



# ERNI Systems Technology

Backplanes and Complete Systems: Design, Simulation, Production and Test

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# Development – From beginning to end

## Product concept

- From idea to the specification sheet
- Structuring
  - Connector selection
  - Shape factor
  - Communication and connection structures

## Equipment

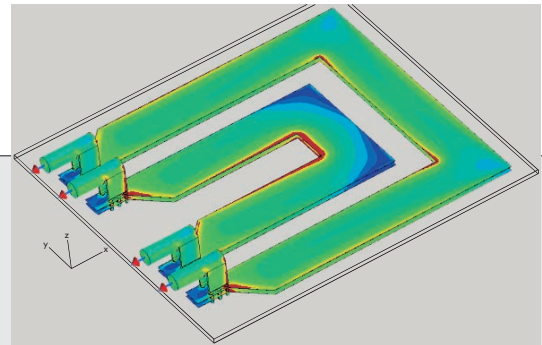
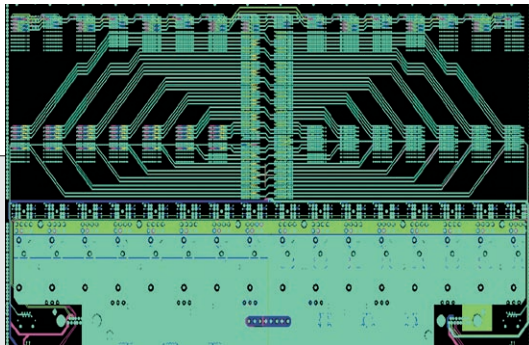
- Experienced team of developers - with over 20 years of development experience

## Simulation

- Electrical
  - Current distribution
  - Signal integrity
- Thermal

## Equipment

- CST MICROWAVE STUDIO®
- Agilent ADS®
- Flomerics CFD®



# ERNI component assembly

## Pressfit technology

- Fully automatic pressfit assembly with automated inspection (AOI)
- Hand press systems with PC control
- Process control and monitoring, recording the press-in forces
- Tools available for all connector designs
- Suitable for large sizes (1400 mm x 600 mm)

## Soldering technology

- Vapor phase soldering system
- Convection soldering system
- Selective soldering system

## Cable production

- IDC, crimping, soldering, etc.
- Fully automated systems for IDC ribbon cable
- Fully automated IDC single strand
- Fully automatic crimp center
- Semi-automated systems for medium unit quantities: stripper crimper, IDC, etc.
- Printing
- Tests performed alongside production

Let our experience work for you!

### System layout

- Signal routing and optimization
- Component positioning
- Power supply
- Electrical safety

### Equipment

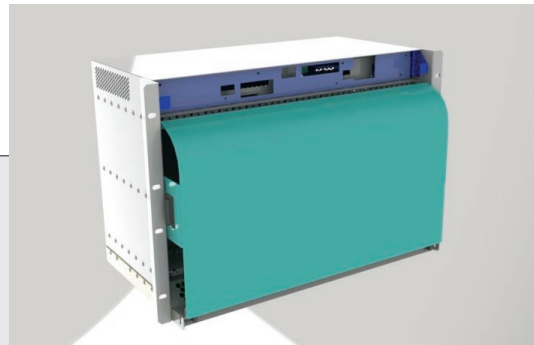
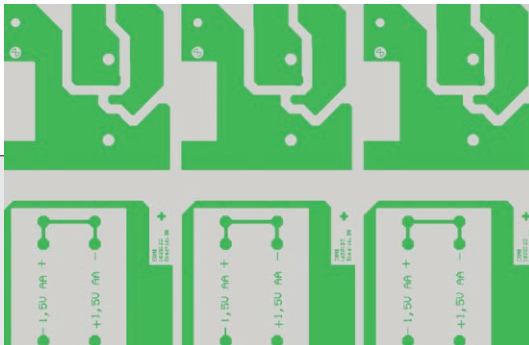
- ORCAD®
- Mentor Integra®
- Mentor Expedition®
- Bartels AutoEngineer®
- Solid Works®

### Mechanical construction – electronic packaging

- Sheet-bending structures
- Profile-based structures
- Composite designs

### Equipment

- Solid Works®



### Subracks/integration

- Housing, backplane, voltage supply, fan, cabling
- 4 ESD assembly lines for subracks
- Fully equipped testing stations for the safety test and system/function tests
- Electrical and mechanical accessories for a ready-to-deliver product
- Packaging

### Final inspection of backplanes

- Fully automatic backplane test (AOI and electrical check)
- Solutions for high contact density (> 100,000 test points, PCBs up to 1400 mm x 600 mm)
- Connection test (up to 2 A and 4-pin measurement), insulation test (up to 1500 V) and check of passive components
- Impedance test upon request
- Additional tests upon request

# ERNI Systems' range of services

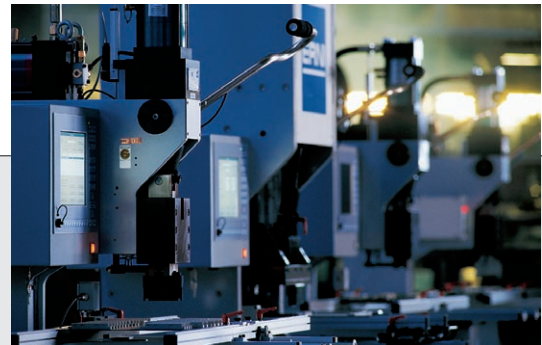
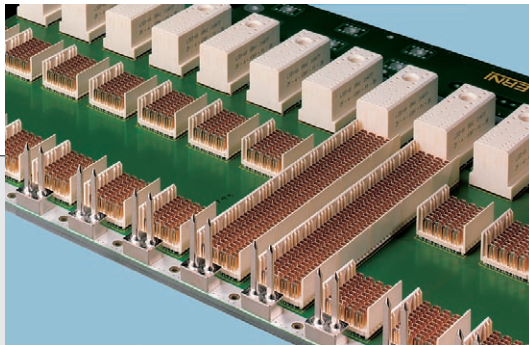
## From prototype to series product

### Prototype construction

- Strategic partnerships with PCB manufacturers and mechanical component producers
- Resources for prototypes

### Small batch production

- Variable production without minimum unit quantities
- Semi-automatic assembly
- Alternative production in North America and Europe
- ERNI EPC3X Hydropneumatic Pressfit Center
- Evaluation of the production efficiency
- Production process oriented toward volume



### Express PCB production

- 24h assembly service

### ERNI EPC3X overview

- Process monitoring
- Slide table
- PCB thickness monitoring
- Up to 30 kN press-in force

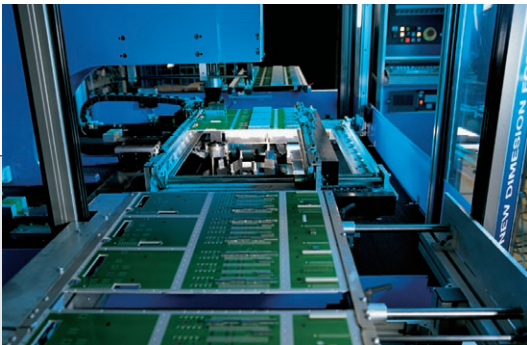
### Supplier management

- PCB and SMT
- Statistical process control (SPC)
- Adapters and tools directly from ERNI

Let our experience work for you!

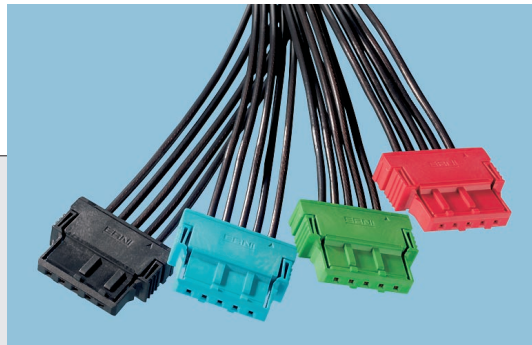
### Global series production

- Fully automatic pressfit assembly with automated inspection (AOI)
- Hand press systems with PC control
- Process control and monitoring, recording the press-in forces
- Tools available for all connector designs
- Suitable for large sizes (1400 x 600 mm)
- UL-certified production E 258941



### Global cable series production

- Supplier management
- Cable production  
IDC, crimping, soldering, etc.  
Fully automated systems for IDC ribbon cable production  
Semi-automated systems for medium unit quantities  
Printing  
Tests performed alongside production
- High degree of automation in cable production and testing



- Logistical service around the world
- Semi-automatic pressing-in
- Fully automatic pressing-in
- Maximum PCB size:  
1400 mm x 600 mm x 10 mm

- Tests performed alongside production
- Micrographs for production approval in the cable production
  - Extraction force tests
  - IPC-A620 class 2
  - Visual inspections following every operation
  - Adjustment gauges, check of the torques, etc. during assembly operations
  - UL-certified production E 332028

Logistical service around the world  
Flat and round cables, crimp, IDC, soldered

### Logistics and strategic partnership

- Global procurement of PCBs and components
- Supplier evaluation

- Preferred suppliers
- QA agreements and audits
- Prototypes in shortest time
- Customer-specific logistics agreements
- High quality standardd

# ERNI integration Subrack production

## Complete subrack solutions

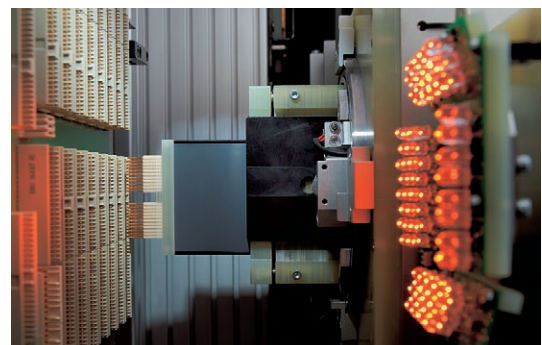
- Chassis with
  - Backplane
  - Power supply
  - Ventilation
  - Cooling units
  - Cables
- ESD protection at assembly line
- State-of-the-art automatic test equipment
- Comprehensive consultation for all aspects, such as
  - Mechanics
  - Security
  - System monitoring
  - Heat dissipation
- Customer-specific packaging



## Test from A to Z

### State-of-the-art test

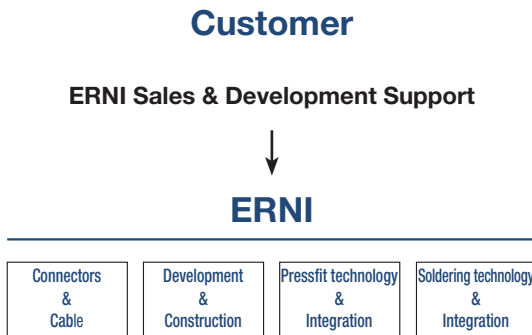
- Every pitch, every connector, every BP size
- Low set-up costs, quick test set-up
- Test against circuit network list
  - Continuity
  - Insulation
  - Passive components
- Automated optical inspection (AOI) recognizes
  - Twisted or incorrect components
  - Bent pins
  - Missing pins
  - Incompletely pressed-in connectors
- Stores all images and test results
- No restriction for test points
- Coordinate measurement



Let our experience work for you!

# Quality is our obligation

We have developed and built our connectors since 1960. We design and build our own connector production equipment, our own computer-operated connector presses and our unique fully automatic press-in center with robot technology.



## Services and products

- We install components from every manufacturer
- Cost reduction when using ERNI products
- No tool costs if ERNI connectors are used
- Customer-specific connector development and production
- 24-hour service for express production and delivery
- No order is too small or too large

## Development phases

- |   |                                       |
|---|---------------------------------------|
| 1 | <b>Concept creation</b>               |
| 2 | <b>Pre-design simulation</b>          |
| 3 | <b>Design</b>                         |
| 4 | <b>Prototyping</b>                    |
| 5 | <b>Design verification + approval</b> |
| 6 | <b>Pre-production series</b>          |
| 7 | <b>Local series production</b>        |

## Development and production

- We combine your ideas, ERNI products and the development experience of our engineers in order to have your product created
- ERNI can help you during every stage of your system development, from the design to the series production
- Backplane revision for cost reduction and to increase system performance
- Flexibility to relocate production internationally between similar production facilities
- Low one-off costs for test set-ups
- We build our own connectors, tools and presses, whereby our customers are offered a high level of experience
- Highest degree of automation of all system production providers

## Quality and reliability

- Our high quality standard ensures that ERNI production is good production
- State-of-the-art test technologies
- Maximum of 3 day test set-up time thanks to the flexibility of our testing options
- ISO 9000 certified
- UL approved
- TS 16949 in planning
- All machine operators are IPC-A610 trained
- IPC-A610 class 2

## Whatever you need:

In line with your design. In line with your schedule.

Whatever your unit quantity.

ERNI Systems is an ideal solution for a “ready-for-operation” production service: We produce customer-specific backplanes and complete system platforms in small and large unit quantities. If you see our EPC III pick-and-place pressfit center in operation, then you know how much ERNI know-how the production contains. From tape-and-reel packaging to the shape and color of component housing; from SMT, THR or pressfit connections to specially developed tools: Each individual process is optimized for automated processing. The measurement of the position of the contacts is performed by camera systems before pressing-in with a defined force. The PCBs are assembled, soldered and then tested as per exact specifications. We apply all the technical advances of system technology for our customers.

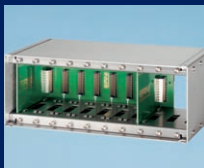
## ERNI Electronics GmbH

The Technology Center



### Connectors

Development + Production



### Backplanes and complete systems

Development + Production



### SMT & THT Soldering

Development + Production



### Cable assembly

Development + Production

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