ACT.
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# Connector Product Selector Guide

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Industrial ▪ Automotive ▪ Communication ▪ Transportation ▪ Medical ▪ Military

# Board-to-Board Interconnect Solutions

| Product Family / Attributes | DIN 41612 | ERmet ZD/ZD+ (HMZD / HMZD+) | ERmet (2mmHM) | ZDHD | MicroSpeed Power | MicroSpeed | MicroStac | PCIe | SMC | MiniBridge | Dsub |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Configurations** | B, M, C | B, M(ZD), C | B, M, C | B | M, B, C | M, B, C | M | M | M, B, C | C | C, B, M |
| Board-to-Board separation (mm) (nominal) | 16.8 | 15, 18 | 15, 18.4 and 25 | - | 5 thru 20 | 5 thru 20 | 3, 5 | 5.84, 11.18 and 16.69 | 8 thru 20 | - | 17.5 thru 26.5 |
| Contact pitch (mm) (col.x row) | 2.54 | 2.50 x 4.5 (pair to pair) | 2.00 | 1.80 x 3.60 (pair to pair) | 2.00 | 1.0 x 1.50 1.0 x1.25 (7-row) | 0.80 | 1.00 | 1.27 | 1.27 | 2.75 x 2.54 |
| Open or differential pinfield | Open | Differen-tial | Open | Differen-tial | Open | Open | Open | Open | Open | Open | Open |
| Application data rate (approx) | 500MHz | 5 - 20 Gbps | 2Gbps | 25Gbps | - | 10Gbps | 500MHz | 12Gbps | 1Gbps | - | 100MHz |
| Termination method ** | Sldr / THR / PF | PF | PF / THR | PF | SMT / THR | SMT / THR | SMT | Sldr/THR | SMT / (PF) | SMT | Sldr / THR / PF / SMT |
| Number of mating rows | 2, 3, 4, 5 | 2, 3, 4 (pairs) | 5, 8 | 6 (pairs) | 1 | 2, 7 | 1, 2 | 2 | 2 | 1 | 2 |
| Number positions or pairs available | 20 - 160 | 20, 30, 40, 45, 60 pairs | 55 - 200 | 84 pairs | 5 | 50, 91 and 133 | 6-20; 50 and 54 | 36, 64, 98, 164, 230 | 12 thru 80 | 2, 4, 6 | 9, 15, 25, 37 |
| Strain relief (additional) | - | - | - | - | Yes | Yes | No | - | Yes | Yes | Yes |
| Interface design | Pin & Socket | Pin & Socket | Pin & Socket | Pin & Socket | Pin & Socket | Pin & Socket | Stamped, 2-points of contact | Edge card | Pin & Socket | Pin & Socket | Pin & Socket |
| EMLB available | Yes | Yes | Yes | No | No | No | No | No | No | No | No |
| Shielding | No | Yes (internal) | Optional | Yes (internal) | Yes | Yes | No | No | No | No | Yes |
| Number of cycles (PL2) | 400 | 250 | 250 | 250 | 500 | 500 | 10 | 50 | 500 | 500 | 250 |
| Current rating [A] per contact | 2.0 A | 0.8 A | 1.5 A | 0.6 A | 8.0 A | 0.8 A | 1.25 A | 1.10 A | 0.8 A | 3.0 A | 3.0 A |
| PCB locating posts | Optional | No | Optional | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

** PF = Press-Fit SMT = Surface Mount Sldr = Solder THR=Through-Hole Solder
B = Backplane M = Mezzanine C = Coplanar

# Wire-to-Board & I/O Interconnect Solutions

| Product Family / Attributes | MaxiBridge | iBridge | MiniBridge | SMC | IDC Contact | PowerTap | Power Elements | ModJacks | Dsub | DIN | M8/M12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Configurations | Wire -to- Board | Wire -to- Board | Wire -to- Board | Wire -to- Board | Wire -to- Board | Wire -to- Board | Wire -to- Board, I/O | I/O, Wire-to-Board | I/O, Wire-to-Board | I/O, Wire-to-Board | I/O |
| Contact pitch | 2.54mm | 2.0mm | 1.27mm | 1.27mm | min spacing | min spacing | min spacing | 1.02mm | 2.75 x 2.54mm | 2.54mm | - |
| Approximate BW (3dB) | n/a | n/a | n/a | 1Gbps | n/a | n/a | n/a | 1GbE | 100MHz | 500Mbps | 1Gb |
| PWB termination/ method** | SMT | SMT, Sldr | SMT | SMT, PF | SMT | Sldr, PF | PF | Sldr, SMT | Sldr/ THR/ SMT/ PF | Sldr/ THR/ SMT/ PF | SMT/ Sldr |
| Wire termination/ method | Discrete Crimp | Discrete Crimp | Ribbon/ Discrete IDC | Ribbon IDC | IDC | n/a | n/a | n/a | Ribbon & Discrete IDC/Crimp | Ribbon IDC & Discrete Crimp | Finished Assemblies |
| Number of rows | 1, 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 3, 5 | - |
| Number positions available | 2, 3, 4, 5 6, 8, 10, 20 | 2 - 12 | 2 - 12 | 12 - 80 | 1 | 1 | 1 | 6, 8, 10 | 9, 15, 25, 37 | 48, 96, 160 | 3, 4, 5 8, 12 |
| Wire AWG | 16, 18, 20, 22, 24, 26 | 22, 24 | 24, 26 | 30 | 22, 24 | - | - | 22, 24 | 22 - 26 | 20 - 26, 24 - 28 | 22 - 24 |
| Latching | Yes | Yes | Yes | Yes | n/a | n/a | n/a | Yes | Yes/ hardware | Yes/ enclosures | Yes |
| Strain relief (additional) | Yes | Yes | Yes | Yes | Yes | - | - | Yes | Yes | Yes | Yes |
| Shielding | No | No | No | No | n/a | n/a | n/a | Yes | Yes | No | Yes |
| Number of cycles (PL2) | 500 | 30 | 500 | 500 | 1 | n/a | n/a | 1000 | 250 | 400 | 100 |
| Current rating [A] per contact | 8.0 A | 5.0 A | 3.0 A | 0.8 A | 5.0 A | 35 A | 250 - 450 A | 1.0 A | 3.0 A, 30 A (Power contacts) | 2.0 A | 4.0 A |

** PF = Press-Fit SMT = Surface Mount Sldr = Solder THR - Through-Hole Solder

# ERNI Board-to-Board, Wire-to-Board

## DIN 41612/IEC

Legacy and proven connector system supports multiple industry segments, focusing on applications demanding ruggedness and reliability over the life of the product. The numerous versions and options available today make it ideal for a wide range of applications and systems requirements.

- Standard and inverted configurations
- Power and coax contacts for mixed signal applications
- Low and high density options extending to 160 pins
- Cable and enclosure offerings for I/O extensions

## D-sub

Popular D-shell I/O interface used for general purpose signaling between host systems and peripheral devices. ERNI advantages include multiple termination options to the pcb, power contacts (stamped and screw machine up to 30A) and various shells/enclosures to complete the application.

- Full SMT, PF and Solder options available
- Stamped contacts on shell to optimize EMC (no dimples)
- Rugged enclosures with shielding options
- Anti-torque design on threaded bolts

## ERmet (2mm HM) ZD, ZD+, ZDHD

Industry standard connector series that accommodates versatile and cost-effective board-to-backplane and board-to-board requirements for high density and high performance applications.

- Most complete Hard Metric product family in the industry
- ERmet ZD/ZD+ extends data rates to 20Gbps
- THR options available in ERmet 2mm for diverse PWB processing
- ZDHD supports 84 pairs/linear inch, up to 25Gbps
- Mixed signaling; power and coax options
- Robust shield design protects differential pairs

## iBridge 2.0mm

Newest addition to ERNI's WtB solutions. Popular 2mm pitch offering facilitates medium density requirements while ensuring robust connection between cable and PCB. ERNI provides full turnkey cable solutions.

- Through-hole solder and SMT terminations options
- Polarized housing on PCB footprint and interface
- Contact guide and latching inside housing for added robustness
- Reliable latching system with audible click
- Rated up to 5A per conductor
- Accepts 22 and 24 AWG wires

## IDC PCB

One of the smallest terminals, this SMT contact and IDC technology eliminates wire preparation and the need for hand soldering. The robust strain relief design provides a sustainable connection for any single wire-to-board application.

- Feed-through or back-stop housing options
- Reliable 2- IDC terminations to wire
- No tooling required for wire terminations
- Accepts 22 and 24 AWG wire
- Extremely short height (closed = 2mm)
- Solid and stranded wire constructions

# & I/O Solutions...

## M8/M12 Circular

Popular and growing defacto-standard connector system, in support of multiple industry segments. New offerings include shielded housings and high pincount solutions for high performance/high density I/O requirements.

- SMT terminations and specific THR versions
- 9 and 13mm height options from main board
- I/O Boxes available as accessory item
- Coded interfaces for industry standard applications
- IP65/67 rated
- NEW horizontal mount version available

## MaxiBridge 2.54mm Cable

Single row (2.54mm) cable connector system designed for high reliability, space saving connections between PCBs and other interconnect solutions. Small outline on PCB surface supports high density PCBAs without compromising a rugged latch system. Enhanced receptacle contact design in a secure clam-shell enclosure.

- SMT terminations with added strain relief on header connectors
- Multi-colored housings for visual coding during systems integration
- NEW 2-row offerings available
- Approximately 8.0A per contact
- Positive latching cable-to-header

## MicroSpeed & MicroSpeed Power

2-row, 50 position standard interface with open pinfield design to support single-ended and differential signaling requirements. Shielded housings to enhance overall performance while mitigating EMI issues in demanding medical and industrial environments.

- SMT terminations with strain relief on both connector halves
- Full SMT or THR shield options to support routing objectives
- 91 and 133 position array connector options
- Any stack height allowed from 5 to 20mm
- Polarized interface and PCB alignment posts

## MicroStac 0.8mm Mezzanine

Unique hermaphroditic design to ensure 2 points of contact in a stamped interface. High density package supports small outline requirements without compromising reliability or integrity of the interface over the life of the product.

- 5mm standard stack height; 3mm variant with latch interface
- 2 points of contact - rugged and reliable in a small package
- SMT terminations in single/dual row solutions
- Single part# mated solution

## MiniBridge 1.27mm

Growing in popularity in LED lighting applications, this single-row but versatile product line continues to support commercial and industrial applications where demanding signal/power solutions are required. Ruggedized design with a very low profile.

- Added strain relief on PCB mounted headers
- Receptacle housing supports passive or active latch options
- SMT signal/power contacts
- Ribbonized or discrete wire options

# ...Designed for Better Connections

## Modular Jacks

ERNI continues to support this ever popular I/O form factor in single module, single- and dual-bank RJ45 series. Available with or without magnetics and LED options.

- High temperature housing material
- Solder or SMT terminations
- Shielded housing with or without panel tabs
- Multi-color LED options

## Power Elements Power Taps

Newest product offering to the ERNI family of interconnect solutions. High power wire-to-board connectors with press-fit terminations. Gas-tight interface to the PCB via without need of high temperature soldering and negative effects on the PCB substrate. Various sizes and configurations available; customs available upon request.

- Standard Metric threads (English /UNC also available) on Power Elements
- Elements include a unique compliant press-fit variant for improved electrical performance
- Current ratings from 30A up to 450A
- 6- & 10-pin Taps, Solder or PF

## SMC 1.27mm

This popular pitch offering continues to grow in demand. Result has been a wide variety of pin counts and configurations over the life of the product family, supporting almost any BtB or WtB application requirement. ERNI also offers full turnkey cable solutions.

- Press-fit headers for thick backplanes where SMT is challenged
- SMT signal conductors with added strain relief
- Polarized interface and PCB locating posts (pick-n-place)
- Vertical or right-angle options
- Active latch on cable receptacle housing; ribbon

## PCIe Horizontal Connectors

This standard edgecard interface for PCIe applications is designed to meet height constrained architectures without the need of interposer boards (riser cards) that ultimately compromise reliability over time. Multiple height options and special requirements upon request.

- High temperature housing material
- Solder or THR terminations
- x1, x4, x8, x16 and x24 variants supported
- PCIe 100ohm and 85ohm supported part#s

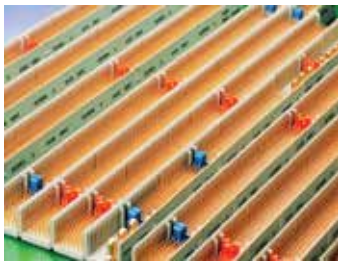
## Icon Key:

Wire-to-Board | I/O | Mezzanine | Backplane | CoPlanar

# Market Segments & Applications

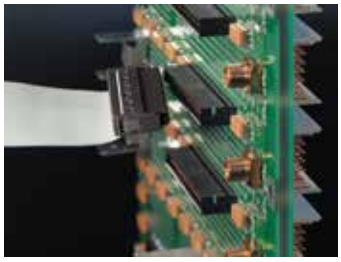
| | Dsub | DIN 41612 | ERmet (2mm HM) | ERmet ZD/ZD+ | iBridge | IDC Contact | M8 / M12 | MaxiBridge | MicroSpeed | MicroSpeed Power | MicroStac | MiniBridge | ModJacks | PCIe | Power Elements | Power Taps | SMC | ZDHD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Market Segments** | | | | | | | | | | | | | | | | | | |
| **Consumer** | | | | | X | X | | | | | X | | | | | | | |
| **Industrial** | | | | | | | | | | | | | | | | | | |
| Automation | X | X | X | | X | | X | X | X | X | X | X | X | | X | X | X | |
| Heavy Equipment | | | | | X | | | X | | | | | | | X | X | | |
| Goods Processing | X | X | X | | X | | X | X | | | | | X | | X | X | X | |
| **Medical** | | | | | | | | | | | | | | | | | | |
| Ultrasound | X | | X | X | X | | | X | X | X | | X | | X | | X | X | |
| Diagnostics | X | X | X | X | X | | | X | X | X | X | X | X | X | | | X | |
| Imaging | X | | X | X | X | | X | X | X | X | | X | | | | | X | |
| **Automotive** | | | | | X | | | X | | | | X | | | X | X | | |
| **Transportation** | | | | | | | | | | | | | | | | | | |
| Railway | | X | | | X | | X | X | | | | X | | | X | X | | |
| Multi-axle | | | | | X | | X | X | | | | X | | | X | X | | |
| **Military/Aero** | | | | | | | | | | | | | | | | | | |
| Multi-media (Aero) | X | X | X | X | | | | X | X | X | | | | | | | | |
| Backplane/Systems | | X | X | X | | | | X | X | X | | | | X | X | X | | X |
| **Datacomm** | | | | | | | | | | | | | | | | | | |
| Telecom | X | X | X | X | | | | | X | X | | | X | X | X | X | X | X |
| Networking | X | | X | X | X | | | X | X | X | | | | X | | X | X | X |
| **Instrumentation** | | | | | | | | | | | | | | | | | | |
| Electronic Test & Measurement | | X | X | X | | | | X | X | X | X | X | X | X | | | X | X |
| Lab Analyzer | | X | X | X | | | | X | X | X | X | X | X | X | | | X | X |
| **Entertainment** | | | | | | | | | | | | | | | | | | |
| Gaming | X | X | X | | X | X | X | X | | | X | X | X | X | X | X | X | |
| Set-top | X | | | | X | X | | X | | | X | X | X | X | | | X | |
| Consoles | X | | | | X | X | X | X | | | | X | X | | | X | X | |
| Audio | X | | | | X | X | X | X | | | X | X | X | | | | X | |
| **Applications** | | | | | | | | | | | | | | | | | | |
| **Power** | X | X | X | | X | X | | X | | X | | X | | | X | X | | |
| **Signal** | X | X | X | X | | X | X | | X | | X | X | X | X | | | X | X |
| **High Speed data** | | | | X | | | | | X | | | | | X | | | | X |

# Vertically Integrated (Value-Added Services)



## Backplane Services

When it comes to backplane and application specific assemblies - think ERNI. Our flexible manufacturing footprint is ideal for small batch as well as production volume programs. ERNI supports customer specific backplanes and fully qualified finished assemblies with automatic optical inspection and options for RoBat electrical test. Our press-fit expertise and in-house capability makes us an ideal partner for development and production volumes where press-fit terminations are required. Semi-automated and fully-automated capabilities provide a consistent and quality finished product.



## Custom PCBAs

Internal capabilities continue to expand. Customers turn to ERNI for interposer and special adaptor boards that begin with an ERNI interconnect solution. Our Systems Team works with customers during design/development to enhance the design cycle, or accept an existing design that will benefit from a small yet experienced manufacturer with the flexibility to support pre-production and full production quantities. Assemblies benefitting from pick-n-place and reflow processes, for both backplane and custom PCBAs, have been added to support surface mount and through-hole solder terminations.

## Cable Assemblies

Our growing portfolio of wire-to-board products has enabled the opportunity for ERNI to provide standard and custom assemblies with ERNI content. Cable plant solutions include flat/ribbon, round bundled and discrete wire, in IDC or crimp terminations. Fully-automated or hand-assembled options support a variety of interconnect applications and custom assemblies. Our low minimum requirements are ideal for those development phases or small batch runs, to include higher volume programs with the same electrical test and quality expectations. Turn to ERNI for your custom cable assembly applications.

ERNI Electronics is ITAR compliant.

## About Us

ERNI Electronics is a leading global manufacturer and worldwide supplier of a broad line of interconnects for the telecommunications, data communications, computer, industrial and medical markets. The current product range covers PCB connectors and I/O connectors, backplanes (development, production and 100% testing), cable connectors, housings, systems, tools and presses. ERNI Electronics GmbH & Co. KG belongs to the international ERNI Group of companies specializing in electrical engineering and electronics. ERNI has manufacturing operations in Europe, North America and Asia, as well as sales offices in over 40 countries. ERNI products are also marketed via a worldwide network of representatives and leading distributors.

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