# GreenStar™ 2 Rate Controller & Swath Control Pro™ Information

JOHN DEERE
AG MANAGEMENT SOLUTIONS

04/28/2009

# SeedStar™, GS2 Rate Controller, & Swath Control Pro Compatibility

| | SeedStar 2* Compatible | Swath Control Pro (No GRC) | Swath Control Pro 1/2 or 1/3 width solution | Swath Control Pro TruCount solution |
|---|---|---|---|---|
| **Air Carts:** | | | | |
| **Air Cart 1 (Black Wedgebox)** | | | | |
| MY98 - MY00 1900 (SN 675101 - 685999) | **NOT SUPPORTED with this implement and operation INCLUDING CAN-Bridge modified units** | | | |
| **Air Cart 2 (Gray Wedgebox)** | | | | |
| MY01 - MY08 1910 (SN 690001 - 725999) | Requires upgrade to SeedStar 2* controller | Requires upgrade to SeedStar 2* controller (single section control only) | No | N/A |
| **SeedStar 2 (Green Wedgebox)** | | | | |
| MY09 1910 and newer (SN 730001 and above) | Base Equipment | Single section control only | No | N/A |
| **Planters:** | | | | |
| **Non-SeedStar machines** | | | | |
| | No | No | Requires a GS2 Rate Controller | Requires GS2 Rate Controller & Tru Count Clutch System |
| **SeedStar Gen I Controllers** | | | | |
| SeedStar Gen I | NO BUNDLES AVAILABLE TO UPGRADE | | | |
| **SeedStar Gen II Controllers** | | | | |
| Ground drive or VRD half or third width disconnects | Requires upgrade to SeedStar 2* controller | Requires upgrade to SeedStar 2* controller & RowCommand™ | Requires a GS2 Rate Controller (manual control from factory) | Requires GS2 Rate Controller & Tru Count Clutch System |
| CAN-based half-width disconnects** or CAN-based frame control** | No | No | No | Requires GS2 Rate Controller & Tru Count Clutch System |
| **SeedStar 2 Controllers** | | | | |
| MY09 and newer | Factory Option | Requires RowCommand | Requires a GS2 Rate Controller | Requires GS2 Rate Controller & Tru Count Clutch System |
| **CCS™ Air Seeders:** | | | | |
| **Non-SeedStar machines** | | | | |
| | No | No | Requires a GS2 Rate Controller | N/A |
| **SeedStar Gen I Controllers** | | | | |
| SeedStar Gen I | No | No | No | N/A |
| **SeedStar Gen II Controllers** | | | | |
| MUST HAVE ALL-RUN SEED COUNTING INSTALLED TO USE GS2 DISPLAY | Requires upgrade to SeedStar 2* controller | Requires upgrade to SeedStar 2* controller (half width only) | Half width only | N/A |
| **SeedStar 2 Controllers** | | | | |
| MY09 and newer | Factory Option | Half width only | No | N/A |

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# Air Carts

**Frequently Asked Questions:**

- **When will Swath Control Pro be compatible with air carts equipped with SeedStar 2?**

  Swath Control Pro is compatible with SeedStar 2 air carts with the AMS Summer Software Bundle released on August 4th, 2008.

- **Is a GS2 Rate Controller required to use Swath Control Pro on a SeedStar 2 air cart?**

  No, a GS2 Rate Controller is not required to enable Swath Control Pro on an air cart equipped with SeedStar 2. To enable Swath Control Pro on an air cart equipped with SeedStar 2, a customer will need a GS2 display, Swath Control Pro activation and a GPS position receiver (i.e. StarFire™ iTC).

- **How will Swath Control Pro work with a SeedStar 2 air cart?**

  Swath Control Pro will control one section (whole tool) only when utilized on a SeedStar 2 air cart.

  Special considerations need to be taken into account when setting up Swath Control Pro for a seeding tool with multiple ranks. Swath Control Pro is single point swath, which determines where the product is being applied, no matter if there are 1, 2 or 3 ranks. The operator will need to enter the Swath Control point (A & B implement dimensions) based on the goal of minimizing skips or minimizing overlap for the entire implement.

- **Can I use a GS2 Rate Controller to control and swath a liquid fertilizer application or anhydrous ammonia while also controlling seed or dry fertilizer through SeedStar 2 on my air cart?**

  For fall 2008 customers will not be able to utilize Swath Control Pro between two controllers (i.e. applying liquid fertilizer or anhydrous ammonia using a GS2 Rate Controller while also using SeedStar 2 to apply seed or dry fertilizer). If a GS2 Rate Controller and a SeedStar 2 controller are on the same CAN bus, Swath Control Pro will only be available for the GS2 Rate Controller.

  After the AMS Winter Software Bundle (scheduled for early 2009), Swath Control Pro can be used to control multiple operations/products using a GS2 Rate Controller and Air Seeder SeedStar 2 Controller in tandem. See the Multiple GS2 Rate Controller and Swath Control Pro section below for more details.

# Planters

**Recommendations:**

- System should be configured for no more than sixteen sections for planters.
- To ensure system accuracy, sections should consist of at least sixty inches (2 rows on 30 inch spacing or 3 rows on 20 inch spacing).
- SF2 or RTK is highly recommended for Swath Control Pro for Planters.
- The GS2 Rate Controller is not capable of controlling ½ or 1/3 width Swath Control on Seedstar planters with CAN frame control boxes. Please refer to DTAC solution 83200 for more information.

**Frequently Asked Questions:**

- **When will Swath Control Pro be compatible for planters equipped with SeedStar 2?**

  Swath Control Pro is compatible with SeedStar 2 planters with the AMS Software Update 2009-1 released January 28, 2009. RowCommand or a GS2 Rate Controller will also be needed on the planter to enable Swath Control Pro for individual section control or half/third-width disconnect control. Read below for more details on each.

- **Is a GS2 Rate Controller required to enable Swath Control Pro on a SeedStar 2 planter with RowCommand?**

  No, a GS2 Rate Controller is not required on a SeedStar 2 planter with RowCommand. To enable Swath Control Pro on a planter equipped with SeedStar 2 and RowCommand, a customer will need a GS2 display, Swath Control Pro activation and a GPS position receiver (i.e. StarFire iTC).

- **Is a GS2 Rate Controller required to run half width disconnect Swath Control Pro with a SeedStar 2 planter?**

  Yes, a GS2 Rate Controller is required to run half width disconnect Swath Control, unless the planter is equipped with RowCommand.

- **Can I use the GS2 Rate Controller to control my row units and my liquid fertilizer application rate simultaneously?**

  After the AMS Winter Software bundle scheduled for early 2009, up to four GS2 Rate Controllers can be installed on one CAN Bus with a GS2 2600 display to control and swath multiple products (liquid fertilizer application, half width disconnect seed applications, Tru Count Clutches, etc.). See the Multiple GS2 Rate Controller and Swath Control Pro section below for more details.

  Other options would be to use the Variable Rate Fertilizer option through Seedstar or utilize an RS-232 approved controller with Field Doc Connect to allow

documentation and prescriptions via the GS 2 2600 display, although these options are not compatible with Swath Control.

## CCS Air Seeders

**Frequently Asked Questions:**

- **When will Swath Control Pro be compatible for CCS air seeders equipped with SeedStar 2?**

  Swath Control Pro is compatible with SeedStar 2 CCS air seeders with the AMS Software Update 2009-1 released January 28, 2009.

- **Is a GS2 Rate Controller required to use Swath Control Pro on a SeedStar 2 CCS air seeder?**

  No, a GS2 Rate Controller is not required on a SeedStar 2 CCS air seeder. To enable Swath Control Pro on a CCS Air Seeders equipped with SeedStar 2, a customer will need a GS2 display, Swath Control Pro activation and a GPS position receiver (i.e. StarFire iTC).

## Sprayers & Spreaders

**Compatibility:**

| | Swath Control w/o GRC | Swath Control with GRC |
|---|---|---|
| **John Deere Self Propelled Sprayers** | | |
| **John Deere 4700 & 4710 Sprayers** | May require update to SprayStar™ Gen IV | No |
| **John Deere 4X20 & 4X30 Sprayers** | Yes | No |
| **Sprayers with New Leader dry box with SpreadStar** | Yes | No |
| **Pull Behind/Integral Sprayers and Spreaders** | | |
| **John Deere DN345 Drawn Dry Box spreader with SpreadStar** | Yes | No |
| **Raven 440 or 450** | No | Yes |
| **Hardi 2500, 3500, 3880, 5500*** | No | Yes |

*Hardi 5500 provides rate control, steering control and boom functions; GS2 Rate Controller will only control rate.

**Recommendations**

- System should be configured for no more than ten sections for a sprayer with Raven Valves.

- The maximum number of sections on Hardi sprayers that the Rate Controller is compatible with is 7, and may be less depending on what options the sprayer is equipped with. Please refer to the GS2 Rate Controller Operator's Manual for more information.

## Liquid Fertilizer and Anhydrous Ammonia

| | Swath Control w/o GRC | Swath Control with GRC |
|---|---|---|
| **Liquid Fertilizer** | | |
| **Raven 440 & 450** | No | Yes |
| **Anhydrous Ammonia** | | |
| **Raven AccuFlow System (Standard or Fast Valves)** | No | Yes |

**Recommendations**

- System should be configured for no more than one section for Anhydrous Ammonia.

## Multiple GS2 Rate Controllers and Swath Control Pro

**Frequently Asked Questions:**

- **What control valve types is the GS2 Rate Controller compatible with?**

  Standard valves, Fast valves, and Fast Close valves are options when the Rate Controller is configured for a sprayer, anhydrous ammonia, or liquid fertilizer application.

- **What is the default speed source for GS2 Rate Controller?**

  The GS2 Rate Controller defaults to GPS Speed (if a receiver is connected and is receiving GPS signal) as the speed source with AMS Software Update 2009-1. GS2 Rate Controller software versions prior to this release (before 3.00M) will default to Wheel Speed under most circumstances.

- **How is GS2 Rate Controller software updated when more than one rate controller is connected to the CAN Bus at once?**

  When updating multiple GS2 Rate Controllers on one CAN Bus to software version 3.00M, the operator will need to cycle power in between updating individual controllers. Future updates (after 3.00M) to GS2 Rate Controllers will not require power cycles and all will update simultaneously. If multiple GS2 Rate

Controllers are installed with a SeedStar 2 Planter, please refer to DTAC solution 79183 for further reprogramming instructions.

- **When will multiple GS2 Rate Controllers be compatible on the same CAN Bus?**

  The ability to utilize multiple GS2 Rate Controllers on one CAN Bus is scheduled for early 2009.

- **How many GS2 Rate Controllers can be connected to one CAN Bus?**

  The number of GS2 Rate Controllers is dependent upon the number of operations being used in the GS2. The GS2 display can manage up to four different operations at one time. Without any other operations, four GS2 Rate Controllers can be connected on one CAN bus. Specific applications (i.e. SeedStar, SprayStar and SpreadStar) will have automatically assign operation(s) for the products/tanks being utilized.

  Example 1: If a customer is running a three tank SeedStar air cart, each tank (no matter the product) will be assigned an operation for a total of three operations. This leaves one operation for a GS2 Rate Controller.

  Example 2: If a customer is running a SeedStar planter utilizing only one operation for planting/seeding, this leaves three operations for three GS2 Rate Controllers.

- **How will Swath Control Pro work when more than one product is being swathed?**

  Swath Control Pro is single point swath, which determines where the product is being applied, no matter if the products are being applied 10 feet apart. This Swath Control point is the A & B implement dimensions or on a self-propelled sprayer, the B & C machine dimensions. The operator will need to enter the dimensions for the control point based on the user's goal of minimizing skips or minimizing overlap for the entire implement or boom.

  There is only one set of Swath Control Pro Settings (Turn on/off times, boundary and coverage settings) for the system, no matter if multiple controllers are utilizing Swath Control Pro.

- **What displays are compatible with multiple GS2 Rate Controllers and Swath Control Pro?**

  GS2 2600 & 2100 are compatible with multiple GS2 Rate Controllers on one CAN Bus. The GS2 1800 is not compatible with multiple GS2 Rate Controllers on one CAN Bus.

- **I already have a height switch on my John Deere planter; do I need another one for the rate controller?**

  Yes, the GS2 Rate Controller for planters, liquid fertilizer, and NH3 applicators requires it own dedicated height control switch. Many times this height switch can be mounted with or near the already existing height switch.

  When using multiple Rate Controllers, one dedicated height control switch can be used to turn multiple Rate Controllers on and off.

## TruCount Clutches

**Frequently Asked Questions:**

- **Are there interference issues when mounting TruCount clutches on John Deere Planters?**

  Yes, there are interference issues with mounting TruCount clutches on John Deere Planters. See interference chart distributed by John Deere Seeding Marketing for greater detail explaining compatibilities. Contact TruCount Inc. for questions regarding clutch fit up and compatibility. When an interference issue is identified and not immediately resolved prior to planter movement, it may bend the row unit shaft and/ or break the seed disk housing. There must be enough allowable space between the interference point for machine flexing and mud/debris buildup. This is NOT a warrantable John Deere failure mode and all bent shaft and cracked seed disk housing warranty claims will be reviewed with added scrutiny at the territory and factory level

- **Does the TruCount Clutch provide adequate shear protection on row units with Pro-Shaft™ Drives?**

  Pre 2008 model year TruCount Clutches have a potential issue where the shear protection is not adequate to protect the row unit. Installing these clutches on Pro-Shaft drives removes the factory installed shear protection device and puts the meter shaft/unit at risk. 2008 Model Year TruCount Clutches (shipped after September 2007) are updated with the proper shear protection.

- **Will the TruCount Clutches work with Pro Drive Units and Chain Drive Units?**

  Please contact TruCount for compatibility per planter platform. They offer many clutch kits for Pro Drive and Mechanical Drive units.

- **Will the TruCount Clutches work with 1.5 or 3.0 bushel boxes?**

In most scenarios, the planter box size does not affect clutch compatibility. Please consult TruCount for specific platform compatibility.

- **Are TruCount Clutches compatible with dry insecticide?**

  Please contact TruCount for specific platform compatibility as many units are compatible and others are not compatible.

- **Can dust or mud buildup affect TruCount Clutches?**

  In harsher operating conditions, build-up of mud or extreme dust on, in, or around the clutch will cause the clutch to stop working. The operator can quickly fix this situation by disassembling and cleaning the clutch or swapping it with a spare clutch if available.

## Swath Control Pro Operation

**Frequently Asked Questions**

- **I have multiple or staggered ranks of application with my implement (i.e. 1790 planter, air tool, etc.) how do I setup Swath Control and corresponding measurements?**

  Swath Control Pro is single point swath that utilizes the sum of the implement dimensions A and B (under GS2 softkey H) to determine the product application point on the implement. If the implement has multiple ranks the operator will need to adjust the A & B implement dimensions to achieve his/her goal of minimizing skips or overlap when entering or existing the pass.

  Example: John Deere 1790 planters have ranks that are staggered from 20 to 65 inches, depending on the model and configuration. The operator will need to select a point on the planter that will allow for adequate planting of the zone when entering or existing a pass.

- **When using Swath Control to apply multiple products, how does this affect my turn on/off times?**

  Swath Control Pro has only one set of Swath Control Settings, no matter if you are using Swath Control to apply one or multiple products. The Swath Control Turn On and Turn Off Settings are to compensate for average physical machine reaction time delays (Electrical & Mechanical).

  If the operator is using Swath Control to apply multiple products, the Turn On and Turn Off times should be set to match the primary operation time delays.

  The GS2 coverage map will provide a representative picture of on and off timing, but the best method to determine where the product is turning on and off is by

ground verification and/or digging to locate the product. See the Swath Control Pro section in the GS2 Basics Operator's Manual for the On-Off Timing Matrix.

- **What happens to my implement position accuracy and Swath Control when I back up to apply product in the corners or end rows?**

  Naturally, Swath Control works best when traveling in a forward direction. It becomes very difficult to accurately gauge the implement position when backing up with a row crop or four wheel drive tractor. It's always best to back past your intended product application point by a few feet when possible and then pull back forward to the zone where Swath Control will be commanding section changes. When backing past the zone is not possible (fences or ditches) we recommend disabling Swath Control in those instances and enabling it after you have traveled forward and applied product at least 10 feet. The implement positioning logic will assume the implement position is directly behind the tractor immediately after the GPS receiver sees a reverse direction.

- **What happens to Swath Control in slopes and terrace conditions?**

  When operating on steep hillsides and slopes there is a tendency for the implement to draft downward and not track directly behind the tractor. Depending on the degree of the slope, it becomes difficult for the GPS receiver mounted on the tractor to determine the amount of side draft on the implement and accurately gauge its position. Compensating for the implement with the tractor will help, as well as not having any sections smaller than 60 inches in width when using individual row clutches. Utilizing a 4WD tractor in these conditions may produce a small degradation in Swath Control performance due to the articulating nature of these tractors and having multiple pivot points.

- **How does Quickstart work with my planter section control?**

  The Rate Controller Section control will not record documentation points when the planter ground speed drops below 2.0 mph or when the height switch is in the up position. Additionally, if the planter is raised and TruCount clutches are installed, Swath Control Pro will need to be disabled to allow Quickstart to function as the Rate Controller will be holding the clutches in the off position.

- **How does Central Insecticide System (Liquid CIS System) work with my planter section control?**

  When using ½ or 1/3 width clutch control, the liquid sections will shut off with the corresponding planter sections. When using individual row clutches, the CIS system will not turn off with the individual rows.

- **When using half width Swath Control on a John Deere Planter, will Swath Control affect liquid fertilizer control?**

When operating VRD fertilizer control with a SeedStar Gen II Controller, the liquid fertilizer is controlled independently of the row unit control so the liquid fertilizer will not turn off when seed sections or individual row units are turned off.

- **What happens to my row unit monitor as the clutches are going on and off?**

  SeedStar GEN II planters will display a warning after the 2 second delay has past from not seeing seed flow in the seed tube. The warning will again go off once seed flow begins again, pending the entire planter has enough rows engaged to begin monitoring. Most SeedStar planters require ¼ of the planter rows to be engaged before actively monitoring.

  Planter monitors' baud rate or CAN Bus rate of data transfer may be slightly delayed in comparison to the actual clutch status. Some of the delays are built into the monitor logic to reduce nuisance warnings when in road transport and also as the planter starts/stops seeding at the end of a pass. These same delays will be in place as the Tru Count Clutches activate and deactivate rows. It may take up to 4 seconds depending on the planter make, model, and ground speed before warnings appear/disappear.

- **How does section control affect my acre counter with SeedStar?**

  There are technically 3 acre counters within the system at this point; GS 2 Documentation (Softkey J), the Rate Controller Totals, and SeedStar itself. The GS 2 Rate Controller Totals area will be the most accurate followed by SeedStar based on when the controller commands a section status change and the seed tube sensor stops seeing see flow (after 2 seconds).
  GS 2 Documentation reads polygon areas from Swath Control and a feedback signal from SeedStar. Time delays and algorithm rounding will create differences in this acre counter from what is viewed in the other two totals area.
  - SeedStar logic counts acres by seeing a certain percentage of the rows having seed for 2 seconds straight. This will vary by planter size and model.
  - If you are running a planter that utilizes shaft mounted acre counters (mainly seen on Kinze Planters) with row unit clutches, acres recorded by the planter could be off (usually long) by up to 15%. As the planter is crossing areas where Swath Control is triggering row units on and off (end rows, waterways, etc.) the shafts are still turning and counting acres. Utilize the acres counted by the GS 2 Rate Controller Totals for these situations.

- **Does the Rate Controller affect any capabilities with Dual Variety mapping?**

  If you have a John Deere SeedStar Gen II Planter and utilize the dual variety function, it will function as it has in the past. Dual varieties can be documented in the Planting/ Seeding operation populated by SeedStar when the Rate Controller is used with a SeedStar Gen II planter.

- For customers that DO NOT use SeedStar, there will be changes to dual variety capabilities. When the GS 2 Rate Controller is connected to the CAN Bus and SeedStar is NOT present, only one variety will be able to be mapped to the entire planter width on the seeding operation that is generated by the Rate Controller.
    - A workaround to this issue is to create a second planting operation in Documentation, and set it up for dual varieties.
    - **IMPORTANT**- If the two operations have the same crop type and variety, the data will be merged together when unloaded into Apex. To avoid this, AMS recommends setting the crop type in the Planting/ Seeding operation tab created by the Rate Controller to a bogus crop type ( such as Oats, etc), and setting the dual variety Planting/ Seeding tab to the correct crop type (Corn, Soybeans, etc). When the planting data is unloaded into Apex, the bogus planting operation can be ignored.
    - The default section width displayed on Apex maps is ½ the planter width, regardless if the existing planter clutches or independent row clutches are used. The actual section widths if independent row clutches are installed will likely be smaller, which may cause the accuracy of variety maps in Apex to vary.

- **Does the Rate Controller affect any capabilities with Dual Variety mapping when using a 3rd party VR planter?**

  When using a 3rd party Variable Rate planter controller, the customer will need to set-up an additional Planting/Seeding operation. The GreenStar Rate Controller (GRC) will automatically create one operation, and a second operation will have to be created in order to set up Field Doc Connect.

  If customer wishes to document Dual Varieties while using 3rd party VR the customer will need to have a total of 3 operations.

  - Operation 1-GRC created operation fill in "dummy" information (Read NOTE below)
  - Operation 2- Created operation to set up Field Doc Connect. Field Doc Connect only allows one variety to be documented at a time.
  - Operation 3-Manually entered operation containing correct info for dual varieties.

  **Note:** Operation 1&2 should not have the same crop type as the manually entered operation 3. As mentioned above for non-SeedStar planters, the operations for the Rate Controller and FD Connect should be set to a bogus crop type (such as Oats, etc.), and the third operation for dual varieties can be set to the correct crop type (Corn, Soybeans, etc).

# GS2 Rate Controller & Swath Control Pro Support

**Ordering**

- GS2 Rate Controller Ordering Guide – interactive tool that helps determine what components are required for a customer's needs (includes information for multiple controller configurations).
  - GS2 Rate Controller Ordering Guide
- GS2 Rate Controller Selector Tool – interactive tool that helps determine what components are required for a customer's needs (focuses on single controller configurations).
  - GS2 Rate Controller Selector Tool

**Installation**

- Installation Instructions – all harnesses are shipped with install instructions
  - GS2 Rate Controller – available on Stellar Support

**Setup & Operation**

- Operators Manuals
  - GS2 Display Basic Applications – available on Stellar Support
  - GS2 Rate Controller – available on Stellar Support
- Quick Reference Guides
  - GS2 Rate Controller – available on StellarSupport
  - Swath Control Pro – available on StellarSupport
- GS2 Softkey H Setup – a detailed explanation of machine setup in the GS2
  - GS2 Softkey H Setup

**Support & Technical Reference**

- DTAC Solutions
  - **79183** – Explains the proper sequence to update Rate Controller software and how to program multiple Rate Controllers on the same CAN Bus
  - **79459** – Frequently asked questions on using the GS2 Rate Controller with Swath Control Pro on Planters.
  - **79191** – Explains the Swath Control Pro settings will with relation to the application.
  - **79509** – Outlines the set up and use of the new Softkey H Machine, Implement, and Swath Control settings:
  - **83200**- Compatibility Issues Between GS2 Rate Controller and Seedstar Planters with CAN Frame Control
  - **75651**- GS2 Rate Controller Approved and Unapproved Platforms

- GS2 Rate Controller Technical Manual – available thru Service Advisor under AMS (disk 4), TM1061 – GreenStar 2 Diagnosis and Test – Section 240 Electrical Systems Diagnosis and Test – Sections 15R – 15U.