Addu Equatorial Hospital

BIO-MEDICAL ENGINEERING SECTION

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Technical Specification: Infrared Vein Detector / Vein Visualization System

1. Scope / Intended Use

The system shall be a portable infrared vein visualization device intended to assist healthcare professionals in locating superficial peripheral veins for venipuncture, IV cannulation, blood sampling, and vascular access procedures in adult, pediatric, and geriatric patients.

The system shall be suitable for use in:

- Emergency Department
- ICU / PICU
- Operation Theatre
- Dialysis Unit
- General wards
- Outpatient settings

2. Technical Features

2.1 Imaging & Visualization

- The system shall use Near Infrared (NIR) or equivalent safe optical imaging technology for vein visualization.
- The device shall be capable of detecting and displaying superficial peripheral veins in real time.
- The system shall provide clear visualization of veins on different skin tones.
- The device shall support visualization of veins in difficult access patients (obese, dehydrated, pediatric, elderly).

2.2 Performance Requirements

- The system shall support visualization of superficial peripheral veins suitable for venipuncture and cannulation procedures
- Real-time image processing with minimal lag shall be ensured.
- The system shall maintain consistent performance under ambient clinical lighting conditions.

2.3 Imaging Output

- The system shall provide direct skin projection of vein patterns
- Adjustable brightness settings shall be available.
- The system shall provide inverted visualization modes for convenience.

2.4 Usability & Design

- The device shall be lightweight, portable, and handheld.
- Ergonomic design suitable for one-handed operation.
- Quick start-up time suitable for emergency use.
- Simple user interface with minimal training requirement.

2.5 Safety & Compliance

- CE marking / FDA clearance or equivalent regulatory approval shall be preferred.

2.6 Accessories

The system shall be supplied with:

- Handheld vein detector unit
- Charging dock or adapter
- Carrying case
- User manual

3. Power Requirements

3.1 Battery Operation

- The system shall operate on an internal rechargeable battery system.
- Battery backup shall be minimum 1 hours of continuous operation, preferably more.
- Battery shall be lithium-ion or equivalent rechargeable technology.
- Low battery indication shall be available via visual or audible alert.

3.2 Charging System

- The system shall be supplied with medical-grade charger or docking station.
- Charging time shall be optimized for clinical use.

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3.3 Electrical Input

- Input power supply shall support:
  - 100–240 V AC, 50/60 Hz .

4. Environmental & Mechanical Requirements

- Operating temperature suitable for hospital environment (approx. 10°C to 40°C).
- Splash-resistant or sealed housing preferred.
- Shock-resistant design suitable for clinical transport.

5. Warranty & Service

- Minimum 1-year comprehensive warranty.
- Onsite or online user training shall be provided.

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