

EMFIT™



QUANTIFIED  
SLEEP



CONTACT FREE  
HEALTH MONITOR  
WITH HEART-RATE-VARIABILITY (HRV)

THIS BROCHURE IS FOR EU AREA



## WHAT IS EMFIT QS®?

EMFIT QS is the world's most sophisticated ballistocardiograph. With incredible resolution, it records heart contractions, breathing and body movement bio-signals.

The comprehensive vital information is collected and transmitted securely via Wi-Fi or cellular data connectivity. It is stored safely on our physical servers in Finland\*. User can easily access the private data anytime, anywhere via the Internet.

## HOW DOES EMFIT QS WORK?

Unbelievable as it sounds, simply place our sensor under your mattress. There is nothing to turn on or off, or attach to body. There are no batteries to be changed or charged. It is autonomous and automatic; no smartphone is needed for EMFIT QS to work.

## WHO IS IT FOR?

EMFIT QS is the only contact-free health monitor on market that can provide recovery and readiness analysis based on whole night heart-rate-variability. This is why professional athletes, triathlons, cyclists, football players and other sports enthusiasts have chosen to use EMFIT QS.

Senior citizens' family members love it for the peace of mind it can give them when looking after their loved ones living alone. EMFIT QS enables caregivers to track the bed routines and sleep habits of the elderly. This is useful when the individual is living independently and is in risk of falling or wandering due memory problems.



\*The right to privacy is protected in the Constitution of Finland (731/1999). This right is enforced through a number of statutes, including the Personal Data Act (523/1999) (henkilötietolaki) (PDA). The PDA implements Directive 95/46/EC on data protection (Data Protection Directive) and applies to all types of processing of personal data.



# EMFIT QS FOR ACTIVE LIVING

OLYMPIC ATHLETES, TRIATHLONISTS, NFL PLAYERS AND OTHER PROFESSIONAL SPORTS ENTHUSIASTS USE TODAY EMFIT QS BECAUSE OF IT'S RECOVERY ANALYSIS BASED ON WHOLE NIGHT HEART-RATE-VARIABILITY.

*"Emfit QS allows me to optimize my training potential by providing a baseline HRV, enabling me to control and manage the ideal balance between training and rest."*

**Teemu Lemmettylä**  
Professional Triathlete



Super Sensitive  
Under Mattress Sensor



All three  
sleep stages



Heart Rate Variability  
(HRV)



Recovery  
data



Heart & breathing  
rate



Trends up to 360  
days



Autonomic Nervous  
System Balance



Movement activity,  
tossing & turning





**Paul Ambrose**  
Professional Triathlete

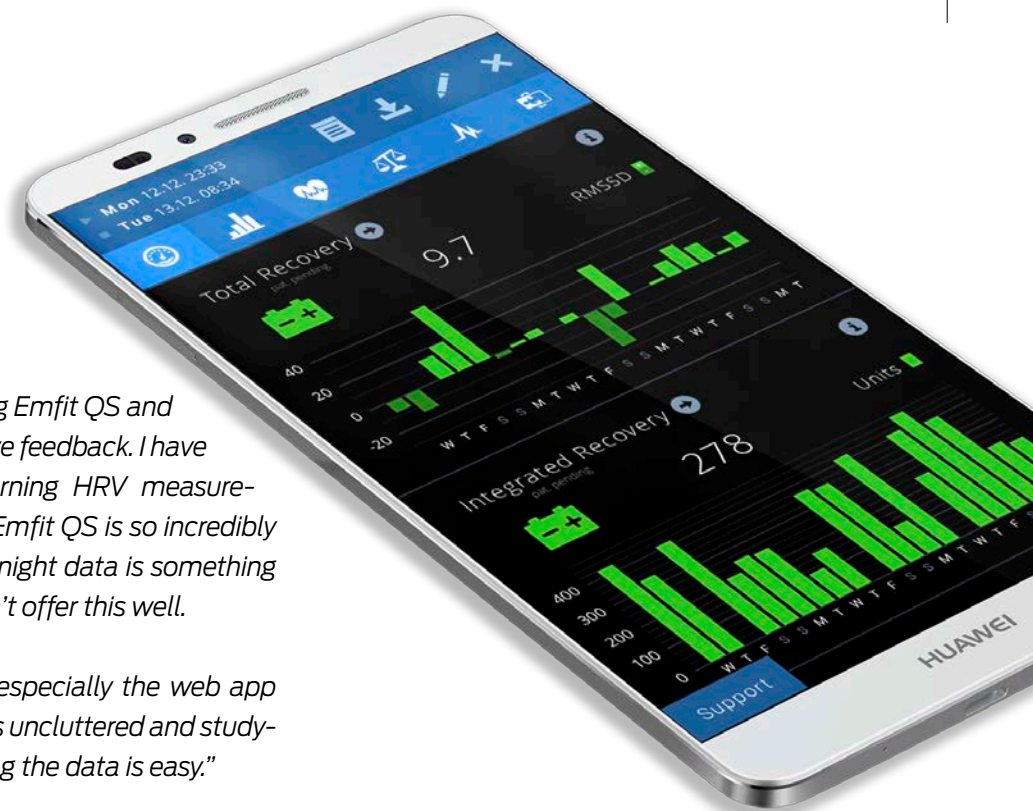
## YOUR HEART SHOWS YOUR RECOVERY AND READINESS

RESEARCH LINKS HIGH HEART-RATE-VARIABILITY TO GOOD HEALTH AND AN OPTIMAL LEVEL OF FITNESS, WHILE DECREASED HRV IS ASSOCIATED WITH STRESS AND FATIGUE.

Tracking Heart-Rate-Variability throughout the night will give you a detailed picture of progression of your recovery during the night. The Evening RMSSD value shows accumulated stress over the day, and Morning RMSSD provides recovery status and readiness for a new day.

RMSSD data allows you to optimize your training schedule according to actual body requirements, helping you avoid overtraining and giving you a peak performance at the office too.

Long-term evaluation of HRV will determine how effectively your exercise or lifestyle changes are affecting your wellness.



*"I have been using Emfit QS and I have only positive feedback. I have stopped my morning HRV measurements, because Emfit QS is so incredibly accurate and all-night data is something other devices can't offer this well."*

*I want to praise especially the web app user interface. It is uncluttered and studying and comparing the data is easy."*



**Jesse Kaislavuo**  
Elite cyclist



# OPTIMIZE YOUR PERFORMANCE WITH WHOLE NIGHT HEART-RATE-VARIABILITY

RMSSD IS A VALUE CALCULATED FROM HEART-RATE-VARIABILITY. IT CAN BE USED TO MONITOR BOTH THEIR DAILY TRAINING LOAD, AND NOCTURNAL RECOVERY.

Heavy training lowers the RMSSD value, and recovery raises it. If the evening value is low, you know that training day was effective. If the morning value is high, you are fully

recovered and ready for another heavy exercise. In this sense, our RMSSD graph can be used to optimize both the training schedule and load.

"Working with Olympic athletes, we use 'Data not Drugs' to boost every aspect of athlete health and performance. Since sleep is foundational to health and performance, it is a focal point of our program and we have used every sensor on the market.

Emfit is creating new capabilities in understanding sleep both with the goal of improving it, but also using it to better inform training decisions as we moved towards truly individualized training. The ease of use and accuracy of Emfit is also unprecedented. As a result, Emfit is now an integral part of our

'Data not Drugs' program as we build a future that uses more data and less drugs, in sport, and hopefully in health."

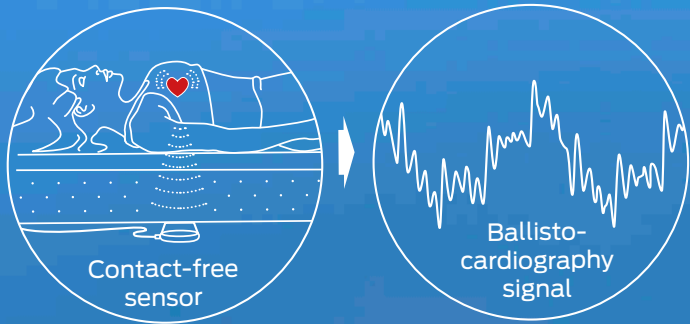


**Sky Christopherson**  
World Record Holder  
and Founder,  
OAthlete Inc.



# HOW EMFIT QS WORKS?

EMFIT QS RELIES ON BALLISTOCARDIOGRAPHY, A TECHNIQUE FOR SENSING THE SUDDEN EJECTION OF BLOOD INTO THE GREAT VESSELS WITH EACH HEART BEAT, AND BREATHING MOVEMENT ANALYSIS.



Emfit's own proprietary sensor technology is super sensitive and thus allows placement even under thick mattress.

Self-biased electro-active material does not generate any capacitive field that might disturb sleep.

Under-mattress placement ensures longevity without need to regular replacement.

Automatic measuring - deep data insight is available after person leaves the bed in the morning

Device has its own processor and memory for totally autonomous operation - no phone is needed!

Abrasion resistant braided cable

The transceiver part can be placed far from the bed to avoid disturbing sleep.



# INCLUDED DATA FEATURES



## Sleep Score

This is a single number indicating the quality of sleep for the night. Number consists of total sleep time, amount of REM and DEEP sleep, and number of times awakened.

This means that the more you sleep, the more you have REM sleep, and the more you have DEEP sleep, and the better your Sleep Score is.

By this formulation Sleep Score can reach values over 100, but in this case the value is truncated to a maximum of 100, which is indication of very good sleep. Usually values around 80 and higher can be regarded as good.



## Sleep Time

Emfit QS shows both time spent in bed and amount of sleep.

For adults, 7-8 hours of sleep is considered optimal, of course there are individual differences — some can manage with less sleep and some require more.

In one study it was found that people who sleep less than 6 hours perform worse in cognitive tests than those who sleep 7-8 hours, but people who sleep more than 9 hours also perform worse.

With athletes, the research has shown that in several different sports, including swimming, tennis, football and basketball, increasing sleeping time to 10 hours per night resulted in improved speed, reaction time, sprint time and accuracy.



## All three sleep stages

Emfit QS sleep tracker can tell you how much light, deep, and REM sleep you get each night. Sleep is the time when your body gets ready for the day ahead, and when we talk about sleep quality, it's REM and deep sleep that get all the attention.

**Deep sleep** is the time when your body recovers. When the cells repair themselves and your body gets ready for all the physical challenges of a new day.

**REM sleep** is when your mind recovers, making sure that all the important things you learned, saw, and experienced during the day are stored in a safe place.

What about **light sleep**? Well, that's just a lighter stage of sleep that doesn't do much for you — it's just there.



## Heart Rate Variability (HRV)

Heart rate variability, or the change in time intervals between heart beats, is a broad indicator of your overall health and fitness.

If your heart beats steadily with intervals of identical length between each pulse, you have low HRV, which is considered "bad." If your heart beats are of varying length between each pulse, you have high HRV, which is considered "good." Years of clinical research has shown that the higher the HRV, the greater your resilience and the lower your stress. The lower the HRV, the lower your resilience and the greater your stress.



## Recovery data

Total Recovery is simply difference between morning and evening RMSSD values. Usually it should be positive, indicating that there has been efficient recovery and resting during the night.

Of course, this should be analyzed with regard to activities of previous day: if previous day was very light (no stress, no heavy exercise) and evening RMSSD is relatively high, it is not reasonable to expect high Recovery number, because there is no load to recover from.

Values of Recovery are highly individual, and you should inspect them against your own baseline values, and also in comparison to Evening RMSSD values.



## Heart & breathing rate

EMFIT QS can measure heart rate via ballistocardiograph technology which determines the volume of blood passing through the heart and the force of cardiac contraction. EMFIT QS measures also breathing by detecting upper body movement.

The software analyses users resting heart rate, which tells about



## Autonomic Nervous System Balance

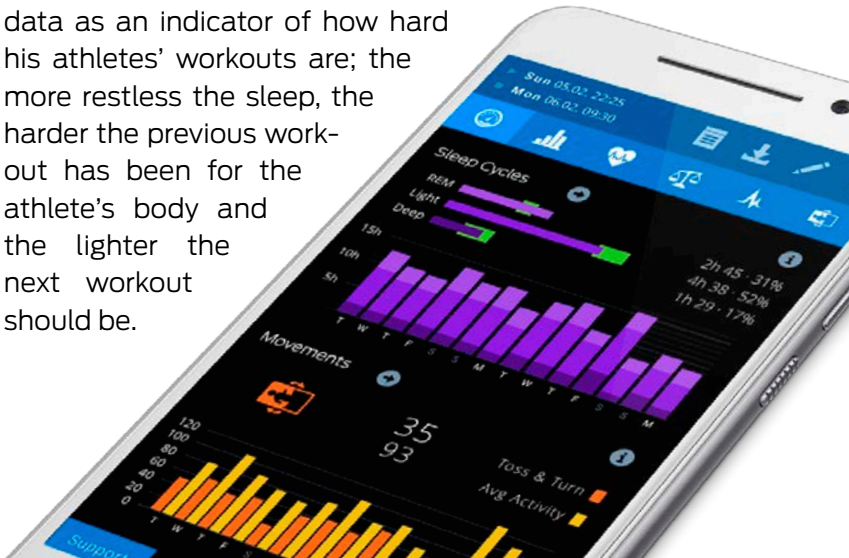
Knowing the balance of the autonomic nervous system is important, because it controls and regulates all the functions necessary to maintain life. This is known as the balance between sympathetic and parasympathetic nervous system, and the balance can be affected by stress, for example.



## Movement activity, tossing & turning

EMFIT QS tracks how restless your sleep is based on the amount of movement during sleep.

Emfit QS sleep tracker can tell how restless your sleep is. One of our users, **Sky Christopherson**, World Record holder and founder of OAthlete, uses movement data as an indicator of how hard his athletes' workouts are; the more restless the sleep, the harder the previous workout has been for the athlete's body and the lighter the next workout should be.





# WHY EMFIT QS IS BETTER THAN COMPETITION?



## You own your data

We at Emfit are passionate about personal data ownership. Every EMFIT QS user owns his/her data and we guarantee that your private data is never handed over to any third party.



## Wi-Fi or Cellular/Mobile Data (no phone needed)

EMFIT QS has embedded data acquisition and Wi-Fi or cellular mobile data connectivity. The transceiver component is connected by a long, durable cable and is placed far from your bed to avoid disturbing your sleep. EMFIT QS electronics include its own processor and memory for totally autonomous operation. When you go to sleep EMFIT QS automatically starts measuring.



## Visually compelling UI

EMFIT QS user interface is visually compelling, the information is provided with simple graphics and vivid colors.



## Super Sensitive Under Mattress Sensor

Just as a cool bonus and thanks to our own proprietary sensor technology, EMFIT QS is placed discreetly under the mattress so you won't even notice it's there. The sensor is comprised of self-biased electro-active material and does not generate any capacitive field that might disturb your sleep. Under-mattress placement also ensures EMFIT QS will last for years to come without having to regularly replace it.



## Trends up to 360 days

Long term trends help you recognize and notice sleep affecting lifestyle patterns, making it easier for you to alter your lifestyle into a healthier direction.



## 2 year full warranty

After manufacturing sleep sensors for over 25 years we have learned how to make these high quality and durable in both consumer and professional use. Therefore we are confident to give the best warranty\* on the market.



## Web application

No app or software download, works on any computing device with browser. For us the user is always first and not focus on reducing the cost to develop. It is far more easier for users to access data on any computing device simply with browser. Compatibility over the years to come when phones, tablets and computers change frequently. These are the reasons for our strategy to use web application rather than a native phone application.



## Daily health report

Our dashboard is said to be the most detailed and users love it. It gives detailed insight into last night recovery and sleep quality in visually compelling way. It also shows data for short term trends, from one week up to four weeks, which user can decide on how it is preferred.

# PREMIUM (PAID) EXTENSIONS



## Push notifications

A daily summary and any abnormalities from daily bed routines are automatically notified via smart phone application or via email. For example user being long time away from bed at night, not going to sleep in the evening or not leaving the bed in the morning.



## Band-pass filtered visualisation

EMFIT QS relies on ballistocardiography, which is a technique for producing a graphical representation of repetitive motions of the human body arising from the sudden ejection of blood into the great vessels with each heart beat. Similarly breathing and all other body motions are sensed and interpreted into data. Web application provides possibility to visually see all this even in seconds scale.



## API integrations

We have API integrations as an example with IoT platforms, value-added-resellers, safety phone operators, OEM mattress manufacturers, health data integrators etc. If you have interest of using EMFIT QS as part of your own product or service, please contact us.

*What is API? It stands for Application programming interface (API) and is roughly defined as the allowance and processes to give programs access to connect and essentially, communicate with other programs. It's a software-to-software interface that allow for separate parties to talk to each other without any previous user knowledge or intervention. It runs the processes behind the scenes.*

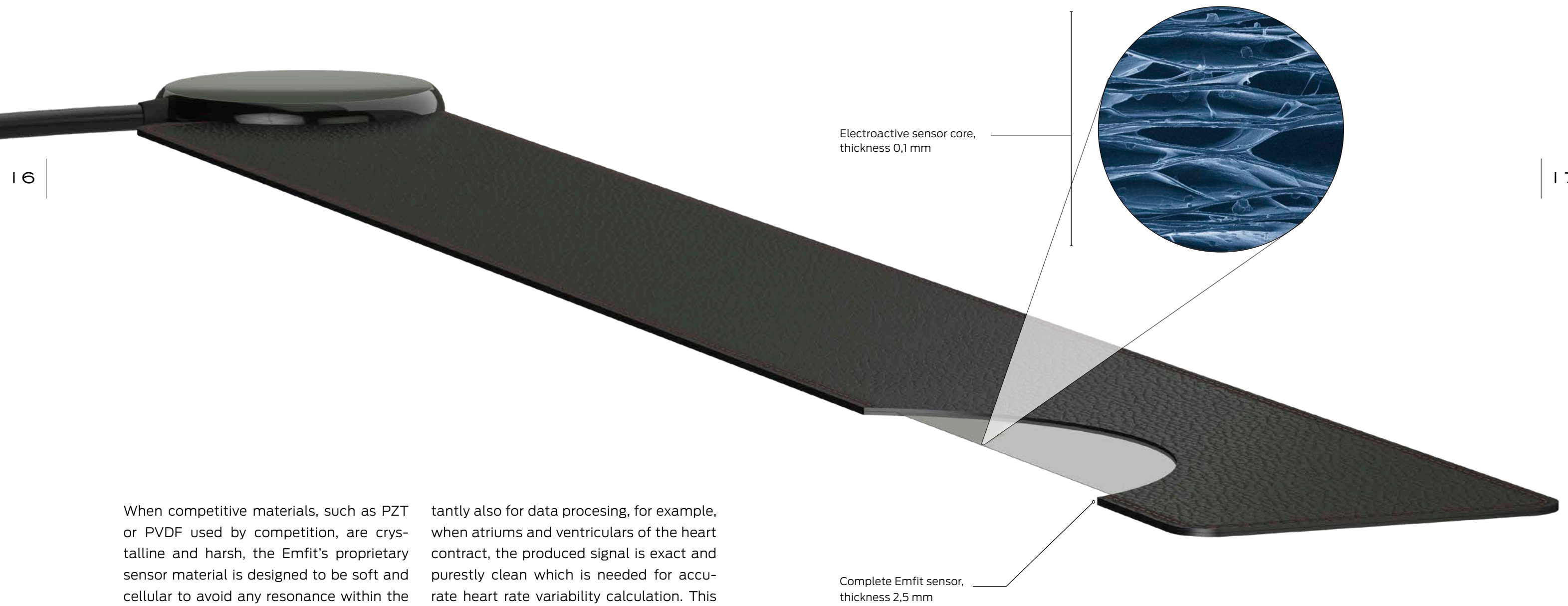


\* Non-transferable



# WHAT MAKES EMFIT SO SURERIOR?

THE CORE OF THE COMPANY’S PATENDED SENSOR TECHNOLOGY IS ALSO THE KEY TO ITS ABILITY TO PRODUCE SUCH A CLEAN MINUSCULE BIOSIGNAL WITHOUT ANY ALTERATIONS CAUSED BY THE ELECTROACTIVE MATERIAL USED.



When competitive materials, such as PZT or PVDF used by competition, are crystalline and harsh, the Emfit's proprietary sensor material is designed to be soft and cellular to avoid any resonance within the material itself. Therefore there is no "ringing" which almost entirely eliminate cross talk from other sleeper in bed and is often a problem with piezo materials. Import-

tantly also for data procesing, for example, when atriums and ventriculars of the heart contract, the produced signal is exact and purely clean which is needed for accurate heart rate variability calculation. This also makes the sensor signal visualisation so clear for clinicians and researchers who are interested in using it to study heart and breathing issues.



## MISSION STATEMENT

WE DEVELOP AND MANUFACTURE ADDICTIVE HEALTH TECH PRODUCTS THAT HELP PEOPLE LIVE LONGER AND HEALTHIER LIFE.

## OBJECTIVES

OUR STRATEGY IS TO FOCUS AT OVER THE INTERNET OPERATING HEALTH MONITOR PRODUCTS THAT DELIVER IMPORTANT AND ACCURATE DATA ON A VISUALLY COMPELLING FORMAT FOR DELIGHTING, ENCOURAGING AND MAKING USER FEEL REWARDED FOR CONTINUOUS COMMITMENT IN HEALTHY LIFE HABITS.

## SLOGAN

SENSING WHAT MATTERS™

## CORE COMPETENCE

OUR CORE COMPETENCIES ARE MANUFACTURING OF PROPRIETARY FERROELECTRET SENSOR MATERIAL AND SENSORS, AND OVER THE INTERNET ALSO IN REAL-TIME OPERATING MULTI USER PLATFORM CONSISTING EMBEDDED SIGNAL ACQUISITION WITH WIRELESS CONNECTIVITY, AND OUR SERVER SOFTWARE SOLUTION PROVIDING AUTOMATIC AND AUTONOMOUS OPERATION.

## PIONEER IN BALLISTOCARDIOGRAPHY

EMFIT IS A WORLD PIONEER IN THE RENAISSANCE OF BALLISTOCARDIOGRAPHY SINCE 1990.







[www.emfitqs.com](http://www.emfitqs.com)

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SENSING WHAT MATTERS™

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