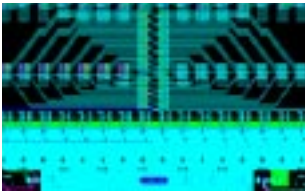




ERNI Systems USA

Backplanes & Sub-Racks: Design, Simulation, Manufacturing and Test

Engineering From Beginning to End

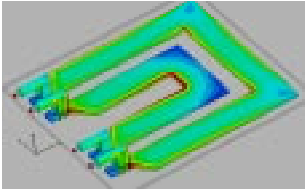


Conceptualization

- From Customer Idea to Statement of Work (SOW)
- Structuring
 - Connector selection
 - Form factor
 - Data architecture

Tools

- Proven engineering development team with over 20 years of systems design experience



Simulation

- Electrical
 - Current distribution
 - High speed channel links
- Thermal

Tools

- CST MICROWAVE STUDIO®
- Agilent (ADS)®
- Flowmetrics (CFD) ®



Systems Layout

- Signal routing and optimization
- Footprint and component placement
- Power distribution and electrical safety aspects

Design Tools

- ORCAD®
- Mentor Integra®
- Mentor Expedition®
- Bartels AutoEngineer®
- Solid Works®



Mechanical Design

- Sheet metal design
- Extrusion-based design
- Mixed designs

Design Tools

- Solid Works®
- Autocad®
- ProEngineer®

ERNI Soldering



State-of-the-Art Soldering

- Single Vapor Batch Type Reflow Systems.
- ERNI has a working envelope of 24"L x 24"H x 2.5"H using a version of a patented palletized conveyor system which keeps the product horizontal throughout the soldering process.
- ERNI provides consistent, uniform, and reliable heat transfer for high quality reflow, curing, and drying.
- ERNI uses a single fluid to generate precise temperature in the reflow chamber. This fluid is environmentally safe and contains no CFC's.
- ERNI also integrates top and bottom ceramic preheats which allow us to create the ideal thermal curve for the specific process. And we can modify the thermal curve to enhance the reflow process.
- The programmable logic control system monitors and controls all critical parameters for safe and efficient operation.
- ERNI can accommodate high volume multi-shift production and larger product sizes.
- ERNI can handle any pitch, any connector, any size backplane.
- Programmable timed cooldown helps cool the product after reflow.



ERNI USA Systems Capabilities From NPI to High Volume Manufacturing



New Product Introduction

- Strategic relationship with PCB and sheet metal prototype suppliers
- Dedicated resources for prototyping are available on manufacturing floor

Quick-turn PCB Fabrication

- Same day turn-around
- 1-2 day premium service
- 3-5 day turn-around available
Circuit Assembly



Low-Volume Manufacturing

- Low-volume high-mix production available, no order is too small
- Semi-automated assembly
- Redundant North America and European production facilities
- ERNI EPC3X
Hydro-Pneumatic Press-fit Assembly
- Manufacturing Efficiency Assessment
- Assembled, keeping volume conditions in mind

ERNI EPC3X Features

- Process Monitoring
- Sliding table
- PCB Thickness Control
- 30 KN Force (~3 Ton)

Management of volume supply chain

- PCB and SMT
- Statistical Process Control
Customized tooling manufactured by ERNI



Localized Volume Manufacturing Capabilities

- Highest level of automation
- Supply chain optimization
- Redundant North America and European production facilities with production volumes ranging from 5 to 500,000 Systems a year
- Production customized to customer requirements

US Production in Virginia

European production in Germany

Logistical services

Semi automated assembly

Fully automated assembly

Maximum board sizes are:

55" (1400mm) x 36" (900mm) x 3/8" (10mm)



Redundant Volume Cable Production Capabilities

- Production localized to customer requirements
- Supply chain optimization
- Highest level of automation for assembly and test

US Production in Virginia

European production in Germany

Logistical services

IDC and discrete wire assemblies

All cables are 100% electrically tested



Logistics and Strategic Partners

- Supply chain optimization
- Sheet metal manufacturing
- Strategic wire and cable partners

Localized partners in North America and Europe

Logistical services

Standards in quality support

At ERNI our attention to details shows!

ERNI Integration Complete Sub-Rack Assembly



Complete Sub-Rack Solutions

- Chassis available with
 - Backplane
 - Power supplies
 - Fans
 - Cooling fixtures
 - Cables
- ESD Assembly Line
- State-of-the-Art testing equipment
- Consulting series available for
 - Mechanical
 - Electrical
- Visual packaging enhancements

As you know from ERNI, our service already begins at the design phase with design and layout, with development and simulation.

We supply the manufacturing and testing technology or produce backplanes and complete systems for you.

Testing From A-Z



State-of-the-Art testing

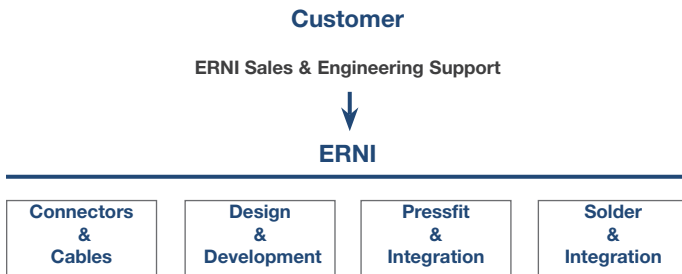
- Any pitch, any connector, any size backplane
- Low NRE charges, quick test development
- Complete Electrical Net-list testing
 - Continuity
 - Isolation
 - Digital Multi-Meter (DMM)
- Automated Optical Inspection (AOI) detects
 - Rotated or incorrect components
 - Bent pins
 - Missing pins
 - Unseated connectors
- Stores all images and test results
- Virtually unlimited test-points
- Co-ordinate measurements

Let us put our expertise to work for you!



Why use ERNI? Our Quality is our Reputation

At ERNI, quality is more than an expectation, it's our reputation. We have been designing and building our own connectors since 1960. We build our own connector manufacturing equipment, our own computer-controlled assembly presses and our exclusive, fully automated Press-In Robotic Centers. Our customers know the difference and our customers expect the best. They expect it from ERNI.



Services and Products

- Produce and assemble any component from any manufacturer
- Customers further reduce material costs with ERNI products
- No tooling charges when ERNI connectors are used
- Customized connector tooling available
- Production localized to customer requirement
- "Red Carpet "service for quick turn and delivery
- No Job is too small or too large

You pick a starting point, ERNI joins you from there

- 1 Conceptualization
- 2 Pre-design simulation
- 3 Design
- 4 Prototyping
- 5 Design verification + approvals
- 6 Pre-volume manufacturing
- 7 Localized volume manufacturing

Engineering and Manufacturing

- Let us combine your ideas, ERNI products and our engineering experience to bring your product to reality
- ERNI can help at any stage of your systems development with support from concept to volume manufacturing
- Backplane re-engineering to leverage cost effectiveness and improve performance
- Flexibility to move production between the continents with redundant ERNI facilities in North America and Europe
- Low NRE charges for test set-up procedures
- We build our own connectors, tooling and presses which provide our customers the highest level of experience
- Highest level of automation of any systems manufacturer



Quality and Security

- Our high quality standards confirm that, if ERNI builds it, it will be built right
- State-of-the-Art Testing
- Maximum 3 day set-up time for testing due to the flexibility of our testing capabilities
- ISO 9000 certified
- UL certified
- IPC-A610 certified Trainer on staff
- All Operators are IPC-A610 certified
- IPC-A610 quality capability from level 1 to 3
- Registered with the Department of State

**Whatever you want:
To Standard. To Size. To Deadline. To Quantity. To Concept.**

ERNI system manufacturing is a genuine turnkey collection: Manufacturing of customized backplanes and complete systems in small and large production runs. When you watch our EPC III pick-and-place Robot Center in operation, it's clear how much ERNI know-how there is in automation. From tape-and-reel packaging to the shape and color of component housing; from SMT, THR or press-fit connections to specially developed tools; each individual process is optimized for automated processing. Optical Inspections the position of the contacts before press-fitting with a defined force. The printed circuit boards are soldered, wired and checked as necessary. We use technological advances in system technology with our customers.

Expect from your system manufacturer. Expect it from ERNI.

ERNI Electronics, Inc.

The Technology Center



Connectors

Development + Production



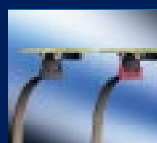
Backplanes and Complete Systems

Development + Production



Soldering

Development + Production



Cable Assembly

Development + Production

ERNI Electronics, Inc.

3005 E. Boundary Terrace
Midlothian, VA 23112 USA
Tel: +1 804-228-4100
Fax: +1 804-228-4099
info@erni.us

ERNI Electronics GmbH

Seestrasse 9
73099 Adelberg / Germany
Tel: +49 71 66 / 50-0
Fax: +49 71 66 / 50-282
info@erni.de

ERNI Asia Holding Pte Ltd

Blk 4008 Ang Mo Kio Avenue 10
#04-01/02 Techplace I
Singapore 569625
Tel: +65 6 555 5885
Fax: +65 6 555 5995
info@erni-asia.com



Let's Get Started Quote Request Form

How can we help you?

Please circle

Board Assembly / Cable / Sub-Rack

Date _____

General:

Customer name _____
Address _____
Project name _____

Your Name _____
Your E-mail address _____
and / or telephone number _____

Your reference number _____

What would you like?

Estimated yearly usage
Units _____

Systems / Backplanes / Cables
Please circle

Quote breaks	Order Qty.	_____	Order Qty.	_____	Order Qty.	_____
Target value in Dollar	Batch Qty.	_____	Batch Qty.	_____	Batch Qty.	_____

Expected delivery on first project

days / weeks please circle _____

Expected lead time

days / weeks please circle _____

Job status

Please circle

New / existing / rework / other _____

Please circle

Assembly level

Please circle

Turn-key / Partial CSI / Labor only / other

supplied inventory

please specify on comments

Your ideas

Job status

Please circle

Single side / Double side + Multilayer / # of layers _____

Board dimensions (mm / inch)

Please circle

X: _____ Y: _____ Board thickness _____

Drill holes in PCB

approx. quantity

_____ Smallest drill hole in PCB _____ (mm / inch)

Material type

_____ RoHS Compliant Yes / No
Please circle

Surface finish

Please circle

Tin / Gold / Matte / Copper / Silver / Other _____
Lead _____
Sn _____

Electrical test

Please circle

Yes / No If 'yes', customer we would appreciate if we could get the IPC356 Netlist from you

Please specify supplier, if you have a preferred supplier

Or can ERNI use its own preferred supplier? Yes / No
Please circle

Please include contact information for PCB supplier (if using your specified supplier)

Company / Contact name / Contact phone / Contact price (\$) _____

In order to provide you a fast and accurate quote please include the following:

- Gerber files (if ERNI is procuring PCB's)
- Assembly drawing
- IPC-356 Netlist (if ERNI will be performing test)
- Detailed BOM with reference designators and AVL list
- Component placement file (for SMT)

Please note any special requirements below:

Need help filling out this form? We can help you through the process.

Call us at (804) 228-4100 or just fax your form to (804) 228-4099.

If you prefer to PDF this questionnaire and want to send it along with your data package, please E-mail it to: ernisystems@erni.us