

# CRG Firmware Update Manual



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## **Release Notice**

This is the March 2024 release of the Agra-GPS CRG Firmware Update Manual.

## **Disclaimer**

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**DO NOT USE THE “CRG” IF YOU DISAGREE WITH THE DISCLAIMER.**

## **Introduction**

The CRG has several different methods for updating firmware.

### **METHODS**

- (I) via built-in Modem (page 3)
- (II) via USB thumb drive, using JD monitor (page 5)
- (III) via mobile app (Android or iPhone/iPad), using Bluetooth (page 9)
- (IV) via Windows laptop, using Bluetooth or USB cable (page 12)

It is recommended to use method (I) in most cases. The other methods are useful when the CRG has no cellular connection. Method (II) is only usable when a JD monitor is attached, and is useful if there is no internet connection.

The CRG houses different devices that may require firmware update. These devices have separate firmware update files.

- i. CPU (Central Processing Unit)
  - contains CRG Receiver and Bridge Control firmware
- ii. Auxiliary Devices
  - Inertial Navigation System (INS) module
  - Global Positioning System (GPS) module
  - Optional internal cellular modem

In addition, there may be files included to update the ISObus virtual terminal (VT) applications (also known as ISO apps), which run on the John Deere (JD) monitors. All these files will first be transferred to the CRG, and then the CRG will self-install them during the next restart.

**The CRG must not used for steering during the update process!**

## Before Updating

- 12V is required to power the CRG. Often, it's best to leave CRG connected to a machine, but it is recommended to have the engine off.
- This can also be done at a desk by providing 12V to pin 5 (purple), 12V to pin 6 (red), and ground to pin 7 (black), on either CRG connector
- GPS signal is not required
- A JD monitor is required only for Method II, and to verify the update

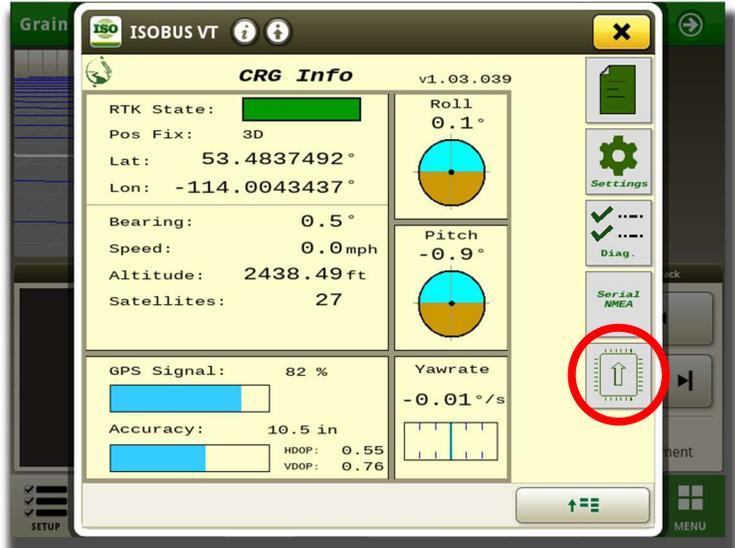
To know for certain if an update has succeeded, it is useful to make note of the current Software Version of the CRG. This can be found in the ISO app, on the Diagnostic page. The version fields shown are defined as {main}/{INS subsystem}/{GPS subsystem}



# I. Upgrade via Modem

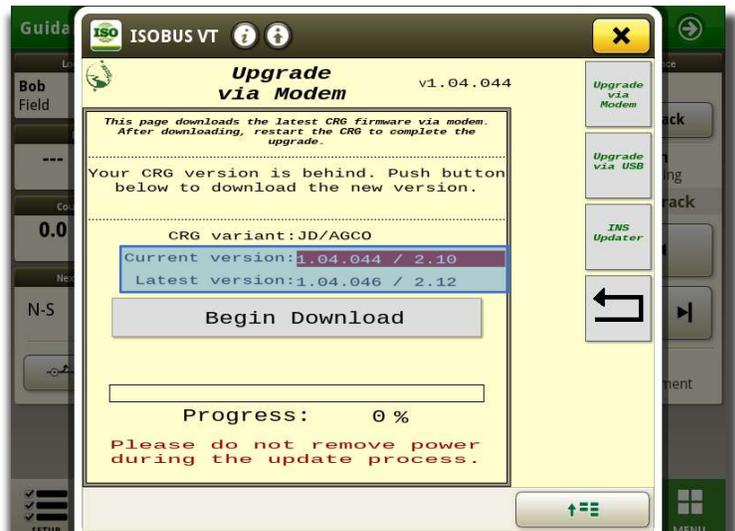
## Step 1: Access the ISO app

Refer to the CRG User Manual for steps to access the CRG's ISO app. Once the CRG Info page is visible, select the "computer chip" icon.



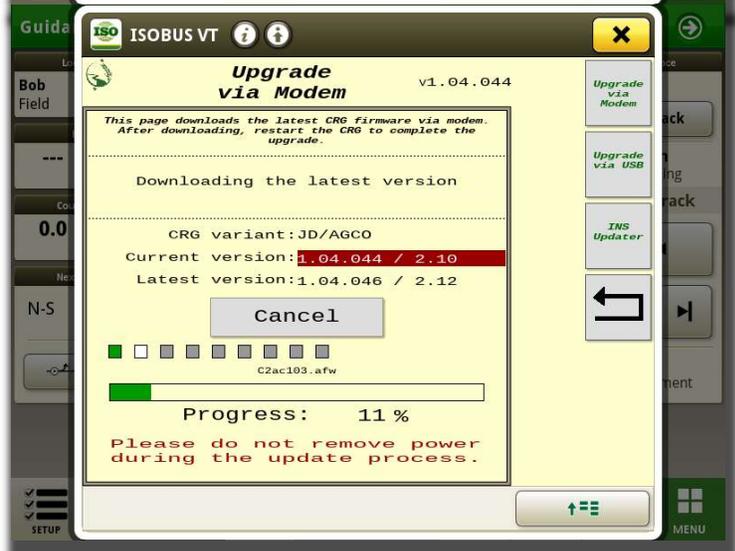
## Step 2: Check Version

An upgrade is only required if one of the version numbers does not match



## Step 3: Begin Download

Several files will be downloaded and stored on the CRG.

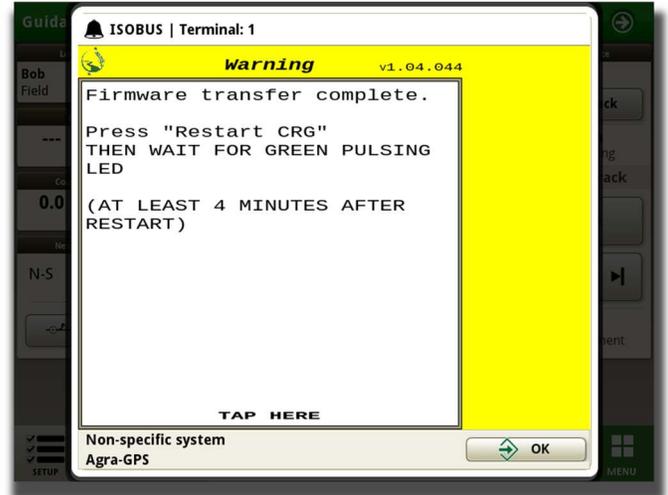


### Step 4: Restart the CRG

Once file transfer is complete, a warning box will be displayed. Press OK.

The CRG can be restarted by various methods:

- Restart button provided on the Upgrade via Modem page, or
- Restart button on the General Settings page, or
- Key power cycle: switch the key off for a few seconds, and then turn it back on. There is no need to wait for the JD monitor to shut down



Refer to the “Troubleshooting” section in this manual for a description of the LED color codes associated with the updating process.

### **AFTER RESTARTING CRG**

**DO NOT TURN OFF POWER FOR 4 MINUTES!**

**DO NOT START THE MACHINE**

**WAIT AT LEAST 4 MINUTES AFTER RESTART BEFORE STARTING THE MACHINE**

## II. Update via USB

### Step 1: Obtain the Firmware

Firmware update files may be obtained directly from Agra-GPS. Contact us via email ([sales@agragps.com](mailto:sales@agragps.com)), or at <https://www.agragps.com/contact-us>.

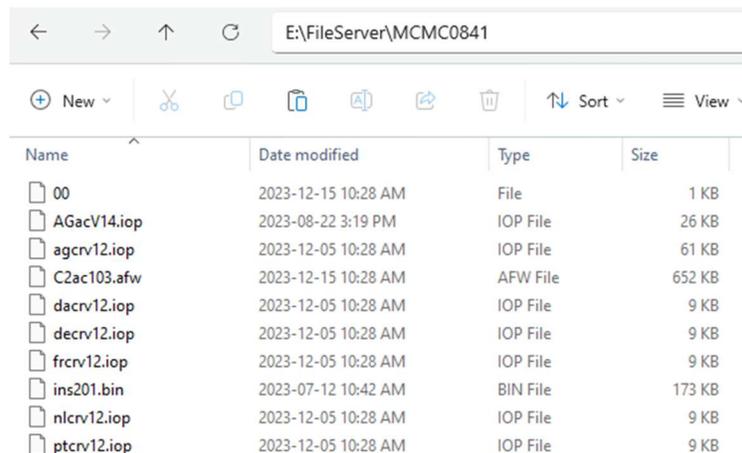
The firmware can also be downloaded using the Windows program called Agra-Toolbox™. To use Agra-Toolbox, refer to section IV in this manual. Once the firmware has been downloaded, click “Save Update to Computer”, and then proceed to Step 2.

### Step 2: Load the USB with Firmware

\*NOTE: The 2600 display differs from other monitors in that firmware may only be loaded via the Compact Flash card accessed from the side (the USB port on the back is not usable for this purpose). Refer to page 8 for additional instructions for the 2600.

\*NOTE: Storage devices must be formatted with the FAT32 file system (this is standard for new USB drives). Other formats such as NTFS or ext4 will not work.

First, the new firmware needs to be loaded onto a USB thumb drive with a specific file structure. Firmware must be placed inside of a folder titled “MCMC0841”, and that folder must be inside of a folder titled “FileServer” (e.g. USB\FileServer\MCMC0841\). The result should look similar the following.



Name	Date modified	Type	Size
00	2023-12-15 10:28 AM	File	1 KB
AGacV14.iop	2023-08-22 3:19 PM	IOP File	26 KB
agcrv12.iop	2023-12-05 10:28 AM	IOP File	61 KB
C2ac103.afw	2023-12-15 10:28 AM	AFW File	652 KB
dacr12.iop	2023-12-05 10:28 AM	IOP File	9 KB
decr12.iop	2023-12-05 10:28 AM	IOP File	9 KB
fr12.iop	2023-12-05 10:28 AM	IOP File	9 KB
ins201.bin	2023-07-12 10:42 AM	BIN File	173 KB
nlcr12.iop	2023-12-05 10:28 AM	IOP File	9 KB
ptcr12.iop	2023-12-05 10:28 AM	IOP File	9 KB

Everything in the MCMC0841 folder will be transferred to the CRG. It is important that the MCMC0841 folder only contains the desired firmware and no other files. The \*.bin and/or \*.afw files update the CRG and its subsystems, and the \*.iop files are for updating the ISO apps.

**The filenames must not be altered, in order for the CRG to accept the firmware properly (however upper/lower case doesn't matter).**

### Step 3: Insert USB

Insert the USB thumb drive into the John Deere monitor, then navigate to the CRG ISO app that will be loaded onto the John Deere monitor.

When the USB is first inserted into the monitor, a dialog box is presented asking for the next action. For the GreenStar 4 series, cancel this dialog by pressing the “X” and proceed to open the ISO app for the CRG Receiver. For previous GreenStar monitors, also ignore the Data Transfer options by simply accessing the main menu.



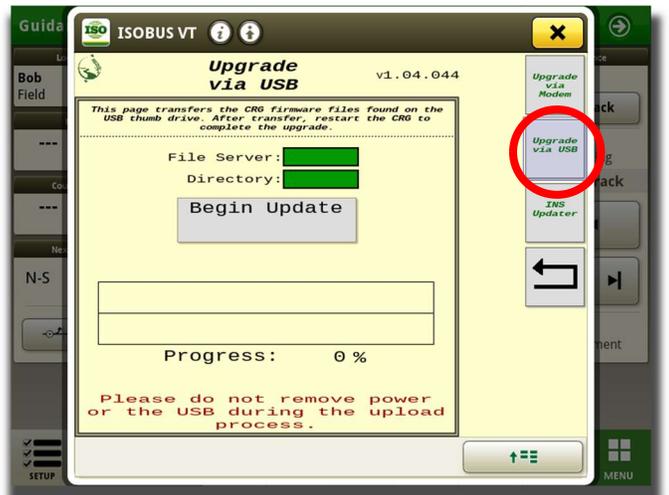
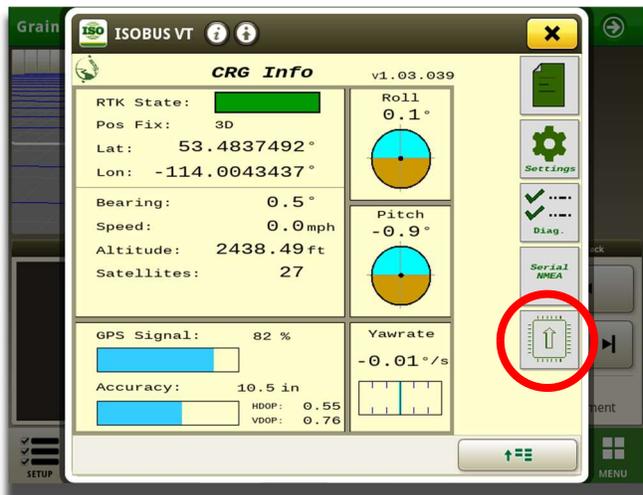
(4620/4640)



(2630)

### Step 4: Access the “Upgrade via USB” ISO App Page

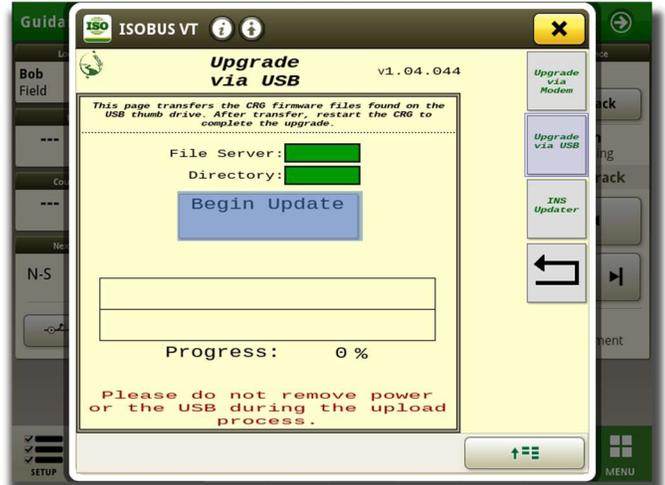
Refer to the “CRG User Manual” for instructions on how to access the CRG ISO app. Once the CRG Info page is visible, select the “computer chip” icon. Then select the 2<sup>nd</sup> menu button



### Step 5: Begin Upgrade

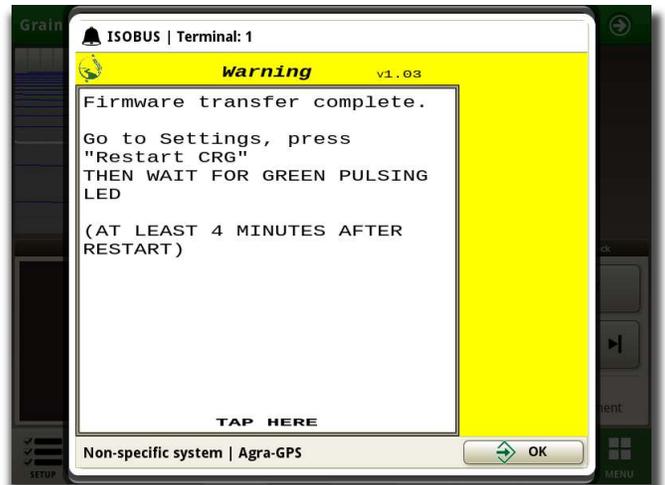
Check that both the 'File Server' and 'Directory' indicators are green. The 'File Server' indicator shows that the John Deere file server is currently running on the monitor. The 'Directory' indicator shows that the Agra-GPS specific directory is found on the USB that was inserted.

If both indicators are green, then the CRG is ready to begin updating. Simply press the 'Begin Update' button and wait for the transfer to complete. Do not power off or remove the USB during the update process.

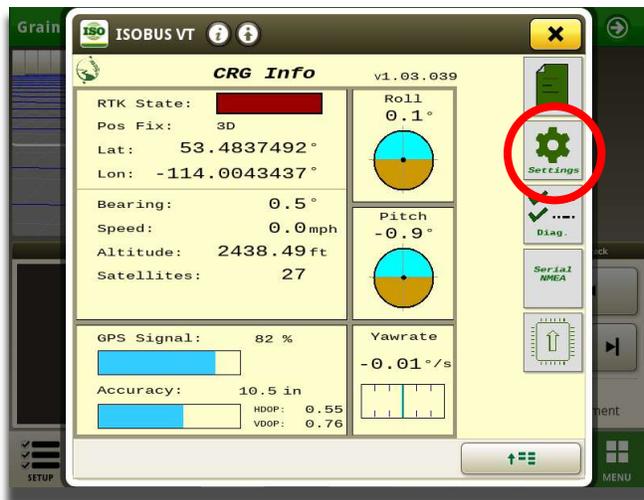


**NOTE ON SPEED:** The speed at which files are transferred are heavily dependent on the amount of traffic on the ISO bus. An ISO bus that is 30% loaded can double the transfer time compared to a bus that is 10% loaded. It may be useful to isolate the JD monitor and the CRG from the machine to complete the firmware transfer efficiently.

Firmware has been successfully transferred if the following message is shown →



**COMPLETION:** Once the transfer has completed the CRG requires a reset to complete the update process. This can be done by cycling power (key off, then key on), or by using the Restart CRG button. Go to the General Settings screen, and press the Restart button, then press "Yes".



**AFTER RESTARTING CRG**

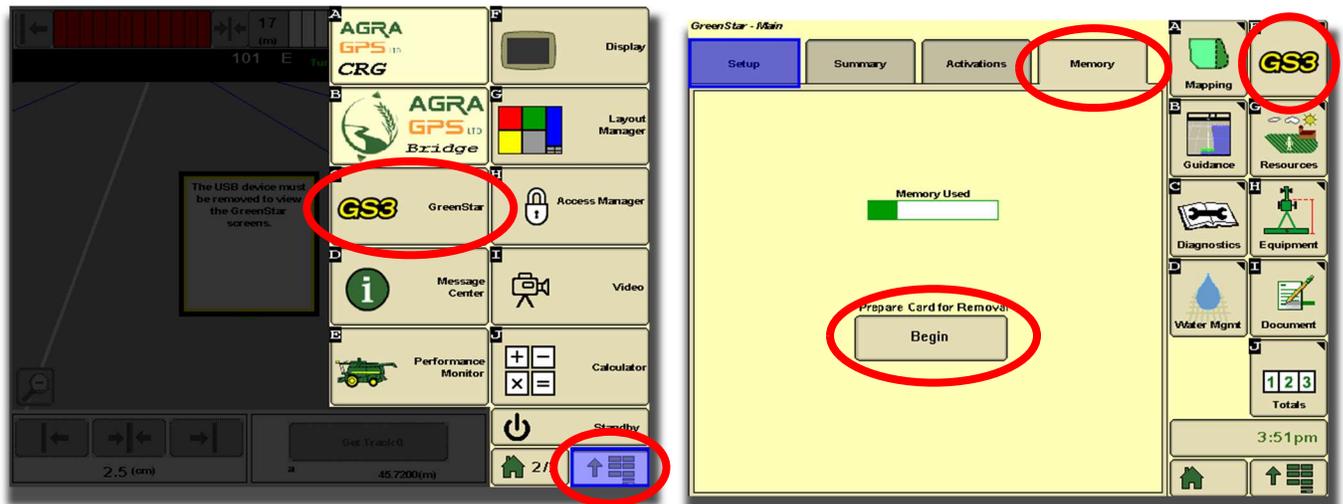
DO NOT TURN OFF POWER FOR 4 MINUTES!

DO NOT START THE MACHINE

WAIT AT LEAST 4 MINUTES AFTER RESTART BEFORE  
STARTING THE MACHINE**JD 2600 Monitor**

The 2600 display differs from the others in that firmware may only be loaded via the Compact Flash (CF) card accessed from the side (the USB port on the back is not functional for this purpose). The CF card requires an external card access device to load firmware files onto it from your personal computer.

To remove the Compact Flash card, first you must safely shut it down. Do this via the following screens:



After pressing “Prepare Card for Removal”, the 2600 must first save data to the CF card. This may take 30 seconds or more to complete. Do not remove the card until the message appears: “Compact Flash Eject OK”.

Known issue: After re-inserting the CF card, the “Begin Update” button has to be pressed twice.

### III. Update via Mobile App

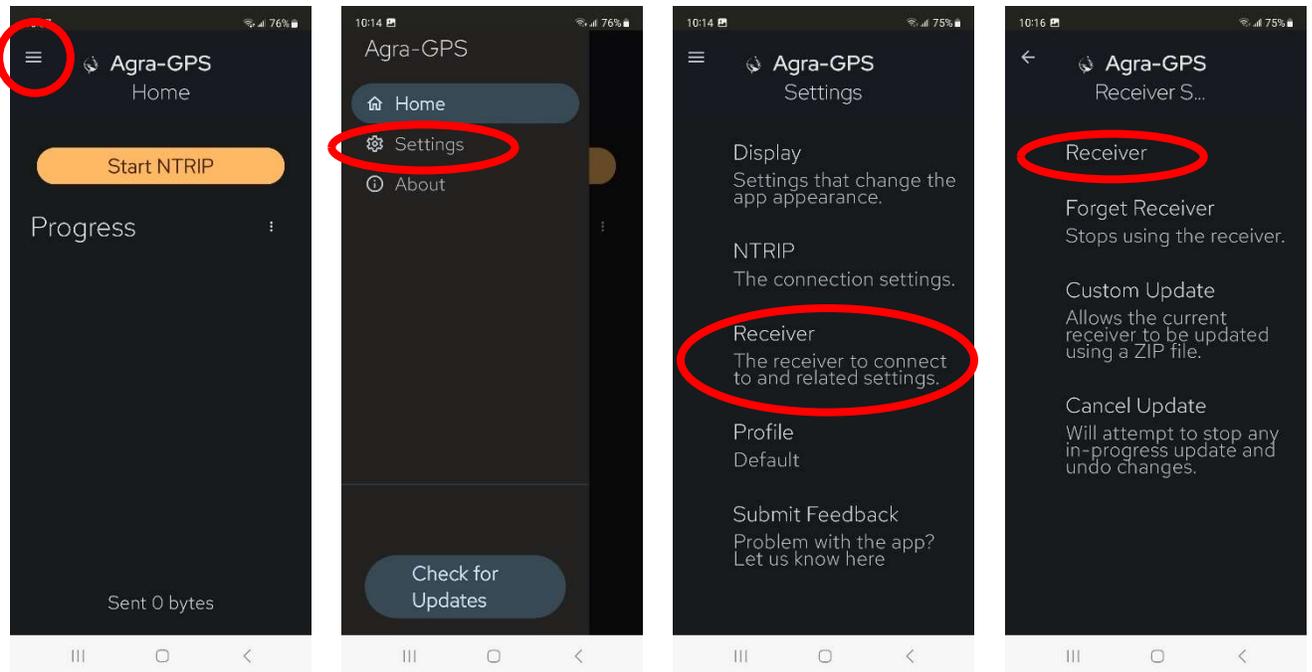
The Agra-GPS mobile app is available for Android and iOS (iPhone and iPad). Before continuing, ensure the CRG is powered up and within Bluetooth range. If there are multiple Agra-GPS devices in the vicinity, ensure you know the Bluetooth name of the CRG you're interacting with (shown in the ISO app under General Settings). The name will have the format AGRA-CRG-xxxx (e.g. AGRA-CRG-C4AA).

**Installation:**

- Android: Go to Google Play Store and search for “agra-gps”
- iOS: Go to the App Store and search for “agra-gps”

During installation and initial use, you may be asked a number of device access permission questions: please ALLOW all requests for device access and notifications.

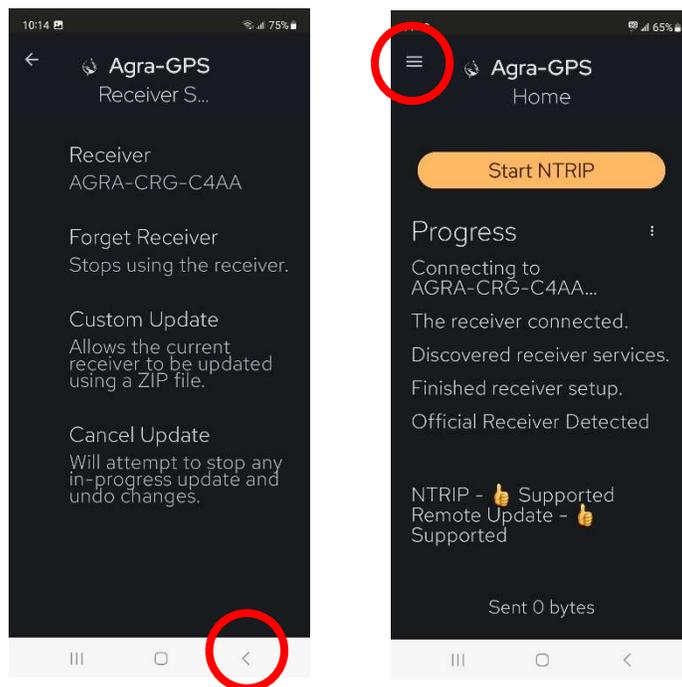
Once installation is complete, the app will appear similarly to the images below. Select the menu (upper left), then select the Settings item, then select Receiver as shown. (Android is depicted, but the iOS app is very similar.)



If there is difficulty connecting, refer to the Agra-GPS document “Troubleshooting Bluetooth”.

NOTE: if the Agra-GPS app was previously installed, the Receiver (CRG) must be re-specified, even if it seems to be correct. Select Settings >> Receiver >> Forget Receiver, and then re-select the CRG.

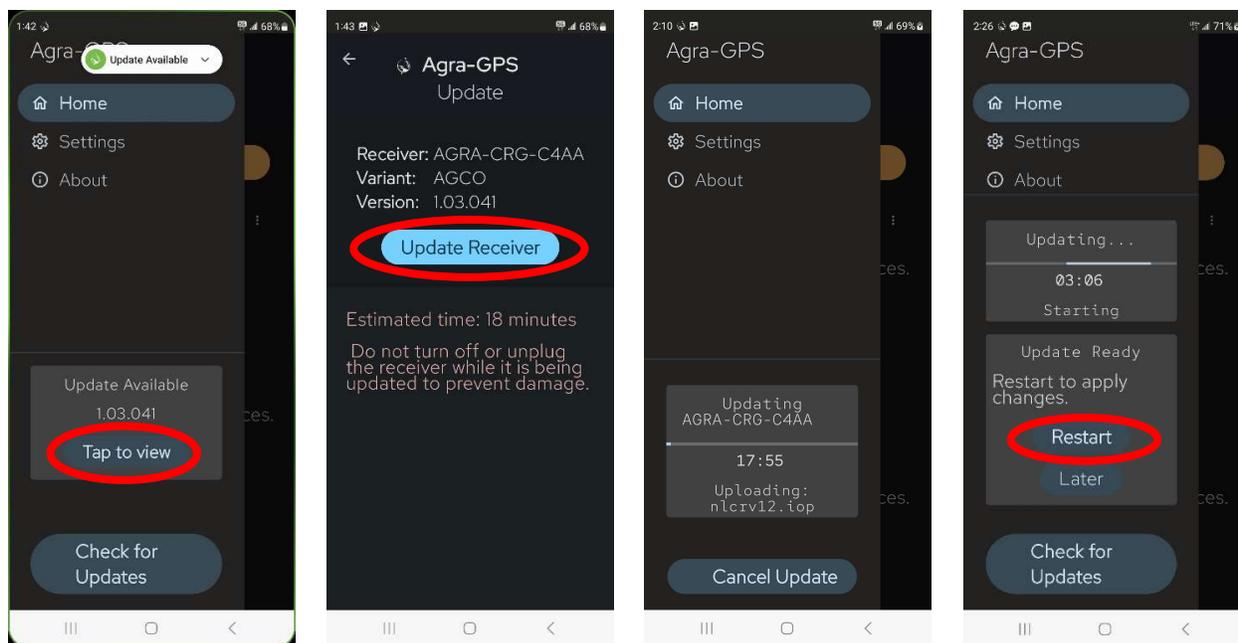
After the CRG receiver is selected, back out of the Receiver Settings page, and then select the menu.



Press the button “Check for Updates”. NOTE: on Android, this will also re-check the Google store for an app update. (If offered, proceeding with the app update is optional, but recommended).

The app will check what variant of CRG is present and obtain the latest firmware automatically.

- If the version detected on the CRG is the latest, you will receive a notification: “Receiver Update Failed: No update available”.
- If there is an update available, press “Tap to view”. (NOTE: for JD-type CRGs, the variant may appear as “AGCO” – this is normal). After this, press “Update Receiver”



Once transfer is complete, the app will create an audible notification. You will be asked to restart the CRG, as shown. If there is time left on the timer, this can be ignored. Press “Restart”.

The CRG requires some time after startup in order to install the firmware files that were just transferred from the mobile app. Refer to “Troubleshooting – Completion of Installation” in this manual for a description of the CRG LED flash pattern to expect when installation is occurring.

### **AFTER RESTARTING CRG**

**DO NOT TURN OFF POWER FOR 4 MINUTES!**

**DO NOT START THE ENGINE**

**WAIT AT LEAST 4 MINUTES AFTER RESTART BEFORE  
STARTING THE MACHINE**

When the update process is complete, the CRG will pulse a slow green, and is ready for use. Please confirm that the new version numbers show up in the ISO app Diagnostic page (“Software Version” field).

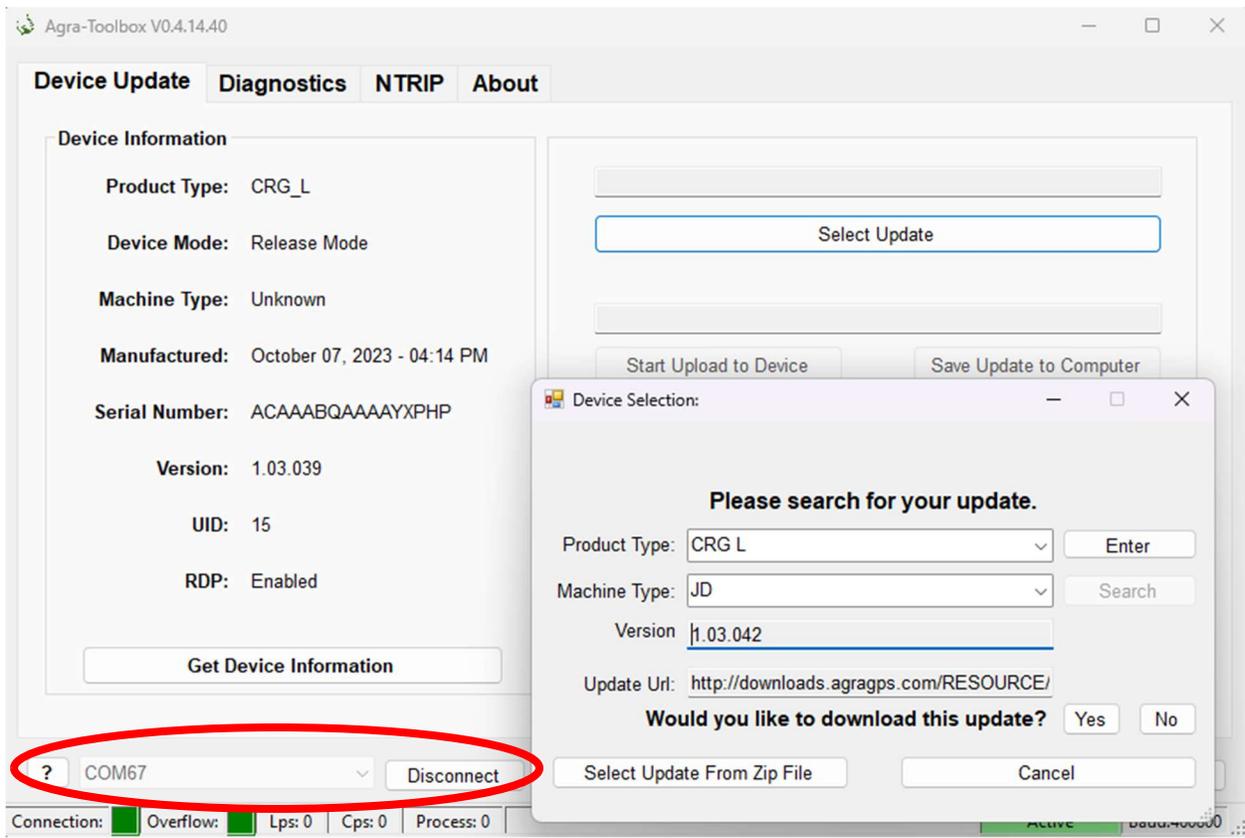
## IV. Update via Windows PC

Updating can be accomplished with a Windows PC (usually a laptop, but a desktop can also work). Note that this method requires an internet connection for the PC. Windows 10 or 11 is best. If using Windows 7 or 8, additional driver installation is required (obtain from <https://www.st.com/en/development-tools/stsw-stm32102.html>).

A Windows PC app called “Agra-Toolbox™” can be downloaded from <http://downloads.agragps.com/AgraToolbox.msi>. The Agra-Toolbox app can be used both for obtaining the firmware, and also for installing it. It is recommended to first connect to the CRG using Agra-Toolbox™, which allows it to select the correct type of firmware, and then completes the transfer and update.

Once installed, open the app and select the “Device Update” tab. The CRG can be connected by either USB cable or Bluetooth.

**NOTE:** if the CRG is powered when a USB cable is connected, it will freeze. To unfreeze it, please cycle the key power (the engine should remain off).



1. Connect to the CRG, using the drop-down circled
  - If using USB cable, select the new COM port
  - If using Bluetooth, select (and pair to) the AGRA-CRG-xxxx device (e.g. AGRA-CRG-94A0). Please refer to “Connecting with Bluetooth” on the following page.
2. Device Information should be automatically obtained when connecting, which helps Toolbox select the correct firmware. If not, press “Get Device Information”
3. Press “Select Update”, which brings up the “Device Selection” dialog box
  - The Product Type is automatically selected, and Machine Type is automatically detected only if the CRG’s Internal Bridge is enabled. If the Bridge is disabled, then “JD” should be selected.
4. For “Would you like to download this update” – press Yes
5. Press “Start Upload to Device”
6. Once transfer is complete, Agra-Toolbox will ask to reboot the CRG – press Yes

The CRG requires some time after startup in order to install the firmware files that were just transferred from Agra-Toolbox. Refer to “Troubleshooting – Completion of Installation” in this manual for a description of the CRG LED flash pattern to expect when installation is occurring.

**AFTER REBOOTING CRG**

DO NOT TURN OFF POWER FOR 4 MINUTES!

DO NOT START THE ENGINE

WAIT AT LEAST 4 MINUTES AFTER RESTART BEFORE  
STARTING THE MACHINE

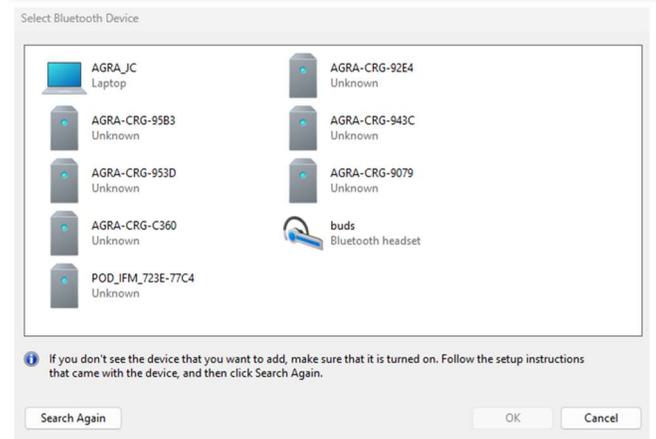
When the update process is complete, the CRG will pulse a slow green, and is ready for use. Please confirm that the new version numbers show up in the ISO app Diagnostic page (“Software Version” field).

### Connecting with Bluetooth

To connect Agra-Toolbox with the CRG, first ensure you know the Bluetooth name of the CRG. This is shown on the ISO app “General Settings” page.

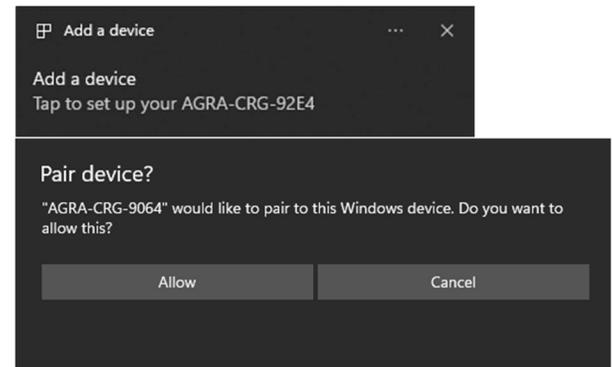


When you press “Connect”, the Windows “Select Bluetooth Device” dialog will open. Select the correct CRG from this window.

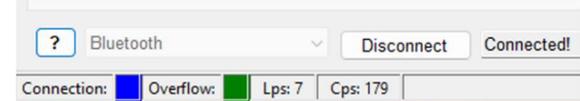


If this is the first time connecting to the CRG with the computer you are using, you will be prompted to pair the device (this appears in the lower right corner of the computer screen).

Press “Allow”



If the connection succeeds, you will see a blue “Connection” indicator.



If there is difficulty connecting, refer to the Agra-GPS document “Troubleshooting Bluetooth”.

## Troubleshooting

### *Troubleshooting Method (I) – Updating via Modem*

A reliable cell signal is required. A cell signal strength of more than 90% is recommended. Ensure the CRG antenna is connected. The modem can be tested by ensuring that NTRIP streaming is working (refer to CRG User Manual for more details on modem setup). Additional problems may include an invalid SIM card, or an exhausted data cap on your mobile plan.

### *Troubleshooting Method (II) – Updating via USB Thumb Drive*

**The ‘File Server’ indicator shows red:** This means that the John Deere file server is not detected on the monitor. To make sure the JD file server is enabled navigate to the ‘Multiple Monitor’ section of the JD monitor and verify that the file server control function is enabled. Note: some older 4600 CommandCenter (armrest console) monitors do not support File Server.

**The ‘Directory’ indicator shows red:** This means that the Agra-GPS manufacturer directory (MCMC0841) with firmware is not found. Verify that the file structure on the USB is correct and that the proper firmware is on the USB.

If everything is correct and the directory indicator remains red, try removing and reinserting the USB. If that does not work, try removing all files on the USB except for the \\FileServer\MCMC0841 folder. Ensure the USB device is formatted with FAT or FAT32. You might also try removing the plug from the monitor and plugging it back in to fully reboot the monitor.

Firmware file transfer should take less than 15 minutes. If the firmware update stalls and the progress bar fails to move, there may be too much traffic on the ISObus (aka implement bus). Ensure that no implements or other devices are connected to the implement bus.

### *Troubleshooting Method (III) – Updating via Mobile App*

**Bluetooth:** Refer to Agra-GPS document “Troubleshooting Bluetooth Issues”

**Restarting the app:** If the mobile app is behaving unexpectedly, it may be useful to force the app to restart.

**Android:** Select ||| from the Android navigation buttons and swipe upward on the Agra-GPS app; or another technique is by long-pressing the Agra-GPS app icon,  selecting and then pressing “Force stop” (this reliably stops background services).

**iOS:** Double-press the home button, then swipe upward on the Agra-GPS app

**Unregistered Receiver Detected or 3rd-party Receiver Detected:** Force the app to restart (see above). Then go to Settings >> Receiver >> Forget Receiver. Then select the CRG again, which forces the app to re-detect it.

*Troubleshooting Method (IV) – Updating via Windows PC*

**Unresponsive CRG:** check the LED status on the CRG. If the color is solid (not pulsing or flashing), or dark, then the CRG is frozen. This is most likely caused by plugging a USB cable in while power is applied. Keep the USB cable plugged in, and cycle power to the CRG.

*Troubleshooting – Completion of Installation*

After the file transfer is complete and the CRG is restarted, the firmware update completes with the following LED color stages:

- flashing sky-blue: Firmware integrity check
- flashing yellow: Create internal backup of existing firmware
- flashing white: Applying firmware update
- solid yellow: Applying INS subsystem update

If the firmware update process fails, the CRG will attempt to restore from its internal backup. Once it has restored the previous firmware, the transfer and update can be attempted again.

### Auxiliary Firmware Update

The CRG auxiliary subsystems that may require update include the Inertial Navigation System (INS) and the GPS receiver subsystem. Under normal circumstances, these auxiliary devices are updated automatically along with the main CRG firmware. However, under abnormal conditions this might not occur.

After completing the initial Firmware Upload step, review the “INS Updater” and “GPS Updater” pages. If there are update file(s) present, the “Firmware” indicator will be green. Press the begin update button to begin the update process, and ensure power remains while the update process takes place.

When complete, the Firmware indicator will turn red to show that the firmware has been successfully applied and the temporary firmware file has been removed. The CRG should then be restarted, which loads the new firmware.

