an internal clock in the MCU, and the FPGA is also supposed to operate using a clock generated in the MCU.

It operates by exchanging data through SPI internally, creates and exports a signal with DAC, and receives the reflected sensor value as an ADC value to measure the data change value.

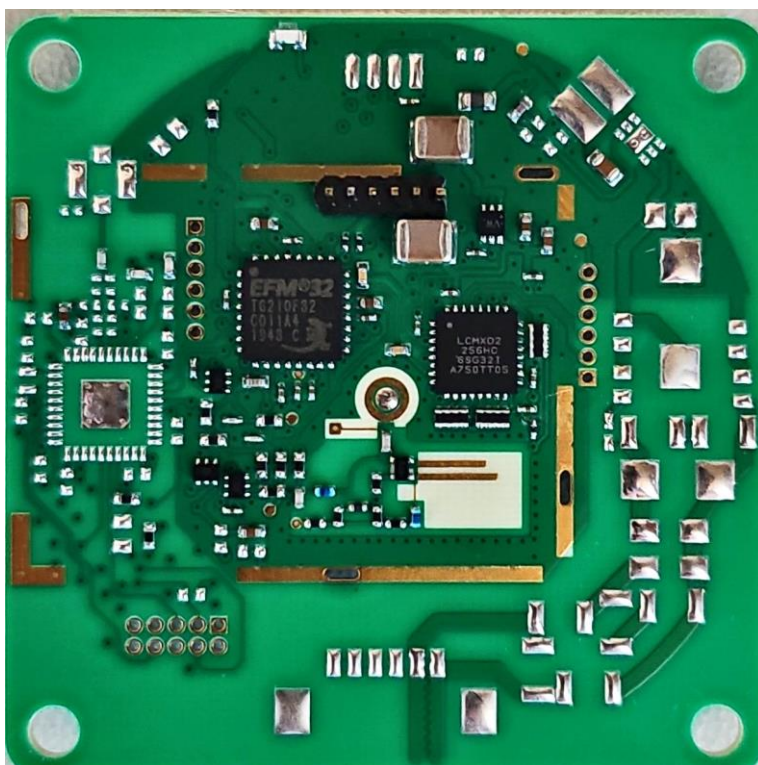
Using the detected value, the MCU transmits data to UART communication with the measured value.

On the WiFi side, when there is no initial setting value, it operates in the BLE mode and operates in the setting mode.

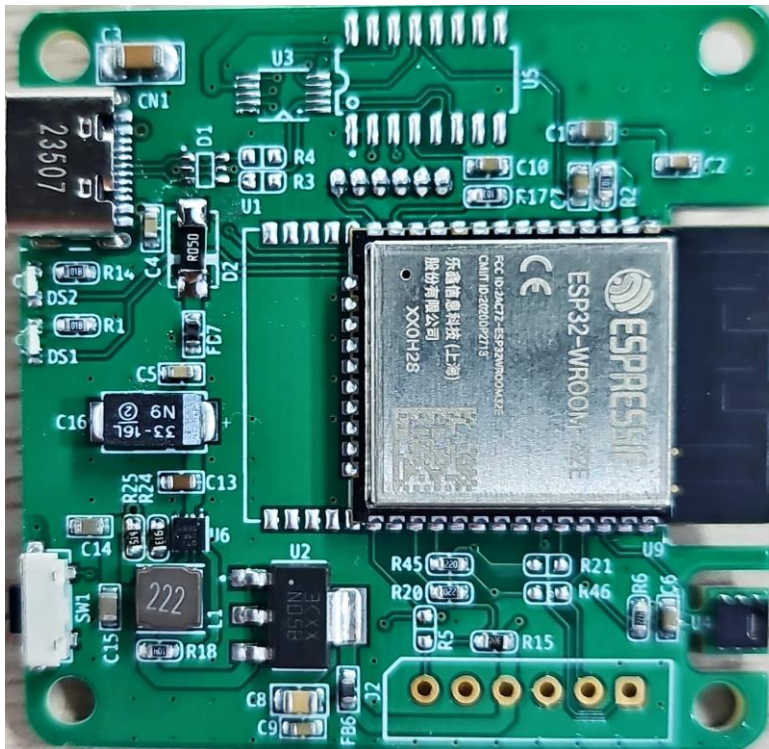
When you set up the WiFi environment with the setting app, you receive the data value through BLE, write it in the EEPROM, reset it, and re-operate, and if there is no abnormality in the setting value, WiFi is connected and the Internet is connected.

When you access Cloud Platform with connected WiFi and send data, the value is stored in the internal database.

If the program defaults to the saved database values with iOS or Android apps, it displays the current status values and operates to deliver alarms.



The picture above is an RF sensor substrate that is largely composed of FPGA/MCU/RF/power, and the inner layer is ground-treated to block noise. In the case of the power supply unit, it does not operate alone, so it is operated by receiving 5V power.



The above WiFi substrate inputs power inputs from 5V to 12V through USB-C, supplies 5V power to the RF sensor with the input power, and supplies power to operate internally by making 3.3V power again.

The LED consists of two LEDs, and if the power is connected and the connection is normal, the orange LED flashes and turns on.

If there is a problem with the WiFi connection, a green light will come on and make it known that it is all BLE.

If the setting is normal, it is configured to be connected to the cloud, transmit data, and store it in the database.