

# load monitoring device



The new **pedoped®** load monitoring device accurately measures the normal plantar force detected inside the shoe during all static and dynamic activities. This is the first system to utilize a single sensor integrated with compact matchbox size wireless electronics for data processing and transmission. In addition, this is the first system of this size and capability which can accurately measure the plantar force between the foot and the shoe without estimation from other variables such as body weight, acceleration, etc.



pedoped® insole with iPhone and shoe

Technical data of the pedoped® insole:	
sizes	all sizes
number of sensors	1 (full plantar surface)
frequency (Hz)	100
transmission	Bluetooth® LE
operating device	actual iPhone, iPad, iPod
battery	3V coin cell

# pedoped®



Evaluation of pedoped® measurement on a Windows PC

## Features of the pedoped®

- Measures the plantar force in standing and walking
- Displays bipedal force over time and bio-feedback
- Provides audio and visual bio-feedback on 2 levels
- Runs with various apps for rehabilitation and biomechanics
- Connects to the novel software family
- Utilizes fully calibrated, capacitive sensors
- Covers the complete plantar surface of the foot
- Works with small, lightweight electronics
- Connects to the iPhone, iPad or iPod via Bluetooth®

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All systems from novel operate with high quality, calibrated sensors and provide reliable and reproducible long term measurements. pedoped®, footpat® and the novel logo (colored foot) are the registered trademarks of novel gmbh © 1992-2015

# pedoped® mobile force sensor



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The new **pedoped®** insole monitors the normal force between the plantar side of the foot and the shoe.

It is now possible for the first time to accurately measure the force statically or dynamically inside a shoe during walking and running utilizing only one large sensor which covers the entire plantar surface of the foot.

The force between the foot and the shoe is accurately measured regardless of from which part of the foot is making contact with the ground. This was not previously possible due to the typical characterization of partly loaded flat surface pressure sensors.

The new **pedoped®** is based on a new patent and consist of a large linear sensor that avoids errors. For applications in which the distribution of localized loads are not of interest, but rather the total load on the foot is of importance, the new **pedoped®** insole is the optimal solution. This new technology has a matchbox sized electronics and communicates wirelessly with a smartphone via Bluetooth®. The data is transmitted to the smartphone in real-time so that the subject can receive an instantaneous biofeedback via sound or vibration. The data can be stored inside the smartphone and later be transferred to a PC for multiple analysis of the data matching with the specific task.

Long-term monitoring of body load on both feet as well as instability, balance, fatigue, performance and biofeedback are possible.

The **pedoped®** insoles come in any foot size and can be custom made for specific applications.

To eliminate any disturbance or influence to the proprioception of the plantar aspect of the foot, the small electronics are connected to the insole via a very thin flexible



band and then attached to the lacing or shoe upper. This method was chosen over embedding the electronics directly into the insole where electronic parts could disturb the sensation.

Additionally, it is possible to place the **pedoped®** insole in the shoe at the same time as a subject's corrective insole without disturbing the biomechanical function of the correction insole.

Several smartphone apps will be available for the pedoport® software, each tailored to the specific application such as long-term load monitoring with biofeedback, bipedal comparison of normal ground reaction force, balance and stability of gait, or monitoring of forefoot walking/running.

The **pedoped®** sensor technology can also be supplied as footpat® sensor mat that can be put on the floor to measure normal ground reaction force in gait or balance of force in posturography.

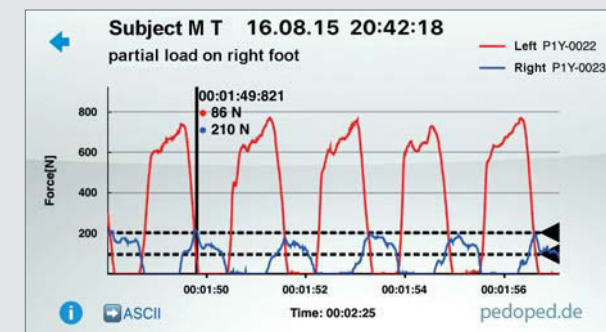
The measurement rate of the **pedoped®** insole and footpat® force mat can be user-defined. The raw data are available so that users may program their own applications.



pedoped® insole with electronics



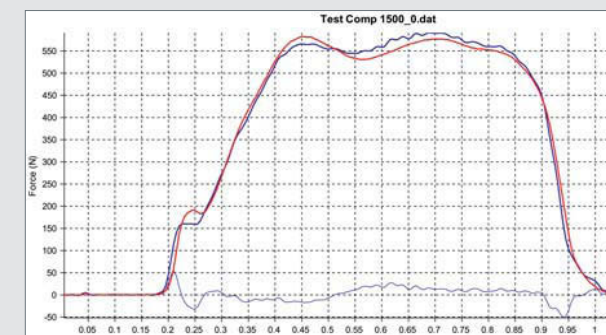
Walking with crutches after surgery:



measurement screen

Subject name:	M T	Interval length [s]:	5	Apply	Cancel
max Force[N]:	1000	Measurement time [s]:	28800		
Force range [N]:		Visual feedback:	<input checked="" type="checkbox"/>		
upper limit:	200	Protected:	<input checked="" type="checkbox"/>		
lower limit:	100	Autostoring:	<input checked="" type="checkbox"/>		
Audio:	<input checked="" type="checkbox"/> sound <input type="checkbox"/> vibrate	with Comment:	<input checked="" type="checkbox"/>		
		with ASCII:	<input checked="" type="checkbox"/>		

settings



Force platform versus pedoped®