

## Foot Pressure Insole Sensor with Controller

### ◆ Description :

Foot Pressure Insole Sensor with Controller is an advanced plantar pressure measurement system designed for real-time monitoring, acquisition, and analysis of foot pressure distribution. The system integrates a flexible printed force-sensitive resistor (FSR) insole sensor with a dedicated embedded controller that converts analog force signals into stable digital data.

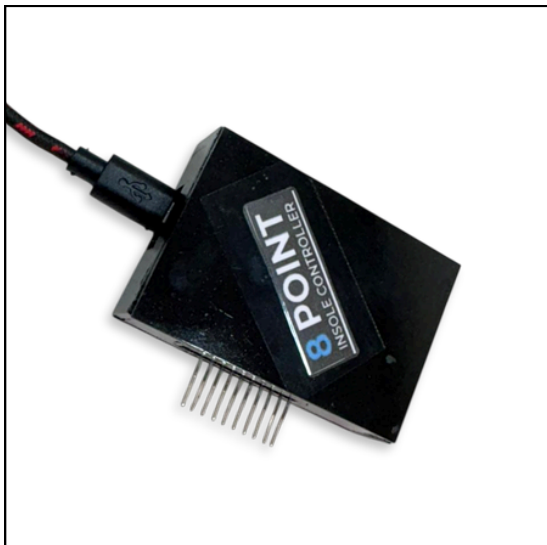
Engineered for medical, sports, rehabilitation, and biomechanical applications, the system provides accurate gait analysis while maintaining a thin, lightweight, and unobtrusive wearable design. The controller performs sensor scanning, signal conditioning, and real-time data transmission to software for visualization and reporting.

### ◆ Key Features

- Flexible printed FSR insole sensor
- 59 distributed sensing points
- Dedicated embedded controller
- Real-time pressure acquisition
- Continuous analog pressure measurement
- Detects force, pressure, and touch
- Thin, lightweight, wearable design
- Wide sensing range (5 N to 450 N)
- High durability (>100K cycles)
- IP67-rated sensor construction
- Single USB cable for power and communication
- Cost-effective sensing solution



## ● — Foot Pressure Insole Sensor with Controller — ●



### ◆ System Architecture

The system utilizes a multi-point sensing architecture in which force-sensitive resistive elements embedded within the insole detect pressure across the plantar surface of the foot.

The embedded controller performs:

- Sequential scanning of sensing points
- Analog signal conditioning
- Noise reduction and filtering
- Data digitization
- Real-time transmission to host software

Processed data can be visualized as pressure distribution patterns for gait analysis and biomechanical evaluation.

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### ✦ Technical Specifications

#### Controller Specifications

Parameter	Specification
Controller Type	Embedded Foot Pressure Controller
Supported Sensor	Foot Pressure Insole Sensor
Data Acquisition Method	Multi-point scanning
Signal Conditioning	Analog conditioning with digital filtering
ADC Resolution	High-resolution analog capture
Output Interface	PC Software / Desktop Application
Data Transmission	Real-time
Communication	USB / Virtual COM Port
Power Requirement	5 V DC via USB
Operating Mode	Continuous monitoring
Frame Processing	Real-time pressure data processing
Cable Interface	Single USB cable for power & data

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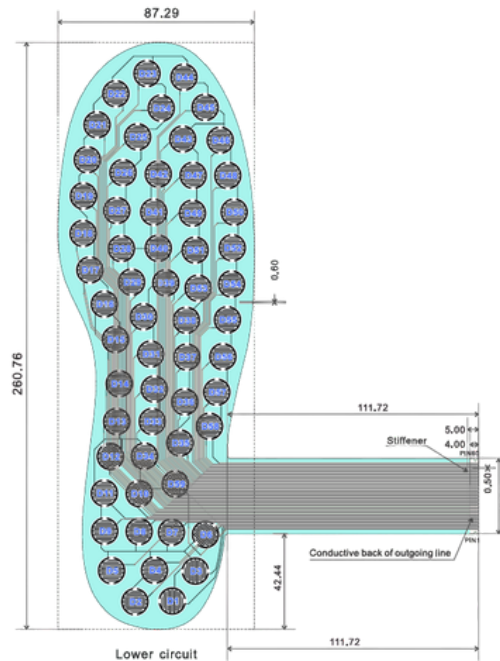
### ✦ Technical Specifications

#### FSR Matrix Specifications

Parameter	Specification
Sensor Type	Printed FSR Foot Insole Sensor
Technology	Force-Sensitive Resistor (FSR)
Number of Sensing Points	59 points
Force Detection	Force / Pressure / Touch
Pressure Resolution	Continuous (Analog)
Force Sensing Range	5 N to 450 N
Weight Range	400 g to 50 kg
Response Time	1 millisecond
Carbon Resistance Range	3 – 4 MΩ
Conductive Material	Silver & Carbon
Overall Thickness	0.385 mm
Material	PET (Polyester)
Dimensions	87.29 mm × 260.76 mm
Form Factor	Thin flexible insole
Durability	> 100,000 cycles
IP Rating	IP67
Operating Temperature	-20 °C to +70 °C

## Foot Pressure Insole Sensor with Controller

### ◆ Mechanical Dimensions



The insole sensor is constructed using durable polyester substrate with printed conductive layers, enabling flexibility, low profile, and long operational life. Its ultra-thin design allows seamless integration into footwear without affecting comfort or gait.

### ◆ Applications

- Plantar pressure distribution analysis
- Gait analysis and biomechanics research
- Sports performance optimization
- Rehabilitation monitoring
- Foot condition diagnosis
- Orthotic design and evaluation
- Smart footwear development
- Balance and posture assessment

# ● — **Foot Pressure Insole Sensor with Controller** — ●

## ✦ **System Components**

### **1. Embedded Controller**

The controller acts as the central processing unit of the system. It acquires signals from all sensing points, stabilizes the data, and transmits structured pressure information to the software interface in real time.

### **2. Foot Pressure Insole Sensor**

The flexible insole sensor contains multiple distributed FSR sensing nodes that capture plantar pressure patterns across the foot. Its thin construction ensures comfortable use inside shoes during walking, running, or standing activities.

### **3. Power & Communication Interface**

The system operates using a single USB connection that provides both power supply and data communication to a computer.

## ✦ **Advantages**

- Non-invasive measurement solution
- Real-time monitoring capability
- Lightweight and wearable
- Flexible and durable construction
- Easy integration with analysis software
- Suitable for clinical and research environments