TacMON: Continuous Physiological Monitoring from Training to Triage

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Background

Military physiological monitoring has traditionally relied on mission-specific systems used separately during training, operations, and casualty care. This fragmentation disrupts data continuity, increases complexity, and limits interoperability across military medical and operational systems. As the Army advances MOSA and integrated digital health capabilities, a common platform is needed across multiple operational concepts. TacMON addresses this need through a modular architecture that supports continuous physiological awareness from training and performance optimization through operational monitoring and combat casualty care.

Description

TacMON is a unified physiological monitoring product platform that delivers a continuum of physiological status monitoring capabilities across the DoW enterprise. Rather than developing separate systems for training, operations, and combat casualty care, TacMON uses a common hardware, firmware, communications, and software architecture that can be configured for each mission while preserving a continuous physiological record. The platform supports standalone operation, integration with Soldier Systems (e.g., TacPAN, HSI's tactically feasible wearable platform providing power, data management, and edge computing) , and adhesive patch-based monitoring for casualty care, providing a scalable, MOSA-compliant solution that interoperates with government software and enables future technology insertion.

Processing Unit Computer (PUC)
Common processing and communications module with configurable mounting location.

Integrated e-Textile Sensor Network
Medical-grade textile sensors for ECG, respiration, skin temperature, and activity monitoring.

Engineered Garment Design
Optimized compression, stretch, and panel construction for reliable sensor performance and user comfort.

Compatible with HSI's TacVITAL, ATAK, and BATDOK for real-time physiological visualization across training, operations, and casualty care.

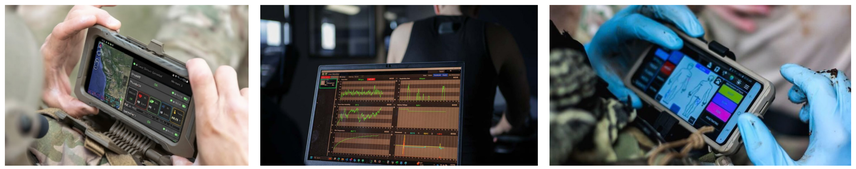
TacMON Building Blocks

The Foundation that Enables Continuity

- Optimized textile architecture for comfort, durability, and signal quality
- Manufacturing-configurable e-textile sensors for mission-specific applications
- Universal sensor interface supporting current and future physiological sensors
- Common electronics platform across all operational configurations
- Shared firmware enabling consistent operation and simplified maintenance
- Standard communication protocol for reliable device connectivity

Compatible with Government Software Platforms

Built for Seamless Integration



- Compression Garment for training, performance monitoring, and physiological readiness
- Soldier System Integration for operational monitoring and situational awareness
- Critical Care Patch for continuous patient monitoring during triage and evacuation
- Common electronics, firmware, and communications across all configurations
- One continuous physiological record throughout the mission lifecycle

Operational Concepts

Built for Seamless Integration

Training & Baseline (TacMON Garment)
- Baseline Creation
- Performance Monitoring
- Readiness Assessment
- Lab / Training / Research

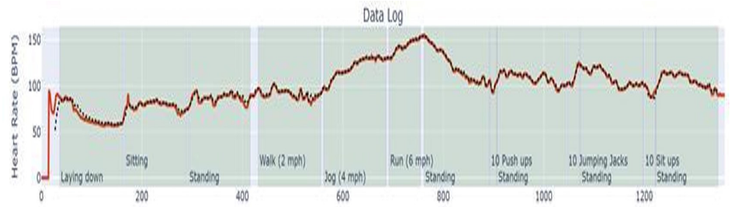
Missions/Operations (TacMON + TacPAN)
- Real-time Monitoring
- Team Situational Awareness
- Heat / Stress Management
- Mission Optimization

Injury & Triage
- Rapid Assessment
- Triage & Prioritization
- Continuous Monitoring
- Hand-off to Higher Care

Results

- Successfully developed and demonstrated three TacMON operational configurations (training, Soldier System integration, and combat casualty care).
- Expanded TacMON physiological algorithms for deployment on edge computing platforms.
- User evaluations reported positive feedback on garment comfort, ease of donning/doffing, and overall usability.
- Human subject testing demonstrated excellent heart rate accuracy, with 95% of activities achieving near-perfect agreement (CCC > 0.90) and a mean error of less than 1.2 bpm compared to the reference device.

Performance of TacMON Garment (RED) vs Golden Sample (Polar Band) (BLK)



Conclusion

TacMON transforms physiological monitoring from isolated, mission-specific solutions into a unified, modular platform that supports continuous physiological awareness from training through operational missions and combat casualty care. By leveraging a common hardware architecture, shared firmware, standardized communications, and open interfaces, TacMON enables seamless integration across multiple operational configurations while preserving a continuous physiological record.

TacMON Value

- Continuous physiological awareness from training to triage
- Access to physiological data when and where it matters
- One continuous physiological record across the mission lifecycle
- Seamless integration with government software ecosystems through MOSA and open APIs
- Medical-grade physiological data supporting operational and clinical decision-making
- Scalable, adaptable, and future-ready platform for emerging technologies

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One Platform, One Record, Every Mission