FlowSense™

FlowSense Operator's Guide
For Gen2 20/20 SeedSense Displays

Precision Planting®

Contents

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System Setup and Operation

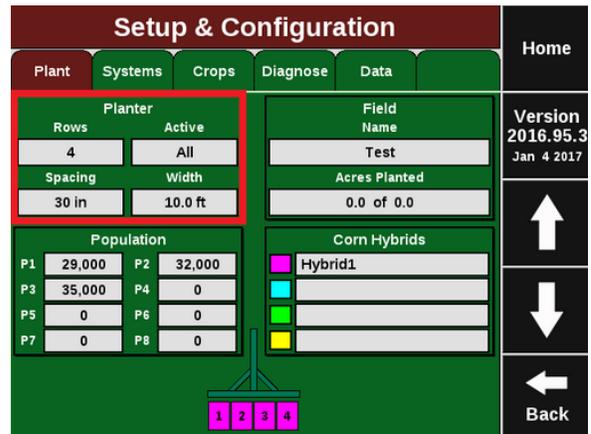There are four requirements for the FlowSense system to function:

1. FlowSense must be configured on the 20|20 monitor

2. There must be a Speed source

3. Seed Data must be present

4. The Master Plant Switch on the Cab Control Module must be in the up position

5. The planter must be lowered

FlowSense can be run as a single product, where only one liquid product type is being monitored, or as a dual product with two liquid product types being monitored simultaneous. For dual product, CAN FlowSense must be installed on the rows.

Configuring Monitor for FlowSense

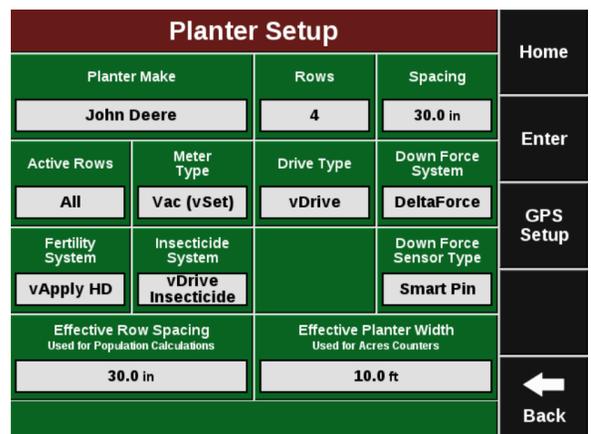**Step 1:**
Set FlowSense as the Fertility System. Navigate to the planter setup page by selecting, "Setup" – "Planter".
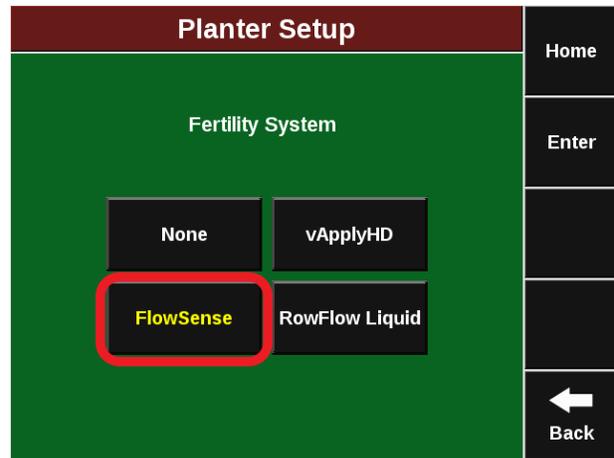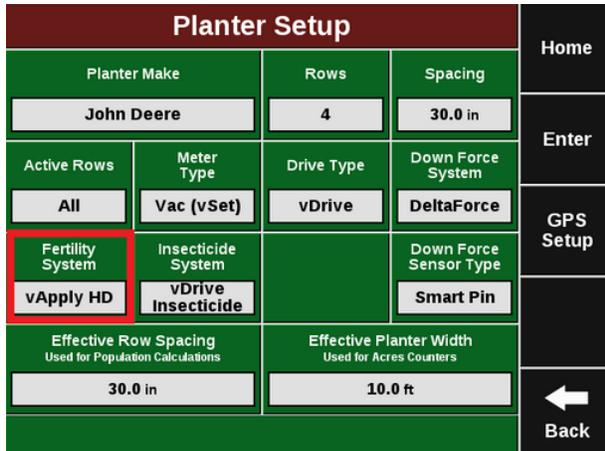

Step 2:
Ensure that "Planter Make", "Rows", "Spacing", "Active Rows", and "Meter Type" are correct.

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Step 3:

Press on the "Fertility System" button and then select "FlowSense".
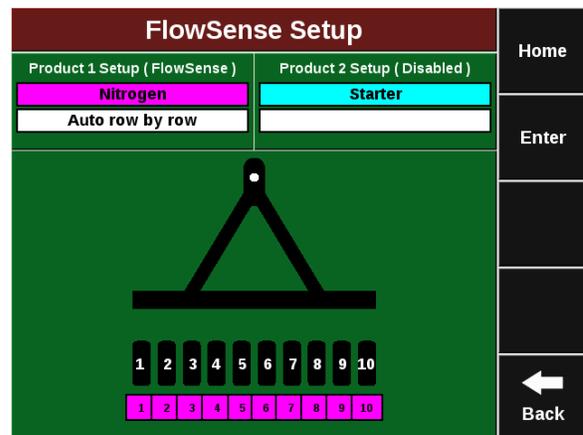
Note: FlowSense will not be displayed on the diagnose page until it has been setup in the systems menu.

FlowSense Setup

Navigate to "Setup" - "Systems" - "FlowSense" For single FlowSense systems, only the first product setup will need to be completed. Press on the Product 1 set up button on the left side to begin the setup process. For dual FlowSense systems both product setups will need to be completed.

Note: Each system will need to be setup individually. The setup screens are the same for both.

It is also possible to have a FlowSense system and vApplyHD system installed on the same planter. The system that is plugged into the Row CAN Expansion Hub with the black CAN jumper harnesses will need to be configured as Product 1, while the system with the brown CAN jumper will be configured as Product 2. Once the setup is complete, the information box towards the top of the screen indicates the rows that have been configured for each product. If a row or product is not configured it will stay gray.

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Begin by selecting "FlowSense" for the Control Style. This will change the screen so that only FlowSense setup buttons are displayed.

Control Style

Change "Control Style" from Disabled to FlowSense to allow the 20/20 to read the FlowSense system.

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FlowSense ID

After selecting control Style, the FlowSense ID selection will appear. Below is an explanation of each option.

First SRM AUX: Select this option if you have a single AUX FlowSense plugged in to an SRM AUX plug.

Second SRM AUX: Select this option if you have two separate AUX FlowSense plugged in to an SRM AUX plug **AND** this product is using the second AUX FlowSense. (Y-Harness plugged into the first AUX Flowsense).

RUM: Use this option if you are using an AUX FlowSense plugged into the AUX plug on a RUM (non SRM planters).

Row CAN Black A: Select this option if you are using a CAN FlowSense with a **Black** CAN Jumper harness **and** have physically plumbed the product from the controlling vApplyHD into the port labeled **"A"** on the CAN FlowSense.

Row CAN Black B: Select this option if you are using a CAN FlowSense with a **Black** CAN Jumper harness **and** have physically plumbed the product from the controlling vApplyHD into the port labeled **"B"** on the CAN FlowSense.

Row CAN Brown A: Select this option if you are using a CAN FlowSense with a **Brown** CAN Jumper harness **and** have physically plumbed the product from the controlling vApplyHD into the port labeled **"A"** on the CAN FlowSense.

Row CAN Brown B: Select this option if you are using a CAN FlowSense with a **Brown** CAN Jumper harness **and** have physically plumbed the product from the controlling vApplyHD into the port labeled **"B"** on the CAN FlowSense.

Row Can Sequential: CAN Sequential allows for vApplyHD FLEX modules to do section control in "side dress" mode.

Product Nickname

Give the product being applied a "Nickname" by selecting the empty box and selecting from the list. If necessary, a Custom name may be entered. The Nickname chosen will be displayed on the homepage, diagnose page, and control pages instead of FlowSense or Product1. The Nickname is used to distinguish the product being applied on the monitor.

Active Rows

Active Rows lets the 2020 know which rows should be actively monitored. When rows are not active, they will remain off and not look for product. Active rows will be displayed on the FlowSense setup page.

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Application Position

Enter the position of the exit point for the liquid in order mapping to be accurate. Select "In Front of Seed Exit" if the liquid will be applied before the seed tube exit. Measure the distance from the front of the seed tube exit to the exit for the liquid product, and enter the distance in inches. Select "Behind Seed Exit" if the liquid will be applied after the seed tube exit. Measure the distance from the distance between the seed tube exit and the exit for the liquid product and enter the distance in inches.

Tank Volume

Tank volume is designed to allow the operator track how many gallons of the active product are available to apply. Tank Volume will be used to calculate the Product Remaining metric that can be added to the home screen as well as used to trigger the low product alarms that can be configured in the "Liquid Alerts" section of the "Crops" menu options. If there are multiple tanks feeding the liquid system, add the tank volumes together.

Placement Hardware

Select the hardware that will be applying the liquid going through the FlowSense sensors. This is for record keeping only and will not affect any settings or controls.

Tank Mix Setup

The Tank Mix is optional information that can be added to help keep track of what mix is being applied to a field (similar to a hybrid/variety). For more information on creating tank mixes see the Tank Mix section in the FlowSense Control.

Row by Row Variation

In order to give correct warnings and alarms, the FlowSense system needs to know the target rate for the liquid being applied. By default "Auto" is set, allowing the system to automatically calculate the target applied rate based on FlowSense feedback.

Instead of auto, a target rate can be manually entered in order for the 20|20 to benchmark individual row FlowSense accuracy. If it is set to manual mode the expected rate must be adjusted in the FlowSense setup in order for the system to give appropriate feedback.

Flow Rate Adjustment

This option provides the ability to implement minor rate adjustments. Our recommendation is to consult your dealer or Precision Planting Product Support prior to making any Flow Rate Adjustments. Additionally, a minimum of three buckets tests should be performed prior to making an adjustment. Proper rate measurements prior to adjustment are critical to ensure accurate control. Enter a percentage to adjust the readings on the current flow rate. Positive numbers increase the reading and negative numbers decrease the reading. For example, if the current flow reading is 10 gpa and a bucket test shows it is actually doing 10.5 gpa (a 5% change), enter 5% into the Flow Rate Adjustment to adjust the readings to show 10.5 gpa.

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Liquid Alerts

Configure the Liquid Alerts in order to correctly give the operator, the warnings and alarms when needed. Navigate to "Setup" - "Crops" - "Liquid Alerts"

Nitrogen Alerts (FlowSense)				Home
Planter	Systems	Crops	Diagnose	Data
Beans (Active)				Enter
Flow Alert	Flow Alarm	Tank Alert	Tank Alarm	
90% - 110%	70%	25%	10%	
Flow Alarm Action	Time to Flow Alert/Alarm	Row by Row Variation	Coverage Minimum Rate	
Jump to Liquid Bar Chart	3 sec	Auto	0.0 gal/acre	
Pressure Alert	Pressure Alarm			
5 psi	20 psi			Back

Flow Alert

Select a flow percentage range. If flow is outside of the selected range, the FlowSense Control button on the home screen will turn yellow. The Flow Alert can be disabled by pressing the green "Enabled" button which will then turn it yellow and "Disabled". Select it again to re-enable the Flow Alert.

Flow Alarm

If the flow drops below the selected percent the FlowSense Control button will turn red on the home screen. The Flow Alarm can be disabled by pressing the green "Enabled" button which will then turn it yellow and "Disabled". Select it again to re-enable the Flow Alert.

Tank Alert

Select a tank level percentage so that if the level of liquid in the tanks falls below the percent, the Tank Volume metric on the home screen will turn yellow. The Tank Alert can be disabled by pressing the green "Enabled" button which will then turn it yellow and "Disabled". Select it again to re-enable the Tank Alert.

Tank Alarm

Select a tank level percentage so that if the level of liquid in the tanks falls below the percent, the Tank Volume metric on the home screen will turn red and sound an alarm. The Tank Alarm can be disabled by pressing the green "Enabled" button which will then turn it yellow and "Disabled". Select it again to re-enable the Tank Alert.

Flow Alarm Action

– Select the action the monitor should take if the Flow Alarm is triggered. Select between Jump to DMC (this is row by row details of flow rates), Jump to Homepage, or None.

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Tank Alarm Action

Select the action the monitor should take if the Tank Alarm is triggered. Select between Jump to DMC (this is row by row details of flow rates), Jump to Homepage, or None.

Time to Flow Alert/Alarm

Enter the amount of time a failure event needs prior to triggering the alert/alarms listed above.

Row by Row Variation

In order to give correct warnings and alarms, the FlowSense system needs to know the target rate for the liquid being applied. By default "Auto" is set, allowing the system to automatically calculate the target applied rate based on FlowSense feedback.
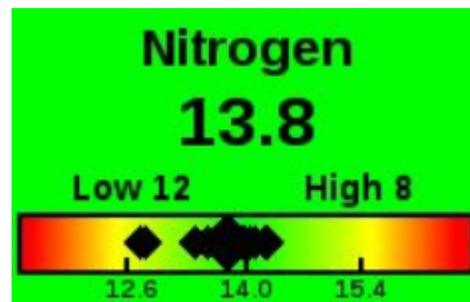
Instead of auto, a target rate can be manually entered in order for the 20|20 to benchmark individual row FlowSense accuracy. If it is set to manual mode the rate must be adjusted in the FlowSense setup in order for the system to give appropriate feedback.

Monitoring FlowSense on the Home Screen

The FlowSense control button (named by the assigned product nickname) displays the status of FlowSense. A green box indicates the system is detected and configured while a grey box indicates that the system is not detected. The control button with show the Row by row Variability setting and the average gallons per acre.
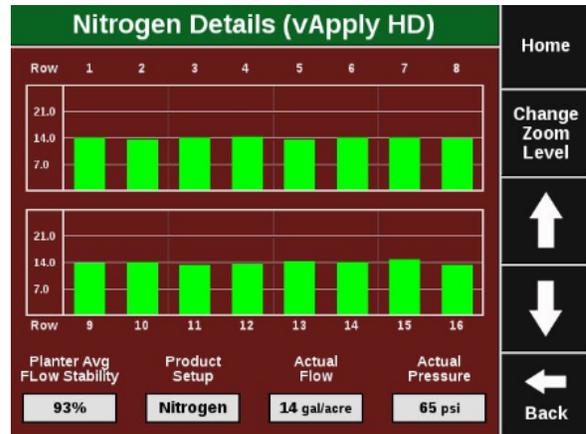

The product dashboard information box on the right hand side of the screen will be labeled with the product nickname selected during the FlowSense setup. The number displayed is the planter wide average rate being applied. The large diamond on the chart represents the planter wide average, while each smaller diamond represents each individual row. Also the high and low rows are listed. Pressing on this button will display the rate being applied on each individual row.

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In the middle of the metric a rainbow chart that displays the planter average as a rectangle and each row as triangles. This chart is designed to give the operator a quick look at where all rows are at compared to the planter average. The low and high values on either end of the chart are determined by the Flow Alarm that is set in the Liquid Alerts.

Pressing on either the large or small liquid metrics will redirect the operator to the level 2 liquid details page. On this page row by row liquid information will be displayed in bar chart form, displaying the current gallons per acre on each row.
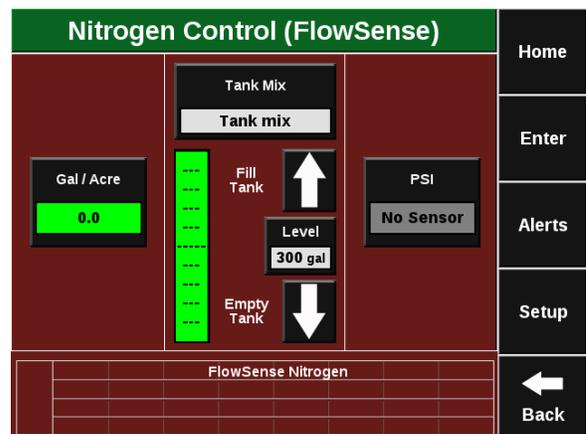
A tank level indicator displaying the number of gallons remaining can be added to the home screen. Pressing on this button will redirect the operator to the FlowSense control page where the tank level can be reset after refilling.
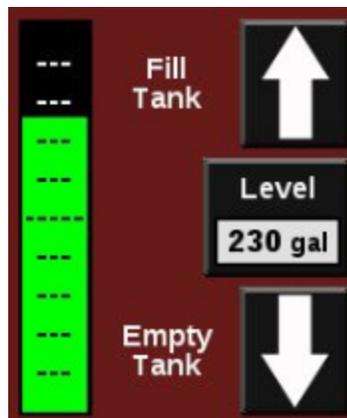
FlowSense Control Button

The average gallons per acre will be displayed on this page as well as a PSI reading if a pressure sensor is plugged in. The tank level and tank mix, are also managed from this page.

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Tank Level

The liquid tank level can be managed from the
FlowSense control page. The chart on the right
indicates the current amount liquid remaining in
the tanks (assuming that the tank level was
initially set correctly). The total volumn of the
tank will be equal to the tank volume set in the
FlowSense setup.

Select "Fill Tank" to tell the system the tanks are full, "Empty Tank" to indicate an empty tank,
or select the volume remaining (indicated by 0.00 gal in the illustration) to manually enter the
number of gallons in the tank.

As liquid is applied the volume of the tank will decrease. A tank level metric can be added to the
home screen so the operator can view the current volume of liquid remaining in the tank. For the
"Tank Level" metic to maintain accuracy, a tank volume must be specified (selecting "Fill Tank"
or manually entering a tank volume) when liquid is added to the tanks.

Note: Alert and Alarm settings for tank level can be configured by going to Setup – Crops –
Liquid Alerts

Tank Mixes

On the right hand side of the screen a separate
tank size measurement can be entered. This is the
size of the tank that the mix is being carried in. It
does not have to be equal to the tank volume size
entered for the planter in the vApplyHD setup.
As the carrier and products are being entered for
the tank mix, the number of gallons for each can
be entered. The system will keep deducting the
remaining volume left for the mix from this new
tank size measurement.

Once the mix has been created it can be given a name and saved by pressing on the Load/Save/
Rename button on the right hand side of the screen. Once tank mixes have been saved, the same
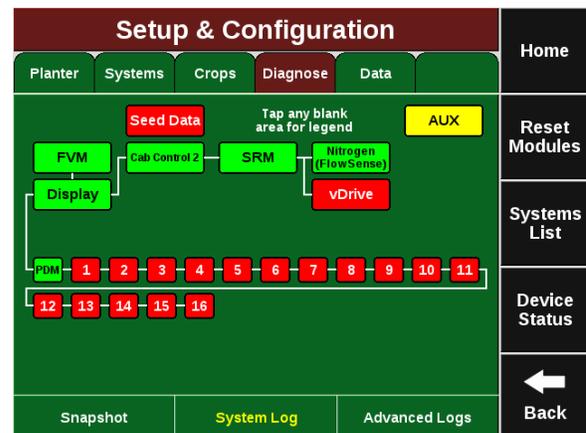button can be pressed to load a previously used tank mix.

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FlowSense Diagnostic Information

Prior to planting, ensure that all planter diagnostic information is ok. Select "Setup" – "Diagnose". Everything should be green on the diagnose page. If there is an issue on a row or rows, it will be indicated on the level 1 diagnose page by displaying the system that is having an issue in a color other than green.
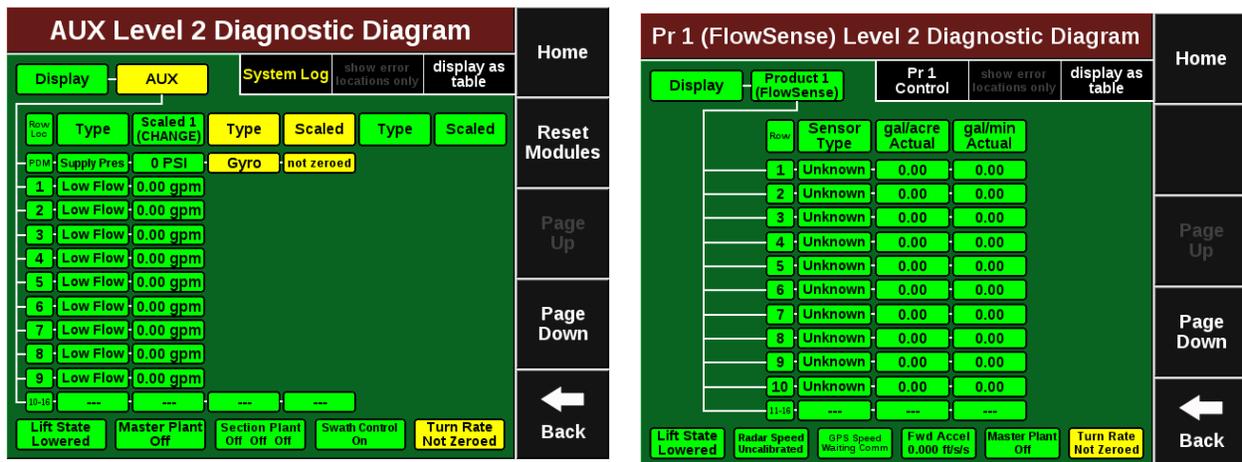
Color Legend

- Green - The system is working correctly and communications are good. Select "Color Legend" to view an explanation of what each color indicates.

- Yellow – a Device or sub-component is not 100%

- Red – Device has failed, or is expected, but not detected.

- White – Device is detected, but is not expected.

- Black – Row has been disabled in the planter configuration

- Gray – Device is being detected, updating firmware, or unreachable.

The FlowSense button (Indicated by the Product Nickname selected during the setup process) will display as green if the system is working correctly and communications are good. If it is not green, press on it to view the FlowSense level 2 row-by-row diagnostics. The level two diagnostic page gives row by row information on the FlowSense sensors.

Note: Modules may be updating during initial connection. Once updates are complete, all modules should be green. If the modules are not green, confirm that the number of rows and planter setup is correct. If still experiencing issues, refer to the Troubleshooting Guide.

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Level 2 diagnose page for FlowSense gives row by row information on the Sensor Type and the Actual Flow measured in gallons per acre and gallons per minute.

Note: FlowSense will not show GPA if there is no speed. Only GPM is available when testing flow readings while stationary.

- Sensor Type – Displays the type of FlowSense sensor (low flow or high flow) installed on each row.
- Actual (gal/ac) – Displays the current rate being applied on each row in gallons per acre.
- Actual (gal/min) - Displays the current rate being applied on each row in gallons per minute.

Indicator Light Status

The "CAN" FlowSense device has three indicator lights. The single light is the CAN communication light. The two indicators near the electrical connector are the turbine indicator lights and the status of them is discussed below. The "Aux" FlowSense housing has a single indicator light on the outside of the device for the turbine indicator. There are three different light colors that can be observed in this light.

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A green light indicates the FlowSense is powered and the sensor is not triggered and not changing. This would indicate that the turbine to measure flow is NOT spinning. This could be due to no flow through the device, or foreign material is preventing the turbine from spinning.

A red or orange light indicates the FlowSense is powered and the sensor is currently triggered, but not changing. This would indicate that the turbine to measure flow is NOT spinning. This could be due to no flow through the device, or foreign material is preventing the turbine from spinning.

A yellow light or light that appears to be flashing rapidly indicates that the FlowSense is powered and the sensor is triggering on and off. This indicates that the FlowSense is measuring flow, therefore if there is flow currently, this is the CORRECT light color and is expected during normal operation.. The faster the light is flashing, the greater the amount of flow being measured.

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