

Company Profile 2025

TRIO
powering the e-world

About Us

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- Industries and Applications
- Our Strengths & Services
- Global Locations
- Our OEM Products
- Our Manufacturing Facilities
- Our Quality Assurance, Recognition & Qualifications

About Trio Engineering

Founded in 1983, Trio Engineering ("Trio") is an international Electronic Manufacturing Services Provider with its main manufacturing facilities in Guangzhou (China), Rayong (Thailand) and Waterford (Ireland). And strong sales support in different locations to help us better serve our growing customer base in Europe & USA.

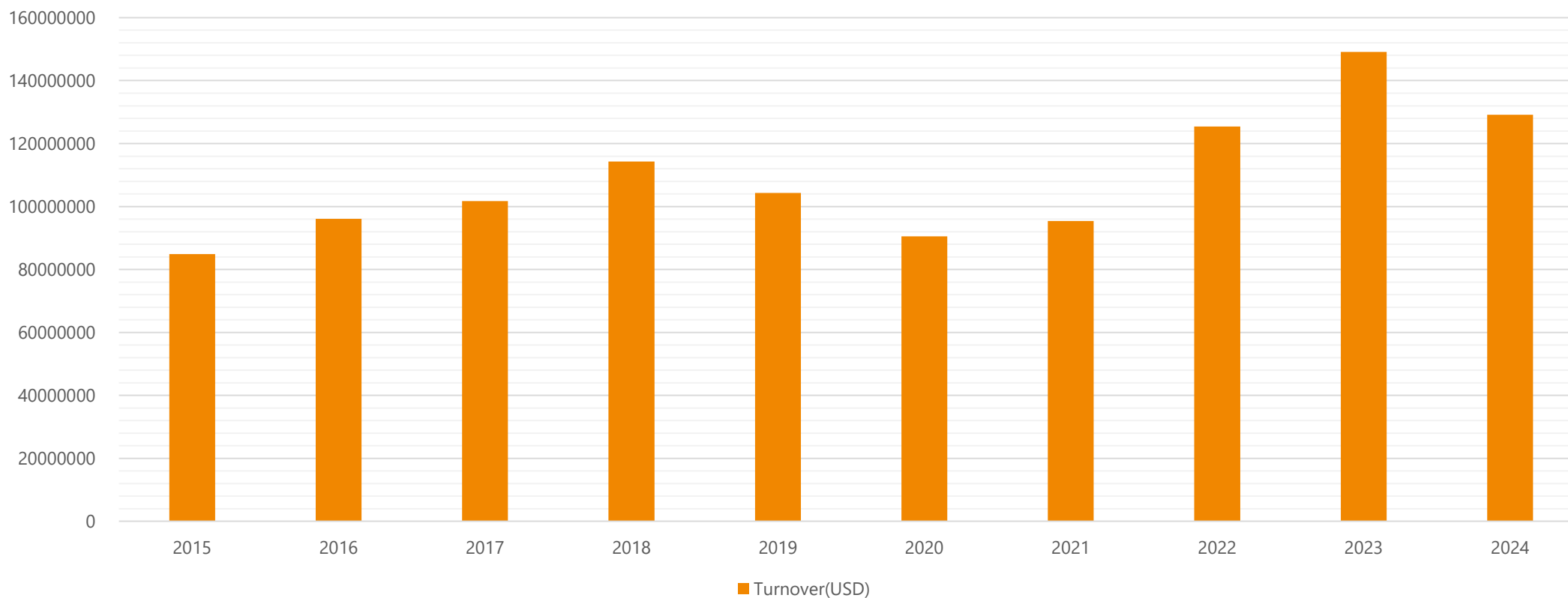
"Powering the eWorld" is Trio's corporate vision. We provide advanced engineering and contract manufacturing services for a wide range of industries. With our experienced team of outstanding track record and reputation, we have been recognized by our customers as a reliable partner for addressing high-complexity and advanced PCB assemblies and turn-key system assembly solutions. We specialise in the manufacture of custom and standard power supplies, industrial battery chargers, inverters, filters and transformers/magnetics for industrial applications, and smart vending systems (e-kiosks).

Backed by our manufacturing facilities in Europe and Asia, Trio has been recognised as an ideal partner for low to medium volume and high mix contract manufacturing as well as high volume production. Trio has an extensive export base in Europe, USA and Asia. Our relationship with our customers, suppliers, contractors and employees is based on trust leading to mutual long term success.



Sales Revenue

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Turnover (USD)	84,853,419	96,116,000	101,682,838	114,318,838	104,335,354	90,525,894	95,419,207	125,397,821	149,127,377	129,172,436



Geographical Coverage

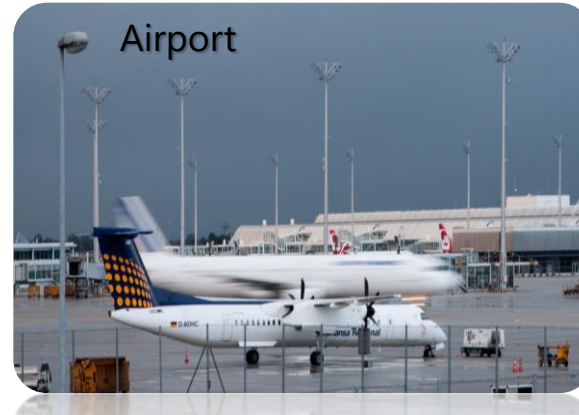
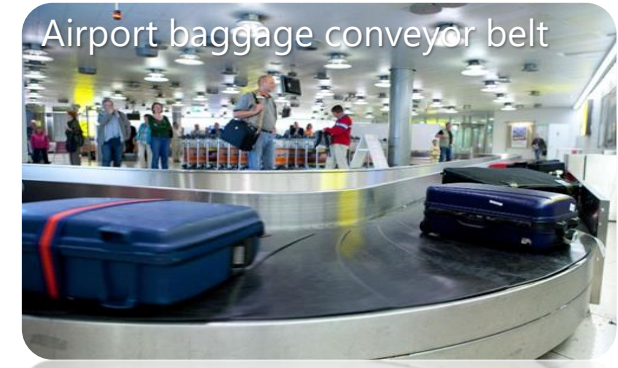
- Europe (over 87%)
- Northern America (over 7%)
- South-East Asia
- China
- Others



* As per Yr2024 sales revenue

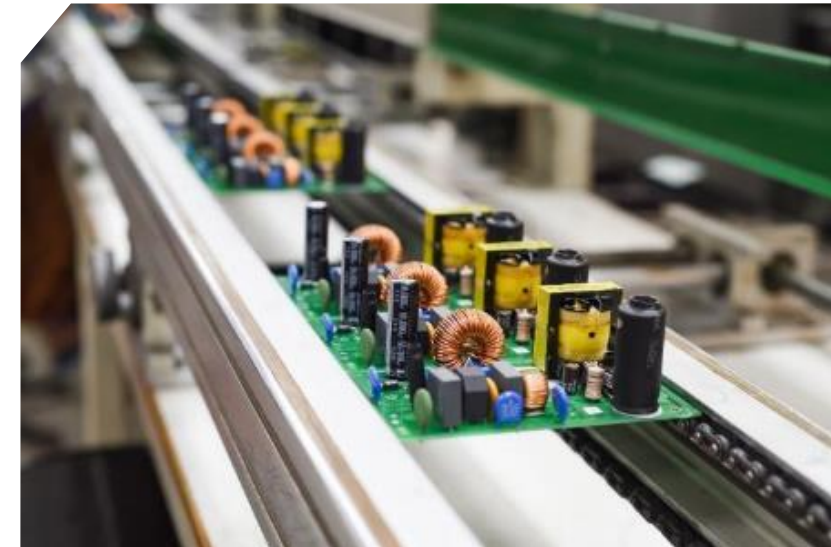
Industries & Application

- Medical Systems
- Airports and container terminals
- Automotive
- Renewable Energy
- Gaming Systems
- Security & Access Control
- Self-Service & Vending
- Industrial Electronics



Our Strengths & Services

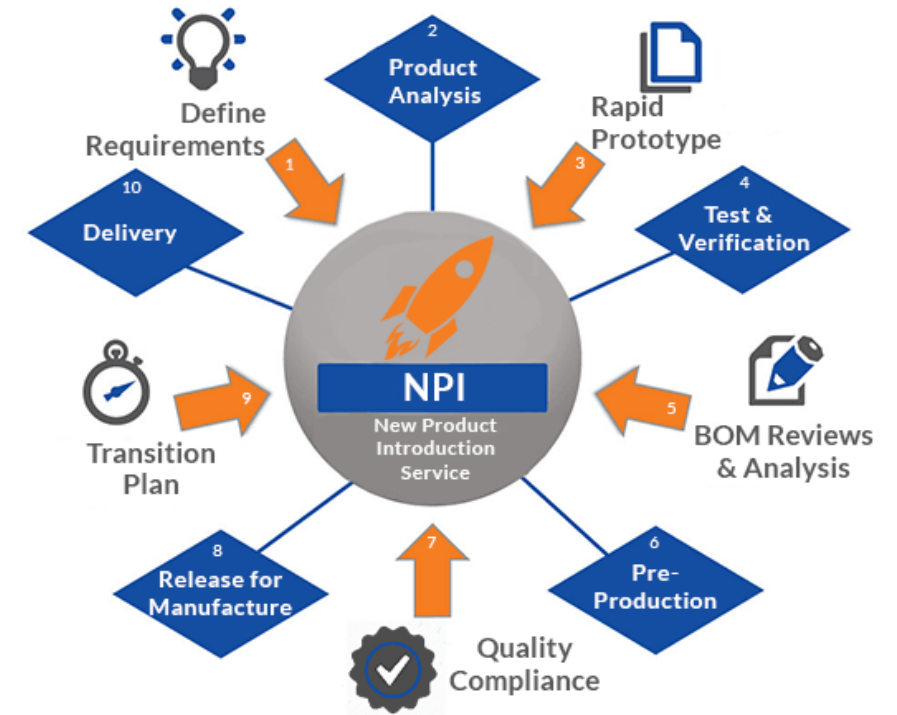
- Agility and Flexibility
- Low to Medium Volume/High Mix
- Full Turnkey System Manufacturing
- Module and Cabinet Build
- Magnetics in-house manufacturing
- Custom Test & Burn-In Equipment Design and Manufacturing
- Mechanical (Metal and Plastics) Design and Tooling support
- Strong NPI Support - Design Reviews and Value Engineering
- DFX Support (Manufacturing, Assembly & Testing)



NPI – New Product Introduction

Our NPI Support helps to optimize your new product's time to market

- Engineering, technology and manufacturing expertise
- We assign a dedicated project team with expertise in engineering, test and supply chain, providing the customer with the resources necessary to get their product to market on time and on budget



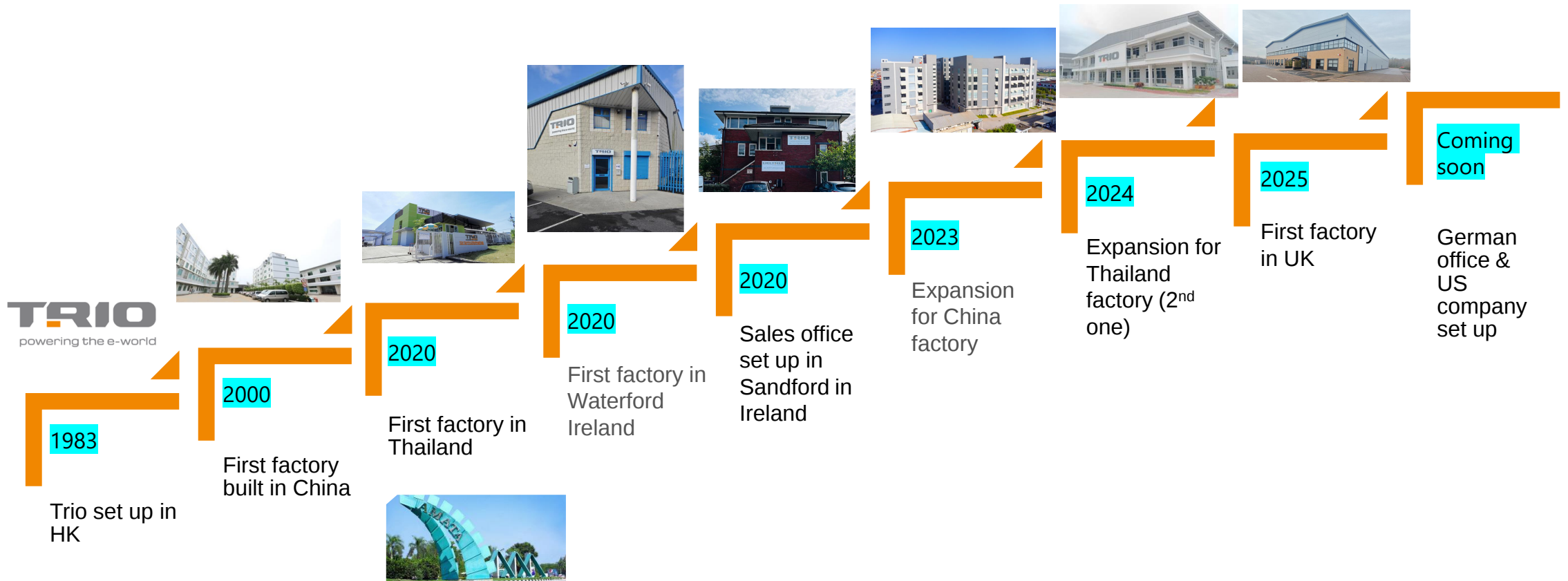
Design for Manufacturing (DFM)

We focus on value-added “DFx” services to ensure excellence and performance from the initial prototyping to the full volume production stage.

- Thanks to our very dedicated engineering teams, we work on foreseeing the upcoming manufacturing challenges and provide suggestions for improvements from the outset.
- We make a difference in how our customers take their new products to market.



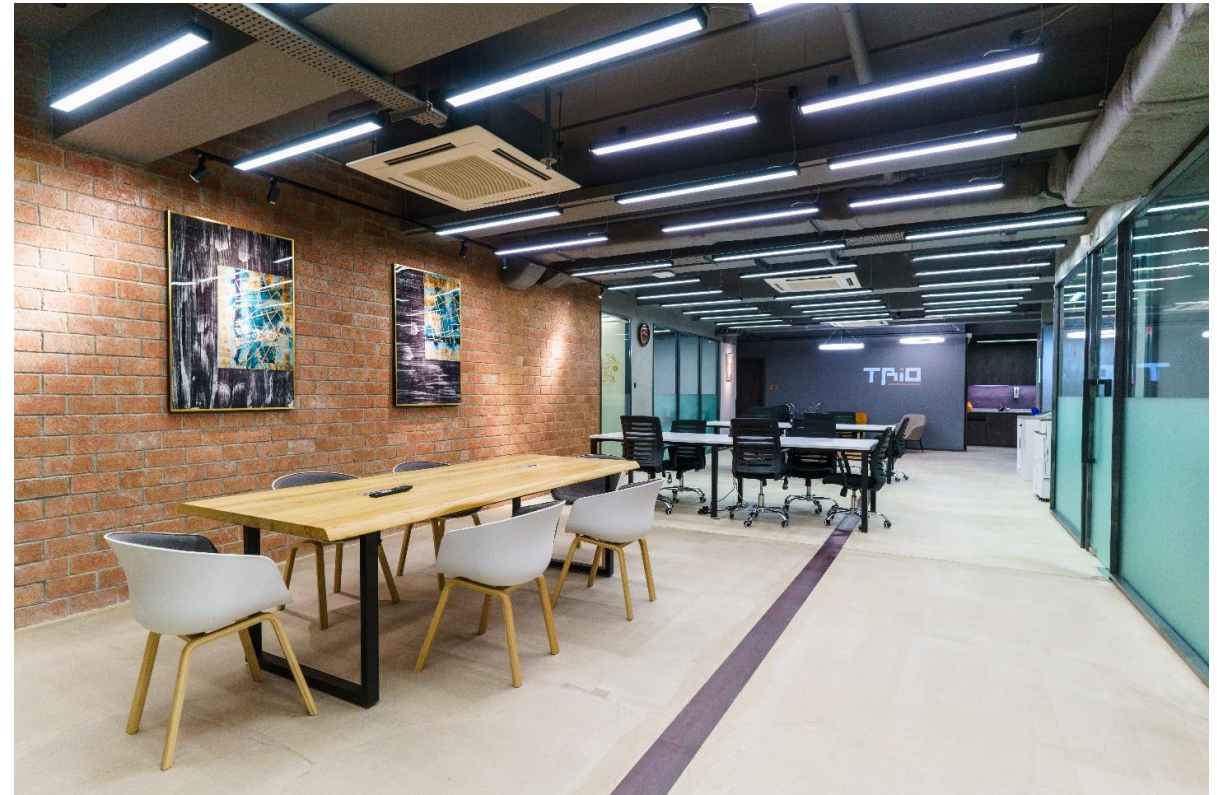
Global Locations – Expansion Roadmap



Global Locations – Asia Pacific Headquarters

Asia Pacific Headquarters – Hong Kong

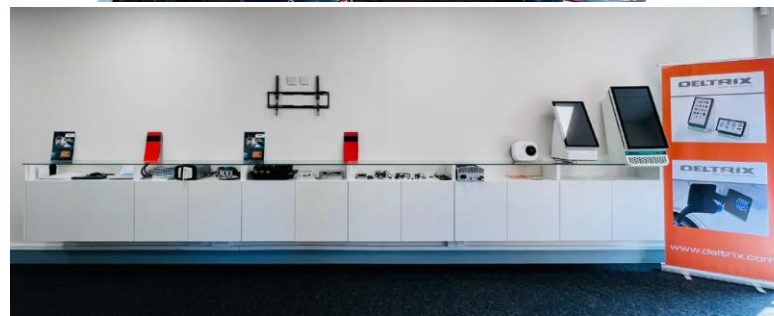
- Functions:
 - Finance & Accounting
 - Transit warehousing, Logistics
 - Sales & Marketing
 - General Administration



Global Locations - European Headquarters

European Headquarters – Ireland

- Factory in Waterford City
 - Factory area: 1100m²
 - 250km far from Airport
 - Functions:
 - Assembly Operations
 - Warehousing
- Sales office in Sandyford (Dublin)
 - Office area: 1000m²
 - Functions:
 - Business development



Global Locations - Thailand Factory

Rayong, Thailand (1st factory)

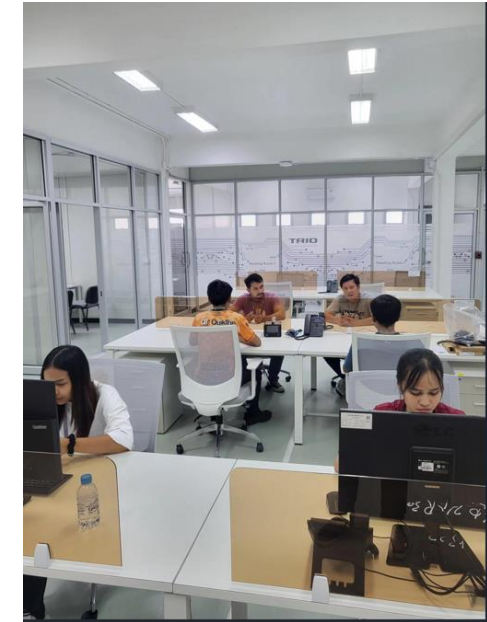
- Close to Bangkok Airport
- The 1st Factory area: 2500m²
- No. of employees : approx. 150
- Functions:
 - Full Turn-key System Production
 - PCBA Production
 - Warehousing, Logistics



Global Locations - Thailand, Expansion 2nd factory

■ The 2nd Factory is located in the same Royong industrial estate

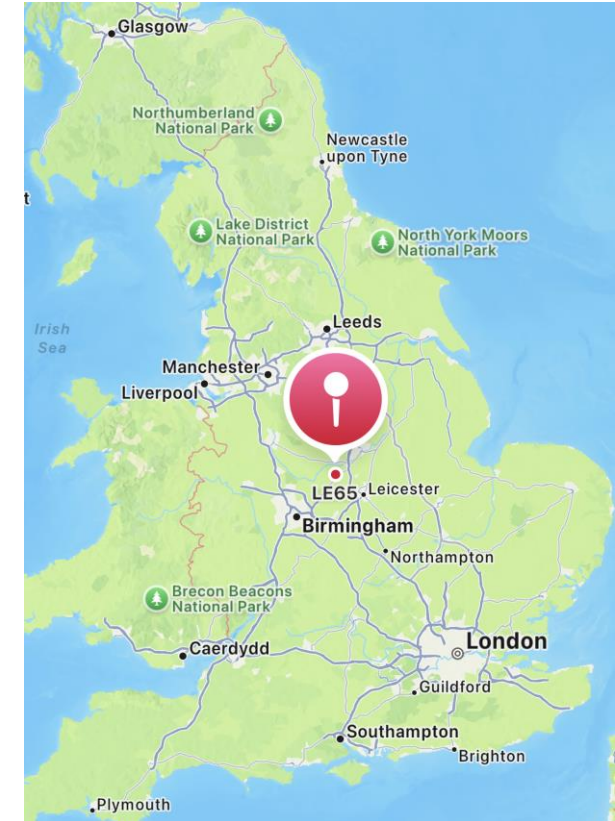
- The 2nd Factory area: 2800m²
- 5km far from the 1st factory
- Start operation in Q2, 2024
- Major expansion :
 - PCBA & Box build Production
 - Warehousing & Logistics



Global Locations - UK Factory

Ashby, UK

- Number of employees: approx. 10ppl
- Close to Birmingham Airport(~45mins by Driving)
- Factory area: 1030m²
- Start operation in April, 2025
- Main operations: Production, Quality Control, Warehouse & Logistics



Global Locations - China Factory

- **Nansha, Guangzhou, China**
- Number of employees: approx. 1,300 ppl (as of Oct 2024)
- Previous factory area : 21,500 m² (floor space 9,460 m²)
- After expansion : 42,860 m² (floor space 13,628 m²)
- Main operations: Engineering, Production, Quality Control, IT, Logistics, Marketing and Purchasing



New Warehouse



New Assembly Line



Our OEM Products

- Custom Power Supplies and Converters
- Renewable Energy
- Wound Components
- Industrial Battery Chargers
- AC and DC Fast Chargers and Components for BEV & PHEV
- Gaming Systems and Self-Service & Vending Solutions
- Custom Products & PCB Assemblies

Custom Power Supplies and Converters

Custom Power Supplies:

- Linear regulated Power Supplies
- Switch Mode Power Supplies
- Mains AC/AC and AC/DC Converters
- High-Voltage Power Supplies
- EMI Filters



Renewable Energy

Renewable Energy Solutions:

Trio manufactures a larger number and volume of sub-assemblies for use in solar and wind energy systems:

- Filters
- Inverters
- Solar String Inverters
- Energy Hubs



Wound Components

Over the years Trio has been competent partner in the design review and manufacture of highly innovative and quality wire wound magnetic components.

Typical components are:

- Mains linear transformers: EI & Toroidal Laminated
- High frequency switch mode transformers & chokes - Ferrite & metal powder cores
- Encapsulated transformers – mains & switch mode
- Surface mount transformers with tape and reel packaging
- Chokes, inductors and filters



Industrial Battery Chargers

Industrial battery chargers have been the backbone of our success over the past 15 years.

We produce a wide range of battery chargers to meet the demands of the motive sector e.g. Forklift Trucks and battery backup systems for zero-outage conveyer systems in airports, warehouses and factories.



Product introduction – eMobility – AC / DC Chargers

Basic and Smart AC Wallbox chargers:

- Wall-mounted
- Pedestal-mounted

DC Fast-Charger systems:

- Wall-mounted Chargers with power ratings between 15 and 30KW
- Combo Chargers (AC and DC) with power ratings up to 180K



Gaming Systems

Trio builds a range of gaming cabinets to address any market or venue type.

The cabinets are built to deliver unmatched player experiences, incomparable excellence, reliability, and easy serviceability.

They are powered by a premium platform technology, subsystems and components



Kiosk & Vending Solutions

We can build a broad range of kiosks suitable for:

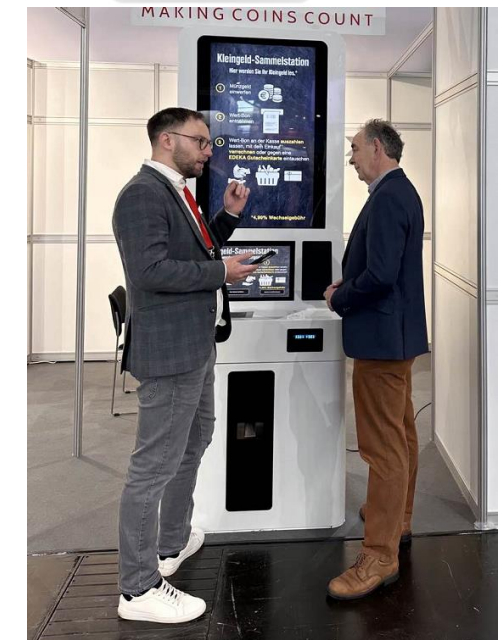
- Retail & Vending
- ESS – Employee Self-Service
- Education
- Travel
- Security
- Health Care



Standard design templates can be customised to meet specific customer requirements.

* Integrate with payment terminals, printers, bill/coin devices, and proximity wireless communication

** Various styles of self-service terminals such as floor-standing, desktop and wall-mounted can be customized.



Custom Products & PCB Assemblies

Custom PCB Assemblies:

- Security devices
- Access control systems
- Control panels
- Pumps & Water Treatment
- Circuit protection devices
- Microscopes and Cameras
- Lighting control

Custom Products & Parts Support:

- Plastic injection tooling
- Metal enclosure tooling
- Machine and stamped sheeting

Custom PCB Assembly



Our Manufacturing Facilities

- SMT Lines
- Production Equipment
- Wound Component Manufacturing
- Custom Cabinet Build

SMT Lines

Surface Mount Technology Lines: (5 in China and 1 in Thailand)

- Auto-Solder Paste Printer
- High-Speed Modular Mounters
- Nitrogen Hot Air reflow oven
- Robotics Dispensers
- Automatic Optical Inspection

Robotics Dispensers



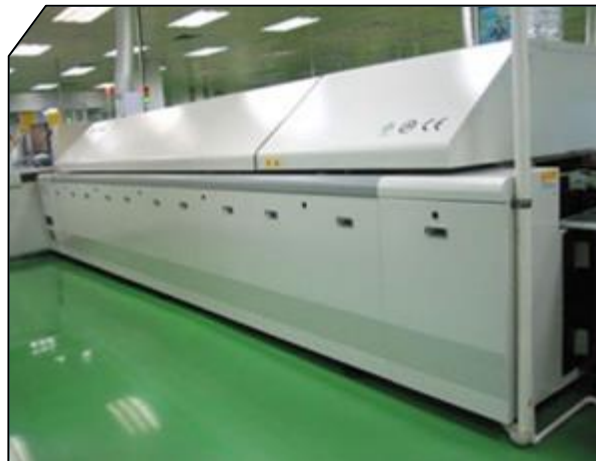
Auto-Solder Paste Printer



High-Speed Modular Mounters



Nitrogen Hot Air reflow oven



Automatic Optical Inspection

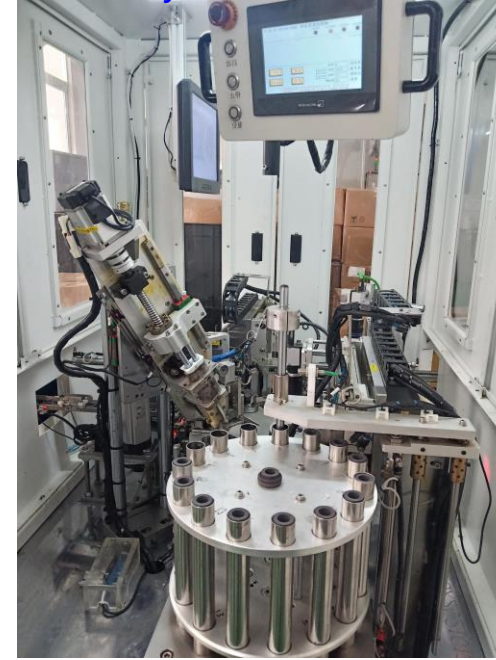


Insertion TH lines and Equipment

Through hole & Assembly Production Equipment:

- Magnetic core gluing and assembly machine
- Odd-form Auto Insertion
- Nitrogen Wave Soldering
- Soldering Joints AOI
- MES Supported Assembly Lines
- Automatic Heatsink assembly

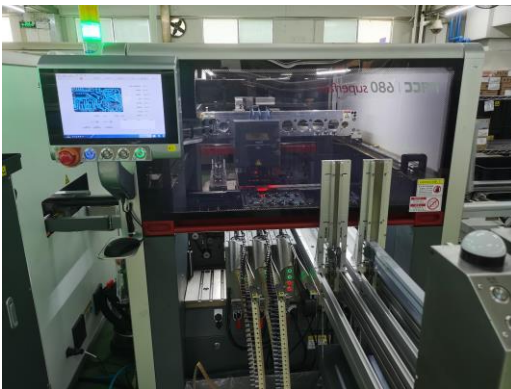
Magnetic core gluing and assembly machine



Automatic Heatsink assembly



Odd-form Auto Insertion



Soldering joints AOI



MES Supported Assembly Lines



Nitrogen Wave Soldering



Production Equipment

Other Production Equipment:

- Automatic Guided Vehicle
- Automatic IC programmer
- Automatic Dispensing Machine
- Potting Machines
- Vacuum/Dry machine for MSD
- Automatic Screwing Machine

Automatic Guided Vehicle



Automatic Dispensing Machine



Potting Machines



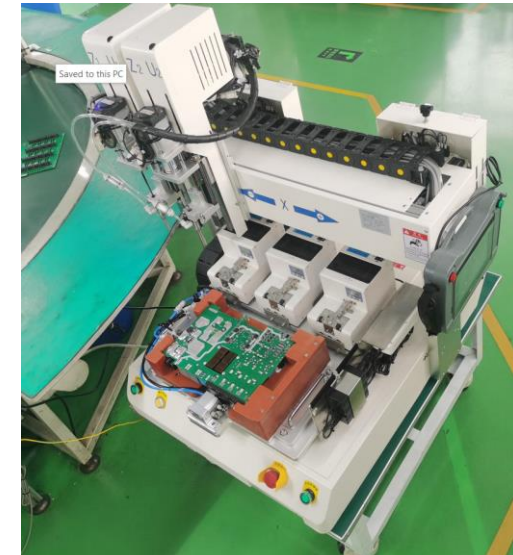
Vacuum/Dry machine for MSD



Automatic IC programmer



Automatic Screwing Machine



Wound Component Manufacturing

Wound Component Equipment:

- Auto Winding Machine
- Toroid Winder
- Pad Printing
- Multi-Spindle Winder
- Multi-function tester

Multi-function tester



Toroid Winder



Auto Winding Machine



Pad Printing



Multi-Spindle Winder



Custom Cabinet Build

Custom Cabinet Building:

- Design
- Prototyping
- Ergonomic Assembly



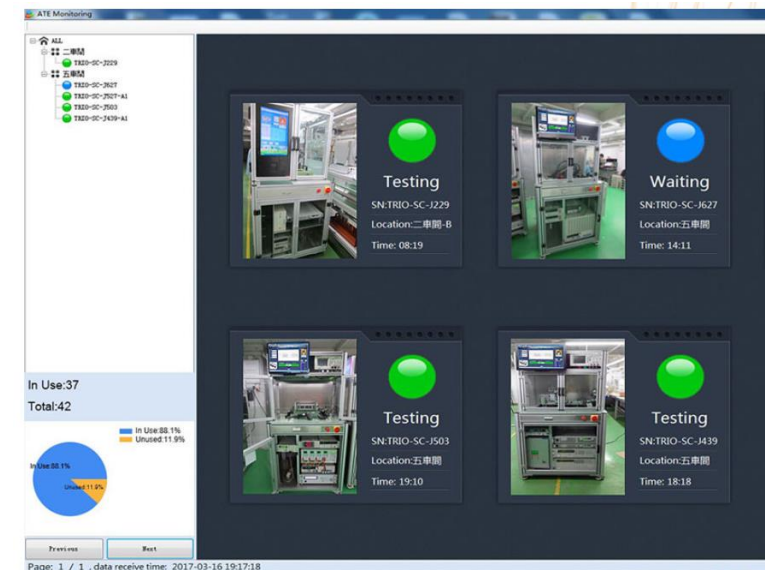
Our Quality Assurance

- T-MICS – Patented MES
- UUT Traceability Control
- Quality & Reliability
- International Recognition & Certifications
- Industry 4.0

T-MICS – Patented MES

T-MICS (Trio Manufacturing In-Line Control System), is our in-house designed and developed Manufacturing Execution System (MES). Although its design is based on a traditional MES System, T-MICS also possesses some very unique features :

- Database and centralize for all manufacturing documents
- Dashboard for real-time productivity & Quality information
- Big data analysis to improve efficiency & utilization
- Unit Under Test system traceability by Individual Barcode on each product



UUT Traceability Control

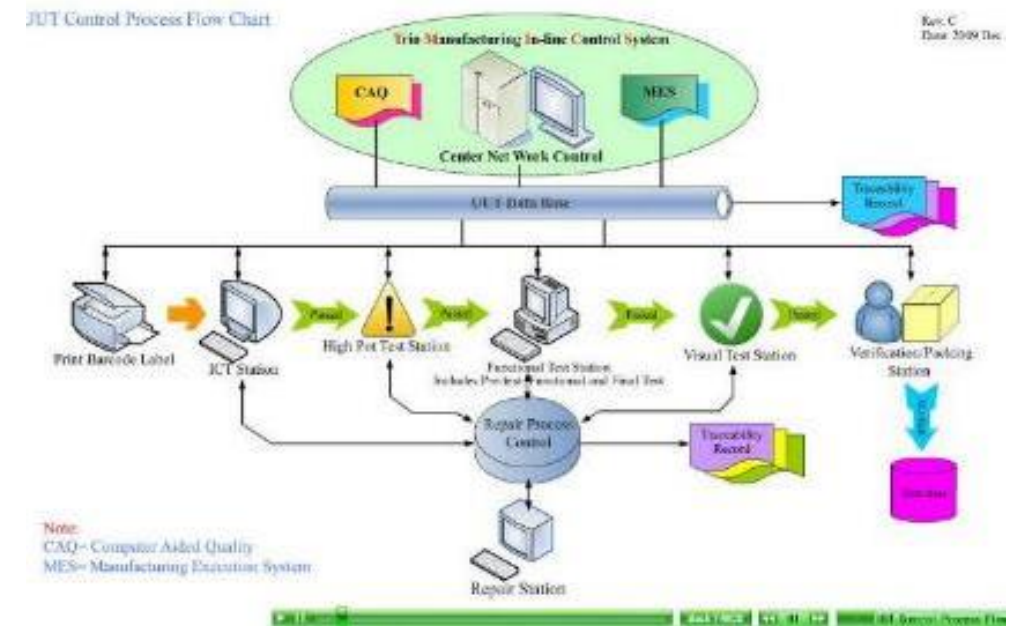
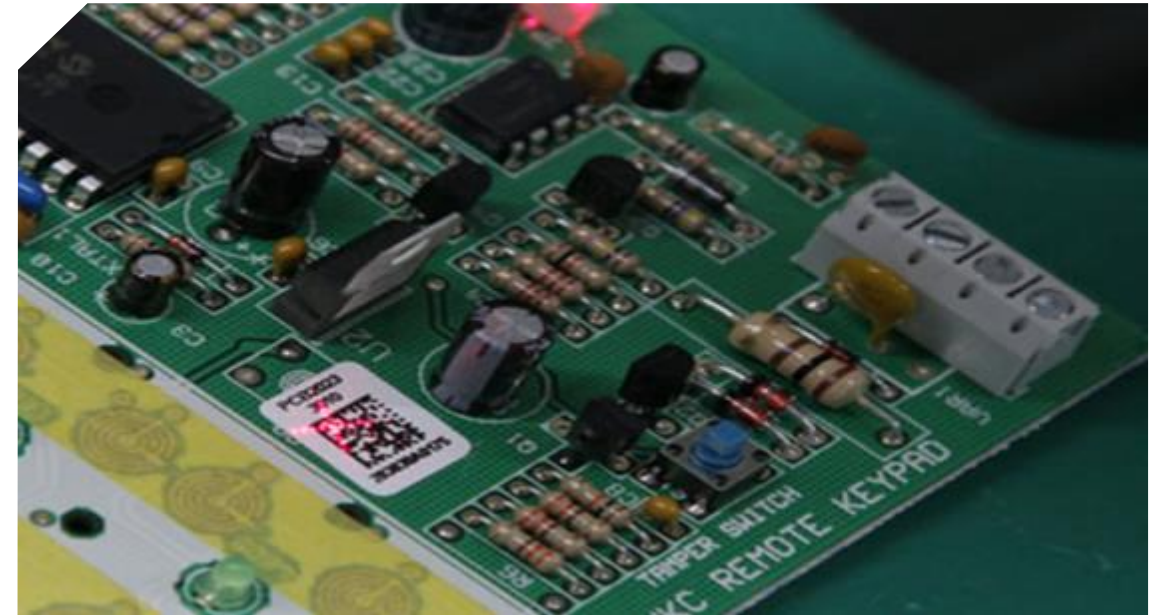
UUT Individual Barcode on each product:

- Traceability down to component level.
- Traceability on all production & test records, locations and dates.

In-Process Control:

- Ensuring that each product passes all critical production stages & test stations.
- Provision for full repair records.
- Provision for productivity information.

UUT = Unit Under Test



Quality & Reliability

We maintain our Quality and Reliability through the uses of:

- RoHS X-Ray System
- Automatic Optical Inspection (AOI)
- Nitrogen Wave Soldering
- Nitrogen Generators
- In-Circuit Testing (ICT)
- Automatic Test Equipment
- Multi-Function Testers
- UUT Systems
- Burn-In Systems
- MSD and ESD Control



RoHS X-Ray System



Automatic Optical Inspection (AOI)



Nitrogen Wave Soldering



Nitrogen Generators



In-Circuit Testing (ICT)



Automatic Test Equipment



Multi-Function Testers



UUT Systems



Burn-In Systems



Quality & Reliability

Test Equipment to guarantee the highest quality:

- 2.5D Projector
- Micro-Focus X-Ray Television System
- Optical Inspection System for BGA
- BGA Rework System
- 3D Solder Paste Inspector

2.5D Projector



Micro-Focus X-Ray Television System



Optical Inspection System for BGA



BGA Rework System

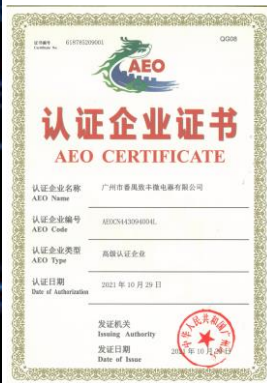


3D Solder Paste Inspector



International Recognition & Certifications

- ISO13485, ISO9001, ISO14001, ISO 45001 & ISO27001 Certified
- UL Traceability requirements for PCBA (category ZPVI2)
- UL1446 Insulation systems (E218598)
- IPC Member
- Industry 4.0 Level 1i  
- AEO Advanced Certified Enterprise
- Global product certificates – UL / CE / CCC / CSA / IMQ / MET / FDA / GMP



Industry 4.0 Maturity

In terms of Industry 4.0 maturity we have reached level 1i and we have been **recognized by the Fraunhofer IPT and Hong Kong Productivity Council (HKPC).**

At this maturity level we have been recognized for our efforts in overall strategy, Smart Production, Digitalized processes, Smart Services and Connected Supply Chains.



Thank you!

TRIO
powering the e-world

Glossary of Terms

- AOI – Automated Optical Inspection
- ATE – Automatic Test Equipment
- BGA – Ball Grid Array
- DFM – Design for Manufacturing
- EMI – Electro Magnetic Interference
- EMS – Electronic Manufacturing Services
- ERP – Enterprise Resource Planning
- ESD – Electrostatic Discharge
- EV – Electric Vehicle
- ICT – In-circuit Testing
- MES – Manufacturing Execution System
- MSD – Moisture Sensitive Device
- NPI – New Product Introduction
- PCBA – Printed Circuit Board Assembly
- RoHS – Reduction of Hazardous Substances
- SMT – Surface Mount Technology
- THT – Through Hole Assembly Technology
- UL – Underwriters Laboratories (US Safety Standards Org.)
- UUT – Unit Under Test

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