USER GUIDE

VISUM SEEDER RF

J.assy

Visum Seeder RF	User Guide v. 1.0	Product v. 1.0

Disclaimer

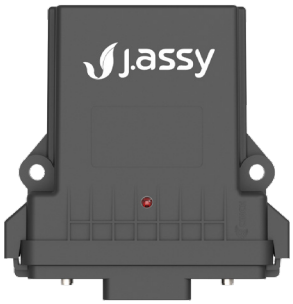
This seed/fertilizer flow sensor is a monitoring tool designed to assist in the efficient management of seed/fertilizer application. While every effort has been made to ensure the accuracy and reliability of this product, it is important to note that no device is completely infallible. Factors such as environmental conditions, interference from other electronic devices, and natural wear and tear may affect the sensor's performance. This product should not be used as a primary safety device. Always follow all applicable safety guidelines and procedures when operating agricultural machinery. The manufacturer is not responsible for any damages, injuries, or losses resulting from the misuse, incorrect installation or unauthorized modifications.

Contents

Technical Specifications

ECU

- Communication via radio frequency at 2.4GHz
- GFSK Modulation
- Omni-directional Antenna, 5dBi, 50 Ohms RP-SMA Connector
- Power voltage: 10Vdc to 30Vdc
- CAN ISOBUS monitoring
- 1 RGB LED
- Resistant to dust and water splash



ECU

Sensor

- Communication Radio Frequency at 2.4GHz
- GFSK Modulation
- Internal Antenna
- Dimensions: 94,1 mm (H) x 61,6 mm (W) x 35,5 mm (D)
- Weight: 130g
- Installed with SS hose clamps
- Diagnostic LED
- 4000 working hours replaceable batteries
- Resistant to dust and water
- Operation Temperature: -10°C (15°F) - 60°C (140°F)
- Storage Temperature: -20°C (-5°F) - 60°C (140°F)

Presentation

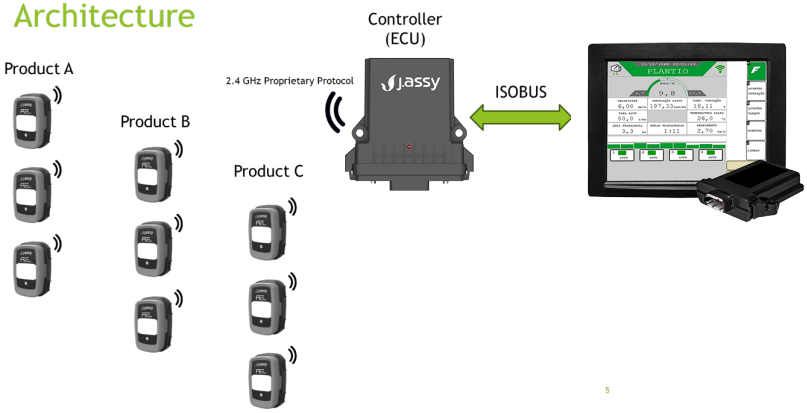
What is the VISUM Seeder RF?

The VISUM Seeder RF is the technology that allows the farmer to remotely monitor the presence or absence of fertilizer and seed flow by providing warnings for both full and partial blockages thanks to its relative flow capabilities. When there is a disruption in the metered flow, a quick response is sent to the user, allowing for a swift reaction and minimizing losses.

What are its advantages?

It is an extremely easy-to-install system due to the externally mounted design and its wireless proprietary technology. The absence of wires is made possible by the long-lasting replaceable batteries that last more than 4000 working hours.

How does it work?



Using a blend of technologies, each Visum Seeder RF sensor transmits its readings via radio to the ECU, which statistically analyzes the flow and identifies anomalies. Through the ISOBUS network, the ECU communicates with the ISO display, providing the operator with a true real time flow monitoring experience.

Components

Sensor

- 1030109 – Visum Seeder RF
- Clamp

ECU

- 1040055 – Kit ECU Seeder V24

Lift Switch

- 1050333 – Inductive Lift Switch Kit 19ft
- 1050474 – Inductive Lift Switch Kit 49ft

Cables

- 1050235 – ISOBUS Cable Kit 16ft
- 1050240 – ISOBUS Cable Kit 36ft
- 1050241 – ISOBUS Cable Kit 55ft
- 1050550 – Y ISOBUS Cable Kit
- 1050520 – Ag Leader Adapter Cable Kit
- 1050521 – Raven Adapter Cable Kit
- 1050522 – Dickey John Adapter Cable Kit

Sensor Installation

This section will describe all the information necessary for the proper installation of the sensors.

Pairing

New sensors come in a state called stock mode. When the sensors are in this state, they are essentially off. To remove them from stock mode, put a magnet close to the lower face of the sensor for 5 seconds. The fading in blue light from the LED indicates that the sensor is exiting stock mode.

On the ISOBUS display, access the Sensor configuration screen in Settings and then select Address Sensor. There are three fields that need to be filled: "ID", "Row" and "Product". The suggested ID value is the current ID value of the ECU. In order for the ECU and the sensors to communicate, they must have the same ID. The field "Row" should be always inserted sequentially, starting at 1; and make sure that no values are skipped; otherwise, the skipped row will always have the alarm "No communication". Finally, the "Product" defines which product that sensor will monitor. Once the fields have been filled, confirm the inserted data and approximate the magnet to the lower face of the sensor. The sensor LED will blink blue twice once the sensor has been successfully paired.

The image below illustrates a sensor assigned to product "A" and row "27"

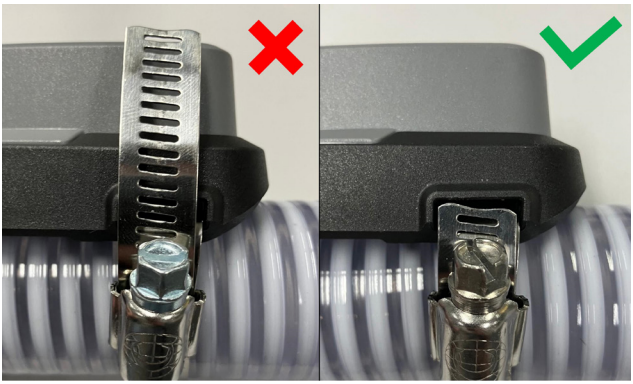
While addressing the sensors, it is recommended to write the product letter and the row number on the white area just like in the picture.

For more information about the sensor, refer to the section Sensor Operation.

Sensor Mounting

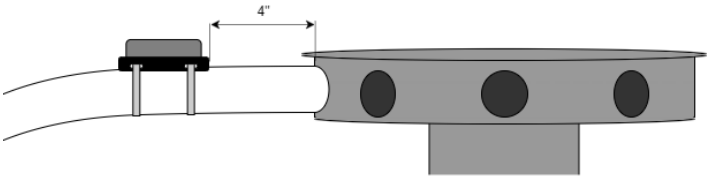
Before taking the sensors to the machine, it is recommended to insert the clamps beforehand. The following picture shows how the clamps should be inserted.

Wrong size clamps must be avoided at all cost. The tab cannot be longer than 1”.



The left picture illustrates an inadequate installation with long tab, while the one on the right shows a tab of adequate length.

It is important to install the sensors according to how they were configured in the ISO display, i.e., each sensor on its assigned manifold.



The distance between the sensors and the manifold should be approximately 4”. In case it is not possible to install at this distance, the distance should be kept as close as possible to 4” and, if possible, all sensors should be at the same distance from the manifold, e.g., all sensors at 4.5”.

The image below shows an installation example where there was not enough space, causing the sensors to be installed at varying distances from the header.

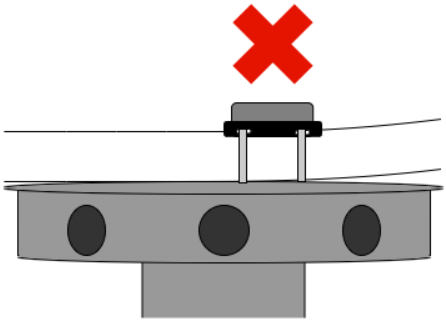
Depending on the situation, there can be exceptions as long as the sensors aren't less than 3" or more than 10" from the manifold.

It is essential to tighten the clamps properly. The sensor should not have any freedom of movement, and the hose should not be constricted. The torque applied must be uniform between the sensors.

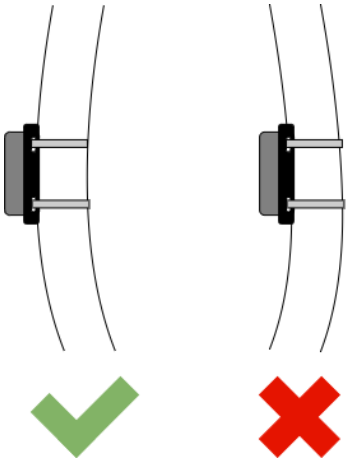
Avoid using impact drivers. Even if excessive tightening does not constrict the hose, it may shorten its lifespan.

Following the instructions above is essential for keeping the normalization factor as close to 1 as possible, improving considerably the accuracy of the system.

It is also important to keep the sensors away from vibration sources. Toolbar frame, chains and manifolds from other airstream cannot be touching the sensor or its brackets. The manifold lid vibrates during operation due the particle flow hitting it from below. Sensors touching the lid will get false readings because of this vibration.



The sensor should always be installed on the outer part of the curve. If the sensor is on the inner part, it will not work properly, because its sensitive region will not be touching the hose.



After finishing the installation, bring the toolbar up and down a couple of times and fold/unfold it to ensure that all sensors are never touching sources of vibration or getting in the inner part of a curve.

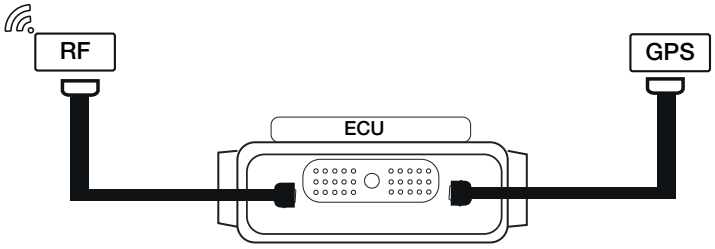
ECU Installation

This section below covers the parts about ECU installation, such as ECU mounting, ISOBUS installation, in addition it also covers all the parts about Antenna Installation.

Such a section shows the user how to set things up for ECU installation, as a matter of fact.

ECU Mounting

Install the ECU magnetic support onto the ECU and select a location where the ECU cable can reach an ISOBUS connection. Ensure the chosen location is close enough to the antennas so that their cables can also reach the ECU. For more details on antenna installation, refer to Antenna Installation and GPS Antenna Installation.



ECU mounting

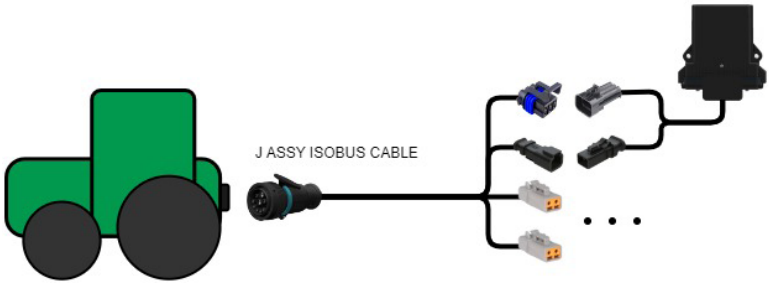
ISOBUS Installation

Properly connecting the ECU to the ISOBUS is essential for real-time monitoring on the ISO display. There are different ways to connect both, and it all depends on the ISOBUS cable.

Before going through the different installation arrangements below, it is important to remember that every ISOBUS network requires exactly two CAN terminators. One is always located in the tractor, and the second should be placed as far away as possible from the IBIC.
If a module already contains a CAN terminator, do not add another to the network.
All J Assy devices that require a CAN connection branch off to another CAN connection, ensuring there is always an additional location available to install the terminator.
If possible, plug all removed dust caps into other exposed connectors for protection.
Upon receiving the message with the sensor ID, the monitor LED will turn green and display the following information on the display:

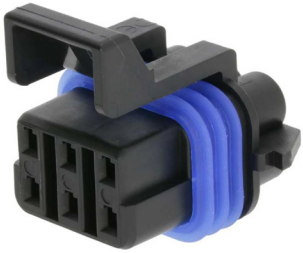
J. Assy ISOBUS Cable

The J. Assy ISOBUS cable is the simplest way to connect the ECU to the ISOBUS: Simply connect the Deutsch 2-pin and the Delphi 6-pin to the ECU harness.

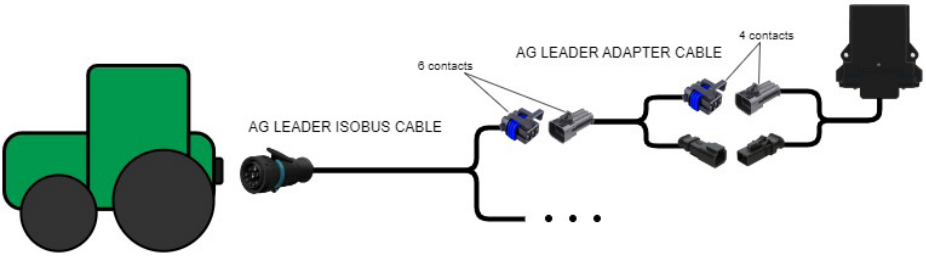


Ag Leader ISOBUS Cable

An Ag Leader ISOBUS cable can be identified by its Delphi 6-way connector that uses all its 6 contacts (usually these connectors only use 4 of the 6 positions).



To connect the ECU to the Ag Leader ISOBUS cable, first attach the Ag Leader adapter cable to the Delphi 6-way connector, then connect the adapter cable to the ECU.

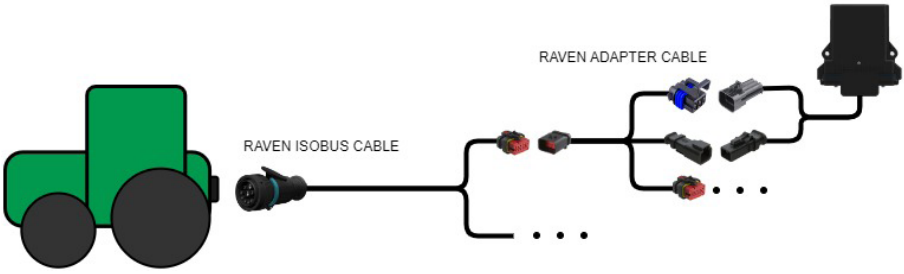


Raven ISOBUS Cable

A Raven ISOBUS cable can be identified by its unique red 12-way connector. Typically, this ISOBUS cable comes with a small adapter cable connected to its red 12-way connector. Be sure to remove it before the installation.

To connect the ECU to the Raven ISOBUS cable, first attach the Raven adapter cable to the red 12-way connector, then connect the adapter cable to the ECU.

If another device was connected to the red 12-way connector from the ISOBUS cable, it can be reconnected to the network by plugging the 12-way connector from the adapter cable into the device.

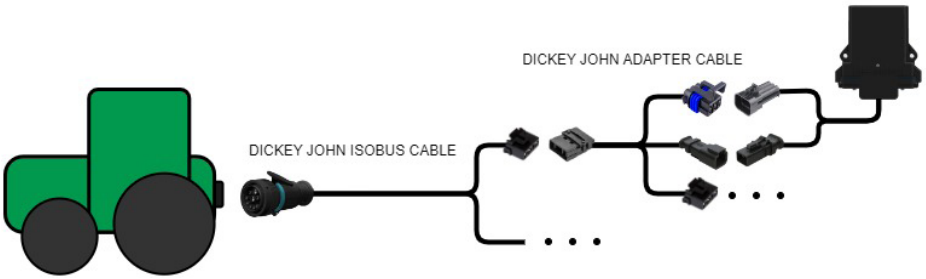


Dickey Jonh ISOBUS Cable

A Dickey John ISOBUS cable can be identified by its 4-way connector.

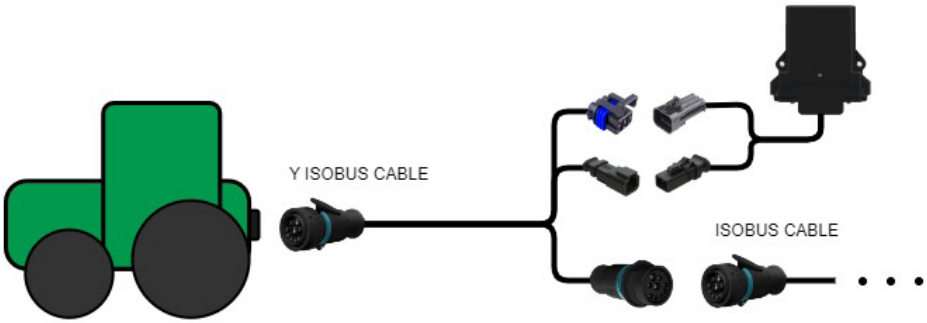
To connect the ECU to the ISOBUS cable, first attach the Raven adapter cable to the 4-way connector, then connect the adapter cable to the ECU.

If another device was connected to the 4-way connector from the ISOBUS cable, it can be reconnected to the network by plugging the 4-way connector from the adapter cable into the device.



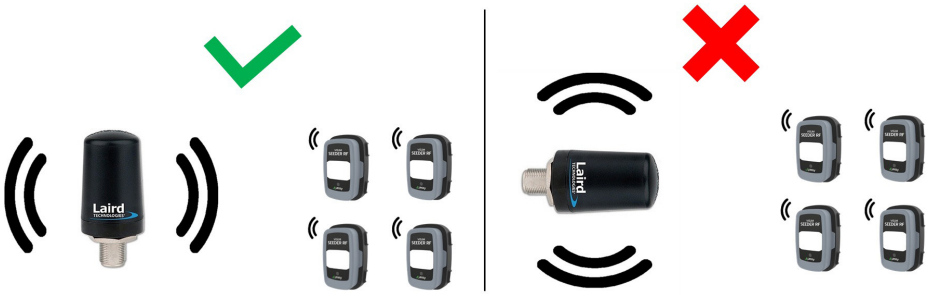
Others

If the ISOBUS cable connector does not match any of the connectors above, attach the Y ISOBUS cable between the tractor and the already installed ISOBUS cable. Then, connect the Deutsch 2-way and the Delphi 6-way connectors to the ECU harness.



Antenna Installation

Mount the antenna onto the magnetic bracket and then find a suitable location to install it where it will have the best line of sight possible to the sensors. It is important not to point the antenna directly at the sensors, as this is the direction where the antenna has the least signal strength. Finally, connect the antenna to the ECU with the coaxial cable.

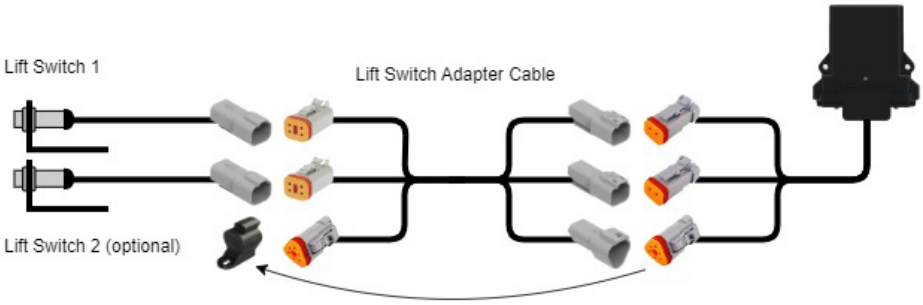


GPS Antenna Installation

This item serves as an alternative for machines already equipped with a GPS system connected to the ISOBUS. To install the GPS antenna, mount it on the toolbar, ensuring it faces the sky, and connect it to the ECU.

Lift Switch Installation

To install the lift switch, find a suitable location where its cable can still reach the ECU. Connect the lift switch to the lift switch adapter cable, and then connect the lift switch adapter cable to the ECU.
Use the Deutsch dust caps that were connected to the ECU cable to protect the exposed connectors from the lift switch adapter cable.
Depending on the type of toolbar, it may be beneficial to install a second lift switch. The picture below exemplifies such an installation.



Display Setup

System Configuration

The screen System can be accessed through Settings. It is crucial to make sure that the inserted ID matches the sensors' ID. In case this machine has section control, i.e., it can cut the flow from certain groups of rows, the option Section Mode must be turned on.

If the ISO display is a Pro 700 whose version is 31 or lower, leave the Save Pool box unchecked. Otherwise, leave it checked for faster initialization.
It is recommended to leave the Mute box unselected for alarms with sound and Pop-up alarm enabled for pop-ups when the virtual terminal is running in the background.

Implement Definition

In Implement, select the total of products the machine has. After that, select Setup and enter the total of Rowl Setup, the total of manifolds and the number of sensors of each manifold for each product.

Speed Source Selection

In Speed Source, select where the system should retrieve the speed value of the machine.

- GPS ISOBUS makes the ECU look for the speed value in the ISOBUS network. For some ISO displays there is a configuration that makes this information available on the network. If this configuration is not enabled, GPS ISOBUS will not work.

- GPS JASSY should be selected only when the GPS antenna that comes with the ECU is connected to it.

- MANUAL SPEED is not recommended, unless the two previous options are both unavailable. It requires the customer to set a value for the speed every time the ECU initiates.

Work Switch Selection

In Work Switch, select the mode used to identify the machine state (operation/lifted).

Lift Switch mode indicates to the system that it should retrieve the machine state from the lift switch connected to the ECU. To verify if the lift switch is well installed, refer to the next section.

Headlands mode is used when there is no lift switch connected directly to the ECU. It estimates the system operation state based on sensors readings.

Manual mode adds a soft-key to the main screens that is used to select the machine state. It has to be manually pressed every time the toolbar is raised or lowered.

Lift Switch Testing

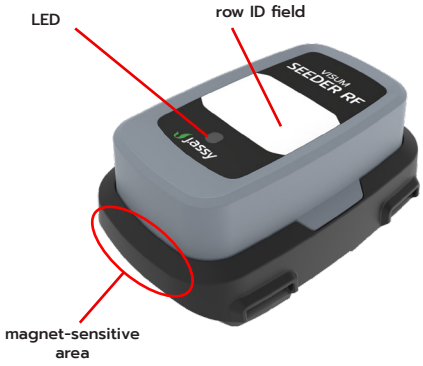
- It is crucial to test the lift switch at the end of the installation. To do this, choose the Work Switch option in Settings and select Lift Switch. On this screen, identify in which port the lift switch has been installed. Make sure that the other port remains deselected.

- Verify if the switch logic is normal or inverted. In case it is inverted, select the option "inverted". Lift and lower the toolbar multiple times to confirm that our ECU is properly identifying the current state of the toolbar by checking the icon on the upper right part of the Home screen.

Sensor Operation

Description

The sensor has three points of interest:



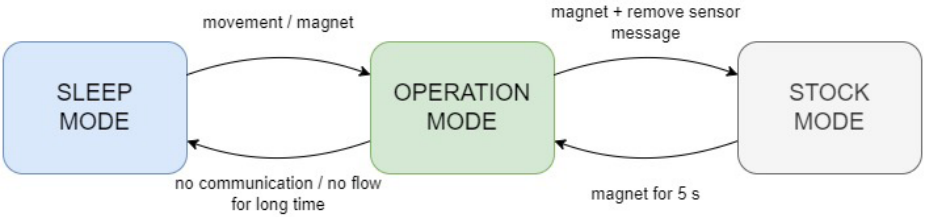
Row ID Field: This is where the product and row of the hose where the sensor is installed should be filled. The row ID has to match the product and the row number configured into the sensor.

LED: The best way to identify the current status of the sensor. It signals state transitions, battery status, message feedback, and is also used by the find me functionality.

Magnet-Sensitive Area: It is one of two ways to interact with the sensor (the other being radio messages from the ECU). Bringing a magnet close to this area causes the sensor to respond based on its current state.

States

The sensor has three states, with transitions outlined by the following chart:



SLEEP MODE: The sensor is in an ultra-low-power consumption mode, waiting for some movement or a magnet to wake it up.

OPERATION MODE: The sensor is active, reading flow and communicating with the ECU. If it does not receive any response from the ECU or detects no flow, it returns to SLEEP MODE to conserve battery. If the ECU sends the command "remove sensor" while a magnet is placed at the magnet-sensitive area, the sensor will enter STOCK MODE.

STOCK MODE: Similar to SLEEP MODE, the sensor is in an ultra-low-power state. However, it cannot return to OPERATION MODE through movement. The only way to change its state is by holding a magnet at the magnet-sensitive area for 5 seconds.

Battery Status

To check the current battery status, hold a magnet at the magnet-sensitive area for a few seconds. The LED will show one of three possible outcomes:

- **Green** twice: The batteries are close to full charge.
- **Yellow** twice: The batteries are about half charge.
- **Red** twice: The batteries are almost empty. It is recommended to replace them as soon as possible.

Sensor Configuration

The sensor's memory contains three editable fields:

- **ID:** An 8 digits field used to establish communication between the sensor and the ECU. If their IDs do not match, they will not communicate.
- **Product:** A simple letter field from A to C used to assign the sensor to a specific product. If assigned incorrectly, the sensor's readings will be compared to the wrong group of sensors during operation, likely triggering false alarms.
- **Row:** Assigns the sensor to a specific row. If more than one sensor is assigned to the same row for the same product, an alarm will be triggered.

These fields can be **read** by accessing Sensor configuration in Settings, then selecting Read Sensor.

To edit these values, on Sensor configuration select Address Sensor.

Finally, the sensor can be placed in **STOCK MODE** by selecting Deactivate Sensor and following the on-screen instructions.

LED

The following table describes the meaning of all LEDs patterns.

Event Description	LED Pattern
Battery insertion	Red, blue and green x2
Movement in SLEEP MODE	Green x5
Magnet in SLEEP or OPERATION MODE	Battery state
Keeping the magnet after the battery state feedback	Oscillating white
Magnet in STOCK MODE	Fading in blue
Receiving “remove sensor” message	Fading out blue
Receiving another message	Blue x3
Entering SLEEP MODE for not communicating with the ECU	Red x4
Entering SLEEP MODE for detecting no flow	Red x5

Display Operation

Relative Flow

Instead of simply indicating the existence of flow coming through the hose, a relative flow system shows how much more (or less) flow a hose has compared to the other hoses. It achieves this by comparing the measured flow (an arbitrary value proportional to the actual flow) to the average flow of all hoses in a group (typically a manifold).
The Visum Seeder RF System not only provides the relative flow between sensors in the same manifold but it also displays the relative flow between different manifolds, being capable of identifying anomalies in these primary runs.

Normalization

Although the Visum Seeder RF sensors come pre-calibrated from the factory, a subsequent field calibration is required to compensate for installation variations, such as differences in tightening strength, mounting positions, and flow patterns that vary from hose to hose.
This calibration, known as normalization, is initiated by selecting Normalization in Settings.
The procedure consists of the following steps:

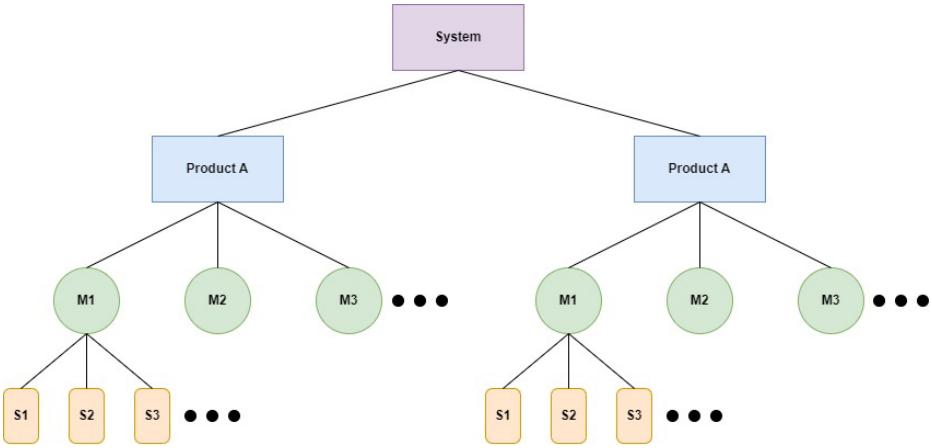
1. Verify if any hoses are obstructed or loose.
2. Ensure there are no leaks.
3. Confirm that the seeder is on flat terrain.
4. Start applying product. The flow rate during this process should preferably be close to or equal to the rate used in normal operation
5. Start the normalization in the Normalization screen.
6. Wait for the process to complete. The product application must not be interrupted until the process finishes.
7. Repeat this calibration if:

- sensors have been moved;
- hoses have been rearranged;
- it is been more than 1 month since last calibration;
- the last normalization was unsuccessful and repairs were made.

If the normalization is successful, the system is fully ready to use. Otherwise, examine each warning individually. For more information on handling specific warnings, refer to Troubleshooting-TS11.

Main Screens

The main screens are all screens that are not accessed through the Settings menu. The system can be divided into four levels. Each of the main screens focuses on one level.



Main

The Main screen provides a summary of the system's state and configuration. It displays the configured products, showing the manifold charts, product rate, and the product flow (for more details, refer to the sub-section Product Rate). The name of each product can be changed in Settings->Products.

Products not in use can be disabled using the toggle button.

Product Details

Instead of showing an overview of multiple products, this screen focuses on detailing a single product. In addition to the product rate, product flow, and manifold charts, it displays a bar chart for each sensor. Additional information can be accessed by selecting the charts.

Manifold Details

By focusing on a single manifold, it is possible to take a closer look at the sensors' bar charts. The average flow value of the selected manifold is also displayed. On this screen, the entire manifold can be enabled or disabled using the toggle button.

Sensor Details

On this screen, further details regarding a specific sensor are available: flow, battery level, and adjust factor. The adjust factor represents the compensation calculated during the normalization process.

Similar to the Manifold Details screen, bar charts from the other sensors are also displayed.

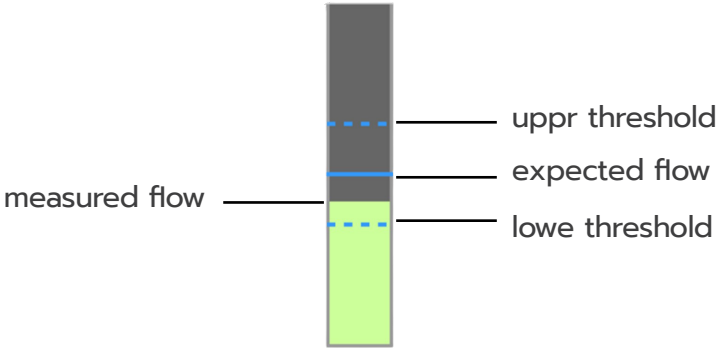
In addition to the toggle button for enabling or disabling this sensor, there is a "lamp" button that, when pressed, activates the find me function. This makes the sensor's LED blink for a couple of minutes, making it easier to locate the sensor at the implement.

The Bar Chart

The bar chart represents final embodiment of the relative flow concept. Based on measurement from all sensors in a manifold, an expected value is calculated for each row, represented by the solid blue line running through the middle of the bar).

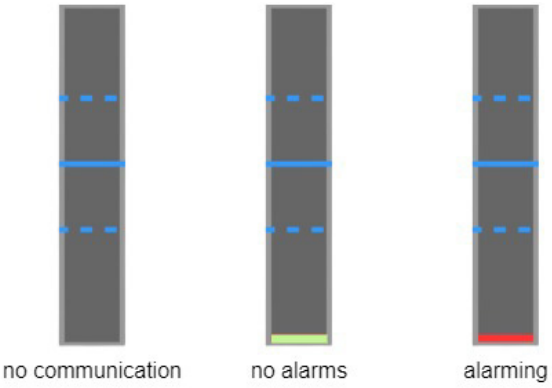
If the sensor measures a value equal to the expected, it indicates that the flow in that row is perfectly aligned with the flow measured in the other rows.

In addition to the expected value, two more values are calculated for each row: an upper and a lower threshold. These thresholds define the acceptable flow range of that row. If the sensor measures a value above the upper threshold or below the lower threshold, the system will trigger a deviating flow alarm.



The current flow is indicated by the filling of the bar, which is green when no alarm is active and red when a row-specific alarm is present.

If the sensor detects no flow in its row, a blockage alarm is triggered. Even without flow, the bar shows some filling as long as the sensor is communicating with the ECU. An empty bar, on the other hand, indicates that the sensor for that row is no longer communicating with the ECU.



Product Rate

The product rate for each product can be selected on the Products screen. Adjusting the product rate changes the sensitivity of all sensors assigned to that product.

Selecting the correct rate is crucial for ensuring the precision of the relative flow measurements. To confirm that the selected rate is adequate, the product flow must be within the following ranges:

Rate	Product Flow Range
Ultra Low	15-150
Low	50-300
Medium	150-400
High	150-400
Ultra High	higher than 150

Troubleshooting

ID	Problem Description	Solution
TS01	Single run with blockage	Verify if there is something blocking flow: close to the knife, at the manifold or in the middle of the hose (sagging). In case there is, clean it.
TS02	Single run reading too low	Verify if there is something blocking flow: close to the knife, at the manifold or in the middle of the hose (sagging). In case there is, clean it. In case there is nothing, verify the sensor installation: look for somethig that may be hitting the sensor or check if the sensor or its clamp is touching a surface that vibrates during operation (example: manifold lid). Secure the sensor from these sources of vibration. In case the position of a sensor has been modified, renormalize.

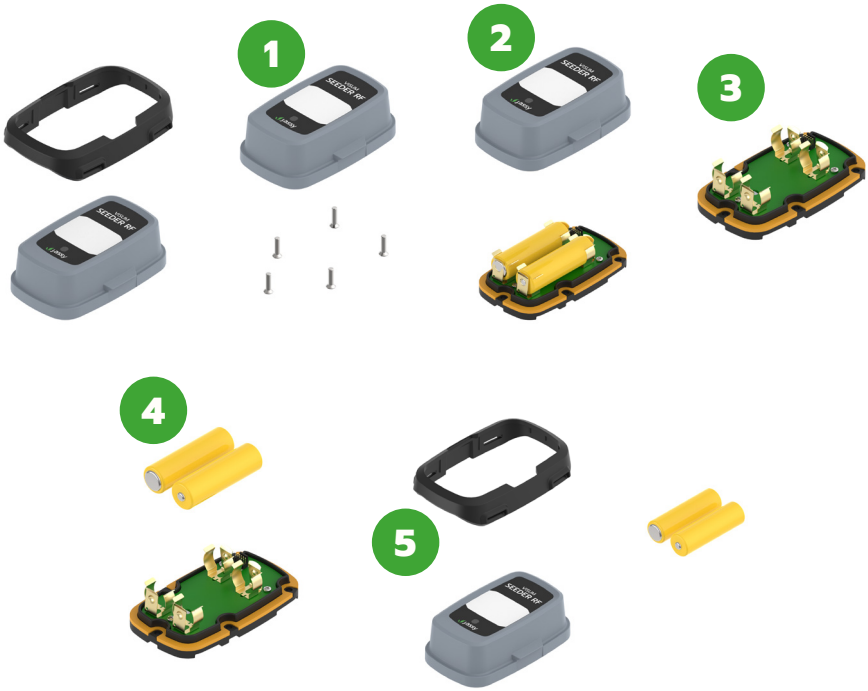
TS03	Single run reading too high	Verify if there is something blocking flow from other runs from the same manifold: close to the knife, at the manifold or in the middle of the hose (sagging). In case there is, clean it. In case there is nothing, verify the sensor installation: look for something that may be hitting the sensor or with the sensor or its clamp is touching a surface that vibrates during operation (example: manifold lid). Secure the sensor from these sources of vibration. In case the position of a sensor has been modified, renormalize.
TS04	Single run without communication	If the sensor is on (the LED lights up when shaken), verify if the ID is correct by inspecting it. To inspect, go to sensor configuration, select Read Sensor and follow the instructions. If the ID is different from the ECU ID, pair the sensor with the ECU ID. If the sensor is in stock mode (the LED does not light up when shaken), put a magnet close to the lower face of the sensor for 5 seconds. The LED will light up and the sensor is ready to be paired. If the sensor LED does not react to the magnet, replace the sensor batteries. The instructions for battery replacement can be found in the section Maintenance. If the sensor still doesn't communicate, replace the sensor. In case the position of a sensor has been modified, renormalize.

TS05	No sensor communicates with the ECU	Verify if the ECU ID is the same as the sensors. If it is not, assign the ECU to the correct ID. Verify if the antenna cable is connected to the ECU. Verify the condition of the antenna cable. If it is damaged, replace it. Verify if the antenna cable is properly connected to the antenna.
TS06	Multiple adjacent runs reading too low/high	Verify if there is something interfering with the flow inside the manifold. In case there is, clean it.
TS07	Multiple non adjacent runs with blockage	In case the product flow is below 150 and the calibration is set to Low, Medium or High, change the calibration to the next lower rate (e.g. if it is Medium, change it to Low).
TS08	Manifold with blockage	Verify if there is flow coming to the manifold
TS09	Manifold reading low	Verify if there is something partially blocking this manifold.
TS10	Manifold reading high	Verify if there is something partially blocking another manifold in the same airstream.

TS11	Normalization warnings	A list of warnings is generated when there are problems during the normalization. This is how to deal with each type of warning: Readings too low: Follow the solution of TS02. If the verification was made and the warning persisted, the normalization can be kept. Readings too high: Follow the solution of TS03. If the verification was made and the warning persisted, the normalization can be kept. No readings: Follow the solution of TS01. Unstable readings: Follow the solution of TS02. No communication: Follow the solution of TS04. Bad communication: Verify the condition of the antenna by following the solution of TS05. Manifold readings too low: Follow the solution of TS09. Manifold readings too high: Follow the solution of TS10.
TS12	GPS signal degraded	Verify the condition of the cable that goes to the GPS antenna.
TS13	More than one sensor assigned to the same row	Look for the sensor that was mistakenly paired and pair it with the correct row number.
TS14	Low battery	Replace the sensor batteries. The instructions for battery replacement can be found in the section Maintenance.
TS15	Incorrect FW version	Ask a local dealer to update the sensor.

Maintenance

Battery Replacement



To replace the batteries, follow the steps below:

1. Remove the screws at the back of the sensor.
2. Take off the gray lid.
3. Remove the discharged batteries.
4. Insert the new batteries, ensuring the correct orientation as indicated on the electronics board.
5. Reattach the screws using a manual screwdriver. Do not overtighten as this can damage the sensor case or the screw.

Do not use alkaline batteries. The recommended batteries for the Visum Seeder RF are the MINAMOTO ER14505.

Storage

At the end of the season, it is recommended to wash the sensors with running water and mild soap. DO NOT use pressure wash. DO NOT use tools to scrape off build-up, as this may damage the sensor.

In case the sensors are removed from the machine, avoid mixing sensors from different machines, and keep them marked with corresponding row number.

Disposal

At the end of the lifetime of the device, please return it to any J.Assy seller partner or implement manufacturer in case of direct sale.

After following the guidelines mentioned in this manual, your VISUM SEEDER RF system will be ready for application

IF YOU HAVE ANY QUESTIONS OR A POTENTIAL EQUIPMENT ISSUE, PLEASE CONTACT YOUR LOCAL SALES REPRESENTATIVE OR RETAILER, OR VISIT:

www.jassy.ag

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