

# Development of Enhanced RTK Configuration and Diagnostic Options for John Deere GNSS Receiver

Precision farming improves accuracy in agriculture by introducing smart agricultural practices and advanced techniques. John Deere is providing guidance system solution which has higher accuracy in navigation positioning. StarFire™ is a navigation system network from John Deere which is used for various positioning applications.



Fig.1: StarFire6000 receiver. John Deere

StarFire6000 GNSS receiver was introduced in 2016, with its RTK accuracy about 2,5cm. It has the ability to acquire newly introduced StarFire 3 (SF3) correction signal accuracy of about 3cm. The StarFire6000 GNSS receiver has a web-interface developed to have easy and faster access to receiver configuration settings. It is very important because the receiver configuration settings can be accessed faster via web-interface which are possible earlier only through John Deere GreenStar™ display

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The StarFire6000 receiver web-interface have RTK configuration settings which includes RTK radio settings. A database management is created for RTK base user management. For handling Rover Access List (RAL) of RTK base, it is easier and simpler via web-interface. Additionally, diagnostic options were included in the web-interface. Since, ionospheric activity influences GNSS signal propagation speed and have severe impact on GNSS positioning, a concept of estimation of Total Electron Content (TEC) was implemented. TEC values are calculated out of raw measurements (GPS L1, L2 frequencies and Pseudorange differences) from GNSS receiver. The estimated values are shown in the web-interface for better management.

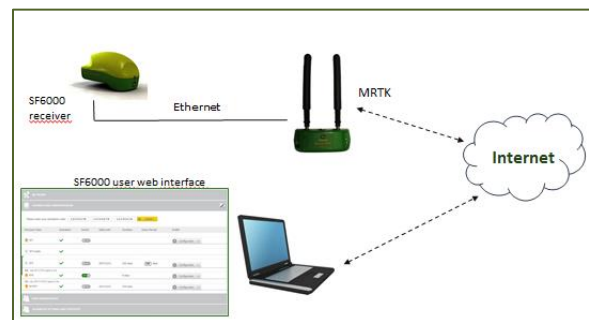


Fig.2. StarFire6000 web-interface remote access

A remote access setup for StarFire6000 receiver was made via John Deere mobile RTK modem (M-RTK uses cellular network for RTK correction signals) 4G LTE. Now, it is possible to have RTK base Remote access and make configuration changes.

