# Capability Brief: NPI, Product Engineering & Design for Excellence

*Rapid prototyping, product engineering, lifecycle management, and DFx discipline*

Design and manufacturing are not separate phases — they share the same yield. Indic operates as a design-aware EMS partner: NPI pods (PE/QE/Test/SCM cross-functional teams), DFX review (DFM/DFA/DFT/solderability/packaging), pFMEA, lifecycle mapping, and process development — all built around the discipline that keeps OEM design decisions visible on the floor through ramp.

## 1. New Product Introduction (NPI) Services

*For OEM founders and engineering managers taking products from prototype to industrialization without design-to-floor leakage.*

### Rapid Prototyping & First Articles

Rapid prototyping bridging digital design and physical PCBA · First-article inspection per variant · EVT/DVT/PVT sprint cadence.

*Builds: PCBA + Box-Build · Certifications: IPC-A-610 Class 2/3*

### Reverse Engineering for Legacy Programs

Reverse engineering services for printed circuit board assemblies where original documentation is incomplete · Re-creation of design packages for sustainable manufacturing.

*Builds: PCBA · Certifications: —*

### Process Development & Fixture Design

Process development · Assembly tools and fixture design for efficient, accurate assembly · Parallel line bring-up for variant families.

*Builds: PCBA + Box-Build · Certifications: IPC-A-610*

**IN PRACTICE**

*For a European OEM with a strict launch window, Indic delivered five product variants from one platform family on parallel-line bring-up, holding FPY steady through variant changeovers — with audits cleared without delay through documented coverage matrices and per-serial MES traceability.*

## 2. Product Engineering & Lifecycle Management

*For product teams needing lifecycle visibility from BOM through field obsolescence.*

### Product Development & Engineering

Electronic product engineering from concept to delivery and end-of-life management · Engineering review meetings over hardware prototypes · Cross-functional NPI handoff discipline.

*Builds: PCBA + Box-Build · Certifications: IPC-A-610*

### Component Engineering & Lifecycle Mapping

Strategic component engineering services for sourcing across the product lifecycle · PCN exposure tracking · EOL and last-time-buy planning · Compliant Crosses for alternates.

*Builds: PCBA · Certifications: RoHS, REACH compliance monitoring*

### pFMEA & Product Lifecycle Management (PLM)

Process FMEA for assembly and manufacturing risk mapping · PLM services from inception through engineering design and manufacturing.

*Builds: PCBA + Box-Build · Certifications: PPAP/APQP where automotive*

**IN PRACTICE**

*When a Swedish solar-powered water-distribution program couldn't scale at its prior Taiwanese partner, Indic rebuilt the transfer discipline end-to-end: BOM reviewed against sourcing risk with documented alternates, DFM and DFT checks built into the flow, controlled change documentation, and test strategy matched to product complexity — moving the program from reactive build execution to controlled repeat production.*

# Design for Excellence (DFx) + Cross-Segment Capabilities

*DFM, DFT, DFA, and design-aware manufacturing supporting Indic's engineering partnership*

## 3. Design for Excellence (DFx)

*For hardware design teams where DFM/DFT/DFA discipline decides yield and ramp stability.*

### Design for Manufacturing (DFM) & Design for Assembly (DFA)

DFM reduces production cost without compromising quality · DFA optimizes the physical assembly process · PCB placement analysis aligned to industry standards.

*Builds: PCBA + Box-Build · Certifications: IPC-A-610*

### Design for Test (DFT) & PCB Layout Analysis

Comprehensive DFT solutions integrating many DFT techniques · Test-point coverage planning at layout freeze · Boundary-scan / JTAG access design · Fixture economics across volume tiers.

*Builds: PCBA · Certifications: IPC-9252, IEEE 1149.1*

### Solderability & Design for Product Packing

Solderability issue resolution for SMT and PTH bonding · Design for product packing for safe transit and storage · Stencil and aperture design for fine-pitch yield.

*Builds: PCBA + Box-Build · Certifications: IPC standards*

**IN PRACTICE**

*On a dense industrial PCBA with inadequate test points and a high final-test failure rate, Indic recommended adding test points at layout — enabling component-level test coverage, earlier defect capture, lower retest and rework cost, and reduced field-failure probability.*

## 4. Certifications & Standards Supporting NPI and Design Engineering

**Quality & Management Systems**

PPAP / APQP (automotive process discipline) · IATF 16949:2016 · ISO 9001:2015 · ISO 14001 · ISO 27001 · ISO 45001

**Segment-Specific Standards**

ARAI readiness (EV/automotive, India) · IEC 62368-1 (hi-pot) · IEC 61851 (EV charging) · IEC 62196-2 (Type 1/2) · AEC-Q100/Q200 · BIS

**Workmanship & Process Standards**

IPC-A-610 Class 2/3 · IPC/WHMA-A-620 Class 2/3 (harness) · ANSI/ESD S20.20 · IPC-9252 · IEEE 1149.1 (boundary-scan)

**Substance, Environmental & ESG**

RoHS · WEEE · REACH · China RoHS · Prop 65 · TSCA · UN Global Compact · EcoVadis · D&B ESG · Scope 1+2 tracked

## 5. Supplier Ecosystem & Supporting Capabilities

**IT, traceability & change-control stack**

SAP S/4HANA (ERP, change masters with effectivity) · SAP Digital Manufacturing (MES, serial-bound auto-scan WIP) · SAP DMS (controlled docs, approval workflow) · CalcuQuote · Same-day ECN disposition

**Test engineering depth & in-house tooling**

In-house test engineering pod (architecture, fixtures, electronics, software validation) · In-house tooling and fixture development · Heat-stacking machines, depaneling jigs, stencils, support blocks · ESD-controlled handling per ANSI/ESD S20.20

**Component sourcing & AVL governance**

Direct accounts with Arrow, Avnet, Mouser, Digi-Key · Turnkey / consigned / partial sourcing · PCN, EOL, NCNR via Compliance Risk Manager · Alternates with package, fit, thermal, performance validation

**Capacity, cleanroom & ramp infrastructure**

292K sq ft total · Phase II: 80K+ sq ft expansion, Class 10,000 cleanroom, 7 dual-lane + 1 NPI SMT lines, ~225% capacity lift · Phase III adjacent to Foxconn India, Q4 2026 kickoff

Schedule a discovery call at **indicelectronics.com** · or email **info@indicelectronics.com** to discuss your NPI or design engineering program.