



## RAD Smart-Socket

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### Introduction

In the controlled bolting industry, bolt torque is used as a reference for a specified clamp load on a fastener. To ensure accurate torque application to a fastener, transducers have been used to measure the applied torque to a bolted joint. However, transducers have been known to be cumbersome and hard to use in the industrial field setting. To help streamline the inspection of applied torque, the Smart-Socket with built-in transducer was developed. The following outlines the RAD Smart-Socket and its features.

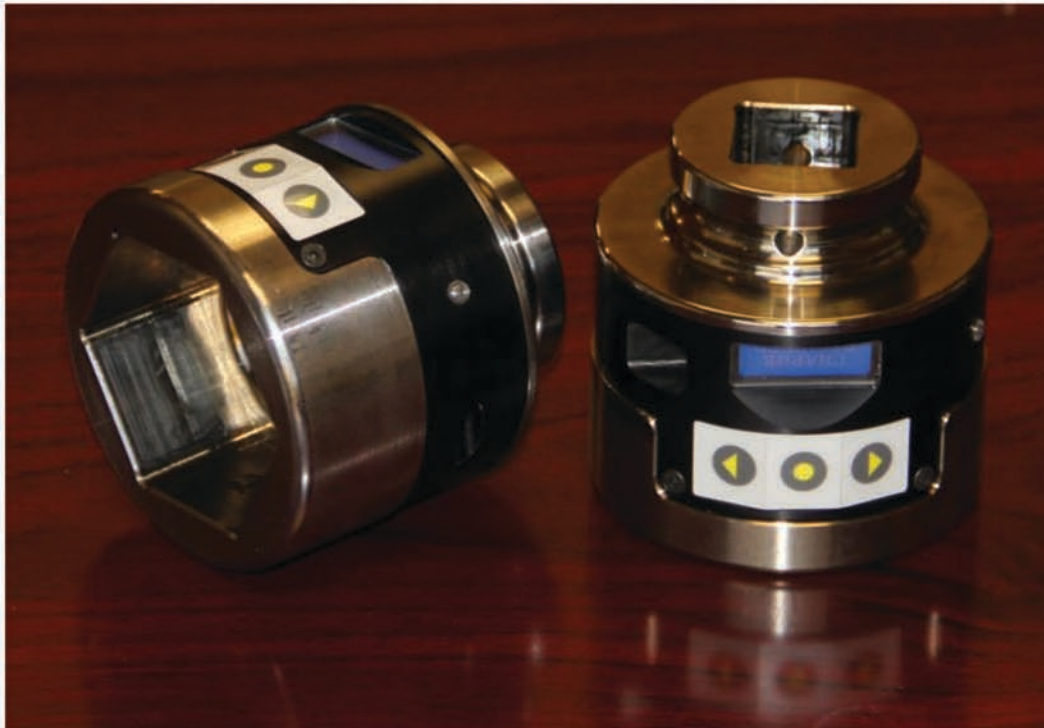


Figure 1 - RAD Smart-Sockets

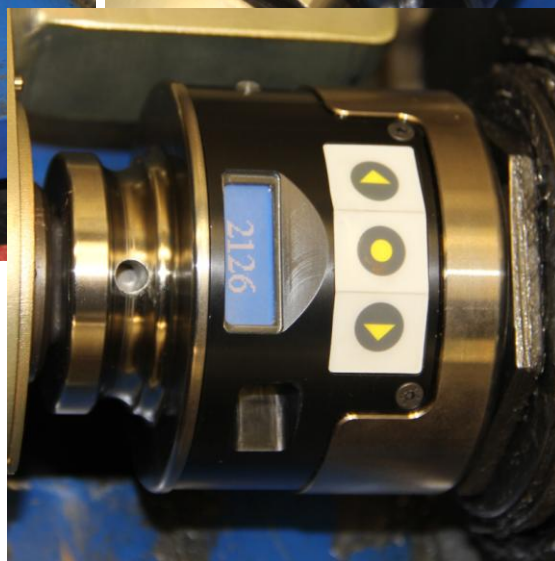
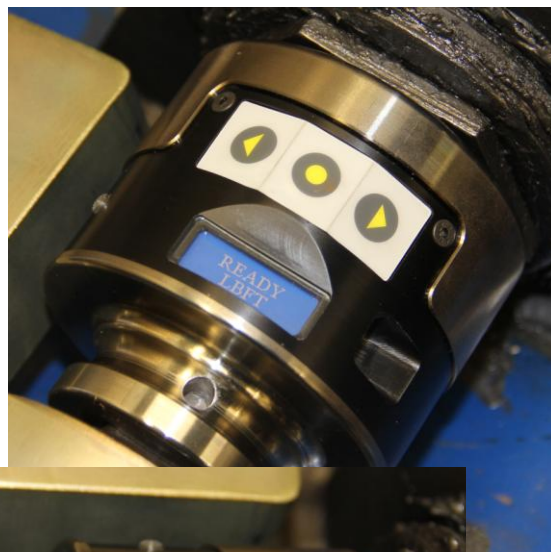
## Smart-Socket Features and Performance

The RAD Smart-Socket uses RAD TORQUE's transducer technology combined with a custom socket to measure the torque applied to the socket during a torque cycle. By carefully packaging the design, the end product is no larger than a standard socket.



Figure 2 - RAD Smart-Socket with standard socket

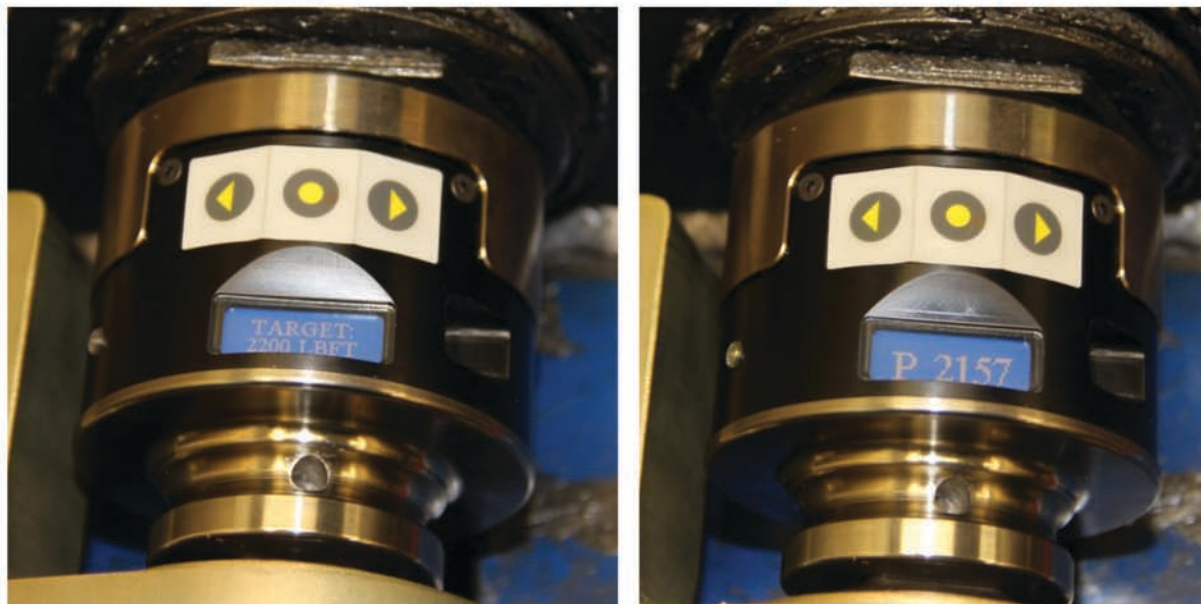
The size and capabilities makes the Smart-Socket a perfect audit tool, for inspecting bolted joints. To use the Smart-Socket, the user replaces the socket on their respective torque tool, and uses the tool as per normal. While in audit mode the Smart-Socket will display and log the peak torque it experiences.



**Figures 3, 4 & 5** - (Above) Smart-Socket running in audit mode. (Above right) Smart-Socket showing ready for use. (Right) Smart-Socket displaying 2126 ft-lbs of torque after torque cycle.



In addition to the audit mode, the Smart-Socket can also be configured to indicate a "Pass" or "Fail" with respect to a target torque. In target mode, multiple target set points can be preset with a specified tolerance on the variance from the target. In this mode, the Smart-Socket will indicate the peak torque applied and a "Pass" or "Fail" depending if the target was reached within the bounds. In this mode, the LED on the housing also lights up to indicate a pass or fail by shining "Green" or "Red" respectively.



**Figures 6 & 7 - (Left) Smart-Socket set with a target of 2200 ft-lbs. (Right) Smart-Socket reading 2157 ft-lbs with a "Pass" within the 5% bounds. (note green LED color)**

In all Smart-Socket modes, all torque values are recorded and logged for collection at a later time. Once downloaded, these logs can serve as supplemental joint information for joint integrity records. To configure the Smart-Socket's set targets or to download these logs, the Smart-Socket can be connected to the RAD RT Data Logger software.



**Figure 8 - Smart-Socket connected to RAD RT Data Logger**

The current Smart-Socket has a maximum torque load capability of 3000 ft-lbs (4000 Nm) through a 60mm hex, with a 1" square drive. It can be used on any torque tool application excluding impact style tools. Current performance of the Smart-Socket is +/- 1% of full scale. Future Smart-Sockets will include additional drive sizes, hex sizes and torque load capabilities.

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