

wearable vital sensor

VitalTAG



Test Plan

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1. System Test Plan Overview

Our system test plan is used to verify all vital measurements along with fundamental specifications for usability and operation.

1.1 SpO₂ Measurements

SpO₂ measurements will be verified using a Contec Medical CMS 50D+ Blue Finger Pulse Oximeter to satisfy requirements [R33], [R37], [R56], and [R61]. Multiple repetitions with multiple subjects will be performed to verify the data.

Table 1: SpO₂ Test Plan

Test	Specific Parameters
Converts Raw Signal to SpO₂	Displays SpO ₂
Accuracy	± 20%
Alarm Limits	Alarms when SpO ₂ < 90%

1.2 Heart Rate Measurements

Heart Rate measurements will be verified using a Contec Medical CMS 50D+ Blue Finger Pulse Oximeter. In addition, we will compare the Heart Rate with radial pulse measurements and a stopwatch by a paramedic. Multiple repetitions with multiple subjects will be performed to verify the data and to satisfy requirements [R33], [R37], [R56], and [R59].

Table 2: Heart Rate Test Plan

Test	Specific Parameters
Converts Raw Signal to Heart Rate	Displays Heart Rate
Accuracy (Portable Monitor)	± 20%
Accuracy (Paramedic)	± 20%
Alarm Limits	Alarms when Heart Rate <ul style="list-style-type: none"> • > 110 bpm • < 50 bpm

1.3 Blood Pressure Measurements

Blood Pressure measurements will be verified using two different electronic portable Blood Pressure monitors. In addition, Blood Pressure measurements will be compared to an inflatable cuff and stethoscope used by a paramedic. Multiple repetitions with multiple subjects will be performed to verify the data and to satisfy requirements [R33], [R37], [R56], and [R60].

Table 3: Blood Pressure Test Plan

Test	Specific Parameters
Converts Raw Signal to Blood Pressure	Displays Blood Pressure
Accuracy (Portable Monitor)	± 20%
Accuracy (Paramedic)	± 20%
Alarm Limits	Alarms when Blood Pressure is out of these ranges <ul style="list-style-type: none"> • 90 – 119 (Systolic) • 60 – 79 (Diastolic)

1.4 Data Storage

Data storage will be verified by interrupting power during use and then accessing the memory to ensure the data was not lost. Multiple repetitions will be performed to verify no data loss and to satisfy requirements [R39] and [R57].

Table 4: Data Storage Test Plan

Test	Specific Parameters
Vitals Stored in Memory (Normal Operation)	Verify vital information saved into memory
Vitals Stored in Memory (Power Interrupted)	Verify vital information saved into memory with no data corruption

1.5 Bluetooth Connectivity

Multiple VitalTAGS will be connected to a single smart eyewear to verify that several VitalTAGS can communicate seamlessly. Multiple repetitions will be performed to verify the data and to satisfy requirements [R03], [R29], [R38], [R48], and [R58].

Table 5: Bluetooth Connectivity Test Plan

Test	Specific Parameters
Easily Connects to Smart Eyewear	VitalTAG connects to Recon Jet within 30 seconds
Adheres with FCC Wireless Regulations	Bluetooth connection between VitalTAG and Recon Jet does not interfere with other Bluetooth devices
Recon Jet can connect to multiple VitalTAGS	Recon Jet can stay connected to more than 1 VitalTAG simultaneously

1.6 Smart Eyewear

The smart eyewear will be used while navigating a vehicle in a closed circuit to verify it does not obstruct the users field of view. Additionally, the vitals will be verified for clarity, ease of view and to satisfy requirements [R44], [R45], [R47], and [R49].

Table 6: Smart Eyewear Test Plan

Test	Specific Parameters
Recon Jet can fold for storage to save space	Recon Jet is foldable
Recon Jet doesn't obstruct the user's field of view	Can drive comfortably in closed circuit
Recon Jet should be comfortable	Recon Jet will be worn for an hour by 4 users and any signs of discomfort will be recorded
Recon Jet GUI should be easy to understand	<ul style="list-style-type: none">• Recon Jet will be worn by 3 different users for the first time• A pre-loaded value will be loaded on the screen• Users will be asked to write down all vitals displayed