

Precision Planting

20/20
DeltaForce™

Operations and Installation Manuals visit

[http://www.precisionplanting.com/Products/
DeltaForce/TechSupport.aspx](http://www.precisionplanting.com/Products/DeltaForce/TechSupport.aspx)

or scan the QR code at right with your iPad.

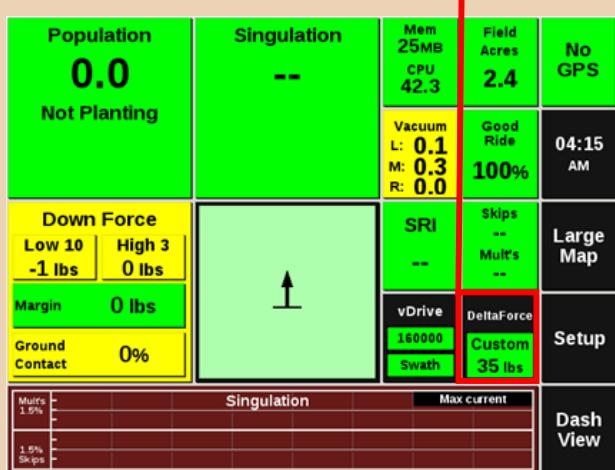


Conditions to Enable DeltaForce:

In order for DeltaForce to function, the following conditions must be met:

1. Planter lowered
2. Planter moving
3. Master Plant Switch "ON"
4. DeltaForce enabled

When **DeltaForce** is plugged into the system, the DeltaForce button will be displayed. By pressing the DeltaForce button, you will be taken to the DeltaForce Control center to make adjustments to your system. If this button is not present, navigate: **SETUP - SYSTEMS - DISPLAY - DASHBOARD BUTTONS** and choose the **4X4** option.



The Down Force button will be displayed. This area will show the operator which row has the lowest down force and which row has the highest down force. Margin is also displayed. Margin is the second lowest weigh pin reading over the last three seconds. Ground Contact displays the percent ground contact of the planter.

A DeltaForce specific Dashboard Mini-chart can be selected from the Dash View page. This will provide DeltaForce specific information in greater detail. Pressing the Dashboard Mini-chart will take you to the DeltaForce Details page.

Normal operating ranges:

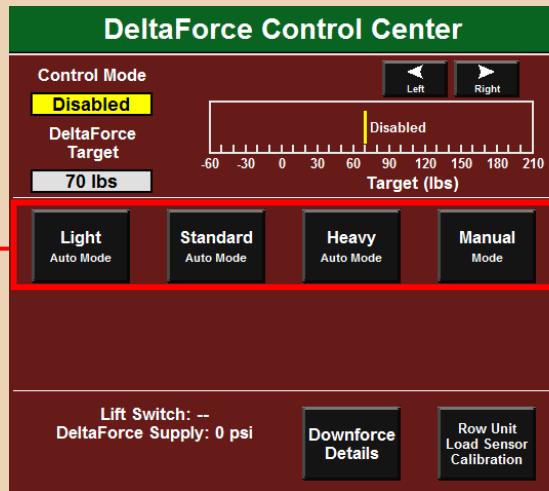
- Lift Pressure Sensor on lift manifold – Up to 3000 psi
- "P" port on lift manifold – Up to 3000 psi
- "R" port on lift manifold – Less than 100 psi
- "L" port on lift manifold – 200-2200 psi *
- "P" port on cylinder – Up to 3000 psi
- "R" port on cylinder – Less than 100 psi
- "L" port on cylinder – 200-2200 psi *
- Cylinder Pressure – 200-2800 psi *

* These pressures will only read when the system is activated.
When the system is reactivated, it should read less than 100 psi.



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The DeltaForce Control Center is the heart of the DeltaForce of the system. This is where you will Enable/Disable Control the system, select control modes, and monitor the functionality and performance of the system.



DeltaForce Diag button will take the operator directly to Level 2 DeltaForce Diagnostics page.

ENABLE CONTROL: This button toggles on and off AirForce Control. The default state for DeltaForce is disabled for safety reasons. Enabling control must be done after installation.

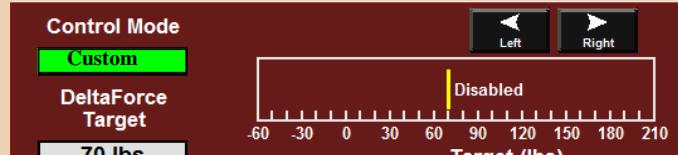
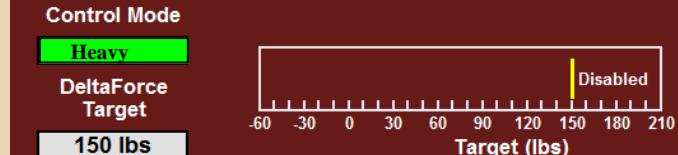
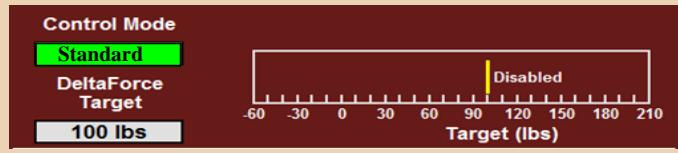
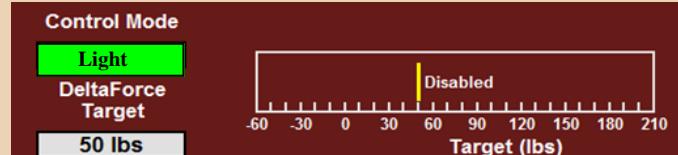
Light Automatic: The target for light is 50 pounds. This setting could potentially be used when seed depth and/or moisture are not as yield limiting as potential row compaction. This will commonly result in a FieldView map split between green and blue.

Standard Automatic: The standard target is 100 pounds. Standard will be the most commonly used DeltaForce setting. This will commonly result in a FieldView map of mostly green and yellow.

Heavy Automatic: The heavy target is 150 pounds. This setting will most commonly be used in dry conditions or cloddy seed-bed. This will commonly result in a FieldView map with yellow and orange.

Custom Automatic: This control mode will allow the operator to create their own target with automatic control. The operator can adjust the target with the Left Arrow and Right Arrow in the upper right corner of the page. The operator can adjust the DeltaForce target to the get desired FieldView map, ranging from blue to red.

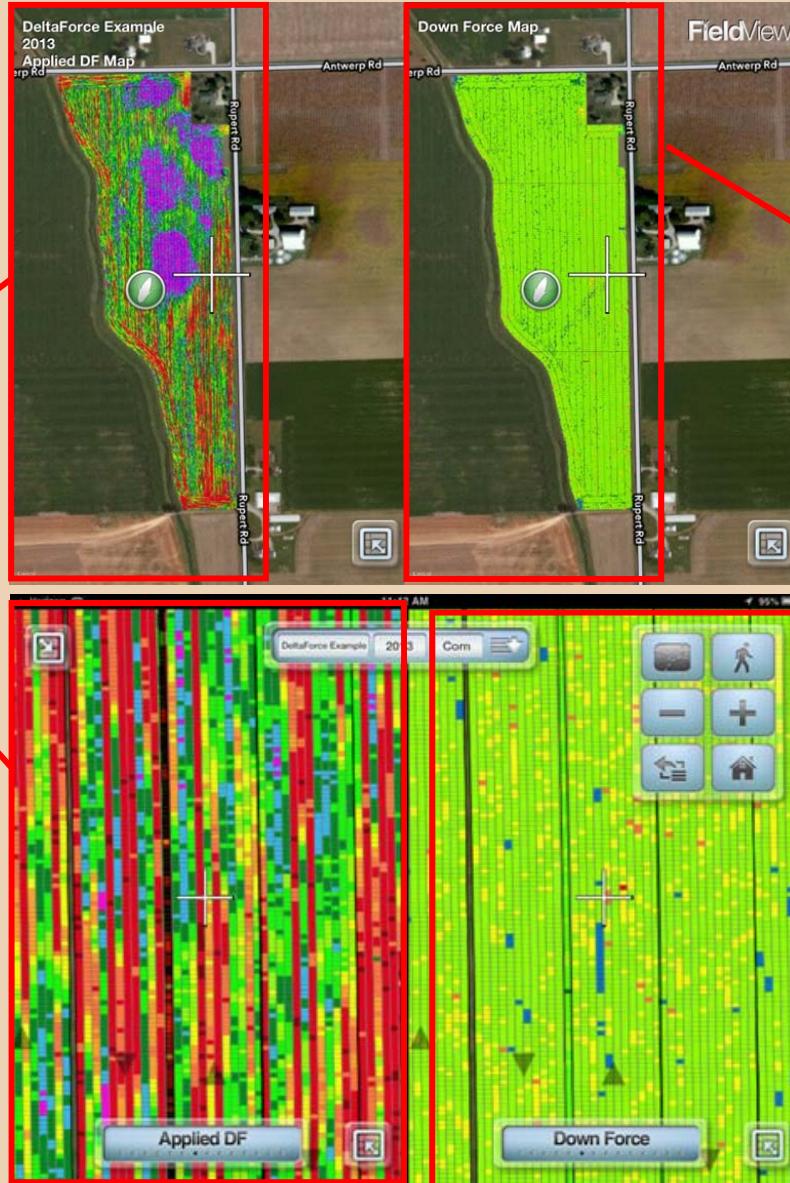
Manual Mode: This control mode allows the operator to designate a desired force for the system to maintain. This control mode allows the operator to specify a set force for the cylinders to push down (or pull up). In this control mode, the cylinders do not respond to the readings of the weigh pins.



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The Applied DeltaForce map is showing the force that is applied on each row. As the operator travels across the field, there are certain situations that will require lift and certain situations that will require extreme down force. In either situation, DeltaForce will manage the pressure of the cylinders to maintain the desired force on the gauge wheels, which will lead to a consistent depth.



The outcome of the Applied DeltaForce map is the Down Force map. The Down Force map displays the force measured on the gauge wheels. Meaning that even though there are certain situations that require lift and certain situations that require down force, DeltaForce is always maintaining good ground contact.

Within the map are some color variations (set by the standard FieldView legend settings):

Blue - Loss of ground contact.

Green - 0-100 pounds of force is being applied to the gauge wheels.

Yellow - 100-150 pounds of force on the gauge wheels.

Orange - 150 - 200 pounds of force on the gauge wheels

Red - Excessive down force. Over 200 pounds of force is being measured on the gauge wheels

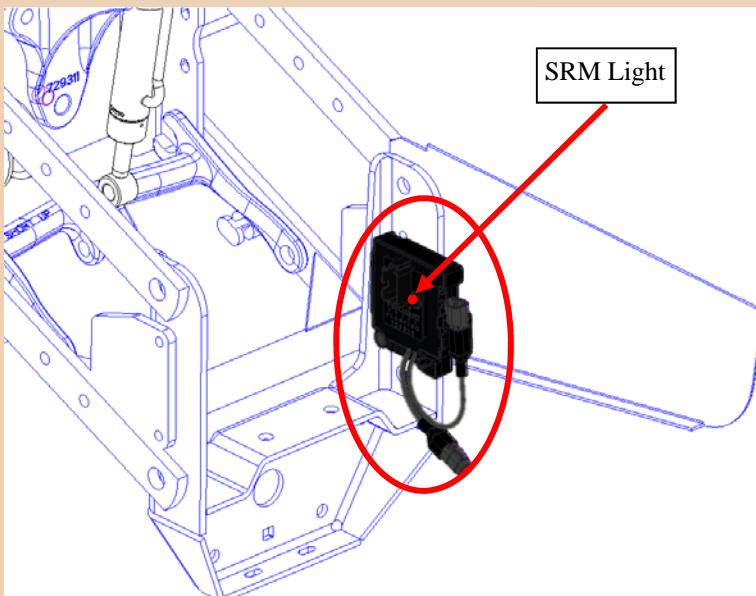
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In order to access the Diagnose Page, navigate: **Setup - Diagnose**

The bottom of the page will list all of the rows on the planter.

SRM Light Status	
Light Pattern	Description
Erratic Blink (..- -.- -.- -..)	Device has power but has never communicated to 20/20
Solid Light (_____)	Device is being updated
Steady Blink (- - - - -)	Device is powered and communicating to 20/20
Fast Blink (.....)	Device is powered but lost communication to 20/20
No Light ()	Device is not powered



The top section of the page will list all of the systems installed on the planter.

Setup & Configuration

Plant	Systems	Alerts	Diagnose	Data																						
FieldView	DeltaForce	Seed Data	AUX																							
Display	InCab			Tap here for legend																						
		PDM/lift																								
		SRM	vDrive																							
<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td></tr> <tr><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16						
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12	13	14	15	16																						

Snapshot **System Log** **Advanced Logs**

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DeltaForce Level 2 Diagnostic Diagram

Row Loc	Load Cell Lbs (CALIB)	Solenoid Volts	Command PSI	Command Force Lbs	Net Applied Down Force
PDM	0.0	0	0	0	0
1	5	0.0	0	0	0
2	3	0.0	0	0	0
3	-3	0.0	0	0	0
4	-7	0.0	0	0	0

Health Check

Page Up

Page Down

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Lifted State - Determined by the lift switches
Lift Supply - Hydraulic supply pressure from the tractor
Radar Speed - Shows speed determined by radar
GPS - Shows speed determined by GPS
Master Plant - Shows if Master Plant switch is On/Off on the CCM
Control Mode - Shows if DeltaForce is Enabled/Disabled and control mode of DeltaForce

Colors of Diagnose Page

Green - All systems are operating and communicating correctly.

Yellow - A system is not functioning 100%

Red - Part of a system has failed. The corresponding row will also be red.

White - Device is detected but is not expected

Level 2 Diagnostics

To access the DeltaForce Level 2 Diagnostic Page, navigate: **Setup - Diagnose - DeltaForce**

Load Cell Lbs - Current reading of load cell

Solenoid Volts - Command of the DeltaForce solenoid

Command PSI - Pressure on the cylinder

Command Force - Target down force

Net Applied Down Force - The difference between down force and the lift force on a row