CALIFORNIA
Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

If this product contains a gasoline engine:

⚠️ WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

The State of California requires the above two warnings. Additional Proposition 65 Warnings can be found in this manual.
Introduction

Foreword

John Deere Mobile RTK is a product of John Deere ISG that receives RTK correction data for GPS signal of StarFire 3000, and uses RTK accuracy for all field operations.

A third party provider is required to transfer RTK correction data through a cell phone network. Contracts to receive RTK correction data and cell phone network are not included in John Deere Mobile RTK bundle. Customers are free to choose their own providers.

Third party components and requirements covered in this Operator's Manual:

- How to configure StarFire 3000 for Mobile RTK
- How to configure JD Mobile RTK
- How to use RTK diagnostics tool application
- How to configure and diagnosis Mobile RTK Modem

Disclaimer: The John Deere Mobile RTK Configuration and Diagnostic Tool application is designed solely for use with John Deere Mobile RTK Modem ("INTENDED USE"). Use in any other way is considered as contrary to the intended use. The manufacturer accepts no liability for damage or injury resulting from this misuse, and these risks must be borne solely by the user. Compliance with and strict adherence to the conditions of operation as specified by the manufacturer also constitute essential elements for the intended use.

Handling this Supplement

This document contains descriptions for operating StarFire 3000 and John Deere Mobile RTK systems.

All other information concerning StarFire 3000 is provided in its Operator's Manual.

Pay special attention to safety information. This is important for the safe operation of the vehicle.

NOTE: Use this supplement with the basic StarFire 3000 and RTK Guidance Systems Operator's Manual to prevent operating errors and personal injuries.

For further information, contact your approved John Deere Dealer.

Trademarks

List of trademarks used throughout this Operator’s Manual.

<table>
<thead>
<tr>
<th>Trademarks</th>
<th>Trademark of Deere and Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>GreenStar™ 3 2630 Display</td>
<td>Trademark of Deere and Company</td>
</tr>
<tr>
<td>SERVICEGARD™</td>
<td>Trademark of Deere and Company</td>
</tr>
<tr>
<td>StarFire™</td>
<td>Trademark of Deere and Company</td>
</tr>
<tr>
<td>AutoTrac™</td>
<td>Trademark of Deere and Company</td>
</tr>
</tbody>
</table>
**John Deere Mobile RTK Setup Data Checklist**

**NOTE:** The following checklist helps to get all information from SIM card and RTK correction data provider required for the modem configuration.

<table>
<thead>
<tr>
<th>John Deere Mobile RTK Setup Data Checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cell Phone Provider Information</strong></td>
</tr>
<tr>
<td>SIM card 2G compatible? (Yes required for John Deere Mobile RTK)</td>
</tr>
<tr>
<td>YES: □</td>
</tr>
<tr>
<td>NO: □</td>
</tr>
<tr>
<td>SIM card able to send and accept SMS? (Yes required for John Deere Mobile RTK)</td>
</tr>
<tr>
<td>YES: □</td>
</tr>
<tr>
<td>NO: □</td>
</tr>
<tr>
<td>Virtual Private Network (VPN) available? (Yes required for John Deere Mobile RTK)</td>
</tr>
<tr>
<td>YES: □</td>
</tr>
<tr>
<td>NO: □</td>
</tr>
<tr>
<td>Provider Name: .....................................</td>
</tr>
<tr>
<td>(for example, Vodafone or T-Mobile)</td>
</tr>
<tr>
<td><strong>Web page:</strong> .....................................</td>
</tr>
<tr>
<td>(for example, <a href="http://www.vodafone.de">www.vodafone.de</a> or <a href="http://www.t-mobile.com">www.t-mobile.com</a>)</td>
</tr>
<tr>
<td><em>Gateway or Access Point Name (APN):</em></td>
</tr>
<tr>
<td>(for example, web.vodafone.de)</td>
</tr>
<tr>
<td><em>User ID:</em>  .......................................</td>
</tr>
<tr>
<td>(for example, wapuser or t-d1)</td>
</tr>
<tr>
<td><em>Password:</em> .......................................</td>
</tr>
<tr>
<td>(for example, gprs or guest)</td>
</tr>
<tr>
<td><strong>RTK Correction Data Provider Information</strong></td>
</tr>
<tr>
<td>Provider Name: .....................................</td>
</tr>
<tr>
<td>(for example, FarmRTK or SmartNet)</td>
</tr>
<tr>
<td><strong>Web page:</strong> .....................................</td>
</tr>
<tr>
<td>(for example, <a href="http://www.farmrtk.com">www.farmrtk.com</a> or <a href="http://smartnet.leica-geosystems.eu">http://smartnet.leica-geosystems.eu</a>)</td>
</tr>
<tr>
<td><em>Host/Server IP/URL Address:</em></td>
</tr>
<tr>
<td>(for example, 141.91.150.73 or rtk-net.dyndns.org)</td>
</tr>
<tr>
<td><em>Host/Server Port:</em></td>
</tr>
<tr>
<td>(for example, 2101)</td>
</tr>
<tr>
<td><em>Mount Point:</em></td>
</tr>
<tr>
<td>(for example, 1033_RTK-CMR or DTNA)</td>
</tr>
<tr>
<td><strong>Correction Type:</strong></td>
</tr>
<tr>
<td>(for example: RTCM2.3, RTCM3.0, or CMR)</td>
</tr>
<tr>
<td><em>User ID:</em>  .......................................</td>
</tr>
<tr>
<td>(for example, JohnSmith)</td>
</tr>
<tr>
<td><em>Password:</em> .......................................</td>
</tr>
<tr>
<td>(for example, FarmRTK or SmartNet)</td>
</tr>
</tbody>
</table>

**NOTE:** * required data for modem configuration.

** optional.

Password cannot include "," or "." or any other special characters.
Contents

Safety
Recognize Safety Information ................................05-1
Understand Signal Words........................................05-1
Follow Safety Instructions.......................................05-1
Practice Safe Maintenance ......................................05-2
Use Steps and Handholds Correctly............................05-2
Handle Electronic Components and
  brackets Safely ..............................................05-3
Prevent Electrical Shock and Fires............................05-3
Avoid Exposure to High Radio
  Frequency Fields ............................................05-3
Avoid Electrical Power Lines..................................05-4

System Requirements
John Deere Components.........................................10-1
Cellular Network Provider ......................................10-1
RTK Correction Data Provider ..................................10-1

GS2 or GS3 Display—StarFire 3000
StarFire 3000 Softkey ..........................................15-1
Info Tab—Mobile RTK .........................................15-2
Setup Tab—Mobile RTK ........................................15-4
Optimize Shading—Mobile RTK ...............................15-5
Activations Tab—Mobile RTK ................................15-6
Serial Port Tab—Mobile RTK .................................15-8
Diagnostic Softkey—Mobile RTK ............................15-10

GS2 or GS3 Display—Mobile RTK
Mobile RTK Softkey ............................................20-1
StarFire 3000 - StarFire Mobile RTK ........................20-2
M-RTK Port Configuration ...................................20-7
Modem/Network Configuration ..............................20-9

Configuration and Diagnostic Tool
Configuration and Diagnostic Tool Installation ....25-1
Connect Mobile RTK Modem to
  Personal Computer ..........................................25-2
Configure Mobile RTK Modem (Connected) ............25-3
Configure Mobile RTK Modem (Not
  Connected) ....................................................25-9
Dial-in Test Mobile RTK Modem ..........................25-13

Troubleshooting
Electromagnetic Interference (EMI) .........................30-1
Troubleshooting John Deere Mobile
  RTK Modem ..................................................30-2

Specifications
Metric Bolt and Screw Torque Values ..................35-1
Safety Note Regarding the Subsequent
  Installation of Electrical and
  Electronic Appliances and/or Components ....35-1
EC Declaration of Conformity ...............................35-2

Serial Numbers
Identification Label ............................................40-1
John Deere Mobile RTK Modem ............................40-1

Original Instructions. All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.
Recognize Safety Information

This is a safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.

Understand Signal Words

A signal word—DANGER, WARNING, or CAUTION—is used with the safety-alert symbol. DANGER identifies the most serious hazards.

DANGER or WARNING safety signs are located near specific hazards. General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.

Follow Safety Instructions

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from your John Deere dealer.

There can be additional safety information contained on parts and components sourced from suppliers that is not reproduced in this operator's manual.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.

If you do not understand any part of this manual and need assistance, contact your John Deere dealer.
**Practice Safe Maintenance**

Understand service procedure before doing work. Keep area clean and dry.

Never lubricate, service, or adjust machine while it is moving. Keep hands, feet, and clothing from power-driven parts. Disengage all power and operate controls to relieve pressure. Lower equipment to the ground. Stop the engine. Remove the key. Allow machine to cool.

Securely support any machine elements that must be raised for service work.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.

On self-propelled equipment, disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

On towed implements, disconnect wiring harnesses from tractor before servicing electrical system components or welding on machine.

**Use Steps and Handholds Correctly**

Prevent falls by facing the machine when getting on and off. Maintain 3-point contact with steps, handholds, and handrails.

Use extra care when mud, snow, or moisture present slippery conditions. Keep steps clean and free of grease or oil. Never jump when exiting machine. Never mount or dismount a moving machine.
Handle Electronic Components and Brackets Safely

Falling while installing or removing electronic components mounted on equipment can cause serious injury. Use a ladder or platform to easily reach each mounting location. Use sturdy and secure footholds and handholds. Do not install or remove components in wet or icy conditions.

If installing or servicing a RTK base station on a tower or other tall structure, use a certified climber.

If installing or servicing a global positioning receiver mast used on an implement, use proper lifting techniques and wear proper protective equipment. The mast is heavy and can be awkward to handle. Two people are required when mounting locations are not accessible from the ground or from a service platform.

Prevent Electrical Shock and Fires

To prevent injury from electrical shock, always disconnect power to the receiver, antenna, and amplifier before installing or servicing.

To prevent injury from electrical shock, always disconnect power to the receiver and radio equipment before installing or servicing.

Understand and follow all local codes and regulations when installing electrical equipment.

Avoid Exposure to High Radio Frequency Fields

Prevent injury from exposure to high radio frequency fields at the antenna. Do not touch antenna while the system is transmitting. Always disconnect power to the antenna before installing or servicing.

The antenna should always be separated from the operator or nearby persons by a minimum distance of 20 cm (8 in.).
**Avoid Electrical Power Lines**

Avoid all low-hanging electrical lines while operating the machine.

On some machines, the antenna may be high enough to come in contact with low-hanging electrical lines. This can result in severe electrical shock to the operator.
System Requirements

John Deere Components
To compose and operate the John Deere Mobile RTK system, the following components are required:

- GreenStar™ (GS) Display GS3 2630, GS3 Command Center, or GS2 2600, 2100, and 1800
- StarFire 3000 receiver
- John Deere Mobile RTK kit:
  - John Deere Mobile RTK Modem (PFP12755)
  - Installation Kit (BPF10515)
  - Mobile RTK activation Gen3 (StarFire 3000)

Cellular Network Provider
The choice of the cellular network provider is free.

To operate the John Deere Mobile RTK system, the cellular network provider must comply with the following:

- The modem is compatible with the mini SIM\(^1\) format only.
  
  \(1\) SIM = Subscriber Identity Module

- Provider supports VPN\(^2\).
- Modem only supports GPRS\(^3\) (2G) and backwards compatible UMTS\(^4\) (3G) or LTE\(^5\) (4G).
- SIM card must be able to receive and send SMS\(^6\).
- Mobile data flat rate with a minimum of 1 GB per month data volume is required.
- Check roaming conditions for SIM card with your provider to avoid additional roaming costs.

RTK Correction Data Provider
The choice of RTK correction data provider is free.

To operate the John Deere Mobile RTK system, RTK correction data provider must comply with data format RTCM 2.3, 3.0\(^1\), and CMR\(^2\) to comply with the StarFire 3000 receiver.

\(1\) RTCM = Radio Technical Commission for Maritime services
\(2\) CMR = Compact Measurement Record

\(\text{NOTE: For more information, use John Deere Mobile RTK Setup Data Checklist.}\)

\(\text{NOTE: For more information about single base stations, use John Deere Mobile RTK Setup Data Checklist.}\)
This section describes StarFire 3000 pages on a GS2 or GS3 display, how to activate receiver, and which configuration of the receiver runs John Deere Mobile RTK. Connect StarFire 3000 and John Deere Mobile RTK Modem to GS2 or GS3 display as described in installation instructions.

Press StarFire 3000 button (A) to display StarFire 3000–Main screen (B).

- **(C) Info tab.** Refer to Info Tab—Mobile RTK in this section.
- **(D) Setup tab.** Refer to Setup Tab—Mobile RTK in this section.
- **(E) Activations tab.** Refer to Activations Tab—Mobile RTK in this section.
- **(F) Serial Port tab.** Refer to Serial Port Tab—Mobile RTK in this section.

StarFire 3000–Main screen contains four tabs that differ depending on RTK system connected to StarFire 3000 receiver:

- **If necessary:**
  - Press Mobile RTK Softkey (H) to display StarFire Mobile RTK screen (refer to StarFire 3000–StarFire Mobile RTK in GS2 or GS3 Display—Mobile RTK section).
  - Press Diagnostic Softkey (I) to display StarFire 3000–Diagnostics screen (refer to Diagnostic Softkey–Mobile RTK in this section).

**NOTE:** Update software for GS2 and GS3 displays and StarFire 3000 receiver to version 13-1 or above. Using version 13-1 or above, main screen is automatically arranged upon RTK system recognition.

If StarFire 3000 button (A) does not appear at start-up, press Menu button (G).
Info tab shows information and status of incoming GPS and StarFire correction signals. No information on this screen can be changed. Use this tab to view:

- **Position Mode (E):** Indicates whether receiver is calculating a 3D position, 2D position, or no position (No Nav). It also shows the status of:
  - SF1 (StarFire 1 differential)
  - SF2 (StarFire 2 differential)
  - RTK (Real Time Kinematic differential)
- **Lat (°) (F):** Displays machine location latitude coordinates with respect to Equator (North or South).
- **Lon (°) (G):** Displays machine location longitude coordinates with respect to Prime Meridian (East or West).

  *NOTE:* TOGGLE button (K) allows operator to change the way latitude and longitude are displayed from degrees/minutes/seconds to decimal degrees.

- **Altitude (H):** Displays height of receiver, measured from top of dome, in feet (meters) above sea level.

- **GPS course (I):** Displays direction of travel, in degrees relative to true north (zero degrees) as measured by receiver. Angle is measured in clockwise direction.

  *NOTE:* Course and speed normally show small speeds and various courses even when machine is not moving.

- **GPS speed (J):** Displays ground speed of machine in mph (kph) as measured by receiver.

- **GPS Accuracy Indicator (L):**
  - L1/L2 signal to noise ratio (SNR) – Radio interference from 2-way radios or other sources may cause low SNR (check satellite button I – Graph).
  - Satellite position in sky – Poor GPS satellite geometry can reduce accuracy (check satellite button I – SkyPlot).
  - Number of satellites above elevation mask – Total number of GPS satellites available to receiver that are above 7 degrees elevation mask (check satellite button I – SkyPlot).
  - Number of satellites in solution – Total number of satellites used by receiver to calculate a position (check satellite button I – SkyPlot).

- **GPS Signal Quality (M):** Displays quality of signals being received from constellation of GPS satellites.

- **SF Signal Quality (N):** Displays quality of SF correction signal received by receiver.

- **TCM (Terrain Compensation Module):**
  - **Roll Angle (O):** A graphical and numerical representation of amount of roll TCM is measuring, relative to calibrated zero degree reference. A positive roll angle means vehicle is rolled to right (depicts what horizon would look like from cab).
  - **Pitch Angle (P):** Positive pitch angle occurs when vehicle cab is tilted back. Negative pitch angle occurs when vehicle cab is tilted forward.
  - **Yaw Rate (Q):** Provides a graphical representation and a numeric figure for amount of rotation TCM is measuring. Positive yaw rate means vehicle is turning to right.

- **Lon (°) (G):** Displays machine location longitude coordinates with respect to Prime Meridian (East or West).

- **Altitude (H):** Displays height of receiver, measured from top of dome, in feet (meters) above sea level.

- **GPS course (I):** Displays direction of travel, in degrees relative to true north (zero degrees) as measured by receiver. Angle is measured in clockwise direction.

  *NOTE:* Course and speed normally show small speeds and various courses even when machine is not moving.

- **GPS speed (J):** Displays ground speed of machine in mph (kph) as measured by receiver.

- **GPS Accuracy Indicator (L):**
  - L1/L2 signal to noise ratio (SNR) – Radio interference from 2-way radios or other sources may cause low SNR (check satellite button I – Graph).
  - Satellite position in sky – Poor GPS satellite geometry can reduce accuracy (check satellite button I – SkyPlot).
  - Number of satellites above elevation mask – Total number of GPS satellites available to receiver that are above 7 degrees elevation mask (check satellite button I – SkyPlot).
  - Number of satellites in solution – Total number of satellites used by receiver to calculate a position (check satellite button I – SkyPlot).

- **GPS Signal Quality (M):** Displays quality of signals being received from constellation of GPS satellites.

- **SF Signal Quality (N):** Displays quality of SF correction signal received by receiver.

- **TCM (Terrain Compensation Module):**
  - **Roll Angle (O):** A graphical and numerical representation of amount of roll TCM is measuring, relative to calibrated zero degree reference. A positive roll angle means vehicle is rolled to right (depicts what horizon would look like from cab).
  - **Pitch Angle (P):** Positive pitch angle occurs when vehicle cab is tilted back. Negative pitch angle occurs when vehicle cab is tilted forward.
  - **Yaw Rate (Q):** Provides a graphical representation and a numeric figure for amount of rotation TCM is measuring. Positive yaw rate means vehicle is turning to right.
### Setup Tab—Mobile RTK

#### StarFire 3000 - Main

<table>
<thead>
<tr>
<th>Info (A)</th>
<th>Setup (B)</th>
<th>Activations (C)</th>
<th>Serial Port (D)</th>
</tr>
</thead>
</table>

#### Correction Mode

- Default Correction Mode (E): M-RTK
- Correction Frequency (F): 1539.8725

#### Mount Direction

- Mount Direction (G): Forward
- Fore/Aft (H): 180
- Height (I): 320

#### 3D TCM

- TCM On/Off Toggle Button (L): On
- TCM Calibration Button (M): CAL

#### Hours On After Shutdown

- Hours On After Shutdown (J): 24

#### Use SF2 if RTK Signal Lost

- Use SF2 if RTK Signal Lost (K):

Setup tab allows for setup of:
- Correction Mode (E).
- Default Correction Frequency (F).
- Mount Direction (Forward/Backward) (G).
- Fore/Aft (Enter value) (H).
- Height (Enter value) (I).
- Hours ON After Shutdown. Select list input: 3-6-12 or 24 (3 default) (J).
- TCM On/Off Toggle Button (K).
- TCM On/Off Toggle Button (L).
- TCM Calibration Button (M).
### Differential correction is the process by which GPS accuracy is improved (See SF1/SF2 Activations, SF2 Subscription under Activation Tab—Mobile RTK in this Section).

**NOTE:** At least five satellites must be tracked to get correction signal. Check total number of satellites that are being used by receiver (check satellite button I – SkyPlot).

### Optimize Shading—Mobile RTK

Enable Optimize Shading must be checked.

**NOTE:** For best performance, use Optimize Shading with RTK-X. No longer than 20 seconds after Mobile RTK data stream is lost the system will use RTK-X; no longer than 10 minutes after using RTK-X the system will re-engage to EGNOS.
Valid activations for receiver:

- SF1 – Activated on every StarFire 3000.
- SF2 Ready – Receiver has to be ordered SF2 Ready or an upgrade to SF2 Ready from SF1 World Solution must be purchased if a SF2 license will be used (not necessary for John Deere Mobile RTK).
- RTK – Activated with valid RTK activation (requires receiver to be SF2 Ready).

SF2 License: Displays status of SF2 License of receiver, such as:

- Yes-Enabled – A valid SF2 license exists and SF2 is the differential correction mode selected.
• Yes-Disabled – A valid SF2 license exists, but SF2 is not the differential correction mode selected.
• No – Appears when no valid SF2 license exists or SF2 license has expired.

NOTE: With John Deere Mobile RTK, SF2 fallback function is inclusive and an SF2 license is not required.

SF2 End Date: Displays date when SF2 License expires.

StarFire SN: StarFire serial number.

M–RTK License: Displays status of receiver’s M–RTK license, such as:
• Yes-Enabled – A valid M–RTK license exists, and M–RTK is selected as the differential correction mode.
• Yes-Disabled – A valid M–RTK license exists, and M–RTK is not selected as the differential correction mode.
• No – Appears when no valid M–RTK license exists or M–RTK license has expired.

M–RTK End Date: Displays date when M–RTK license expires.

Activation/License Status Window: Displays messages when SF2 License has expired and provides option for using a grace period.

NOTE: Three 24-hour grace periods are available when a current license expires. These periods allow sufficient time for operator to renew a license. Grace period signal will be SF2 differential correction signal.

To use a grace period:
1. Select USE 1 button from status window.
2. Select YES button.

NOTE: Mobile RTK button [H] appears on screen only when RTK activation has been properly carried out.

For the usage of John Deere Mobile RTK, you need the following activations and license on your SF3000 receiver:
• SF2 Ready Activation
• RTK Activation
• Mobile RTK Access, License

A 24-digit activation code will be provided by www.stellarsupport.com. Contact your local John Deere dealer for support.

Activation Code

NOTE: Activation Codes obtain SF2 Ready and RTK Activations, SF2, and M–RTK license.

Enter button is used to enter 24-digit codes for SF2 Ready and RTK Activations, SF2, and M–RTK license and deactivation codes for transferring all StarFire™ activations and licenses previously mentioned.

1. Upon selecting Enter button, an Activation Code box appears with three input boxes.
   NOTE: If more than eight digits are entered into an input box, 99999999 appears. Reselect box and type only eight digits into input box.

2. Select first input box labeled Digits 1-8, and enter first 8 digits of 24-digit code.
3. Select second input box labeled Digits 9-16, and enter second 8 digits of 24-digit code.
4. Select third input box labeled Digits 17-24, and enter last 8 digits of 24-digit code.
5. Press Enter button.
6. If 24-digit code is valid and entered correctly, a confirmation message appears.

Deactivation Code Input

This input only appears when a deactivation code has been entered following a procedure previously listed. It displays six-digit deactivation codes for SF2 License, SF2 Ready, RTK activations, and M–RTK license. These codes are needed when transferring the previously mentioned activations or license to another receiver. Deactivation codes are input like activation codes.
Configure RS232 and NMEA message information.

Rates:
- Define Baud Rate by selecting 19200 from list (4800, 9600, 19200, 38400, 57600, or 115200).
- Put spaces between numbers and measurements. Define output rate by selecting 1 Hz from list (1 Hz, 5 Hz, or 10 Hz).

Messages:
- Allows for output of five NMEA strings:
  - GGA provides current fix data (3D location and accuracy data). Check GGA box.
  - GSA provides satellite status data (Overall Satellite data).

Continue on next page
- **RMC** provides minimum GPS sentences information (Recommended minimum data for GPS).
- **ZDA** provides data and time.
- **VTG** provides vector track and speed over the ground.

**NOTE:** Make sure to select 19200 baud rate (E) and check GGA message box.

\(^{1}\text{NMEA: National Marine Electronics Association}\)

Refer to basic StarFire 3000 and RTK Guidance Systems Operator's Manual for more description of NMEA sentences information.
Press StarFire 3000 button (A) to display StarFire 3000–Main screen (B).

Press Diagnostic softkey (C) to display StarFire 3000–Diagnostic screen (D).

StarFire 3000–Diagnostic screen contains three tabs:

**Readings tab** (E) has detailed information about receiver, including:
- Unswitched voltage
- Switched voltage

- CAN High voltage (Vehicle Bus)
- CAN Low voltage (Vehicle Bus)
- Software Part Number
- Software Version Number
- Hardware Part Number
- Hardware Serial Number
- Receiver Hours (h)
- Receiver Address
- QuickStart Status
- External Antenna
- Serial NMEA

Continued on next page
<table>
<thead>
<tr>
<th><strong>Data Logs tab</strong> (F) has seven pages of graphed GPS data logged over the previous 60 minutes, including:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• GPS Accuracy (0 to 100%)</td>
</tr>
<tr>
<td>• PDOP¹ (0—10)</td>
</tr>
<tr>
<td>• Satellites Used (Amount)</td>
</tr>
<tr>
<td>• SF Signal Quality (0 to 100)</td>
</tr>
<tr>
<td>• Nav Mode (0, 2D, or 3D)</td>
</tr>
<tr>
<td>• Differential Mode (None, WAAS, WCT, RTG, or RTK)</td>
</tr>
</tbody>
</table>

**Over the Air tab** (G) displays Over the Air (OTA) messages which allow StarFire 3000 to receive licenses and activations through the StarFire network.

¹PDOP: Positional Dilution of Precision

Rather than getting a license code over the cell phone or internet, the license code is transmitted wirelessly from a StarFire satellite.

**NOTE:** A message history shows OTA messages that have been received since the receiver has been powered on. History shows whether an OTA activation was applied successfully or not. OTA message history can be cleared.
Mobile RTK Softkey

This section describes the Mobile RTK pages on a GS2 or GS3 display, the status of the RTK correction, and which configuration of the RTK port runs John Deere Mobile RTK. Connect StarFire 3000 and John Deere Mobile RTK Modem to GS2 and GS3 displays as described in assembly instructions.

Press StarFire 3000 button (A) to display the StarFire 3000–Main screen (B).

Press Mobile RTK softkey (C) to display the StarFire 3000–StarFire Mobile RTK screen (D). This page provides the following functions:

- System Status
  - M–RTK Correction (see StarFire 3000–StarFire Mobile RTK in this section)
  - StarFire 3000 (see StarFire 3000–StarFire Mobile RTK in this section)
- RTK Port Configuration
  - Serial Settings and NMEA message (see Mobile RTK Port Configuration in this Section)

If necessary, on this screen:

- Press Mobile RTK Softkey (E) to display Starfire–Main screen (see StarFire 3000 Softkey in the GS2 or GS3 Display—StarFire 3000 section).
- Press Diagnostic Softkey (F) to display StarFire 3000–Diagnostics screen (see Diagnostic Softkey in the GS2 or GS3 Display—StarFire 3000 section).

NOTE: To set up John Deere Mobile RTK Modem, use external cell phone to disable PIN code. Or, use Configuration and Diagnostic Tool connected to a personal computer to set up optional PIN code.

Anytime the modem is reconfigured or changed, power must be cycled at the GPS receiver before continuing.
System Status M–RTK Correction (A) provides:

- **Correction Type (B):**
  Operator must select one of the following Mobile RTK correction sources:
  - Off
  - RTCM
  - CMR

- **Corrections Age (C):** Indicates Mobile RTK correction data stream during Maximum Correction Message Age (MCMA).

- **Data Received (kb) (D):**

- **Connection Duration (hr) (E):**

- **Signal Strength (F):** Indicates cellular signal strength of your current position.

- **GPS Signal (%) (G):**

- **SF Signal (dB) (H):**

- **System Status–StarFire 3000**

- **Accuracy (%):**

- **StarFire Mobile RTK**

- **Correction Type:**

- **Correction Age (s):**

- **Data received (kb):**

- **Connection duration (hr):**

- **NOTE:** Update software for GS2 and GS3 displays and StarFire 3000 receiver to version 13-1 or newer.

- **Status bar (C):** is green when Mobile RTK correction is streaming or red when no Mobile RTK correction streaming is detected during MCMA.

- **NOTE:** Mobile RTK correction source status bar (C) displayed in red while StarFire 3000 status
NOTE: Pressing Read button interrupts the Mobile RTK connection up to 1 minute. Mobile RTK reconnects automatically after signal strength has been measured.

After a power cycle, Signal Strength button is inactive, or grayed out, because Modem Type in the Modem/Network Configuration menu (O) is not selected. To enable Signal Strength button, set Modem Type to Smart Modem.

- Data Received (kb) (E): Indicates total kilobytes (kb) of data received. Calculation starts once connection is accepted and used by StarFire.
A—System Status—M-RTK Correction
B—Correction Type
C—Corrections Age (s)
D—Signal Strength
E—Data received (kb)
F—Connection duration (hr)

System Status - StarFire 3000 (G):
H—Accuracy (%)
I—GPS Signal (%)
J—SF Signal (dB)

RTK Port Configuration (K):
L—Serial Settings and NMEA message
M—Modem and Network

• Connection Duration (hr) (F): Indicates duration in hours (hr) of connection. Calculation starts once connection is accepted and used by StarFire 3000.

NOTE: If correction messages are not recognized or received for more than MCMA¹, data (E) and duration (F) totals do not accumulate.

System Status - StarFire 3000 (G): Operator can view accuracy, GPS signal, and SF signal.

NOTE: GPS accuracy (H), GPS signal quality (I), and differential signal quality (J) are also displayed on StarFire 3000—Main Page—Info tab screen (see StarFire 3000—Main Page in GS2 or GS3 Display—StarFire 3000 Section).

• GPS Accuracy Indicator (GPS AI) (H): GPS AI displays percentage (0-100%) of GPS position accuracy achieved by receiver.

When receiver is initially powered, GPS AI displays 0 percent. As receiver acquires satellites and calculates a position, GPS AI will increase as accuracy improves. Acceptable guidance performance for Parallel Tracking and AutoTrac is achieved when GPS AI displays 80 percent or greater. This may take up to 20 minutes. GPS accuracy is affected by many factors. If 80 percent accuracy or greater is not achieved within 25 minutes, consider the following possibilities:

• Unobstructed view of sky – Trees, buildings, or other structures may block receiver from receiver signals from all available satellites.
**StarFire 3000 - StarFire Mobile RTK**

**System Status M-RTK Correction**

<table>
<thead>
<tr>
<th>A</th>
<th>System Status - M-RTK Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Correction Type</td>
</tr>
<tr>
<td></td>
<td>RTCM</td>
</tr>
<tr>
<td>C</td>
<td>Corrections Age (s)</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>D</td>
<td>Data received (kb)</td>
</tr>
<tr>
<td></td>
<td>93</td>
</tr>
<tr>
<td>E</td>
<td>Connection duration (hr)</td>
</tr>
<tr>
<td></td>
<td>0,1</td>
</tr>
<tr>
<td>F</td>
<td>Signal Strength</td>
</tr>
<tr>
<td>G</td>
<td>Read</td>
</tr>
</tbody>
</table>

**System Status - StarFire 3000**

<table>
<thead>
<tr>
<th>H</th>
<th>Accuracy (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>J</th>
<th>GPS Signal (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>L</th>
<th>SF Signal (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>11,7</td>
</tr>
</tbody>
</table>

**RTK Port Configuration**

<table>
<thead>
<tr>
<th>N</th>
<th>Serial Settings and NMEA message</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>Configure Button</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>P</th>
<th>Modem and Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q</td>
<td>Configure Button</td>
</tr>
</tbody>
</table>

- **L1/L2 signal to noise ratio (SNR)** – Radio interference from 2-way radios or other sources may cause low SNR (check satellite button I – Graph).
- **Satellite position in sky** – Poor GPS satellite geometry can reduce accuracy (check satellite button I – SkyPlot).
- **Number of satellites above elevation mask** – Total number of GPS satellites available to receiver that are above 7 degrees elevation mask (check satellite button I – SkyPlot).
- **Number of satellites in solution** – Total number of satellites used by the receiver to calculate a position (check satellite button I – SkyPlot).

- **GPS Signal Quality (I)**: Displays quality of signals being received from constellation of GPS satellites.
- **Differential Signal Quality (J)**: Displays quality of differential correction signal being received by receiver.

**RTK Port Configuration (K):** Allows operator to configure:

- **RS232 serial port setting and NMEA message (L).** Press Configure button (N) to proceed (see M–RTK Port Configuration in this Section).
- **Modem and Network (M).** Press Configure button (O) to proceed (see Modem/Network Configuration in this section).
NOTE: To configure John Deere Mobile RTK Modem with StarFire 3000, PIN code must be either:

- Disabled using an external cell phone
- Set and stored using Mobile RTK Configuration and Diagnostic Tool (refer to Configuration and Diagnostic Tool section)

1MCMA = Maximum Correction Message Age
M-RTK Port Configuration

Use the following functions to configure the Mobile RTK correction stream used by the solution provider network to the StarFire via RS232 port:

NOTE: Contact your approved John Deere dealer before modifying RS232 port configuration parameters (B), (C), (D), or (E), or modifying Connection Age Limits parameters (L) or (M).

• RTK RS232 Settings (A) include:
  - **Baud Rate (B):** Defines data bits per second transmission by selecting list input: 4800, 9600, 19200, 38400, 57600, or 115200 (19200 default).
  - **Parity (C):** Defines parity type by selecting list input: None, Odd, Even, Mark, or Space (None default).
  - **Data Bits (D):** Defines packet length (number of data bits) by selecting list input: 7 or 8 (8 default).

• NMEA Message (F) allows for output of NMEA² string, such as:
  - **Output Rate (G):** Defines output rate in seconds by selecting list input: 1, 5, or 10 (1 default).
  - **GGA (H):** Provides current Fix data (3D location and accuracy data).

NOTE: Refer to basic StarFire 3000 and RTK Guidance Systems Operator’s Manual for more description of NMEA sentences information.
- **Connection Age Limits** (I) define MCMA\(^3\) parameters which determine the period Mobile RTK correction stream is detected. Parameters include:
  - **Max Correction Age** (J): Defines maximum MCMA correction age in seconds by selecting list input: 1—20 (20 default).

1RS232 = Recommended Standard 232
2NMEA = National Marine Electronics Association
3MCMA = Maximum Connection Message Age

- **Initialization Time** (min.) (K): Defines time of MCMA initialization in minutes by selecting list input: 1—10 (5 default).
Modem/Network Configuration

- Modem Settings (A) defines modem profile, including:
  - Type (B): Defines modem type. Select Smart Modem.
    - Signal Strength button is inactive or grayed out after a power cycle because the Modem Type selected in Modem/Network Configuration menu. Set Modem Type to Smart Modem to enable the Signal Strength button.
  - Profile (C): Defines profile name by selecting list input: Default 1, 2, 3, or 4.

- Gateway Settings (F):
  - APN (G): Inputs Access Point Name provided by the cell phone provider (for example, web.vodafone.de).
  - User ID (H): Displays user identifier (for example, wapuser or t-d1).
  - Password (I): Displays hidden password correctors as asterisks (****).
  - Edit Login Information (J): Press button to display the Gateway Login Information page.

NOTE: To input requested fields (G), (H), and (I) on Modem/Network Configuration page 1, information provided by the cell phone provider and RTK correction data provider. This information can be found on the John Deere Mobile RTK Setup Data Checklist completed during Mobile RTK modem installation or in this Operator’s Manual.

- Edit Profile Name (D): Press button to input a profile name.
- Retrieve Modem Settings (E): Press button to recover modem settings when selecting another Profile (C). The relevant Gateway and Correction Data Settings are then recalled.

- Next Page Button (K)
- Cancel Button (L)
- Enter Button (M)
From the Gateway Login Information page (A), enter user ID (B) and password (C) provided by the cell phone provider.

A—Gateway Login Information  B—User ID  C—Password  D—Cancel Button  E—Enter Button
Press Next Page button to access Modem/Network Configuration Page 2/2.

- **Profile (A):**
  Modem profile name defined on Modem/Network Configuration page 1/2.

- **Correction Data Settings (B):**
  To enter correction data provider information:
  - **IP/URL (C):** Input domain name provided by the correction data provider (for example, 141.91.150.73 or rtk-net.dyndns.org).
  - **Port (D):** Input port number provided by the correction data provider (for example, 2101).
  - **Stream (Mount Point Name) (E):** Input virtual reference station provided by the correction data provider (for example, 1033_RTK-CMR or DTNA).
  - **User ID (F):** Displays user identifier (for example, JohnSmith).
  - **Password (G):** Displays hidden password correctors as asterisks (****).
  - **Edit Login Information (H):** Press button to display Correction Data Settings page (L). From this page, enter UserID (F) and Password (G) provided by the correction data provider.

Press Previous Page button (I) to access Modem/Network Configuration page 1/2.

Press Enter button (K) to store all settings or Cancel button (J) to abort setup.
Configuration and Diagnostic Tool

Installation

NOTE: To install the Configuration and Diagnostic Tool, installation file must be downloaded from Stellar Support. Contact your John Deere dealer for support.

Purpose of the Configuration and Diagnostic Tool is to:

• Configure the Mobile RTK Modem
• Prepare ready-to-use modem profiles
• Practice modem dial-in tests to check SIM card and RTK functionality

NOTE: Only use the Configuration and Diagnostic Tool to set up SIM card.

PIN code of SIM can be disabled via cell phone. After PIN code is disabled, it is not necessary to set PIN code any more.

Check that the data correction license is running on one modem. For multiuser licenses, do not configure modems beyond the number of available licenses.

Before installing the configuration and diagnostic tool on a computer, make sure:

• SIM card connects to cell phone network provider.
• Settings of cell phone provider and RTK correction data provider are available (see John Deere Mobile RTK Setup Data Checklist).
• Personal computer uses Microsoft™ Windows© XP or Windows© 7 Operating System.

To install configuration and diagnostic tool, click Next button (A) to start installation process and follow the Setup–Mobile RTK Configurator wizard.

At the end of the process, click Finish button (B) and launch Mobile RTK Configurator. After launching the Mobile RTK Configurator:

• If only one modem must be configured, connect and configure the modem as described in Configure Mobile RTK Modem (Connected) section.
• If several modems must be configured, it is possible to pre-configure the modem profiles first. Load desired profile to the desired modem as described in Configure Mobile RTK Modem (Not Connected) section.
Connect Mobile RTK Modem to Personal Computer

To connect the Mobile RTK modem to Personal Computer, the following parts are necessary:

- Special cable—KJD10585 (A). This special cable includes:
  - One configuration harness (A)
  - One RS232 serial port-to-USB port adapter cable (B)
  - One 12 V Power Supply adapter cable (C) with 5A fuse
- Mobile RTK Modem (D).
- Wiring harness† (E) to be connected on Mobile RTK (D).
- GPRS antenna (F).
- The SIM card from the cell phone provider.
- Personal computer with USB port and Microsoft™ Windows® XP or Windows® 7 System (not shown).
- 12 V Power Supply (not shown).

Follow these instructions to connect Mobile RTK Modem to personal computer:

1. Ensure 5A fuse of power supply harness (C) is not blown. Replace fuse if necessary.
2. Connect adapter cable (B and C) to special cable (A). Use adapter cable (B) only if the computer does not feature an RS232 port.
3. Connect both connectors of wiring harness (E) to Mobile RTK Modem (D).
4. Connect antenna (F) to Mobile RTK Modem (D).
5. Connect adapter cable (B) to free USB port of personal computer or connect special cable (A) to free RS232 port.
6. Check that personal computer is started.
7. 12 V Power Supply:
   - In machine shop or office:
     - Connect RED cable of power harness (C) to battery PLUS and BLACK cable to MINUS.

†From bundle BPF10515

NOTE: Do not reverse polarity.
Configure Mobile RTK Modem (Connected)

Configure Mobile RTK Modem as follows:

1. Connect Mobile RTK Modem to personal computer (see Connect Mobile RTK Modem to Personal Computer section).

2. Click Mobile RTK Configurator icon to launch John Deere Modem Configuration Tool program. Then, input the following Connection Settings:
   • Select COM-Port from drop-down menu (A). Selected port depends on which COM port was used while installing USB-RS232 adapter cable.
   • Select 19200 at Baudrate drop-down menu (B).
   • Select desired language (C).

3. Click Connect button (D) to start configuration of Mobile RTK Modem or Cancel button (E) to abort process.
   If message “SIM card entered?” appears, check SIM card insertion. Click Retry button (F).

4. When SIM card is recognized, enter SIM PIN code (G) furnished by cell phone provider. Then, click OK button (H).

NOTE: If PIN code setting is incorrect, modem locks SIM card after three tries to dial in. To unlock SIM card, PUK code and an extra cellular phone is needed. The modem cannot set PUK code.
   If PUK code is not known, contact SIM card provider.
   SIM PIN code (G) is required at first SIM card insertion.
   If SIM card is swapped between modems or if an old SIM card is reused, SIM PIN code (G) is required again. The modem is able to save one SIM PIN.
   It is possible and preferred to disable SIM PIN code of SIM card using an external cell phone. SIM PIN code (G) is not required for modem.

A—COM-Port  E—Cancel Button
B—Baudrate  F—Retry Button
C—Language  G—SIM PIN Code
D—Connect Button  H—OK Button
5. John Deere Modem Configuration Tool interface appears and Modem Firmware Data (A) and Hardware Modem Version (B) are checked. Wait for complete reading settings process.

NOTE: After pressing Read Setting from Device button, signal strength is tested once and shown on signal strength bar.

If firmware data cannot be read or recognized, the following message appears:

“Could not read Firmware Data. Device could not be recognized. Ensure that device is active and connected properly.”

Check modem connection and SIM card activation. Click Try Again button (C) to restart firmware reading process.

Clicking Continue button (D) voids firmware data (A) being read and displayed.

When launching John Deere Modem Configuration Tool, input the following information furnished by the cell phone provider and RTK correction data provider. To determine information, refer to John Deere Mobile RTK Setup Data Checklist filled up during the modem bundle installation or contact the relevant provider:

- Connection type (F)
- GPRS Settings (G)
- Correction Data Settings (H)

If modem has been configured, it is possible to recall settings from the modem for further modification. Click Read Settings from Device button (I). Then, the connection type (F), GPRS settings (G), and correction data settings (H) on modem appear.

NOTE: Device signal strength is tested once and shown on signal strength bar (K).
6. If help is required to input settings, click About button (A):
   • Click Help button (B) to access the help file.
   
   NOTE: Help file is in pdf format and requires Adobe® Reader® to be viewed.
   
   • Click License button (C) to read terms of license.
   • Click Close button (D) to go back to configuration window.

   NOTE: John Deere Modem Configuration Tool Software version is also displayed.

   A—About Button          C—License Button
   B—Help Button            D—Close Button

   Continued on next page
If no profile has been previously configured: Input all requested fields (A) to (M). Do not use special characters such as “;” “,” or “?” for the passwords (F and J).

Select “user defined” at GPRS Setting Provider (C) and Correction Data Setting Service (G) drop-down menus.

NOTE: GPRS Settings and Correction Data Settings must be the same as the Modem/Network Configuration Subpages input. To input the requested fields on Modem/Network Configuration pages 1 and 2, it is necessary to use information provided by the cell phone provider and RTK correction data provider. This information can be found on the John Deere Mobile RTK Setup Data Checklist filled up during Mobile RTK Modem installation or in this Operator’s Manual. For more information, refer to GS2 or GS3 Display—Mobile RTK section.

If a profile has been configured and saved: Do not input requested fields (A) to (M). Click Recall Profile button (O). Then locate the desired profile on the personal computer to populate all required fields (A) to (M).

7. If no profile has been previously configured: Input all requested fields (A) to (M). Do not use special characters such as “;” “,” or “?” for the passwords (F and J).

Select “user defined” at GPRS Setting Provider (C) and Correction Data Setting Service (G) drop-down menus.

NOTE: GPRS Settings and Correction Data Settings must be the same as the Modem/Network Configuration Subpages input. To input the requested fields on Modem/Network Configuration pages 1 and 2, it is necessary to use information provided by the cell phone provider and RTK correction data provider. This information can be found on the John Deere Mobile RTK Setup Data Checklist filled up during Mobile RTK Modem installation or in this Operator’s Manual. For more information, refer to GS2 or GS3 Display—Mobile RTK section.

If necessary, check Roaming activation box (N).

NOTE: Selecting Roaming activation box (N) may lead to expensive fees when driving next to a border or in a foreign country. Extra fees for roaming may be applied by cell phone provider. To avoid additional roaming costs, check roaming conditions for SIM card with your provider.

8. Once the input is completed, click Configure Device button (P) to load settings on the modem SIM Card.
NOTE: Do not switch off power supply while proceeding to the SIM card configuration save process.

9. Wait for the loading process to finish. Then click Close button (A).

10. If necessary, save the settings under a specified profile name. Click Store Profile button (B). Then input the desired profile file name (C), and click Save button (D) or Cancel button (E) if saving the profile is not desired.

   A—Close Button       D—Save Button
   B—Store Profile Button E—Cancel Button
   C—File Name Field

Configure Modem

Configure Modem

Save Profile

Continued on next page
A—Dial-In Test Button

11. Once configuration of modem is done, modem network connection can be tested (diagnosticated). Click Dial-In Test button (A) to proceed and see Dial-in Test Mobile RTK Modem in this section.
Configure Mobile RTK Modem (Not Connected)

If several modems must be configured, pre-configure modem profiles first. Then, load desired profile to the correct modem. It is not necessary to connect modem to personal computer.

Configure Mobile RTK Modem profile as follows:

1. Click Mobile RTK Configurator icon to launch John Deere Modem Configuration Tool program. Then, input the following connection settings:
   - Do not change COM-Port selection from drop-down menu (A).
   - Do not change Baudrate selection from drop-down menu (B).
   - Select desired language (C).

2. Click Connect button (D) to start configuration of Mobile RTK Modem profile.

   As modem firmware data cannot be read or recognized, the following message appears: “Could not read Firmware Data. Device could not be recognized. Ensure that the device is active and connected properly.”

3. Click Continue button (F) or Cancel button (E) to abort process.

NOTE: Clicking Continue button (F) voids Firmware Data from being read and displayed.

A—COM-Port  B—Baudrate  C—Language  D—Connect Button  E—Cancel Button  F—Continue Button  G—Try Again Button
A—Country
B—GPRS
C—Provider
D—Gateway
E—UserID
F—Password
G—Service
H—IP/URL
I—UserID
J—Password
K—Mountpoint
L—Format
M—Port
N—Roaming Activation Box
O—Store Profile Button

NOTE: GPRS settings and RTK correction data settings must be the same as the Modem/Network Configuration subpages input. To input the requested fields on Modem/Network Configuration pages 1 and 2, use information provided by the cell phone provider and RTK correction data provider. This information can be found on the John Deere Mobile RTK Setup Data Checklist filled up during Mobile RTK Modem installation or in this Operator’s Manual. Refer to GS2 or GS3 Display—Mobile RTK section.

4. John Deere Modem Configuration Tool (Modem not Connected) interface appears.

5. Input all requested fields (A) to (M). Do not use special characters, such as “,” “,” or “?” for the passwords’ (F) (J) input.

Select “user defined” at GPRS Setting Provider (C) and Correction Data Setting Service (G) drop-down menus. If necessary, check Roaming activation box (N).

NOTE: It is not recommended to check Roaming activation box (N). Selecting this box may lead to expensive fees when driving next to the border or in a foreign country. Cell phone provider may charge extra fees for roaming. Check roaming conditions for SIM card with your provider to avoid additional roaming costs.

6. Once the input is completed, click Store Profile button (O).
7. Save settings under a specified Profile name. Input desired profile File Name (A). Click Save button (B) or Cancel button (C) if saving the profile is not necessary.

8. Repeat steps 4–6 to configure each modem profile.

A—File Name Field        C—Cancel Button
B—Save Button
9. Once configuration of modem profiles is done, click Exit button (A) and connect desired modem to load relevant profile. To proceed, refer to Connect Mobile RTK Modem to Personal Computer and Configure Mobile RTK Modem (Connected) sections.
Dial-in Test Mobile RTK Modem

A—Dial-In Test Button

Once configuration of modem is done or if a required modem profile must be diagnosticated, the modem network connection can be tested. Perform the following actions to test the network connection:

1. Prepare and connect the John Deere Mobile RTK Modem to the personal computer as indicated in Connect Mobile RTK Modem to Personal Computer and Configure Mobile RTK Modem (Connected) sections.

2. Click Dial-In Test button (A) to proceed.
3. Dial-In Test window appears.

4. To receive GGA information, check Direct Position Input box (A) for manual input or click Advanced button (B) to display GGA Selection/Input box (C).

   NOTE: To insert GGA position for testing purposes, longitude and latitude positions can be read on StarFire 3000 receiver.

   Advanced button (B) automatically selects a coordinate for desired country.

5. Click Dial-In Test button (D) to start modem diagnostic or click Close button (E) to abort process.

   NOTE: Following warning message appears: “Dial-In test causes costs. Start Dial-In test?”

   Contact your cell phone provider to be aware of cell phone contract internet flat rate. Incoming data read may take some time.

6. Click Yes button (F) to accept these costs and proceed or No button (G) to abort dial-in test process.

A—Direct Position Input Box  E—Close Button
B—Advanced Button  F—Yes Button
C—GGA Selection/Input Box  G—No Button
D—Start Dial-In Test Button

Cost Imply Warning
Continued on next page
7. Incoming data are read from the correction data provider as follows:
   a. Modem calls into RTK provider.
   b. LED on modem first blinks slow to show that it is called into GPRS network.
   c. LED on modem starts blinking fast when it is in contact with RTK service provider.

Correction data flow can be observed in Incoming Data window (B).

If correction data are correct, LED on modem blinks fast (test OK) and status (A) displays OK.

NOTE: If status (A) does not display OK, refer to Troubleshooting John Deere Mobile RTK Modem in Troubleshooting section.

8. Click Stop Dial-In Test button (C) to stop dial-In test process and cut costs.

NOTE: Stop dial-in test process before closing window; otherwise, test is not interrupted and costs continue to be applied.

9. Click Close button (D).
Electromagnetic Interference (EMI)

EMI can disrupt or overload the communication circuits of the computer and monitor system, causing erratic display activity. Severe cases result in complete system shutdown.

Common causes of EMI include:

- Operating close to high tension wires and broadcast towers
- Noisy power supply
- Monitor too close to radio antenna
- Old radio cables used
- Poor system ground
- Monitor power not directly connected to battery
- Radio power not directly connected to battery
- Monitor wiring harness too close to radio wiring
- Monitor not connected to on-board computer with standard system cables

Check causes of EMI and take corrective measures to overcome problems before replacing monitor.

NOTE: To avoid potential interferences, distance between StarFire 3000 receiver and GPRS antenna must be at least 60.0 cm (23.6 in.).
Troubleshooting John Deere Mobile RTK Modem

The front of the Mobile RTK Modem is equipped with a yellow LED (A) for status output. This LED indicates the status of the cellular network and correction data.

Use LED status to diagnose the Mobile RTK Modem quickly as shown in table:

A—Yellow LED

<table>
<thead>
<tr>
<th>LED Status</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow Fix</td>
<td>Powered on but not attached to cellular network.</td>
</tr>
<tr>
<td>Slow Long Flashing (500 ms ON-500 ms OFF)</td>
<td>Attached to GPRS network but no correction data.</td>
</tr>
<tr>
<td>Quick Short Flashing (100 ms ON-100 ms OFF)</td>
<td>Attached to GPRS network. Receive GPS signal and RTK correction data. → Operating status</td>
</tr>
<tr>
<td>Double Quick Flashing (100 ms ON-100 ms OFF, 100 ms ON-100 ms OFF)</td>
<td>Correction data stream interrupted.</td>
</tr>
</tbody>
</table>

Troubleshooting Mobile RTK:

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not lit up</td>
<td>Bad connector connections.</td>
<td>Check power and all connection points.</td>
</tr>
<tr>
<td>No or bad cellular network connection</td>
<td>Defective hardware.</td>
<td>Replace modem.</td>
</tr>
<tr>
<td></td>
<td>Check LED status on modem or wiring harness.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Check Signal Strength button at M–RTK page.</td>
<td></td>
</tr>
<tr>
<td>Wrong settings entered.</td>
<td>Check settings for cellular network access.</td>
<td></td>
</tr>
<tr>
<td>Wrong password.</td>
<td>Check password. Modern does not allow &quot;&quot;, or &quot;:&quot; characters.</td>
<td></td>
</tr>
<tr>
<td>SIM card not activated.</td>
<td>Check if cellular provider has activated SIM card.</td>
<td></td>
</tr>
<tr>
<td>No PIN code set.</td>
<td>PIN code must be set with configuration tool (see Configuration and Diagnostic Tool section).</td>
<td>PIN code can be enabled with a cell phone (recommended).</td>
</tr>
<tr>
<td>Wrong PIN code set.</td>
<td>Modem locks SIM card after three tries to dial in. To unlock SIM card, PUK code and an extra cellular phone is needed. PUK code cannot be set by modem. PIN code can be enabled with a cell phone (recommended). If PUK code is not known, contact SIM card provider.</td>
<td></td>
</tr>
<tr>
<td>Wrong SIM card used.</td>
<td>Only 2G (GPRS) can be used with John Deere Mobile RTK Modem.</td>
<td></td>
</tr>
<tr>
<td>Bad coverage (2G networks) or APN service interrupts cause more dropouts.</td>
<td>Try another location with known coverage or try another day time. Check Signal Strength button on M–RTK page.</td>
<td></td>
</tr>
<tr>
<td>Wrong SIM card configuration.</td>
<td>Re-configure SIM card.</td>
<td></td>
</tr>
<tr>
<td>SIM card contract ended.</td>
<td>Renew contract.</td>
<td></td>
</tr>
<tr>
<td>Problem</td>
<td>Cause</td>
<td>Solution</td>
</tr>
<tr>
<td>---------</td>
<td>-------</td>
<td>----------</td>
</tr>
<tr>
<td>No correction data running in (no RTK accuracy)</td>
<td>Wrong settings entered.</td>
<td>Check LED status on modem.</td>
</tr>
<tr>
<td></td>
<td>Wrong password.</td>
<td>Check settings for cellular network access.</td>
</tr>
<tr>
<td></td>
<td>Correction data stream not compatible.</td>
<td>Check password. Modem does not allow &quot;,&quot; or &quot;:&quot; characters.</td>
</tr>
<tr>
<td></td>
<td>Incorrect NMEA message or baud rate set.</td>
<td>Check compatibility of correction data stream and SF 3000 (SF 3000 supports RTCM 2.3, 3.0, and CMR streams).</td>
</tr>
<tr>
<td></td>
<td>Bad correction data provider coverage.</td>
<td>Check if GGA checkbox on NMEA Message on Mobile RTK Configuration Page (SF 3000) is enabled and Baud Rate is 19200.</td>
</tr>
<tr>
<td></td>
<td>Contract ended.</td>
<td>Check with RTK correction data provider. Check if service is available on website of provider or provider support.</td>
</tr>
<tr>
<td></td>
<td>Contract not started yet or not activated.</td>
<td>Try another location.</td>
</tr>
<tr>
<td>Bad RTK accuracy (deviation more than 2 cm)</td>
<td>RTK baseline effect (2 ppm/10 km) depends on the distance between single base station and rover.</td>
<td>Ensure only one license per modem is in use.</td>
</tr>
<tr>
<td></td>
<td>Correction data provider (for example, Shutdown, Maintenance, Changes).</td>
<td>Only by use of single base streams: As distance between the area of the single base stream and receiver of the tractor grows longer, accuracy of correction decreases or falls.</td>
</tr>
<tr>
<td></td>
<td>Modem not configurable with SF 3000 (not possible)</td>
<td>Update software version of SF3000 receiver (bundle 13-1).</td>
</tr>
<tr>
<td></td>
<td>Old software version of SF3000 receiver.</td>
<td>No modem and network configure button available</td>
</tr>
<tr>
<td>No access to modem with Configuration tool (Modem connected to personal computer)</td>
<td>Wrong COM port selected.</td>
<td>Check data correction provider website or ask data correction provider support for issues with data stream of correction data.</td>
</tr>
<tr>
<td></td>
<td>Connection points.</td>
<td>Check which COM port is available for serial-usb adapter. Close and open Configuration tool again to update COM ports in drop-down menu.</td>
</tr>
<tr>
<td></td>
<td>SIM card not inserted correctly.</td>
<td>Check connection point between modem configuration harness, serial-usb-adapter, power, and computer.</td>
</tr>
<tr>
<td>Installation of Configuration tool failed</td>
<td>Wrong computer operating system used.</td>
<td>Check if SIM card is entered correctly.</td>
</tr>
<tr>
<td></td>
<td>Are administrator rights needed for application installation?</td>
<td>Execute program with administrator rights.</td>
</tr>
</tbody>
</table>
### Metric Bolt and Screw Torque Values

<table>
<thead>
<tr>
<th>Bolt or Screw Size</th>
<th>Class 4.8</th>
<th>Class 8.8 or 9.8</th>
<th>Class 10.9</th>
<th>Class 12.9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lubricated(^a)</td>
<td>Dry(^b)</td>
<td>Lubricated(^a)</td>
<td>Dry(^b)</td>
</tr>
<tr>
<td>------</td>
<td>--------</td>
<td>------</td>
<td>--------</td>
<td>------</td>
</tr>
<tr>
<td>M6</td>
<td>4.7</td>
<td>42</td>
<td>6</td>
<td>53</td>
</tr>
<tr>
<td>M8</td>
<td>11.5</td>
<td>102</td>
<td>14.5</td>
<td>128</td>
</tr>
<tr>
<td>M10</td>
<td>23</td>
<td>204</td>
<td>29</td>
<td>21</td>
</tr>
<tr>
<td>M12</td>
<td>40</td>
<td>29.5</td>
<td>50</td>
<td>37</td>
</tr>
<tr>
<td>M14</td>
<td>63</td>
<td>46</td>
<td>80</td>
<td>59</td>
</tr>
<tr>
<td>M16</td>
<td>100</td>
<td>74</td>
<td>125</td>
<td>92</td>
</tr>
<tr>
<td>M18</td>
<td>135</td>
<td>100</td>
<td>170</td>
<td>125</td>
</tr>
<tr>
<td>M20</td>
<td>190</td>
<td>140</td>
<td>245</td>
<td>180</td>
</tr>
<tr>
<td>M22</td>
<td>265</td>
<td>195</td>
<td>330</td>
<td>245</td>
</tr>
<tr>
<td>M24</td>
<td>330</td>
<td>245</td>
<td>425</td>
<td>315</td>
</tr>
<tr>
<td>M27</td>
<td>490</td>
<td>360</td>
<td>625</td>
<td>460</td>
</tr>
<tr>
<td>M30</td>
<td>660</td>
<td>490</td>
<td>850</td>
<td>625</td>
</tr>
<tr>
<td>M33</td>
<td>900</td>
<td>665</td>
<td>1150</td>
<td>850</td>
</tr>
<tr>
<td>M36</td>
<td>1150</td>
<td>850</td>
<td>1450</td>
<td>1075</td>
</tr>
</tbody>
</table>

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For stainless steel fasteners or for nuts on U-bolts, see the tightening instructions for the specific application. Tighten plastic insert or crimped steel type lock nuts by turning the nut to the dry torque shown in the chart, unless different instructions are given for the specific application.

*Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class. Replace fasteners with the same or higher property class. If higher property class fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.

\(^a\)"Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or M20 and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.

\(^b\)"Dry" means plain or zinc plated without any lubrication, or M6 to M18 fasteners with JDM F13B, F13E or F13H zinc flake coating.

---

### Safety Note Regarding the Subsequent Installation of Electrical and Electronic Appliances and/or Components

The machine is equipped with electronic components whose function may be influenced by electromagnetic radiation from other appliances. Such influences may be hazardous, so take the following safety instructions into account:

If electrical and electronic appliances are subsequently installed on the machine and connected to the onboard system, the user must verify whether the installation affects the electronics or other components. This applies particularly to:

- Personal Computer
- GPS (Global Positioning System) receiver

In particular, subsequently installed electrical/electronic components must comply with the relevant edition of EMC Directive 2004/108/EC, and be CE marked.

Wiring, installation and maximum permissible current supply must be as stated in the installation instructions of the machine manufacturer.
EC Declaration of Conformity

Deere & Company
Moline, Illinois U.S.A

The person named below declares that

Product: John Deere Mobile RTK Modem

Part Number: PFP12755

fulfills all relevant provisions and essential requirements of the following directives:

<table>
<thead>
<tr>
<th>Directive</th>
<th>Number</th>
<th>Certification Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio and Telecommunication Terminal Equipment (R&amp;TTE)</td>
<td>1999/5/EC Annex III</td>
<td></td>
</tr>
<tr>
<td>Restriction of Hazardous Substances (RoHS)</td>
<td>2011/65/EU Article 7 of the Directive</td>
<td></td>
</tr>
</tbody>
</table>

The product is in conformity with the following standards and/or other normative directive(s):

EN 301 489-1 v1.8.1
EN 301 489-7 v1.3.1
EN 301 511 v9.0.2
EN 60950-1:2006 + A11:2009
EN 50385:2002

Name and address of the person in the European Community authorized to compile the technical construction file:

Brigitte Birk
John Deere GmbH & Co. KG
Mannheim Regional Center (Zentralfunktionen)
John Deere Strasse 70
Mannheim, Germany D-68163
EUConformity@johndeere.com

Place of declaration: Urbandale, Iowa
Name: Michael R. Moody
Date of declaration: 24 January 2013
Title: Infrastructure Development Manager, John Deere Intelligent Solutions Group

Manufacturing unit: John Deere Intelligent Solutions Group

DXCE01 —UN—28APR09

HC94949,00001D3 -19-24JAN13-1/1
Identification Label

Letters and numbers on the label identify a component or assembly. All of these characters are needed when ordering parts or identifying the system or component for any John Deere product support program. Also, they are needed for law enforcement to trace your John Deere Mobile RTK system if it is ever stolen.

For these reasons, accurately record these characters.

John Deere Mobile RTK Modem

Label is located on side of RTK modem.
<table>
<thead>
<tr>
<th>Page</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td><strong>O</strong></td>
</tr>
<tr>
<td>ACTIVATIONS tab</td>
<td>Optimize Shading</td>
</tr>
<tr>
<td>StarFire 3000</td>
<td>StarFire 3000</td>
</tr>
<tr>
<td>15-6</td>
<td>15-5</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td><strong>P</strong></td>
</tr>
<tr>
<td>Bolt and screw torque values</td>
<td>Prepare</td>
</tr>
<tr>
<td>Metric</td>
<td>Mobile RTK Modem</td>
</tr>
<tr>
<td>35-1</td>
<td>25-2, 25-9</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td><strong>R</strong></td>
</tr>
<tr>
<td>Check Mobile RTK Modem</td>
<td>RTK port configuration</td>
</tr>
<tr>
<td>30-2</td>
<td>20-2</td>
</tr>
<tr>
<td>Configuration and Diagnostic Tool</td>
<td><strong>S</strong></td>
</tr>
<tr>
<td>Installation</td>
<td>Safety, Steps and Handholds</td>
</tr>
<tr>
<td>25-1</td>
<td>Use Steps and Handholds Correctly</td>
</tr>
<tr>
<td><strong>D</strong></td>
<td>30-1</td>
</tr>
<tr>
<td>Diagnosticate</td>
<td><strong>T</strong></td>
</tr>
<tr>
<td>Mobile RTK Modem</td>
<td>Torque charts</td>
</tr>
<tr>
<td>25-13</td>
<td>Metric</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>35-1</td>
</tr>
<tr>
<td>15-10</td>
<td>Troubleshooting</td>
</tr>
<tr>
<td>Dial-in test</td>
<td>Electromagnetic interference (EMI)</td>
</tr>
<tr>
<td>25-13</td>
<td>30-1</td>
</tr>
<tr>
<td><strong>E</strong></td>
<td><strong>H</strong></td>
</tr>
<tr>
<td>Electromagnetic interference</td>
<td>Hardware torque values</td>
</tr>
<tr>
<td>30-1</td>
<td>Metric</td>
</tr>
<tr>
<td><strong>F</strong></td>
<td><strong>I</strong></td>
</tr>
<tr>
<td>Identification label</td>
<td>INFO tab</td>
</tr>
<tr>
<td>40-1</td>
<td>StarFire 3000</td>
</tr>
<tr>
<td><strong>G</strong></td>
<td>15-2</td>
</tr>
<tr>
<td><strong>M</strong></td>
<td><strong>N</strong></td>
</tr>
<tr>
<td>Metric bolt and screw torque values</td>
<td>Serial numbers</td>
</tr>
<tr>
<td>35-1</td>
<td>Identification label</td>
</tr>
<tr>
<td><strong>O</strong></td>
<td>40-1</td>
</tr>
<tr>
<td>Mobile RTK</td>
<td>Modem</td>
</tr>
<tr>
<td>20-1</td>
<td>40-1</td>
</tr>
<tr>
<td>Modem/network configuration</td>
<td><strong>S</strong></td>
</tr>
<tr>
<td>20-9</td>
<td>SERIAL PORT tab</td>
</tr>
<tr>
<td>Serial port configuration</td>
<td>StarFire 3000</td>
</tr>
<tr>
<td>20-7</td>
<td>15-8</td>
</tr>
<tr>
<td>Softkey</td>
<td>SETUP tab</td>
</tr>
<tr>
<td>20-1</td>
<td>StarFire 3000</td>
</tr>
<tr>
<td>20-1</td>
<td>15-4</td>
</tr>
<tr>
<td>System requirements</td>
<td>Softkey</td>
</tr>
<tr>
<td>Cell network provider</td>
<td>Mobile RTK</td>
</tr>
<tr>
<td>10-1</td>
<td>20-1</td>
</tr>
<tr>
<td>John Deere components</td>
<td>StarFire 3000</td>
</tr>
<tr>
<td>10-1</td>
<td>15-1</td>
</tr>
<tr>
<td>RTK correction data provider</td>
<td><strong>T</strong></td>
</tr>
<tr>
<td>10-1</td>
<td>Torque charts</td>
</tr>
<tr>
<td>System status</td>
<td>Metric</td>
</tr>
<tr>
<td>20-2</td>
<td>35-1</td>
</tr>
<tr>
<td><strong>P</strong></td>
<td><strong>U</strong></td>
</tr>
<tr>
<td><strong>Q</strong></td>
<td><strong>V</strong></td>
</tr>
<tr>
<td><strong>R</strong></td>
<td><strong>W</strong></td>
</tr>
<tr>
<td><strong>S</strong></td>
<td><strong>X</strong></td>
</tr>
<tr>
<td><strong>T</strong></td>
<td><strong>Y</strong></td>
</tr>
<tr>
<td><strong>U</strong></td>
<td><strong>Z</strong></td>
</tr>
</tbody>
</table>
John Deere Service Keeps You On The Job

**John Deere Parts**
We help minimize downtime by putting genuine John Deere parts in your hands in a hurry.
That's why we maintain a large and varied inventory—to stay a jump ahead of your needs.

**The Right Tools**
Precision tools and testing equipment enable our Service Department to locate and correct troubles quickly . . . to save you time and money.

**Well-Trained Technicians**
School is never out for John Deere service technicians.
Training schools are held regularly to be sure our personnel know your equipment and how to maintain it.
Result?
Experience you can count on!

**Prompt Service**
Our goal is to provide prompt, efficient care when you want it and where you want it.
We can make repairs at your place or at ours, depending on the circumstances: see us, depend on us.

JOHN DEERE SERVICE SUPERIORITY: We'll be around when you need us.