

Outdoor Safety Bracelet: Group 37

Team Members:

Sam Sitzmann

Seth Katz

Sameeth Gosike (gosike2)

Requirement Summary Table

Module Name	High-Level Requirements	Points
Control Module (MCU)	<ul style="list-style-type: none">● Module should successfully acquire and parse data from GPS (UART) and accelerometer (I2C) to calculate location and detect fall● Module should be able to receive alert interrupts and activate buzzer/flash alert on screen● (Bracelet) Module should be able to package GPS/Alert data and send to RF module● (Monitoring) Module should be able to update screen with Location/Status data	5
RF Transceiver Module	<ul style="list-style-type: none">● Module should be able to successfully send and receive data to/from bracelet/monitoring device over wireless RF communication at 915MHz	5
GPS Module	<ul style="list-style-type: none">● Module should be able to obtain bracelet/monitoring device's coordinates and send to MCU over UART● Should update coordinates every 1 second (1Hz)	10
Fall Detection Module (Accelerometer)	<ul style="list-style-type: none">● Module should be able to raise interrupt during free-fall event, single-tap (acceleration spike) event, and orientation change event● Module should be able calculate bracelet's acceleration within $\pm 2g$ range on 3 axis	5
Monitoring Display Module	<ul style="list-style-type: none">● Module should display monitoring device User Interface with no glitches with bracelet status	10

	<p>and location</p> <ul style="list-style-type: none"> ● User should be able to interact with touch-screen button to send out alert to bracelet 	
Bracelet HMI Module (Help Button+Buzzer)	<ul style="list-style-type: none"> ● Button should be debounced and raise signal to send out 'Help Alert' to monitoring device ● Buzzer should sound at hearable frequency when 'Buzz Alert' is sent to bracelet 	10
Power Units	<ul style="list-style-type: none"> ● Module should supply enough steady power to the circuit and its components 	5
	Total	50