

USER GUIDE

VISUM STRIP TILL



Visum Strip Till

User Guide v. 4

Product v. 1.0

FCC

Please take attention that changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and*
- (2) This device must accept any interference received, including interference that may cause undesired operation.*

ISED

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference.*
- (2) This device must accept any interference received, including interference that may cause undesired operation of the device.*

l'appareil contient des émetteurs/récepteurs exempts de licence qui sont conformes aux CNR exempts de licence d'Innovation, Sciences et Développement économique Canada. L'exploitation est soumise aux deux conditions suivantes:

- (1) l'appareil ne doit pas produire de brouillage,*
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

Disclaimer

This fertilizer flow sensor is a monitoring tool designed to assist in the efficient management of 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.

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Technical Specifications

ECU

Communication via radio frequency at 2.4GHz

GFSK Modulation

Omni-directional Antenna, 5dBi, 50 Ohms

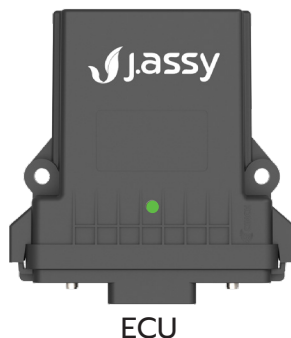
RP-SMA Connector

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

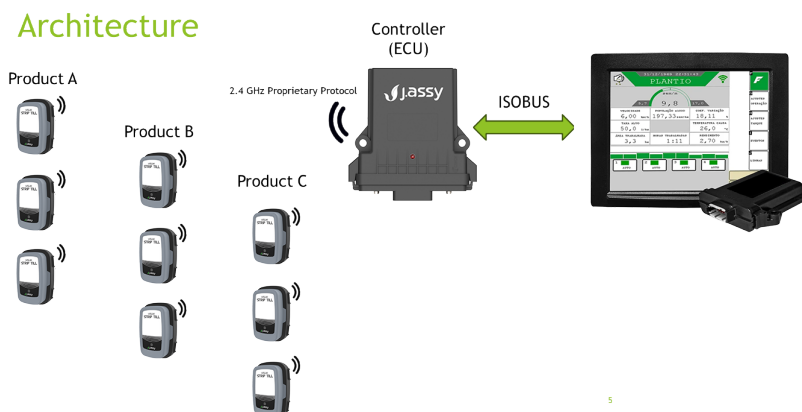
What is the VISUM Strip Till?

The VISUM Strip Till is the technology that allows the farmer to remotely monitor the presence or absence of fertilizer flow by providing precise warnings for blockages thanks to its accurate flow readings. 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 Strip Till 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

30000001236 - Visum Strip Till



Clamp

30000001411 — Evereon Hose Clamp Kit (12 PC)
For 1" To 1-1/2" Hoses

30000001421 — Evereon Hose Clamp Kit (12 PC)
For 1-3/4" Hoses

30000001413 — Evereon Hose Clamp Kit (12 PC)
For 2" Hoses

30000001414 — Evereon Hose Clamp Kit (6 PC)
For 2-1/2" Hoses

30000001424 — Evereon Hose Clamp Kit (6 PC)
For 3" Hoses



ECU

30000000056 – Seeder ECU Kit V24



Lift Switch

30000000429 – Inductive Lift Switch Kit 19ft

30000000359 – Inductive Lift Switch Kit 49ft



Cables

30000000516 – ISOBUS Harness Kit 16ft

30000000521 – ISOBUS Harness Kit 36ft

30000000522 – ISOBUS Harness Kit 55ft

30000000244 – ISOBUS Y-Cable Kit

30000000280 – Ag Leader Adapter Cable Kit

30000000281 – 12-Pin Raven Adapter Cable Kit
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30000001220 – 19-Pin Raven Adapter Cable Kit
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30000000282 – 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 two fields that need to be filled: "ID" and "Row". 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”. 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 row “13”.



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

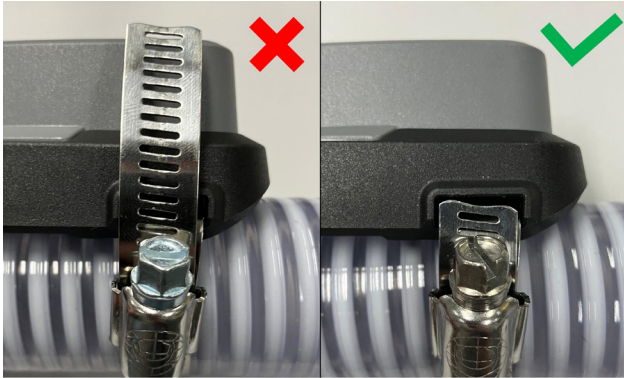
For more information about the sensor, refer to the section Sensor Operation.

Sensor Mounting

Before taking the sensors to the machine, it is recommended to insert the clamps beforehand. For an easy and reliable installation, use hose clamps supplied by J.Assy. The following picture shows how the clamps should be inserted. 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 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.

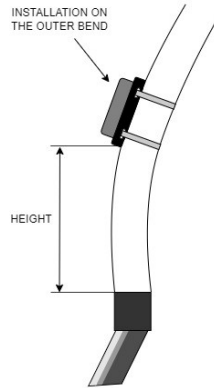
Avoid using impact drivers. Even if excessive tightening does not constrict the hose, it may shorten its lifespan.



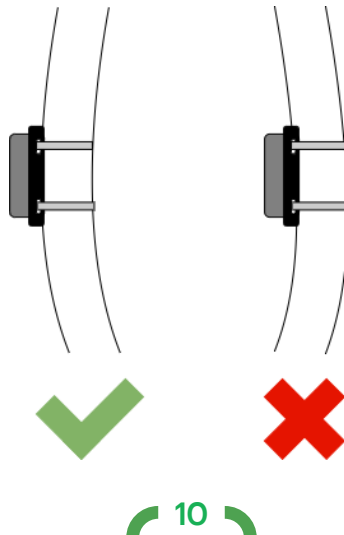
Following the instructions above is essential for keeping the calibration factor (refer to Calibration for more details)

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 and chains cannot be touching the sensor or its brackets.



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. It is recommended to install the sensors in a similar position for all runs. Keeping them on the outer bend with a similar bend radius between runs and at a consistent height will improve their performance and accuracy.



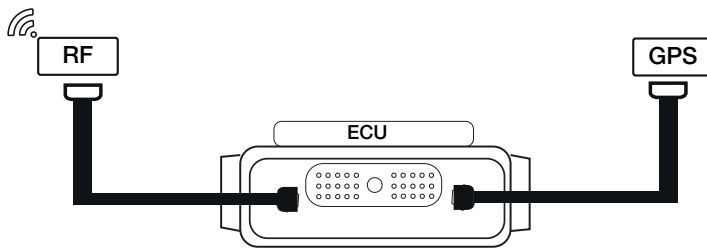
After finishing the installation, bring the toolbar up and down a couple of times and fold/unfold it to ensure that all sensors are never touching sources of vibration or getting in the inner part of a curve.

ECU Installation

The section below covers ECU installation, including ECU mounting, ISOBUS installation, and antenna installation. It provides users with detailed instructions on how to set up the ECU properly.

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.

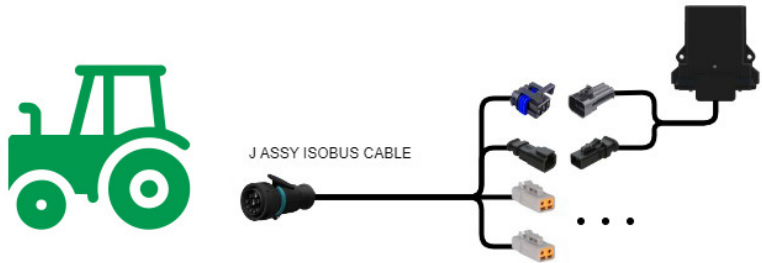
If a module already contains a CAN terminator, do not add another to the network.

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.

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.

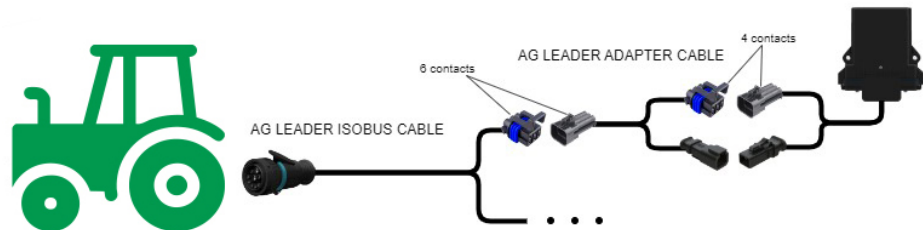


Ag Leader ISOBUS Cable

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.



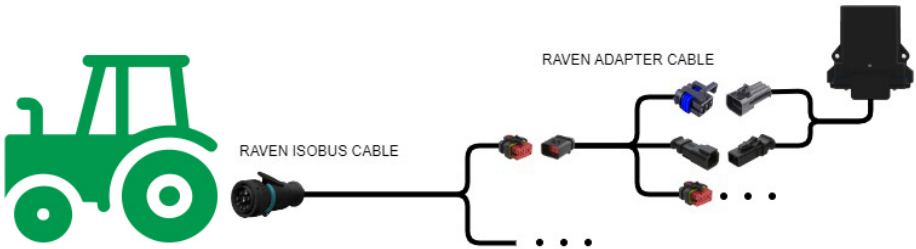
Raven ISOBUS Cable

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.



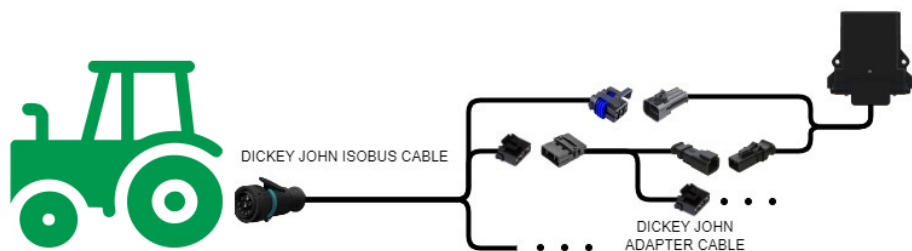
Dickey John ISOBUS Cable

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



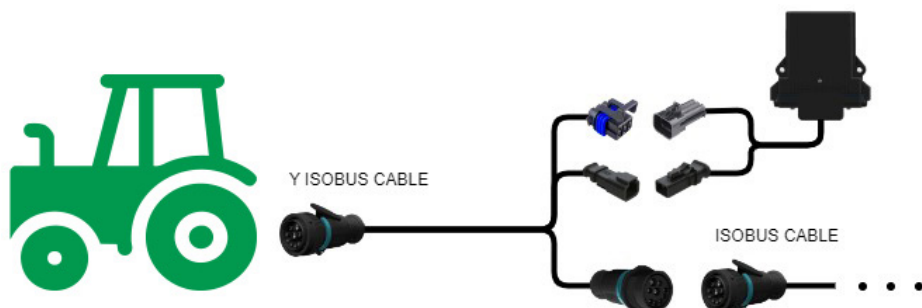
To connect the ECU to the ISOBUS cable, first attach the Raven adapter cable to the 4-way connector, then connect the adapter cable to the ECU.

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 none of the adapters mentioned above are compatible with the machine, please contact your vendor regarding the availability of other adapter cables. If no other options are available, attach the ISOBUS Y-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

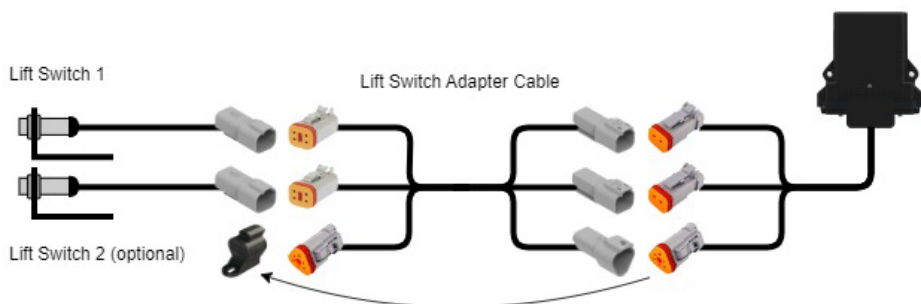
This item serves as an alternative for machines already equipped with a GPS system connected to the ISOBUS. To install the GPS antenna, mount it on the toolbar, ensuring it faces the sky, and connect it to the ECU.

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 Row Setup and enter the total of rows, the total of sections and the number of sensors of each section. If the machine works as a single section, set total of sections to 1.

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 J.Assy should be selected only when the GPS antenna that comes with the ECU is connected to it.
- MANUAL SPEED is used when the previous two options are unavailable. In this mode, the speed value needs to be inserted manually.

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.

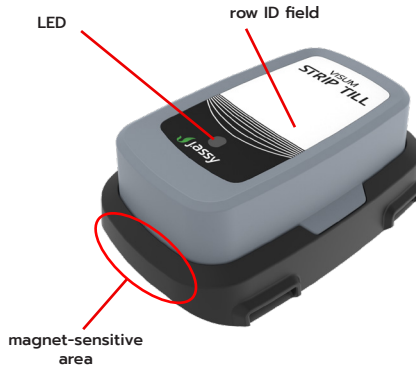
Lift Switch Testing

- 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:



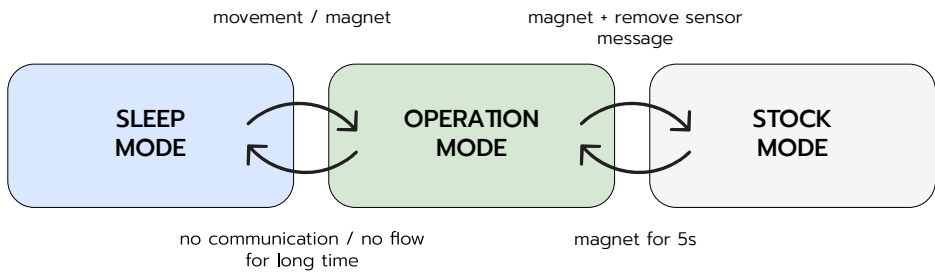
Row ID Field: This is where the product and row of the hose where the sensor is installed should be filled. The row ID has to match the product and the row number configured into the sensor.

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 Between Sections

The Visum Strip Till System has the capability to measure relative flow between different sections, allowing it to detect anomalies in primary runs. By analyzing measurements from all sensors within a section, the system calculates the total flow and compares it to the flow of other sections. Anomalies are identified based on flow differences.

Calibration

Although the Visum Strip Till 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 is initiated by selecting Calibration in Settings.

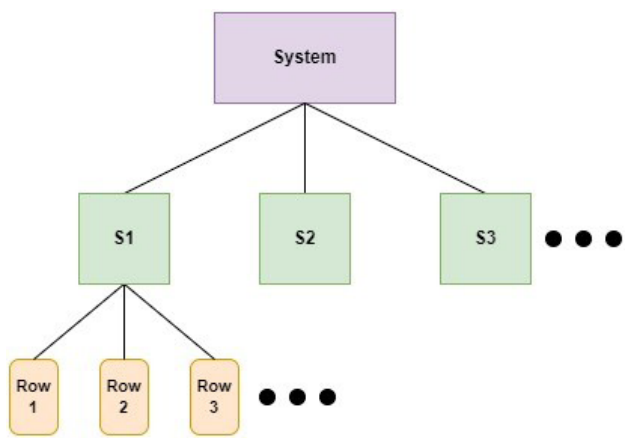
The procedure consists of the following steps:

1. Verify if any hoses are obstructed or loose.
2. Ensure there are no leaks.
3. Confirm that the strip till applicator 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 calibration in the Calibration 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 calibration was unsuccessful and repairs were made.

If the calibration 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 section charts, sensitivity, and the product flow (for more details, refer to the sub-section Sensitivity) and a bar chart for each sensor. Additional information can be accessed by selecting the charts.

Section Details

By selecting a section chart, it is possible to take a closer look at that section’s sensor bar charts. The average flow value of the selected section is also displayed. On this screen, the entire section can be enabled or disabled using the toggle button.

Sensor Details

By selecting a sensor chart, further details regarding that specific sensor are available: flow, battery level, and adjust factor. The adjust factor represents the compensation calculated during the calibration process.

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

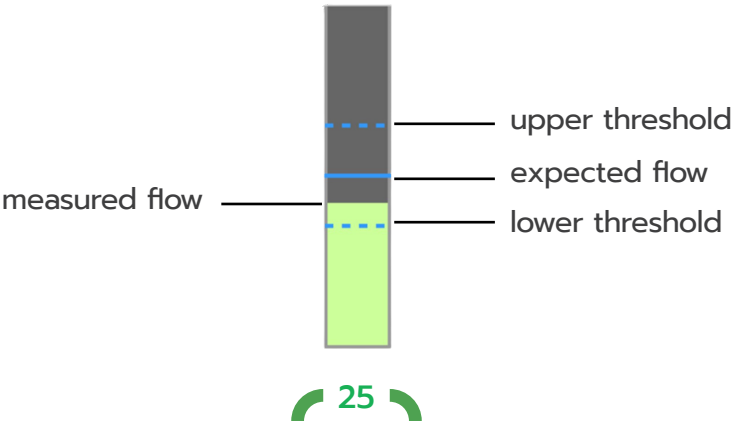
In addition to the toggle button for enabling or disabling this sensor, there is a “lamp” button that, when pressed, activates the find me function. This makes the sensor’s LED blink for a couple of minutes, making it easier to locate the sensor at the implement.

The Bar Chart

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).

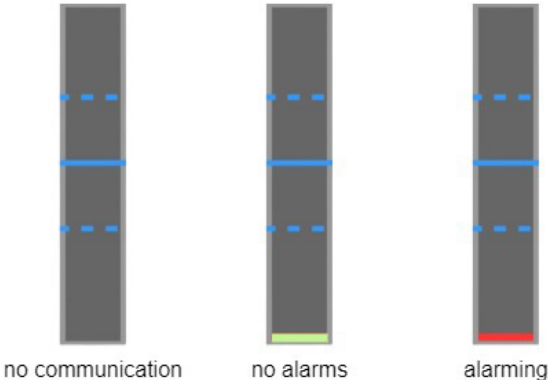
If the sensor measures a value equal to the expected, it indicates that the flow in that row is perfectly aligned with the flow measured in the other rows.

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.



Sensitivity

The sensitivity for each product can be selected on the Sensitivity screen. Selecting the correct setting is crucial for ensuring the precision of the relative flow measurements. To confirm that the selected sensitivity is adequate, the product flow must be within the following ranges:

Sensitivity	Product Flow Range
High	150–400
Medium	150–400
Low	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 something 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, recalibrate
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 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, recalibrate

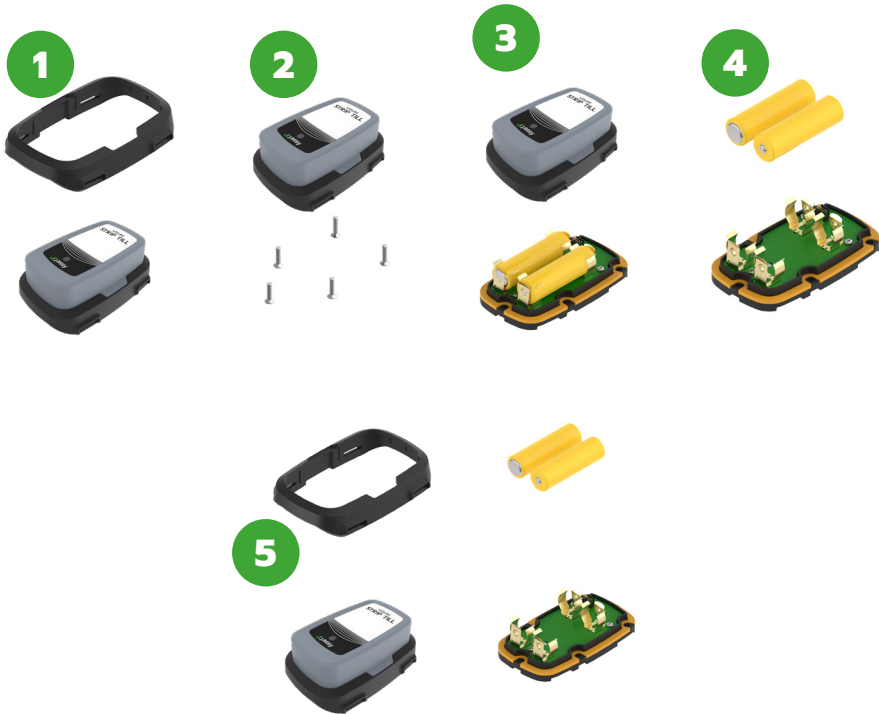
TS04	Single run without communication	If the sensor is on (the LED lights up when shaken), verify if the ID is correct by inspecting it. To inspect, go to sensor configuration, select Read Sensor and follow the instructions. If the ID is different from the ECU ID, pair the sensor with the ECU ID. If 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, recalibrate
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 the adequate range (refer to table in Sensitivity) and the sensitivity is set to any level besides Ultra High, change the sensitivity to the next higher level (e.g. if it is at Medium, change it to High).

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	Calibration warnings	A list of warnings is generated when there are problems during the calibration. 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 calibration can be kept. Readings too high: Follow the solution of TS03. If the verification was made and the warning persisted, the calibration 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

Before starting the procedure, make sure the sensors are in stock mode.



To replace the batteries, follow the steps below:

- 1** Remove the screws (Torx T10) 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** Reinstall the screws and tighten them to 8 in-lbf (0.9 N·m). 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

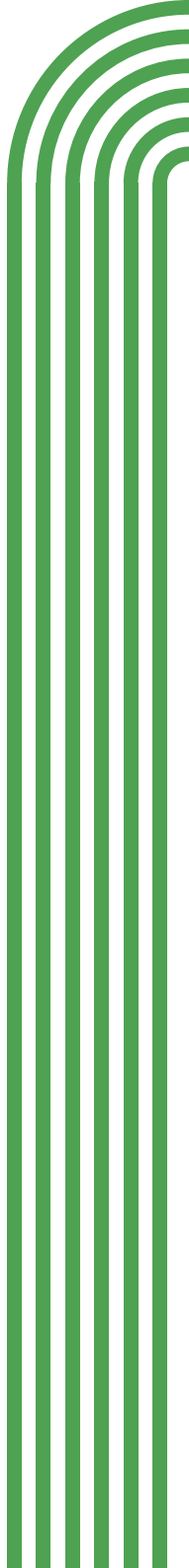
At the end of the lifetime of the device, please return it to any J.Assy seller partner or implement manufacturer in case of direct sale.

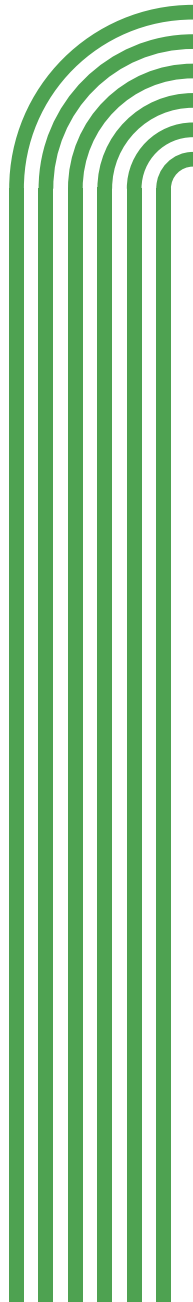
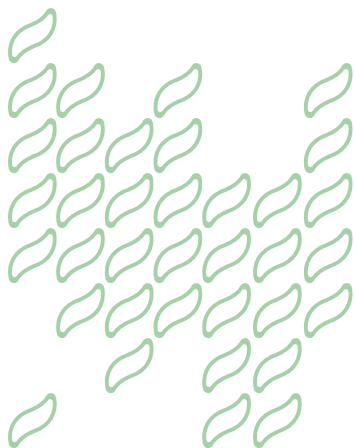
After following the guidelines mentioned in this manual,
your VISUM STRIP TILL system will be ready for application

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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