

# Sensor pad analyzes impacts in football helmets

Jason Lomberg, Technical Editor



One of the highlights of this year's Consumer Electronics Show (CES) was a low-power wireless system that could revolutionize the game of pigskin.

The Riddell InSite Impact Response System utilizes a five-point sensor pad lined in the player's helmet to quantify an impact and, if it passes a predetermined threshold, notifies the sideline. Using Texas Instruments' CC2530 series System-on-Chip transceiver & microcontroller - which operates a custom 802.15.4 compatible RF communication protocol - the Player Unit wirelessly transmits the information to the Alert Monitor held by the parents and/or coaches.



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Published on Electronic Component News (<http://www.ecnmag.com>)

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Erin Griffin, Media Relations Manager with Riddell, described the technology as follows:

“The sensor pad is a five-zone polymer thin film installed inside a player’s helmet. The sensor is mated with custom helmet electronics that feature on-board impact processing and alert determination, as well as on-board memory for up to 40 pending alerts. All alerts are automatically transmitted wirelessly from the sensor to the Alert Monitor.



The sensor is operated by an internal battery that is replaceable during factory reconditioning. It features automatic motion-sensitive power management, so no user-intervention is required. However, there is a supplemental “on/off” switch that can disable the motion-sensitive power management for extended off-season storage and/or installation or removal from helmets.”

This fascinating technology is the natural evolution of the NFL’s – and assorted amateur organizations’ – [renewed focus](#) [1] on player safety. A string of high-profile tragedies – including the [suicide](#) [2] of Hall of Famer Junior Seau – have been attributed to the long-term brain damage caused by concussions.

A recent AP article, analyzing the death of Seau, notes that “more than 3,800 players have sued the NFL over head injuries in at least 175 cases as the concussion issue has gained attention in recent years.”

And none other than President Obama recently [weighed in](#) [3] on the discussion:

“I’m a big football fan, but I have to tell you if I had a son, I’d have to think long and hard before I let him play football,” Obama said.

Many parents would wholeheartedly agree, which is one of the reasons the InSite

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Impact Response System is a great fit for youth leagues.



Griffin was quick to point out that the InSite Impact Response does *not* diagnose concussions (a particularly important concept for those with itchy litigious fingers). Instead, it is “a risk exposure alert. Historically, the determination of a concussion relied on a player’s admission of symptoms, and it’s been documented that many concussions go unreported.”

“The prescribed head impact thresholds account for player position and player skill (youth, high school or college). InSite flags single impacts at or above the top 1 percent of impacts as well as a multiple-impact algorithm that includes head impacts recorded over a rolling seven day period,” she said.

Riddell’s Head Impact Telemetry System (HITS) and Sideline Response System (SRS) technology, from which InSite evolved, is used by 19 college teams and approximately 1,300 players.

The company is promoting InSite primarily for youth and high school football programs. They also noted that the NFL’s increased awareness and understanding of concussions “will lead to more testing of monitoring technology at the professional level.”

If adopted on a larger scale, the InSite system – and similar technology – could change the game of football and revolutionize the prevention and treatment of sports injuries.

**Source URL (retrieved on 10/23/2014 - 1:39am):**

<http://www.ecnmag.com/articles/2013/01/sensor-pad-analyzes-impacts-football-helmets>

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### Links:

[1] <http://fifthdown.blogs.nytimes.com/2013/01/28/safety-fines-continue-to-be-hot-topics/?partner=rss&emc=rss>

[2] <http://sports.yahoo.com/news/seaus-family-sues-nfl-over-173338006--nfl.html>

[3] [http://www.huffingtonpost.com/2013/01/29/aldon-smith-bernard-pollard-nfl-safety\\_n\\_2572749.html](http://www.huffingtonpost.com/2013/01/29/aldon-smith-bernard-pollard-nfl-safety_n_2572749.html)