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

www.StellarSupport.com

NOTE: Product functionality may not be fully represented in this document due to product changes occurring after the time of printing. Read the latest Operator’s Manual and Quick Reference Guide prior to operation. To obtain a copy, see your dealer or visit www.StellarSupport.com

Foreword

WELCOME to the iGrade™ System offered by John Deere.

READ THIS MANUAL carefully to learn how to operate and service your system correctly. Failure to do so could result in personal injury or equipment damage. This manual and safety signs on your machine may also be available in other languages. (See your John Deere dealer to order.)

THIS MANUAL SHOULD BE CONSIDERED a permanent part of your system and should remain with the system when you sell it.

MEASUREMENTS in this manual are given in both metric and customary U.S. unit equivalents. Use only correct replacement parts and fasteners. Metric and inch fasteners may require a specific metric or inch wrench.

RIGHT-HAND AND LEFT-HAND sides are determined by facing in the direction of forward travel.

WRITE PRODUCT IDENTIFICATION NUMBERS (P.I.N.) in the Specification or Identification Numbers section.

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Accurately record all the numbers to help in tracing the components should it be stolen. Your dealer also needs these numbers when you order parts. File the identification numbers in a secure place off the machine.

WARRANTY is provided as part of John Deere’s support program for customers who operate and maintain their equipment as described in this manual. The warranty is explained on the warranty certificate which you should have received from your dealer.

This warranty provides you the assurance that John Deere will back its products where defects appear within the warranty period. In some circumstances, John Deere also provides field improvements, often without charge to the customer, even if the product is out of warranty. Should the equipment be abused, or modified to change its performance beyond the original factory specifications, the warranty will become void and field improvements may be denied.
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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.

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Moline, Illinois
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A John Deere ILLUSTRATION ® Manual
Safety

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.

Operate Implement Automation Systems Safely

Do not use implement automation systems on roadways. Always turn off (disable) implement automation systems before entering a roadway. Do not attempt to turn on (activate) an implement automation system while transporting on a roadway.

Implement automation systems are intended to aid the operator in performing field operations more efficiently. The operator is always responsible for the machine path.

Implement automation systems include any application that automates implement movement. This includes, but may not be limited to, iGrade™ and Active Implement Guidance.

To prevent injury to the operator and bystanders:

- Verify the machine, implement, and automation systems are set up correctly.
- Remain alert and pay attention to the surrounding environment.
- Take control of the machine, when necessary, to avoid field hazards, bystanders, equipment, or other obstacles.
- Stop operation if poor visibility conditions impair your ability to operate the machine or identify people or obstacles in the machine path.

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Avoid High-Pressure Fluids

Inspect hydraulic hoses periodically – at least once per year – for leakage, kinking, cuts, cracks, abrasion, blisters, corrosion, exposed wire braid or any other signs of wear or damage.

Replace worn or damaged hose assemblies immediately with John Deere approved replacement parts.

Escaping fluid under pressure can penetrate the skin causing serious injury.

Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high-pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available in English from Deere & Company Medical Department in Moline, Illinois, U.S.A., by calling 1-800-822-8262 or +1 309-748-5636.
Introduction

Theory of Operation

iGrade™ is an active elevation control system which uses selective control valves (SCVs) to control implement height based off GPS elevation data.

iGrade™ has four functional modes:
• Plane Control – used to create a surface design with either a single slope direction or a dual slope direction.
• Grade Control – performs desired slope entered based on actual distance traveled not linear distance. Grade control is not direction-dependent.
• Remote Control – receives elevation data commands from an outside source to control implement height through SCVs to a desired plane or ditch design.
• Distance Trip – allows GPS position to trigger machine hydraulics based on distance traveled. For example, using distance trip to create irrigation bays for bedded crop irrigation.

iGrade™ utilizes StarFire™ Receivers to obtain a plane or elevation point correlated to a latitude and longitude position. To function properly, setup is crucial to performance. Setup including but is not limited to:
• SCV thresholds setup
• SCV flow rates setup
• TCM calibrations setup
• Correctly setting a benchmark daily or a zero point for system reference
• Correct inputs into system for correct plane design

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StarFire is a trademark of Deere & Company

Activate iGrade™

To operate iGrade™, a 26-digit activation code is required for Application Controller 1100.

1. Visit StellarSupport.com or call 1-888-953-3373.
2. Use controller serial number and COMAR order number to generate an activation code.
3. Select Application Controller 1100 from main menu.
4. Select Setup softkey.
5. Select Activation Entry button.
6. Select activation input box and enter activation code.

If iGrade™ is activated, Activation Entry screen displays:
• Distance Trip
• Remote Control
• Grade Control
• Plane Control
iGrade™ Requirements

Display:

NOTE: Update software on display.

- GreenStar™ 2 2600 Display or GreenStar™ 3 2630 Display recommended.
- GreenStar™ 2 2100 Display and GreenStar™ 3 CommandCenter™ Display are compatible.
- Surface Water Pro™ Plus (SWP+) automation requires GS2 2600 Display or GS3 2630 Display.

Receiver:

- StarFire™ RTK Receivers installed and functioning on machine and implement.
- StarFire™ Receiver and Deluxe Bracket mounted on implement.

NOTE: A StarFire™ 300 Receiver can be used as a machine receiver to provide speed for Load Limiting application only.

- StarFire™ Receiver mounted on machine for Load Limiting, Max Cut, Distance Trip, AutoTrac™, and SurfaceWaterPro™ Plus automation (Remote Control).
- TCM turned on and calibrated.
- Machine receivers (Original StarFire™, StarFire™ iTC, or StarFire™ 3000) require RTK when using Distance Trip and Max Cut.
- Implement receivers (StarFire™ iTC or StarFire™ 3000) are required to have an RTK signal level.

NOTE: When operating dual scrapers, use same model of receiver on both implements. Only use two StarFire™ iTC Receivers or two StarFire™ 3000 Receivers. Receivers calculate elevation differently.

When operating Surface Water Pro™, use same receivers (StarFire™ iTC or StarFire™ 3000) for collecting elevation data for ditching operation.

- Machine receivers can use SF1 or SF2 if Distance Trip is not being used and Max Cut is disabled.
- Receiver offsets can be entered for iGrade™. When using multiple implements, install receivers at same height from blade to receiver. If needed, adjust scraper offsets for application purposes.
- Implement receiver must not be mounted higher than 4 m (13.1 ft.) above ground level.
- Implement receiver must be connected to machine implement CAN Bus through ISO connector.
- Mount receiver mast on center line of implement over control point of implement.
- StarFire™ Global Navigation Satellite System (GNSS) antenna is recommended. Implement receivers may require use of StarFire™ GNSS antenna if operating iGrade™ in high multipath conditions. High multipath conditions can occur when satellites are low on horizon or signal reflects off a surface and intercepted by receiver.

Additional Hardware:

- Application Controller 1100 installed on machine.
- Various harnesses associated with power supply, controller integration, and receiver installation.

Optional:

- Complete AutoTrac™ setup and activate on display.
- Complete Surface Water setup if using Remote Control for SWP+ automation.

NOTE: iGrade™ does not use an implement feedback sensor.
**Machine Controller Compatibility**

If installing iGrade™ on a machine in serial number ranges listed in the table, contact a John Deere dealer to determine if any machine controllers require updates before operating iGrade™.

<table>
<thead>
<tr>
<th>Machine Model</th>
<th>Serial Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>8100</td>
<td>-021245</td>
</tr>
<tr>
<td>8200</td>
<td>-021030</td>
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<td>9300</td>
<td>-10928</td>
</tr>
<tr>
<td>9400</td>
<td>-10931</td>
</tr>
</tbody>
</table>

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Set SCV control lever (A) to AUTO or Actively Controlling (AC) mode.

StarFire™ RTK Receiver (B) communicates elevation of blade height to application controller (C). Receivers require an RTK activation and radio installed for each implement receiver and for each machine receiver using Distance Trip and Max Cut.

Application controller calculates desired elevation information from operator inputs entered in to display (D).

SCV controller receives instructions from application controller to automate blade height.

Constant adjustments are made to keep height at targeted grade elevation.

Constant power harness (E) connects to convenience outlet. Harness is routed to rear of cab where it connects to front extension harness (F) and application controller harnesses (G).

Front extension harness is available in two different lengths 3 m (9.8 ft.) and 10 m (32.8 ft.). Harness connects to constant power harness and ISO implement connector. Harness is routed along frame of machine and connects to implement receiver application harness (H).

If needed, center extension harness (I) extends the distance between front extension harness and implement receiver application harness. Harness is available in two lengths 2 m (6.6 ft.) and 8 m (26.2 ft.).

Implement receiver application harness connects to front extension harness and is routed up mast to implement receiver.

NOTE: If a rear extension harness (J) is not used, a terminator is needed at end of harness.

Rear extension harness (optional) provides ISO 9-pin connector on rear of scraper.

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Configure SCVs On CommandCenter™ - Auto Mode

To use Auto mode, application controller must be installed and connected to machine. When connected through CAN Bus or implement connector, SCV(s) automatically enter feature mode. SCV Home page with feature option displays for selected SCVs. On Advanced Settings page, specified SCV independent mode checkbox (A) is grayed out.

1. Connect implement to machine.
2. Select Menu button.
3. Select SCV softkey.
4. Select Advanced Settings softkey.

**NOTE:** Bar graph (B) depicts detent flow. Amount of detent flow is shown in box (C).

- AUTO (D) indicates normal auto mode operation.
- !AUTO! (E) indicates a fault and auto mode is inoperable. AUTO with a strike through it (F) indicates auto mode is not active.

5. Select Extend Set softkey (G) to navigate to detent flow bar graph. Select Confirm button to highlight. Rotate thumb wheel to adjust flow, then select Confirm button.

**NOTE:** Detent time drop-down (H) can only be adjusted when auto mode checkbox (I) is unchecked. If auto mode checkbox is checked, detent time cannot be adjusted. Use standard mode when adjusting detent time.

6. To adjust detent, rotate thumb wheel to auto mode checkbox to left of AUTO, then select Confirm button. When checkbox is unselected, AUTO displays with a strike through it.

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Adjust SCV Flow Rate

**CAUTION:** Excessive operating speed can cause damage or injury. Full extension or retraction of cylinder should take at least 2 seconds.

Adjust rate of operation for each job. Rate should be slow enough to be safe, yet fast enough to be practical.

Change flow setting as follows:

1. Press selected SCV switch (A). Display below touch switch shows previous rate of flow.

   **NOTE:** To provide operator with additional indication of command setting, as operator “clicks” flow knob (B) through the flow settings, the display will increase or decrease the number of multiple line increments as the flow changes.

2. Turn flow rate knob clockwise (rabbit) to increase flow or counterclockwise (turtle) to decrease flow. Flow setting is shown on bar graph display (C) when adjustments are made.

   **NOTE:** SCV can be operated to observe flow rate while in adjustment mode. Reduced cylinder cycle times and (or) a reduction in motor speed may result if total flow demand exceeds available pump flow.

### SCV FLOW OUTPUT (APPROXIMATE)

<table>
<thead>
<tr>
<th>SCV Flow Settings</th>
<th>L/min.</th>
<th>gpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1.0</td>
<td>3.6</td>
<td>1.0</td>
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<tr>
<td>2.0</td>
<td>7.2</td>
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<td>10.2</td>
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<td>39.6</td>
<td>10.5</td>
</tr>
<tr>
<td>9.0</td>
<td>65.4</td>
<td>17.2</td>
</tr>
<tr>
<td>10.0</td>
<td>114</td>
<td>30.0</td>
</tr>
</tbody>
</table>

* 0.1 = Minimum Flow Setting
Adjust Valve

NOTE: Flow rates between 11–30 L/min. (3—8 gpm) are recommended.

If hydraulic flow rate is adjusted, complete SCV threshold calibration test.

1. Adjust hydraulic flow on machine to operators preference, then adjust valve.
2. Loosen lock nut (A) on valve cartridge.
3. Use 1/4 turn increments to adjust valve. If implement is:
   - erratic or moves too fast, turn cartridge clockwise until implement reaches desired operation.
   - slow or not responsive, turn cartridge counterclockwise until implement reaches desired operation.

NOTE: Torque lock nut to 20—25 N·m (15–18 lb.-ft.).
4. Tighten lock nut on valve cartridge.

Calibrate SCV Thresholds

CAUTION: To avoid serious injury, keep area around equipment clear. This procedure requires machine to move forward. Implement will move during calibration.

NOTE: Anytime an adjustment to system is made, such as SCV hydraulic flow rate or counterbalance valve adjustment, calibrate SCV threshold.

SCV threshold calibration is necessary for optimal performance. Perform SCV threshold calibration each time Application Controller with iGrade™ is installed on a different machine. Without SCV threshold calibration, scraper may move significantly faster in one direction, undercompensate, overcompensate, or not perform as expected due to hydraulic limitations.

To calibrate SCV, machine must move faster than 0.5 km/h (0.3 mph) to initiate hydraulic flow for SCV control. Select SCV (1 or 3) then AC mode as indicated on SCV control display. Implement does not need to be in working (lowered) position to calibrate.

1. Select Application Controller 1100 button.
2. Select Setup softkey.
3. Select SCV Threshold Setup button.

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4. Select SCV being used from SCV Threshold Setup drop-down (A).

5. Select Valve Test Extend On (B) from Valve Test drop-down menu (C).

6. Place SCV lever into detent.

NOTE: Extend raises implement and retract lowers implement.

7. Adjust Extend Threshold value (D) to lowest setting that produces a steady, consistent motion.
   - If scraper height does not change, increase Extend Threshold value, until minimal movement is achieved.
   - If scraper moves quickly or erratically, decrease Extend Threshold.
   - Repeat procedure as required to obtain a smooth, constant change in scraper height.
   - Extend and Retract thresholds valves may have different values.

8. Select Valve Test Retract On (E) from drop-down.

9. Repeat adjustment procedures used in Valve Test Extend calibration.

10. Turn Valve Test Off (F) when calibration is complete.

   If SCV flow rate is too high, scraper could be overly sensitive and cause washboard effect.

   If SCV flow rate is too low, control and load limit functionality could be impaired or limited.
Basic Operation

- SCV controller is set to AC mode (A) by placing SCV into detent position.
- iGrade™ calculates elevation error using location of StarFire™ Receiver(s) in relation to a desired elevation set by operator.
- When AUTO control is enabled and activated, and if implement requires height adjustment to bring it back on desired grade, a signal is sent from iGrade™, through Application Controller harness, to machine SCV controller.
- SCV controller communicates instructions for sending hydraulic fluid to implement control cylinder.
- Entire process returns to first step to continually monitor for any implement elevation error. Constant adjustments are made to keep implement on desired grade.

NOTE: AUTO (B) indicates normal auto mode operation. !AUTO! (C) indicates a fault and auto mode is inoperable. AUTO with a strike through it (D) indicates auto mode is not active.

- If operating a machine with a CommandCenter™ display, select AUTO by placing a check in checkbox (E).

A—SCV Controller Set in AC Mode
B—AUTO Status Indicator (Turned On)
C—AUTO Status Indicator (Fault Identified)
D—AUTO Status Indicator (Turned Off)
E—AUTO Mode Checkbox

SCV Controller Set in AC Mode

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StarFire is a trademark of Deere & Company
CommandCenter is a trademark of Deere & Company
Engage iGrade™

1. Set up control type display.

2. Using SCV controls, place SCV control lever (A) to forward detent position to activate elevation control. Engage SCV levers (A and B) if using dual scrapers.

3. Select SCV button on TouchSet™ display.

4. Verify EC on TouchSet™ display changes to AC (C).

   If operating a machine with CommandCenter™ display, verify AUTO off (D) changes to AUTO on (E).

   (For more information on CommandCenter™ SCV controls refer to machine Operator’s Manual.)

   iGrade™ begins acquiring desired elevation immediately after SCV is placed into forward detent if machine is moving faster than 0.5 km/h (0.32 mph) and control type has been properly set up.

   A—SCV 1 Control Lever  D—AUTO Status Indicator
   B—SCV 3 Control Lever  (Turned Off)
   C—AC Mode  E—AUTO Status Indicator  (Turned On)

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CommandCenter is a trademark of Deere & Company
iGrade is a trademark of Deere & Company
Dual Scrapers

Every receiver on CAN Bus is shown in display menu. Each receiver button contains receiver serial number and location (machine or implement).

Implement receivers are shown on display when they are connected to receiver application harness. When using dual scrapers, two implement receiver buttons are shown.

For dual scraper applications, SCV 1 must control front scraper and SCV 3 must control rear scraper. Verify on Implement receiver pages that each implement receiver correlates to respective SCV movement.

NOTE: It is crucial to system performance to use lowest serial numbered receiver on front scraper and highest serial numbered receiver on rear scraper.

• Dual scrapers require a receiver mounted on each scraper.
• Implement harnesses accommodate multiple receivers.

NOTE: Stored planes or grades are same for both SCVs when using same control type. Setting benchmark or zero point for front scraper also sets rear scraper.

For dual scraper applications, threshold calibrations must be performed for both SCV 1 and SCV 3.

• Selecting same control type for SCV 1 and SCV 3 allows dual scrapers to control same plane or grade.

For best performance:

• Mount receiver mast on center line of implement over control point.
• Receiver offsets can be entered for iGrade™. When using multiple implements, install receivers at same height from blade to receiver. If needed, adjust scraper offsets for application purposes.

NOTE: When operating dual scrapers, use same model of receiver on both implements. Only use two StarFire™ iTC Receivers or two StarFire™ 3000 Receivers. Receivers calculate elevation differently.

When operating SWP+, use same receivers (StarFire™ iTC or StarFire™ 3000) for collecting elevation data for ditching operation.

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StarFire is a trademark of Deere & Company
**Load Limiting**

Load Limiting raises scraper when Engine Speed Threshold or Slip Threshold are exceeded to protect machine. StarFire™ Receivers are required on both machine and implement for full Load Limiting functionality. Load Limiting auto mode functions with Grade Control, Remote Control, and Plane Control.

1. Select Application Controller 1100 from main menu.
2. Select Main softkey.
3. Select Plane Control Setup, Remote Control Setup, or Grade Control Setup button.
4. Select Load Parameter Setup button.
5. Enter Elevation Control Sensitivity.

    **Elevation Control Sensitivity** allows operator to adjust up and down movement of implement.

    Elevation Control Sensitivity defaults to 2000, and is adjustable between 10—10,001. For slower and less aggressive up and down implement movement, decrease value. For faster and more aggressive up and down implement movement, increase value.

    *StarFire is a trademark of Deere & Company*

8. Enter Engine Speed Threshold (B) and Slip Threshold (C).

    If either threshold is reached, system raises blade until acceptable conditions are restored. Slip requires machine receiver to function as ground speed source. Engine Speed defaults to 1500 and Slip defaults to 15%.

    **A**—Load Limiting Drop-down Menu  
    **B**—Engine Speed Threshold  
    **C**—Slip Threshold  
    **D**—Load Limit Diagnostics  
    **E**—Back Button
Max Cut

NOTE: If using SF2 signal on machine receiver, Distance Trip does not function and Max Cut must be disabled.

Max Cut allows operator to set a maximum amount of cut implement takes in a single pass. Max Cut requires machine and implement to have a StarFire™ Receiver with RTK signal.

1. Select Application Controller 1100 button.
2. Select Main softkey.
3. Select Plane Control Setup, Remote Control Setup, or Grade Control Setup button.
4. Select Load Parameter Setup button.

5. Enter Elevation Control Sensitivity.  
   **Elevation Control Sensitivity** allows operator to adjust up and down movement of implement.

   Elevation Control Sensitivity defaults to 2000, and is adjustable between 10—10,001. For slower and less aggressive up and down implement movement, decrease value. For faster and more aggressive up and down implement movement, increase value.

6. Select Max Cut Setup button.
7. Enable Max Cut by selecting Max Cut Enabled from drop-down (A). Disable Max Cut by selecting Max Cut Disabled from drop-down.
8. Operate implement manually to desired Max Cut depth and select Set Max Cut Here button (B). Select Shift Max Cut Down button (C) or Shift Max Cut Up button (D) to increase or decrease maximum cut depth in increments of 2 cm (0.79 in.).
Offsets

iGrade™ allows user to preset step size for shifting offsets for Remote Control and Plane Control. For dual scraper, setting offsets step size changes step size for both SCV 1 and SCV 3.

1. Select Application Controller 1100 button.
2. Select Main softkey.
3. Select Remote Control Setup or Plane Control Setup for SCV 1. If using dual scrapers, selecting SCV 1 or SCV 3 sets the same step size for both SCVs.
4. For Plane Control, select Parameter Setup. For Remote Control, skip this step.
5. Select Offsets Setup.
7. For dual scrapers, scraper 2 offset may be set higher or lower than scraper 1.
   1. Enter Scraper 2 Offset (B).
   2. Select Scraper 2 Higher or Scraper 2 Lower from drop-down menu (C).

A—Offsets Step Size
B—Scraper 2 Offset
C—Scraper 2 Drop-down Menu

iGrade is a trademark of Deere & Company
Remote Control—Surface Water Pro™ Plus

Theory of Operation

SWP+ is an advanced ditching program that generates a “best fit drain.” SWP+ calculates the most effective drain in a field while moving the least amount of soil. Information is generated from vertical GPS signals calculated from the StarFire™ Receiver. SWP+ requires an RTK enabled receiver on implement and SF2 or RTK enabled receiver on machine.

Remote Control feature automatically controls blade height to a desired elevation calculated from ditches created in Apex™ or by SWP+ software on the display.

NOTE: If using SF2 signal on machine receiver, Distance Trip does not function and Max Cut must be disabled.

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Apex is a trademark of Deere & Company

Control Selection

1. Select Setup softkey.
2. Select Control Selection button.
3. Select Remote Control from SCV 1 Control Type drop-down.

NOTE: Remote Control can utilize dual scrapers. When utilizing dual scraper functionality, use SCV 1 for front scraper and SCV 3 for rear scraper.

4. Select Back button.
Operation

NOTE: Separate offsets can be placed in Remote Control Main and on SWP+ Create/Edit Drain page. If system is not cutting to grade, check both offsets.

Offsets are based on designed ditch, not ground level (distance off grade, not a maximum cut limit).

(Refer to Surface Water Pro™ Operator Manual for in-depth information on SWP.)

1. Select Main softkey.
2. Select Remote Control Main button.

After SCV(s) have been placed in detent and AC enabled, iGrade™ controls blade height to grade.

- Offsets are changed in increments.
- Set Offset—Zero Error (A) takes current error and applies it as an offset to the designed ditch.
- Shift offsets are useful when implement is attempting to control an elevation that machine cannot attain. Shift Offset Up (B) to achievable cut and Shift Offset Down (C) back to 0 over subsequent passes.

A—Set Offset—Zero Error  C—Shift Offset Down
B—Shift Offset Up

Surface Water Pro is a trademark of Deere & Company
iGrade is a trademark of Deere & Company
Remote Control—Serial Port

Theory of Operation
The John Deere Application Controller allows the ability to connect with 3rd Party Software through the use of a serial connection. This functionality may be useful if you currently use an additional software package to provide capabilities such as cut/fill mapping and would like the John Deere Application Controller to connect and communicate with this software. After a serial connection is established, the 3rd Party Software can send setpoint commands that the Application Controller will use to automatically control elevation on an implement. This is accomplished using the serial port on the controller and the operation specific message protocols. The controller is also capable of retransmitting GPS data to the third party software using the same serial port, eliminating the need for an additional connection.

Message Definition
The John Deere Application Controller can use two types of command messages.

Elevation Setpoint
The 3rd Party software can send a commanded elevation to the Application Controller. The implement will be controlled such that the implement receiver elevation attempts to match the setpoint elevation. The message protocol is as follows:
$JD,ELEV, 274.32 Carriage Return
Where the elevation value is in meters and can handle two decimal places. Ensure that there are no spaces and that the carriage return ends the message.

Depth Setpoint
The 3rd Party software can send a commanded depth to the Application Controller. The implement will be controlled such that the implement receiver elevation attempts to match the setpoint depth. When using this mode a machine receiver will be needed to calculate the elevation of the ground surface. Offsets will need to be used to account for height differences between the machine and implement receivers. The message protocol is as follows:
$JD,DEPTH, 1.54 Carriage Return
Where the depth value is in meters and can handle two decimal places. Ensure that there are no spaces and that the carriage return ends the message.

Serial Port Hardware
Remote Control harnesses for third-party software must follow these guidelines.

NOTE: Contact your John Deere dealer to order parts. Harness does not come assembled.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>57M9804</td>
<td>Mating Connector to Controller Harness</td>
<td>1</td>
</tr>
<tr>
<td>57M8164</td>
<td>Pins for 57M9804</td>
<td>3</td>
</tr>
<tr>
<td>57M8164</td>
<td>DB9 Plug Connector Assembly</td>
<td>1</td>
</tr>
<tr>
<td>57M8164</td>
<td>2.5 m (8 ft.) of 0.5 mm² (20 AWG) wire</td>
<td>3</td>
</tr>
</tbody>
</table>
Serial Port Setup

1. Select Setup softkey.

2. Select Serial Port Setup button.

NOTE: Baud Rate is the data transfer rate used for commands from third-party software as well as GPS position data going to third-party software, if applicable.

3. Select Baud Rate from drop-down menu (A).
   - 4800
   - 9600
   - 19200
   - 38400

4. If utilizing Application Controller to retransmit StarFire™ implement position data through serial port, select National Marine Electronics Association (NMEA) messages needed by third-party software from drop-down (B).

   NOTE: If not using Application Controller to send StarFire™ implement position data through serial port, select NMEA Off.

   - NO NMEA
   - NMEA GGA
   - NMEA GGA, GSA
   - NMEA GGA, GSA, RMC
   - NMEA ALL

5. If utilizing Application Controller to retransmit StarFire™ implement position data through serial port, select data frequency needed by third-party software from drop-down (C).
   - 1 Hz
   - 5 Hz

6. If utilizing third-party software to show an as applied map, Last Altitude allows a third receiver on last implement for elevation data. John Deere does not have an approved setup for this application. Customer must determine best installation setup for this application.

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Control Selection

1. Select Setup softkey.
2. Select Control Selection button.

NOTE: Remote Control can utilize dual scrapers. SCV 1 must be used for front scraper and SCV 3 for rear scraper. When utilizing dual scraper functionality, change SCV Control Type for both SCV 1 and SCV 3 to Remote Control.

3. Select Remote Control from SCV 1 control type drop-down (A).
4. Select Back button (B).

A—SCV 1 Control Type Drop-down Menu
B—Back Button

Operation

Offsets are based on desired command from third-party software, not ground level (distance off grade, not a maximum cut limit).

1. Select Main softkey.
2. Select Remote Control Main button.

After SCV(s) have been placed in detent and AC enabled, iGrade™ controls blade height to grade.

- Set Offset—Zero Error (A) takes current error and applies it as an offset to desired command.
- Shift offsets are useful when implement is attempting to control an elevation that machine cannot attain. Shift Offset Up (B) to achievable cut and Shift Offset Down (C) back to 0 over subsequent passes.

When setting zero point in Remote Control a value is displayed next to Offset. This value represents difference between surveyed receiver elevation and elevation of front implement receiver when zeroing error.

A—Set Offset—Zero Error
B—Shift Offset Up
C—Shift Offset Down

iGrade is a trademark of Deere & Company
Theory of Operation

Grade Control automatically controls scraper to a defined slope over a GPS distance. Grade may be defined by the Grade Calculator or operator inputs (slope and direction) at point of origin on slope. Slope direction is calculated based on GPS logic. North corresponds to an angle of 0° and 360°. Angles increase clockwise in degrees with a full circle equaling 360°. Direction of travel does not affect grade and system automatically fills or cuts during uphill or downhill operation. The slope causes an increase in elevation over a given distance for uphill operations and decreases in elevation for downhill operations.

A—Point of Origin (Start Point)  G—North = 0°/360°
B—Starting Grade             H—East = 90°
C—Finished Grade             I— South = 180°
D—Slope %                    J—West = 270°
E—Area Cut (Dirt Removed)   K—Slope Direction (Degrees)
F—Area Filled (Dirt Added)

Grade Calculator

1. Select Setup softkey.
2. Select Control Selection button.
3. Select Grade Control for SCV 1 (or SCV 1 and SCV 3 for dual scrapers).
4. Select Main softkey.
5. Select Grade Control Setup button.
6. Enter Slope (A) if known or use Grade Calculator (B) to calculate slope.

**NOTE:** Use front scraper as SCV 1 to define grade when utilizing dual scrapers.

Grade Calculator (B) records a series of points and calculates slope to connect end points of recorded path.

- Select Start Grade Calculator (C) to reset Grade Calculator, clear any previous data, and take start position.
- Drive to end position and select Stop Grade Calculator.
- Grade Statistics are displayed on screen.
- If data appears correct, select Set as Grade Control Slope (D).

Operator must drive same path during operation recorded with Grade Calculator. If same path is not driven, final elevation may not match desired or recorded elevation due to a different distance traveled. Make sure that scraper remains in a constant position during data collection (for example: in up position).

| A—Slope | C—Start/Stop Grade Calculator |
| B—Grade Calculator | D—Set as Grade Control Slope |

---

**Selecting Grade**

After entering desired grade, go to start point for grade and lower cutting edge.

1. Select Main softkey.
2. Select Grade Control Main button.
3. Select Grade Direction (A) machine will travel (uphill or downhill).

**NOTE:** Uphill is a positive slope and downhill is a negative slope.

4. Select Start Grade (B).

Front scraper sets grade. For dual scrapers, raise front pan when full and place rear pan into auto mode. If pan(s) are full before grade is complete, select Pause button (C) to stop grade and empty pan(s). Return to spot grade was paused and lower front scraper cutting edge back to desired grade. Select Resume and continue grade. Pause and resume as needed until desired grade is completed.

| A—Grade Direction | C—Pause/Resume |
| B—Start Grade |
Theory of Operation

Plane Control automatically controls scraper to cut to defined plane. Defined planes can be a single sloped plane or a dual sloped plane. Planes may be defined by the Plane Calculator or operator inputs (slope and direction) for a set origin point on plane. Slope direction is calculated based on GPS logic and in the down slope direction. North corresponds to an angle of 0° and 360°. Angles increase clockwise in degrees with a full circle equaling 360°. The system allows operator to set up two independent planes that can be used as a cut and a fill plane.

The Plane Calculator can create a best fit plane based on recorded elevation data. Once all data has been collected, a best fit plane is created.

A—North = 0°/360°  
B—East = 90°  
C—South = 180°  
D—West = 270°  
E—Slope 0.12%, Down Slope Direction 160°  
F—Slope1 0.12%, Down Slope Direction1 270°  
G—Slope2 0.14%, Down Slope Direction2 180°
Control Selection
1. Select Setup softkey.
2. Select Control Selection Button.
3. Select Plane Control from SCV 1 Control Type drop-down menu.

NOTE: For ease of instruction, this manual uses SCV 1 for the iGrade™ system. Turn other SCV Controls to OFF unless using dual scrapers.

Select Active Plane
1. Select Main softkey.
2. Select Plane Control Setup button.
3. Select active plane from Plane Control Setup drop-down menu.

NOTE: Both SCVs control same active plane if same control type is selected for both SCVs.
Single Slope Plane

1. Select plane to define from Plane Control Setup drop-down menu.
2. Select Single Slope Entry button.
3. Enter plane Slope (A) and Slope Direction (B) if known, or use Plane Calculator.
4. Drop scraper on point of origin and select Set Plane Origin (C).

**NOTE:** If running dual scrapers, use front scraper (SCV1) to set plane origin.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slope</td>
<td>Slope Direction</td>
<td>Set Plane Origin</td>
</tr>
<tr>
<td>E</td>
<td>F</td>
<td>G</td>
</tr>
<tr>
<td>East = 90°</td>
<td>South = 180°</td>
<td>West = 270°</td>
</tr>
<tr>
<td>H</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slope 0.12%, Down Slope Direction 160°</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dual Slope Plane

1. Select plane to define from Plane Control Setup drop-down menu.
2. Select Dual Slope Entry button.
3. Select Dual Slope Input button.
4. Enter plane Slope1 (A), Down Slope Direction1 (B), plane Slope2 (C), and Down Slope Direction2 (D) if known, or use Plane Calculator.

NOTE: Slope direction allows operators to define desired direction of slopes in relation to each other. Slope directions can be at any angle to one another.

5. Select Dual Slope Setup button to return to Dual Slope Entry page to set plane origin.
6. Drop scraper to a point on the plane and press Set Plane Origin button. The plane is created at the elevation of the set origin.

NOTE: If running dual scrapers, use front scraper (SCV1) to set plane origin.

A—Slope1
B—Down Slope Direction1
C—Slope2
D—Down Slope Direction2
E—Back Button
F—North = 0°/360°
G—East = 90°
H—South = 180°
I—West = 270°
J—Slope1 0.12%, Down Slope Direction1 270°
K—Slope2 0.14%, Down Slope Direction2 180°
Plane Control

Theory of Operation

Plane calculator records a series of elevation points (approximately every 1.5 m [5 ft.]) and stores elevation data. When data collection is turned off, iGrade™ generates a best fit plane and displays calculated slope and direction. If given slope and direction look realistic, select Save to Active Plane button (A). Start (Stop) Data Collection (B) can continuously record by leaving data collection on or only record desired points of interest by turning data collection on and off between points to generate the best fit plane.

If calculated plane does not appear correct, collect and save more data points to active plane, or plane data can be cleared and collection restarted. Plane created displays in both Single and Dual Sloped Entries pages.

Tips

- Use front scraper as SCV 1 to define plane, if utilizing dual scrapers.
- Collecting more points results in better accuracy.
- Scatter data points (do not drive in straight line unless collecting data from the entire area).
- Clear plane data at start of every new plane. Un Cleared data is applied to current plane.
- Edit calculated plane information, if needed, through Single or Dual Slope entry pages after saving created plane to active plane.
- Ensure that scraper remains in a constant position during data collection (for example, in up position).
- Plane Calculator assumes a 1:1 cut-fill ratio.
- Plane Calculator calculates a plane origin based on height of implement receiver during data collection. Origin can be shifted to an actual on-grade point by selecting Set Plane Origin button in either Single Slope or Dual Slope Entry pages or by using offsets.

Tips

- Use front scraper as SCV 1 to define plane, if utilizing dual scrapers.
- Collecting more points results in better accuracy.
- Scatter data points (do not drive in straight line unless collecting data from the entire area).
- Clear plane data at start of every new plane. Uncleared data is applied to current plane.
- Edit calculated plane information, if needed, through Single or Dual Slope entry pages after saving created plane to active plane.
- Ensure that scraper remains in a constant position during data collection (for example, in up position).
- Plane Calculator assumes a 1:1 cut-fill ratio.
- Plane Calculator calculates a plane origin based on height of implement receiver during data collection. Origin can be shifted to an actual on-grade point by selecting Set Plane Origin button in either Single Slope or Dual Slope Entry pages or by using offsets.

Dual Scrape

- Dual Scrapers can be used with Plane Control or Grade Control.
- Select the same control type for each SCV.
- Plane setup can be completed with either SCV control. Only one plane is used for both scrapers.
- Front scraper (SCV 1) must be used for Plane and Grade Calculators and to set plane origins.

A—SCV 1 Main
B—SCV 1 Setup
C—SCV 3 Main
D—SCV 3 Setup
E—Version Information

Main Menu

A—Plane Control Main
B—Plane Control Setup
C—No Main
D—No Setup
E—Version Information

Plane Control — Dual Scrapper
**Operation**

1. Select Active Plane (A).

2. Use Shift Offset Up (B) and Shift Offset Down (C) to adjust designed plane.
   - When pan cut is too aggressive, select Shift Offset Up button to obtain an achievable cut. Shift offset back to 0.00 on subsequent passes.
   - When pan cut is not aggressive enough, select Shift Offset Down button to obtain an achievable cut. Shift offset back to 0.00 on subsequent passes.
   - Plane shift offsets are based on previously designed plane, not ground level. Offsets shift entire plane up or down.

---

iGrade™ cuts to active plane as long as machine is in AC (A) or AUTO mode (B) and moving faster than 0.5 km/h (0.3 mph). When scraper is full, raise scraper and unload. Place machine back in AC or AUTO mode and iGrade™ returns blade elevation to active plane.

- **A**—SCV Controller Set in AC Mode
- **B**—AUTO Status Indicator
- **C**—AUTO Mode Checkbox
- **D**—Detent Time Drop-down
- **E**—Detent Flow Bar Graph
- **F**—Detent Flow Value Box
- **G**—Extend Set Softkey
Distance Trip

Theory of Operation
Distance Trip collects GPS distance and cycles SCV controller based off a predetermined interval. Controller calculates where trip needs to occur based off a furrow heading in degrees and distance between furrows. This calculation allows direction of travel to be at varying angles to furrow. Distance Trip operation requires RTK enabled machine and implement receivers. Distance Trip works off GPS distance, not elevation.

Select Distance Trip
NOTE: If using SF2 signal on machine receiver, Distance Trip does not function and Max Cut must be disabled.

1. Select Setup softkey.
2. Select Control Section button.
   NOTE: Distance Trip is only available on SCV 1.
3. On Control Selection drop-down for SCV 1, select Distance Trip. Select OFF for all other SCV(s).
**Distance Trip Setup**

1. Select Main softkey.
2. Select Distance Trip Setup button.

**Furrow Heading (A)** – Angle or heading of furrows (rows) in reference to North (0°). To determine furrow heading, center machine over furrow and obtain heading from display.

**Interval Distance (B)** – Distance between parallel furrows.

**GPS Offsets to Implement (C)** – Distance from machine receiver and working point of implement.

**Implement Width (D)** – Distance between furthest working points of an implement.

**Trip Time (E)** – Time in seconds SCV completes a cycle.

A—Furrow Heading  
B—Interval Distance  
C—GPS Offset to Implement  
D—Implement Width  
E—Trip Time
Distance Trip

**Initiating Trip Cycle**

1. Select Main softkey.
2. Select Distance Trip Main button.

**Trigger First Trip** (A) – Cycles SCV controller and sets current locations as origin point to calculate distance.

**Manual Trip** (B) – Cycles SCV without distance setup or setting current point as origin.

**Left or Right Furrow Position** (C) – Allows iGrade™ to calculate correct GPS distance based off which side of implement furrow is located to trip implement.

- **A**—Trigger First Trip
- **B**—Manual Trip
- **C**—Furrow Position

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**Adjusting Trip Cycle**

**Stop Tripping** (A) – Stops measuring distance and tripping SCV.

**Trip Earlier** (B) – Shifts preset trip interval to occur sooner but does not decrease interval distance.

**Trip Later** (C) – Shifts preset trip interval to occur later but does not increase interval distance.

Each press of Trip Earlier or Trip Later buttons changes trip distance by 5 cm (2 in.).

- **A**—Stop Tripping
- **B**—Trip Earlier
- **C**—Trip Later
Disconnect iGrade™ System

NOTE: If an electronic failure occurs, hydraulic control can be set to operate in normal, manual mode.

Without electronic control, automatic implement height adjustments are not possible.

Disconnection procedure for changing machine or implement:
1. Shut off machine, set parking brake, and remove key.
2. Disconnect implement receiver harness at ISO 9-pin connector (A).
3. Disconnect constant power harness.
   
   NOTE: Once completed, machine SCV control reverts to normal manual operation.
4. Disconnect lighting connector (B) and all other implement connections related to releasing equipment from machine.

Disconnection procedure for electronic failure:
- On Application Controller Setup menu, select Control Selection.
- On Control Selection drop-down, select Off.
- After Off has been selected, cycle machine power and iGrade™ will be disabled.

Disconnection procedure for permanent removal:
- Shut off machine, set parking brake, and remove key.
- Disconnect application controller from rear ISO connector.

Remove controller and components following procedures in Application Controller installation instructions.

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## Troubleshooting — iGrade™ System

### A—Status Code Location

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>No GPS</td>
<td>No GPS correction available.</td>
<td>Ensure StarFire™ Receiver on implement and machine are connected and functioning properly.</td>
</tr>
<tr>
<td>Cycle Power</td>
<td>Controller must be restarted to communicate with new function.</td>
<td>Shut OFF machine and start again.</td>
</tr>
<tr>
<td>No RTK</td>
<td>No RTK correction received from selected StarFire™ Receiver, or RTK not currently available.</td>
<td>Activate RTK on implement StarFire™ Receiver and (or) machine StarFire™ Receiver.</td>
</tr>
<tr>
<td>Update GPS SW</td>
<td>Incompatible software loaded.</td>
<td>Update software on implement StarFire™ Receiver(s) to compatible version.</td>
</tr>
<tr>
<td>OK</td>
<td>System is ready to be operated. Any faults still occurring are likely to be independent of iGrade™ control system.</td>
<td>System is working properly.</td>
</tr>
</tbody>
</table>

### Symptom

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitor screen not readable on hookup to machine</td>
<td>No communications with implement controller.</td>
</tr>
<tr>
<td>Paused</td>
<td>Shows current state of Grade Control.</td>
</tr>
<tr>
<td>No remote commands</td>
<td>Display is not set up to send proper elevation error from Surface Water Pro™ Plus.</td>
</tr>
</tbody>
</table>

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iGrade is a trademark of Deere & Company  
DEUTSCH is a trademark of Deutsch Co.  
Surface Water Pro is a trademark of Deere & Company
## Troubleshooting — I/O Voltages Page

<table>
<thead>
<tr>
<th>Description</th>
<th>Reading</th>
<th>System Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog In Pin 1 (Pin G2)</td>
<td>Wheel angle sensor voltage reading:</td>
<td>Not applicable for iGrade™ system.</td>
</tr>
<tr>
<td></td>
<td>SCV 1 = 0–5 V,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.5 V = neutral (center)</td>
<td></td>
</tr>
<tr>
<td>Analog In Pin 2 (Pin K2)</td>
<td>Wheel angle sensor voltage reading:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SCV 2 = 0–5 V,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.5 V = neutral (center)</td>
<td></td>
</tr>
<tr>
<td>Analog Out Pin 1 (Pin H1)</td>
<td>Command SCV 1 voltage value 0–5 V,</td>
<td>When set up for SCV 1, voltage commanded</td>
</tr>
<tr>
<td></td>
<td>2.5 V = neutral</td>
<td>to hydraulics controller, or current command voltage of respective SCV when not</td>
</tr>
<tr>
<td></td>
<td></td>
<td>in Auto mode.</td>
</tr>
<tr>
<td>Analog Out Pin 2 (Pin J1)</td>
<td>Command SCV 3 voltage value 0–5 V,</td>
<td>When set up for SCV 3, voltage commanded</td>
</tr>
<tr>
<td></td>
<td>2.5 V = neutral</td>
<td>to hydraulics controller, or current command voltage of respective SCV when not</td>
</tr>
<tr>
<td></td>
<td></td>
<td>in Auto mode.</td>
</tr>
<tr>
<td>5 Volt Out</td>
<td>Supplied voltage 0–5 V for system.</td>
<td>Voltage supplied to the system, should</td>
</tr>
<tr>
<td></td>
<td></td>
<td>read close to 5 V.</td>
</tr>
<tr>
<td>Sense Volt</td>
<td>Sense voltage 0–5 V:</td>
<td>Voltage coming from hydraulic controller</td>
</tr>
<tr>
<td></td>
<td>with 9-pin implement feedback harness connected = 5 V,</td>
<td>system, should read approximately 5 V.</td>
</tr>
<tr>
<td></td>
<td>with paddle pot connected = 0 V and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>changes with command</td>
<td></td>
</tr>
<tr>
<td>Digital In 1 (Pin G1)</td>
<td>External valve paddle pot:</td>
<td>Not applicable for iGrade™ system.</td>
</tr>
<tr>
<td></td>
<td>0 = no command,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 = command</td>
<td></td>
</tr>
<tr>
<td>Digital In 2 (Pin K1)</td>
<td>Value displays a 1</td>
<td></td>
</tr>
<tr>
<td>Line Count</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Not applicable for iGrade™ system.*

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<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC not showing on TouchSet™ display.</td>
<td>Dirty or loose 10-pin connector at rear of machine.</td>
<td>Power down machine and disconnect all iGrade™ components. Clean all connectors and check for lose or dirty pins. Reconnect all iGrade™ components and power up machine. Verify correct control type and SCV are selected in iGrade™ setup and power has cycled.</td>
</tr>
<tr>
<td>Machine is not adjusting to desired grade.</td>
<td>EC displayed on SCV display.</td>
<td>Push correct SCV control lever into detent to bring up AC mode.</td>
</tr>
<tr>
<td>Loss of display and operation of implement.</td>
<td>Dirty or loose 4-pin connection at rear of machine.</td>
<td>Clean connectors and reconnect tightly.</td>
</tr>
<tr>
<td>Loss of display and operation of implement.</td>
<td>GreenStar™ harness improperly connected.</td>
<td>Power down machine and system, then disconnect harness, clean, and install properly.</td>
</tr>
<tr>
<td>Loss of display and operation of implement.</td>
<td>Electrical short in harness.</td>
<td>Check electrical wiring for breaks, shorts, and damage.</td>
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<tr>
<td>Washboarding — scraper overly sensitive and</td>
<td>SCV's flow rate is too high.</td>
<td>Adjust SCV flow rate down.</td>
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<tr>
<td>causes washboard effect.</td>
<td>Counterbalance valve improperly adjusted.</td>
<td>Readjust counterbalance valve cartridges and perform threshold calibration.</td>
</tr>
<tr>
<td>Control and load limit functionality</td>
<td>SCV's flow rate is too low.</td>
<td>Adjust SCV flow rate up.</td>
</tr>
<tr>
<td>impaired or limited.</td>
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*TouchSet is a trademark of Deere & Company
iGrade is a trademark of Deere & Company
GreenStar is a trademark of Deere & Company*
iGrade System

Being an electronic controller, minimal service is required to maintain performance levels. However, John Deere Ag Management Solution’s commitment to continued improvement and quality may lead to periodical software updates available for this controller. To maintain optimum performance, these updates should be loaded.

For the GreenStar system, this is accomplished when performing a “live update” using a connection to the StellarSupport™ website (www.stellarsupport.com). Updates, once downloaded, must be loaded onto a USB flash drive (A). After updating the USB flash drive, the next time the flash drive is inserted into the display console (B) the operating system will prompt the operator of available updates. Accepting updates will automatically update iGrade system to the most recent version.

StellarSupport is a trademark of Deere & Company

Preseason Checklist

NOTE: In addition to performing checklist before season begins, utilize preseason checklist if any of the following occur:

- A different tractor or implement is introduced to system.
- A Hydraulic system component is repaired, replaced, or adjusted.
- An AMS component is replaced.

Preseason Checklist

- Update Software. Refer to StellarSupport.com for latest software.
  - Display
  - Machine receiver
  - Implement receiver(s)
  - Base station receiver
  - Controller
- Load and activate applications on display.
- Inspect wiring harness for wear and damage around pinch points, corners, edges, and harness support locations. Repair as necessary.
- Inspect wiring harness at connectors for wear on exposed wires. Repair as necessary.
- Inspect connector seals and latching mechanisms. Repair as necessary.
- Inspect connector pins for wear, debris, and corrosion. Clean and (or) repair as necessary.
  - ISO connector
  - Receivers
  - Display
- Inspect mounting hardware. Retorque as necessary.
  - Display
  - Receivers
  - Mast
- Adjust SCV flow rates.
- Adjust counterbalance valve (if applicable).
- Calibrate SCV thresholds.
- Calibrate machine and implement TCMs.

Daily Checklist

- Calibrate benchmark.
- Inspect wiring harness for wear and damage around pinch points, corners, edges, and harness support locations. Repair as necessary.
- Inspect wiring harness at connectors for wear on exposed wires. Repair as necessary.
- Inspect mounting hardware. Retorque as necessary.
  - Display
  - Receivers
  - Mast
### Postseason Checklist

- Inspect wiring harness for wear and damage around pinch points, corners, edges, and harness support locations. Repair as necessary.
- Inspect wiring harness at connectors for wear on exposed wires. Repair as necessary.
- Inspect connector seals and latching mechanisms. Repair as necessary.
- Inspect connector pins for wear, debris, and corrosion. Clean and (or) repair as necessary.

- ISO connector
- Receivers
- Display
- Inspect mounting hardware. Retorque as necessary.
- Display
- Receivers
- Mast
EC Declaration of Conformity

Deere & Company
Moline, Illinois U.S.A.

The person named below declares that
Product: Universal CAN Controller
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>
</table>

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

Brigitte Birk
Deere & Company European Office
John Deere Strasse 70
Mannheim, Germany D-68163
EUConformity@johndeere.com

Place of declaration: Urbandale, Iowa U.S.A
Name: John H. Leinart
Date of declaration: 09 April 2010
Title: Engineering Manager, Ag Management Solutions
Manufacturing unit: John Deere Intelligent Solutions Group
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Technical Information

Technical information can be purchased from John Deere. Some of this information is available in electronic media, such as CD-ROM disks, and in printed form. There are many ways to order. Contact your John Deere dealer. Call 1-800-522-7448 to order using a credit card. Search online from http://www.JohnDeere.com. Please have available the model number, serial number, and name of the product.

Available information includes:

• PARTS CATALOGS list service parts available for your machine with exploded view illustrations to help you identify the correct parts. It is also useful in assembling and disassembling.
• OPERATOR’S MANUALS providing safety, operating, maintenance, and service information. These manuals and safety signs on your machine may also be available in other languages.
• OPERATOR’S VIDEO TAPES showing highlights of safety, operating, maintenance, and service information. These tapes may be available in multiple languages and formats.
• TECHNICAL MANUALS outlining service information for your machine. Included are specifications, illustrated assembly and disassembly procedures, hydraulic oil flow diagrams, and wiring diagrams. Some products have separate manuals for repair and diagnostic information. Some components, such as engines, are available in separate component technical manuals.
• FUNDAMENTAL MANUALS detailing basic information regardless of manufacturer:
  - Agricultural Primer series covers technology in farming and ranching, featuring subjects like computers, the Internet, and precision farming.
  - Farm Business Management series examines “real-world” problems and offers practical solutions in the areas of marketing, financing, equipment selection, and compliance.
  - Fundamentals of Services manuals show you how to repair and maintain off-road equipment.
  - Fundamentals of Machine Operation manuals explain machine capacities and adjustments, how to improve machine performance, and how to eliminate unnecessary field operations.
John Deere Service Keeps You on the Job

John Deere Is At Your Service

CUSTOMER SATISFACTION is important to John Deere. Our dealers strive to provide you with prompt, efficient parts and service:

– Maintenance and service parts to support your equipment.
– Trained service technicians and the necessary diagnostic and repair tools to service your equipment.

CUSTOMER SATISFACTION PROBLEM RESOLUTION PROCESS

Your John Deere dealer is dedicated to supporting your equipment and resolving any problem you may experience.

1. When contacting your dealer, be prepared with the following information:
   – Machine model and product identification number
   – Date of purchase
   – Nature of problem

2. Discuss problem with dealer service manager.

3. If unable to resolve, explain problem to dealership manager and request assistance.

4. If you have a persistent problem your dealership is unable to resolve, ask your dealer to contact John Deere for assistance. Or contact the Ag Customer Assistance Center at 1-866-99DEERE (866-993-3373) or e-mail us at www.deere.com/en_US/ag/contactus/.