

Using M2M Technology to Measure Concussions

Stan Marszalek, Avnet Electronics Marketing

Concussions, also known as mild traumatic brain injuries (MTBI), are a very serious topic in the world of sports today. According to the Center for Disease Control, nearly four million MTBIs are reported each year due to impacts in sports and recreational activities.

Despite all this focus, there is still a lot to discover about MTBIs. "It is inexact, a science in its infancy," Dr. Michael O'Brien of the sports concussion clinic at Boston Children's Hospital told the New York Times in May 2013. "We know much more than we once did, but there are lots of layers we still need to figure out."

In the past, one of the largest challenges to fully understand MTBIs has been the ability to collect data about the severity and frequency of sustained impacts. How can neurologists, coaches or parents know when an impact is going to be a critical event if they don't know how severe it is or how often other impacts have been sustained?

In order to answer these questions, Sensuss, a start-up electronics company, created a portfolio of electronic products that measure and collect data from impacts that athletes sustain. And to create these products, they worked closely with Avnet Electronics Marketing, a business region of Avnet, one of the world's largest electronics distributors.

Using M2M Technology to Measure Concussions

Published on Medical Design Technology (<http://www.mdtmag.com>)



Sensuss knew that any product that would be adopted to answer the questions of MTBIs would require a number of complex electronic components that would have to be available nearly on-demand to make cost-effective and successful products. Sensuss planned for this, even as the company was developing early prototypes.

Yet, trying to evaluate and develop relationships with each individual supplier was onerous. So, Sensuss turned to Avnet. With an extensive line card and supplier relationships, Avnet allowed Sensuss to shortcut much of this process. The Avnet sales team listened carefully to Sensuss' goals, identified target component manufacturers, and crafted a supply chain strategy to take the company from the chalk board to the production floor.

Today, Sensuss offers the S2, a small, translucent helmet-based device with LEDs that light up when an athlete experiences a pre-defined level of impact; immediately alerting personnel that a critical event may have occurred. This product, which combines Analog Devices' sensor technology with highly visible LEDs is available in three preset levels: ages 7-9, 10-13 and 14+.

Using M2M Technology to Measure Concussions

Published on Medical Design Technology (<http://www.mdtmag.com>)

The Sensuss S3 uses cloud-based computing with machine-to-machine (M2M) technology to collect both the severity and the history of impacts that an individual user might experience. It combines sensor technology from Analog Devices, microcontrollers, and Eurotech Helix cloud-based technology. The Eurotech gateways combine Intel hardware, along with Oracle and Hitachi software and cellular service from Verizon Wireless to connect the sensors and gateways to the Everyware Cloud. The S3 supports 802.11 WiFi, cellular, or Zigbee standards.



If a user wearing the S3 sensor experiences an impact, the S3 device will monitor impacts and capture that data; it then uses M2M technology to transmit and store that information, and through a cloud based application, provides real-time assessments that protect the athlete from further potential harm. Given the level of impact, the database will be programmed to email, text or send a phone alert to a coach, doctor, parent or other specified caregiver.

The S2 and S3 sensors are helpful for monitoring players who have experienced high level G force impacts that could lead to MTBIs. Research groups are working to determine whether a single impact causing an MTBI is more dangerous than numerous smaller impacts. Sensuss' product portfolio extends beyond athletics into other industries. The S3 sensors are also installed in gloves and are used to assist children with autism. Clinicians and medical personnel use data from the gloves to

Using M2M Technology to Measure Concussions

Published on Medical Design Technology (<http://www.mdtmag.com>)

educate the children on safe versus dangerous impacts.

In the past year, the Sensuss products have been widely recognized for their ability to collect data that can transform the paradigm for treatment of head-trauma. Sensuss has been a 2013 Laureate in IDG's Computerworld Honors Program, a 2013 ConnectedWorld Value Chain award winner, and won the silver level application award for Best of Sensors 2013 - in competition with the Goodyear Tire and Rubber Corporation, NASA, and other experienced developers.

To meet the growing demand for the S2 and S3, Sensuss leverages Avnet Electronics Marketing's supply chain management for global manufacturing and distribution. Avnet's ability to get materials on-demand anywhere in the world is crucial in getting the Sensuss products to market.

Source URL (retrieved on 03/30/2015 - 4:07am):

<http://www.mdtmag.com/articles/2013/10/using-m2m-technology-measure-concussions>