T11 - Suspicious Package Training Aid

# SPTA Block Diagram

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## Level 0 Block Diagram



|  |  |
| --- | --- |
| Module | SPTA |
| Inputs | 1. Power: 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. |

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| --- | --- |
| Module | Vibration Sensor |
| Inputs | 1. Power: Ground 2. Force (N) |
| Outputs | 1. Digital signal out |
| Functionality | Triggers a switch when moved abruptly causing a digital low output. |

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

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| --- | --- |
| Module | LED indicator |
| Inputs | 1. Vcc (5V) 2. Digital signal <0:3> |
| Outputs |  |
| Functionality | Notifies user when device is active and when the device was triggered do to a radio signal or movement on an active low input. |

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| --- | --- |
| 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. |

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| --- | --- |
| 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. 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) |

|  |  |
| --- | --- |
| 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

