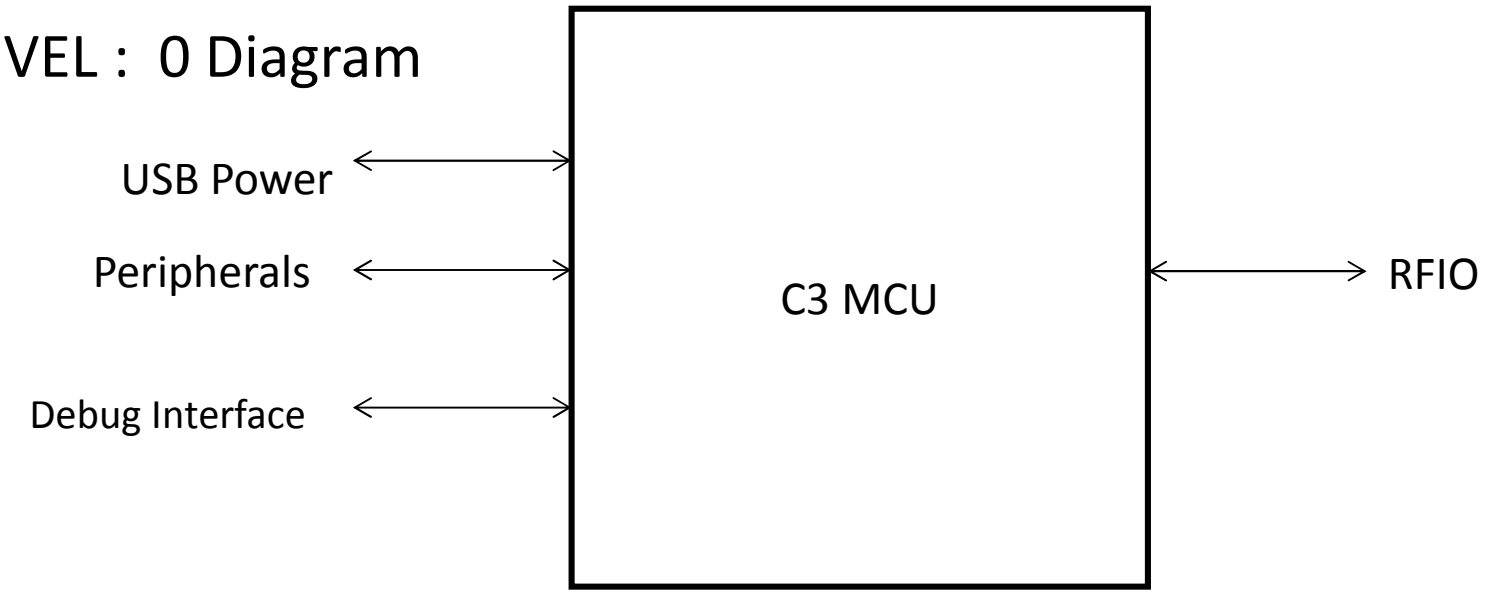
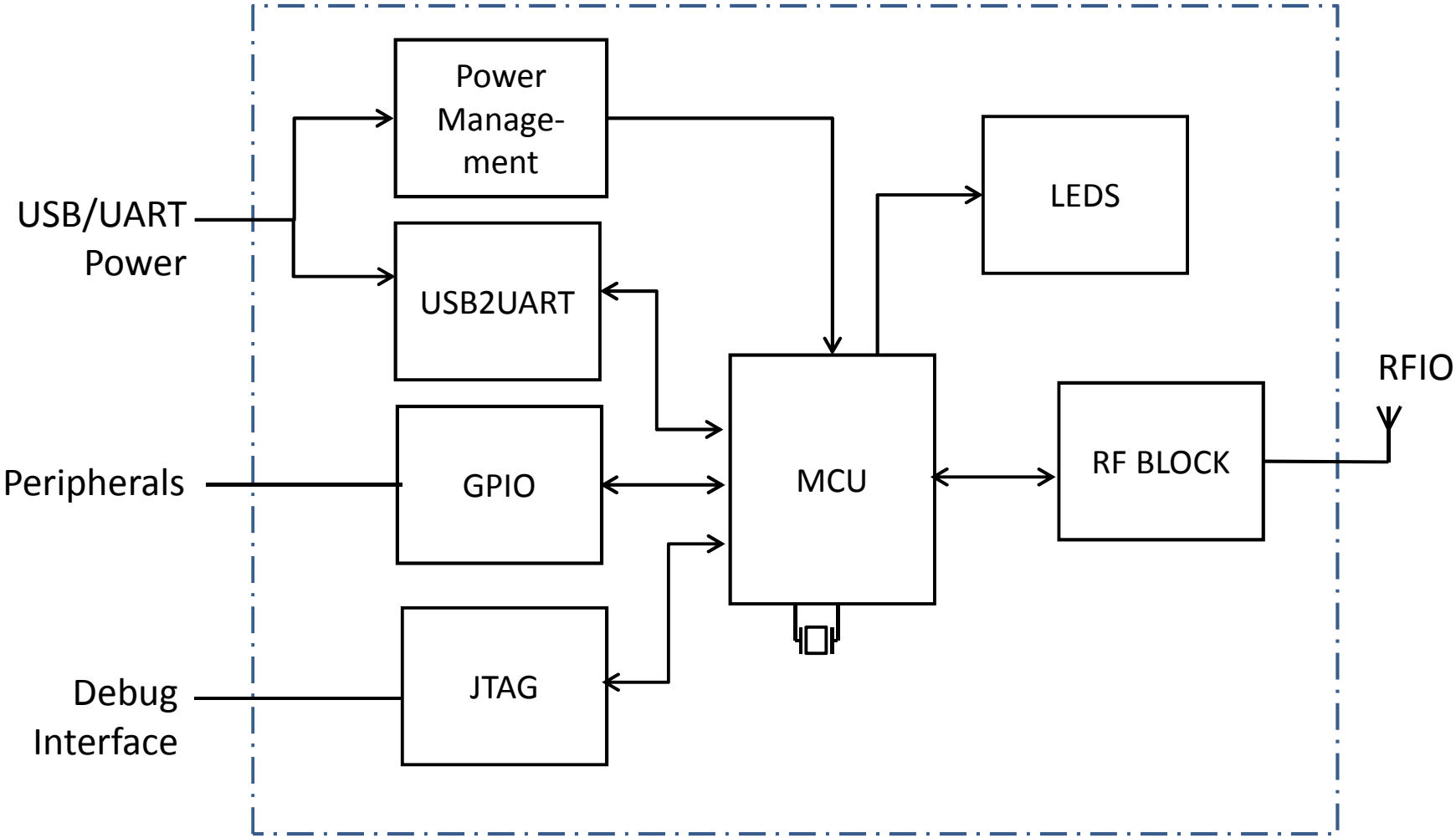
LEVEL : 0 Diagram

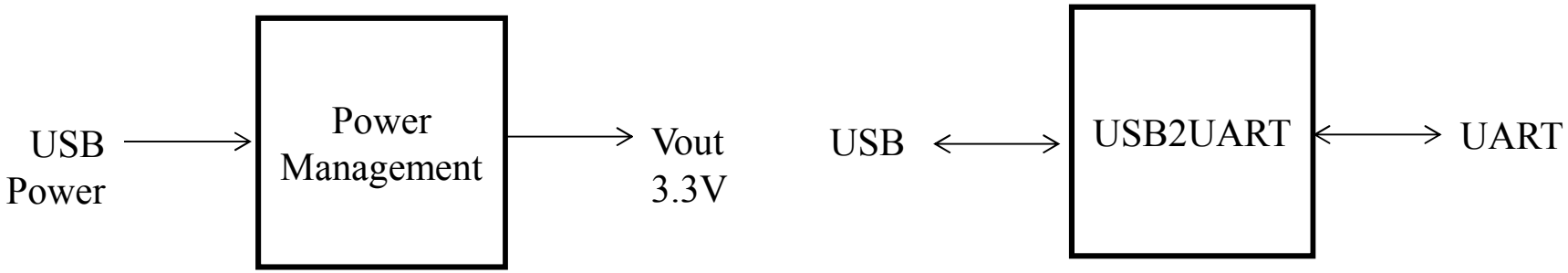


Module	**C3 MCU**
Bi-directional (Input-Output)	1) USB Power : supplies 4.5V-5.5V to the board and feeds data into and out of the system 2) Debug Interface : Debug with JTAG interface 3) Peripherals: Connection via GPIO to other components, for e.g. LEDs, audio-channel etc. 4) RFIO: Radio input-output channel at 436.5 MHz passband ; uses an antenna
Functionality	This module is a subsystem of a larger satellite CubeSat system. The main function of this subsystem is to receive and transmit high frequency data signal using Wi-Fi protocol. At the heart of this module is a microcontroller that takes commands via USB, GPIO, and JTAG configurations and uses radio frequency to communicate messages from and to another similar module.

LEVEL : 1 Diagram



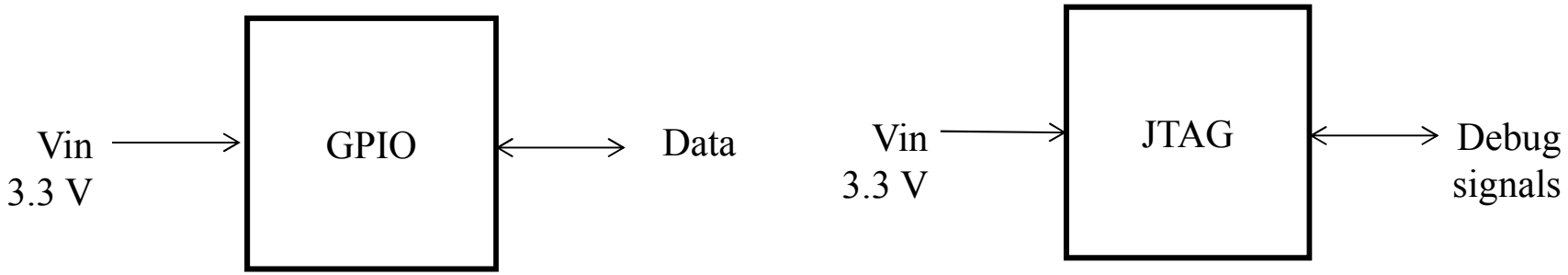
LEVEL : 0-1 Diagram



Module	**Power Management**
Input	USB Power : supplies 4.5V-5.5V DC through USB connection
Output	Vout: Outputs 3.3 V DC
Functionality	The function of this unit is to manage the power system. It is powered through USB connection. It consists of voltage regulator and a battery pack that stores voltage and outputs constant 3.3V.

Module	**USB2UART**
Bidirectional (Input –Output) Output	USB : Data via USB connection (D+ and D-) UART: Data via UART (RX and TX)
Functionality	This unit consists of USB-to-UART Bridge controller that converts USB signals to RS-232 and vice-versa.

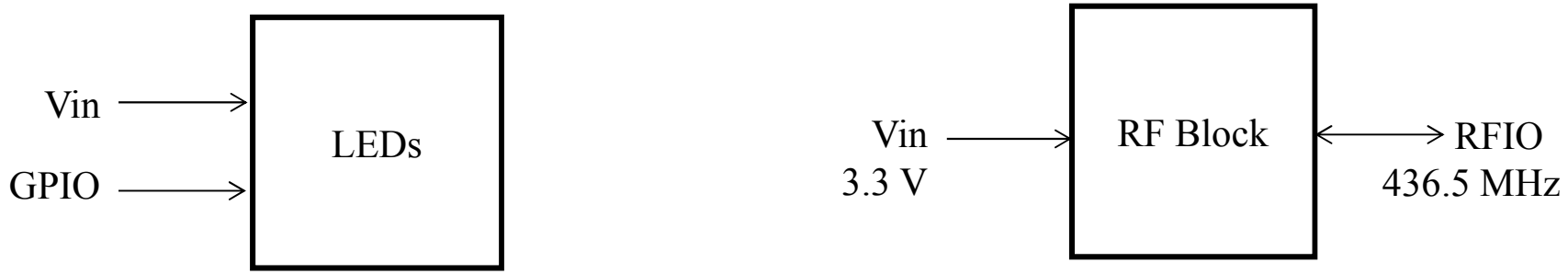
LEVEL : 0-1 Diagram



Module	**GPIO**
Input	Vin: 3.3 V DC
Bi-directional (input-output)	Data: common channel for data in and out using GPIO connection
Functionality	This modules provides an interface between microcontroller units other peripherals.

Module	**JTAG**
Input	Vin: 3.3 V DC
Bi-directional (input-output)	Debug signals: Common channel to transfer data between microcontroller and environment.
Functionality	This consists of a 10-pin JTAG connector system that allows to debug the chip.

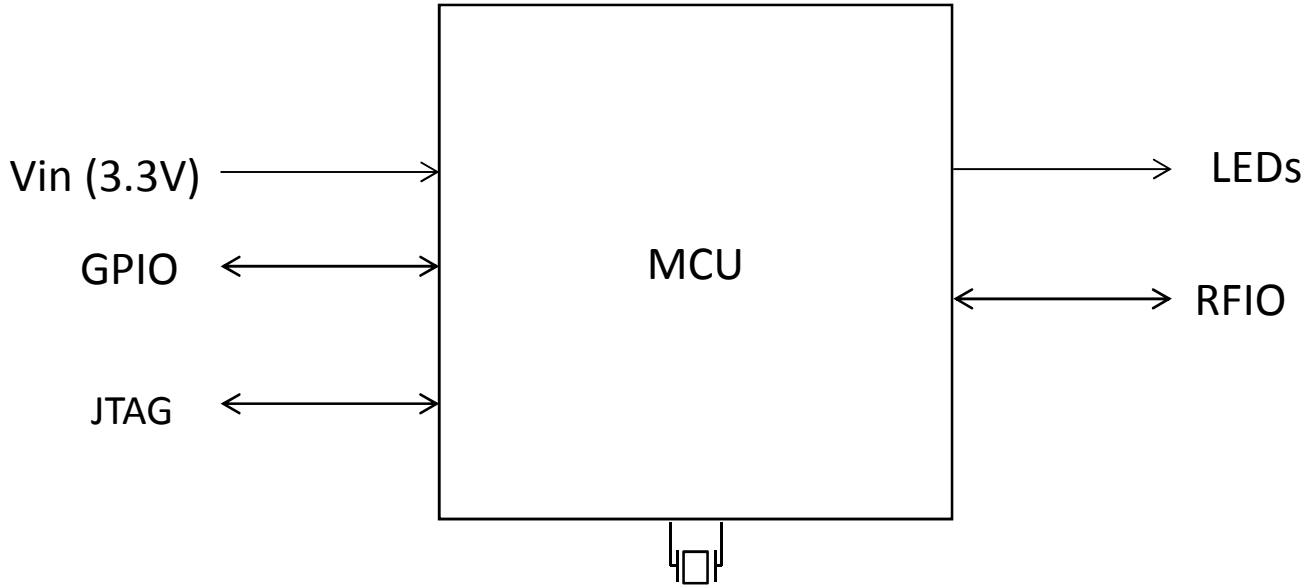
LEVEL : 0-1 Diagram



Module	**LEDs**
Input	Vin: 3.3 V voltage supply GPIO: GPIO pins connection
Functionality	It's function is to indicate a connection of a device. It consists of tri-color LED (RGB). The lights turn on or off when a device is connected or disconnected respectively.

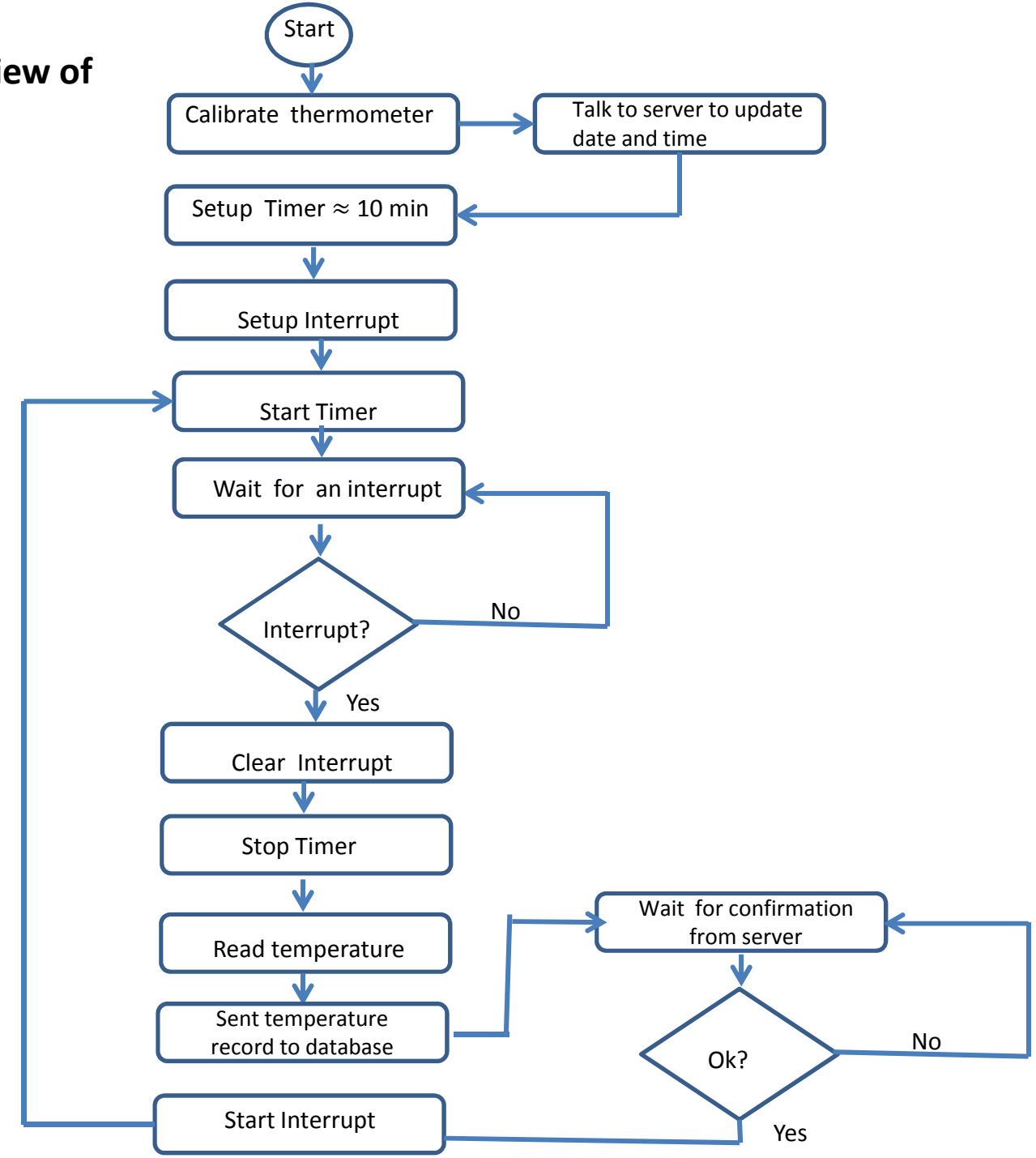
Module	**USB2UART**
Input	Vin: 3.3 V supply
Bidirectional (Input –Output)	RFIO: 0-13dB power signals at 436.5 MHz
Functionality	The main purpose of this module is to receive and transfer radio signals at a passband frequency of 436.5 Hz.

LEVEL: 0-1 Diagram



Module	**MCU**
Input	Vin: supplies 4.5V-5.5V
Output	LEDs : Tri-colored LEDs (RGB)
Bi-directional (Input-Output)	1) GPIO: Connection to peripherals via GPIO 2) JTAG: connection to 10-pin JTAG interface 3) RFIO: Radio input-output channel at 436.5 MHz passband
Functionality	This is the main microcontroller unit in the system. It uses a real-time operating system.It has a resonator connected to it that clocks at 32MHz. This unit monitors radio signals, as well as provides multiple interfaces , for eg.GPIO, JTAG, SPI, I2C etc., to transmit and receive data.

UML State Machine View of Vaccine Temperature Monitoring



UML Sequence Diagram
View of Vaccine
Temperature Monitoring