



RTK Bridge®-X Installation Guide

*for the
John Deere StarFire™ 3000*

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1 Overview

The John Deere StarFire™ 3000 can be configured to accept RTK corrections from an Intuicom RTK Bridge®-X which in turn has been configured to connect to a GPS/GNSS reference network. The intended audience for this document is a dealer or integrator familiar with the StarFire™ 3000 and generally familiar with the Intuicom RTK Bridge®-X. The Intuicom RTK Bridge®-X User Guide covers the steps necessary for its configuration.

2 Requirements for Installation

2.1 Required Information

In order to operate an Intuicom RTK Bridge®-X, it is required to have the necessary information to access and log in to the Real-Time Network. This information is entered into the RTK Bridge®-X and stored in a profile. More details on setting up an RTK Bridge®-X is available in the RTK Bridge®-X User Manual.

- IP Address/Hostname
- TCP Port
- NTRIP Nountpoint name
- Username and Password for access to the real-time GPS/GNSS network

2.2 Required Equipment

2.2.1 Intuicom Equipment and Accessories

1. Intuicom RTK Bridge®-X with activated data provider account (Verizon, AT&T, etc.)
 - Verizon Modem [P/N: XRTK-V]
 - SIM-Based Modem [P/N: XRTK-S]
2. Intuicom RTK Bridge®-X Bluetooth Receiver:
[P/N: XRTK-BT-JD]
3. Power Cable: (power pigtail for John Deere Power Strip to SAE, 6 foot)
[P/N: JDPW-SAE]
4. RAM Kit
[P/N: FIP4-RAMKT-JD]

2.2.2 Other Equipment and Accessories

5. PC with serial port
6. John Deere StarFire™ 3000 (RTK option enabled) with Radio Housing
7. John Deere monitor to program StarFire™ 3000 (Has been tested with 2600, 2630, 1800 and Brown Box monitors)

3 Installation Instructions

Below is a diagram for the recommended installation of the Intuicom RTK Bridge®-X utilizing the equipment noted above.



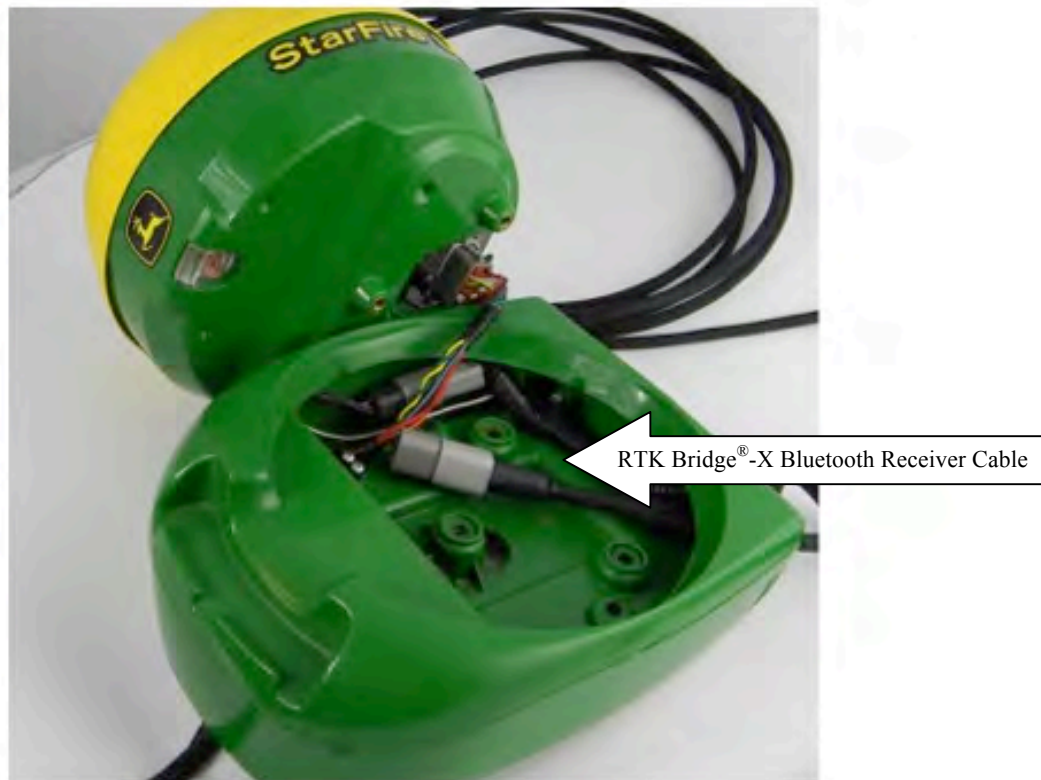
The RTK Bridge-X Bluetooth Receiver is designed to be plugged directly into the GNSS receiver and has both data and power connections. The unit should be mounted so that it is secure and not overly straining the cable and connectors.

The RTK Bridge-X should be installed in the cab of the tractor where the diagnostic LEDs can be monitored. When using the RTK Bridge-X Bluetooth Receiver, the RTK Bridge-X will need to be powered via the included DC power leads since it is no longer being powered through the StarFire™ 3000. Connect all antennas to the RTK Bridge-X and connect the power cable. Plug the RTK Bridge-X Bluetooth Receiver into the GNSS receiver.

Connecting the RTK Bridge®-X to the StarFire™ 3000

- Open the base of the StarFire™ 3000 and unplug the radio connector if included. Plug the connector from the RTK Bridge®-X Bluetooth Receiver into the StarFire™ connector. Reassemble the StarFire™ 3000 making sure the cable is not crimped and waterproofing the housing where the cable enters. Diagram 2, below shows the inside of the StarFire™ receiver and where the RTK Bridge®-X Bluetooth Receiver cable will plug in.

Diagram 2



- The RTK Bridge®-X Bluetooth Receiver mounts inside the John Deere Radio Housing which is attached as directed to the StarFire™ 3000. [See page 17-18.]
- It is recommended that the RTK Bridge®-X be installed where the operator can view the status LEDs for troubleshooting and to verify operation. Intuicom has a variety of installation options available for the RTK Bridge®-X.

INSTRUCTION SHEET FOR MOUNTING IN THE RADIO HOUSING

Preparing the John Deere Radio Housing for mounting the Intuicom RTK Bridge[®]-X Bluetooth Receiver.

- STEP 1:** Place the provided template on the Radio Housing as shown below [Figure 1]. Secure it with tape to prevent it from moving during the drilling process.
- STEP 2:** Using a drill with a ¼” bit, drill the two holes where indicated.
- STEP 3:** Remove the template. Insert the Intuicom RTK Bridge[®]-X Bluetooth Receiver as shown [Figure 2], securing it to the Radio Housing with the hardware provided.



Figure 1

Connect to Receiver

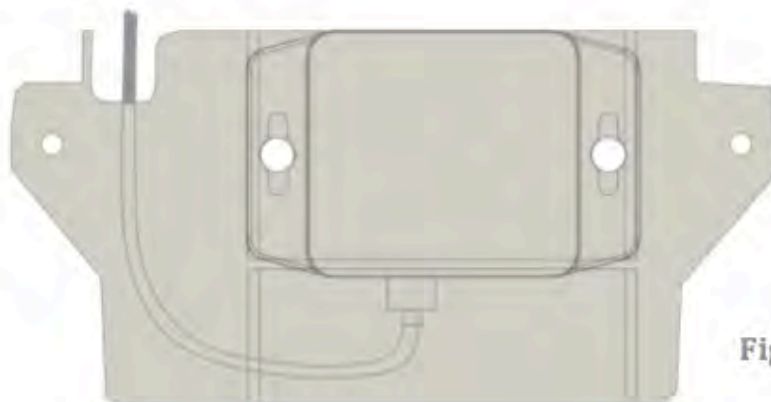


Figure 2

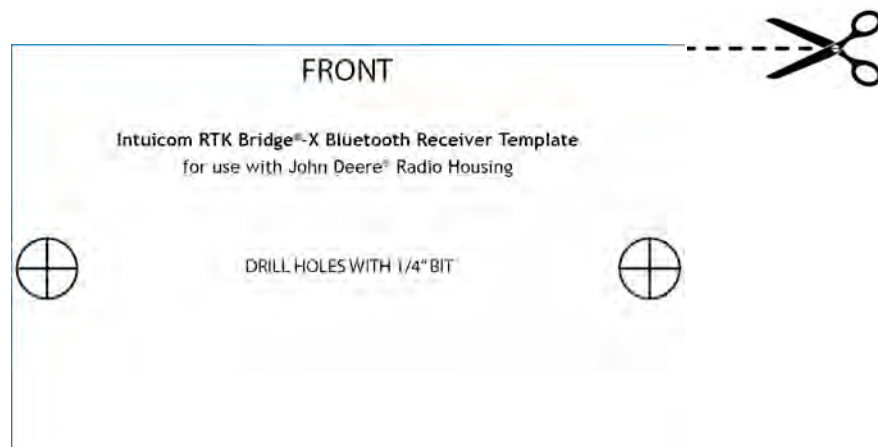
Photo [Figure 3] of the installed RTK Bridge®-X Bluetooth Receiver in the John Deere Radio Housing.



Figure 3

Template for use with John Deere Radio Housing

Cut out the template below and affix to Radio Housing as shown in Figure 1.

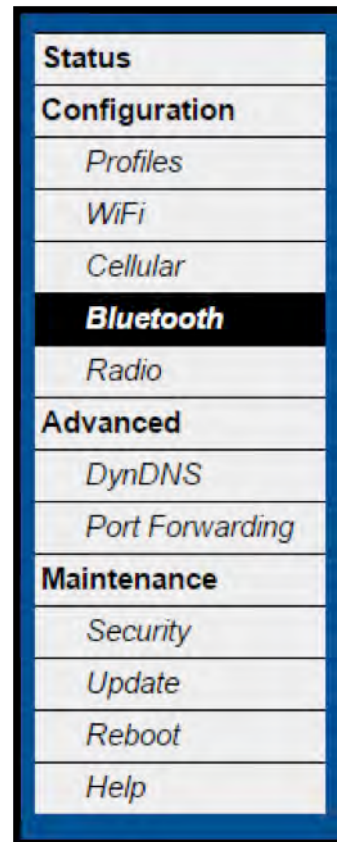


Configuring the RTK Bridge[®]-X to send Corrections to the StarFire[™] 3000 via the RTK Bridge[®]-X Bluetooth Receiver

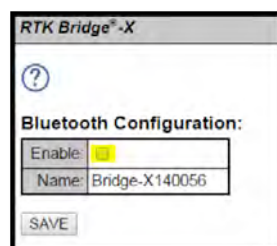
NOTE: Be sure the RTK option is unlocked before proceeding. An unlock code can be obtained from a John Deere dealer.

4 Configuration

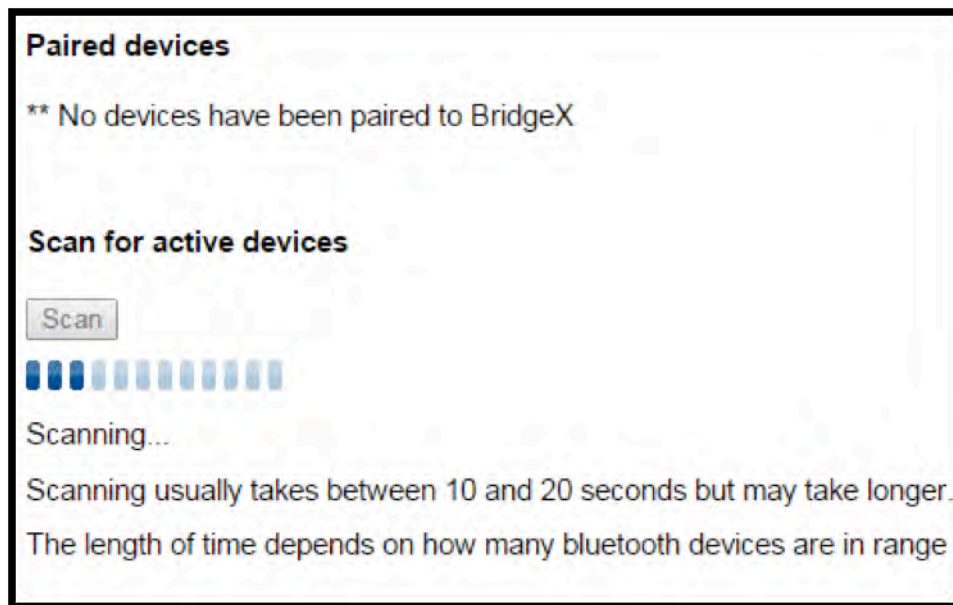
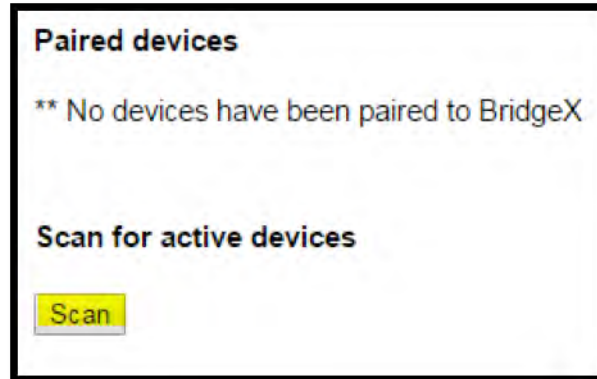
In order to send the correction to the Intuicom RTK Bridge-X Bluetooth Receiver, it must first be paired with the RTK Bridge-X. Once RTK Bridge-X Bluetooth Receiver is powered up, the LINK LED will begin flashing, this indicates the receiver is in pairing mode. Now the RTK Bridge-X needs to find the RTK Bridge-X Bluetooth Receiver. Log into the RTK Bridge-X and navigate to the Bluetooth page.



Bluetooth must be enabled on the RTK Bridge-X. Check the *Enable* box and click the *SAVE* button.



Now the RTK Bridge-X is ready to pair to the RTK Bridge-X Bluetooth Receiver. Press the *Pairing* button and the RTK Bridge-X will start to search for the RTK Bridge-X Bluetooth Receiver. This process can take 10-20 seconds and may have to be run more than once if there is interference. Disabling the WiFi may help for the pairing process to be faster; but will require that the unit be configured via direct Ethernet connection or via Cellular connection.



Once the RTK Bridge-X Bluetooth Receiver has been discovered, press the *Pair with device* button. The PAIR LED on the RTK Bridge-X Bluetooth Receiver should stop blinking and be constantly on indicating a successful pairing. The DATA LED should start blinking as the RTK Bridge-X begins sending data to the RTK Bridge-X Bluetooth Receiver.

Scan for active devices

Scan

Name	
IntuicomBT-1113	Pair with device

* only devices supporting the serial-port profile are shown
 ** devices requiring PIN codes cannot be paired

Paired devices

Name	Status	
IntuicomBT-1113	Connected	Remove

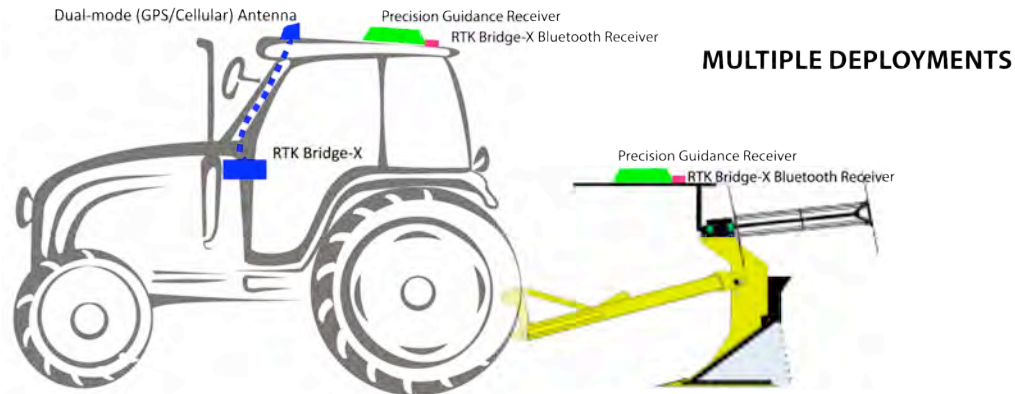
Scan for active devices

Scan

** No un-paired, supported devices have been found.
 Make sure your device is turned on and try again.

The StarFire™ 3000 must be configured to receive at 38,400 baud rate (set baud rate), 8 data bits, no parity, and 1 stop bit. The correction type must match the correction type being received in the RTK Bridge-X (typically RTCM). See the StarFire™ 3000 Installation guide for details on configuring the receiver.

Multiple RTK Bridge-X Bluetooth Receivers may be connected to the RTK Bridge-X and will all receive a copy of the same correction the RTK Bridge-X is receiving from the NTRIP Caster. This allows for Multiple GNSS Receivers to receive a correction from the same RTK Bridge-X



IMPORTANT NOTE

If the RTK Bridge-X is not currently connected to any Bluetooth devices, it is advised that the devices be removed from the Paired Devices list or Bluetooth be disabled. Having paired devices in the list that are not currently paired to the RTK Bridge-X will cause the RTK Bridge to continually search for them which will impact the WiFi capability.

Paired devices		
Name	Status	
IntuicomBT-1113	Connected	Remove

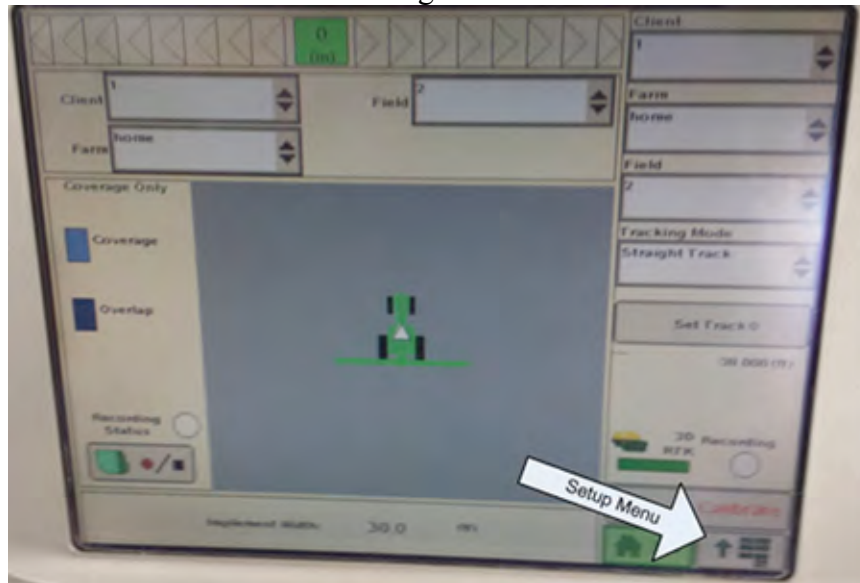
For the most efficient technical support of the RTK Bridge-X, Intuicom recommends “Intuicom Remote Support”. Please contact Intuicom for details on this real-time, remote support alternative.

For general technical support, please contact us at support@intuicom.com or call us at 303.449.4330.

5 How to Check for an RTK Fix on the StarFire™ 3000

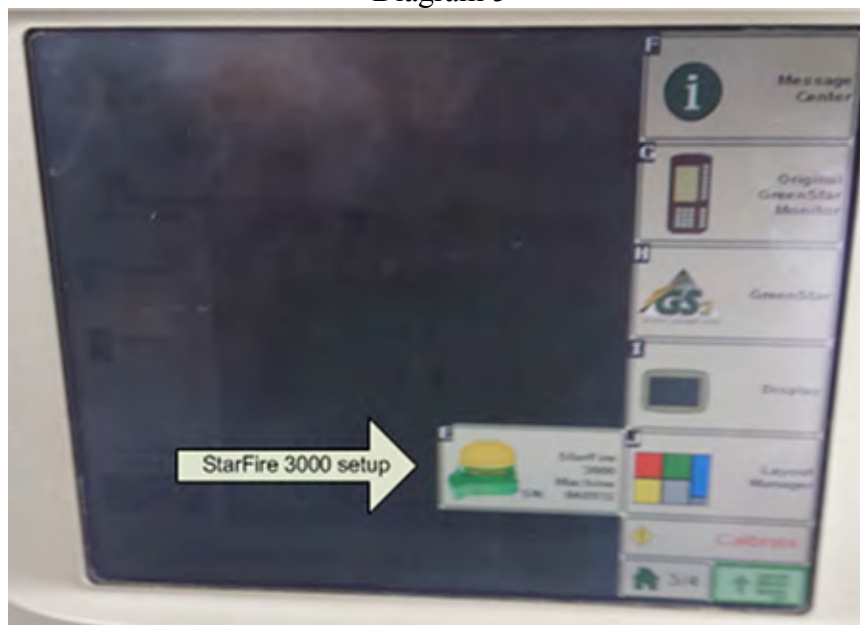
- 1 From the main screen on the John Deere system, press the setup menu button – Diagram 4.

Diagram 4



- 2 In the Setup Menu, select the StarFire™ 3000 Icon – Diagram 5.

Diagram 5



- 3 Once the RTK Bridge® -X connects to the server and starts transmitting corrections (blinking TXD LED), the StarFire™ 3000 should start receiving the RTK corrections and should get an RTK Fix – Diagram 6.

Diagram 6



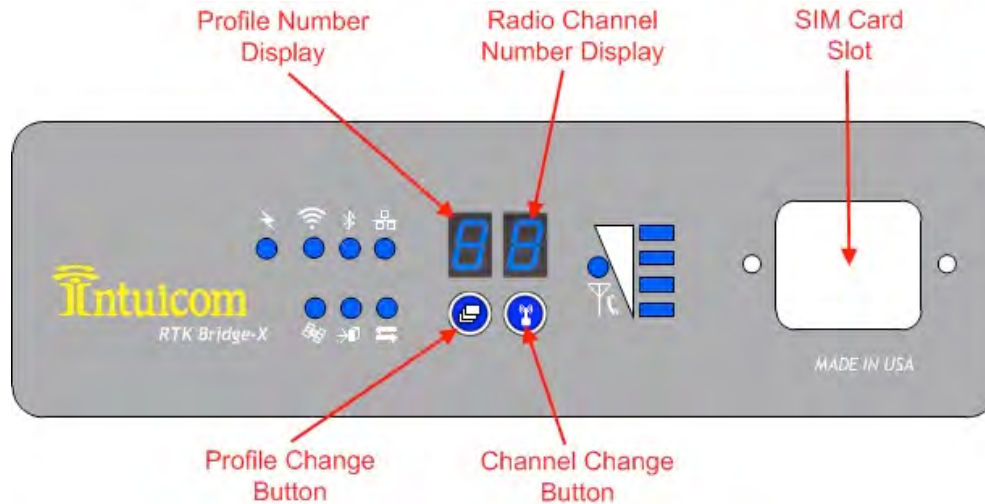
- 4 If the RTK Bridge®-X TXD LED is blinking and the StarFire™ 3000 is not getting an RTK fix, section 4.3 will show how to get an RTK fix.
- 5 Diagram 7 is the receiver without an RTK Fix.

Diagram 7



6 Programming and Troubleshooting

RTK Bridge[®]-X Panels, Buttons, Lights, and Connectors



Front Panel (Model with Internal Data Radio)

Symbol	Description
	Indicates power to the unit.
	Indicates that WIFI is enabled.
	Indicates that Bluetooth is enabled.
	Indicates Ethernet link and activity.
	Indicates whether the internal GPS is tracking when used in the current Profile. Solid indicates tracking, flashing indicates not tracking.
	Indicates Bridge-X operating as NTRIP client or server is connected to NTRIP Caster. Alternatively indicates when an NTRIP Client is connected to the Bridge-X in Base Socket Mode.
	Flashing indicates flow of data. Where data is flowing to or from depends upon the current Profile configuration. Data flow could be to or from NTRIP Caster, to NTRIP Client, to or from internal radio when in Base Radio or Radio Receive modes.
	Cellular link and registration. A flashing LED indicates carrier registration. No lit LED or a solid LED indicates no service, no SIM or unsuccessful registration.
	Cellular signal strength. Ranges from four lit LEDs (strong signal) to no lit LEDs (weak or absent signal)

Front Panel LED Symbols and Descriptions

6.1 Troubleshooting the RTK Bridge®-X

Issue	Possible Cause(s)	Correction Step(s)
No LEDs	Power issue	Check power supply and cabling
RTK Bridge keeps rebooting/can't access setup page or WIFI	Power issue	Make sure Power supply is providing enough current, start Tractor
GPS is not tracking/Cellular has low or no signal	Antenna or Coax issues	Make sure Dual Mode antenna has good sky view and is connected to the correct ports
Cannot access WIFI	WIFI disabled forgot WPA2 passphrase WIFI antenna not installed WIFI not enabled on device	-Enable WIFI through direct Ethernet connection or call for Intuicom Remote Support -Change passphrase through direct - Ethernet connection or Intuicom Remote Support -Install WIFI antenna -Enable WIFI on device (Smart Phone, Tablet or Laptop)
Unit will not connect to NTRIP caster	Profile Settings incorrect GPS is not tracking Cellular plan not active Profile has been set to disabled ("-" on profile LED)	-Verify IP/Hostname, Port, Mountpoint, Username and Password, and positioning settings. Intuicom Remote Support can assist with this step -Make sure GPS antenna is properly installed and positioning is set correctly -Activate unit with Cellular Carrier -Change profile to desired profile in setup or with button
RTK Bridge will not connect to Cellular Network	Unit not activated with carrier APN not entered correctly (SIM unit) Activation Process has not been run (Verizon) Antenna issue	-Ensure Cellular plan is active with carrier -Ensure correct APN and SIM settings are entered in Cellular page (SIM) -Run activation process (Verizon) -Ensure antennas are correctly installed
RTK Bridge is transmitting, but corrections are not being received	Incorrect settings on receiver Wrong correction type RTK not installed on receiver pinout issue	-Verify that receiver settings are correct (Baud Rate, Serial settings, correction type, etc.) -Verify that receiver accepts the selected correction type -Verify that receiver is activated for RTK -Check cable pinout
No Internet access	RTK Bridge is not activated No Cellular Signal	Verify that unit is activated with Cellular Carrier and has good signal strength
A radio channel selection resulted in the channel being changed to "-"	Radio has been disabled	Press the radio change button to use the desired radio channel or change in setup
A working unit suddenly stops operating, is disconnected from the cellular network, the GPS is not tracking.	Unit absorbed severe electrostatic discharge	-Reboot the device using the Reboot page -Power cycle the device

6.2 Troubleshooting the StarFire™ 3000

Once the RTK Bridge®-X TXD LED is flashing, the following steps will walk through troubleshooting your device.

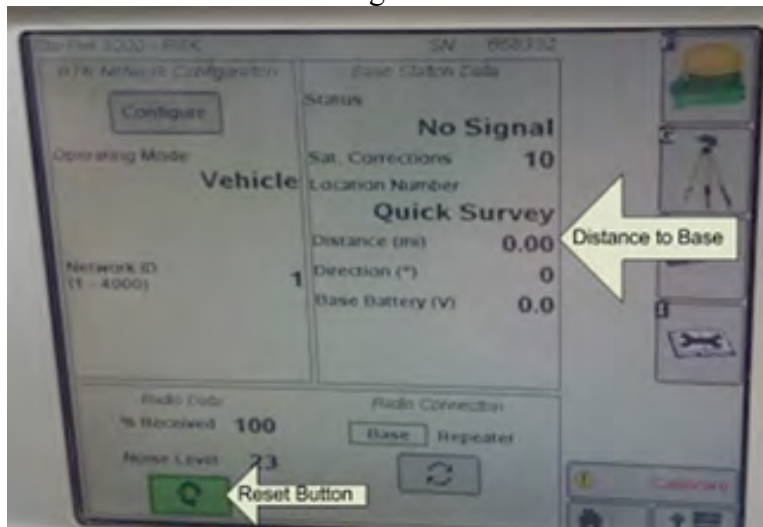
1. From the StarFire 3000 setup screen, press the “Base Setup” button – Diagram 8

Diagram 8



2. In the Base Station Data menu, check that the StarFire™ 3000 is correctly displaying a “Distance to Base” – Diagram 9

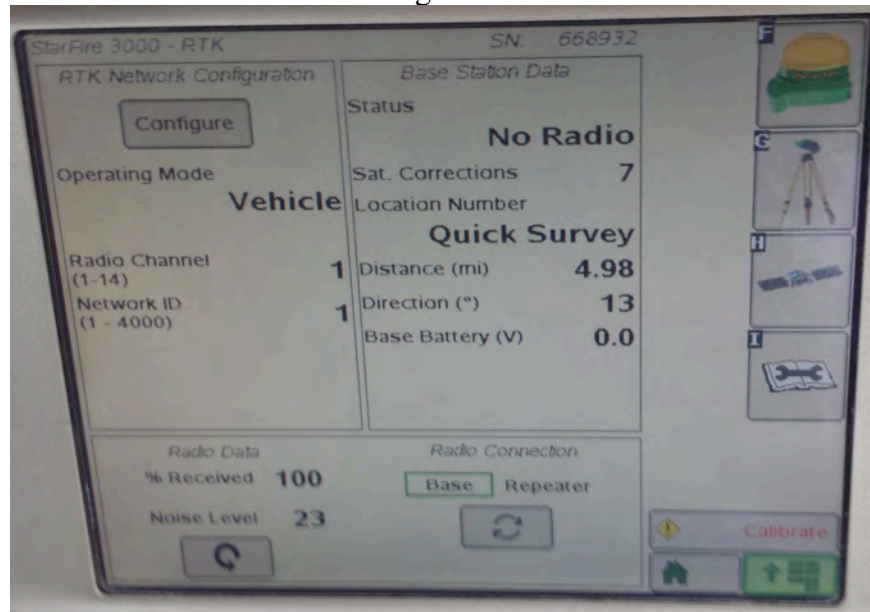
Diagram 9



If the Distance to Base is 0.00, press the Reset “Radio Data” button in the bottom left corner (Diagram 9). The % Received should go to 0 and then climb to 100. The Distance to Base should correctly display. If not, repeat this step until this item is not 0.

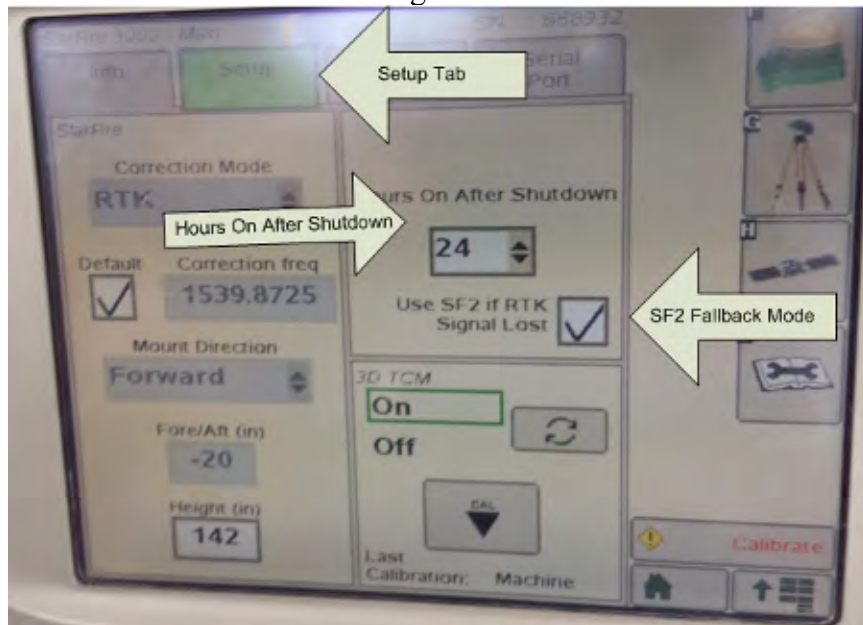
3. When the Distance displays correctly, it should look like Diagram 10.

Diagram 10



4. The StarFire™ 3000 should now get an RTK Fix. To verify, select the StarFire 3000 icon in the upper right corner. The page should look like Diagram 6. It may take a minute or two for the receiver to get an RTK Fix.
5. If the receiver does not get an RTK Fix and is in SF2 Fallback Mode, select the “Setup” tab and uncheck the “SF2 when lost” box. This should force the receiver out of SF2 fallback and into RTK quicker. Once the receiver has an RTK Fix, this box can be rechecked to allow for SF2 Fallback Mode. Diagram 11.
6. If the receiver is still not maintaining an RTK Fix, the “Hours On After Shutdown” option can be set to 0. Then the receiver should be powered off and then restarted. This should force the receiver to do a fresh sky view and should get an RTK Fix faster. Diagram 11.

Diagram 11



7. The StarFire™ 3000 receiver should now be in RTK and ready for operation.

Intuicom Technical Support is available M-F 7:30AM to 5PM MST (GMT-7) at either 303-449-4330 or support@intuicom.com for help connecting your RTK Bridge®-X.

Template for use with John Deere Radio Housing

Cut out the template below and affix to Radio Housing as shown in Figure 1.

