Test & Measurement, Enclosures, Power Supplies

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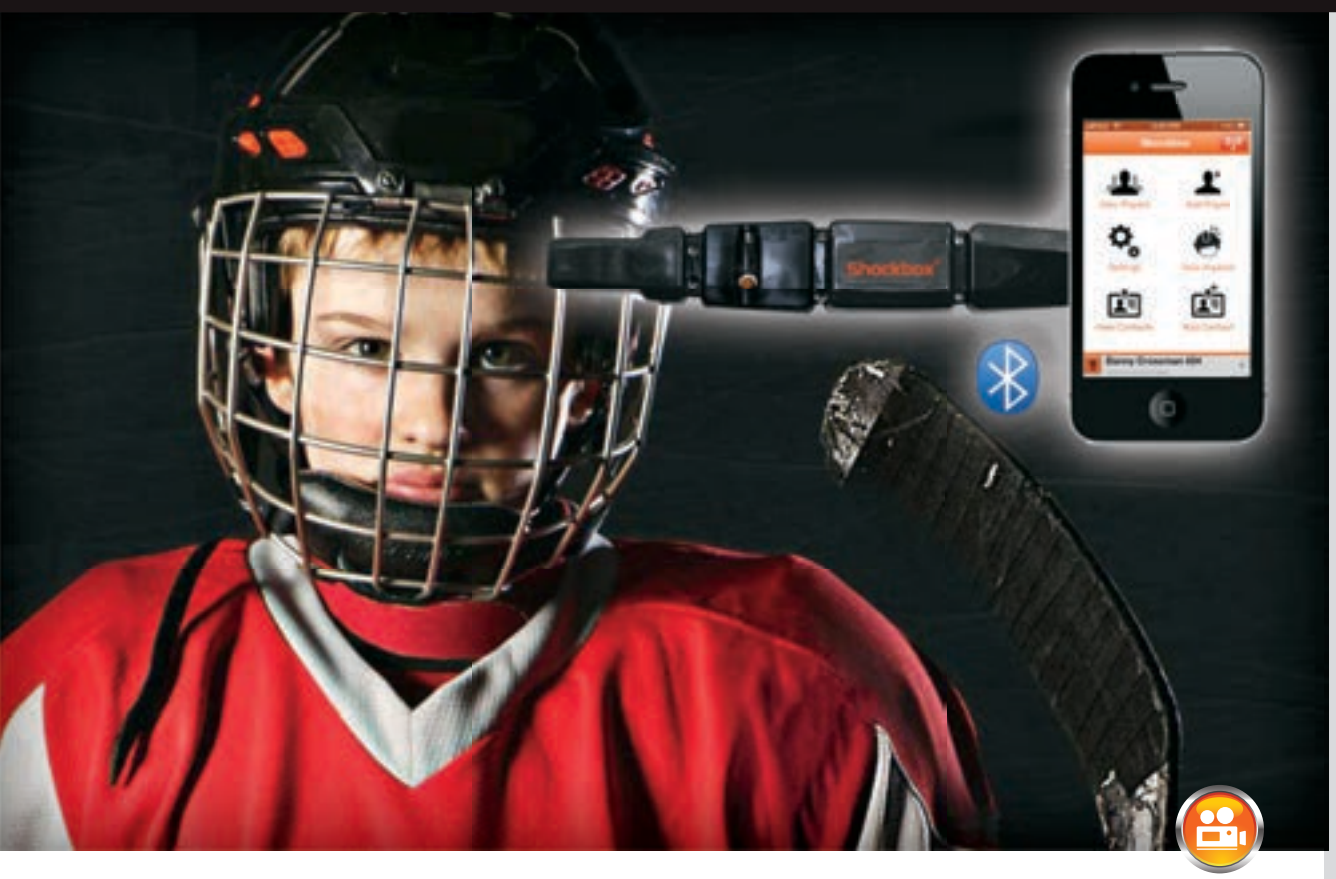

Helmet sensor monitors hits to the head

OCM Manufacturing guides production process By Peter Caulfield

Sensor technology that was developed for the U.S. military to record the impact of roadside bomb blasts on soldiers has been adapted by Kanata, ON-based Impakt Protective Inc. for use in another type of conflict. The company's product, called Shockbox, is worn inside a hockey helmet and monitors the effects of any hits to the head a player receives.

The wireless sensors in Shockbox send live alerts to a sideline smart phone when a hit exceeds a predetermined threshold. A smart phone app, which displays player histories and records hit counts, enables up to 125 players to be connected to a single device.

Scott Clark, Impakt's president and VP operations and R&D, says the idea for a helmet sensor came to him in 2010, when his 10-year-old son Cameron hit his head on the boards.

"Because no injury was obvious, we sent him back on the ice, instead of side-

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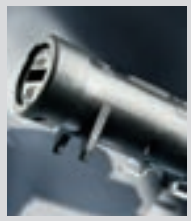
FEATURED PRODUCTS

Vector network analyzer

The MS4640B VectorStar VNA from Anritsu is said to offer the broadest coverage in a single instrument, 70 kHz to 70 GHz. PulseView, when combined with an IF digitizing option, offers 2.5 ns pulse resolution and 100 dB dynamic range.

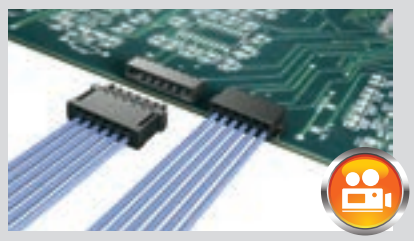
www.anritsu.com

Compact SMD fuse holder



Schurter Inc. has announced that its FPG7 shock-safe SMD fuse holder is now equipped with two stabilizing posts. The 5 x 20 mm fuse holder system has a rated power consumption up to 2.5 W and 10 A/250 Vac according to IEC, combined with rated current up to 16 A at 400 Vac according to UL/CSA. Units are RoHS-rated materials and reflow soldering safe.

www.schurterinc.com



Wire-to-board connectivity

Harting has announced its har-flexicon series of discrete wire-to-board connectors and terminal blocks said to deliver greater PCB performance and density with robust connectivity. The SMT components for pluggable single conductor wiring of I/O signals are available in two main pitch categories.

www.harting.ca

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Shockbox sends alerts from helmet to sideline smart phone

lining him," Clark said. "Coaches and trainers are faced with similar circumstances in every game, so the idea for creating a device that had another set of eyes on the kids' heads was what started Impakt Protective just days later."

Clark and his partners worked fast, and they developed a commercial product by the end of 2011. The target market for Shockbox is youth hockey, football and lacrosse.

"There are many other possible applications of the technology, but for now we're focusing on sports," Clark said.

Clark explained the design and technical infrastructure of Shockbox is different from its military predecessor's.

"When we started the company, we focused on building a product that signalled that a player needed to be assessed after a head impact," he said. "The product needed to be responsive, durable and affordable for the average sports parent. In comparison, the sensors in military head gear are more precise, capture more data and are more expensive."

Shockbox contains a microprocessor, sensors, communications chip and rigid-flex printed circuit board. The sensors are encapsulated in a plastic enclosure.

"Shockbox needs to be rugged enough for sports applications and to be able to take a direct hit on the sensor," Clark said.

Impakt worked with Ottawa contract manufacturer OCM Manufacturing Inc. to turn the Shockbox prototype into a commercial product.

"It was always my intention to find a manufacturing partner that was less than an hour from our office," Clark said. "Instead of sending diagrams of board layout questions, or having a video conference to discuss a quick work-around for a DFM (design for manufacturability) issue, we would just drive over and sit with them to discuss it face-to-face with the board layout in our hands. I think too often we search out the least expensive manufacturing solution that focuses too much on the quote and not on the relationship."

Top: OCM Manufacturing in Ottawa provides electronic manufacturing services, as well as fulfillment services. Bottom: Shockbox test cell tackles a football helmet.

Clark says OCM helped with prototyping Shockbox.

"It feels like we're always in prototyping mode," he said. "When we were switching from a rigid FR4 design to a flexible PCB layout, it felt like we were speaking with OCM every week. We met with them regularly to review layout constraints, location of stiffeners and optimal ways to panelize the product, to make manufacturing easier and less error-prone."

Clark said it was a very iterative process that required a manufacturer who was willing to be flexible in its line-scheduling.

"OCM was exactly that for us," he said. "They would see something in the production run that they didn't like and wanted to discuss with us. We would rush across town to discuss the situation with them, decide on a work-around and the line would be back up and running within a couple of hours."

OCM president George Henning said his company has been providing electronics manufacturing services for low-to mid-volume products, such as Shockbox, since the company was founded in 1988.

"We have a small target market," Henning said. "Most of our customers are similar in size to OCM and are located in Ottawa or nearby."

Henning says OCM has 45 active customers with 350 different products. The company's facility, which has a staff of 50 and is 22,500 square feet in area, has two surface mount assembly lines, an electromechanical assembly area and a PTH assembly area. For high-volume jobs, OCM partners with Baja Electronics in China.

OCM provides fulfilment services for some of its clients, such as shipping to customers and warranty claims.

"We offer an à la carte selection of services," Henning said. "Customers can pick and choose what they want."

www.ocmmanufacturing.com
www.theshockbox.com