

Capabilities Statement

Definium Technologies Pty. Ltd. is a Tasmanian company which specialises in producing custom hardware and software solutions to solve problems in multiple domains, including low-power remote sensor monitoring and control, industrial sensor gateways, real-time control platforms, and protocol interoperability layers for carrier, enterprise, and industrial grade deployment.

Electronics Design

Custom product design that leverages Definium's existing Intellectual Property and product range to reduce time-to-market.

Definium has designed and manufactured a large range solutions from low-power wireless sensors and communication gateways through to high-end audio devices, fuel injection and other real time industrial control systems. We specialise in providing custom hardware and software solutions which operate autonomously or as part of a larger integrated system. All of Definium Technologies' products are manufactured in Tasmania, Australia.

Software Development

Full-stack software development that develops and integrates bare-metal and real time embedded systems, embedded Linux systems, communications protocols, data and management servers, and client-facing desktop, web, and mobile applications.

Complete Product Solutions

Scope, schedule, design, and develop complete embedded solutions including:

- Requirements elicitation and analysis
- Feasibility and cost analysis
- Project planning
- Project management
- Resource management
- Product certification and compliance management

Manufacturing & Assembly

Fully automated high-mix surface mount production line:

- RoHS Compliant Manufacturing
- Automatic PCB stacker
- Automated screen-printing with optical alignment
- Surface mount assembly with high speed chip-shooter, high-speed flexible mounter, matrix tray changer, placement monitoring.
- Vacuum Vapour-phase reflow
- Automated Optical Inspection
- Automated selective soldering
- Automated wire processing
- Manual soldering stations
- Manual hot-air rework station
- Manual final product assembly
- Automated test fixtures
- Secure firmware installation
- Prototype enclosure modification with 3-axis milling machine

Hardware Manufacturing

Complete electronics hardware manufacturing solution in-house with automated in-line surface-mount assembly, vacuum vapour-phase reflow, automated optical inspection, selective & wave soldering, x-ray inspection, and manual soldering/assembly tooling.

Embedded Systems

Full stack hardware and software design and development with experience in:

- Electronics hardware design and development
- Low-power hardware engineering
- Miniature device design
- Flex strip design
- Internet of Things speciality, including long-range LoRa radio, LoRaWAN, NB-IoT, LTE Cat M1, LTE / 3G, Satellite (Iridium)
- Capable of low volume, short lead time prototype hardware builds.
- Software architecture design
- Embedded system and comms gateway with local intelligence as well as supporting client and server software development
- Protocol integration, including LoRaWAN, CAN, Modbus, BacNET, DNP3, 1-Wire, SDI12.
- Experience in developing custom communications protocols
- Extensive Embedded Linux systems
- Real-time operating systems

Custom Solutions

Build upon our existing Intellectual Property to efficiently create complete custom solutions.

Previous success stories:

Internet of Things low-power secure device platform with first-class support for LoRaWAN and a host of I/O capable sensors/nodes.

Industrial LoRaWAN gateway platform with 8, 16 and 32 channels

Multi-protocol gateways with support Building Automation and Industrial communication protocols and physical interfaces.

Propane Fuel injection system for Las Vegas Taxis.

Secure wireless remote control system for Residential Lifts.

Quality Control & Test Equipment

Validate designs and qualify manufacturing processes with a range of specialised inspection test equipment:

- X-ray inspection
- Thermal test chamber
- High-bandwidth mixed-signal oscilloscopes
- Precision Power Supplies Units
- Battery Simulator
- Source Measure Units (SMU)
- Spectrum analysers

Manufacturing Capabilities Matrix

Process Capabilities

Board limits	Maximum 820 x 360 x 5 mm Minimum 50 x 50 x 0.4 mm Stencil min 520 x 300 mm, max 736 x 736 mm
Component limits	Minimum 0201 Imperial (0603 Metric) (KE0020) Minimum 01005 Imperial (0402 Metric) (RS-1S) Maximum 48 mm (or 24 x 72 x 20 mm) in-line, 150 x 100 x 5 mm batch-mode Maximum 20 trays
Solder	Leaded or lead-free screen printing, reflow, automated through-hole, and manual soldering
Reflow	Vapour phase (in-line) Vacuum vapour-phase (batch-mode)
Assembly	Full manual final assembly capabilities

Equipment

Magazine loader	Eunil ESL-200YL 2-rack magazine loader
Screen printer	Autotronik AP430L
Chip shooter	Juki RS-1 <i>Long board support, 8-nozzle head, fine-pitch camera, adjustable component height, 112 feeder locations</i>
Flexible mounter	Juki KE-3020VAL <i>Long board support, placement monitor, 20-tray matrix tray changer, 7-nozzle head, fine pitch camera, 80 feeder locations, 160 8mm components (dual-lane feeders)</i>
Batch-mode mounter	Autotronik BA385V2 128x 8 mm feeder locations
Vapour-phase reflow	ASSCON VP3000 (<i>in-line</i>)
Vacuum vapour-phase reflow	ASSCON VP800 (<i>batch-mode</i>)
Automated optical inspection	Saki Sirius 2D AOI
Manual inspection	Optilia and Ash HD digital microscopes
Selective/wave soldering	Inertec Cube 460 <i>dual head, inert-atmosphere lead-free</i>
X-ray inspection	SEC X-eye 5100F
Wire processing	Comax Cappa 315 0.5 mm to 10 mm ² (AWG30 - AWG8)

