

## **SETUP GUIDE**

# JOHN DEERE RATE CONTROLLER 2000 SINGLE LIQUID with SECTION CONTROL

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### **Overview**

This document provides instructions for setting up a Liquid Systems (SA) Rate Control Module with a John Deere Greenstar Display using a John Deere Rate Controller 2000 (JDRC 2000). The scenario covers setup of a single liquid system with section control where it is the one and only product being controlled by the JDRC 2000.

This document should be read in conjunction with JDRC 2000 Operator's Manual.

## **Configuration Prerequisites**

Before the liquid system can be configured in the Greenstar Display (2630 or newer), the following steps need to be completed.

- Physical installation of Liquid Systems (SA) Rate Control module including tank plumbing.
- Installation and connection of JDRC 2000 to the Greenstar Display with Front Extension Harness and Foot Switch see photo below.
- Installation of Height Switch on planting implement if required.





## Physical Connection to Liquid Systems module

Connect Liquid Systems (SA) module to the JDRC 2000 with wiring looms supplied. Liquid Systems (SA) looms available for single liquid set up with section control are:

Part No.	Name		Description
LL07019	JDRC2000 Single SC		Adapter that connects to 47
	Adapter Loom (47 pin)		pin connector on JDRC 2000
			Main Harness.
1107072	Generic Module Loom		Connects to individual device
	(5m)		connectors on LQS pump
			module.
			Loom via 23 pin circular
			connector.
LL07079	Section Loom		Connects to individual section
	(12 Section, 6m)		valve connectors on LQS
or		6	section module.
1107090	Section Learn		Connects to LL07019 Adapter
	(6 Section 6m)		Loom via 20 pin circular
Or			connector.
-			
LL07082	Section Loom		
	(8 Section, 6m)		
LL07014	Section Loom Extension		Extensions of Section Loom for
(optional)	(12 Section, 6m)		when additional length is required from LOS section
or	Section Loom Extension		module to JDRC 2000.
1107024	(12 Section, 12m)		
(ontional)	(		
	Generic Module Loom		Extensions of Generic Module
(optional)	Extension (6m)	No.	Loom for when additional
			length is required from LQS
or			pump module to JDRC 2000.
LL07020	Generic Module Loom		
(optional)	Extension (12m)		



1. Connect Generic Module Loom (LL07072) to device connector on Liquid Systems (SA) module, ensuring connector is securely clipped in.



- 2. Connect and route Extension Loom (LL07015 or LL07020) to reach JDRC 2000 if required for the routing distance.
- 3. Connect JDRC 2000 Single SC Adapter Loom (LL07019) to the Generic Module Loom (or Extension Loom if installed) and to the JDRC 2000 Main Harness.



4. If installed connect Height Switch to height switch input on Adapter Loom (LL07019).





5. Connect Section Loom (LL07079 or LL07080 or LL07082) to individual connectors on the Liquid Systems (SA) section module. Ensure section valve number matches connector number. e.g. valve No. 1 plugs in to connector No.1. Insert dust plugs into un-used connectors on the Section Loom.





- 6. Route Section Loom towards JDRC 2000 module.
- 7. Connect and route Section Extension Loom (LL07014 or LL07021) to reach JDRC 2000 if required for the routing distance.
- 8. Connect JDRC 2000 Single SC Adapter (LL07019) to the Section Loom (or Section Extension Loom if installed) and to the JDRC 2000 Main Harness.







## Rate Controller 2000 Setup

Press Menu button & select JDRC2000 button



Enter Rate Controller Setup and press Change/New button on the Implement tab



Select New Profile from drop down menu and press Accept button.

Select Profile	
Select the Profile that you would like to load. If "New" is selected the Setup Wizard will begin and a new Profile will be created.	
New Profile	
Accept	
	0.45

Assign an appropriate **Profile Name**. Select **Liquid Fert Tool** from Machine Type drop down menu. Enter effective operating width of implement and press **Next Page** button (right arrow).

Name Profile	
Profile <sup>*</sup> Single 12 Section	
<sup>Machine</sup> * Liquid Fert. Tool ◆	
Width 18.000 m 🗢	
Software Version Number 1.08B	
	(i) Setup Req



#### **Constant Flow**

The LQS Stacker Section Control Module is designed to operate in both Constant Flow and Hard Shut-off mode. When a section valve is switched off in Constant Flow mode, excess flow is diverted back to tank thus maintaining a constant flow through remaining section valves.

In Hard Shut off mode there is no return line to tank from the section valves. When a section valve is switched off, the control system needs to reduce output from the pump module so flow to remaining open sections remains the same. This is only recommended if a dosing system is installed, and the contaminated product cannot be returned to the tank **or if the RC200 profile is setup as a Generic or Air cart multi product system.** 

#### Liquid Systems (SA) recommends CONSTANT FLOW mode for better rate control.





Select appropriate section control mode from Application Mode drop down menu.

Liquid Constant Flow for Constant Flow Mode or

Setup Application Type	
Product 1 Liquid	
* Liquid Constant Flow	
Application Mode-Liquid Constant Flow	
Single boom liquid application using three-way boom valves that divert flow back to tank in the OFF position.	
	Setup Reg

Liquid for Hard Shutoff mode. Press Next Page button (right arrow).

Setup Application Type	
Product 1 Liquid Application Mode	
* Liquid	
Application Mode-Liquid	
Conventional liquid application. Application rate is entered and documented as Gallons/Acre (Liters/Hectare).	
	Setup Req

Enter Number of Sections. Select **3-Wire** for Section Valve Type. Tick Equal Width Sections. Press **Next Page** button (right arrow). If required, press **Previous Page** button (left arrow) to go back and re-enter data.



Enter the Width of Sections. (widths will be pre-filled if Equal Width Sections was ticked in previous screen)



			S	Setu	ıp S	Sec	tior	າຣ				
k 18.000(m) →												
<mark>2</mark> 1	<b>2</b> 2	23	2 4	2 5	2	2	2	2 9	2 10	2 11	2 12	
	Liquic Sectio	1		Dry Section	1		Wired Signal			Switch		
	VALUE		[]		]							Setup Req

Review section set up data and press **Next Page** button (right arrow).

Select **Custom** from Pressure Sensor 1 drop down menu. Ignore any warnings at this stage.

Setup Pressure Sensors	
?	
Pressure Sensor 1	
Pressure Sensor 2 None	
	No Display



Set Maximum pressure alarm at **1000 kPa** (or 145 psi).

Setup Pressure Alarms	
Minimum Maximum Alarm? Pressure 1 0 1000 1 Pressure 2 0 0	145 psi
	No Display

If installed, enable Height Switch and press Next Page button.

Setup Aux Functions	
Agitator Valve Installed	
Agitator Duty Cycle	
Flow Return Installed	
Height Switch	
	No Display



Enter following Control Valve settings as a starting point. If rate control is erratic or slow, these settings can be adjusted later. For **SPIKER** module, enter **Valve Response Rate** of **30**.

Setup Control Valve		
Product 1 Liquid	?	
Control Valve Type Fast Close	\$	
Valve Response Rate 50		
Control Deadband		
Control Effort		
		Setup Req

Enter Flowmeter Factory Calibration number as below.

Flowmeter	Pulses/Litre	Pulses/US Gal	Pulses/IMP Gal
Teejet 801	82	310	373
ARAG Orion 2.5-50L/Min	1200	4542	5455
ARAG Orion 1-20L/Min	3000	11355	13638
ARAG Orion 0.5-10L/Min	6000	22710	27277



Enter Tank Capacity, Level and Alarms as required.



Enter Target Application Rates as required.

Product 1 Liquid Rate 1* Rate 2 Rate 3 Preset Rate 40.0 50.0 60.0 Rate Bump 5.0 Rate Predefined (L/ha) 8.0 Rate 2 Rate 3 Rate 1 8.0 Rate 2 Rate 3 Rate 1 8.0 Rate 2 Rate 3 8.0 Rate 3 8.0 Rate 3 8.0 Rat	
Rate 1* Rate 2 Rate 3 Preset Rate Values (L/ha) 50.0 60.0 Rate Bump (L/ha) 5.0 Rate Selection Predefined	
Rate Bump 5.0 Rate Selection	
Rate 3 %	
Smoothing V	
	No Display

Enter Off Target Rate Alarm as required.

Setup Alarms	
Product 1 Liquid Alarm? Off Rate Alarm (% off target rate)	
If Pressure Sensor 1 has a minimum pressure alarm enabled the system will not drop below that pressure to maintain spray pattern	
	No Display

Review Setup summary. Press Accept or Previous Page button (left arrow) to edit.





At this stage of set up, following screen will be displayed. Press Accept.

i	CSS .	
New Im	plement Detected	
	Implement Type: Liquid Fert. Tool Connector Type: Manufacturer: John Deere Model: JRC Name/SN: A000840004200624	
	Offsets are available Widths have been auto-populated	
	Equipment Accept	(î) No Display ОК

IGNORE THIS WARNING. Press Accept to proceed to pressure sensor set up.

۰	JDRC 2000	3132.4 JDRC 2000		
Pressure Detected Sensor-1	Sensor Not	JDRC2000 Test		
The syst pressure check sy	em has been configur sensor but it is not d stem setup before pro	ed for a etected. Please oceeding.		
		Accept		
			Pre	ssure
			Д	OK

Select **Settings** tab from the Setup screen.



#### Select Pressure Sensor Setup.



Select Calibrate Pressure Sensor and press Accept.

Pressure Sen	sor Setup	
Pressure Sensor 1 <mark>Custo</mark> Pressure Sensor 2 <mark>None</mark>		
Calibrate Pressure Senso	r Accept	Pressure

Ensure Master switch is **OFF** (& pump is **NOT** running). Select **Voltage-based Calibration**.



Enter Pressure Sensor Calibration factor 5mV/kPa : 500mV/bar : 34.5mV/psi Press **Accept**.



Press Accept to save settings and return to the Setup screen.





Pressure Sens	sor Setup	
Pressure Sensor 1 <sup>Custor</sup> Pressure Sensor 2 <sup>None</sup>		
Calibrate Pressure Sensor	- Accept	2:38pm



## **Section Valve Tuning**

For correct application of liquid in **Constant Flow** mode, section valves must be tuned while the module is running using the following procedure.

1. Start the pump and press **Test Speed** button on Implement tab of the Setup screen.

JDRC 2000 - Setup	Single Liq Fert Tool	F
Implement Settings Alarms	Rates	<b>JDRC</b> 2000
Profile Single Liq Fert To Name Machine Type Liquid Fert. Tool	ool	C Setup
Change / New Edit	Remove	123 Totals
Application 18.00	)O(m)	
Section Setup Summa	iry	Diagnostics
		10:05am
Height Switch	Test Speed	

2. Press Test Speed.





- Entering a test sp the controller. If a the test speed wi 10 1 2 3 5 6 4 8 9 7 0 ⇒ % Cancel Accept
- 3. Enter a typical operating speed using the virtual keyboard and press Accept.



4.

Press icon to go to the JDRC 2000 Run screen. Select a typical application rate and turn the system on using the virtual toggle switch. Ensure all sections are open.





5. Record indicated pressure on the section control module gauge. Taking a photo on a smartphone is an easy way to do this.



6. Select the Section virtual switch bar to display all section switches



7. Shut off Section 1 and observe any pressure change.

JDRC 2000 - Main Ro	b 🖪 🗖
Section Switch Box	<b>JDRC</b> 2000
Guick Start On On	Totals
5000 (L) 1 2 3 4 5 6	Diagnostics
	1:32pm

- If pressure has increased, rotate the dial on the valve anti-clockwise until pressure drops to the level recorded in step 5.
- If pressure has decreased, rotate the dial clockwise until pressure increases to the level recorded in step 5.



8. Repeat step 7 for remaining valves one at a time. Sections with the same number of outlets will normally end up with the same setting on the dial.



## **RPM Sensor Integration**

1. Select **Settings** tab from the Setup screen.



2. Select Auxiliary Features Setup.



3. Enter **36** for RPM Calibration Pulses/Rev and **250** & **550** for Low & High RPM Alarm limits respectively. Press **Accept** to save settings and to return to Set up screen.



6. To configure the screen to display Pump speed, select **Display Settings**.





7. Select a Data Field to display pump speed.



8. Scroll down the menu and select **Pump Speed** (RPM) option.





9. **Pump Speed** should now be displayed in the data field. Press **Accept** to save settings and return to Set up screen.



10. Press JDRC 2000 button to return to RC2000 Run screen.





11. **Pump Speed** should now be displayed on the RC2000 Run screen.





## System Set Up Verification Tests

Enter Diagnostics screen and select Tests tab.

Start the pump and perform **Nozzle Flow Check** to test control. Use typical speed and application rate to start the test then vary the speed and application rates to ensure the control system is performing correctly across the required range. Turn the master switch (foot switch) off to terminate the test.



If rate control is erratic, go to Control Valve Setup screen and reduce Valve Response Rate

