Embedded solutions

SSG EMBEDDED SOLUTIONS

House of Electronics R&D Projects
(Hardware, Software, firmware)

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ssges.co.in

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ELECTRONIC DESIGN FOR THE MODERN WORLD..!!

We are a dedicated Electronics Hardware, Software, and Firmware development company committed to building intelligent and reliable technology solutions. At the core of our work lies Research & Development (R&D)
— **transforming imagination into innovation.**

Whether you come to us with an idea, concept, challenge, or problem, our team works closely with you to create a smart, practical, and scalable solution. From initial brainstorming to design, prototyping, development, and deployment, **we specialize in turning your thoughts into real, working products.**

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OUR VISION

To become the leading one-stop destination for **hardware, software, firmware, and R&D innovations,** empowering students, educators, and institutions with cutting-edge technology solutions. We envision a future where every idea — small or big — is **transformed into reality** through intelligent engineering and practical learning.

OUR MISION

- To continuously evolve as a strong **R&D-driven company**, building technology that accelerates skill development and future-ready engineering.
- To support clients — from students to institutions — in converting their **thoughts, challenges, and concepts into functional, high-quality products.**
- To provide **industry-ready, educational solutions** including robotics, drones, embedded systems, and IoT kits that inspire hands-on learning and innovation.
- To use our **expertise, engineering capabilities, and deep technical knowledge** to solve real-world problems with smart, reliable, and scalable solutions.

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From Concept to Creation — Everything You Need Under One Roof.

1. Research & Development (R&D)

- Custom Product Development
- Idea to Prototype Conversion
- Technical Problem-Solving
- Innovation Consulting

2. Educational Sector

- Educational Kits
- Drone Lab Setup & Training
- Embedded & IoT Workshops
- Robotics solutions

3. Agriculture & Agro Tech

- Smart Agro Devices
- IoT-based Monitoring Systems
- Sensor-based Automation

4. Display Solutions

- Commercial & Industrial LED Displays
- P10 LED Modules (Powered by Our Brand AUPIXEL)
- Custom Display Boards

5. Wearable Technology

- Smart Wearables
- Health & Motion Tracking Devices

6. Security Sector

- Smart Surveillance Solutions
- Access Control Systems
- Sensor-based Security Modules

7. Firmware Development

- Embedded Firmware
- Protocol Integration
- Device Optimization

8. Sensor Development Projects

- Custom Sensor Design
- Industrial/Commercial Sensor Integration
- IoT Sensor Networks

9. Software Development

- Custom Applications
- Automation Tools
- Cloud & Dashboard Solutions

10. Specialized Services

- 3D Printing
- Pick and Place (SMD Assembly)
- PCB Design & Fabrication
- Prototyping & Testing

11. Mechatronics Projects

- Electro-Mechanical Systems
- Automation Modules
- Custom Machine Development

12. Many More...

- Tailored Solutions for Any Technical Requirement
- End-to-End Project Support

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Our Innovations We Are Proud Of..!!

...

A Wide Spectrum of Innovations — Products & Projects That Define Us

Agricultural Projects:

1. Online Microwave Cotton Bell Moisture Measurement
2. Online Raw Cotton Moisture Measurement
3. SMS and CALL based GSM Pump Controller
4. Agricultural Pump Timer / Scheduler
5. Dog Barking and Other Animal Sound Generators
6. Wifi Camera with Android App

On-Going Projects:

1. Soil Quality Analyzer
2. Oil Contents in Oil-Seeds
3. Cotton Staple Length Measurement.

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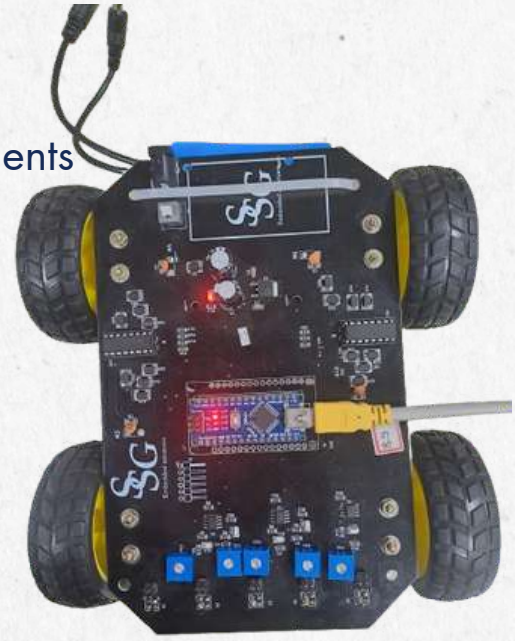
Our Innovations We Are Proud Of..!!

Trusted by industries, startups, R&D teams, training centers, and commercial clients who rely on our innovation, quality, and smart engineering solutions.

You imagine it.
We design it, build it, and bring it to life.

Wearable Projects:



1. Breath , Activity, Posture wearable device
2. Newly born Baby's Pulse and SPO2 measurements
3. Women safety Device with GPS Tracking
4. Walking Steps Counter
5. Person Dependent Voice recognition
6. Blood Pressure measuring device

On-Going Projects:

7. Smart Watch

Mechtronics Projects:

(Proudly We export our device to US)

1. Button Pusher with BLE and Wifi Interfaces(Exporting to US)
2. Bundi Making Machine
3. Robotic Vehicle with Sensors
4. Wireless Solenoid ON/OFF for Army
5. Auto Urinal Cleaning
6. BLE based Fireworks

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Our Innovations We Are Proud Of..!!

...

A glimpse into our product journey — what we've built, what we're building, and what we're shaping for the future.

Security Projects:

(Proudly We Secure Banks in India since 2002)

1. Bank Security and Alarm Systems
2. Silent Secure Button for Cashier(GSM Dialler)
3. ATM Security Device
4. Home Security and Alarm Systems
5. Security Systems for Jewellery Shops
6. Godown Security Systems
7. Cash Back with GPS Trackker

On-Going Projects:

8. BLE smart Sensors for Home
9. Up-gradation of Old systems

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Our Innovations We Are Proud Of..!!

A glimpse into our product journey — what we've built, what we're building, and what we're shaping for the future.

Sensor Development Projects:

(Proudly We Export)

1. Line Temperature Scanner Sensor 2. Area Temperature Scanner Sensor

3. PIR algorithm for Human Motion Detection 4. Ultrasound Sensor.

5. Moisture Sensor 6. Microwave Moisture Sensor

7. Color Sensor. 8. Text Reader

On-Going Projects:

9. Oil contents in OilSeeds 10. coal calorific value

Why This Section Matters..!!

This diverse product & project portfolio represents:

- Our end-to-end engineering capability
- Our strong R&D foundation
- Our experience across domains
- Our commitment to innovation
- Our ability to deliver custom, scalable solutions

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Our Innovations We Are Proud Of..!!

A glimpse into our product journey — what we've built, what we're building, and what we're shaping for the future.

Other Projects:

1. Long backup GPS Tracker
2. Battery Monitoring IOT Devices
3. RS232 to Wifi (IOT Brigde)
4. RS485 to Wifi (IOT Brigde)
5. 4-20mA to Wifi (IOT Brigde)
6. GPIO to Wifi (IOT Brigde)
7. BLE – MESH Networks
8. Wifi Home Automation
9. BLE Home Automation
10. BLE Tag
11. Drunken Driver Detection
12. Petrol volume in the Generators.
13. PLC equivalent Hardware
14. Python Based Project particularly for LINX industrial printers
15. GSM -IOT devices for Industrial Printers
16. Army Tank Navigation and Guidance system
17. Power Controller for Lights
18. SMPS (we make our own SMPS)
19. GSM Dialler for Elderly
20. Car Counter on Road
21. Power Protector for Army radio's
22. Helicopter GSM Tracker
23. Industry Encoder to USB Bridge.
24. LAN based Switches
25. Timer/ Scheduler
26. Teeth Screw Detector
27. Metal/Alcohol Detectors
28. Android App
29. Sun Tackker for Solar Panel

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Our Innovations We Are Proud Of..!!

Cotton Bale & Raw Moisture

The cotton bale moisture measurement system uses a **transmitter–receiver setup** to measure moisture remotely. A sensor placed in the cotton bale detects moisture and sends the data through the transmitter. The receiver unit collects this data and displays the moisture level. This allows **quick, accurate, and remote monitoring** of cotton quality with reduced manual effort.

Thermal camera

The SSG Industrial Thermal Camera is a high-performance radiometric sensor designed for 24/7 process monitoring. Beyond simple imaging, this camera acts as an intelligent diagnostic hub with integrated **Hotspot Location Detection**, pinpointing critical failures before they lead to downtime.

Engineered for Industry 4.0, it features native **MODBUS Master communication**, allowing direct integration with PLCs and SCADA systems without requiring a separate PC. For legacy systems, it provides **optional 4-20mA analog outputs**, ensuring your industrial operations remain safe, automated, and proactive.

Belt Tension

The SSG Digital Tension Meter is a high-precision, contactless acoustic measurement tool used to determine the correct tension of industrial and automotive belts by measuring their vibration frequency.

LINX

Linx Printers are world-class Industrial CIJ (Continuous Inkjet) machines used in high-speed manufacturing. They are the "printers of the factory," responsible for marking critical information—like expiration dates, batch numbers, and barcodes—onto products like bottles, cans, and food packaging at incredible speeds. We provide an All-in-One Reliability Ecosystem that makes industrial printing easier. By bridging your data directly with your printer hardware, we ensure that what you design is exactly what prints—including fully-customized print labels. Manage your entire factory floor remotely from a single dashboard with Real-Time Data Sync and Machine Monitoring, making your production line 100% reliable and effortless.

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WHAT WE PROVIDE.

Our Offerings at a Glance.

Innovative Educational & Development Kits designed to turn learning into hands-on engineering.

- 8051
- STM-32 BLUE PILL
- RASPBERRY Pi4
- RASPBERRY Pi5
- PIC 16F877
- NodeMCU
- MSP430
- LPC 2148
- ESP32

- AVR ATMega 16/32A
- ARDUINO NANO
- ARDUINO UNO
- RASPEBERRY Pi PICO
- STM32 NUCLEO

We offer a wide range of educational kits customized to your needs.

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WHAT WE PROVIDE.

1. 8051 Development Board

This is a Nuvoton 8051 Microcontroller Development Board. This Board can be used to evaluate and demonstrate the capabilities of microcontrollers In this Board, microcontroller and other interfaces are used for developing your own prototype.

Specifications

- 8-bit Microcontroller based development board
- 40-pin DIP microcontroller support
- In-built programmer for easy programming
- 4 KB ROM storage
- 128 KB RAM
- 16-bit timer
- Operating voltage: 5V

2. AVR (ATMEGA 16/32 A) DEVELOPMENT BOARD

This is an AVR ATMega16/32A Microcontroller Development Board. Atmega 16 has 16KB flash, 1KB RAM and 512B EEPROM, whereas Atmega 32 has 32KB Flash, 2KB RAM and 1KB EEPROM. This board is intended for general-purpose use and includes a variety of hardware for testing microcontroller peripherals.

Specifications

1. 8 bit micro-controller
2. 32 GPIO
3. JTAG interface for boundary scan
4. 32 KB read write flash
5. In-Built Programmer
6. 1024 Bytes of EEPROM
7. 2048 Bytes of SRAM
8. 5V supply voltage

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WHAT WE PROVIDE.

3. RASPBERRY PI PICO DEVELOPMENT BOARD

This is a Raspberry Pi Pico development Board with raspberry Pi Pico Board. It is equipped with RP2040 Microcontroller chip developed by Raspberry Pi Foundation itself. RP2040 , has a dual- core Arm Cortex- M0+ processor, 264KB of internal RAM, and up to 16mb off-chip Flash memory. The RP2040 is supported with both c / c ++ and micro-python, meaning that if you're a beginner and want to learn any of these languages , the Raspberry Pico wouldb be the best product - option to start with.

SPECIFICATIONS

32 bit Microcontroller

Dual core

160MHz to 240 MHZ frequency with Bluetooth & Wi-Fi

4MB of flash storage

Bluetooth v4.2 BR/EDR & BLE

4. PIC 16F877 DEVELOPMENT BOARD

This PIC development board supports all 18F PIC series but commonly used with PIC18F45520 or PIC16F877A since they are beginner friendly microcontrollers. It is an excellent board for debugging, developing, and prototyping code. It is user-friendly and ideal for training and development.

SPECIFICATIONS

1. 5MIPS CPU speed
2. 2x 8 bit Timers
3. 14KB programmable flash
4. In-Built Programmer
5. 256 Bytes of EEPROM
6. ADC (8 channel)
7. 5.5V max supply voltage

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WHAT WE PROVIDE.

5. MSP430 DEVELOPMENT BOARD

MSP 430 microcontrollers from Texas instruments are 16-bit, RISC based, mixed signal processors designed specifically for ultra-low power. It has right mix of intelligent peripherals, ease of use, low cost .it is designed specifically for ultra-low power application. This development kit is an easy-to-use evaluation module for the MSP430FR4133, 16MHz UltraLow-Power Microcontroller with 16KB FRAM.
The kit contains everything needed to start developing, including on-board emulation for programming, debugging and energy measurements.
SPECIFICATIONS
1. 16 bit processor
2. 32 MHz Clock frequency
3. 14kb programmable flash
4. 512 KB non-volatile storage
5. 66kb RAM
6. Data Bus width 8, 16, 32 bits
7. ADC 8/10/12/16/24
ADC upto 20 channels
8. 9mV to 3.6V supply voltage

6. LPC2148 DEVELOPMENT BOARD

LPC2148 is a high-performance 32-bit ARM7TDMI-S microcontroller with Thumb instruction set. It features 512KB on-chip Flash with In-System Programming (ISP) and In-Application Programming (IAP), 32KB RAM, a Vectored Interrupt Controller, and a CPU clock up to 60MHz. The microcontroller includes two 10-bit ADCs (14 channels), two UARTs (one with full modem interface), two I2C and two SPI interfaces, two 32-bit timers, a PWM unit, Watchdog timer, Real-Time Clock with optional battery backup, brown-out detection, general-purpose I/O pins, on-chip crystal oscillator, and PLL.
Specifications
1.32-bit processor
2. 512-KB ROM
3. 32-KB RAM
4. ADC- Two 10 bit, ADC with 14 channels
5. Input voltage 4.5V~6.5V
6. USB 2.0 full speed device controller

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WHAT WE PROVIDE.

7. ARDUINO NANO DEVELOPMENT BOARD

This is an Arduino Nano Development Board with Arduino Nano. All pins are available at female bugs connector, which can be used as the main board for developing applications. Arduino Nano is a small, complete and breadboard-friendly board based on the ATmega328. IT is one of the smallest and yet most exciting breadboard-friendly boards available on the market today.

SPECIFICATIONS

1. 32 KB Flash Memory
2. 2 KB SRAM
3. 1KB EEPROM
4. Digital I/O Pins (6 of which are PWM)
5. 16 MHz Clock Speed
6. 8 Analog IN Pins
7. 5V Operating Voltage

8. RASPBERRY PI 4 DEVELOPMENT BOARD

The Raspberry Pi 4 Model B is the latest addition to the Raspberry Pi family, offering improvements in processor speed, memory, multimedia performance, and connectivity compared to the Raspberry Pi 3 Model B+. It features a 64-bit quad-core Cortex-A72 processor running at 1.5GHz, supports dual 4K displays at 60fps, and comes with up to 8GB of RAM. Connectivity options include dual-band Wi-Fi, Bluetooth 5.0/BLE, Gigabit Ethernet, USB 3.0, and optional PoE support via a separate HAT.

Specifications

- Processor: 64-bit quad-core Cortex-A72, 1.5GHz
- RAM: 4GB LPDDR4
- Video: 2 Micro HDMI ports (up to 4Kp60)
- USB Ports: 2 USB 3.0 & 2 USB 2.0
- Ethernet: Gigabit
- Wireless: 802.11 b/g/n/ac Wi-Fi, Bluetooth 5.0
- Power: 5V/3A USB-C, PoE capable

13. ARDUINO UNO DVELOPMENT BOARD

The Arduino UNO is a widely used standard Arduino board built around the ATmega328P microcontroller, an 8-bit single-chip microcontroller from the Atmel family. It integrates essential components such as SRAM, EEPROM, Flash memory, analog-to-digital converters, SPI serial ports, I/O lines, registers, timers, internal and external interrupts, and an oscillator into a compact, versatile platform for embedded system projects.

SPECIFICATIONS Microcontroller: ATmega328P

Digital I/O Pins: 14

PWM Digital I/O Pins: 6

SRAM: 2 KB

EEPROM: 1 KB

Flash Memory: 32 KB

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WHAT WE PROVIDE.

9. Node MCU (ESP 8266) DEVELOPMENT BOARD

NodeMCU (Node Microcontroller Unit) is an open-source hardware and software development platform built around the low-cost ESP8266 system-on-chip (SoC). It is widely used as an IoT module with built-in Wi-Fi connectivity. The board includes a CH340G USB-to-TTL IC, making it easy to connect to a computer for programming and serial communication. NodeMCU is ideal for training, development, and rapid prototyping of IoT applications.

SPECIFICATIONS

1. Microcontroller: 32-bit ESP8266
2. GPIO: 10 Integrated Pins
3. Connectivity: Wi-Fi 802.11 b/g/n
4. SRAM: 64 KB
5. Flash Memory: 4 MB
6. Supply Voltage: 5V

10.RASPBERRY PI 5 DEVELOPMENT BOARD

The Raspberry Pi 5 is a high-performance single-board computer, offering 2-3x the CPU speed of the Pi 4 with a 2.4GHz quad-core Arm Cortex-A76 processor. Key features include 4GB/8GB RAM options, dual 4Kp60 HDMI display output, PCIe 2.0 support, and a dedicated power button. It requires a 5V/5A USB-C power supply and active cooling is recommended .

Processor: Broadcom BCM2712 2.4GHz quad-core 64-bit Arm CortexA76.

Performance: 2–3× increase in CPU performance over Raspberry Pi 4.

GPU: 800MHz VideoCore VII, supporting OpenGL ES 3.1, Vulkan 1.2.

RAM: LPDDR4X-4267 SDRAM (available in 2GB, 4GB, 8GB, and 16GB models).

I/O: 2 × USB 3.0 ports, 2 × USB 2.0 ports, and a Gigabit Ethernet port.

Connectivity: Dual-band 802.11ac WiFi and Bluetooth 5.0/BLE.

Storage/Expansion: MicroSD card slot, and a PCIe 2.0 x1 interface for fast peripherals.

Power: 5V/5A DC power via USB-C, with Power Delivery (PD) support

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WHAT WE PROVIDE.

11. STM 32 BLUE PILL DEVELOPMENT BOARD

The STM32 Blue Pill is a small, lowcost development board based on the STM32F103C8T6 microcontroller with a 32-bit ARM Cortex-M3 core. It offers better speed and memory than 8-bit boards like the Arduino Nano, making it great for learning embedded systems, IoT, and robotics.

Specifications

Microcontroller: STM32F103C8T6 (ARM Cortex-M3)

- Runs at 72 MHz with high performance
- Works on 3.3V, but many pins can handle 5V
- 37 Digital I/O Pins
- PWM available through timers
- 10-channel, 12-bit ADC for analog inputs
- Communication ports: 3 USART, 2 I2C, 3 SPI, USB, and CAN
- Flash Memory: 64 KB (some versions have 128 KB)
- SRAM: 20 KB
- Can be powered using a 5V pin or onboard 3.3V regulator

12. STM 32 NUCLEO BOARD DEVELOPMENT BOARD

The STM32 NUCLEO-F072RB is an affordable and flexible development board from STMicroelectronics, built around the STM32F072RBT6 microcontroller, which features a 32-bit ARM Cortex-M0 core. It is designed for rapid prototyping, learning embedded systems, and developing IoT applications. The board includes an integrated ST-LINK debugger/programmer, eliminating the need for external hardware.

Key Specifications:

- Microcontroller: STM32F072RBT6 (ARM Cortex-M0)
- Digital I/O Pins: Up to 55 (5V tolerant on selected pins)
- PWM Pins: Multiple, via dedicated timers
- SRAM: 16 KB
- EEPROM: Emulated in Flash
- Flash Memory: 128 KB

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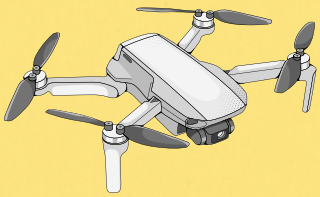
Our Newly Launched Educational Modules

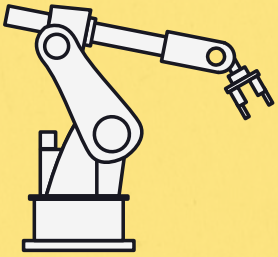
We proudly introduce two powerful academic modules designed to upgrade institutional learning, enhance practical skills, and prepare students for industry-ready innovation. These modules combine **hands-on exposure, structured training, and real-world application**, making them ideal for engineering colleges and technical institutes.

Bringing Structured technical Worshops on Cutting-Edge Technologies

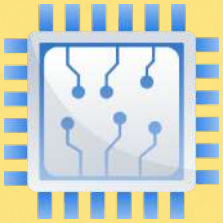
Worshop Module Available



Drone Technology



Robotics



Embedded Systems

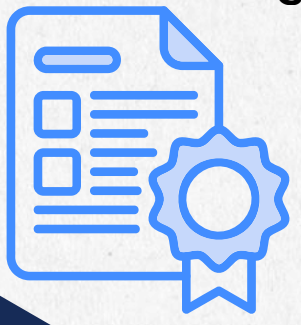
Internet of Things (IoT)

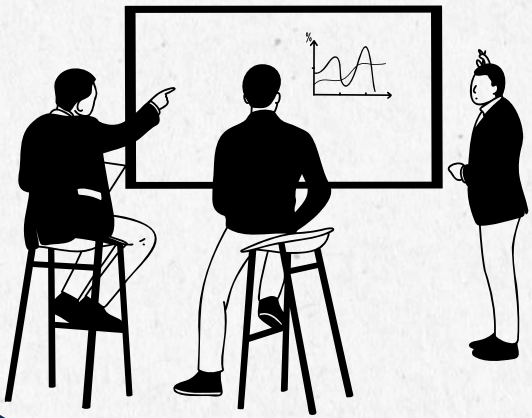
WHAT WE AIM TO DO

- Hands-On Learning Experience
- Bridge Academia & Industry
- Boost Skills & Employability

WHY JOIN?

- Industry-level exposure
- Live project opportunities
- Mentorship from experts
- Skill-based certification





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Introducing AUPIXEL

AUPIXEL LLP
SOLUTIONS

AUPIXEL is our own company, specializing in **high-performance P10 LED displays for industrial and commercial applications**. We design and manufacture customizable, durable, and intelligent display solutions with advanced interfaces, making AUPIXEL a reliable choice for industries, institutions, and commercial clients.

We provides various interfaces with various dimensions and customization.

Interfaces:

- **RS232**
- **RS485**
- **LAN (Ethernet)**
- **Wi-Fi**
- **USB**
- **Bluetooth**

- **Standard Module Size** - 320 mm × 160 mm (P10)
- **Standard Module Resolution** - 32 ×16 pixels , pixel density - 1000 pixels/m^2
- **Standard Assembled Display Sizes** - 1×1 ft, 1×2 ft, 1×3 ft,1×4 ft,1×ft,2×1ft, 0.5×1 ft, etc.
- **Customization Range** - Any combination of P10 modules to achieve desired dimensions.
- **Form Factor Options -** Single-face / Dual-face
- **Mounting Options** - Wall-mount / Pole-mount / Custom enclosure
- **Special Design Requests -** Available for corporate branding, event signage, industrial dashboards
- **Pixel Configuration**- Scalable horizontally and vertically depending on required

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Our Services

- Inhouse Circuits design
- Inhouse PCB design
- Inhouse Firmware developments
- Inhouse Software development in Python
- Inhouse Android App Development
- Lab and Field trails
- Inhouse Enclosure Design and Developments (3D prints for Proto)
- Third Party Ordering as per requirements
- Procurements from Worldwide Sources
- Inhouse Production

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Our Services

Services

1. Inhouse Circuits Design
Design and development of electronic circuits tailored to project requirements.

Ensures optimized performance, reliability, and customization.

2. Inhouse PCB Design
Creation of printed circuit board layouts for compact and efficient hardware implementation.

Includes schematic design, routing, and testing for error-free operation.

3. Inhouse Firmware Development
Development of low-level code that directly controls hardware components.

Ensures smooth communication between sensors, controllers, and devices.

4. Inhouse Software Development in Python
Development of software tools and applications using Python for data processing and control.

Used for automation, analysis, and communication with hardware systems.

5. Inhouse Android App Development
Design and development of mobile applications for device monitoring and control.

Provides user-friendly interfaces for real-time data access.

6. Lab and Field Trials
Testing of systems in controlled lab environments and real-world conditions.

Ensures reliability, accuracy, and performance before deployment.

7. Inhouse Enclosure Design and Development (3D Prints for Prototype)
Design of protective enclosures using 3D modeling and printing techniques.

Helps in rapid prototyping and improves product durability and aesthetics.

8. Third Party Ordering as per Requirements
Procurement of specialized components or services from external vendors.

Ensures availability of quality materials not produced in-house.

9. Procurements from Worldwide Sources
Sourcing of components and materials from global suppliers.

Ensures access to advanced technology and cost-effective solutions.

10. Inhouse Production
Manufacturing and assembly of developed products within the organization.

Maintains quality control and supports prototype-to-product transition.

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Our Clients & Partners

SINCE 1961

Bajaj Steel Industries LTD

SYSLOGYX
ELECTRONICS PRIVATE LIMITED

SYSLOGYX Electronics Pvt Ltd

RED ALERT

Rakshak Electromech Devices

CONTROL SYSTEMS & SOLUTIONS
Energy Saving Solutions. Value Additions.

Control Systems & Solutions

Mahindra

Mahindra & Mahindra

NowZone
Live Longer

NOWZONE

and MANY MORE.....

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Our Presence..!!

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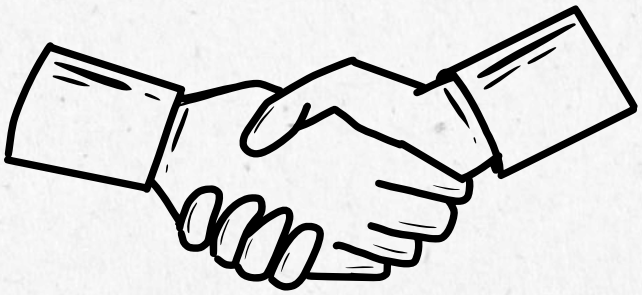

Let's Work Together

Partner with us to turn ideas into innovation. Whether you need educational solutions, custom hardware, software, firmware development, R&D support, or complete tech setups —
we are here to build it with you.

Let's collaborate, create, and engineer the future together.

Your vision. Our expertise. One smart solution.
Let's make it happen — together.

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