

PADIS



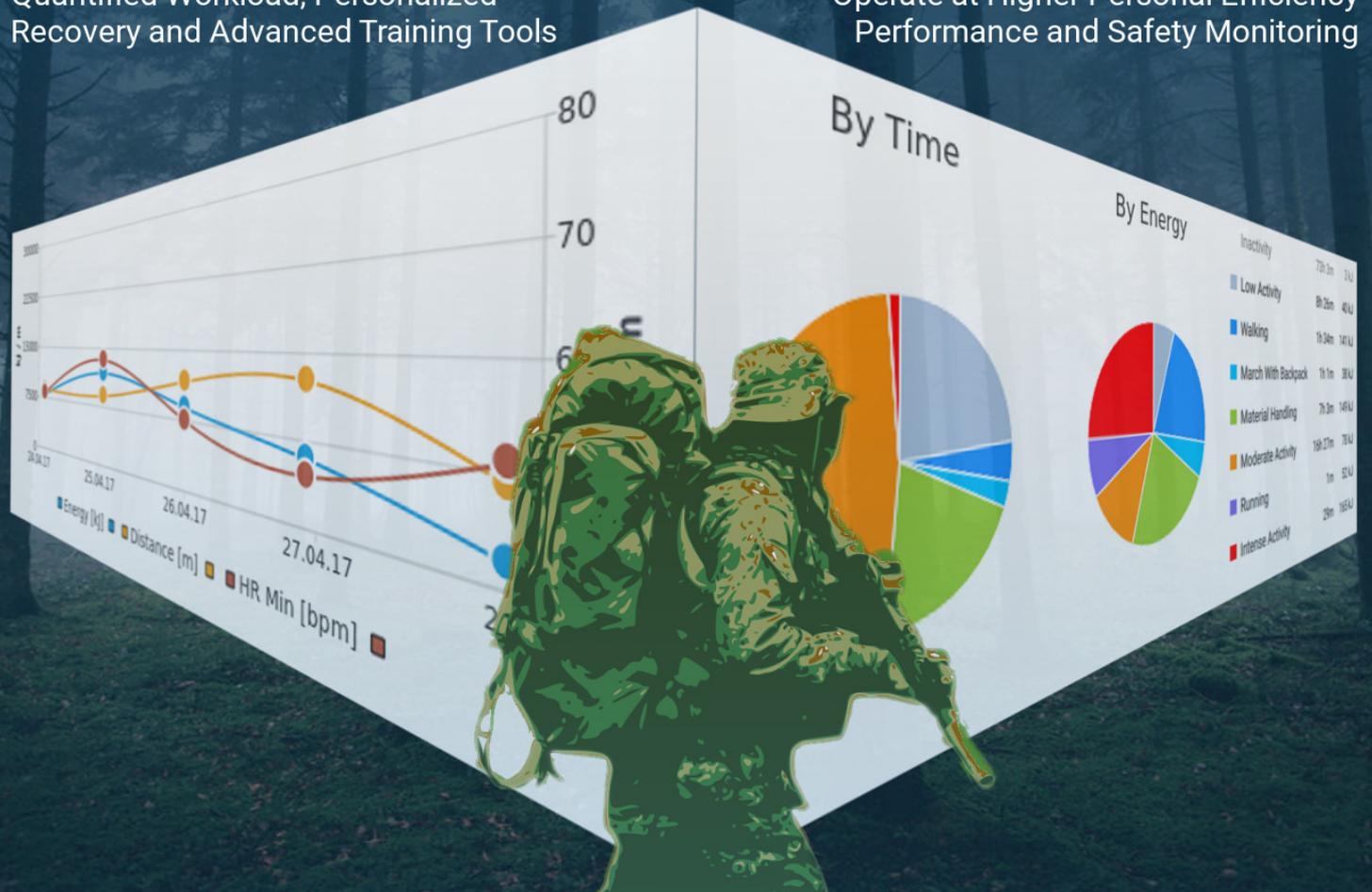
activity monitoring for soldiers

Objective

Quantified Physical Readiness
Quantified Workload, Personalized
Recovery and Advanced Training Tools

Benefits

Injury Prevention
Operate at Higher Personal Efficiency
Performance and Safety Monitoring



Axiamo PADIS is the proven scalable solution for fully automatic and continuous soldier activity monitoring.

Get objective insight on soldier's workload to avoid outage and optimize overall performance.

The system application is scalable from small short time performance measurements of several soldiers up to continuous data collection for big amounts of squads. Remote control and visualization of results is possible thanks to the integrated data synchronization with end to end encrypted data transfer.

Each equipped soldier delivers continuous data which is fed in the Axiamo PADIS system for automatic analysis. Axiamo PADIS enables gaining accurate and relevant measures of troops with very little effort for the operator and without distracting the soldiers in their service activities.

Compare each squad's performance score and improve their configuration based on objective and scientifically validated feedback.

key benefits

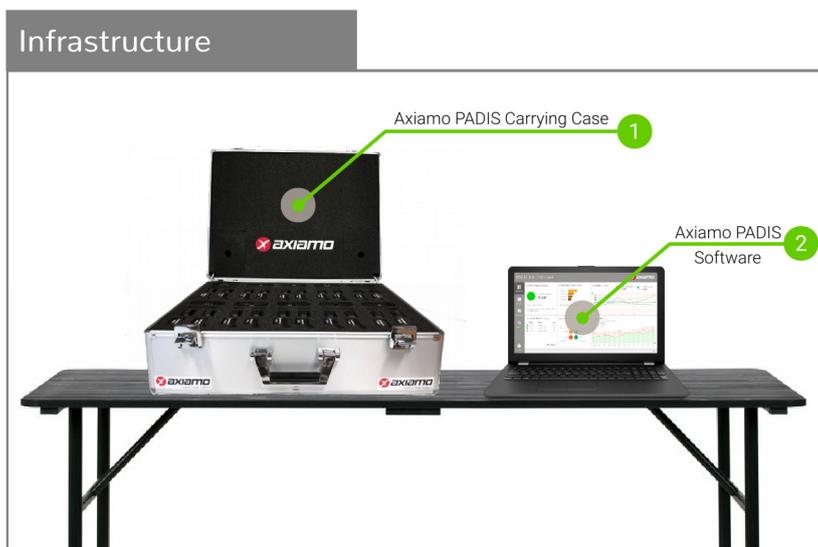
- ▶ avoid outage due to overloading
- ▶ compare different squad's performance
- ▶ optimize squad's composition
- ▶ injury risk identification & mitigation
- ▶ measure development over time
- ▶ physiological overview

system principle

- a Collection**
Operate registered and equipped squads as usual
- b Feedback**
Get detailed reports on physical soldier performance
- c Adaption**
With measured physical parameters, adapt for optimal load

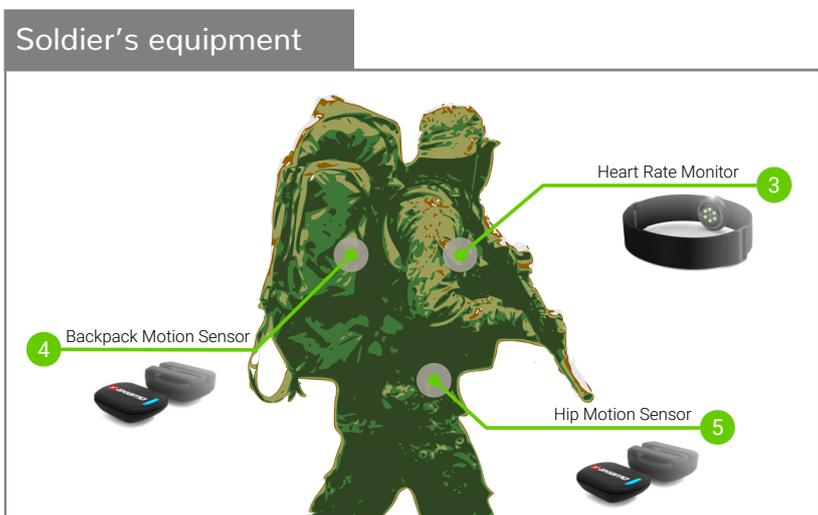


system components



- 1 Axiamo PADIS Carrying Case**
Set consisting of 10 complete Soldier's equipment. All motion sensors can be connected for data transmission and recharging through integrated USB ports. Connect the Carrying Case to mains power and a computer running Axiamo PADIS Software for operation.

- 2 Axiamo PADIS Software**
Data collection and visualization is performed through the Axiamo PADIS Software running on a laptop or desktop computer. Connecting the Axiamo PADIS Carrying Case is done through two USB Type A connectors.



- 3 Heart Rate Monitor**
Heart rate can be captured by either an arm or chest worn heart rate monitor. The measured data is automatically read out by the hip motion sensor through Bluetooth Low Energy.

- 4 Backpack Motion Sensor**
Capturing motion at the backpack enables the PADIS system to detect activities with backpack worn.

- 5 Hip Motion Sensor**
Both hip and backpack motion sensors capture all activity during the whole measurement period and are worn with a silicone attachment protecting the sensors from splash water and impacts.

proven wearing comfort

Axiomo PADIS is able to measure physical performance key parameters based on motion sensors attached to the hip and the backpack of a subject. A heart rate monitor of choice (chest or arm worn) is used to determine physical energy expenditure.

Wearing the system does not decrease operational capability at all. Various studies prove excellent wearing comfort of PADIS.



product proposal



Axiomo PADIS includes free credits on Kit basis



The Software features an integrated cloud solution for data synchronization and remote control (SSL encrypted transmission)

included per case



Credits are calculated in units of trainee hours.

Example: 10'000 trainee hours last for monitoring 100 soldiers for 100 hours.

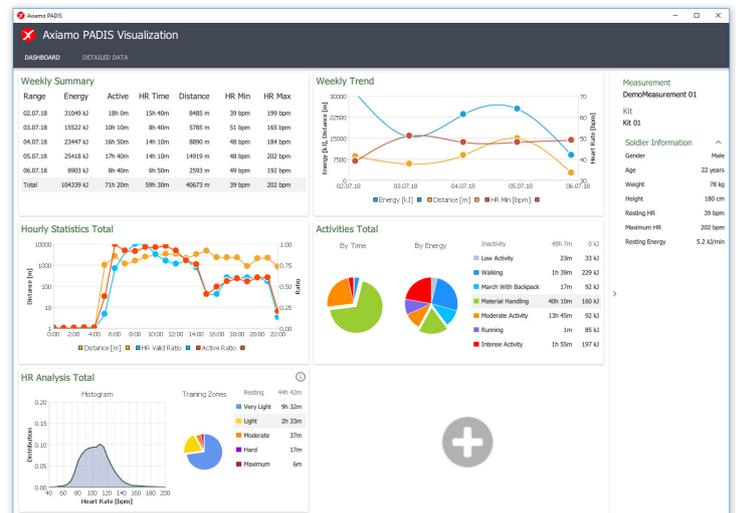
Unlimited cloud storage for PADIS measurements is included

5 Soldier's case	5'000 h	✓
10 Soldier's case	10'000 h	✓

5 Soldier's case



Visualization Dashboard



Supplements

Trainee hour credits

We provide trainee hour credits in the following three different amounts. One analyzed trainee hour equals one credit.

10'000h



50'000h



250'000h



Custom Visualization / Export

We provide any adaption or extension of integrated visualizations or data exporting format tailored to your needs.

Custom Data Uplink

In case you require to store your data in another storage, we can implement a custom interface.

Customer Training

If requested, we provide customer specific training for optimal system exploitation.

Custom Data Analysis

For further data analysis requirements, supplementary algorithms can be implemented fully tailored to customer requirements.

Spare Parts

Every component of Axiamo PADIS can be replaced and is available separately as spare part.

- ▶ PADIS Motion Sensor
- ▶ Sensor Silicone Case

- ▶ Heart Rate Sensor
Chest or arm worn

- ▶ PADIS Carrying Case
Equipped with cables and USB Hubs
5 Soldier's case or 10 Soldier's case



product background

Axiamo PADIS is continuously evolving since 2012, where it started as PARTwear PADIS. This system was scientifically validated with hundreds of hours activity data of soldiers (see referenced publications).
Developed in cooperation with the Swiss Federal Institute of Sport Magglingen SFISM.

For further information contact



Axiamo GmbH
Switzerland Innovation Park Biel/Bienne
Aarbergstrasse 5
2560 Nidau
Switzerland
info@axiamo.com

Project partner



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Office of Sport FOSPO

Swiss Federal Institute of Sport Magglingen SFISM

References

- Wyss, T., & Mäder, U. (2010). Recognition of military-specific physical activities with body-fixed sensors. *Mil Med*, 175(11), 858-864.
- Wyss, T., & Mäder, U. (2011). Energy expenditure estimation during daily military routine with body-fixed sensors. *Mil Med*, 176(5), 494-499.
- Wyss, T., Scheffler, J., & Mader, U. (2012). Ambulatory physical activity in swiss army recruits. *Int J Sports Med*, 33(9), 716-722.
- Wyss, T., Roos, L., Hofstetter, M. C., Frey, F., & Mader, U. (2014). Impact of training patterns on injury incidences in 12 Swiss Army basic military training schools. *Mil Med*, 179(1), 49-55.
- Roos, L., Boesch, M., Sefidan, S., Frey, F., Mader, U., Annen, H., & Wyss, T. (2015). Adapted marching distances and physical training decrease recruits' injuries and attrition. *MilMed*, 180(3), 329-336.
- Nadja Beeler, Lilian Roos, Simon K. Delves, Bertil J. Veenstra, Karl Friedl, Mark J. Buller & Thomas Wyss (2018). The Wearing Comfort and Acceptability of Ambulatory Physical Activity Monitoring Devices in Soldiers, *IJSE Transactions on Occupational Ergonomics and Human Factors*, 6:1, 1-10, DOI: 10.1080/24725838.2018.1435431