



KC Flowmetering Ltd

ISO-Slurry System Manual

System Manual

An installation and user guide for the Solsteer
ISO Slurry System.



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Solsteer Ltd
Link Farm
Pulborough
RH20 2EL
West Sussex

Web <http://www.solsteer.com>
E-mail info@solsteer.com

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Information and technical data detailed in this manual represent the latest version at the time of publication. Revisions to this document may be made without prior notice. This document is revision 4.0.

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1. Important User Information

1.1 The Solsteer ISO-Slurry System

The Solsteer ISO Slurry System has been designed to provide the operator with data associated with slurry application during operation, via an ISOBUS display. Data includes current application rate, average application rate, total amount of slurry applied and total hectares covered. The ISO Slurry System also informs the user of the correct forward speed to travel at, in order to achieve a desired application rate.

The Solsteer ISO Slurry System will also upload information and data to the task controller such as the implement width, offsets and data associated with work totals.

1.2 The Installation and User Manual

This installation and user manual must be read and fully understood prior to using the ISO Slurry System. This installation and user manual provides information regarding the correct use of the ISO Slurry System. It is required that all safety instructions are read carefully, prior to using the ISO Slurry System. It is advised that this manual always remains with the operator of the machine and is easily accessible.

This installation and user manual does not replace the user manuals of other manufacturers of tractors, agricultural equipment, and devices. These manuals must be carefully read and understood including all safety instructions prior to reading this manual.

Information regarding regulations for the prevention of accidents and protection of the environment must also be followed when conducting any work with the use of the ISO Slurry System.

1.3 Intended Use

The ISO Slurry System should only be used for applications of agricultural machines. The use of the ISO Slurry System for other applications, making unauthorised changes, adding, or removing parts or any configurations to the software or hardware will be considered contrary to the intended use of the ISO Slurry System.

The manufacturer is not liable for any damages or negative externalities resulting from these activities and therefore the risk lies solely with the user. The manufacturer disclaims any liability for damage or injury resulting from the failure to follow all instructions, cautions and warnings detailed in this manual.

It is required that the ISO Slurry System is only used by authorised individuals who have been introduced to the functions of the product.

The product may only be used in conjunction with the information provided in this manual. The use of the ISO Slurry System beyond what is stated in this manual may lead to personal injury, as well as machine damage.

Any safety and warning iconography used in this manual must be closely observed to ensure safe use of the ISO Slurry System. It is important that the operator must contact SolSteer Ltd prior to use of the ISO Slurry System, if any information provided in this manual is not fully understood by the operator.

1.4 Technical Support

SolSteer will assist with any technical support or information that is required. Support is available via telephone, email and the internet from during business hours, Monday to Friday. Please contact SolSteer using the following contact information:

Address: SolSteer Limited, Link Farm, Pulborough, West Sussex, RH20 2EL, UK

Mobile: +(44) 7510300835

Website: www.solsteer.com

Email: chaunce@solsteer.com will.hook@solsteer.com

1.5 Copyright

This document must be treated as confidential and its intended use is for the operator alone. Breaching this may result in legal action.

2. Safety

This manual contains basic safety information that must be followed during installation and operation. If safety instructions are not followed, you risk injury to yourself and others as well as risk of damage to the product, property and the surrounding environment.

2.1 Symbols

The following symbols are used throughout this document to notify of safety instructions that must be carefully followed to avoid accidents, personal injuries and damage to property.



WARNING!

A danger which may result in death or serious injury if instructions are not followed.



CAUTION!

A danger which may result in injury if instructions are not followed.



ELECTRICAL HAZARD!

An electrical hazard which may result in injury if instructions are not followed.



FIRE HAZARD!

An fire hazard which may result in injury if instructions are not followed.



INFO

Useful information and recommendations to ensure optimal product performance.

2.2 Important Safety Warnings



During installation of the flow meter, heavy items connected to the vehicle can fall causing serious injury. To prevent this risk ensure that the vehicle is close to the ground, prior to removing attachments.



When installing cabling on the roof, or high up the vehicle, always use a step ladder. Where a step ladder can't be used to reach the required position, cautiously use steps and handrails.



Some components of the system may be under significant pressure. To avoid injury from pressurized parts all hydraulic pressure in any lines and fittings must be fully relieved before they are removed. To avoid being sprayed by fluid, hold a protective cloth over any caps, breathers and connections upon removal. Never use bare hands alone to check for leaks.

2.3 Important Safety Cautions



Carefully inspect wiring of equipment before each use. No exposed wiring should be visible. Any damaged or frayed wiring, lack of insulation on wiring and any damaged plugs or connectors should be taken out of service immediately and reported and returned to SolSteer Ltd



Know the location of isolator switches and how to operate them prior to use of the vehicle.



When handling electrical equipment that is plugged in, dry non-conductive protective gloves and insulated protective footwear are recommended



If the product directly interacts with water or other chemical liquids, the equipment must be shut off at the main power and disconnected immediately



If an individual comes into direct contact with a live electric source do not make contact with the individual, equipment, wiring or other connected devices. Disconnect the power source immediately by switching off the main power or disconnecting the main plug.



Immediately disconnect the power source when a component exhibits abnormal heat generation

2.4 User Responsibility

The Solsteer ISO Slurry System is to be used solely for commercial applications and therefore the user is subject to statutory requirements for safety at work. The user must follow all safety instructions, the instructions for the prevention of accidents and the regulations for environmental protection.

The user must familiarize himself with all health and safety requirements and if necessary carry out a risk assessment for the environment in which the product is used. The user must ensure that any other persons installing the Solsteer ISO Slurry System has read and understands this installation manual prior to use.

Any other persons who install the Solsteer ISO Slurry System must also be familiarized with the functions of the product and of the potential risks associated with the product if the safety instructions are not followed.

2.5 Specialist Staff

Specialist staff are those who are permitted to carry out assigned tasks and are able to identify potential risks associated with installation of the Solsteer ISO Slurry System. They are specialized individuals with the capable knowledge and experience of applicable regulations associated with the vehicle. They are the only personnel permitted to carry out repairs. These individuals include but are not limited to the following:

- SolSteer staff and technicians
- SolSteer dealers
- Individually SolSteer trained personnel

2.6 Personal Protective Equipment (PPE)

It is important during the installation of the Solsteer ISO Slurry System that PPE is worn. Not wearing this equipment increases the risk of injury or serious health problems. The following are recommended while installing the Solsteer ISO Slurry System:

- Wear non-conductive, protective gloves
- Wear insulated protective footwear
- Wear protective clothing
- Never wear rings, chains or jewellery
- Long hair must be tied up, or covered

3. System Components

The following components are part of the Solsteer ISO-Slurry Kit:

ISO-Slurry Harness (S/026)



Solsteer TTC Controller (ECU/002)



3. System Components

If a Fendt tractor is used, then the following part number will also be included:

ISO Slurry Fendt Extension (S/028)



The following components are not included as part of the Solsteer ISO-Slurry Kit:

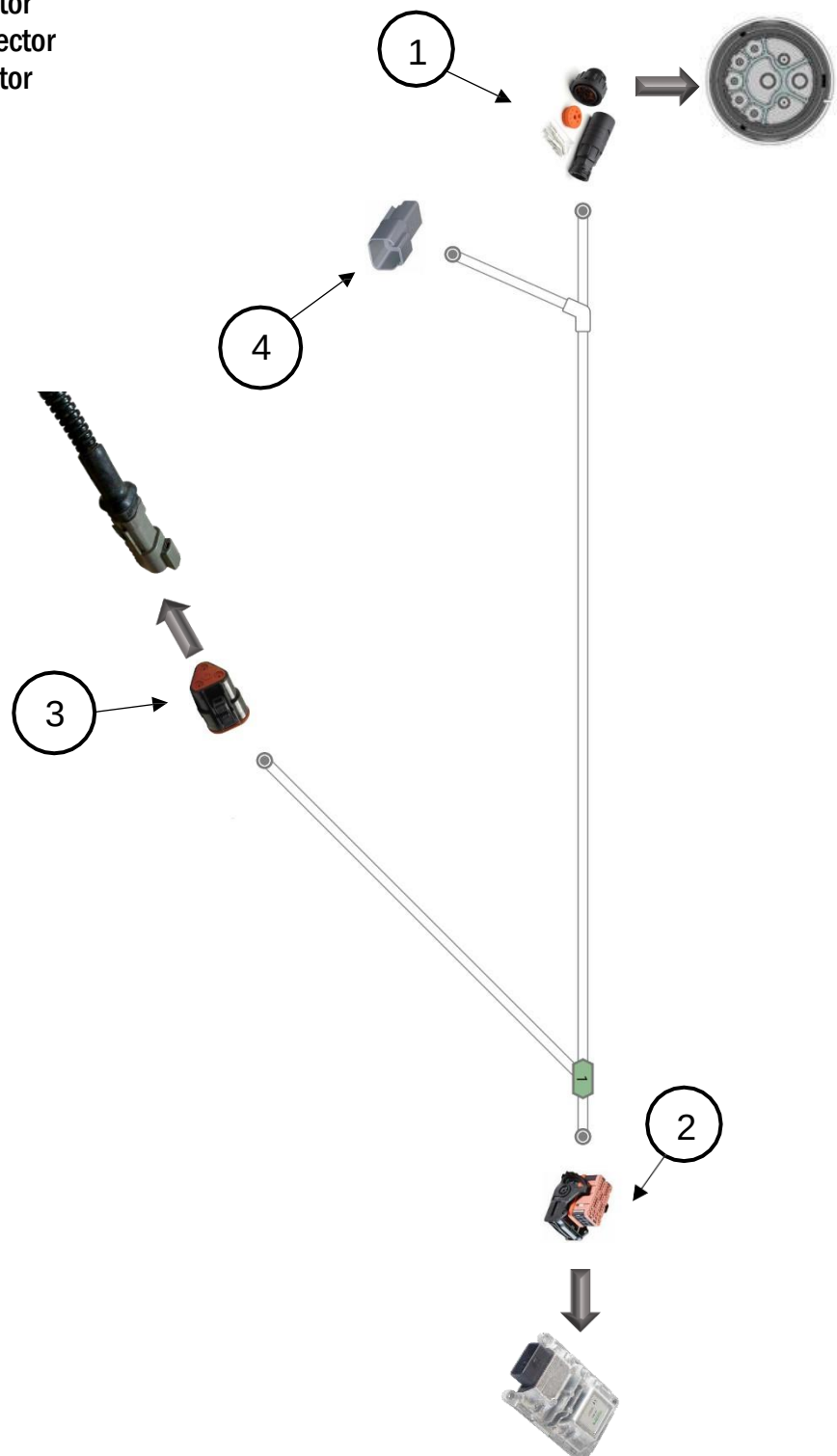
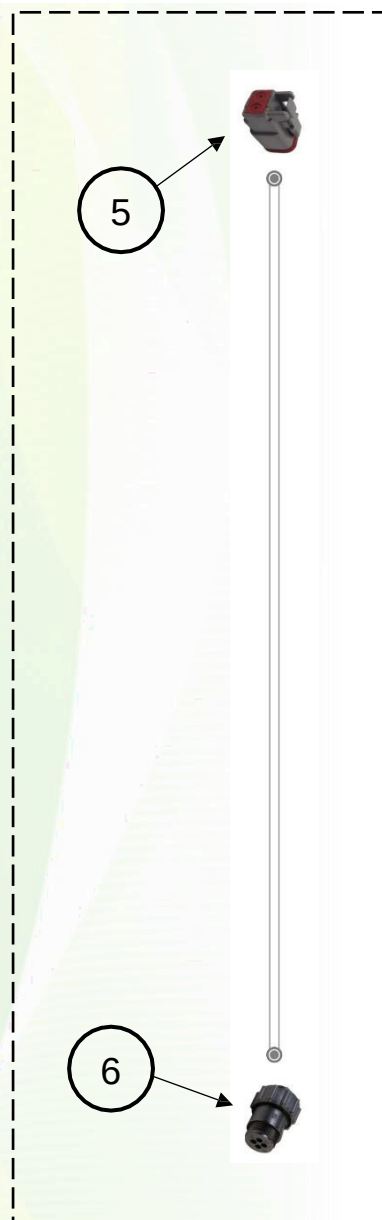
- GPS receiver
- ISOBUS UT display (with task controller enabled)

4. Installation and Set-up

The hardware schematic for all the electrical hardware is shown below. If a Fendt vehicle is used then connectors 5 and 6 are used.

1. IBBC connector
2. 46-way Molex connector
3. 3-way Deutsch male connector
4. 2-way Deutsch female connector
5. 2-way Deutsch male connector
6. 4-way ISO connector

(ISO Slurry Fendt Extension)



4. Installation and Set-up

To install the ISO-Slurry harness safely and correctly, please adhere closely to the following instructions:

1) Connect the 46-way Molex connector (2) to the Solsteer TTC Controller.



2) Connect the 3-way Deutsch connector (3) to the harness of the flow meter.

3) Connect the IBBC connector (1) to the IBBC connector socket on the rear of the tractor. If using a Fendt tractor follow steps 4 and 5.

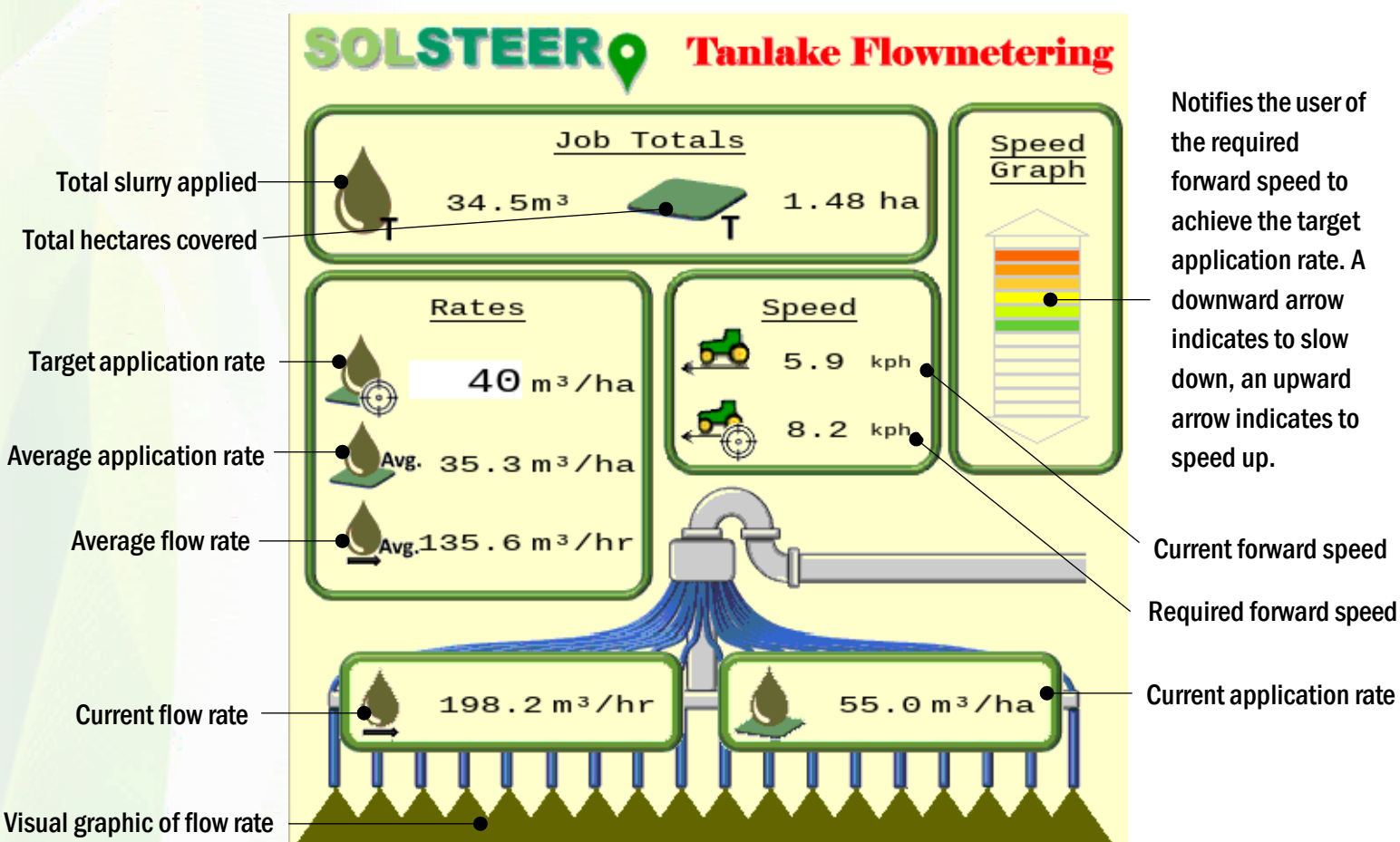


Note: If using a Fendt tractor with the speed control feature then required further installation and set-up instructions are provided in Section 7 of this manual.

4. Installation and Set-up

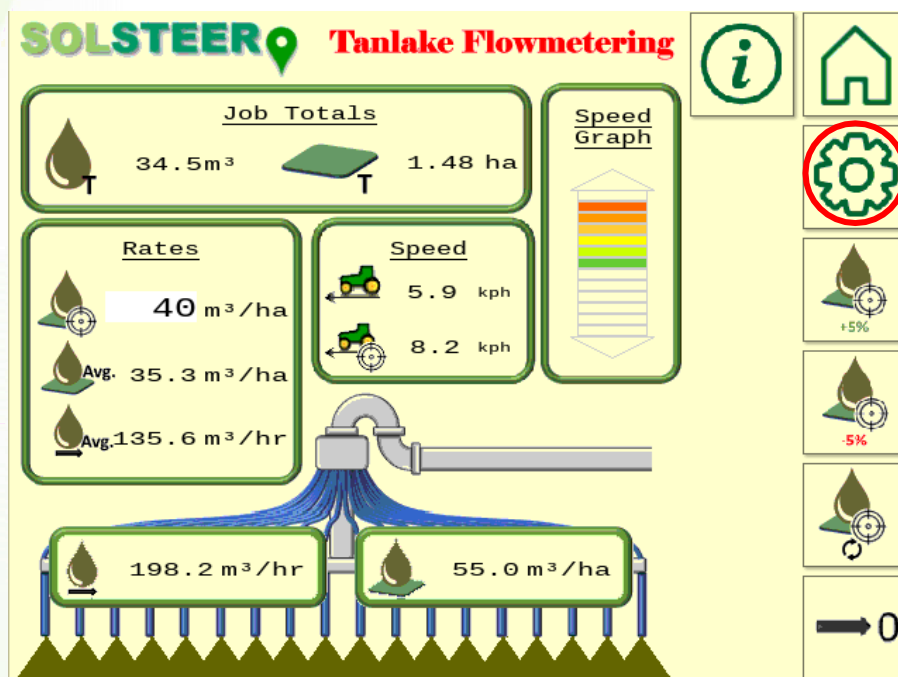
To set up the Solsteer ISO-Slurry System please adhere closely to the following instructions:

- 1) Switch on the machine. Ensure that the vehicle is in a wide open space and that GPS signal is available. Wait for the ISOBUS display to load.
- 2) Once the ISOBUS display has loaded go to the Solsteer UT page. If it cannot be seen, check the 'multiple display settings' in the UT. The following page will be shown.

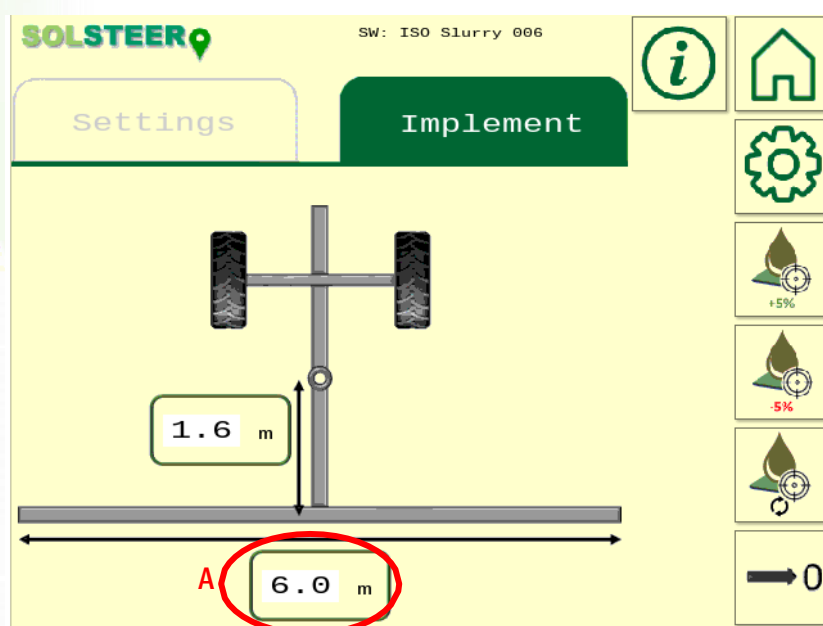


4. Installation and Set-up

5) Select the 'settings' softkey icon.

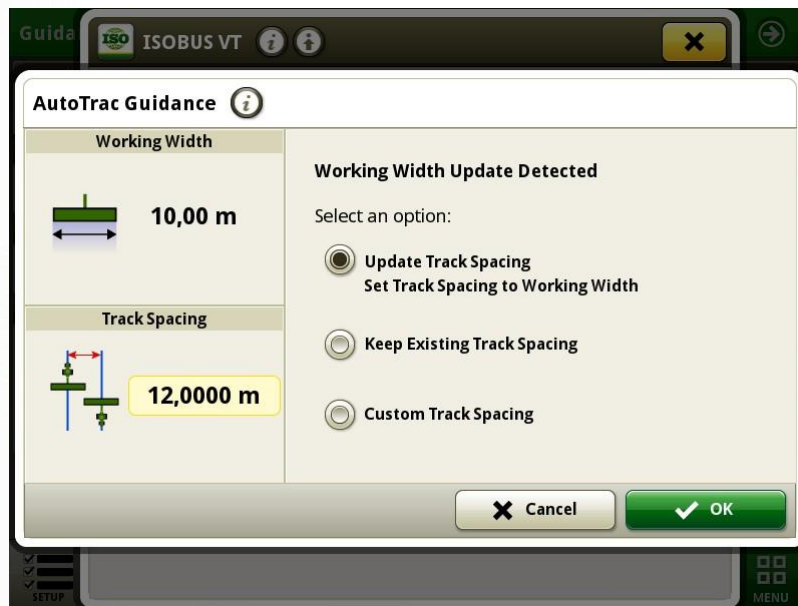


6) Click on the 'Implement' tab. The following page will then be shown.



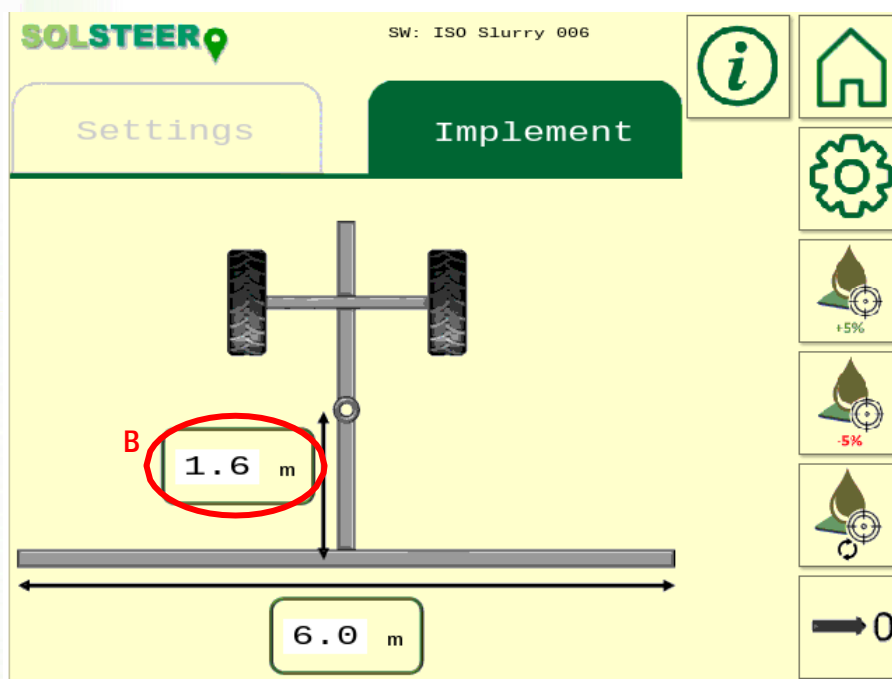
7) The working width of the machine is required to correctly calculate the application rate and the number of hectares covered. Measure the working width of the implement on the machine. Enter this value in meters into box 'A'.

8) The following window will display, depending on the machine manufacturer (see next page).



9) To confirm the value entered, ensure that 'Update Track Spacing' is selected and press 'OK'. This will automatically update the working width in the task controller of the ISOBUS UT. This ensures that mapping on the ISOBUS UT display will be correct.

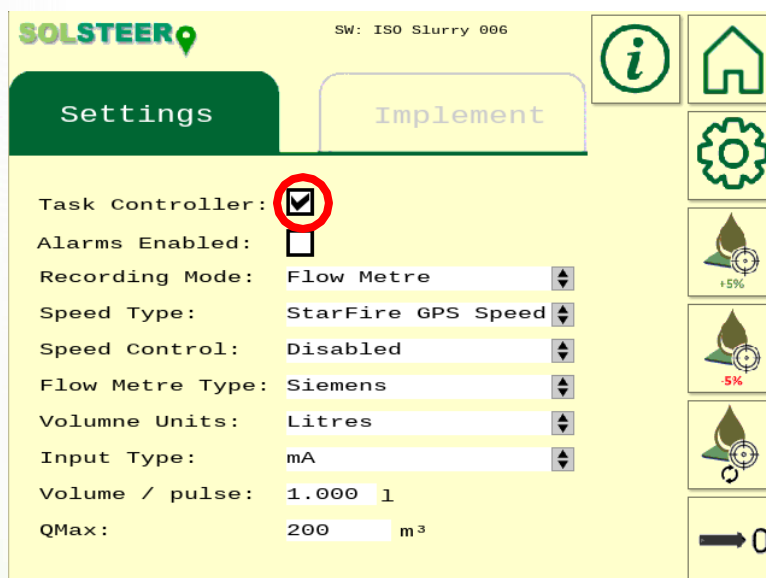
10) The distance from the pivot point to the application point is required for correct mapping on the ISOBUS UT display. Measure the distance from the pivot point to the application point. Enter this value in meters into box 'B'.



11) Ensure that both the values entered are the same as those in the task controller. The steps to view the information on the task controller are explained in Section 6 on page 19 of this manual.

4. Installation and Set-up

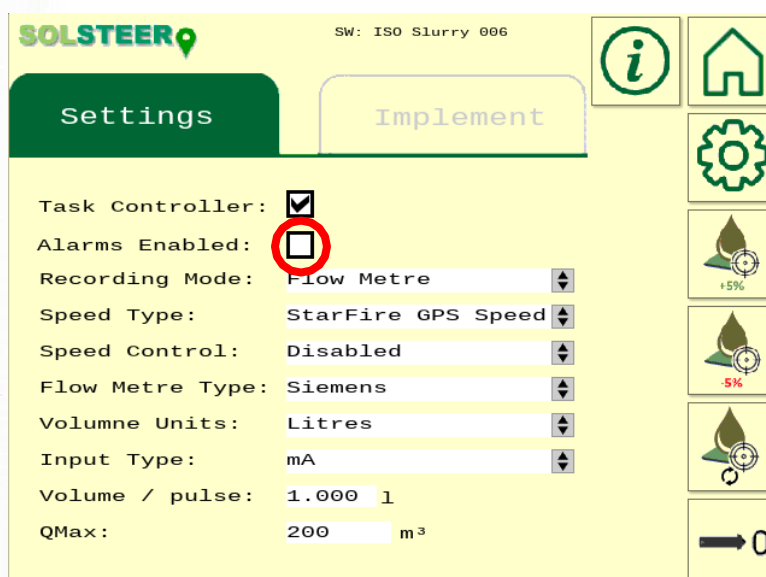
12) On the same page click on the 'Settings' tab. If you require the data to be sent to the Task Controller then make sure the 'Task Controller' box is ticked (this is enabled by default).



The screenshot shows the SOLSTEER Settings page. The 'Settings' tab is selected. The 'Task Controller' checkbox is checked and highlighted with a red circle. Other settings include: Alarms Enabled (unchecked), Recording Mode (Flow Metre), Speed Type (StarFire GPS Speed), Speed Control (Disabled), Flow Metre Type (Siemens), Volume Units (Litres), Input Type (mA), Volume / pulse (1.000 l), and QMax (200 m³). The right sidebar contains icons for information, home, settings, and three alarm status indicators (+5%, -5%, and a reset button).

Task Controller:	☒
Alarms Enabled:	☐
Recording Mode:	Flow Metre
Speed Type:	StarFire GPS Speed
Speed Control:	Disabled
Flow Metre Type:	Siemens
Volume Units:	Litres
Input Type:	mA
Volume / pulse:	1.000 l
QMax:	200 m³

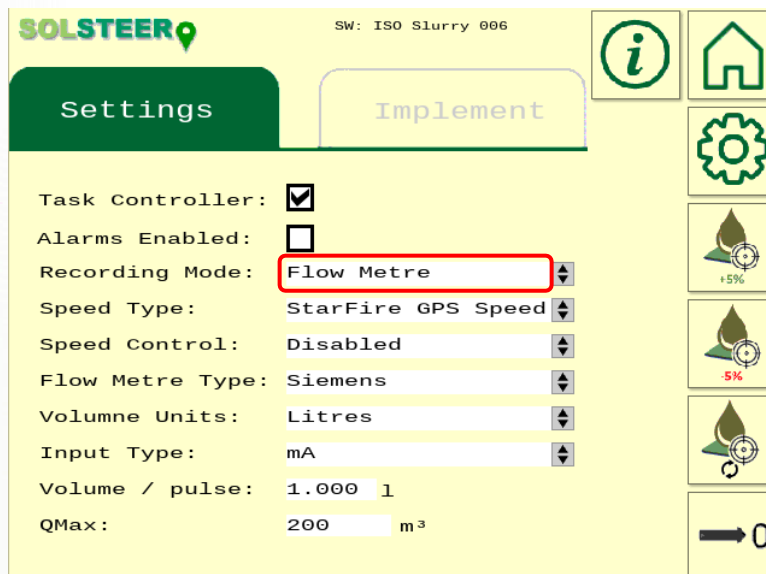
13) Alarms alert the user if the current target application rate is not being adhered to. To enable these alarms, make sure that the 'Alarm Enabled' box is ticked (this is enabled by default).



The screenshot shows the SOLSTEER Settings page. The 'Settings' tab is selected. The 'Alarms Enabled' checkbox is unchecked and highlighted with a red circle. Other settings are the same as in the previous screenshot. The right sidebar contains icons for information, home, settings, and three alarm status indicators (+5%, -5%, and a reset button).

Task Controller:	☒
Alarms Enabled:	☐
Recording Mode:	Flow Metre
Speed Type:	StarFire GPS Speed
Speed Control:	Disabled
Flow Metre Type:	Siemens
Volume Units:	Litres
Input Type:	mA
Volume / pulse:	1.000 l
QMax:	200 m³

14) The position at which the flow is recorded will affect the mapping on the ISOBUS UT display. Select the correct option by clicking on the white box located to the right of 'Recording Mode'.



SOLSTEER SW: ISO Slurry 006

Settings Implement

Task Controller: ☒

Alarms Enabled: ☐

Recording Mode: **Flow Metre**

Speed Type: StarFire GPS Speed

Speed Control: Disabled

Flow Metre Type: Siemens

Volumne Units: Litres

Input Type: mA

Volume / pulse: 1.000 l

QMax: 200 m³

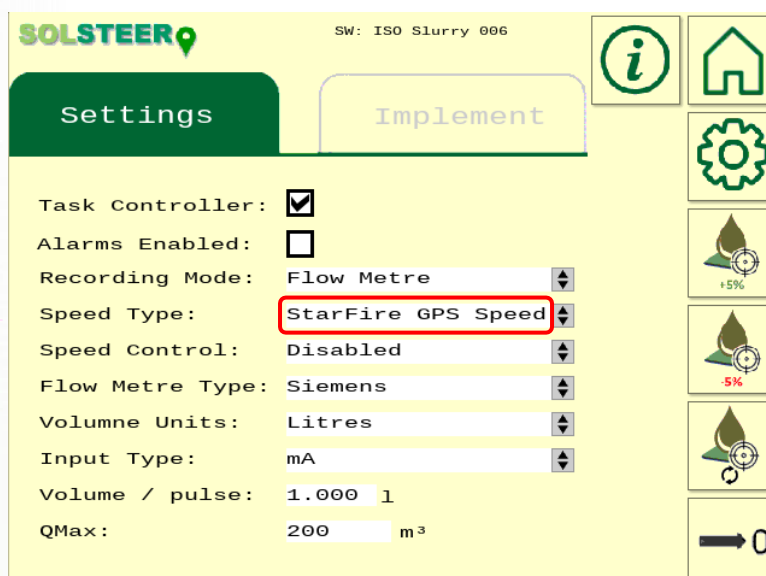
15) On the same page click in the 'Settings' tab. Depending on the configuration of the machine, three different methods of obtaining the forward speed of the vehicle are possible. These are:

Wheel-Based Speed – Speed of rotation of the wheels are used to determine forward speed typically with the use of a hall effect sensor.

Ground-Based Speed – A radar mounted to the machine is used to determine forward speed.

StarFire GPS Speed – If a John Deere StarFire™ GPS system is used then this can be used to determine forward speed.

Select the correct option by clicking on the white box located to the right of 'Speed Type'.



SOLSTEER SW: ISO Slurry 006

Settings Implement

Task Controller: ☒

Alarms Enabled: ☐

Recording Mode: Flow Metre

Speed Type: **StarFire GPS Speed**

Speed Control: Disabled

Flow Metre Type: Siemens

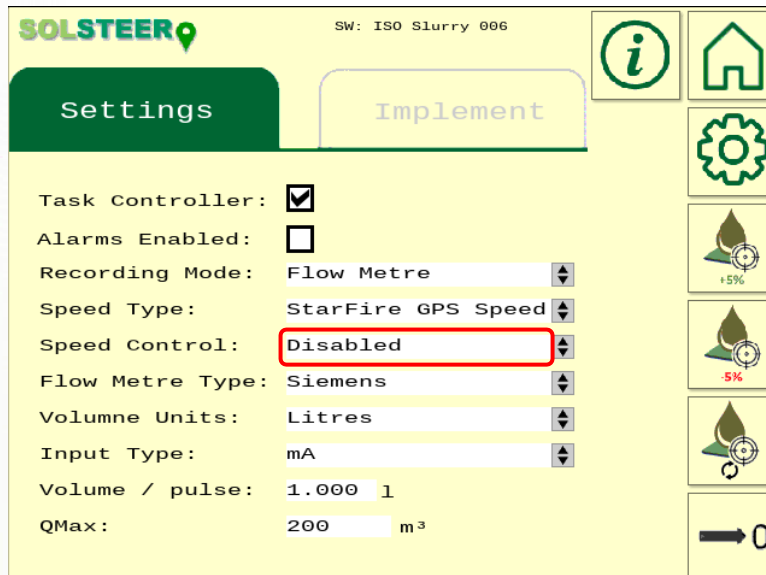
Volumne Units: Litres

Input Type: mA

Volume / pulse: 1.000 l

QMax: 200 m³

16) If a Fendt vehicle is being used, then the tractor forward speed can be automatically controlled, to ensure that the correct application rate is achieved. To enable this feature, click on the white box located to the right of 'Speed Control'.



SOLSTEER SW: ISO Slurry 006

Settings Implement

Task Controller: ☒

Alarms Enabled: ☐

Recording Mode: Flow Metre

Speed Type: StarFire GPS Speed

Speed Control: **Disabled**

Flow Metre Type: Siemens

Volume Units: Litres

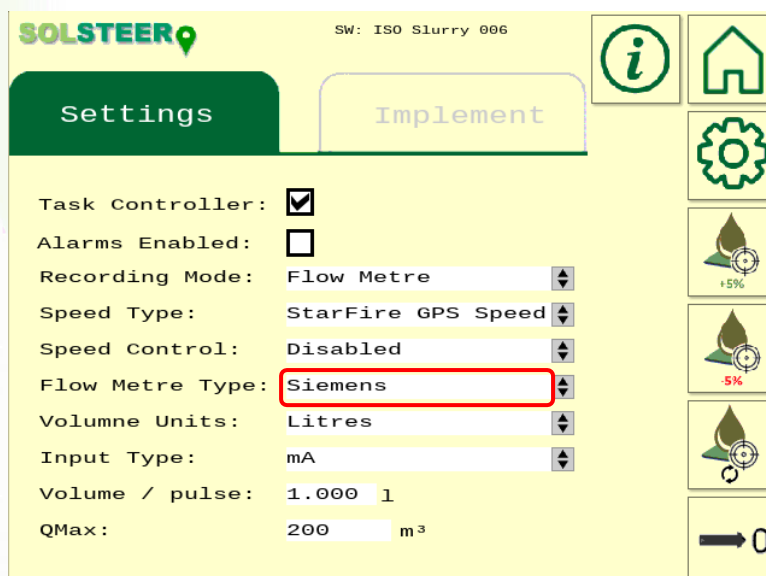
Input Type: mA

Volume / pulse: 1.000 1

QMax: 200 m³

Navigation icons: Info, Home, Settings, +5%, -5%, 0

17) Different manufactures of flow meters will likely produce flow meters with different signal types. Select the correct flow metre by clicking on the white box located to the right of 'Flow Metre Type'.



SOLSTEER SW: ISO Slurry 006

Settings Implement

Task Controller: ☒

Alarms Enabled: ☐

Recording Mode: Flow Metre

Speed Type: StarFire GPS Speed

Speed Control: Disabled

Flow Metre Type: **Siemens**

Volume Units: Litres

Input Type: mA

Volume / pulse: 1.000 1

QMax: 200 m³

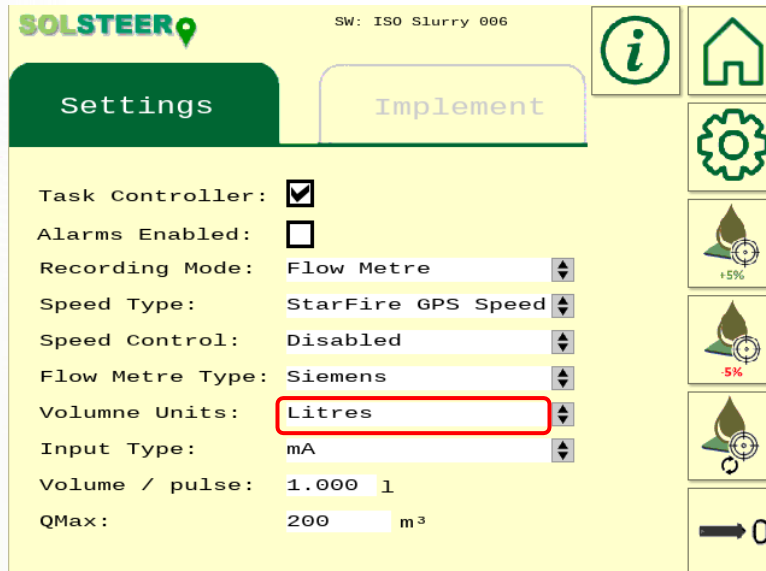
Navigation icons: Info, Home, Settings, +5%, -5%, 0

The following flow meter brands will be shown:

Krohne – This flow meter typically uses a pulse signal to transmit the flow rate.

Siemens – This flow meter typically uses a milliamp signal to transmit the flow rate.

18) The ISO-Slurry system can operate in metric units, imperial (UK) units or imperial (US) units. To select your preferred units of volume, click on the white box located to the right of 'Volume Units' and select the correct units from the drop-down list.



SOLSTEER SW: ISO Slurry 006

Settings Implement

Task Controller: ☒

Alarms Enabled: ☐

Recording Mode: Flow Metre

Speed Type: StarFire GPS Speed

Speed Control: Disabled

Flow Metre Type: Siemens

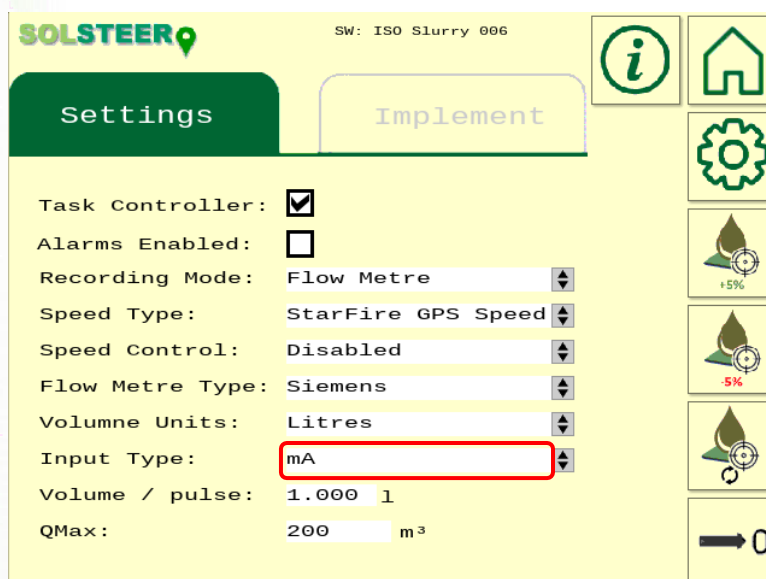
Volume Units: **Litres**

Input Type: mA

Volume / pulse: 1.000 1

QMax: 200 m³

19) To determine the current flow rate, pulses or a milliamp (mA) signal can be used. After selecting the correct 'flow meter type', the 'input type' field will automatically update to the correct signal setting. However if the input type needs to be changed, select the correct option from the drop-down list. Restart the controller by turning the ignition on and off to save the changes made to 'Input Type'.



SOLSTEER SW: ISO Slurry 006

Settings Implement

Task Controller: ☒

Alarms Enabled: ☐

Recording Mode: Flow Metre

Speed Type: StarFire GPS Speed

Speed Control: Disabled

Flow Metre Type: Siemens

Volume Units: Litres

Input Type: **mA**

Volume / pulse: 1.000 1

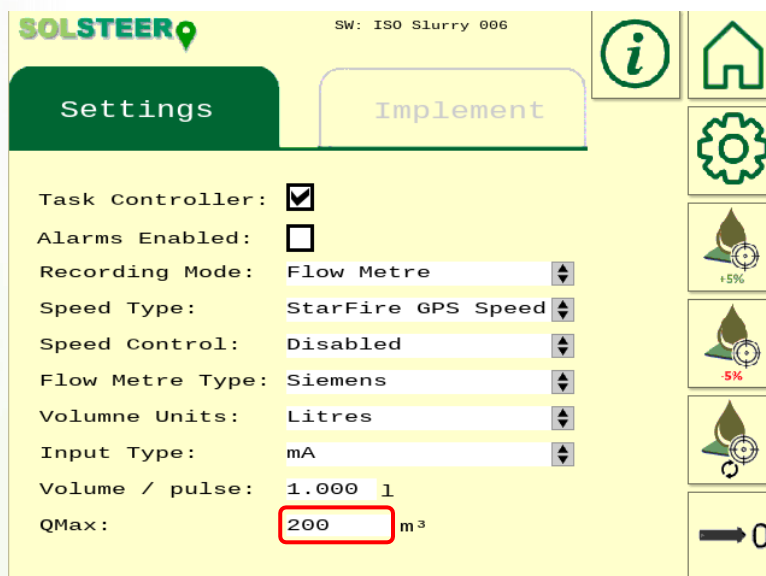
QMax: 200 m³

Flow Meter Setup

mA Input Type

In the flow meter settings ensure the scaling of milliamps (mA) to flow rate is correct. This should be 20mA corresponding to the maximum value of cubic metres (m³).

In the Solsteer settings page of the ISOBUS UT, select the field to the right of 'QMax'. Enter the maximum flow rate of the flow meter into this field.



SOLSTEER
SW: ISO Slurry 006

Settings Implement

Task Controller: ☒

Alarms Enabled: ☐

Recording Mode: Flow Metre

Speed Type: StarFire GPS Speed

Speed Control: Disabled

Flow Metre Type: Siemens

Volumne Units: Litres

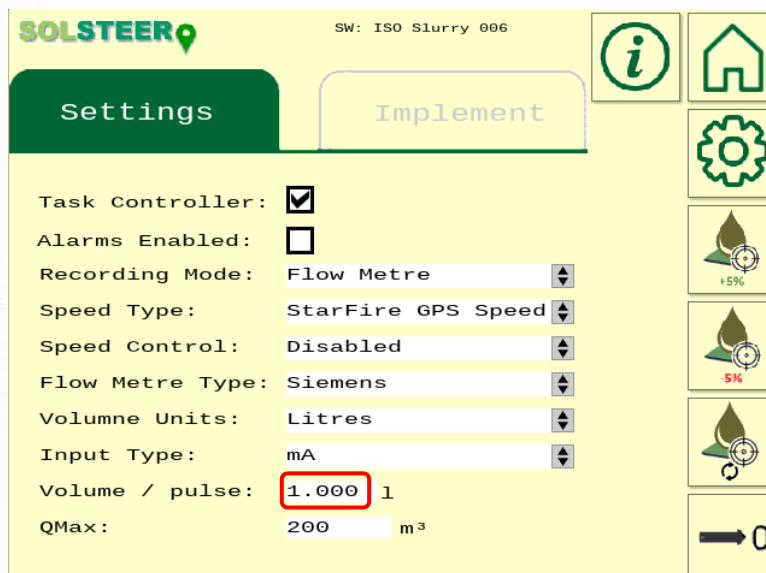
Input Type: mA

Volume / pulse: 1.000 1

QMax: 200 m³

Pulse Input Type

Ensure that the flow meter is set as 1 litre per pulse. If there is a different amount of litres per pulse then enter this value into the white box located to the right of 'Volume / pulse'.



SOLSTEER
SW: ISO Slurry 006

Settings Implement

Task Controller: ☒

Alarms Enabled: ☐

Recording Mode: Flow Metre

Speed Type: StarFire GPS Speed

Speed Control: Disabled

Flow Metre Type: Siemens

Volumne Units: Litres

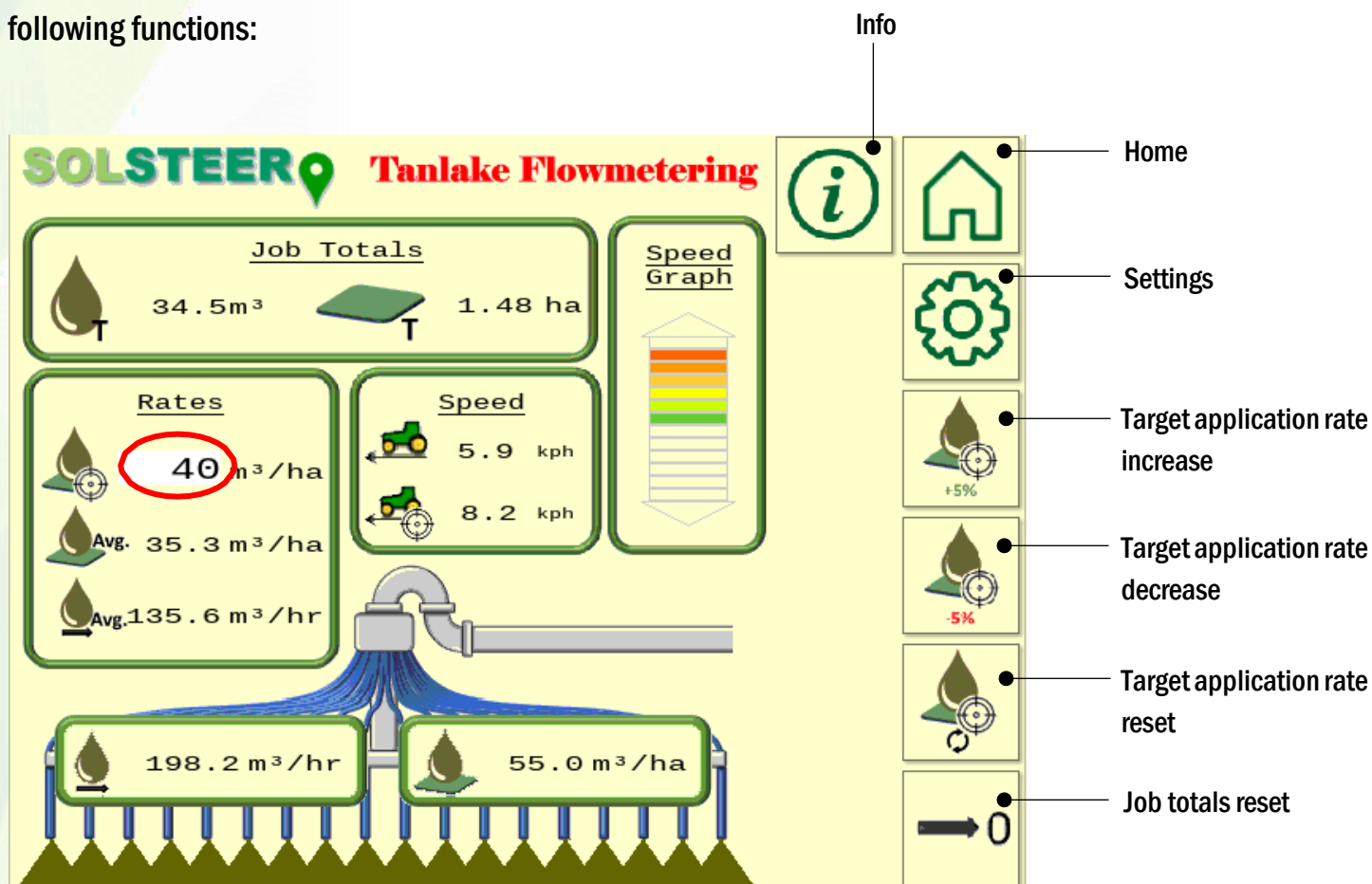
Input Type: mA

Volume / pulse: 1.000 1

QMax: 200 m³

5. User Interface

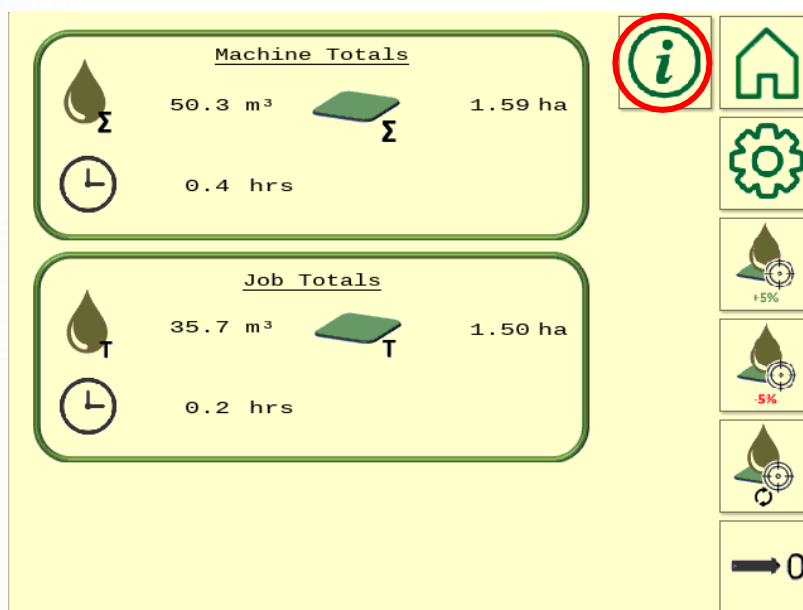
The ISO-Slurry user interface contains three separate pages and a number of softkeys which have the following functions:



The target application rate of the user can be set in the white box circled red. The target application rate softkeys will increase or decrease the target application rate value by 5%. The target application rate can also be reset to the value that it was, before the target 'increase' or 'decrease' buttons were pressed. Upon turning on the system, the target application rate value will automatically assume the value that it was before the machine was switched off.

5. User interface

Access the information page by clicking the 'Info' softkey. The following page will be displayed:



This page will display the machine totals and the job totals for both total amount of slurry in meters cubed and total area in hectares. The machine totals values cannot be reset and will continue to accumulate for the lifetime of the machine. The job totals value can be reset by pressing and holding the 'Job totals reset' softkey for at least two seconds.

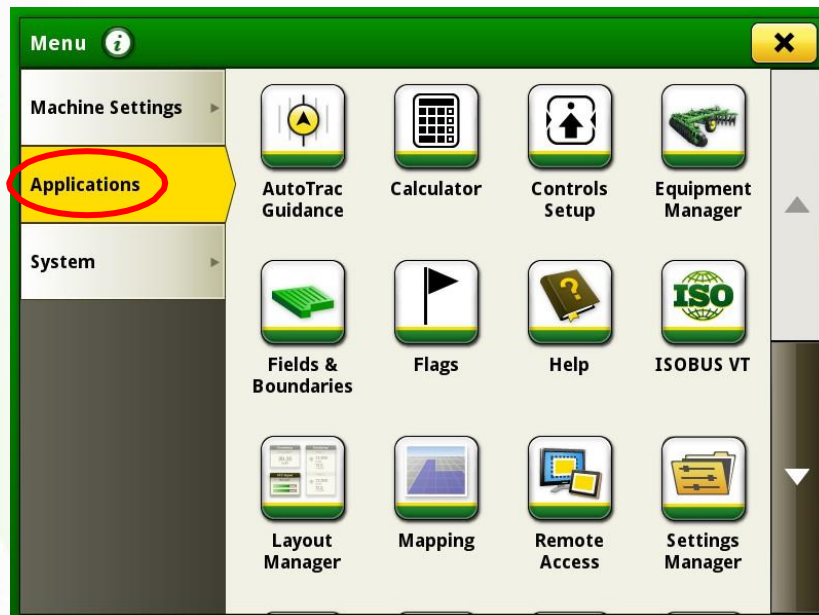
6. ISOBUS Task Controller

The Solsteer ISO-Slurry system will automatically transfer information and data from the Solsteer UT page to the task controller of the ISOBUS UT and populate values in the task controller.

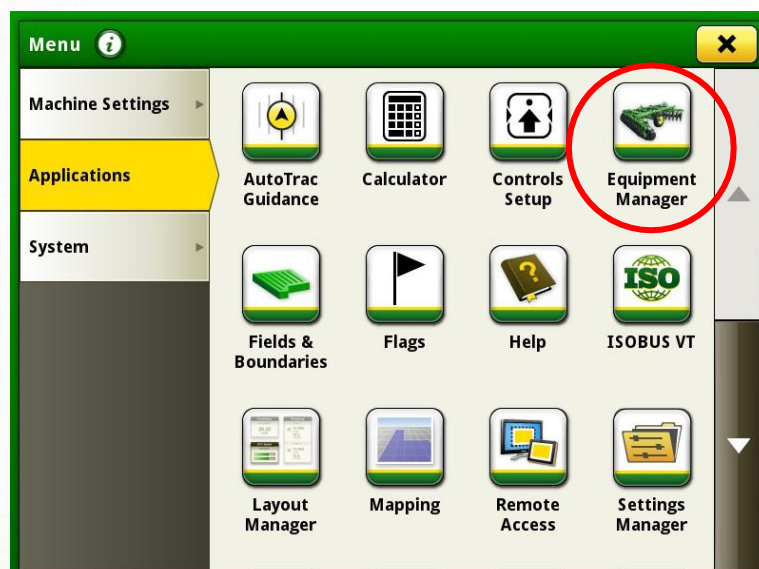
John Deere GreenStar™ UT Display

For the examples shown, a John Deere GreenStar™ display has been used (other interfaces may vary). Use the following steps to view the information and data on the task controller.

- 1) In the lower right corner of the screen select 'MENU' and select 'Applications'.



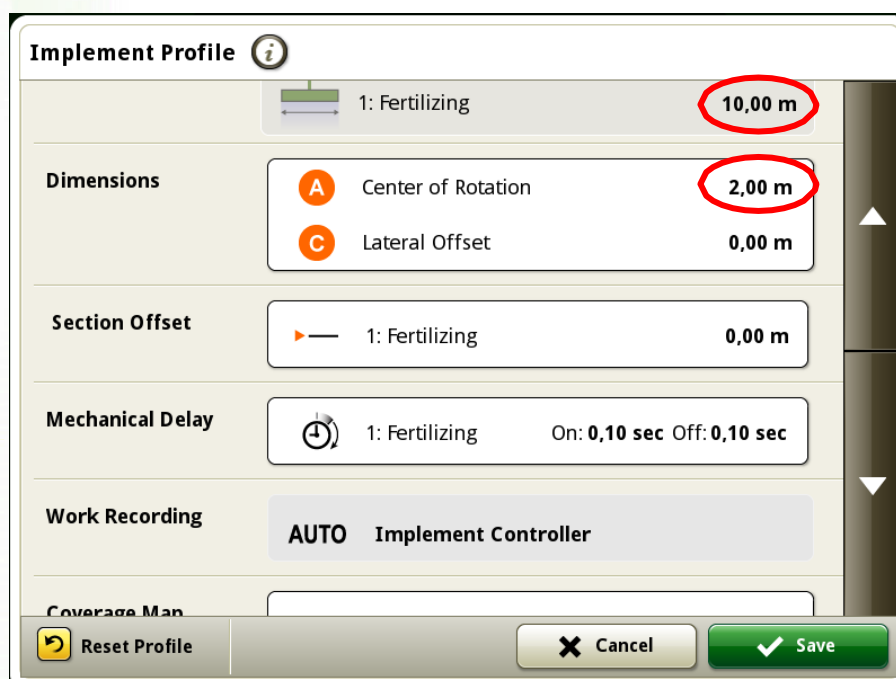
- 2) Select 'Equipment Manager'.



3) Select 'Fertilizer'.



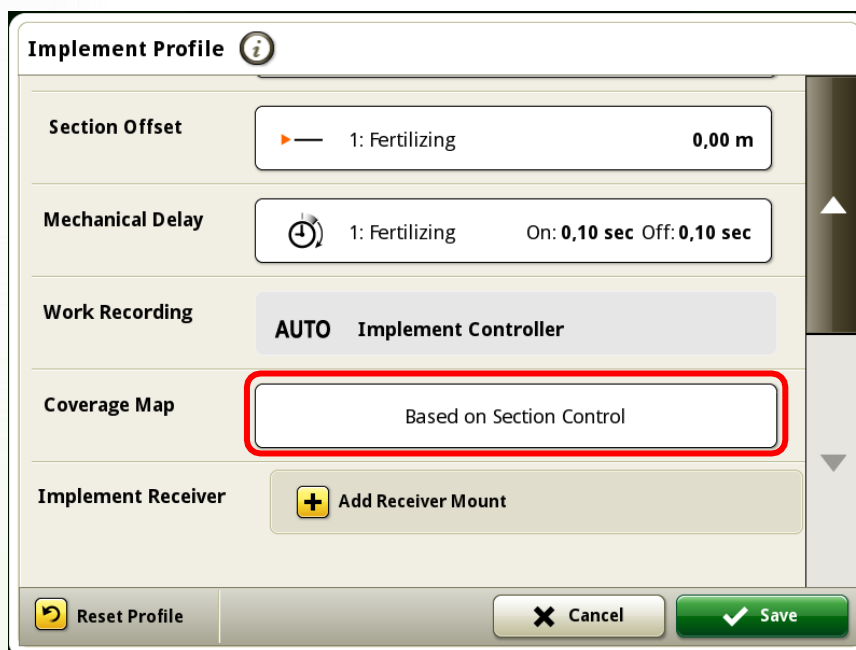
4) Ensure the values shown are identical to the values entered into the 'Settings' page of the Solsteer ISO-Slurry UT page (see pages 12 and 13).



If these values are not correct, then click the 'Reset Profile' button. **IMPORTANT!** From the window that appears after pressing 'Reset Profile' select 'Cancel' instead of 'Save'. This ensures that values updated in the Solsteer ISO-Slurry UT will automatically update correctly in the task controller.

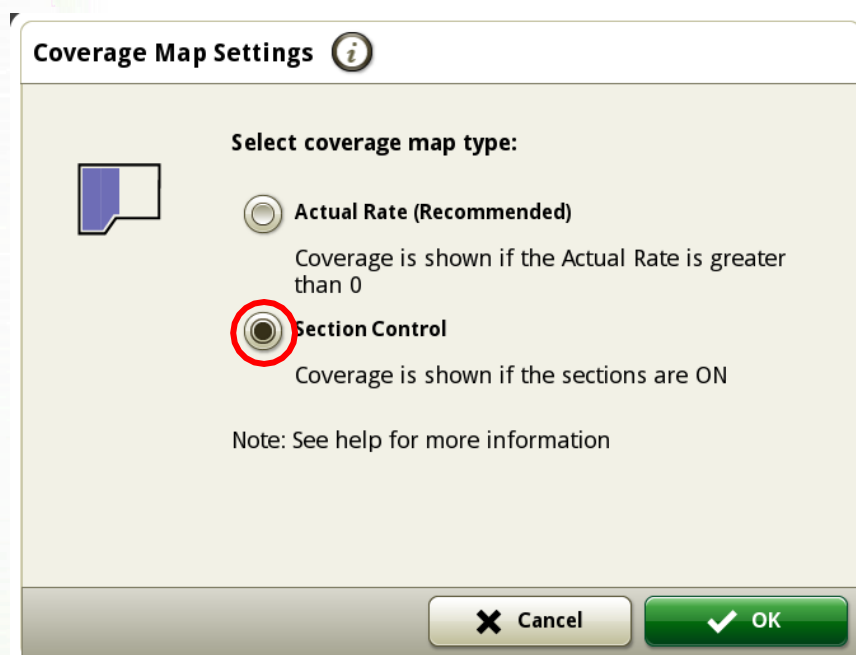
The type of coverage map that displays on the ISOBUS UT can also be changed within the 'Equipment Manager'. The two types are 'Actual Rate' and 'Section Control'.

To check the coverage map type click on the white box located to the right of 'Coverage Map'.



The 'Implement Profile' window shows various settings for a task. The 'Coverage Map' section is highlighted with a red rectangle, showing 'Based on Section Control'. Other settings include 'Section Offset' (0,00 m), 'Mechanical Delay' (On: 0,10 sec Off: 0,10 sec), 'Work Recording' (AUTO Implement Controller), and 'Implement Receiver' (+ Add Receiver Mount). At the bottom are 'Reset Profile', 'Cancel', and 'Save' buttons.

The following window will be displayed. It is recommended that the 'Section Control' type is selected to avoid any gaps in coverage.



The 'Coverage Map Settings' window allows selecting the coverage map type. The 'Section Control' option is selected and circled in red. The 'Actual Rate (Recommended)' option is also visible. A note at the bottom states: 'Note: See help for more information'. At the bottom are 'Cancel' and 'OK' buttons.

7. Fendt Speed Control

7.1 SCR/S4 Installation and Set-up

The installation of the ISO Slurry system on a Fendt tractor follows steps 1 to 3 on page 10. To complete the installation follow steps 1 and 2 below.

- 1) Connect the two 2-way Deutsch connectors together of the ISO Slurry Fendt Extension and the ISO Slurry Harness (4 and 5, page 9).
- 2) In the tractor cab, remove the cover of the fuse board located on the right-hand side. Connect the 4-way ISO connector to the port labelled 'K-bus'.

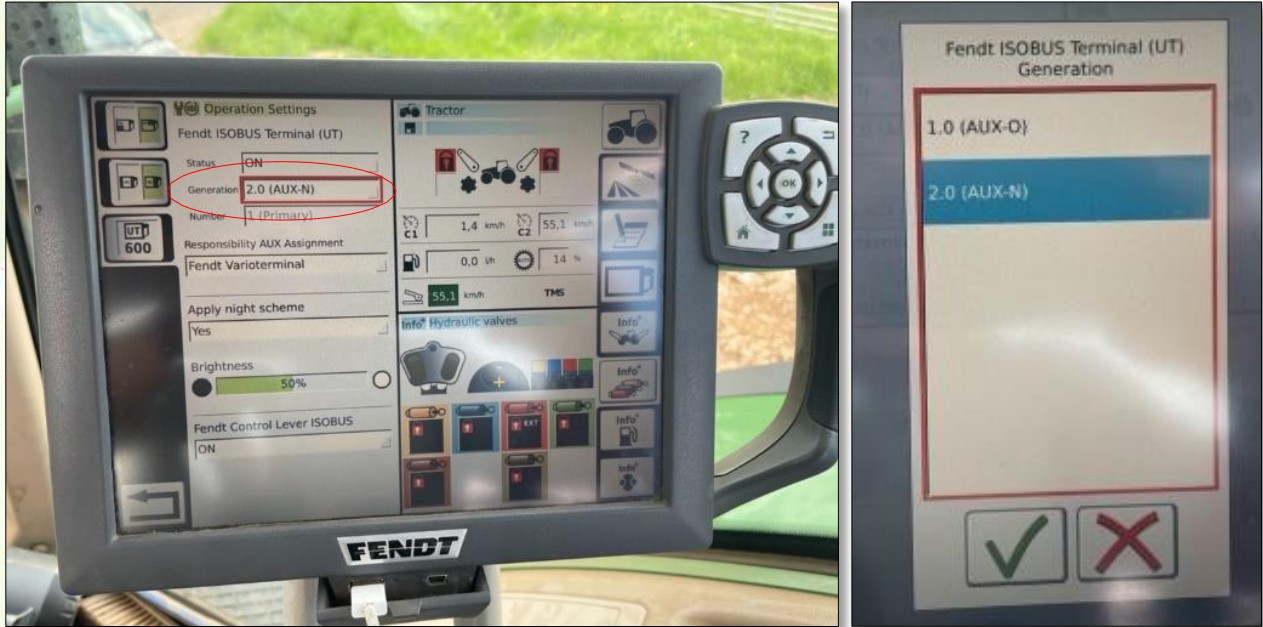


- 3) Go into ISOBUS Operation Settings by clicking on the 'spanner' icon on the left side panel of the display.

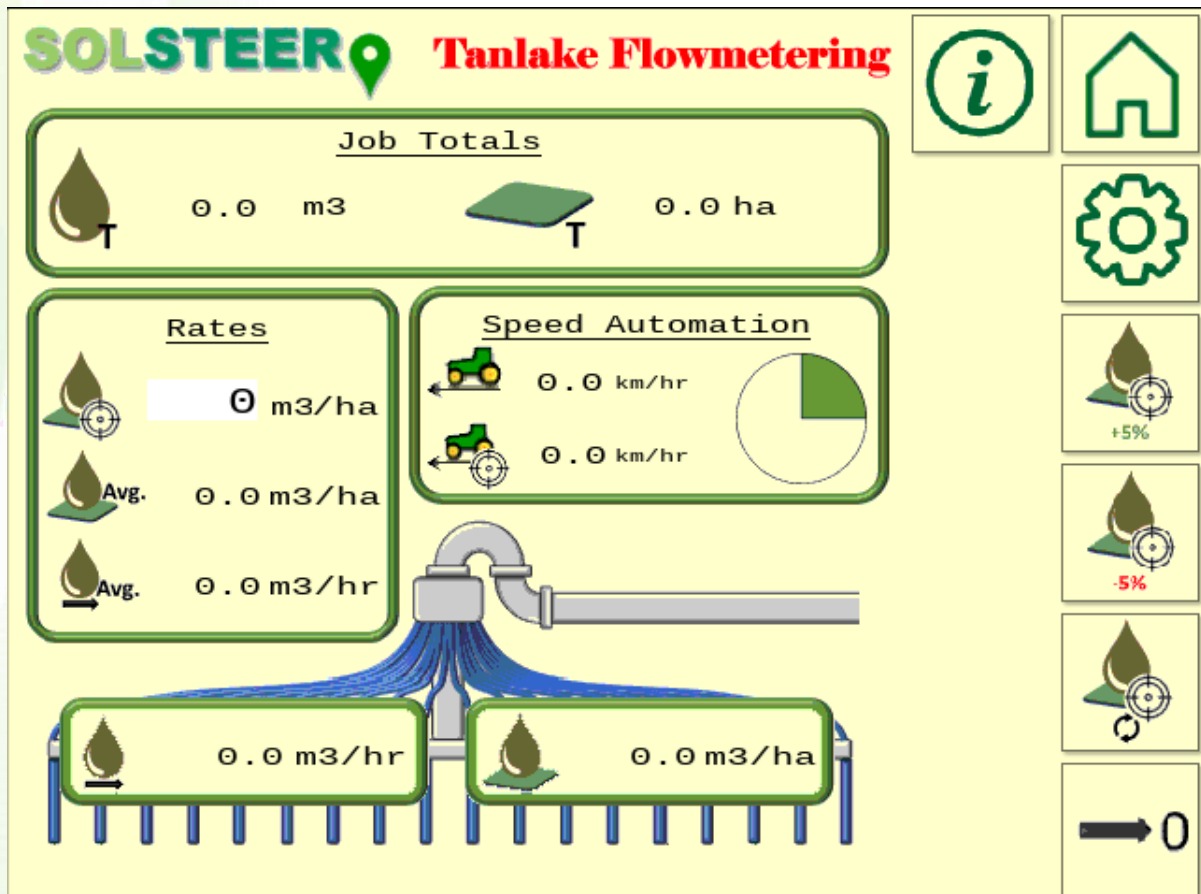


7. Fendt Speed Control

4) Click on the 'Generation' field. From the menu that appears, ensure that '2.0 (AUX-N)' is selected.



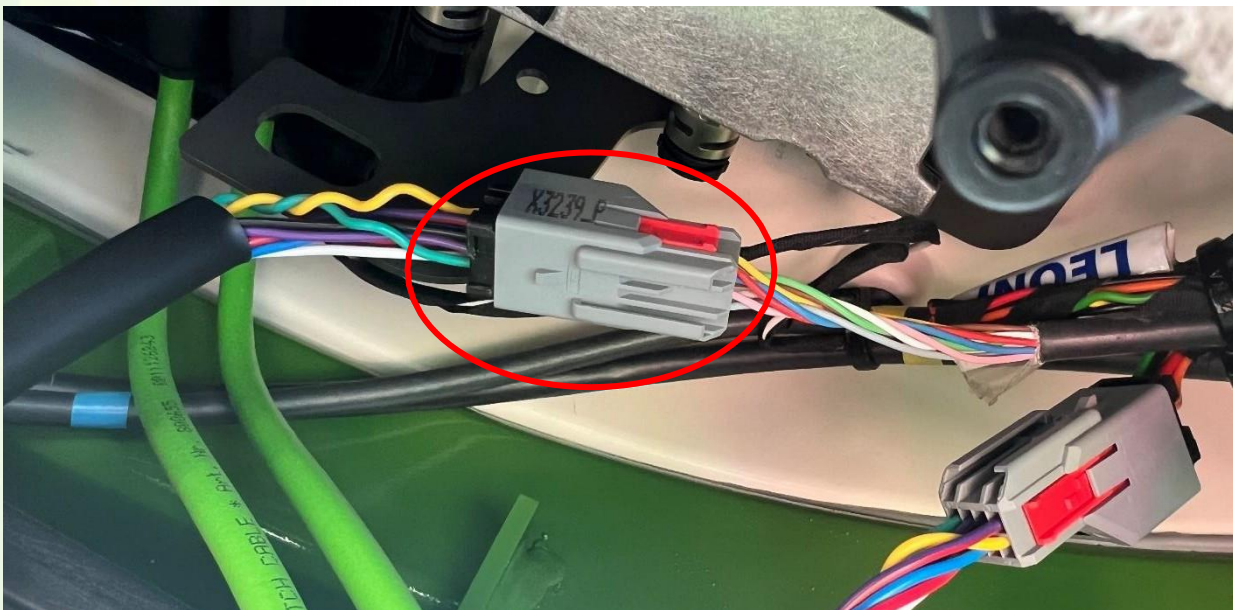
5) Follow steps 1 and 2 shown on page 11. The following UT page will now be displayed after selecting the ISO-Slurry icon:



7.2 FendtONE Installation and Set-up



- 1) Remove panel located above the armrest on the roof liner.



- 2) Locate the connection circled red – part number X3239_P. Note - this may be tucked away from this panel. 'Tee' the S/048 ISO-Slurry FendtONE Speed Adaptor into this connection.



3) Remove hole cover from the earlier removed panel, feed the round connector through this hole allowing access from the other side one this panel. Fix the connector to the underside of this panel and refit the panel as before.

4) Connect the S/028 Fendt ISO-Slurry Adaptor to the S/048 ISO-Slurry FendtONE Speed adaptor you just fitted. The other end 2-way square plug of this can be connected into S/026 ISO-Slurry Harness



5) Cruise Control 2 must be toggled on for Fendt Speed Control to engage. Speed control can be then engaged and by moving the joystick to the right.

SOFTWARE CHANGE for FendtONE

- 1) Disconnect the speed cable with the engine off
- 2) Start the tractor
- 3) Go into the ISO-Slurry settings and change Speed Control to Fendt Zone.
- 4) Turn the key off for 2 mins
- 5) Plug the Speed Cable back in
- 6) Start the tractor
- 7) Installation is complete.

7.3 Fendt Speed Control Settings

Fendt speed control will automatically drive the vehicle at the correct forward speed to achieve the target application rate. Enable this feature by following the steps below:

1) Go to the settings (⚙️) icon and click on the field to the right of 'Speed Control' and select 'Fendt SCR/S4' or 'Fendt ONE'.

Speed Type:	StarFire GPS Speed	⬆️⬆️
Speed Control:	Disabled	⬆️⬆️
Flow Metre Type:	Siemens	⬆️⬆️



In the ISO Slurry UT display a pie chart will be shown under 'Speed Automation'. Each stage of the pie chart is explained below:

1 – No communication with Fendt speed control (Issue with connection).



2 – Connected to Fendt speed control. Touch the pie chart to connect to stage 3.



3 – Fendt speed control is ready to engage.



4 – Fendt speed control is engaged.



7. Fendt Speed Control

2) On the joystick press the 'C2' button.



3) On the Fendt display, ensure that C2 is now highlighted orange. On the Solsteer display, the green pie chart should now be half full. Press on the green pie chart to turn the pie chart to $\frac{3}{4}$ full to make the system ready to engage.



4) Flick the joystick to the right to make the Fendt speed control engage. The C2 box should now be green and the green pie chart should be full, with the auto icon showing.



8. Troubleshooting

Problem: The SolSteer ISO-Slurry user interface will not display

Causes	Solutions
ISOBUS is disabled in the display	Check ISOBUS is enabled in the display
The priority number is incorrect	Check the priority number and set it as the highest priority number possible
If a Fendt screen is being used, the Fendt UT is in the wrong generation.	See page 19 of this manual to set the correct generation of the Fendt UT.