T11 - Suspicious Package Training Aid

# SPTA Block Diagram – Rev 2

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## Level 0 Block Diagram



|  |  |
| --- | --- |
| Module | SPTA |
| Inputs | 1. Power Switch: 9v DC. 2. 0 to -75db RF input (410-470MHz). |
| Outputs |  |
| Functionality | The SPTA senses a RF signal in the UHF radio range and triggers a buzzer and LED indicator if the signal surpasses a set threshold. If the SPTA is subjected to a physical force the buzzer and LED indicator will trigger indicating a training fault. |

## Level 1 Block Diagram







|  |  |
| --- | --- |
| Module | RF Detector |
| Inputs | 1. Vcc (5V) 2. Enable (5V) 3. RF input signal (410MHz-470MHz) |
| Outputs | 1. Analog DC Voltage (.3V – 1.8V) |
| Functionality | Received RF signal in the range if 410-470MHz and outputs analog voltage relative to the signal strength received, starting at -75db - .3V. |

|  |  |
| --- | --- |
| Module | Vibration Sensor |
| Inputs | 1. Power: Ground 2. Force (N) |
| Outputs | 1. Digital signal out |
| Functionality | Pulls the output low when moved abruptly. |

|  |  |
| --- | --- |
| Module | Switch |
| Inputs | 1. Vcc (5V) |
| Outputs | 1. Digital signal |
| Functionality | Outputs a digital high signal to the enable bit of the processor |

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| --- | --- |
| Module | LED indicator |
| Inputs | 1. Vcc (5V) |
| Outputs | 1. Digital signal <0:3> |
| Functionality | Notifies user when device is active and when the device was triggered due to a radio signal or movement on an active low input. |

|  |  |
| --- | --- |
| Module | Power Supply |
| Inputs | 1. 9v DC voltage |
| Outputs | 1. 5v DC Voltage |
| Functionality | Limits the supply voltage to 5V DC and supplies enough current to run all devices. |

|  |  |
| --- | --- |
| Module | processor |
| Inputs | 1. Vcc 5V 2. Enable 5V 3. analog input (.3-1.7V) 4. digital input (0-5V) |
| Outputs | 1. four digital signals |
| Functionality | Device activates on an active high enable input which sets toggles a low output to the On LED indicator for a few seconds before remaining low. Once active a digital output it set high to activate the RF detector. If analog input is above threshold or the digital input is set low, the device will set a low output to the corresponding LED indicator for the event that was detected first (All PGIO pins have internal pull up resistors). In either scenario an output low is set to start the buzzer |

|  |  |
| --- | --- |
| Module | Buzzer |
| Inputs | 1. Power (5V) 2. Digital signal active low |
| Outputs |  |
| Functionality | The Device emits a sound at 75dBA, 4KHz when a digital low signal is applied. |

## ULM Activity View



## ULM State Machine View

