

YieldTrakk YM-1 Yield Monitoring Operator's Manual



YieldTrakk YM-1

Yield Monitoring

Operator's Manual

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For use with Software Version 4.01

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Preface

This manual provides information about operating and maintaining this Topcon Precision Agriculture product. Correct use and servicing is important for safe and reliable operation of the product.

It is very important that you take the time to read this manual before using the product.

Information in this manual is current at the time of publication. A system may vary slightly. The manufacturer reserves the right to redesign and change the system as necessary without notification.

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Note: Please read these Terms and Conditions carefully.

General

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Service Information

Service assistance can be provided by contacting your local TPA Authorized Dealer.

Communications Regulation Information

FCC Compliance Statement (USA)

This equipment has been tested and found to comply with the limits for a Class 'A' digital device, pursuant to Part 15 of the FCC Rules. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the user's expense.



FCC Compliance Statement (Canada)

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulation.



CE EMC Statement (European Community)

Warning: This is a class 'A' product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.



'C' Tick EMC Statement (Australia & New Zealand)

This product meets the applicable requirements of the Australia and New Zealand EMC Framework.

Type Approval and Safety Regulations

Type approval may be required in some countries to license the use of transmitters on certain band frequencies. Check with local authorities and your dealer.

Unauthorized modification of the equipment may void that approval, the warranty and the license to use the equipment.

The receiver contains an internal radio-modem. This can potentially send signals. Regulations vary between countries, so check with the dealer and local regulators for information on licensed and unlicensed frequencies. Some may involve subscriptions.

Radio and Television Interference

This computer equipment generates, uses, and can radiate radio-frequency energy. If it is not installed and used correctly in strict accordance with TOPCON Precision Agriculture instructions, it may cause interference with radio communication.

You can check if interference is being caused by this equipment by turning the Topcon equipment off to see if the interference stops. If the equipment is causing interference to a radio or other electronic device, try:

- Turning the radio antenna until the interference stops
- Moving the equipment to either side of the radio or other electronic device
- Moving the equipment farther away from the radio or other electronic device
- Connecting the equipment to another circuit that is not linked to the radio.

To reduce potential interference operate the equipment at the lowest gain level that will allow successful communication.

If necessary contact your nearest Topcon Precision Agriculture dealer for assistance.

Note: Changes or modifications to this product not authorized by TOPCON Precision Agriculture could void the EMC compliance and negate authority to operate the product.

This product was tested for EMC compliance using Topcon Precision Agriculture peripheral devices, shielded cables and connectors. It is important to use Topcon Precision Agriculture devices between system components to reduce the possibility of interference with other devices

General Safety



DANGER: It is essential that the following information and the product specific safety information is read and understood.

Most incidents arising during operation, maintenance and repair are caused by a failure to observe basic safety rules or precautions. Always be alert to potential hazards and hazardous situations.

Always follow the instructions that accompany a Warning or Caution. The information these provide aims to minimize risk of injury and/or damage to property. In particular follow instructions presented as Safety Messages.

Safety Messages and Warnings

The safety symbol is used with the relevant word: DANGER, WARNING or CAUTION.

Messages marked in this way recommend safety precautions and practices. LEARN and apply them.



DANGER: Indicates an imminently hazardous situation that, if not avoided, could result in **DEATH OR VERY SERIOUS INJURY**.



WARNING: Indicates a potentially hazardous situation that, if not avoided, could result in **DEATH OR SERIOUS INJURY**.



CAUTION: Indicates a potentially hazardous situation that, if not avoided, may result in **MINOR INJURY**.

Safety Signs



WARNING: DO NOT remove or obscure safety signs. Replace any safety signs that are not readable or are missing. Replacement signs are available from your dealer in the event of loss or damage.

If a used vehicle has been purchased, make sure all safety signs are in the correct location and can be read. Replace any safety signs that cannot be read or are missing. Replacement safety signs are available from your dealer.

Operator Safety



WARNING: It is **YOUR** responsibility to read and understand the safety sections in this book before operating this vehicle. Remember that **YOU** are the key to safety.

Good safety practices not only protect you, but also the people around you. Study this manual as part of your safety program. This safety information only relates to Topcon equipment and does not replace other usual safe work practices.



WARNING: Ensure power is removed from the Topcon equipment prior to maintenance or repair of the vehicle or implements.



WARNING: Ensure appropriate precautions are taken prior to handling any hazardous substances. Always read the Material Safety Data Sheet prior to commencing work.



WARNING: In some of the illustrations or photos used in this manual, panels or guards may have been removed for demonstration purposes. Never operate the vehicle with any panels or guards removed. If the removal of panels or guards is necessary to make a repair, these **MUST** be replaced before operation.



WARNING: Always check that any suspended vehicle attachments are lowered to the ground before beginning repair or maintenance work on a vehicle.



WARNING: Vehicle and implement parts can become hot during operation and may be under pressure. Refer to vehicle manuals.



WARNING: Wear appropriate protective clothing for the task being undertaken and conditions.



WARNING: Do not operate equipment around explosive equipment or supplies.



WARNING: Topcon is committed to good environmental performance and minimizes the use of any potentially harmful substances in its products. However, it is always advisable not to handle damaged electronic equipment. This Topcon product may contain a sealed lithium battery. Always dispose of any electronic equipment thoughtfully and responsibly.

Exposure to Radio Frequency

Exposure to energy from radio frequencies is an important safety issue. Keep a distance of at least 20 cm (7.8 inches) between people and any radiating antenna. Keep a distance of at least 20 cm between transmitting antennas.



WARNING: Products using cellular modem or an RTK base station can transmit radio frequency energy. Check with your dealer.

This device is designed to operate with TPA approved antennas. Discuss with your dealer.

Preparation for Operation

- Read and understand this manual and learn all of the controls before you use the equipment.
- Keep the manual with the equipment.
- If the equipment is moved to another vehicle, move the manual as well.
- Read the manual for the vehicle with which the equipment will be used and check that the vehicle has the correct equipment required by local regulations.

- Make sure you understand the speed, brakes, steering, stability, and load characteristics of the vehicle before you start.
- Check all controls in an area clear of people and obstacles before starting work.
- Identify possible hazards.



WARNING: Topcon equipment must not be used by an operator affected by alcohol or drugs. Seek medical advice if using prescription or over-the-counter medication.

Disclaimer

Topcon accepts no responsibility or liability for damages to property, personal injuries, or death resulting from the misuse or abuse of any of its products.

Further, Topcon accepts no responsibility for the use of Topcon equipment or the GNSS signal for any purpose other than the intended purpose.

Topcon cannot guarantee the accuracy, integrity, continuity, or availability of the GNSS signal.

The operator must ensure that the equipment is correctly turned off when not in use.

Before operating any vehicle equipped with Topcon products, read and understand the following product specific safety precautions.

Important Safety Information

Operator Alertness and Responsibility

The console helps the operator to steer the vehicle, but the operator remains in charge and must be alert and in complete control of the vehicle at all times. The operator is ultimately responsible for safe operation of this equipment.

It is essential that safety requirements are met when operating the console and any of its components. All operators and other relevant personnel must be advised of safety requirements.

Electrical Safety



WARNING: Incorrectly connected power can cause severe injury and damage to people or the equipment.

When working with electrical components, you must do the following:

- Make sure the negative terminal of the battery is disconnected before doing any welding on the vehicle.
- Check that all power cables to system components are connected to the correct polarity as marked. Please refer to the vehicle manual for safety information.
- Check that equipment is grounded in accordance with installation instructions.

Operation and Risk of Obstacles

The following list is not exhaustive or limited. To use the console for assisted steering along a defined wayline, the operator must ensure that it is used:

- Away from people and obstacles
- Away from high voltage power lines or other overhead obstructions (identify any clearance problems before activating the console)
- On private property without public access
- Within cleared fields
- Off public roads or access ways.

Note that:

- The operator needs to know the vehicle's position and the field conditions at all times.
- The operator will need to respond if the GNSS satellite or differential correction signal is lost momentarily.
- The console cannot detect obstacles (people, livestock or other).
- Only use the console in areas that are clear of obstacles and keep a proper distance.
- Steering needs to be disengaged for manual control if an obstacle appears in the path or the vehicle moves away from the wayline.

On/Off and Manual Control



WARNING: Ensure the steering switch is Off to prevent unintentional engagement of the assisted steering. When repairing or maintaining the vehicle/implement, ensure the vehicle CANNOT be moved. Disengage steering, apply brakes and remove keys.

The operator must ensure that the steering switch is Off (*all* LED indicators are off) when assisted steering is not being used.

The operator must disengage assisted steering and use manual control if an obstacle is in the line of travel or moves into the line of travel, or if the vehicle steers away from the desired wayline.

To disengage assisted steering:

- Turn the steering wheel a few degrees OR
- Select the Disengage Auto Steering button on the console AND/OR
- If using an external steering switch, disengage using the switch if the above actions do not disengage assisted steering.

Vehicle Shut Down Safety

Before leaving the vehicle, disengage assisted steering, disengage external steering switch if this is being used, and remove the key from the key switch.

Using a Reference (Base) Station



WARNING: Do not move a reference station while in operation. Moving an operating reference station can interfere with the controlled steering of a system using the reference station. This could result in personal injury or damage to property.

Operators and other affected personnel must be advised of the following safety precautions.

- Do not erect the reference station under or within the vicinity of high voltage power lines.
- When using the portable reference station, make sure that the tripod is securely mounted.

To Get the Best Out of the Product

Back up data regularly. The console has large, but limited storage capacity. Use the Diagnostics Mini-view to view capacity available. A warning screen displays if storage is reaching its limit.

Be aware of file format compatibility. Discuss compatible formats with the dealer. Topcon Agricultural Products are hardy and designed to work in tough conditions. However, if equipment is unused for a length of time, store away from water and direct heat sources.

Alert Symbols

In this manual two alert symbols are used:

Note: This offers additional information.



WARNING: A warning signal appears on safety signs and in this manual to show that this information is very important to your safety. LEARN these and APPLY them.

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Chapter 1 – Introduction

The YieldTrakk yield monitor is a console device that captures sensor data from a harvesting machine, combines that sensor data with geodetic data, and logs that information to its file system in real time. Simultaneously, the yield monitor displays this geodetic yield data in various formats to the end user.

A typical yield monitor system consists of:

- A mass flow sensor (most common form is an impact type plate)
- A grain moisture sensor
- A GPS receiver
- A console

Note: The yield monitoring software requires a license. Contact your dealer for details.

To enable yield monitoring once it is licensed:

1. Select **System**  / **Features**  / **Implement**  .
2. Select **YIELD MONITORING** and select **Enabled**.

Chapter 2 – Enabling ISOBUS

Enables the ISOBUS Universal Terminal server that allows interaction with the YieldTrakk ISOBUS compliant ECU.

To enable ISOBUS / Universal Terminal:

1. Select **System**  / **Features**  / **Console** .

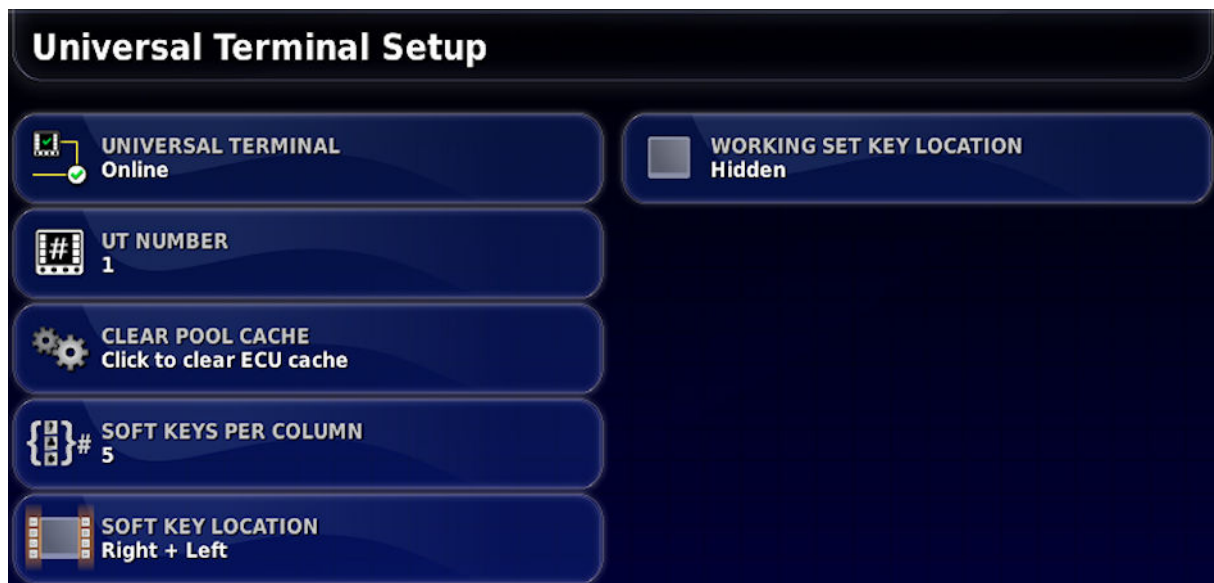


2. Select **UNIVERSAL TERMINAL** and select **Enabled**.

3. Select **System**  / **ISOBUS**  / **UT** .



The Universal Terminal setup page is displayed.



- **Universal terminal:** Controls whether the UT server is actively receiving connections from other devices.
This may be useful if there are multiple UTs on the bus and multiple UTs claim to be the primary UT (in which case the UT will go offline automatically and require the UT Number to be changed before it will go online again), or to temporarily deactivate the UT on the console.
- **UT number:** Sets the UT number for the console. If there are multiple UTs on the bus, use this setting to assign a unique number to this UT to avoid conflicts. The UT with number 1 will be the default UT. If the UT client doesn't appear on the correct UT you may need to reconfigure its UT number appropriately. If there is a conflict, the following message will appear:
'The UT Number of this UT conflicts with another UT on the bus, and this UT has been disabled. Please make sure that this UT has a unique UT Number.'
- **Clear pool cache:** Clears the contents of the UT pool cache. Should only be used if a UT error is displayed.
- **Soft keys per column:** Sets the number of available softkeys on the UT interface on the Operation screen. **Note:** This should be set to 6.

- **Soft key location:** Sets the location of the softkeys on the UT interface and the number of columns (1 or 2). **Note:** Ensure 2 columns is selected.
- **Working set key location:** Sets the visibility and location of the keys that switch the interface between ECUs (if more than one ISOBUS compliant ECU is connected). **Note:** This should be set to **Hidden**.

Note: Ensure that ISO GROUND SPEED and GPS NMEA2000

SPEED are both enabled. These are accessed via the **Implement**

Speed & Position



menu.

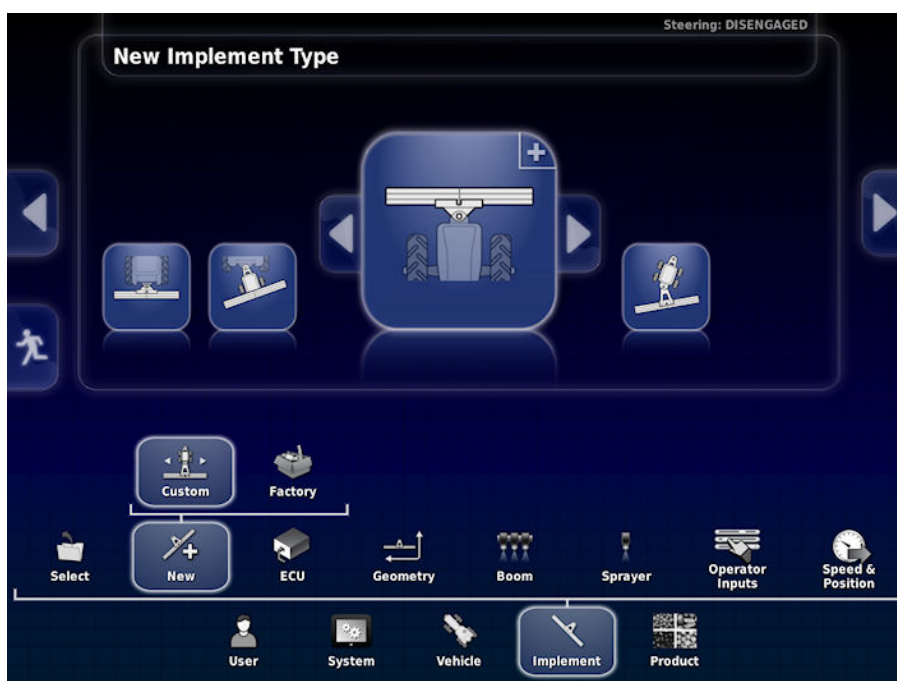


/

Chapter 3 – Setting up a New Implement

Once the yield monitoring functionality is enabled, the connected implement must be set up in the console. Auto section control is automatically enabled to allow auto cut width to work.

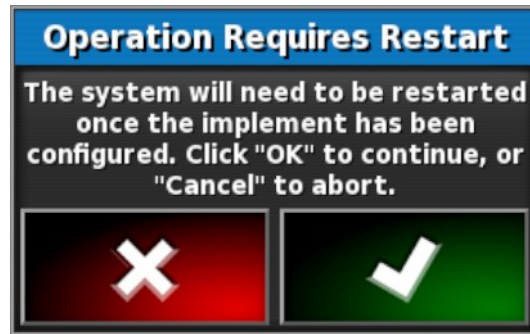
1. Select **Implement**  / **New**  / **Custom** .



2. Use the arrows to choose the type. Type can be Rigid, Pivoted (Tow behind), Front, or Double Pivoted (Tow between).

Note: Front  would usually be selected.

3. The system will warn you that it needs to restart after you have finished setting up the implement. Select  to continue (or select  to cancel the action).



4. Select **IMPLEMENT NAME** if you wish to change the default name of the implement.



5. Enter the preferred name and confirm .



6. Confirm  the new implement details to continue.

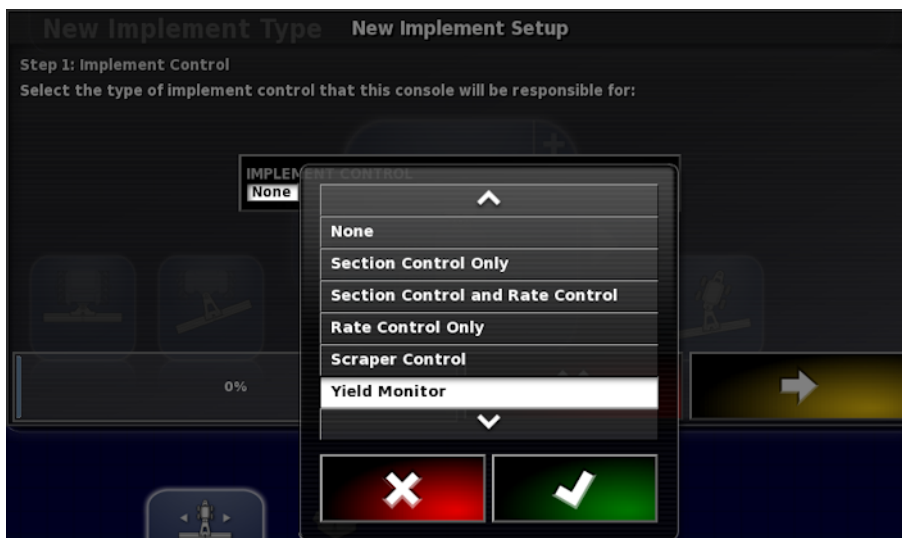
The ECU setup wizard starts. The wizard contents are dependent on the selections made.

Note: If you make a mistake in the wizard, it is possible to go back and change a selection.



7. Select **IMPLEMENT CONTROL**.

8. Select **Yield Monitor**, confirm  and select next .



9. Select **YIELD MONITOR**.

10. Select the required yield monitor (**YieldTrakk – YM-1**) and select next .

11. When the screen shows that the setup is complete, confirm . The console will restart.



12. Ensure the implement setup is complete and correct. Refer to Implement Setup in the Guidance and Auto Steering Operator Manual for instructions.

3.1. Setting the implement geometry

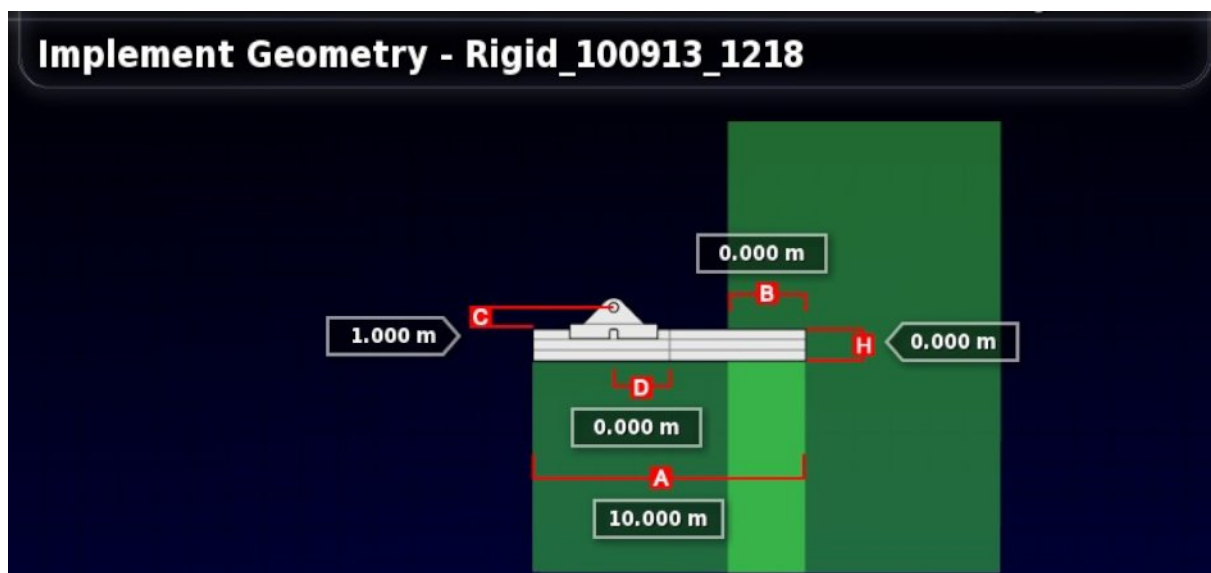
Sets the implement measurements so that guidance can work accurately.

Note: Measure the implement dimensions as accurately as possible. The recommended tolerance is +/- 5 cm.

When an ISOBUS implement is connected, some of the geometry items are provided by the implement and cannot be altered in the console. Any changes to these must be made in the implement ISOBUS UT control screen.

To set the implement geometry:

1. Select **Implement**  / **Geometry** .



2. Select an implement dimension. The name of the dimension appears in the title bar.

Dimensions requested vary according to the type of implement selected.

3. Add or adjust dimensions where needed and confirm.

Measurements used are as follows:

- **Swath Width:** Measures the working width of the implement (that is, the width of the area that is treated during one pass of the implement).

3.1. Setting the implement geometry

- **Working Length:** Length from the start to the finish of the working area of the boom. Together with swath width, it defines the 'Working Area', which is the region that product is applied over for that boom.
- **Overlap:** Measures the width of the overlap between two adjacent passes.
- **Implement Offset:** Measures the distance between the hitch point and the wheels of the implement.
- **Implement Wheels Offset:** Measures the distance between the wheels and the working area of the implement.
- **Inline Offset:** Measures the off-center offset of the implement relative to the hitch point. Enter a positive number if the implement is shifted to the right and a negative number if it is shifted to the left.
- **Trailer Offset:** Measures the distance between the trailer hitch point and the trailer wheels.
- **Trailer Wheels Offset:** Measures the distance between the implement hitch point and the trailer wheels.

3.2. Setting up the master switch

The master switch turns on the application control and also enables the coverage map on the guidance screen.

To set up the master switch:

1. Select **Implement**  / **Master Switch**  .

Virtual

Enables the master switch to be operated by selecting the virtual master switch on the console Operation screen.

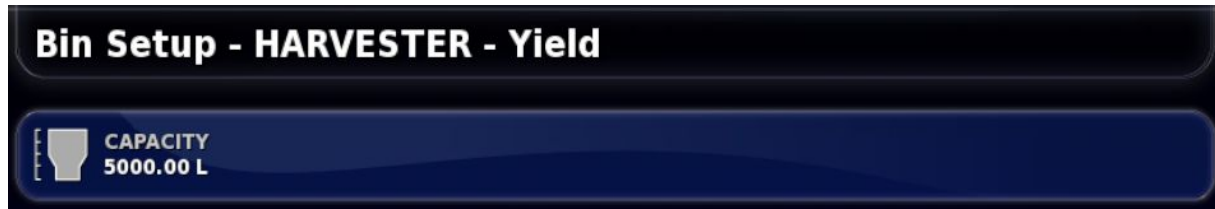


Follows device work state

Follows the state of the YieldTrakk ISOBUS ECU. The virtual master switch is then for status display only.

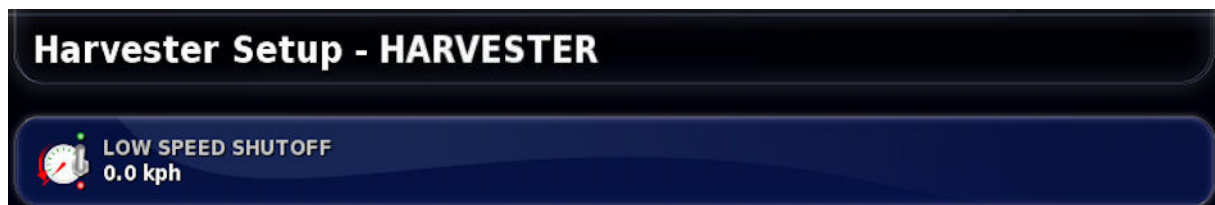
3.3. Setting up the harvester

1. Select **Implement**  / **Harvester**  / **Bin**  .



- **Capacity:** The volume of the combine bin.

2. Select **Implement**  / **Harvester**  / **ISOBUS Settings**  .



- **Low speed shutoff:** Sets the speed at which the master switch will disengage. If it is set to 0.0 kph, the feature is off.

Chapter 4 – Console Controls

4.1. Using the master switch

When **Virtual** has been selected in the Setup screen (**Implement**



/ **Master Switch**



), the harvester master switch on the Operation screen turns the harvester system on. This switch does not work if **Follows device work state** is selected as the master switch.



The switch also indicates the readiness of the system:

Red

Harvester controller is off and cannot be used. Select the master switch to see possible causes of the problem. See example below.

Green

Harvester controller is on and working. Select the master switch to turn the harvester off.

White

Harvester Controller is ready to use. Select the master switch to turn the harvester on.



Green indicates that the system is ready.

Red indicates that the system is not ready.



Select to return to the main screen and complete the necessary action.

Note: When the master switch is turned off during harvesting, the master switch flashes yellow and a countdown is displayed. This

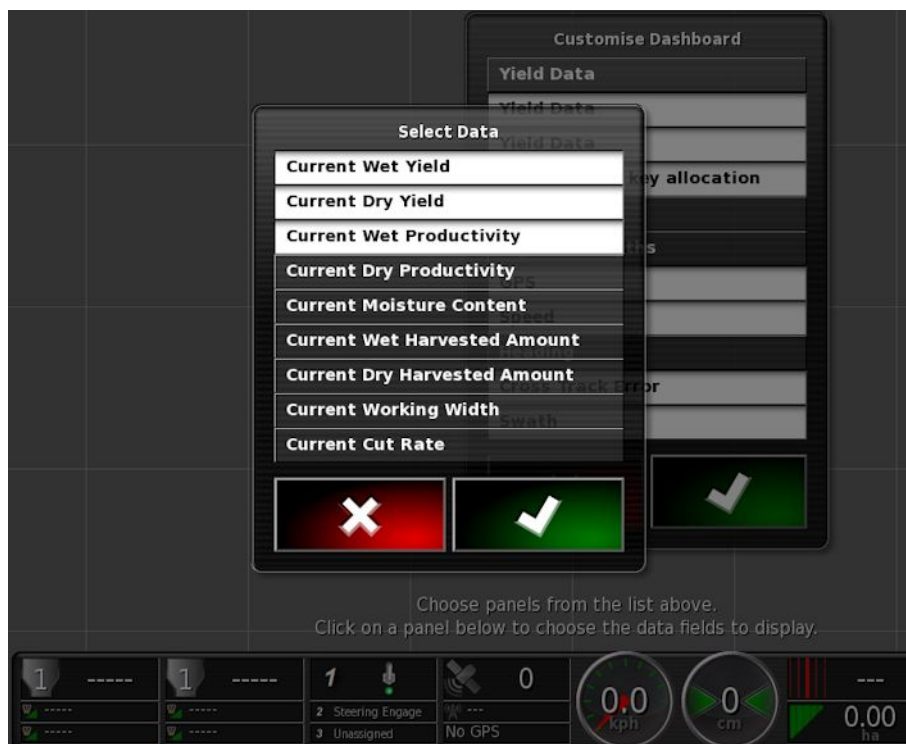
4.1. Using the master switch

indicates that task shut down is delayed so that the final crop harvested has time to pass the yield sensors before the task is stopped.

4.2. Using the yield monitor dashboard

Yield monitor information is added to the dashboard when the harvester controller is enabled.

1. Select anywhere on the dashboard to customize the information it displays.
2. Press again on the particular panel to be customized and further options display.
3. Deselect and select options as required.



4. Confirm the new dashboard display. The selected options appear on the dashboard.

4.3. Opening the yield monitor mini-view

The yield monitor controller appears in a mini-view accessed via the navigation bar on the left side of the operation screen.

Note: The figures displayed in the mini-views may also be shown via the YieldTrakk UT screens. See page 31.

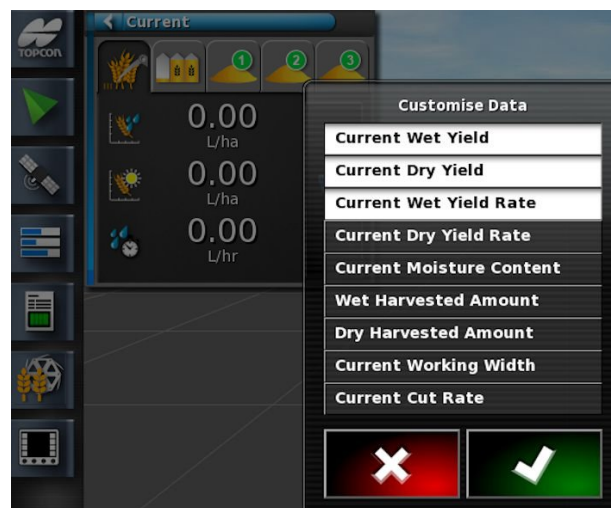
1. Select the **Yield Monitor Controller** to open a mini-view .



Use the mini-view to monitor yield data for current harvest, job totals and sub-totals.

The information displayed may be customised.

2. Press the information area of the mini-view to display the options available.



3. Deselect and select options as required.

4.3.1. Harvest current



1. Press the information area of the mini-view to display the options available.



- **Current wet yield:** T/Ha (Bu/Ac) based on the raw yield data.
- **Current dry yield:** Calculated T/Ha (Bu/Ac) based on current wet yield data with respect to the desired moisture reference point (i.e. after it has dried). The moisture reference point is set via the YieldTrakk UT interface.
- **Current wet productivity:** T/Hr (Bu/Hr) Raw yield sensor data.
- **Current dry productivity:** Calculated T/Hr (Bu/Hr) based on the current wet productivity with respect to the desired moisture

4.3. Opening the yield monitor mini-view

reference point. The moisture reference point is set via the YieldTrakk UT interface.

- **Current moisture content:** Percentage raw moisture sensor data.
- **Wet harvested amount:** Raw Total Tonnes (Bu) harvested.
- **Dry harvested amount:** Calculated Total Tonnes (Bu) based on the wet harvested amount with respect to the desired moisture reference point. The moisture reference point is set via the YieldTrakk UT interface.
- **Working width:** In metres (inches) measuring how much of the combine's header is actually harvesting (uses auto-cut-width from existing coverage to vary this).
- **Current cut rate:** Ha/Hr (Bu/Hr) based on speed and working width. Sometimes used as a measurement of productivity.

2. Deselect and select options as required.

Product configuration

The **Product Configuration** button  displays the Yield window. This window selects the product being harvested and internally maps it to the rate channels.



1. Select **PRODUCT NAME** to select a product from the list, or to add a new product.



Selecting **New Product** opens the New Product Setup wizard.



Follow the wizard to add a new product. **Custom Product** may be selected to create a new product from scratch, or a product template may be selected from the list.

Note: The product rate settings defined below are not relevant for yield monitoring.

- **Product rate increment:** Defines how much the application rate will change when the operator presses the application rate up/down button. The rate can be changed by a fixed rate or by a percentage of the rate set for **Product rate preset 1**. To change the rate increment type:

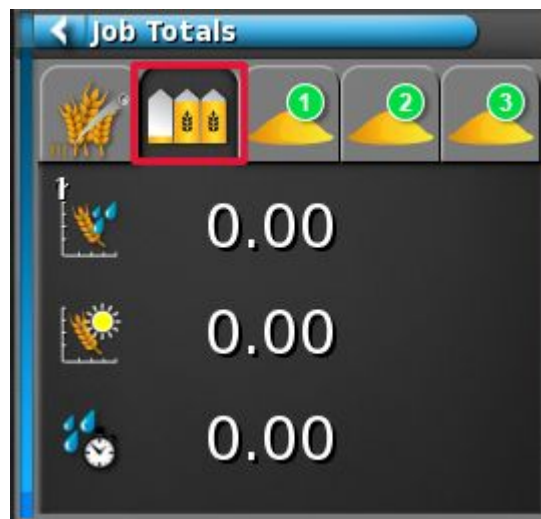
4.3. Opening the yield monitor mini-view

1. On the Setup screen, select **User / Region / Units**. The **APPLICATION RATE INCREMENT TYPE** may be set to **Fixed rate** or **Percentage of Preset 1**.

- **Rate preset 1 / Rate preset 2**: Defines preset application rates.

4.3.2. Job totals

The totals displayed on this mini-view are reset when a new job is started.



1. Press the information area of the mini-view to display the options available.

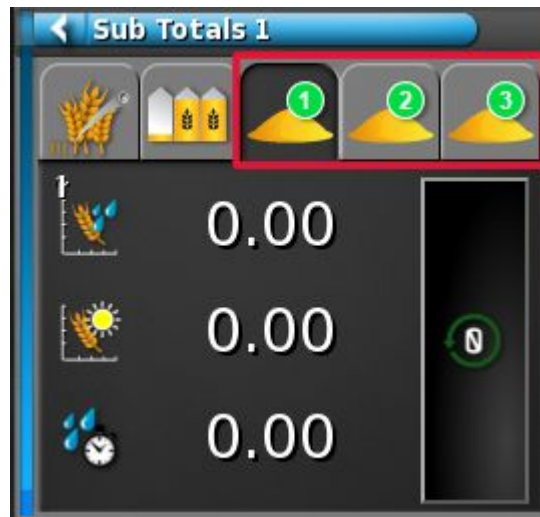


2. Deselect and select options as required.

4.3.3. Sub totals

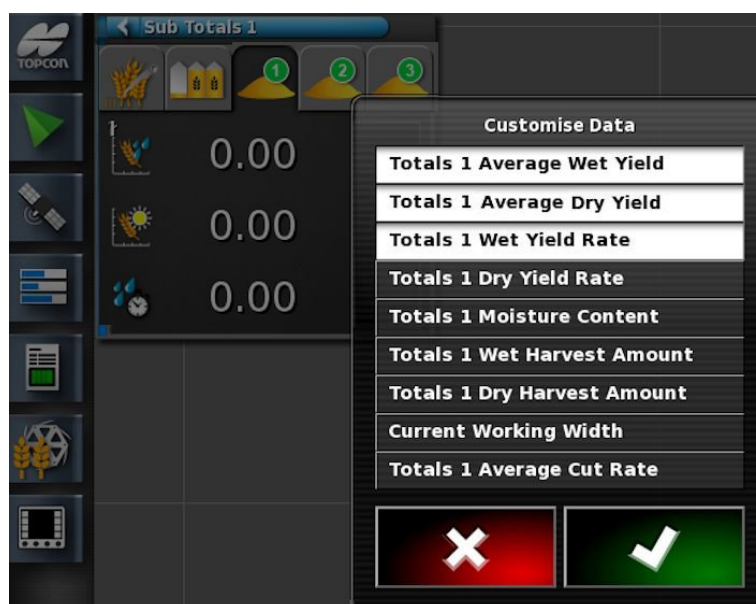
Sub totals are independently re-settable subtotals, typically reset when the bin is emptied to keep track of the total per bin load (for example; harvested amount and moisture content).

This could also be used to keep track of harvest subtotals per truck.



The **Reset task window** button  opens a confirmation screen to clear the data stored for the currently selected sub totals.

1. Press the information area of the mini-view to display the options available.

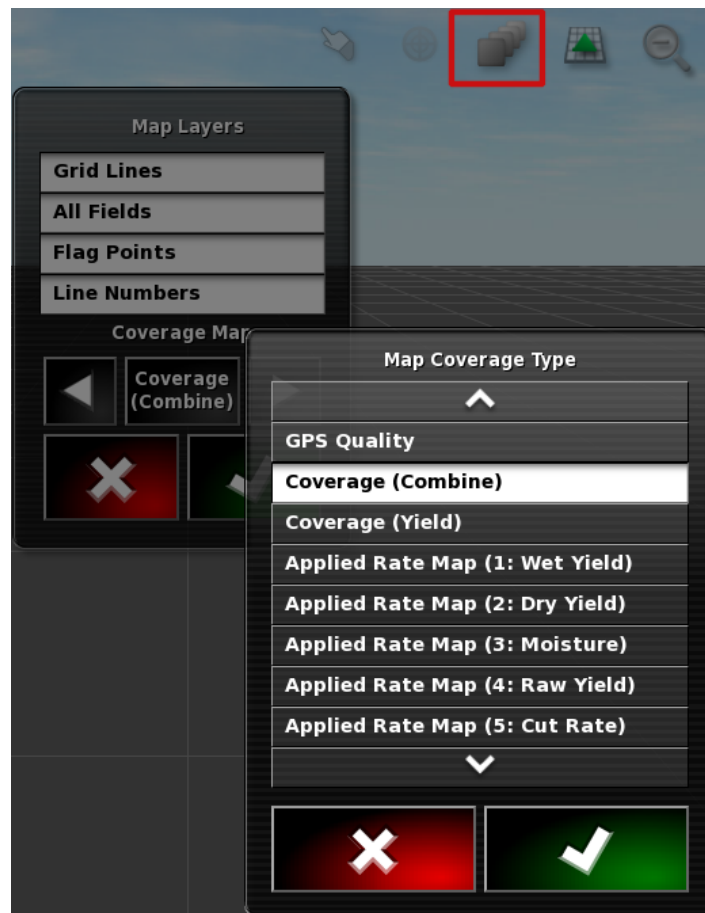


2. Deselect and select options as required.

4.4. Viewing map layers

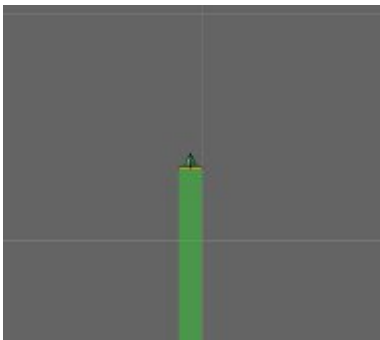
The coverage map selector enables one type of coverage map to be selected.

1. Select the highlighted icon to choose which coverage and information layer will appear on the screen.

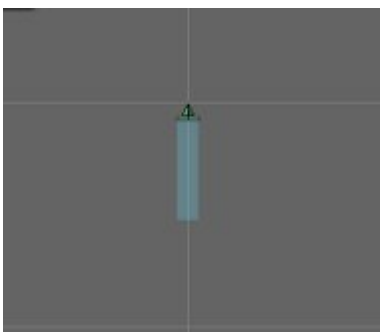


2. Press the center button and select from the list or press the left/right arrows to scroll through the list with a live preview of that layer in the map in the background.
- **Coverage (Combine):** Shows the area covered by the harvester.
 - **Coverage (Yield):** Shows the area covered by the harvester with a delay value equal to the time taken for the crop to get from the header to the yield sensor. Refer to the **Delay Time** figure in Yield sensor, page 47.
 - **Applied rate map (wet yield):** T/Ha (Bu/Ac) based on the raw yield data.

- **Applied rate map (dry yield):** Calculated T/Ha (Bu/Ac) based on current wet yield data with respect to the desired moisture reference point (i.e. after it has dried).
- **Applied rate map (moisture):** Percentage raw moisture sensor data.
- **Applied rate map (raw yield):** Reports exactly what the yield sensor is measuring at that point in time in T/Hr. Sometimes referred to as productivity.
- **Applied rate map (cut rate):** Ha/Hr (Bu/Hr) based on speed and working width. Sometimes used as a measurement of productivity.



Coverage shows in green.



Applied rate shows in selectable colors.



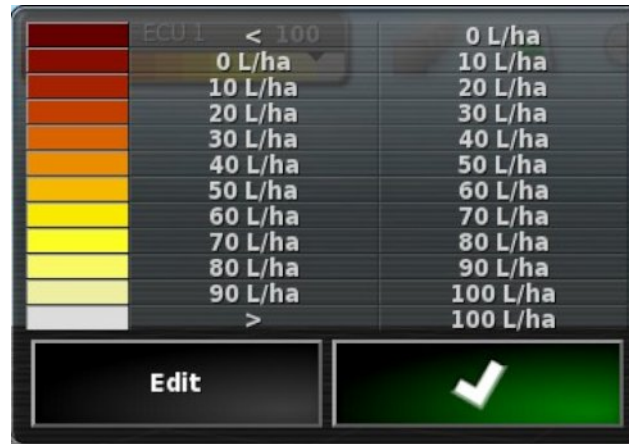
Legend displays for applied rates.

4.4.1. Editing the legends

The legends that are displayed for Applied Rate may be edited.

1. Click on the legend to display the legend color and range map.

4.4. Viewing map layers



2. Select **Edit** to change the colors and ranges used.

Chapter 5 – YieldTrakk Operation

5.1. Getting the best results

To achieve the best possible accuracy, the system must be properly set up and maintained. The main points to observe are:

- If harvesting particularly oily crops, check that the grain sensor lenses and the moisture sensor fin stay reasonably clean.
- Cross-check moisture readings and grain density settings by measuring reference samples of the crop at the start.
- Check and if required tare (zero) the yield reading with the harvester running empty.
- The clean grain elevator chain should be in good condition and correctly tensioned.

5.2. Operation checklist

Step	When / why?	How?
Check tare	At least once per day, or more often with dirty or oily crops.	See Set tare screen, page 43.
Set crop type	Whenever a different crop type is harvested.	See Crop settings screen, page 36.
Check storage moisture percentage	If incorrect, DRY weight totals will be incorrect.	See Crop settings screen, page 36.
Harvest a short strip	For initial calibration of crop moisture and density.	

5.2. Operation checklist

Step	When / why?	How?
Test moisture percentage and adjust	At regular intervals throughout the day. Adjustment is needed if the harvest moisture reading is different from that of a reference moisture meter.	See Crop settings screen, page 36.
Test crop density and adjust (kg/hl)	At regular intervals throughout the day. An incorrect density setting is one of the most likely causes of inaccurate yield data.	A grain weight tester is supplied with the system. This is used to determine the value to enter on the Main screen, see page 33.
Compare actual weight with calculated weight	Adjustment may be required if YieldTrakk provides consistent discrepancies between its yield readings and the weighbridge readings. Note: Always check moisture % and crop density before adjusting Crop Cal. Factor.	See Crop settings screen, page 36.

5.3. Troubleshooting

Periodically it may be necessary to replace the lenses. The type of crops being harvested will affect how often this is required.

To check the condition of the lenses:

1. Refer to the Set Tare screen (see page 43). If the frequency (Freq.) is stable, but the % darkness (Actual %) fluctuates more than 1% when the elevator is being run empty, the lenses may require replacement.
2. Unscrew the lenses and look through them.
3. If they are opaque, replace them.

Note: It is very important that the % darkness figure is stable when the elevator is being run empty. Any error will directly affect the accuracy of the system. For example, 5% fluctuation = 5% error in yield measurement.

5.3. Troubleshooting

Chapter 6 – UT Screens

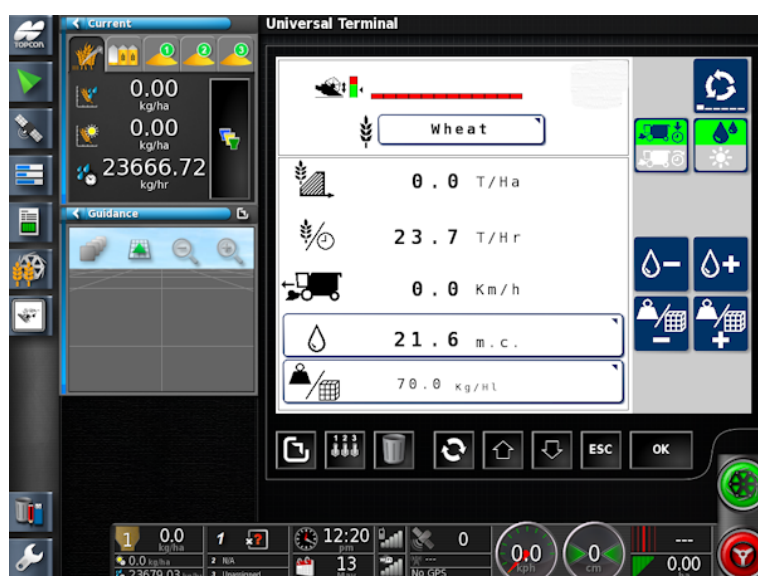
6.1. Opening the YieldTrakk UT window

To view the YieldTrakk UT window:

1. Select the UT icon on the left of the operation screen .



The mini-view may be expanded to display in the main window by selecting the arrow in the top right corner, or by swiping left to right across the mini-view (ending the swipe to the right of the mini-view screen).



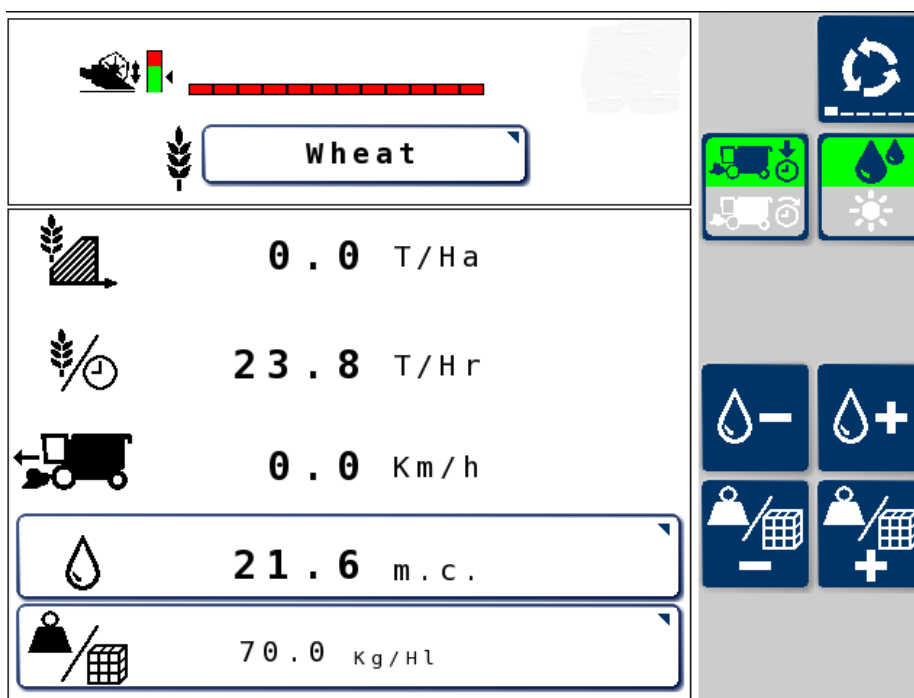
6.2. Units displayed

Function	Units		
	Metric	Imperial (UK)	Imperial (US)
Yield	tonnes/ha	tons/acre	bushels/acre
Productivity (output)	tonnes/hr	tons/hr	bushels/hr
Cut rate (work rate)	ha/hr	acres/hr	acres/hr
Forward speed	km/hr	miles/hr	miles/hr
Part / total area	hectares	acres	acres
Part / total weight	tonnes	tons	x1000 bushels
Crop density	kg/hl	lbs/bushel	lbs/bushel

The displayed units can be changed via the console Setup screen
; **User / Region / Units.**



6.3. Main screen



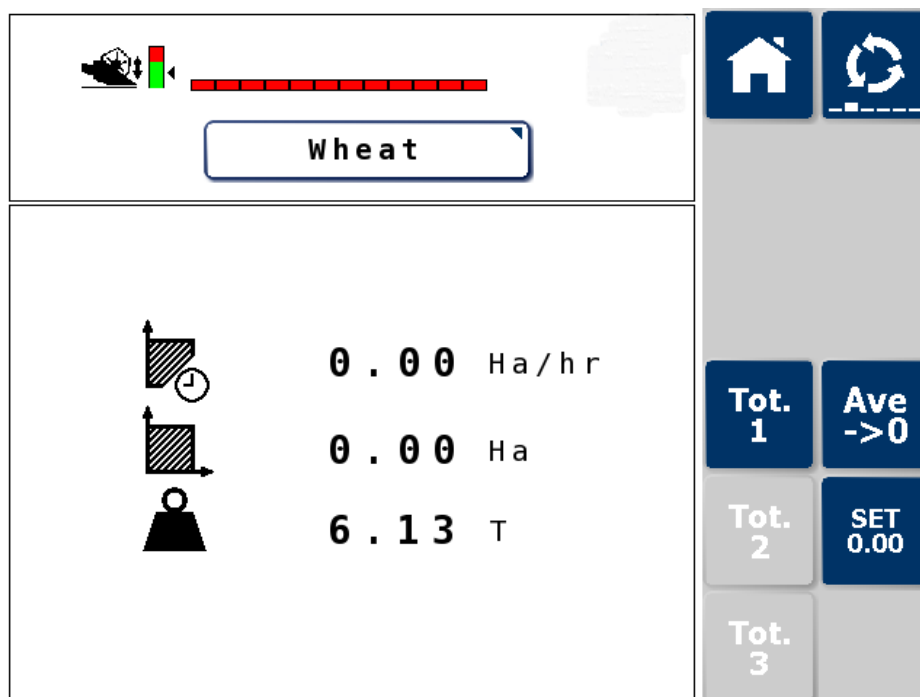
The  button is used to cycle through the YieldTrakk UT screens.

Icon	Description
	Header height cut out Displays the header height at which data logging will stop. Refer to Crop settings screen, page 36.
	Working width This is set on the Header Setup screen, Width setting. See page 39. Once set, it is controlled by auto section control.
	Crop type Press to select the crop type.
	Yield

6.3. Main screen

Icon	Description
	Productivity (output) (mass/hour)
	Forward speed
	Switch between current (instantaneous) readout and average readout for the current job.
	Set quantity readouts based on 'wet' or 'dry' content.
	Moisture content Select, then use  and  to change the moisture content.
	Crop density Select, then use  and  to change the density. Displayed as kilograms per hectoliter (kg/hl) or pounds per bushel (lb/B). Note: Incorrect density is a likely cause of inaccurate yield results. Check the density regularly. Adjusting the density does not change existing crop data.

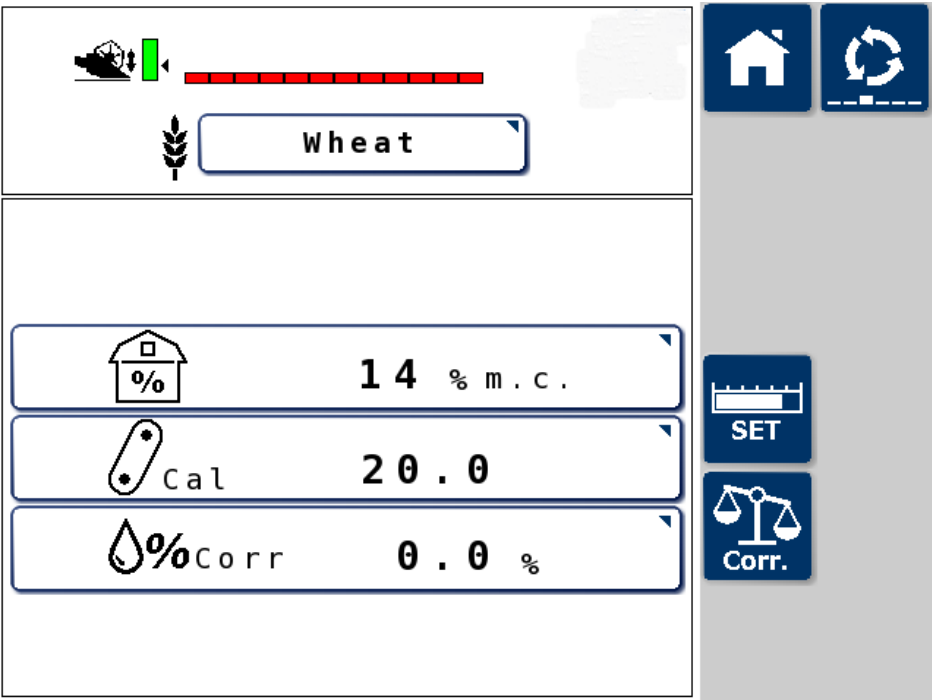
6.4. Totals screen



This screen can display three totals values, which can be reset independently.

Icon	Description
	Cut rate (work rate) (area/hour) since last reset.
	Area total harvested since last reset.
	Total yield quantity since last reset (reset should be performed once the combine is emptied).
	Resets the Yield and Productivity averages displayed on the Main screen to zero.
	Resets the displayed total value to zero. Select the total to be reset, press the reset button and press OK to confirm.

6.5. Crop settings screen



The settings shown on this screen are pre-programmed for the following crops: Wheat, barley, oats, oilseed rape (canola), linseed, beans, peas and maize (corn). It is also possible to define two further crop types.

Displayed settings may require adjustment for specific crop conditions. Adjustments cannot be made while logging data. The job must be completed and the adjustments made before starting a new job.

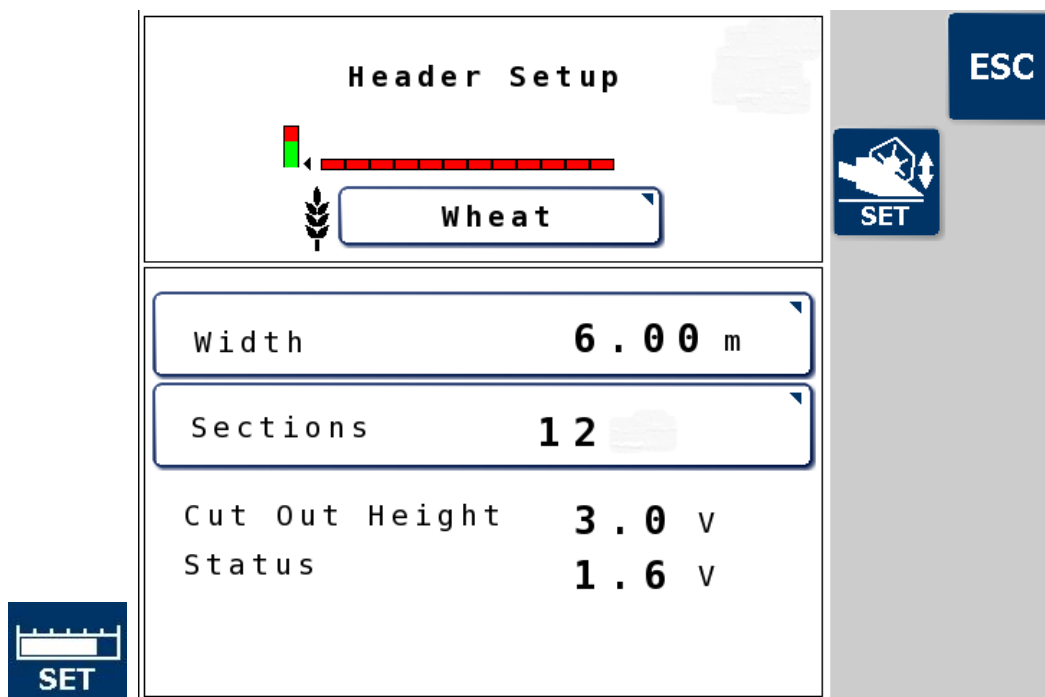
Icon	Description
	Crop type Press to change the crop type.
	Storage moisture content The storage moisture content (specific to each crop) determines the dry yield value displayed. If the harvest moisture content drops below the set storage moisture content, the harvest weight stays equal to the dry weight.

Icon	Description
	Crop calibration factor The default crop calibration factor (supplied on the calibration spreadsheet with the install guide) will generally require slight adjustment due to crop variation, crop varieties and harvester operating characteristics. Note: Discrepancies between the yield readings and the weighbridge readings may indicate that crop calibration factor adjustment is required, however this may also be caused by inaccurate tare, crop density or moisture content settings. These should be checked first. Select  to calculate the correction percentage, which will update the crop calibration factor on this screen. See page 41. A new calibration factor corrects all existing summary data. It is good practice to make a note of the existing factor for future reference prior to adjustment. The new factor is calculated as follows: (existing factor x true weight) ÷ displayed weight reading.

6.5. Crop settings screen

Icon	Description
	Moisture correction factor. This figure is only required if a moisture sensor is fitted. This setting may require adjustment if the storage moisture content reading is different from that of a handheld moisture meter. If Storage Moisture Content (% m.c.) is 14 and the moisture meter reading is 10, you would enter -4 here. If a large offset is required, first check that the fin on the moisture sensor is clean. (If it is clean, the sensor may need re-calibrating). If the Moisture Content figure is manually adjusted on the Main screen, it is this figure that will be adjusted. Note: If no moisture sensor is fitted, or it is switched off, the default moisture content is set to 16% for all crops. Note: This setting is the same as the % Corr setting on the Moisture Sensor screen. See page 49.
	Opens the Header Setup screen, which allows settings for the cutter bar (changes per crop). See page 39.
	Select to calculate the correction percentage, which will update the crop calibration factor on this screen. See page 41.

6.5.1. Setting up the header



Header Setup

  **Wheat**

Width 6 . 0 0 m

Sections 1 2

Cut Out Height 3 . 0 v

Status 1 . 6 v

SET

ESC

SET

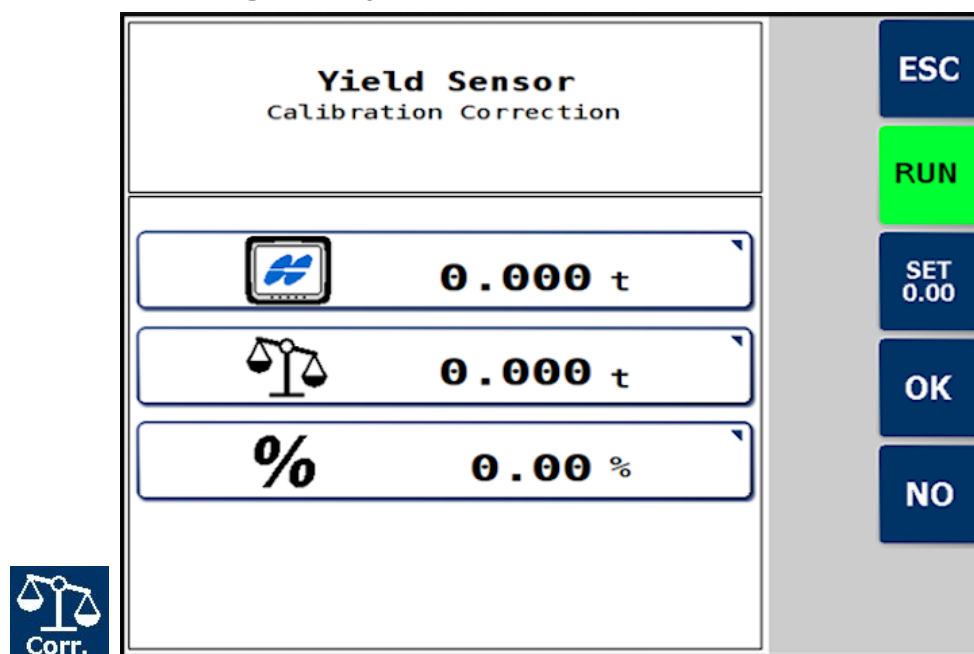
Cut Out Height and **Status** display as zero if Switch type is selected on the Header cut out sensor, page 45.

Icon	Description
Width	The actual working width of the header or cutting surface unit. This will vary depending on the operator but is typically 0.25 meters (10") less than the maximum width of the header.
Sections	The number of equal width sections that the actual working width is divided into.

6.5. Crop settings screen

Icon	Description
Cut out height	Cut out height Sets the header (table) height at which the sensor will start/stop recording harvest data. The current position of the header is shown on the following icon:  To set the cut out height: 1. Ensure the required crop type is selected. 2. Move the header height to just above the required cutting height. 3. Press  to set the cut out height. This height should be set for each crop type.
Status	The voltage signal from the header (table) height sensor.

6.5.2. Calibrating the yield sensor



This screen is used to display the yield reading displayed by YieldTrakk and the weighbridge (true weight) reading to calculate the correction percentage.

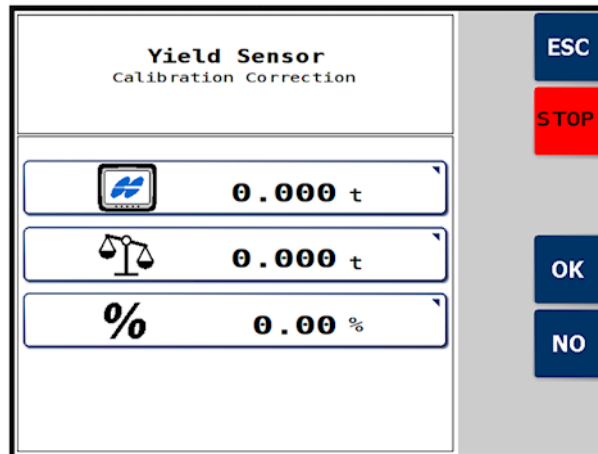
Icon	Description
	Yield reading displayed by YieldTrakk (displayed on Totals screen ). Press to enter value.
	Weighbridge reading (true weight). Press to enter value.
	Displays calculated correction percentage, which automatically corrects  Cal on Crop Settings screen.

To calibrate the yield sensor:

1. Ensure the combine tank is empty before starting the calibration and that the machine is stationary.
2. Press **SET 0.00** to reset the calibration total to 0.

6.5. Crop settings screen

3. Press **RUN** to start the calibration.
4. Harvest a known quantity of a crop. This may be one or multiple tank loads. **Note:** The quantity of crop unloaded must be known.
5. Once the tank has been emptied and the machine is stationary, return to the calibration page and press **STOP**.



The amount shown next to the Topcon Console logo  is the total calibration load calculated by YieldTrakk. This figure will no longer increase (whilst calibration mode is 'stopped').

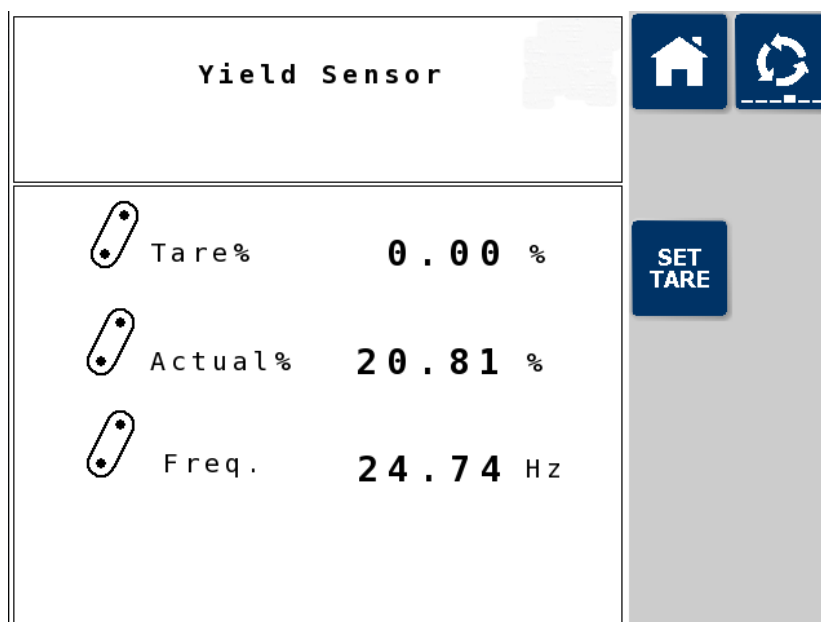
If required, harvesting can now continue until you get the actual calibration load weight from the weighbridge.

6. Enter the actual weight of the calibration harvest next to the scale logo .

The correction percentage is now shown .

7. Press **OK** to accept or **NO** to cancel.

6.6. Set tare screen



It is good practice to set tare at least once a day, or more often if harvesting oily or dirty crops. This informs the system of the height of each empty paddle in the clean grain elevator. While harvesting, this tare value is removed from each paddle reading so that just grain is being measured.

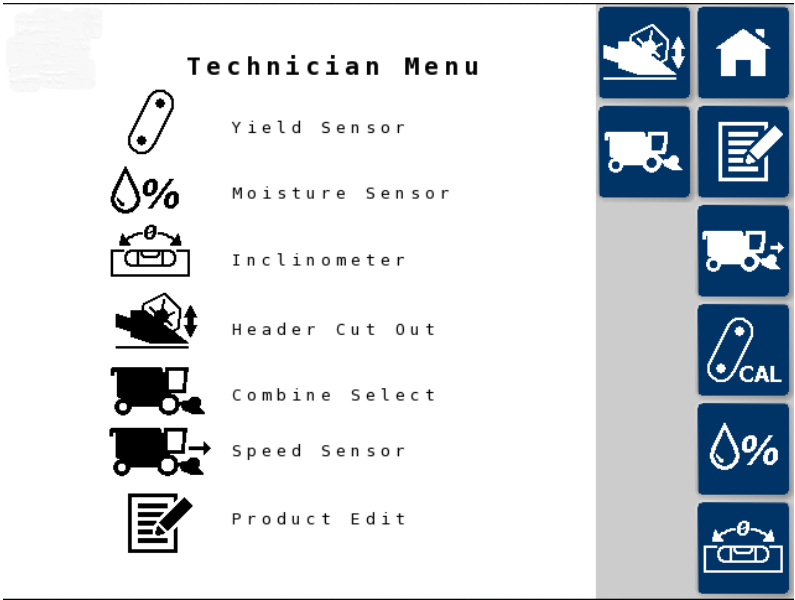
1. Ensure the harvester is on level ground.
2. With the grain elevator empty, run the harvester at normal threshing speed.
3. Press **SET TARE**. Figures are automatically adjusted.

Tare = unladen weight. Setting the tare is the same as zeroing scales.

Icon	Description
Tare%	Percentage of darkness when machine is not harvesting (empty paddles on grain elevator)
Actual%	Shows percentage of darkness being measured by optical sensors on clean grain elevator
Freq.	The chain speed, should be constant. This shows the paddles per second seen by the sensors.

6.7. Technician screen

This screen requires a password to enter.

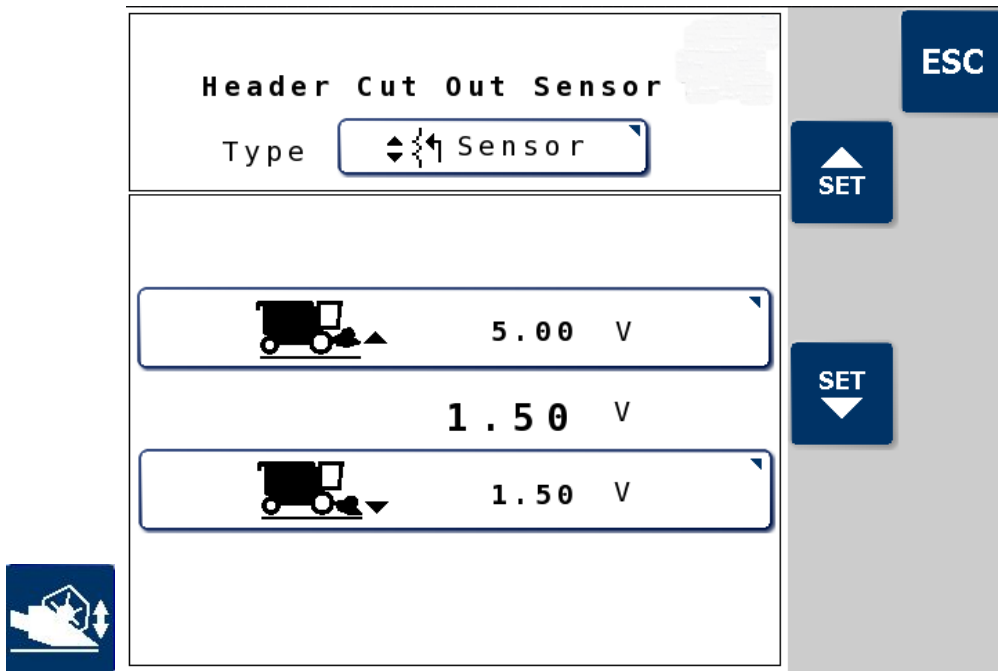


Press the buttons on the right to select the required screen.

Icon	Description
	Header cut out sensor. See page 45.
	Combine select. See page 46.
	Product edit. See page 46.
	Speed sensor. See page 47. Note: This screen is currently N/A.
	Yield sensor. See page 47.
	Moisture sensor. See page 49.

Icon	Description
	Inclinometer. See page 52.

6.7.1. Header cut out sensor



Note: The header cut out **Type** may be **Sensor** or **Switch**. The settings on this page are only applicable if a sensor is installed.

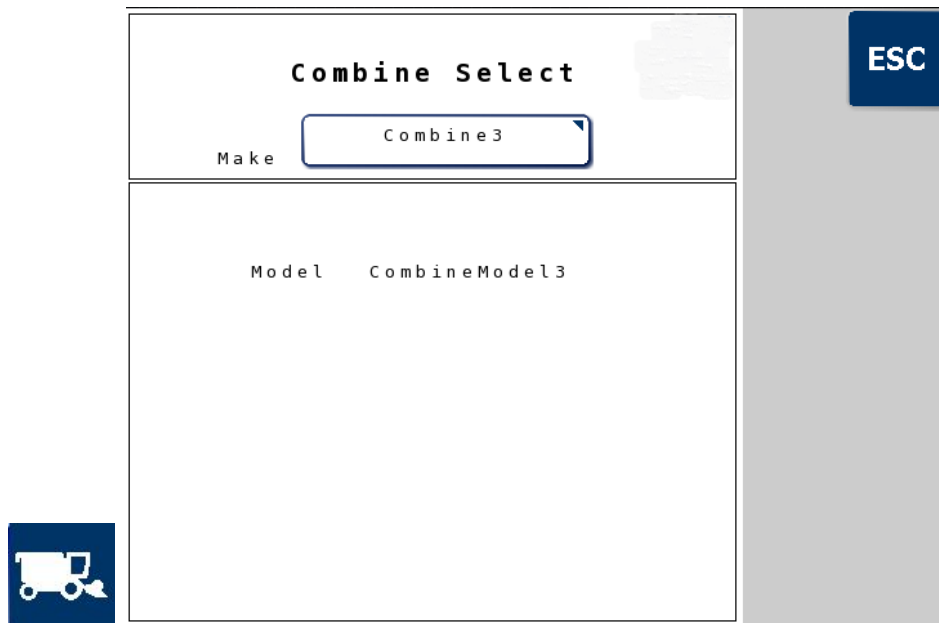
Icon	Description
Type	Press to select Sensor or Switch .
	Sensor maximum voltage Displays the sensor voltage at the upper limit of the header height. Move the header as high as it will go and press the  button.
	Sensor minimum voltage Displays the sensor voltage at the lower limit of the header height. Move the header to the ground and press the  button.

6.7. Technician screen

Once the maximum and minimum voltage are set for the header, the header cut out height must be set. Refer to Setting up the header, page 39, Cut out height.

6.7.2. Combine select

Use this screen to select a different combine if the whole system is moved to a different combine. Setup values for the original combine are saved.



Combine Select

Make

Model CombineModel3

ESC



6.7.3. Product edit

Use this screen to edit the name of products displayed on the product list.



Product Edit	
0:	Wheat
1:	Barley
2:	Oats
3:	Oilseedrape
4:	Linseed
5:	Beans
6:	Peas
7:	Maize
8:	Crop1
9:	Crop2

ESC

6.7.4. Speed sensor

Note: This screen is currently N/A and should not be altered.

6.7.5. Yield sensor



Yield Sensor	
PC Tare	0.000
PC 1	5.730
PC 2	10.100
PC 3	17.290
PC 4	23.760
PC 5	30.120
Delay Time(sec)	9.0
% Darkness Smoothing	50
IP02 zero Smoothing	40

ESC

AUTO CAL

There are six calibration points (PC points) that enable accurate yield measurement from zero throughput (PC Tare) to maximum throughput (PC 5) of grain in the clean grain elevator. PC points are derived from

the measurement of grain throughput in barn tests on a wide range of combine makes and models.

The 'PC Points' can be found on the calibration spreadsheet that is supplied in the installation manual, or they can be calculated by doing barn tests.

Delay Time: The grain sensor is measuring grain that entered the combine some time earlier. A programmable 'yield delay' is needed to match the measured grain flow to the work rate measured when that grain entered the combine. This is the time taken for the crop to get from the header to the yield sensor. The figure is supplied on the calibration spreadsheet.

Darkness smoothing and IP02 zero smoothing are smoothing settings that should not be altered.

Auto Cal

Note: This process is only required if a new combine type is being used that does not have the PC Points supplied on the calibration spreadsheet. Alternatively, a barn test can be used to determine the PC Points for a new combine type.

This procedure should be used if it is not possible to do a barn test.

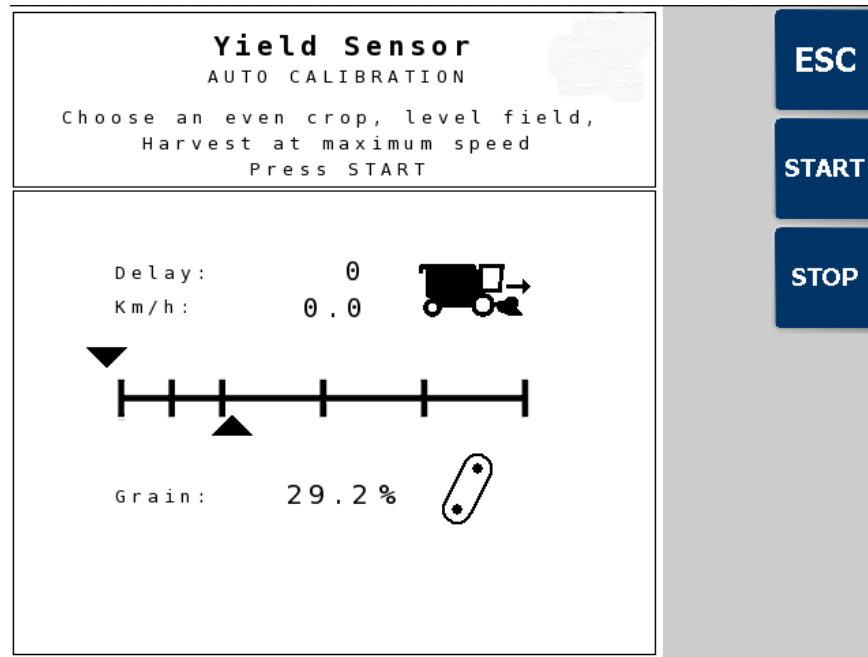
To perform an auto calibration:

The following AUTOCAL procedure calibrates the yield sensor(s) in a field test under real harvest conditions.

Position the combine in an area of the field with a good crop (wheat or barley will give the best results) where there are no tramlines or flattened patches. This will obviously affect the quantity of crop going through the machine so the test must be carried out on a continuous section of crop.

1. Set the Tare. See Set tare screen, page 43.

2. Select the  button.



The display shows the forward speed and the throughput in the clean grain elevator (% darkness). The indicator bar displays these parameters relative to the calibration points (PCt and PC1 – PC5).

3. Start combining at maximum harvest speed, then press START to begin the calibration. Both indicators should go to the maximum (PC5). When both indicators remain steady for 10 seconds, the instrument beeps three times and the % darkness value is automatically saved for PC5.
4. Slow the forward speed until the top indicator is at the PC4 mark. The bottom indicator will slowly move left.

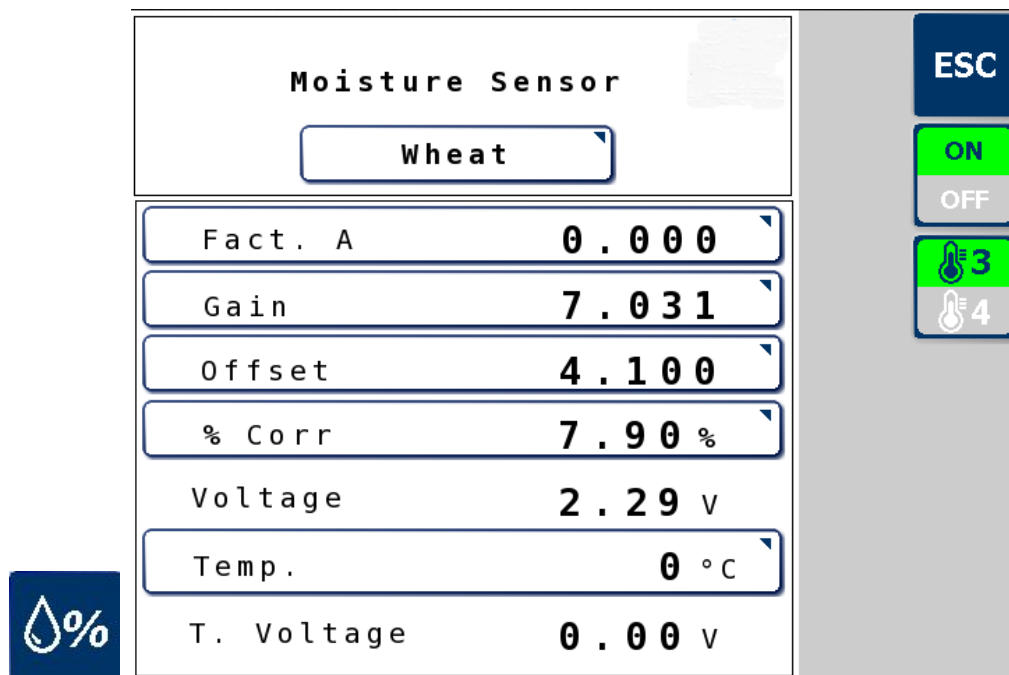
When both indicators remain steady for 10 seconds, the instrument beeps three times and the % darkness value is automatically saved for PC4.

5. Repeat the above step for PC3, PC2 and PC1. This concludes the calibration procedure.

6.7.6. Moisture sensor

Use this screen to calibrate the moisture sensor.

6.7. Technician screen



Moisture Sensor

Wheat

Fact. A 0.000

Gain 7.031

Offset 4.100

% Corr 7.90 %

Voltage 2.29 V

Temp. 0 °C

T. Voltage 0.00 V

ESC

ON

OFF

3 °C

4 °C

Water drop icon with %

If no moisture sensor is fitted press the  button to select **OFF**.

Fact. A: This setting should not be changed.

The **Gain**, **Offset** and **% Correction** values calibrate the moisture sensor to enable accurate readings for crops up to a certain limit of moisture content. They are specific to each crop, so you must first select the required crop.

Gain and Offset

Gain and Offset have been determined for each pre-programmed crop type by a series of calibration tests. They are pre-programmed and do not normally need altering.

Crop	Gain	Offset
Wheat	7.031	4.100
Barley	3.747	10.200
Oats	5.520	8.400
Oilseed rape	2.117	10.000
Linseed	4.000	5.000

Crop	Gain	Offset
Beans	4.013	7.100
Peas	4.000	5.000
Maize	7.907	2.000
Crop1	7.037*	2.000*
Crop2	7.037*	2.000*

*Default values – may need to be adjusted depending on crop type assigned.

% Correction

Note: This setting is the same as the $\Delta\%_{\text{corr}}$ setting on the Crop Settings screen. See page 36.

Voltage

The voltage reading is for diagnostic purposes to indicate that the sensor is operating.

Temp and T. Voltage

Temp: Temperature at the moisture sensor. This can be calibrated by entering the actual known temperature if needed.

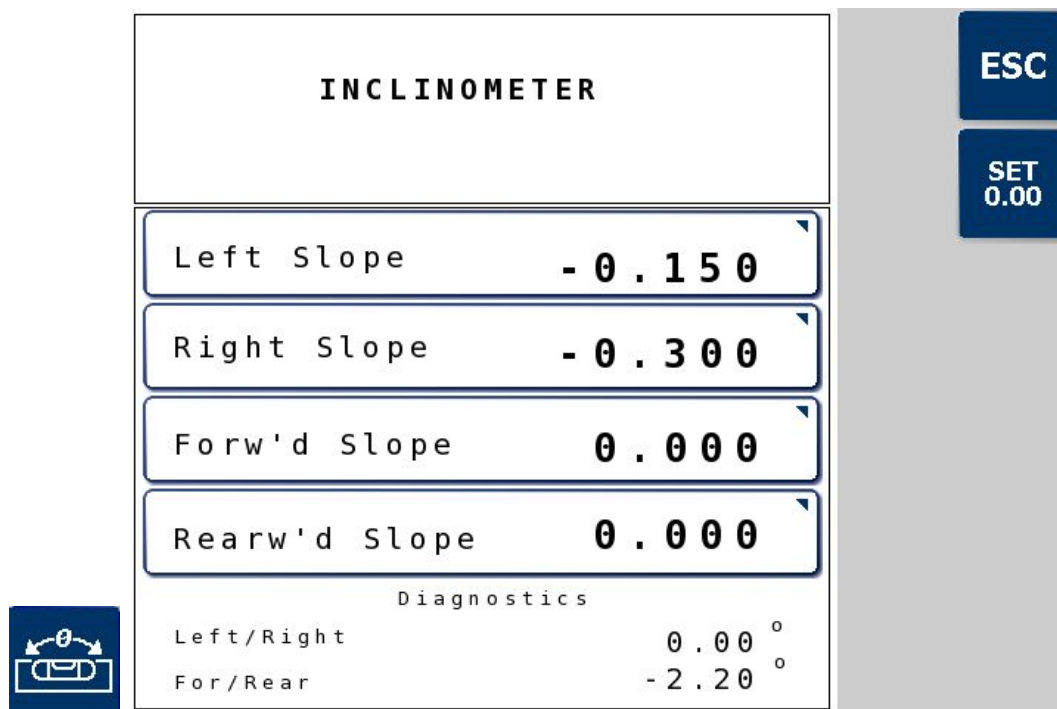
T. Voltage: Voltage feedback from temperature sensor.

3 / 4 button



enables the Mk3 or Mk4 sensor type to be selected.

6.7.7. Inclinometer



The screen displays the following information:

INCLINOMETER	
Left Slope	- 0 . 1 5 0
Right Slope	- 0 . 3 0 0
Forw'd Slope	0 . 0 0 0
Rearw'd Slope	0 . 0 0 0
Diagnostics	
Left/Right	0 . 0 0 °
For/Rear	- 2 . 2 0 °

Buttons on the right: ESC, SET 0.00. A small icon of a harvester is on the left.

Movement on sloping ground alters the distribution of grain on the elevator paddles and affects grain measurement. There are four slope factors that compensate for the effect of side slope and forward / backward slope on the flow of grain through the clean grain elevator. Slope factors are derived from the measurement of grain throughput in barn tests on a wide range of combine makes and models.

The slope factors can be found on the calibration spreadsheet that is supplied in the installation manual. Alternatively, they can be calculated using barn tests.

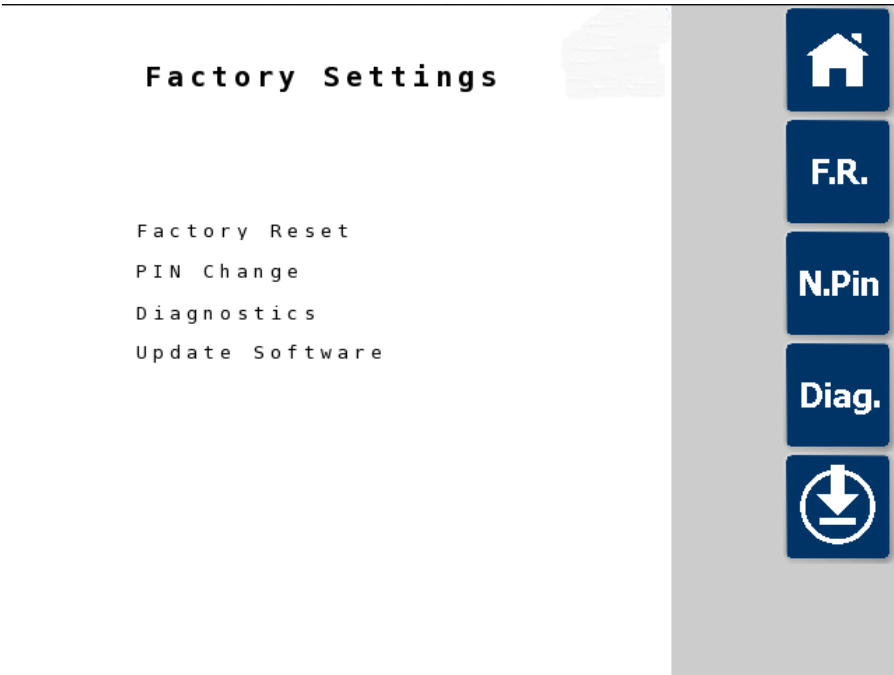
The sensor calculated output should read 0 degrees when level in either axis. This calibration should be checked when the system is installed and then once yearly.

To calibrate: park the harvester on level ground. Assuming that the sensor unit has been mounted correctly, the left/right and forward/rearward readouts should be close to 0 degrees.

Press the  button. The angle sensor is then fully calibrated.

The **Diagnostics** values in degrees shown at the base of the screen are the actual calculated angles of the ECU.

6.8. Factory setup screen



Icon	Description
	Factory Reset Restores all settings to factory default
	PIN Change Change the PIN used to access the Technician and Factory Setup screens
	Diagnostics
	Update Software Refer to Upgrading ECU Firmware, page 57.

Chapter 7 – Exporting Data

Job records can be exported in PDF format to a USB.

Exporting a job places the PDF report in D:/Reports and in D:/Client/Farm/Field/Reports.

Note: Job reports may also be exported as .csv files by enabling **PER-POINT DATA LOGGING** on the setup screen (**System / Features / Console**) before performing the job.

1. Insert the USB into the console.

2. Select **Job Menu**  / **Data Exchange**  / **Export Job**

Report to USB



The Job Report Options screen displays.

3. Select the required option/s:
 - **Auto adjust ranges:** If data exists that uses a color legend, the colors used in the report map shading are altered so that the maximum variation in colors is used to illustrate the yield rates.
 - **Create shape files:** Shape file data is exported to D:/Client/Farm/Field/CoverageShapefiles and D:/Client/Farm/Field/BoundaryShapefiles
 - **Task data:** Exporting a job report also exports XML based task data into a folder named TASKDATA.

The active or current job is exported to a folder named Reports on the USB.

Before removing the USB, always disconnect first by touching the

USB Eject icon on the base of the console . A message will display that it is safe to remove the USB. If this is not done, the report may be missing or corrupt.

Note: It is also possible to batch export job reports (and jobs) for non-active jobs using the Inventory Manager. Refer to the Guidance and Auto Steering Operator's Manual.

Chapter 8 – Upgrading ECU Firmware

The YieldTrakk ECU firmware can be upgraded from the Factory Setup screen, see page 54.

The firmware upgrade files must be placed in the root directory of a USB flash drive in the following folder structure:

- (folder) **YieldTrakk** / (folder) **Updates.cms** / (files) **538XXXYY.bin** and **538XXXYY.mop**

Where X is the issue number and Y is the revision number.

Note: If the upgrade fails and you are upgrading from an old firmware version, it may be necessary to change the **YieldTrakk** folder name to **Ceres**.

1. Insert the USB drive into the console's USB port.
2. Select the Factory Setup screen, press GO and enter the password.

3. Select the Upgrade Software icon .

The firmware upgrade version is displayed.

4. Select the Upgrade Software icon again.

The screen displays 'Saving Data', then 'Loading Software'. Do not remove the USB until the process is complete.

Before removing the USB, always disconnect first by touching

the **USB Eject** icon on the base of the console . A message will display that it is safe to remove the USB.



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