LINEPRO CONTROLS PVT. LTD.
Key Solutions in Electronics

LP5038

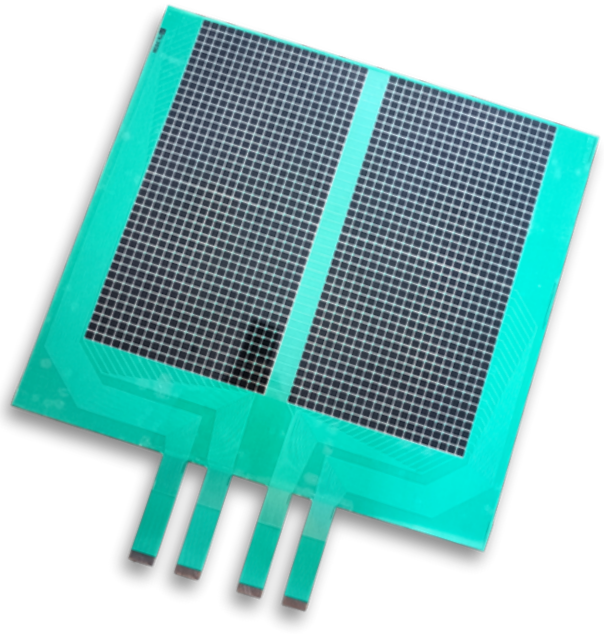
PressuraX

High-Resolution FSR Matrix Control System

Description :

PressuraX LP5038 is a high-density FSR matrix controller platform engineered for real-time pressure acquisition, processing, and visualization. Built around a 40 × 40 force-sensitive resistor (FSR) matrix architecture, the system captures 1,600 discrete sensing points and converts raw analog pressure signals into stable, high-resolution spatial maps.

The integrated embedded controller performs matrix scanning, signal conditioning, and digital filtering to ensure accurate and repeatable pressure measurement across clinical and research applications.



Key Features

- 40 × 40 high-density FSR matrix
- 1,600 independent sensing nodes
- Dedicated embedded controller
- 12-bit ADC resolution (1–4095 levels)
- Real-time frame acquisition
- Live pressure heatmap visualization
- Integrated digital signal filtering
- Raw frame data logging
- Automated PDF report generation
- Single USB cable for power and communication

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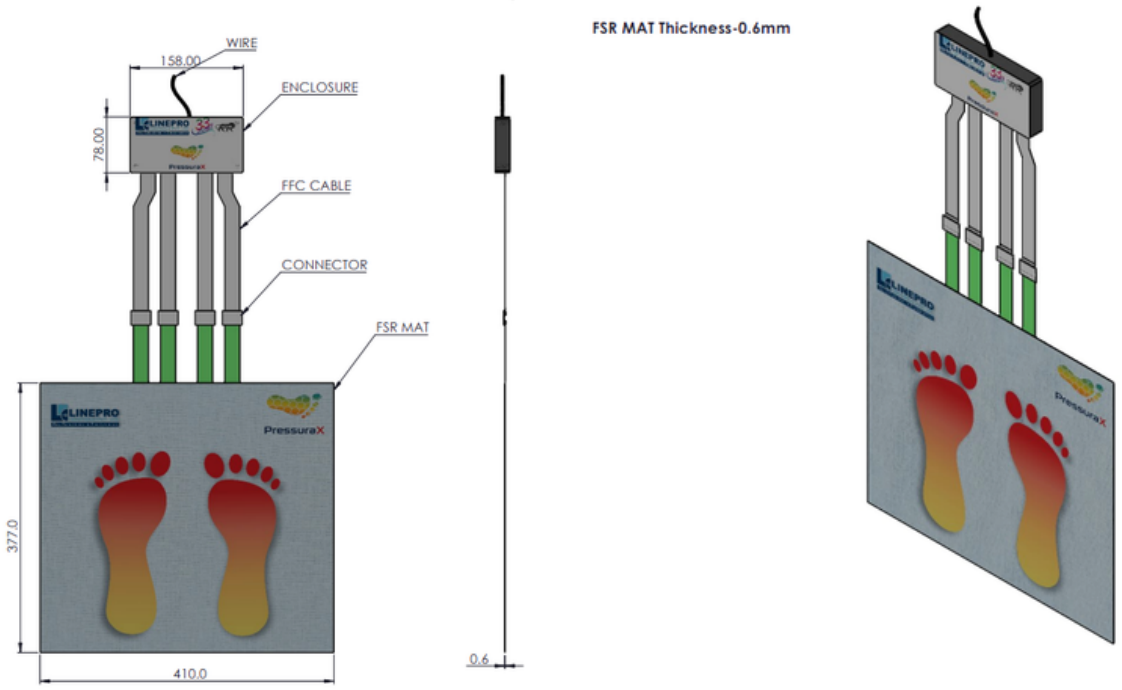
System Diagram



System Architecture

PressuraX uses a row–column scanning architecture to sequentially acquire pressure data from all 1,600 sensing nodes. The embedded controller performs matrix multiplexing, analog signal conditioning, and digital filtering before packaging the data into structured frames.

The processed frames are transmitted in real time to the desktop application, where the pressure distribution is rendered as a dynamic heatmap and stored for further analysis and reporting.

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✦ Technical Specifications

Controller Specifications

Parameter	Specification
Controller Type	Custom Embedded FSR Matrix Controller
Matrix Size Supported	40 × 40
Total Sensing Channels	1,600 Nodes
ADC Resolution	12-bit
ADC Range	1 – 4,095
Data Acquisition Method	Row–Column Scanning Architecture
Frame Transmission	Real-time via WebSocket
Signal Processing	Integrated Digital Filtering
Output Interface	Desktop Application
Data Logging	Raw Frame Storage + PDF Export
Power Requirement	5 V DC (via USB)
Communication	USB / Virtual COM

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✦ Technical Specifications

FSR Matrix Specifications

Parameter	Specification
Sensor Type	Force-Sensitive Resistor (FSR) Matrix
Matrix Configuration	40 × 40 Grid
Total Active Sensing Points	1,600
Sensing Principle	Resistive Pressure Variation
Pressure Mapping Output	High-Resolution Heatmap
Operating Mode	Real-Time Dynamic Sensing
Sensing Area (Single Sensor)	7 mm × 6.6 mm
Pressure Range	1 to 50 kg
Dimensions (Standard)	410 mm × 462 mm

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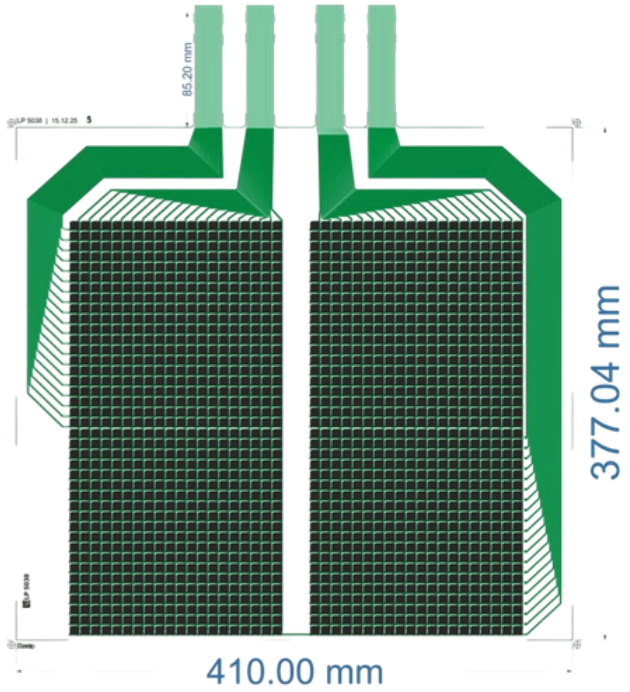
✦ Mechanical Dimensions



Key Dimensions

Parameter	Value
Matrix Length	410 mm
Matrix Width	462 mm
Sensor Grid	40 × 40
Total Nodes	1,600
Form Factor	Flexible Matrix + External Controller
Cable Interface	Single USB Cable

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✦ System Components

1. Controller

The PressuraX controller functions as the central processing unit of the system. It acquires pressure data from the 40 × 40 FSR matrix and converts it into high-resolution digital output. The controller processes and stabilizes the captured data before transmitting structured pressure frames to the desktop interface in real time.

2. FSR Matrix

The FSR matrix is a high-density pressure-sensing grid comprising 1,600 active sensing nodes. It captures spatial pressure distribution across its surface and provides the raw sensing input for the system.

3. Power Supply

PressuraX is powered directly through the PC via the same USB/COM port used for data communication. This single-cable architecture enables simultaneous power delivery and real-time data transmission.

✦ Applications

- Plantar pressure distribution analysis
- Gait and balance assessment
- Orthotic and insole development support
- Rehabilitation progress monitoring

PressuraX

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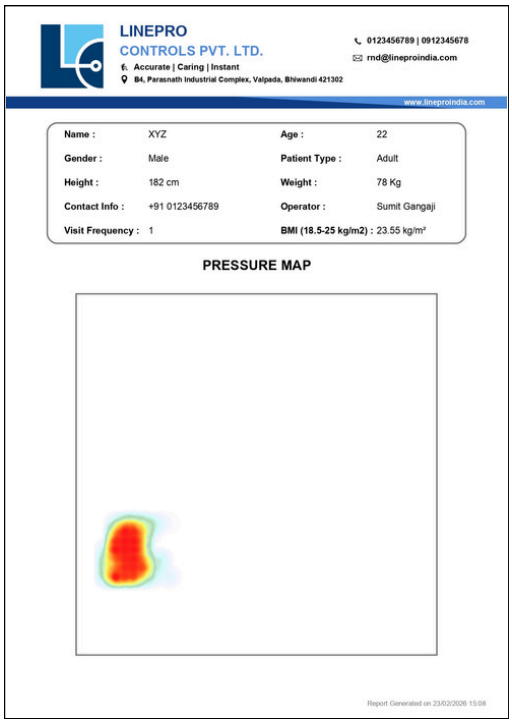
✦ Typical Output Report

PressuraX automatically generates a structured pressure analysis report after each successful measurement. The report includes patient information, pressure heatmap visualization, and raw pressure matrix data for detailed analysis and record keeping.



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Name :	XYZ	Age :	22
Gender :	Male	Patient Type :	Adult
Height :	182 cm	Weight :	78 Kg
Contact Info :	+91 0123456789	Operator :	Sumit Gangaji
Visit Frequency :	1	BMI (18.5-25 kg/m2) :	23.55 kg/m²

PRESSURE MAP

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