

pedar®



pedar® system

The **pedar®** system is an accurate and reliable pressure distribution measuring system for monitoring local loads between the foot and the shoe. The **pedar®** offers the ultimate versatility with its multiple standard features and operating modes. The **pedar®** can be tethered to a PC via a fiber optic/USB cable. It can also function in a mobile capacity with its built-in Bluetooth™ technology or, as yet another alternative, the **pedar®** system's flash memory storage allows data to be collected in any setting and then downloaded to the computer at a later time. The **pedar®** can also be used for long-term load monitoring. For that application novel has developed the **pedoport®** software which fully integrates with the **pedar®** system.

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art science



A standing or walking body generates ground reaction forces under the feet. These ground reaction forces are caused by gravitation and the velocity of the body. When a patient stands on both feet without moving, all forces should be vertical and distributed over the two feet. The distribution of the force is dependent on the posture and foot structure of the patient. During walking or running the ground reaction forces are higher due to the acceleration and deceleration of the body mass. Under dynamic conditions both vertical and horizontal ground reaction forces occur. However, the vertical force provides the largest contribution of the foot-ground's total force.

When measuring the pressure distribution under the foot, the distribution of the local ground reaction forces can be calculated by multiplying the surface area of the region of interest by the local pressure. Collection of the dynamic pressure distribution throughout the gait cycle is called pedography.

Pedography can be performed either when a patient walks barefoot across the emed® platform which has been placed on the floor, or with pedar® measuring insoles, which are placed within the shoes of the patient.

With the emed® platform measurement the dynamic load distribution under the feet provides information about the foot structure and function.

Therefore, foot deformities and malfunction can be detected during analysis of the barefoot pressure data.

The pedar® in-shoe measurement provides accurate information about the function of the foot in combination with the function of the shoe and the shoe insert, while allowing free movement of the patient.

During pedography analysis the foot is divided into anatomical areas and landmarks of interest. Comparisons can be performed, either intraindividually, pre and post treatment, or interindividually with matched control groups. Comprehensive pedographic reports based on these comparisons are generated by the novel software for easy information exchange between the foot care specialists.

The novel pedography systems emed® and pedar® provide not only accurate pressure measurements, but also a complete analysis of the foot function during stance and dynamic gait.



groupmask evaluation of emed® platform measurement data files

### The Foremost Pedography Parameters

- the applied local force
- the applied local pressure
- the pressure-time integral
- the timing of the foot loading processes
- the deformation of the foot during loading
- the total force in an anatomical foot area
- the force-time integral in an anatomical foot area

The emed® systems are the family of novel platform measurement systems.

All emed® platforms operate with calibrated capacitive sensors. For easy data transfer the platforms connect directly to the computer via the USB interface.

The emed®-m and the emed®-x systems are used in a high sensor resolution mode with a sensor resolution of 4 sensors/cm<sup>2</sup> and, depending on the emed® version, a frame rate from 50 to 100 Hz. The emed®-x alternatively operates in a high-speed mode with a sensor resolution of 1 sensor/cm<sup>2</sup> and a frame rate up to 400 Hz.

With a user-defined reduced sensor area, the platforms can be scanned with frequencies greater than 800 Hz.

The emed®-x supplies frame-by-frame input and output signals for synchronization with motion analysis, digital video and EMG. All emed® platforms bear the CE mark for calibrated medical device Class 1 with a calibrated pressure range from 10 kPa to 1.25 MPa.

novel developed specific scientific software for pedographic data collection and analysis for use in combination with all emed® systems.

