

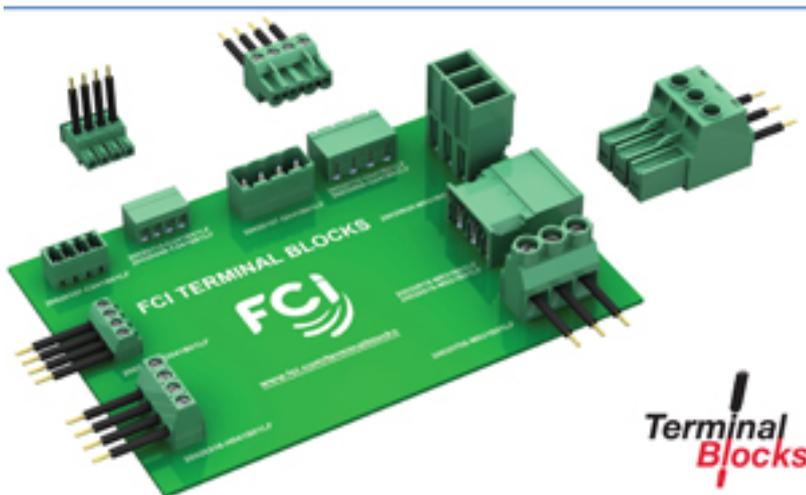
## Miniaturization and Through-hole Reflow Tech Drive Terminal Block Advancements

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Terminal blocks have been around a long time, but they are still popular choices as interconnect solutions and continue to evolve based on users' current application needs. Approximately nine out of 10 PCB boards currently supplied to FCI customers require a terminal block component, and the terminal block industry is growing at a rate of 8.2 percent annually, despite being considered an "old" product group. The technology is still valid and useful, and since they are used in just about every PCB, as the need for PCBs continues to grow and expand, so does the need for terminal blocks.

Many of today's terminal block manufacturers only sell terminal blocks—they have every possible terminal block a customer could want, from A to Z, and they are very focused on the assembly of terminal blocks, but they do not provide other interconnects. Purchasing terminal blocks through a connector supplier that offers the full breadth of interconnects, however, allows customer more options as well as the ability to mix and match products to ensure specifying the best possible solution for a system design.



Only some connector manufacturers have extensive experience with making and marketing proven standard PCB connectors for board-to-board, wire/cable-to-board and rectangular I/O connector applications, and can easily leverage that expertise in developing a complete terminal block product line. Although buying terminal blocks from a

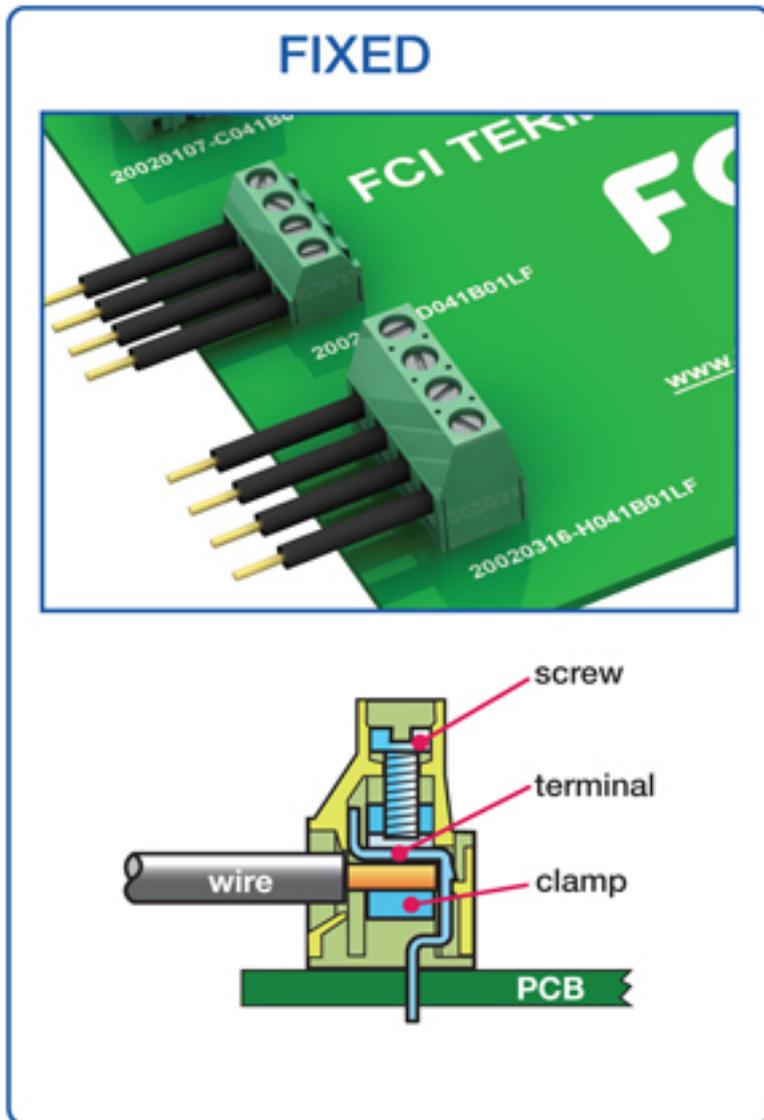
company that makes only terminal blocks does guarantee a certain level of expertise and quality, it cannot offer a one-stop shop for all the connector requirements of a system design.

Reduced installation cost, miniaturization, throughhole reflow technology and high power are the areas that will drive advancements in terminal block designs. Upcoming technology advances will include spring contact versions, which simplify installation and can reduce system costs. There will also be an increased number of power products made available, as well as throughhole reflow products. Many of these innovations are being driven by the OEMs in the datacom and telecom industries in addition to the industrial OEMs. Big OEMs all use terminal blocks in their designs and now they are looking for trusted connector manufacturers to supply them so that they can reduce their supplier base.

So what does a design engineer need to consider in specifying a terminal block for today's applications?

### **Throughhole technology**

In today's market, customers want to reduce costs by reducing assembly and installation time, often with automatic component placement and reflow soldering. To do so, pin-in-paste technology is a must. Throughhole reflow products have been utilized in all industries for different types of connectors (like pin headers) for many years now. Throughhole technology is especially beneficial to big OEM customers because it allows for fully automated production that results in higher production volumes and shorter time-to-market. This will be a driver in future terminal block sales, so more suppliers will be offering this technology on more of their products in the very near future. Where throughhole technology was once a rare option in terminal block products, it is quickly becoming the standard.



## Reduced installation costs

Previously, all terminal blocks used screw-type technology, which was time consuming and challenging for installation in the field. Most terminal blocks have an average pole number of eight to 10, and there may be numerous terminal blocks in a single assembly. If a user has to unscrew and screw each connection during installation or maintenance it can take quite a bit of time. The spring contact versions, however, reduce this amount of time significantly and are being incorporated more and more often into new designs because of their ease-of-use. It reduces the time and requires less equipment. A lot of customers may still believe that the screw version offers a more reliable and durable connection, but the spring versions are designed today to meet the standards and specifications required for most applications.

## Rising cage clamp contacts

A lot of terminal blocks are used in true consumer applications for which barrier type and wire protector contacts are sufficient. But printed circuit board pluggable and fixed terminal blocks are ideal for industrial and instrumentation applications, especially if they employ rising cage clamp contacts. Additionally, for these demanding applications, the key to high performance is superior materials that provide good conductivity as well as chemical and dimensional stability. Sometimes, though, proven materials are overlooked in lieu of new 'exotic' entrants

to this market. Customers need to choose a supplier that is experienced in working with traditional materials as well as incorporating these latest ones where it makes sense.

## **Performance versus price**

Design engineers will evaluate a component on performance and smart design features to see if that component meets the requirements of the system design. Price will be secondary for the engineer; but in today's market, equipment and system purchases are strongly driven by price. Therefore, a design engineer will take the pricing of terminal blocks into account as far as how it will affect the end-system's price; but it is important to choose a terminal block that provides good quality to ensure high performance and long life for the end-user's system.

## **Off-the-shelf availability**

Terminal blocks are often not specified until late in the design cycle, since they are considered commodity products and are secondary to incorporating newer technologies with more cutting-edge features. Often, the terminal block is expected to "work around" other components in a system. For this reason, it's important to the design engineer to be able to find a standard, off-the-shelf product that can be easily procured and designed into the product in the last stages of the project, and terminal block suppliers can facilitate this process by providing an easy-to-use website with design assistance and product specifying features.

## **Service**

When choosing a terminal block supplier, design engineers should look for high-quality products with these beneficial features, as well as for a manufacturer who can offer years of interconnect experience backed by superior service. Design engineers greatly benefit when it is as easy as possible to design an entire system because drawings, 3-D models, specifications, and sampling of a broad variety of connector solutions are available online.

Since these are, in fact, commodity products, the true differentiator in specifying a terminal block will be a high-quality product with a superior level of design assistance and prompt and reliable delivery to meet the OEM's production needs.

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