AMBIMAT ELECTRONICS

ENGINEERING PRODUCTS & SERVICES

# Ambimat Group of Companies

India

Design and manufacturing under one roof — from concept to box-packaged product.

ESTABLISHED 1982

44+ YEARS

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**Concept → Box-Packaged**

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# 44+ years of solving tomorrow’s problems today

Company snapshot & key metrics

**1982**

ESTABLISHED

**200+**

EMPLOYEE STRENGTH

**240+**

PROJECTS EXECUTED

**70+**

GLOBAL CLIENTS

**20+**

INDUSTRIES SERVED

**8**

CORE TECHNOLOGIES

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# What we do

End-to-end product realization — we take products from concept to production with the full engineering stack under one roof.

### Design & Prototyping
Architecture, PCB design & rapid prototypes

### Development
Embedded software, firmware & hardware

### Fabrication & QA/QC
Global partner ecosystem for PCB fabrication

### Packaging
Enclosure design & retail-ready packaging

### Certifications
FCC, CE, PTCRB & industry compliance

### Supply Chain
Global sourcing & inventory management

### Manufacturing
Turn-key solutions for mass production

### App Development
Webserver + mobile apps (AWS, Google IoT)

CORE PHILOSOPHY

**Concept to box-packaged product**

One accountable team — every engineering discipline in-house.

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# Full-stack expertise

One team owns the entire journey — concept to box-packaged product — with every engineering discipline in-house.

1 Concept → 2 Design → 3 Develop → 4 Fabricate & QA → 5 Certify → 6 Box-Packaged

## DESIGN & ENGINEERING

- **Design (Product + Architecture)**
  System architecture & industrial design
- **Prototyping**
  Rapid functional prototypes & iteration
- **Development**
  Embedded firmware, hardware & software

## BUILD & QUALITY

- **Fabrication & QA/QC**
  PCB fabrication through global partners, rigorous QC
- **Manufacturing / Turn-Key**
  Mass production, box-build & logistics
- **Packaging**
  Enclosure design & retail-ready packaging

## CONNECT & CERTIFY

- **Webserver + Mobile Apps**
  Cloud, APIs & Android / iOS apps
- **Supply Chain**
  Global sourcing & inventory management
- **Certifications (FCC, PTCRB)**
  Compliance-oriented design & testing

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# Embedded Software

Production-grade firmware engineered for robust, secure and field-serviceable device performance.

## Firmware & RTOS

Real-time, resource-constrained software

- ✓ Embedded firmware
- ✓ RTOS / bare-metal development
- ✓ Device drivers

## Connectivity & Security

Protocols and secure-by-design firmware

- ✓ Communication protocols
- ✓ Secure boot readiness
- ✓ OTA firmware update readiness

## Quality & Integration

Validated, observable, production-ready

- ✓ Diagnostics and logging
- ✓ Sensor / device integration
- ✓ Production firmware validation

**ENGINEERING STACK**

Low-level to high-level — every layer built and validated in-house.

C / C++ / Assembly | 8085 → ARM Cortex-M | RTOS

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# Hardware Design

End-to-end hardware development — from architecture and schematics to certification-ready production files.

### Architecture & Schematic

From block diagram to net-list

- ✓ Architecture & component selection
- ✓ Schematic design
- ✓ PCB layout

### Signal, Power & RF

Integrity-aware, wireless-ready boards

- ✓ Power design
- ✓ RF / antenna considerations
- ✓ 4G / 5G-ready hardware design

### Prototype to Production

Manufacturable, certifiable designs

- ✓ Prototyping
- ✓ DFM / DFT readiness
- ✓ Certification-oriented design

**DESIGN OUTPUTS**

From concept schematics to certification-ready production files.

Schematic → Gerber | 4G / 5G-ready | DFM / DFT

# Cloud and Mobile

Connecting devices to people and enterprise systems — the bridge into the end-to-end IoT story that follows.

## Mobile Apps

Android & iOS for connected devices

- ✓ Mobile app development
- ✓ Android and iOS
- ✓ Device onboarding
- ✓ BLE / Wi-Fi provisioning

## Cloud & Backend

Scalable APIs and device services

- ✓ Cloud APIs
- ✓ Server-side development
- ✓ MQTT / HTTPS
- ✓ Device registry

## Operate & Integrate

Dashboards, OTA and enterprise links

- ✓ Dashboards
- ✓ OTA management
- ✓ Enterprise integrations

**PLATFORMS**

Devices, people and enterprise systems — connected end to end.

Android / iOS | AWS / Google IoT | MQTT / HTTPS

# Mobile + server-side development deep dive

Ambimat combines embedded engineering with production-grade mobile and server-side development.

## Mobile App Development

- ✓ Android & iOS
- ✓ BLE / Wi-Fi provisioning
- ✓ Real-time device status
- ✓ Firmware update flows
- ✓ Customer & admin apps
- ✓ Device onboarding
- ✓ Secure login & user management
- ✓ Alerts & notifications
- ✓ Diagnostics & logs

## Server-Side / Cloud Development

- ✓ API development
- ✓ MQTT / HTTPS communication
- ✓ Data ingestion & storage
- ✓ OTA update management
- ✓ ERP / CRM integration
- ✓ Device registry & identity
- ✓ User & role management
- ✓ Dashboards & reporting
- ✓ Audit logs & monitoring

**Nearly a decade** of experience building secure connected products across hardware, firmware, mobile, cloud and deployment.

# Why Ambimat is different: hardware-rooted IoT security

Not just an IoT development house — we design connected products with hardware-rooted trust built into the device from the start.

Secure Element / Root of Trust › Device Firmware › Mobile App › Cloud APIs › Enterprise Systems

- Secure element integration
- Hardware device identity
- Cryptographic key protection
- Secure boot readiness
- Firmware authenticity
- Encrypted device → app → cloud
- OTA update security
- Tamper-aware design
- Device / app / server auth
- Lifecycle auditability

UNDER ONE GROUP

**Hardware + firmware + mobile + cloud + secure-element expertise**

Most IoT vendors stop at apps, firmware and dashboards — Ambimat adds the secure hardware and identity layer.

# End-to-end secure IoT product development

From connected hardware to mobile apps, secure cloud platforms and production deployment — Ambimat has built end-to-end IoT systems for nearly a decade.

**01** IoT Hardware — 4G / 5G-ready
›
**02** Secure Firmware — secure boot
›
**03** Mobile App — Android / iOS
›
**04** Cloud / Server — MQTT / HTTPS
›
**05** Dashboard / APIs — reporting
›
**06** Customer Systems — ERP / CRM

**SECURE** Secured across the chain — secure boot · device identity · encrypted communication · authentication · OTA readiness · audit logs · role-based access

## CONNECTIVITY & HARDWARE

Wi-Fi | BLE | 4G LTE | NB-IoT | 5G-ready

**4G / 5G-ready hardware**
Cellular-grade connectivity designed into the board.

**~10 years**
building secure connected IoT products, end-to-end

## WHAT WE BUILD IN-HOUSE

- ✓ Hardware design & PCB
- ✓ Embedded firmware
- ✓ Mobile apps (Android / iOS)
- ✓ Backend & server
- ✓ APIs & dashboards
- ✓ Testing & deployment

One accountable team across hardware, firmware, mobile, cloud and deployment — no integration gaps between vendors.

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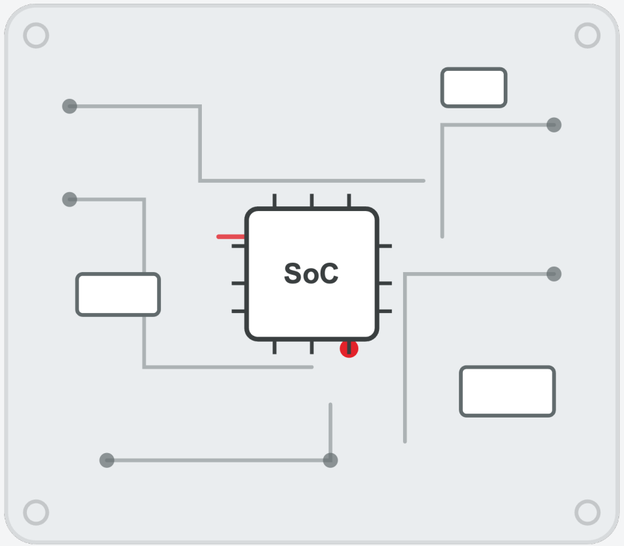
# PCB design capabilities

Multilayer board design built for signal integrity, manufacturability and connected-product readiness.




MULTILAYER PCB DESIGN

- **PCB architecture & layout**
  Component placement & routing strategy
- **Multilayer — rigid / flex / rigid-flex**
  2-layer to high-layer-count stack-ups
- **Signal integrity awareness**
  Controlled impedance & high-speed nets
- **Power & grounding**
  Clean distribution & return paths
- **EMI / EMC-conscious design**
  Lower emissions, better immunity
- **DFM / DFT readiness**
  Built for manufacture and test
- **Prototype-to-production**
  Smooth scale-up from POC to volume
- **Industrial · telecom · connected**
  Application-ready board designs

Rigid | Flex | Rigid-Flex | HDI | Multilayer | Up to 24 layers

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# Expertise across protocols & stacks

## Wireless

- Bluetooth Low Energy (with Mesh)
- Wi-Fi (802.11 b/g/n)
- Zigbee (with Mesh)
- LoRa & Sigfox

## Connectivity & M2M

- Ethernet (Industrial & Consumer)
- GPS / GNSS
- GPRS / NB-IoT / CAT-M1

## Payments & ID

- NFC (Near Field Communication)
- UHF / RFID
- NXP MiFare Family

## Other

- Sound (Audio Processing)
- Proprietary Protocols
- Custom RF Implementations

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# Our process — from idea to packaged product

A clear, repeatable progression from concept to box-packaged product.

**01**
**Ideation**
Concept & requirements

**02**
**Proof of Concept**
Feasibility & models

**03**
**Prototype**
Functional PCB & testing

**04**
**Industrial Design**
Enclosure & aesthetics

**05**
**Testing**
Rigorous QA/QC validation

**06**
**Design for Mfg.**
Optimized for production

**07**
**Certifications**
FCC, CE, PTCRB

**08**
**Packaging**
Final box build & shipment

We manage the entire lifecycle, ensuring a seamless transition from one stage to the next with minimal friction and maximum efficiency.

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SECTION 02

# Solutions & Product Portfolio

Ready-to-use solutions and integration-ready modules to reduce time-to-market.

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# Eight solution families, one integration-ready core

Ready-to-use solutions and integration-ready modules across eight industries.

### AmbiSpace
AEROSPACE

Mission-critical space & defence electronics

### AmbiAutomation
INDUSTRIAL

HVAC bridge boards & OT building automation

### AmbiSense
MEDICAL

Cold-chain & contactless temperature monitoring

### AmbiPay
PAYMENT

Closed-loop payment & access-control readers

### AmbiCon
RETAIL

BLE beacons for proximity engagement

### AmbiPower
UTILITY

Meter reading, DESU & RTUs to SCADA

### AmbiLogistics
LOGISTICS

GNSS vehicle tracking & fleet telematics

### AmbiSecure
SECURITY

Hardware-backed identity, access & transactions

**Integration-Ready Core**

Open APIs · Logistics track & trace · Security → ERP · Payments → gateway

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FLAGSHIP OFFERING · AMBISECURE

FIDO2-Certified Hardware

# AmbiSecure — secure identity, access & transactions

Hardware-backed security and identity solutions for transport, smart cities, authentication and enterprise deployments.

+ Also extending into SIM/eSIM-rooted authentication & OTP security via Ambimat's eSIM Security Platform.

### Closed Loop Ticketing

- Transit, campus & enterprise ticketing
- Secure card + backend validation

### ONE Pass Card

- Unified access & identity credential
- Multi-application card platform

### FIDO Validation Server

- FIDO2 / passkey ecosystem support
- Relying-party integration

### BioKey Biometrics

- Biometric authentication & assurance
- Secure enrolment & verification

### AmbiSEC Smart City Module

- City-scale credential & access
- Secure platform modules

## STANDARDS & INTERFACES

FIDO2 | ECC P256 | ISO 14443 A/B | NFC | JavaCard | USB-A/C

SCAN TO EXPLORE

**Visit AmbiSecure**

ambisecure.ambimat.com

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AMBISECURE · eSIM SECURITY PLATFORM

# eSIM Security Platform — OTP security beyond SMS

Extending AmbiSecure into telecom-grade authentication, secure-element applications and SIM/eSIM-rooted identity.

User Device / eSIM › Secure Element App › AmbiSecure Platform › Relying Party / Bank › Telco / Auth Network

- eSIM / eUICC integration
- SIM / secure-element apps
- Hardware-rooted identity
- OTP security beyond SMS
- Cryptographic auth flows
- Telco-ready architecture

## USE CASES

Banks | Fintechs | Telecoms | Enterprises | Government identity

SCAN TO EXPLORE

eSIM platform

esim.ambimat.com

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FLAGSHIP OFFERING · AMBIPAY

Contactless Reader Hardware Engineering

# AmbiPay — payment, transaction & value-transfer

Secure value-transfer across hardware, backend and apps — from contactless acceptance to merchant and enterprise integration.

### Payment Acceptance
Contactless, NFC & QR-ready

### Transaction Workflows
Integrates with operator-owned payment systems

### Secure Credential Handling
Hardware-protected keys & data

### Device-to-Server Flow
Encrypted device → gateway → host

### UPI / Payment-Device Readiness
Android OTG & payment-app integration

### Merchant & Enterprise Integration
Gateways, ERP & acquirer systems

## STANDARDS & INTERFACES

ISO 15693 | NFC Forum (Tags 1–5) | ISO 14443 A/B | MIFARE family | Sony FeliCa | RS-232 / USB / OTG

## TRANSACTION FLOW

**Device → Secure Credential → Gateway → Merchant / ERP**

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# Industrial Automation — AmbiAutomation

**Preventive-Maintenance Ready**

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## AmbiAutomation

Industrial

### WHAT IT IS

Intelligent HVAC bridge boards and OT integration products to monitor building networks and lift productivity.

### WHO IT'S FOR

Building management systems, energy management firms and preventive maintenance teams.

### KEY DIFFERENTIATORS

- Multi-protocol: native BACnet IP & MODBUS RTU
- Connectivity: RS232/RS485/Ethernet/Wi-Fi + cellular

### SPECS

- Field-ready: rugged IP65 enclosure option
- Proprietary RS232 communication support

SCAN TO EXPLORE

**Visit the product site**

ambiautomation.ambimat.com

**Integration-Ready:** Backend integration via JSON/HTTP over an encrypted channel to the server.

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# AeroSpace — AmbiSpace (+ AmbiDefence)

**100% Mission-Critical Success**

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## AmbiSpace

Aerospace

### WHAT IT IS

Specialized electronics for mission-critical use on ground stations, space exploration and defence applications.

### WHO IT'S FOR

Space research programs, aerospace OEMs, defence labs and test & evaluation teams.

### KEY DIFFERENTIATORS

- Indigenous design house with 100s of products delivered
- Design partner for prestigious missions: Chandrayaan & Mangalyaan

### PRODUCTS

- Spacecraft Interface Simulators
- Automated Weather Monitoring Systems

**Integration-Ready:** Rack-mount subsystems with motherboard/daughterboard modularity for future expansion.

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# Medical — AmbiSense

Tamper-Evident Design

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## AmbiSense

Medical

### WHAT IT IS

Temperature monitoring: Smart Label for cold-chain logistics and AS-300 for contactless sensing.

### WHO IT'S FOR

Healthcare facilities, pharma logistics providers and QA teams needing precise monitoring.

### SMART LABEL

- Paper-thin flexible data logger with NFC interface
- ~13,500 samples, 3–6 months battery life

### FEATURES

- CSV export for cloud-ready analytics
- Cost-effective disposable / reusable options

**Integration-Ready:** Easily integrated into existing products to send temperature data directly to the cloud.

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# Retail — AmbiCon

FCC Certified (2014)

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## AmbiCon

Retail

### WHAT IT IS

BLE beacon solution broadcasting user-defined data for proximity engagement and location-based services.

### WHO IT'S FOR

Retail environments needing proximity marketing, indoor geolocation and behaviour analytics.

### KEY DIFFERENTIATORS

- Direct, real-time communication to mobile devices
- Complete Made-in-India hardware-to-software stack

### STRENGTHS

- Proven reliability in retail deployments
- Low power consumption for extended battery life

**Integration-Ready:** Works with retail apps and analytics platforms via standard SDK/API patterns.

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# Utility — AmbiPower (+ UDR App)

**Optimized for Field Operations**

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## AmbiPower

Utility

### WHAT IT IS

Utility solution with mobile meter-reading app, Data Extraction & Storage Unit (DESU) and Remote Terminal Units.

### WHO IT'S FOR

Utility companies, AMI/AMR implementation teams and field-service operations.

### KEY DIFFERENTIATORS

- DESU: multi-bus field data pushed to SCADA cloud via LAN/cellular
- RTUs connect digital/analog field devices to in-house SCADA

### APPS

- Workforce & consumer apps optimize install/replace workflows and engagement

SCAN TO EXPLORE

**Visit the product site**

ambipower.ambimat.com

**Integration-Ready:** Direct data transmission to billing engine or head-end systems.

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# Logistics — AmbiLogistics

**Accuracy: 2.5 m CEP**

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## AmbiLogistics

Logistics

### WHAT IT IS

Comprehensive Made-in-India vehicle tracking solution for seamless fleet monitoring and management.

### WHO IT'S FOR

Fleet operators, logistics platforms and track-and-trace service providers.

### KEY DIFFERENTIATORS

- High-precision GNSS: 72-channel u-blox M8, 2.5 m CEP
- Robust design: −25°C to 70°C operating range

### FEATURES

- Enhanced security: SHA-256 data-integrity signature
- Compatible with existing backend infrastructures

**Integration-Ready:** Open APIs for direct connection to customer track & trace software, with optional Ambimat backen

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# Why Ambimat

- ✓ Cost Effective
- ✓ Single Point of Contact
- ✓ Fast Turnaround Time
- ✓ One-Stop Solution
- ✓ Vendor Relationships Across Segments

## PROVEN SUCCESS STORIES

### Robotics
2019

Control system for robotic arm (upper-limb amputee application)

PASSED ISO 13485 PRE-CERT (1ST ATTEMPT)

### Medical Device
2019

Hardware design for multi-therapeutic wound-healing device

PASSED ISO 13485 PRE-CERT (1ST ATTEMPT)

### Industrial
2018–19

HVAC bridge board for preventive-maintenance automation

BACNET / MODBUS PROTOCOL DEPLOYMENT

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# Let's build your next product—faster, production-ready

**business.development@ambimat.com**

www.ambimat.com

NDA-safe: client names withheld where required for confidentiality.

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