

# Design <sup>fax</sup>

Tech for OEM Design Engineers

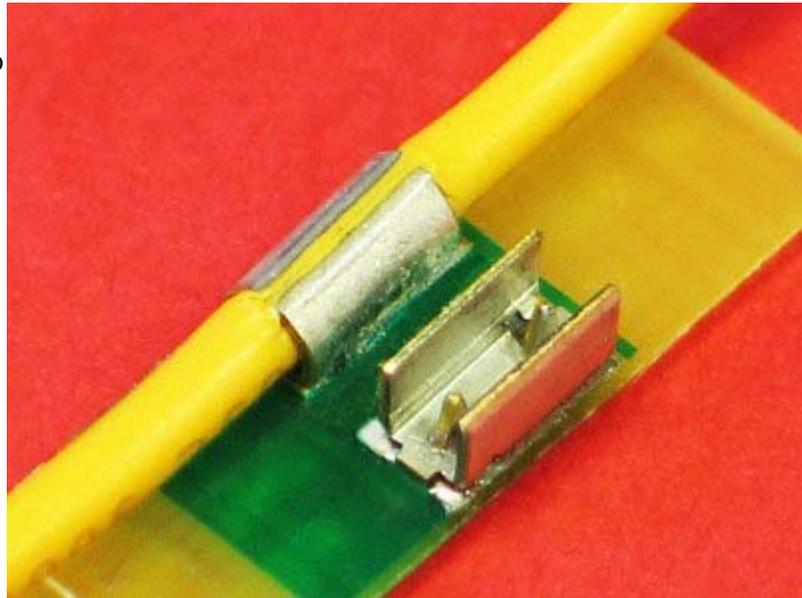
## Engineer's Toolbox: Clever PCB wire connector makes for snappy assembly

**N**o one says that you have to use an award-winning connector for joining wires to your board, but why not give something great a go?

Zierick Manufacturing Corporation (Mt. Kisco, NY) has been named the 2009 recipient of the prestigious Higgins-Caditz Award presented by the Precision Metalforming Association in its annual "Awards of Excellence in Metalforming" competition.

What's all the fuss about?

Zierick was honored for its new Surface Mount Insulation Piercing Crimp Terminal and the tools that quickly and easily terminate a wire to surface mount printed circuit boards. This new metal-stamping-based system features many unique advantages including reduced production costs, improved reliability, and faster processing speeds.



*Zierick's wire-to-PCB connector solution combines the advantages of crimping, insulation piercing, and Surface Mount Technology into a highly reliable and economical way to terminate wires. **If you'd like to read Zierick's winning Higgins-Caditz Award entry paper (.pdf), complete with all the engineering specs, usage, and test data, please [click here](#).***

Engineers in the electronic packaging business know that wire-to-board connection is considered one of the most costly and troublesome steps in the process. Zierick's new method of termination combines the advantages of crimping, insulation piercing, and Surface Mount Technology into a highly reliable and economical way to terminate wires. The system consists of a surface-mount terminal and a terminating machine that feeds the wire into the connector and makes the termination.

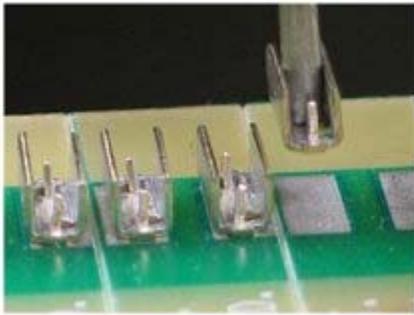
While the new Zierick Surface Mount Insulation Piercing Connector Terminal System and termination tools can be used whenever a wire needs to be permanently connected to an SMT board, its most popular use is for instances where the wire passes through the terminal and numerous serial connections are made to one single wire. A good example of that kind of application is channel block lettering, where a series of LEDs is attached to a pair of wires.

Compared to conventional methods, the new system is less expensive than a two-piece pin/socket connection or an IDC (insulation displacement connector) type of connection that provides strain relief. It is more cost effective than soldering wires to a board by hand. Yawn! And it also takes up very little area on the printed circuit board.

### How it works

The terminal has a flat base and two sidewalls perpendicular to the base. Two insulation-piercing contact spikes protrude from the flat base. Between the contact spikes there is a flat area to facilitate vacuum pick-up and

terminal placement. There are two deep score lines near the transition area between the sidewall and the base of the terminal.



The new Zierick process begins with the terminal being placed on, and soldered to, the SMT board together with the other required components. After the assembly goes through reflow, it is moved to the terminating machine which feeds the wire into the terminal and crimps the terminal walls over the wire. In the process, the insulation piercing spikes penetrate into the wire without the necessity of

removing the insulation. The spikes make contact with the wire strands. The terminating tool wraps the crimp ears around the wire, pushing the two spikes into the center of the wire and ensuring a good electrical connection.

The crimp not only facilitates the contact, but it also provides excellent strain relief for the wire. The two score lines on the terminal wall ensure that no deformation is introduced near the edge of the solder fillets, thereby preventing cracking and peeling of the solder joint.

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