



**ELECTRONICS CORPORATION OF INDIA LIMITED**  
ELECTRONIC MANUFACTURING SERVICES DIVISION

Electronic Manufacturing Services Division (EMSD) of ECIL (A Govt. of India Enterprise) under the Department of Atomic Energy deals in Mass Manufacturing of Electronic Products and population of High Density Complex PCB Assemblies. This Division has been in the business of Electronic Voting Machines (EVMs) for Election Commission of India (ECI) and State Election Commissions (SECs) of different States in India for over a decade. EMSD has the credit of manufacturing 8, 50,000 EVMs and supplying them to ECI and SECs. These machines were successfully used in the general Elections of 2004 and 2009 both for Assembly and Parliament. In addition, this Division has undertaken the production of 2, 50,000 PCB Assemblies consisting of SMT and leaded components for single phase Static Electronic Energy Meter and supplied to different electricity boards in the Country. We also, deal in supplying very complex multiple layer PCB assemblies for DAE projects of NPCIL, PFBR and other customers. We meet the requirement of DAE of their very high standard of stage wise quality inspections including Optical and X-Ray for the 100% quality and met all the stringent relevant quality standards of manufacturers.

Therefore, to sum up the entire capability of our Division, that we have all the qualifications of being the mass manufacturer of any electronic product, mass population of any kind of PCBs consisting of SMT devices, leaded components etc., Turnkey conversion into electronic product i.e., with the supply of manufacturing documents, we can procure all the components like Electronic (passive, active, SMT etc.,) Mechanical, Electro Mechanical, Plastic Parts etc., and convert them in to finished products, test as per the ATPs and supply them to customers at their destinations.

As far as the infrastructure of our Division is concerned, all the technical data of each and every machine is provided to the benefit of our prospective customers who can understand our capability well and approaching us for their mass requirement of either for the complete product conversion or a part of it like the electronic population of any type of complex (multi-layer) PCBs including testing.

We have expertise to undertake the responsibility of accepting very large volumes of production of products or sub-assemblies like PCBs of different capacities, turnkey conversions and so on. The technical information provided below of our infrastructure will manifest our capabilities.

Having showcased our capabilities of mass manufacturing of products explained, ECIL-EMSD invites enquiries from organizations which have the requirement of mass manufacturing items. ECIL can certainly accept the challenges from the prospective customers in all the fields of mass manufacturing and assure them that they will get the best services in terms of better finished products to the satisfaction of their customers.

Please send your enquiries to the following address for your requirement of mass manufacturing products.

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## **Capabilities:-**

- ♦ 3 SMD Assembly Lines with 1,00,000 chip components per hour placement capacity with all type of components package like chip 01005, SOT, SO, BGA,  $\mu$  BGA etc.
- ♦ All assembly lines having capacity to produce 2500 PCBs per shift with an average mounting of 200 components per board.
- ♦ Multilayer PCB handling capacity with fully antistatic environment.
- ♦ Automatic rework station with latest facility like BGA rework and ball mounting on BGA etc.
- ♦ X-ray inspection system having a capacity to inspect BGA including 3D inspection.
- ♦ Wave soldering machine RoHS compatible having capacity to produce 5000 PCBs per day.
- ♦ Conveyors (2nos.) 5000 PCBs per shift with an average of 50 leaded component per PCB.
- ♦ Walk in chamber for temperature cycling having area of 108 sq. ft for hot cycling room and 80 sq. ft. for cold chamber.
- ♦ Power on burn-in facility having area 546 sq. ft.(Burn in facility 2000 PCB at a time with size(240mm x 455mm).
- ♦ Automatic test equipment (with through put of 45 sec. /PCB).
- ♦ Mechanical assembly line – with electrical torque controlled screw drivers.
- ♦ PCB Assembly and Testing.
- ♦ PCB baking (oven system) for moisture removal. (temp:105°C, Duration:30 minutes).
- ♦ Environment Test Facility. (-20°C to +55°C thermal shock).
- ♦ Dust free environment.

# Electronic Manufacturing and Services Division



## SMD Placement machine –MyData- 2Nos.

Make – Mydata	Model – My9 & My9e (with electrical test verification).
Board size range	Min 50 x 50 mm Max 440 x 508 mm
Component range	01005 up to QFPs and BGA (max. 56x56x15mm)
Max. Speed	21, 000 chip component per hour
Feeder slots	96(8mm)
Standard performance	6,500 component per hour (tact time 0.55 s).
HYDRA Speed mounts	21,000 CPH on chips (tact time 0.17 s).
Line scan Vision System (LVS)	6,100 CPH on fine-pitch components (tact time 0.59 s).
Accuracy	Repeatability of 15 mm at 3 sigma.



## Screen printers – 3 Nos.

DEK	Model- ELA V
SPEED print	Model - SP200avi (with 2D inspection system)
Reprint	Model - R29-Spectrum (with 2D inspection system)
PCB size	Min 50mm × 50mm Max 460mm × 500mm
Vision system	Fiducial recognition capability (Automatic)

- ◆ Programmable XY tooling (board stopper conveyor width).
- ◆ Z-axis tooling through quick-change magnetic support pins.
- ◆ Motorized stencil alignment (x, y, theta).
- ◆ Software controlled squeegee pressure.
- ◆ Programmable under stencil dry/solvent cleaner 520mm.
- ◆ Adjustable stencil mount for frame size 12"×12" to 29"×29".





## Reflow systems – 3 Nos.

Make	vitronics soltec	Heller	vitronics
Model	XPM 820	1809EXL	XPM 610
Heat flow	convection	convection	I.R
No. of zone	8(top & bottom) Heating &cooling	10(top & bottom) Heating &cooling	3 (top & bottom) heating 1 preheating
PCB size	460mm MAX	460mm MAX	460mm MAX
Inter face	SMEMA	SMEMA	SMEMA
Transport	Conveyor & chain	Conveyor & chain	Chain
Controls	Computerized PID Controls	Computerized PID Controls	PID controls



## X-Ray Inspection system

The X –ray machine XD7500VR provides the optimum image quality for PCB and device X-ray failure analysis using an open X-ray tube. It includes following features -

Make	DAGE
Model	XD7500VR
Maximum Board Size / Inspection Area	20" x 17.5" (508 x 444 mm) with no oblique views. 18" x 16" (458 x 404 mm) with oblique views.
High Magnification	1500X (7500X optical) geometric magnification.

- ◆ Up to 3 W of power at 950 nm feature recognition over 30 – 160 kV.
- ◆ Automatic BGA and die-void measurements.
- ◆ Comprehensive data logging and reporting facilities.
- ◆ Uninterrupted rotating live oblique views 360° around any point in the sample.



## COMPUTERISED INSPECTION FACILITIES

### AOI (Automatic Optical Inspection)

AOI visually scans the surface of the PCB. The board is lit by several light sources and observed by a scanner or by a number of high definition cameras.

Make	VI technology
Model	VI3k
PCB Size	Max size 458 x 406mm
Inspection rate	2, 50,000 picture/hour

- ◆ For Post Print, Mixed Mode, Pre Reflow or Post Reflow applications.
- ◆ 100% inspection: presence, absence, polarity and placement accuracy as well as OCV, solder joint and lead inspection with Profiler tool.
- ◆ Cycle time: 250 000 to 400 000 components per hour.
- ◆ Inspection time per component 4 - 20 ms.
- ◆ Real-time Statistical Process Control (SPC) capability.
- ◆ JEDEC component library powered with Vectoral Imaging



### 3D inspection system

It is capable to inspect hidden solder joints. It also can inspect under BGAs, PLCCs or for inspection where other microscopes cannot see.

Make	ERSA
Model	ERSA SCOPE

- ◆ Magnification 400x & 3000x vision through PC monitor.
- ◆ Software for analyzing the defects of BGA and other components.
- ◆ Focus ring & adjustable back light.
- ◆ Footprint 1.5 x 4.5 mm.
- ◆ Typical inspection gap ~ 300 µm.

