TOPCON

Value Line

Horizon Lite 1.00

Operator Manual

Horizon Lite 1.00
Operator Manual

Part Number 1073426-01
Revision A

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Preface

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Technical Documentation and Utility Software

The myTopcon NOW! mobile app has manuals, tutorials, and software updates. The myTopcon NOW! app is available for iOS and Android phones and tablets.

The Topcon website (mytopconnow.topconpositioning.com) has these resources for computers.

Safety

Improper use of the Product can lead to injury to persons or property and/or malfunction of the Product. The Product should only be repaired by authorized TPS warranty service centers.

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Manual Conventions

Convention	Description	Example
Bold	Menu or drop-down menu selection	**File > Exit** (select the **File** menu, then select **Exit**)
	Name of a dialog, window or screen	From the **Connection** screen...
	Button or key commands	Select **Finish**
Italic	Reference to another manual or help document	Refer to the Topcon *Quick Start Guide*

DANGER: Action has the potential to result in severe personal injury or death.

WARNING: Action has the potential to result in personal injury or property damage.

CAUTION: Action has the potential to result in minor personal injury, system damage, loss of data, or loss of warranty.

NOTICE: Supplementary information that if disregarded can have an adverse effect on system operation, system performance, data integrity, or measurements.

Note: Further information to note about system configuration, maintenance, or setup.

Safety warnings

This safety information relates only to Topcon equipment. It does not replace other usual safe work practices or instructions.

Only use auto steering and guidance features:

- Away from obstacles and overhead obstructions
- On private property without public access
- Away from public roads or access ways

WARNING: Make sure auto steering is OFF when driving the vehicle on public roads.

WARNING: When leaving the vehicle, make sure auto steering is OFF, turn off any external steering switch and remove the ignition key.

The guidance and auto steering system cannot detect obstacles (e.g. vehicles, people).

WARNING: Be aware of the vehicle’s position, field conditions and obstacles at all times, and remain ready to take manual control of the vehicle.

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

CAUTION: Be ready to respond if GNSS signal is lost or vehicle moves away from active guideline.

Console overview

Value Line delivers precision auto steering and guidance to agricultural machines.

The system includes:

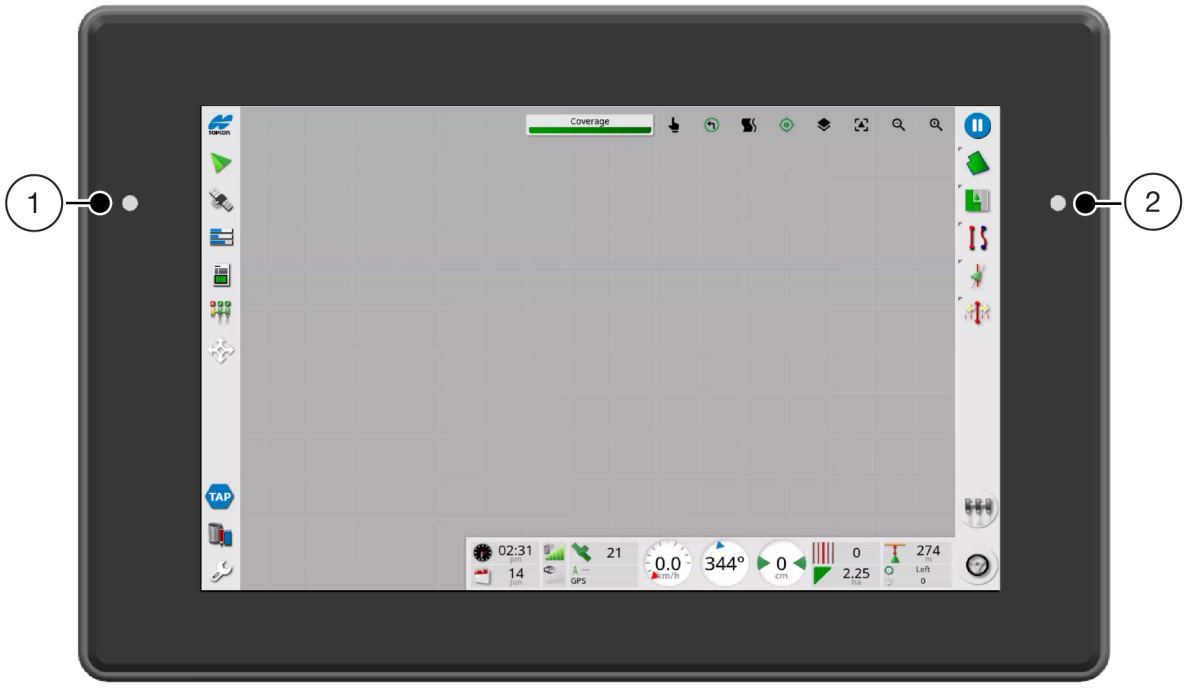
- XR-1 GNSS receiver
- XW-1 electric steering wheel
- Horizon Lite software
- XC1 series console

Horizon Lite comes installed and runs on Topcon's XC1 (7-inch) and XC1 plus (10-inch) in-cab touchscreen consoles.

Console layout

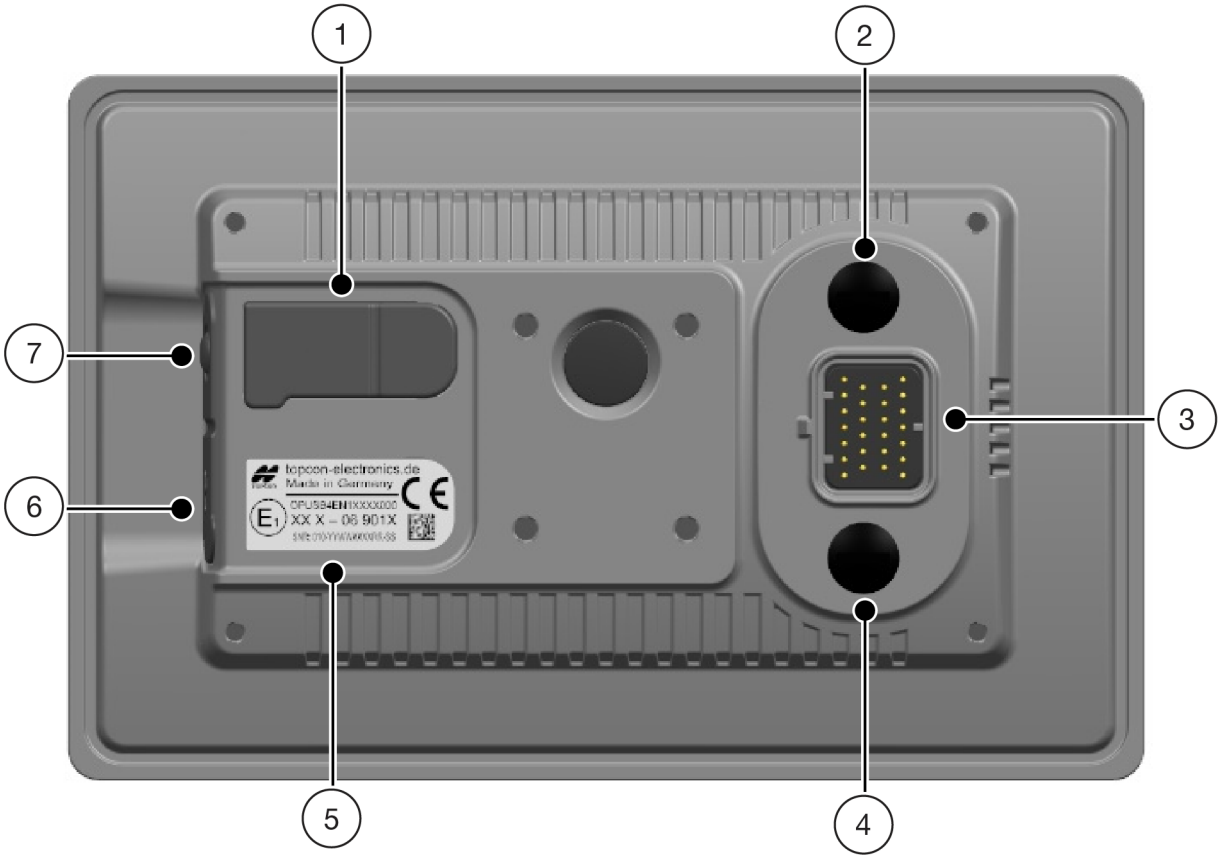
The XC1 and XC1 plus consoles have a similar external layout.

XC1/XC1 plus console - front



1 Light sensor 2 Power LED

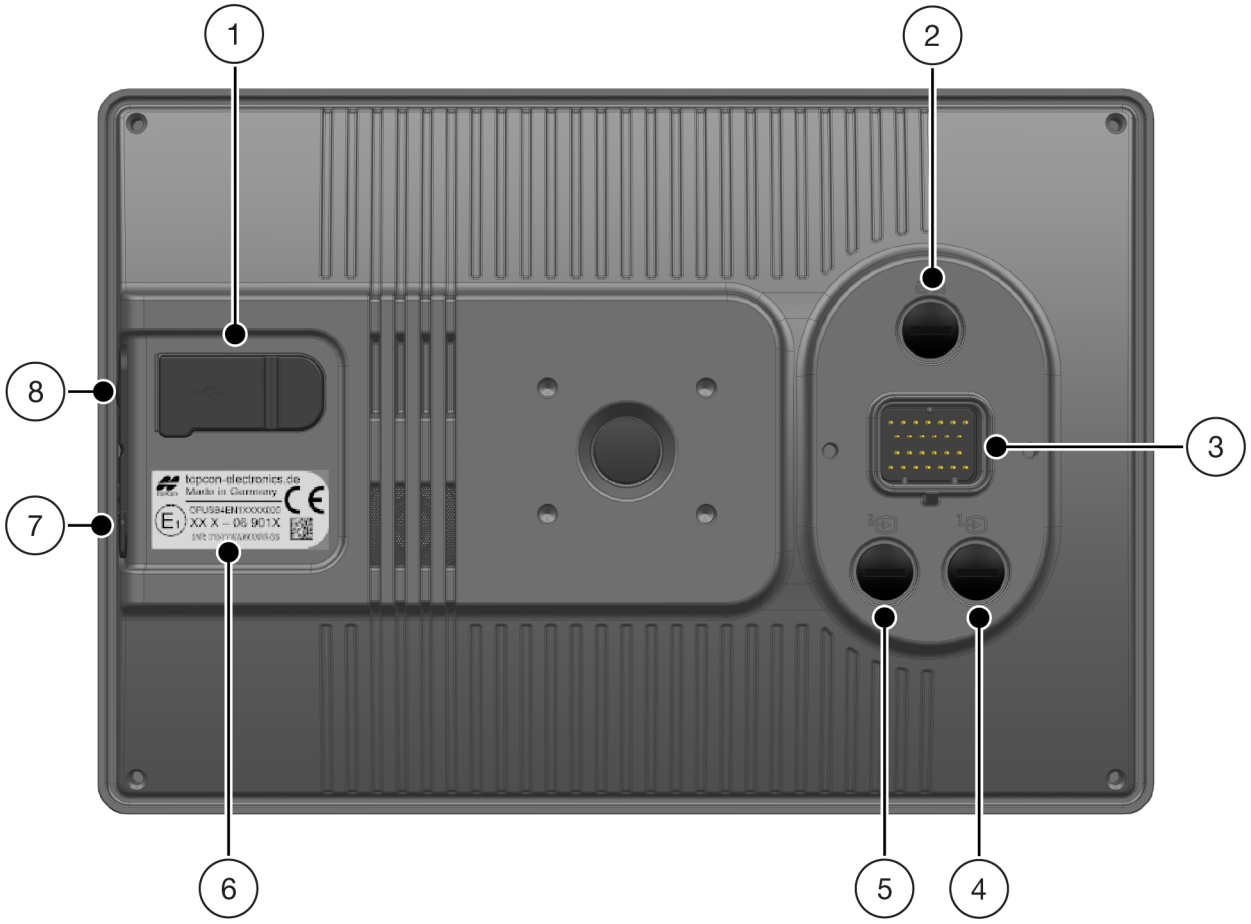
XC1 console - rear



1	Rear USB-A port	4	Interface - not used	7	Power button
2	BroadR-Reach interface	5	Serial number		
3	Main connector	6	Side USB-A port		

Light sensor	Adapts the screen brightness based on ambient light intensity
Power LED	LED is green when console is on
Power button	Power on and off
Rear USB port	USB interface
Side USB port	USB interface
Main connector	Power supply and CAN communications
BroadR-Reach interface	Main communication with GNSS receiver

XC1 plus console - rear

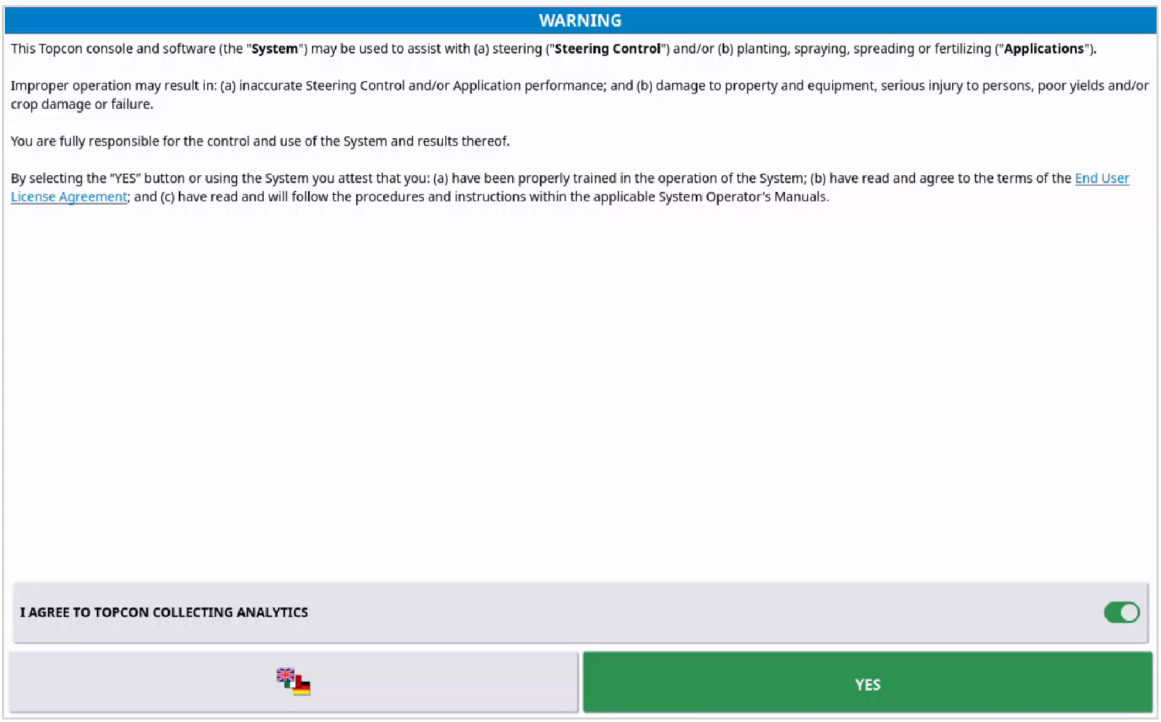


1	Rear USB-A port	4	Interface - not used	7	Side USB-A port
2	BroadR-Reach interface	5	Interface - not used	8	Power button
3	Main connector	6	Serial number		

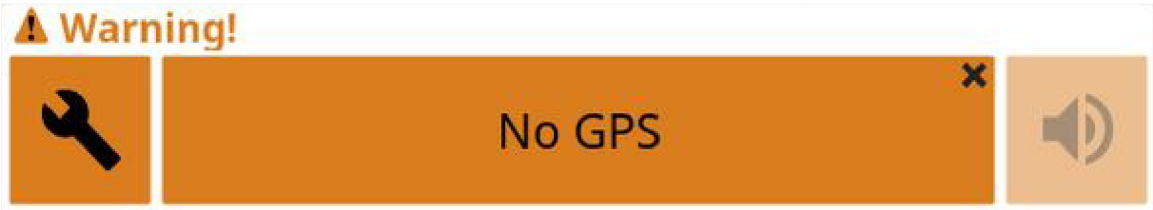
Start the console

To start the console:

1. Press the power button.
2. Acknowledge the **Warning** screen.



The following warning can appear while the GNSS receiver is initializing.

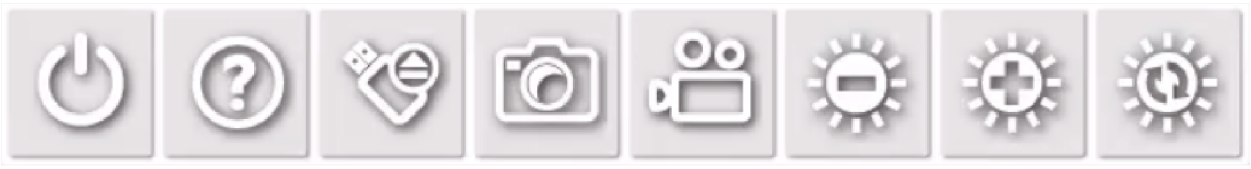


3. Select the center of the alarm window to clear the alarm.

   If the warning repeats, refer to Troubleshooting.

Pop-up toolbar

Open the **Pop-up Toolbar** by swiping upwards from the bottom of the screen.



Power		Shut down or restart console
Tool tips		Show menu and icon names when  is selected. Reselect the icon to turn tool tips off and continue use
Eject USB		Disconnect USB devices before removing
Screen shot		Record screenshots to USB storage device
Screen recording		Record screen video to USB storage device. The screen border appears red when recording. Reselect the icon to stop recording and save to USB storage device
Decrease brightness		Decrease screen brightness
Increase brightness		Increase screen brightness
Day/night mode		Set brightness modes (Day, Night, and Auto). Auto mode is based on ambient light conditions

User Interface

There are two main screens: **Setup** and **Operation**.

Setup screen

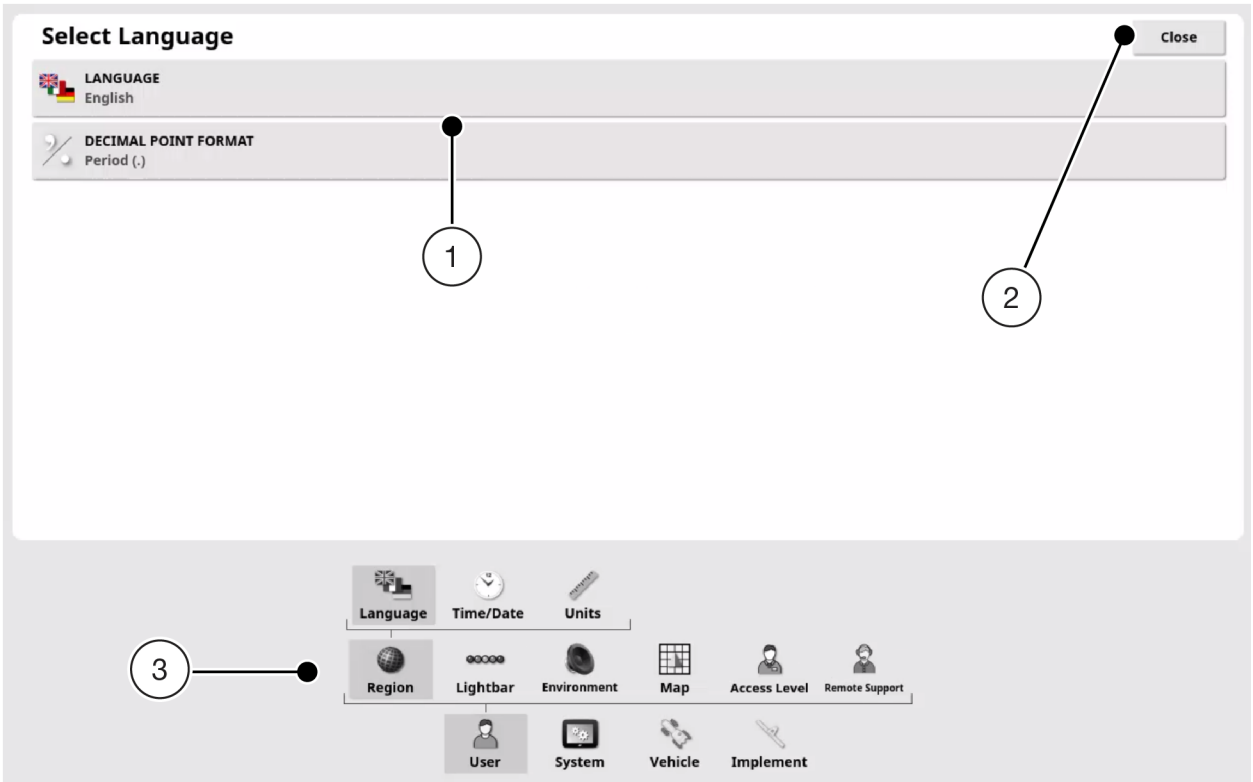
The **Setup** screen is the interface for configuring system settings.

Select (**Setup**) to open the **Setup** screen.

The **Setup** screen has the following main elements.

Settings tabs	Configure specific settings
Close button	Close the **Setup** screen and return to the previous screen
Setup menu	Select menu options to show settings tabs

Setup screen - example



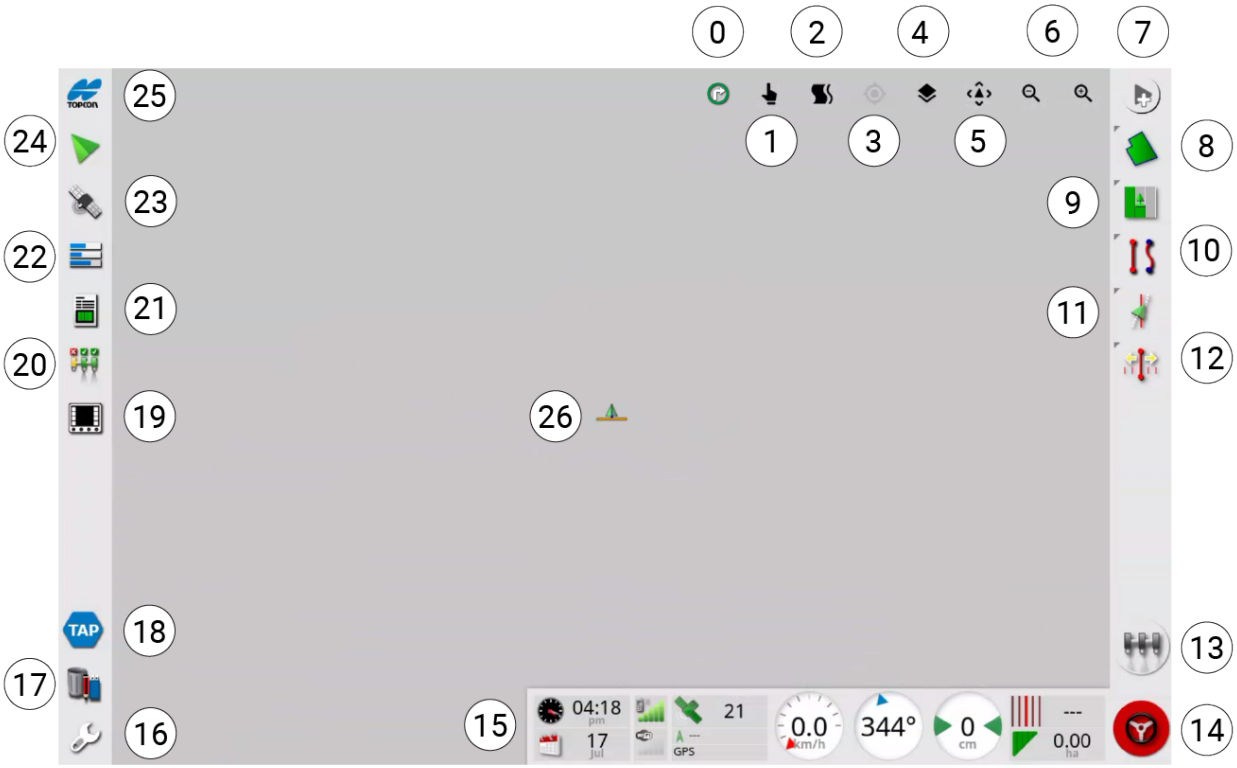
1 Settings tabs 2 Exit **Setup** screen 3 **Setup** menu

Operation screen

The **Operation** screen is the interface for using the system.

Select screen icons to access the features and tools, and show system information. The icons change depending on licensed features, user access level, and system configuration.

Operation screen - example



Icons

Map tools					
0		Show headland turn alarm	**4**		Select map layers
1		Select mode	**5**		Toggle map view mode
2		Guidelock mode	**6**		Zoom out/in
3		Center map on vehicle			

Guidance tools					
7		**Task** button	**11**		**Steering options** menu
8		**Field** menu	**12**		**Nudge** menu
9		**Task** menu	**13**		Master switch
10		**Guideline** menu	**14**		Auto steering button

Dashboard	
15	System, vehicle, and task information

System tools					
16		Open the **Setup** screen	**21**		Task information
17		**Inventory Manager**	**22**		System diagnostics
18		Topcon Agricultural Platform (TAP)	**23**		GNSS information
19		ISOBUS universal terminal	**24**		Guidance
20		Auto section control	**25**		System information

Vehicle/implement		
26		Vehicle position and direction, and implement position (front/rear) and status (color): • Yellow: section enabled but not recording coverage (normally due to auto section control preventing overlap of mapping) • Orange: section enabled but coverage recording delayed (normally due to delay from section timing) • Green: section on and recording coverage

Menus

	**Field menu**		
	Select field		Boundary recording offset
	New field		Configure headland for task
	Unload field		Clear boundary
	Place flag point		Create boundary from shapefile
	Record field boundary		Create boundary from coverage
	Complete field boundary recording		

	**Task menu**		
	Select task		Clear task
	Create new task		

	Guideline menu		
	Select guideline		Record pivot
	Cycle guidance mode		Manual AB line entry window
	Cycle guideline		Configure headland turns
	Create guideline		Set A point
	Record AB line		Set B point
	Record identical curve		Set A point
	Cancel guideline recording		Set B point
	Start center pivot recording		Pause/resume curve recording

	Steering options menu		
	Auto steering status		Auto steering calibration
	Steering tuning		Advanced steering tuning

	Nudge menu		
	Open nudge options		Nudge guideline to vehicle position
	Nudge guideline right		Save nudged guideline group
	Nudge guideline left		GPS drift compensation

Buttons

Task button			
	Task active, start task		Task running, pause task
	System ready, create task		Task paused, unpause task
	System not ready, active task cannot be started		Task complete

Master switch			
	Ready to engage		System cannot engage
	Engaged and active		

Auto steer button			
	Ready to engage		Delayed engage (flashing)
	Engaged and active		System cannot engage

Get started

Firmware/software update

Install the latest firmware/software versions before using the system. They can be found on myTopcon NOW!. Search for "Dealer Current Software Versions".

The latest version of Horizon Lite can be found here.

Firmware/software versions

To view installed firmware/software versions:

1. Open the **Operation** screen.
2. Select to view the **About** mini-view window.
3. Swipe left to right on the window or select to expand the window and show more system information.
4. Make sure the latest versions are installed.

Update procedure

To update software:

1. Download the latest firmware and software versions from myTopcon NOW!
2. Transfer the required files onto a blank, formatted USB storage device.
3. Make sure any compressed folders (e.g. *.zip folders) are extracted to the root level on the USB device.
4. Insert the USB device into the console.
5. Do any firmware updates before updating software.
6. Select to open the **Setup** screen.
7. Select **>** (**System > Utilities**).
8. Select the **Console Software Upgrade** tab.
9. Select **OK** to automatically begin the update process.
   The console restarts when installation is complete.
10. Select the **Close** button to open the **Operation** screen.
11. Select to open the **About** mini-view.
12. Check the software version to confirm update was successful.

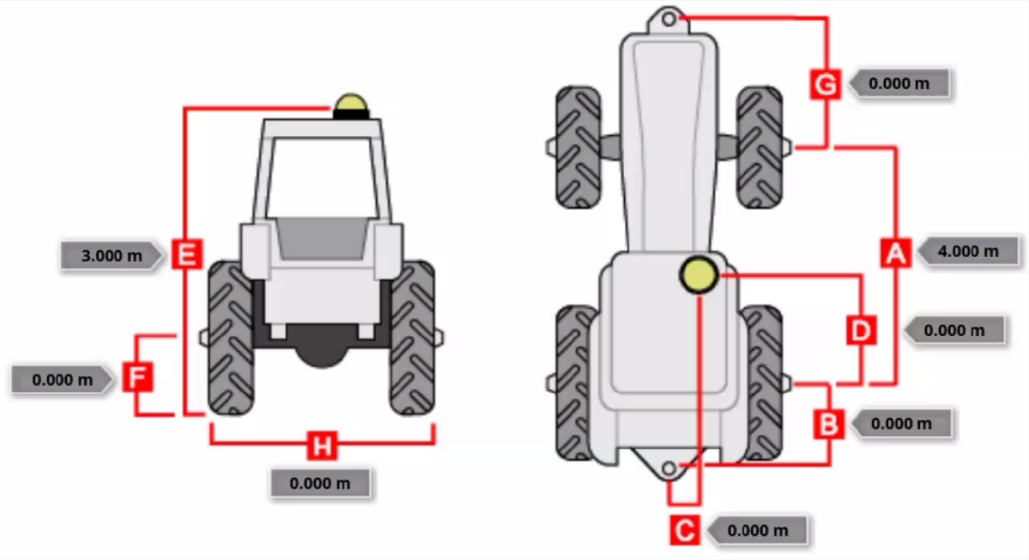
Vehicle/implement measurements

Vehicle and implement profiles are necessary to use the system. Each profile requires the physical dimensions of the machine to be accurately measured and entered. The recommended tolerance is ±5 cm.

Measure and record the required dimensions before starting system setup.

Vehicle

1. Select to open the **Setup** screen.
2. Select **>** (**Vehicle > Geometry**).
3. Measure and record the required vehicle dimensions (example below).

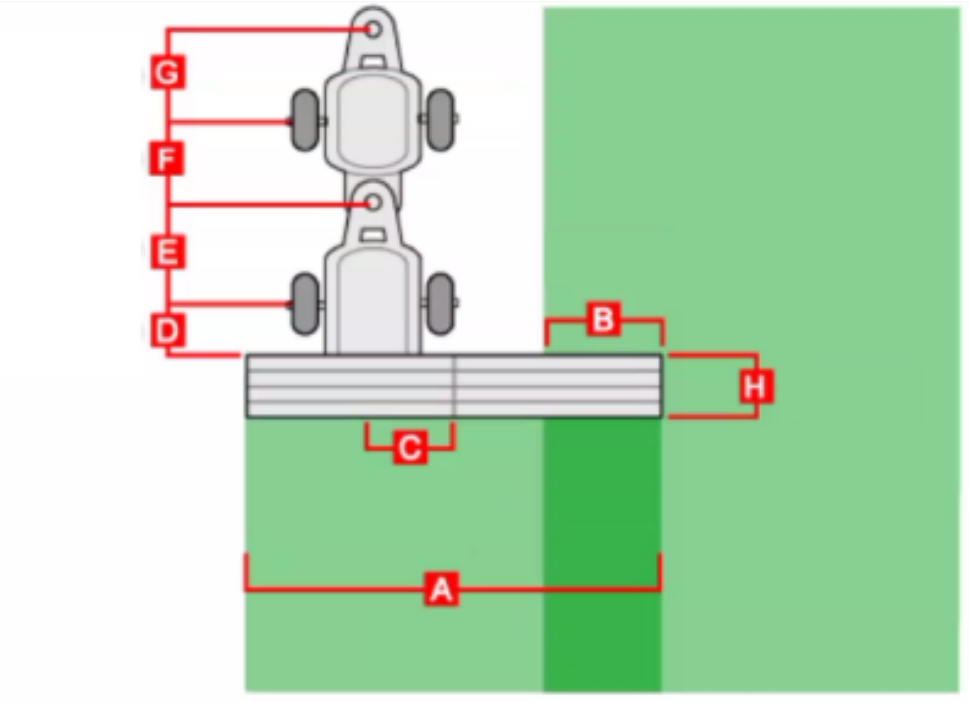


A	**Wheelbase**	From the center of the front axle to the center of the rear axle
B	**Implement tow point**	From the center of the rear axle to the tow point
C	**GPS offset (left/right)**	Offset from the middle of the vehicle centerline to the GNSS receiver. Positive value for offset to the right of the middle of the axle; negative value for offset to the left
D	**GPS offset (front/rear)**	Horizontal distance to the GNSS receiver from the center of the rear axle. Positive value if the receiver is in front of the rear axle; negative value if it is behind the rear axle
E	**GPS height**	From the top of the GNSS receiver to the ground
F	**Axle height**	From the axle from the ground
G	**Front hitch**	From the center of the front axle to the front hitch position
H	**Width**	Vehicle width

Implement

The necessary measurements depend on the implement type.

1. Select to open the **Setup** screen.
2. Select > (**Implement > Geometry**).
3. Measure and record the implement dimensions (example below).



A	**Swath width**	Implement working width
B	**Overlap**	Width of the overlap between two adjacent passes
C	**In-line offset**	Off-center offset of the implement relative to the hitch point. Positive value if right offset; negative value if left offset
D	**Implement wheels offset**	Distance between wheels and the front of the implement working area. Negative value if the wheels are behind the working area (e.g., air seeders)
E	**Implement offset**	Distance between hitch point and implement wheels
F	**Trailer wheels offset**	Distance between implement hitch point and trailer wheels
G	**Trailer offset**	Distance between trailer hitch point and trailer wheels
H	**Working length**	Length from start to finish of the boom's working area. Along with swath width, defines the ‘working area’

Quick start guide

Use the following steps to start working quickly without doing a detailed system setup or creating a field.

Select GNSS receiver

1. Select  to open the **Setup** menu.
2. Select  **>**  **>**  (**System > GPS > Receiver**).
3. Select the **GPS Receiver** tab.
4. Select the GNSS receiver to use.

Select correction source

5. Select  **>**  **>**  (**System > GPS > Correction**).
6. Select the **Correction Source** tab.
7. Select the correction source.

Create vehicle profile

8. Select  **>**  (**Vehicle > New**).
9. Select a vehicle template.
10. Enter a unique profile name.
11. Enter the vehicle dimensions.

Create implement profile

12. Select  **>**  (**Implement > New**).
13. Select an implement type.
14. Enter a unique profile name.
15. Enter the implement dimensions.

Enable features

16. Select  **>**  **>**  (**System > Features > Guidance**).
17. Make sure Auto Steering is enabled.
18. Make sure Guidelines is enabled.
19. Select  **>**  **>**  (**System > Features > Console**).
20. Make sure Tasks is enabled.

Create guideline

21. Select >
22. Create a guideline.

Note: Guidelines can also be created using the XW1 electric steering wheel.

Do task

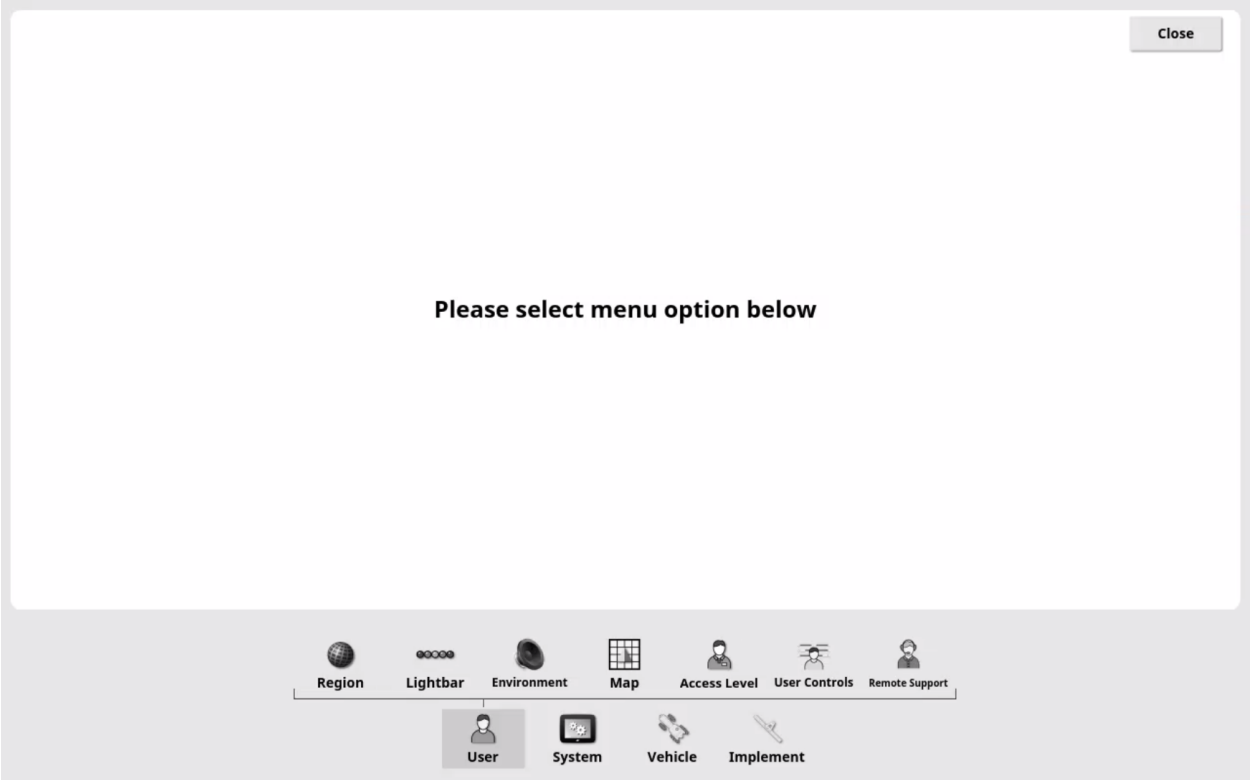
23. Select the **Task** button to start work quickly without setting up a field. A new task is automatically created.
24. Select the **Master Switch** to start recording coverage on the Guidance map.
25. Drive the vehicle forward.
26. Select the **Auto Steer** button to engage the auto steering.
    If the auto steering does not follow the active guideline adequately, it may need tuning. Refer to page 102
27. Select the **Task** button, then select **Done** to complete and save the task.

Note: Auto steering can also be operated using the XW1 electric steering wheel.

User settings

To view the user settings:

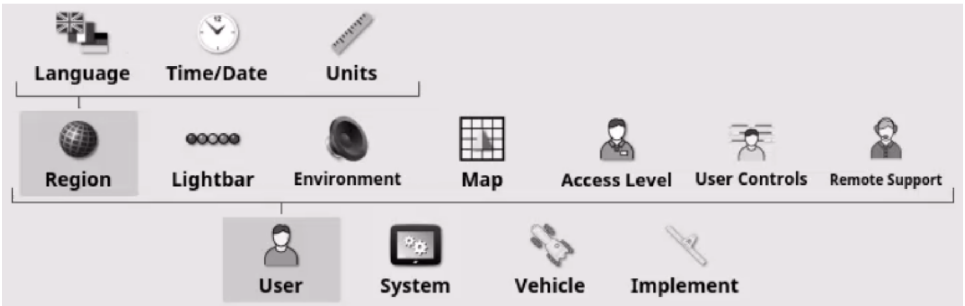
1. Select (**Setup**) to view the **Setup** screen.
2. Select (**User**) from the **Setup** menu.
3. Select a User menu option (e.g. Region).



Region

Region-specific settings can be customized (i.e. language, time and date, units of measurement):

1. Select > **(User > Region)**.
2. Select a Region menu option (e.g. Language).



Language

To set the language:

1. Select > > (**User > Region > Language**).
2. Select the **Language** tab.
3. Select the language, and then confirm.

Decimal point format

To set the decimal point format:

1. Select > > (**User > Region > Language**).
2. Select the **Decimal Point Format** tab.
3. Select either period or comma, and then confirm.

Time and date

To set time or date settings:

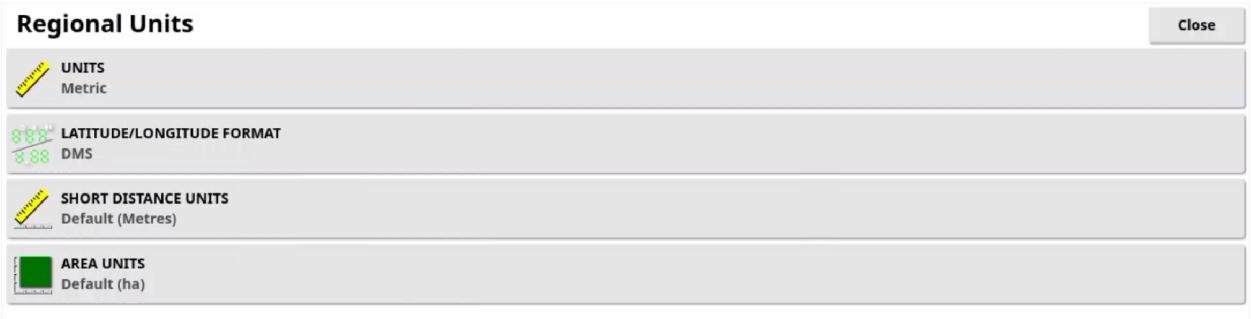
1. Select > > (**User > Region > Time/Date**).
2. Select a settings tab.
3. Enter or select the time, time source or date, and then confirm.

Date format	Available date formats
Time format	Available time formats
Time zone	Country/regional time zones. If the time zone is not selected, the "No time zone set" alarm will repeatedly appear on the **Operation** screen
Time source	Manual or automatic time source. A GNSS signal or internet connection is necessary to select Automatic. Select **Manual** to manually enter the current time. When the console is power cycled, the manually set time source returns to Automatic
Current date	Current date used by the system
Current time	Current time used by the system

Units

To set the units of measurement:

1. Select > > **(User > Region > Units)**.
2. Select a settings tab.
3. Select the necessary units and confirm.



Units	Metric or Imperial (UK and US)
Latitude/longitude format	Decimal degrees or degrees, minutes, seconds (DMS)
Short distance units	Metric or Imperial
Area units	Metric or Imperial

Lightbar

The system includes two lightbars: a virtual lightbar on the console and a physical lightbar on the XW-1 electric steering wheel.

The virtual lightbar can be shown on the top of the **Operation** screen. The physical lightbar is incorporated in the steering wheel dashboard.

The two lightbars show the vehicle's deviation from the active guideline (direction and distance) using colored LED lights.

Each LED on the XW-1 lightbar corresponds to three LEDs of the same color on the virtual lightbar.

To configure the lightbar settings:

1. Select > (**User > Lightbar**).
2. Select a settings tab.
3. Enter or select the setting and confirm.

LED spacing	Distance from the active guideline at which each of the LEDs on the physical XW1 steering wheel lightbar is lit. Each LED on the XW-1 lightbar corresponds to three LEDs of the same color on the virtual lightbar
LED mode	Direction to the guideline. Drive away: drive away from lit LEDs to return to the guideline. Drive towards: drive toward lit LEDs to return to the guideline
On-screen light bar	Enable or disable (hide) the on-screen virtual lightbar

Environment

To configure the environment settings:

1. Select > (**User > Environment**).
2. Select a settings tab.
3. Select the necessary setting, and then confirm.

Audio volume	Set the console sound volume
Button clicks	Enable or disable sounds when making on-screen selections
Alarm audio	Enable or disable alarm sounds. The Steering Engage/Disengage alarm audio cannot be disabled
Automatic steering status window	Selecting the **Auto steer** button (System cannot engage) automatically shows the **Steering Status** window
Toolbar button size	Changes the size and spacing of the Guidance tools and System tools icons

Map

The Guidance map is shown on the **Operation** screen. It shows the vehicle icon and objects such as fields, guidelines, flags, and coverage.

To set the Guidance map settings:

1. Select > (**User > Map**).
2. Select a settings tab.
3. Select the desired setting and confirm.

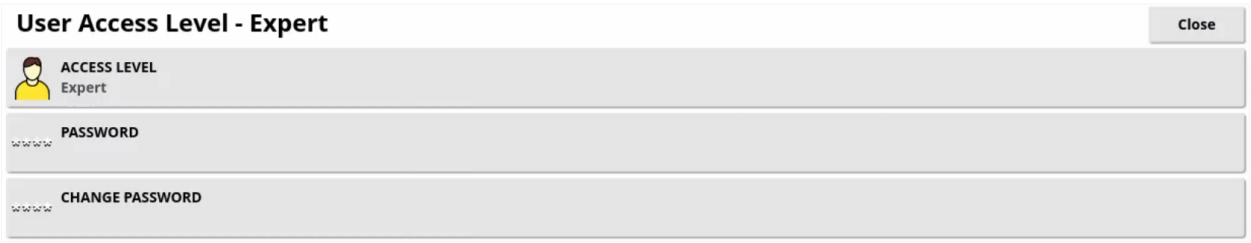
Point of focus	Center the map to the vehicle's position
Map panning	Select and drag on the map to move
Map focus auto-shift	Position the vehicle in the centre of the available screen area when a mini-view window is opened
Pause boundary recording with master	Use the **Master Switch** to automatically pause boundary recording. Boundary recording can still be manually paused
Visual reference line length	Show a marker in front of the vehicle icon at a selected distance. Use to acquire the guideline after a turn when using manual guidance

Access level

Access levels restrict the features and functions available to users. It can be set to Easy, Standard, or Expert.

To select the user access level:

1. Select > (**User > Access Level**).
2. Select the **Access Level** tab.
3. Select the desired access level and confirm.



The Standard and Expert access levels can be individually password protected. By default, no passwords are applied.

To set the password for Standard or Expert access levels:

1. Select > (**User > Access Level**).
2. Select the **Change Password** tab.
   The **Change Password** window appears.
3. Enter and confirm the desired password.

Note: A password reset file is necessary to reset a password. It can be downloaded from MyTopcon NOW!

User controls

The features and functions available at each user access level can be changed from the default settings.

To configure the user controls available for an access level:

1. Select > (**User > User Controls**).
2. Select the desired control(s).
3. Select **Preview** to navigate the software and view the controls available at that level. This is useful when access levels are password protected.
4. Select **Reset** to return the user controls for all access levels to default settings.

Remote support

Remote support allows a third party to connect to and remotely operate the console for troubleshooting. Internet access is required.

To use remote support, a Support Desk is necessary. For Topcon/dealer support, Support Desks are already be created. Users can also create their own Support Desk to provide remote support to other users.

Create support desk

Users can create a support desk via TAP or the free Horizon Remote Support app available from Android and iOS app stores.

TAP

All TAP users can create a support desk, no special permissions or subscriptions are required.

1. Open TAP using an internet browser.
2. Allow pop-ups from tap-support.topconagriculture.com.
3. Log in to or create a TAP account.
4. Navigate to the Support page.
   A Support Desk number is shown.

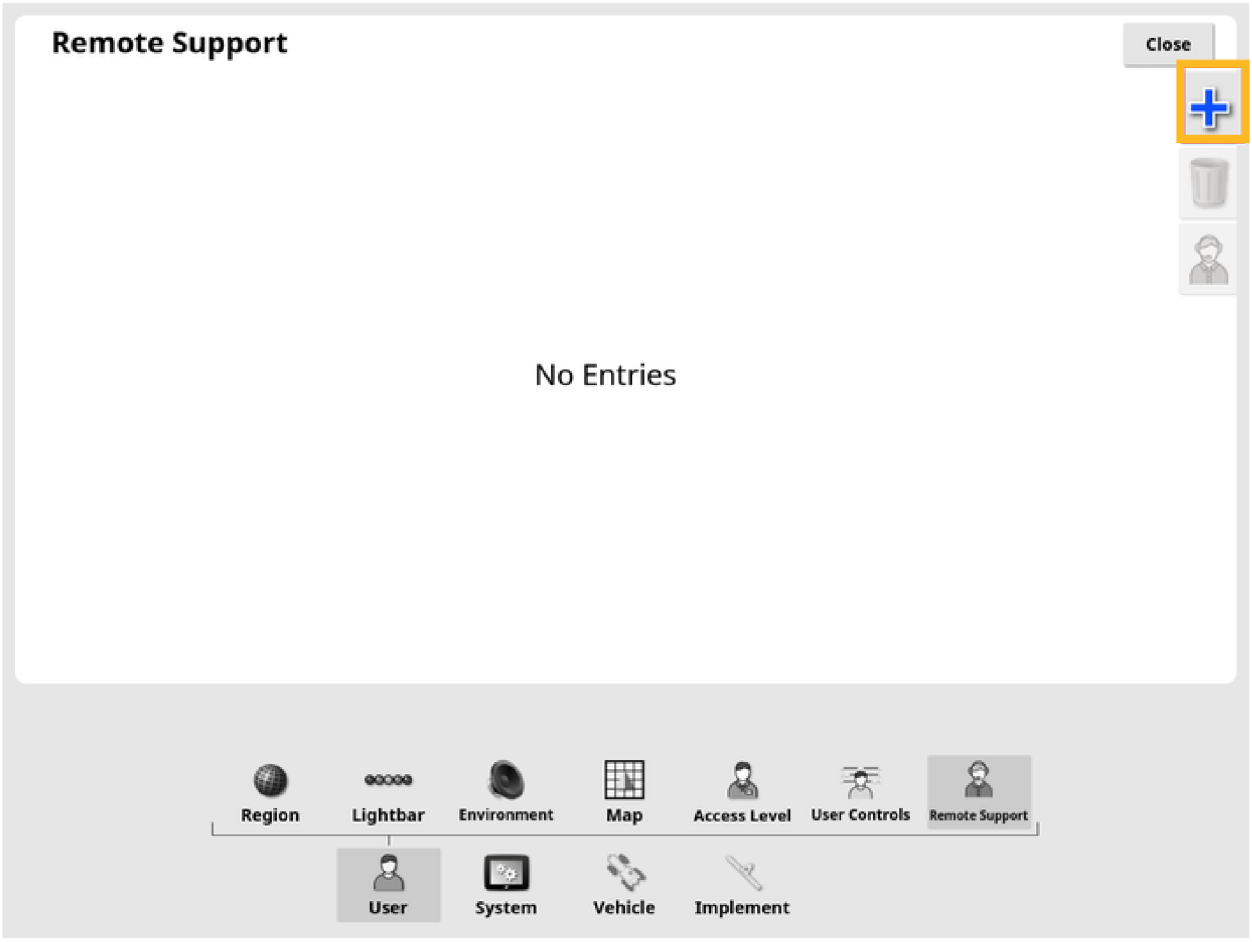
Horizon remote support app

1. Download the free Horizon Remote Support app from the Android or iOS app stores.
2. Log in using an existing Topcon single sign-on account or create a new account.
   Once logged in to the app, the Desk PIN is shown at the top of the screen.

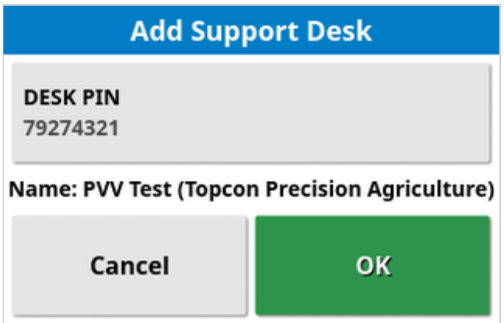
The Desk PIN and Support Desk number are unique ID numbers associated with that user account and do not change.

Add support desk

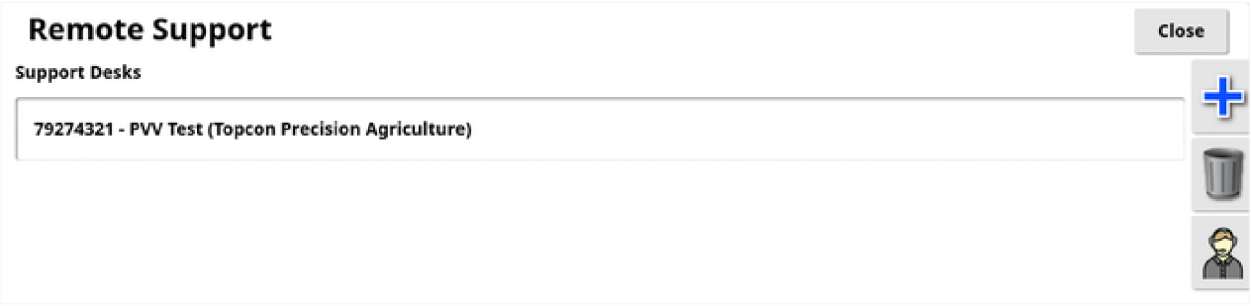
1. Select  **>**  (**User > Remote Support**).
   The **Remote Support** window appears.
2. Select  (**Add**).



3. Select ✚ (**Add**).
   The **Add Support Desk** window appears.
4. Select the **Desk Pin** tab.
5. Enter the Desk PIN and confirm.
   For Topcon/dealer Support Desks, enter the supplied Desk PIN.
   For user-created Support Desks, enter the Desk PIN shown in the Horizon Remote Support app or the Support Desk number shown in TAP.



The Support Desk is added to the list of Support Desks.



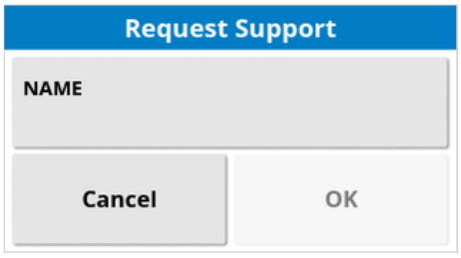
Request remote support

Users must send a request for remote support. The selected Support Desk must then accept the user request to start the remote support session.

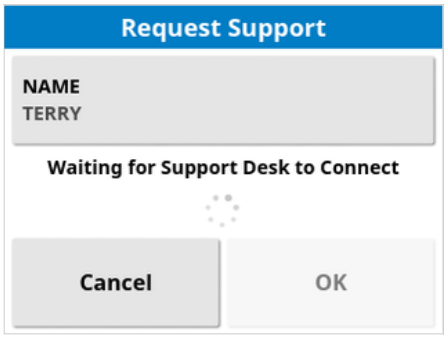
To request support:

1. Select > (**User > Remote Support**).
2. Select a Support Desk.
3. Select (**Remote Support**).

   The **Request Support** window appears.



4. Select the **Name** tab and enter an identifying name.
5. Select **OK** to send the support request to the selected Support Desk.

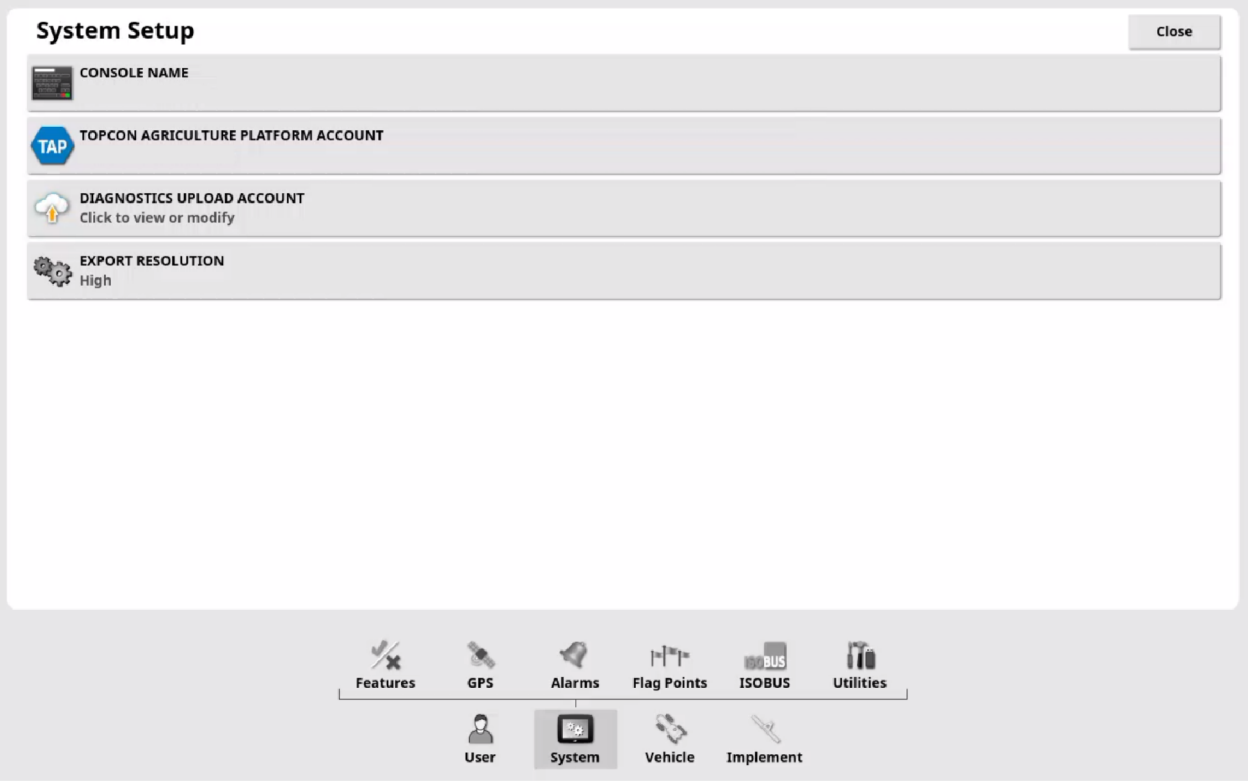


Once connected, the Support Desk has access and control of the console functions, except auto steering, the **Master Switch** and the Universal Terminal.

System settings

To configure the system settings:

1. Select (**Setup**) to view the **Setup** screen.
2. Select (**System**) only from the **Setup** menu.
   Make sure no other menu option is selected.
3. Select a settings tab.

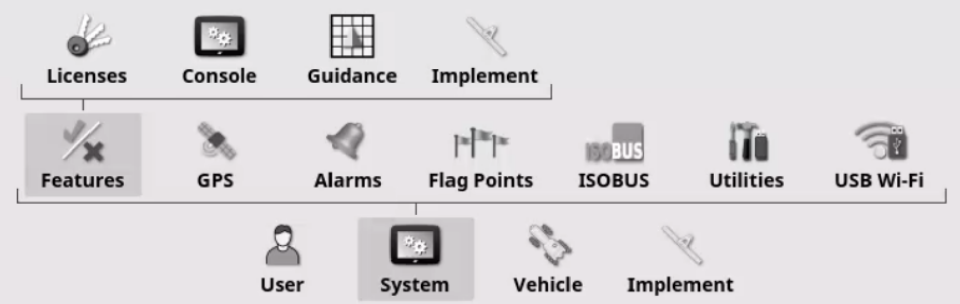


Console name	Unique console identity on TAP
TAP	Log in to TAP
Diagnostics upload account	Change the default settings for the Topcon FTP server (as directed by Topcon support)
Export resolution	Select USB and TAP data export resolution. Lower settings export fewer data points

Features

To configure system features:

1. Select > (**System > Features**).
2. Select a Features menu option (e.g. Licenses).



Licenses

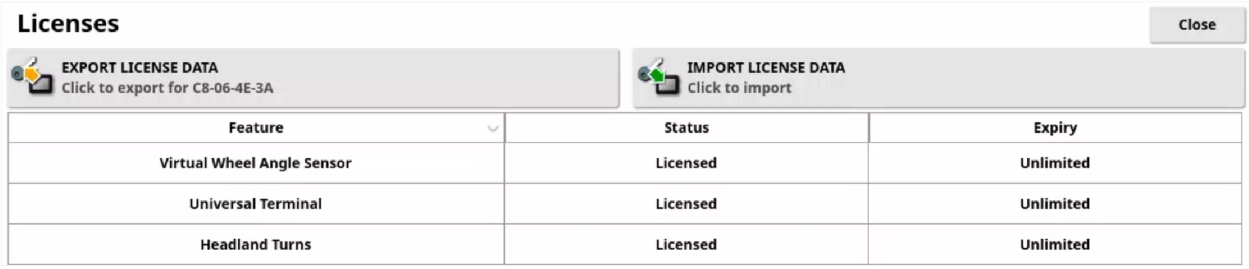
Licenses for optional features can be purchased from Dealers.

Purchased licenses update automatically if the console is connected to TAP. If TAP connection is not possible, files can be downloaded from TAP/Dealers and imported by USB or manually entered by selecting "Unlicensed" next to the optional feature.

Note: Purchased features must be enabled via the **Setup** screen before they can be used.

To show licensed features:

1. Select > > (**System > Features > Licenses**).
   The **Licenses** window appears.



To transfer license data:

1. Select the **Export License Data** to export license information to USB storage device.
2. Select the **Import License Data** tab to import license information from USB storage device.

Console

To enable or disable console features:

1. Select > > (**System > Features > Console**).
2. Select a settings tab.
3. Select the desired setting and confirm.

Universal terminal	Enable the UT
Dashboard	Show on the **Operation** screen
Cloud based services	Enable TAP

Guidance

To enable or disable guidance features:

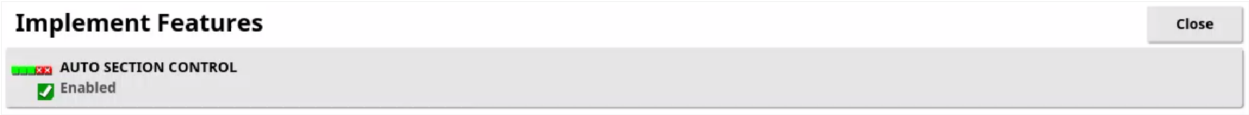
1. Select > > (**System > Features > Guidance**).
2. Select a settings tab.
3. Select the desired setting and confirm.

Guidelock	Enable Guidelock mode
Boundary steering	Enable boundary steering
Headland turns	Enable headland turns

Implement setup

To enable or disable auto section control for virtual implements:

1. Select > > .(**System > Features > Implement**).
2. Select a settings tab.
3. Select the desired setting and confirm.

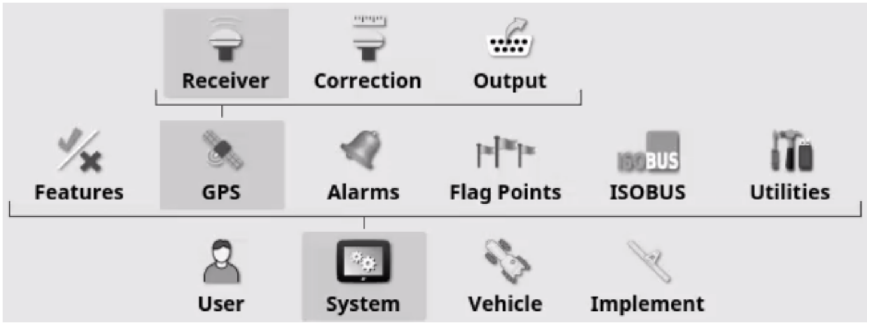


Auto section control	Enable auto section control

GPS

To configure GNSS settings:

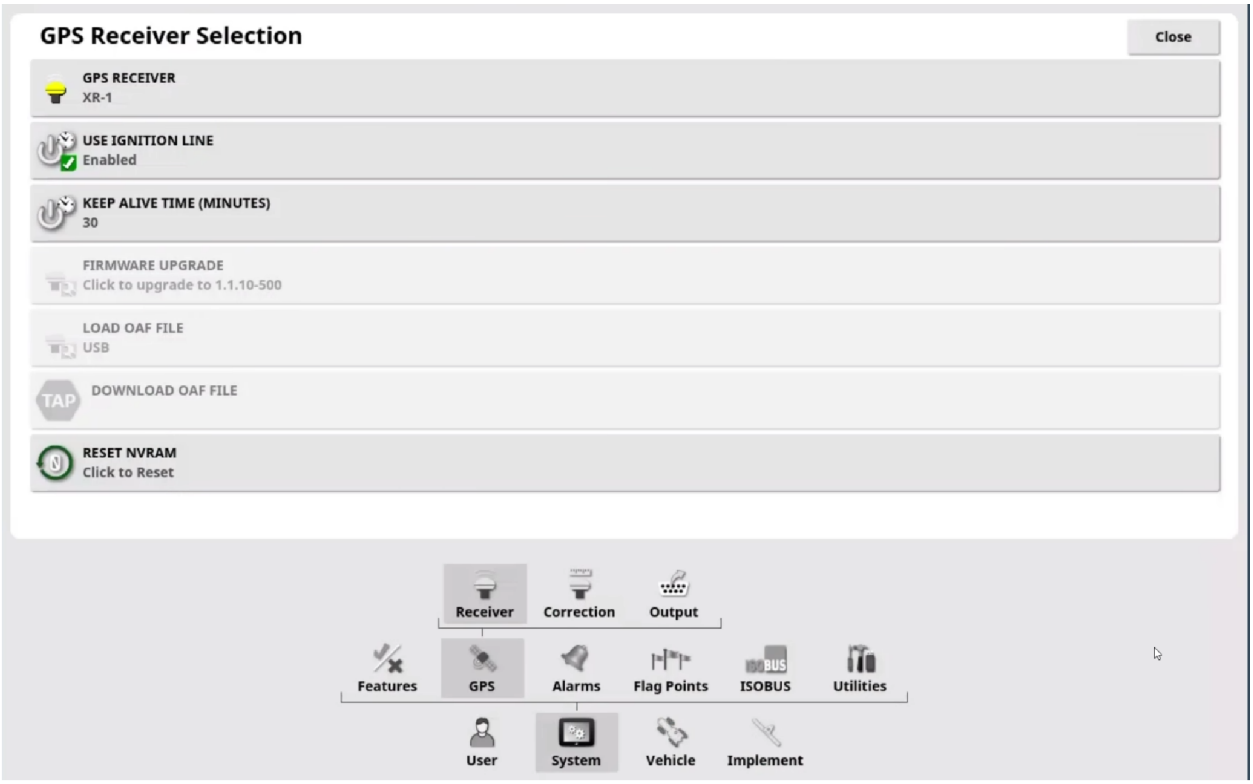
1. Select > (**System > GPS**).
2. Select a GPS menu option (e.g. Receiver).



GNSS receiver

To set GNSS receiver settings:

1. Select > > (**System > GPS > Receiver**).
2. Select a settings tab.
3. Select the desired setting and confirm.



GPS receiver	Select receiver type
Use ignition line	With feature disabled, the receiver powers down when the system is physically powered down using the rocker switch. Use to reduce vehicle battery demand. With feature enabled, the receiver remains powered on for the 'keep alive' time when the system is physically powered down using the rocker switch. Use to maintain RTK convergence while power cycling other system components
Keep alive time	Time the receiver remains powered on after system is switched off
Firmware upgrade	Update the GNSS receiver firmware using the update packaged with Horizon Lite
Load OAF file	Upload Options Authorization File (OAF) to the receiver using USB storage device
Download OAF file	Download OAF from TAP
Reset NVRAM	Reset the receiver's memory and any completed calibrations

Correction source

To set GNSS correction settings:

1. Select  **>**  **>**  (**System > GPS > Correction**).
2. Select a settings tab.

Correction source	Select a correction source. **Autonomous** allows receiver to find any free satellites and does not use correction
Fallback	Reduces the position accuracy requirement when using auto steering. Useful when a high degree of position accuracy is not required

NTRIP

To set NTRIP settings:

1. Select > > (**System > GPS > Correction**).
2. Select **NTRIP** as the correction source.
3. Select > > (**System > GPS > NTRIP**).
4. Select a settings tab.

NTRIP address	IP address for NTRIP service
NTRIP port	Port used for NTRIP
NTRIP mount point	Base station ID (either real or virtual)
NTRIP username	Username for NTRIP service
NTRIP password	Password for NTRIP service
Base station type	Type of base station

RTK

To set RTK settings:

1. Select > > (**System > GPS > Correction**).
2. Select **RTK** as the correction source.
3. Select > > (**System > GPS > RTK**).
4. Select a settings tab.

Frequency	Frequency used
Channel spacing	Frequency difference between adjacent allocations in a frequency plan
Link protocol	Radio data transmission protocol
Base station type	RTK base station type

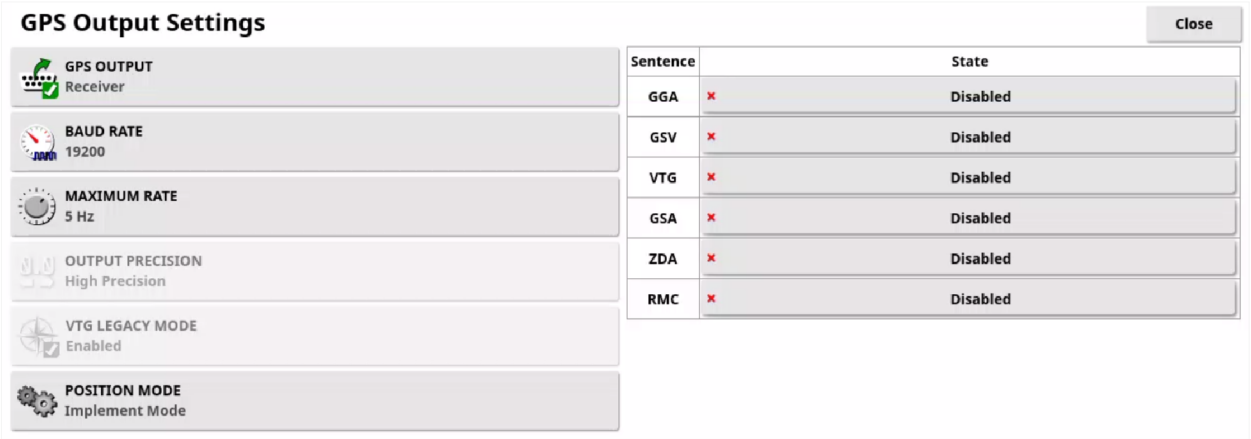
Select to load RTK base station settings from a previously saved profile.

Select to save the current RTK base station settings to a profile. A new profile is created or existing profile is overwritten.

Output

To set the GNSS output settings:

1. Select > > (**System > GPS > Output**).
2. Select a settings tab.



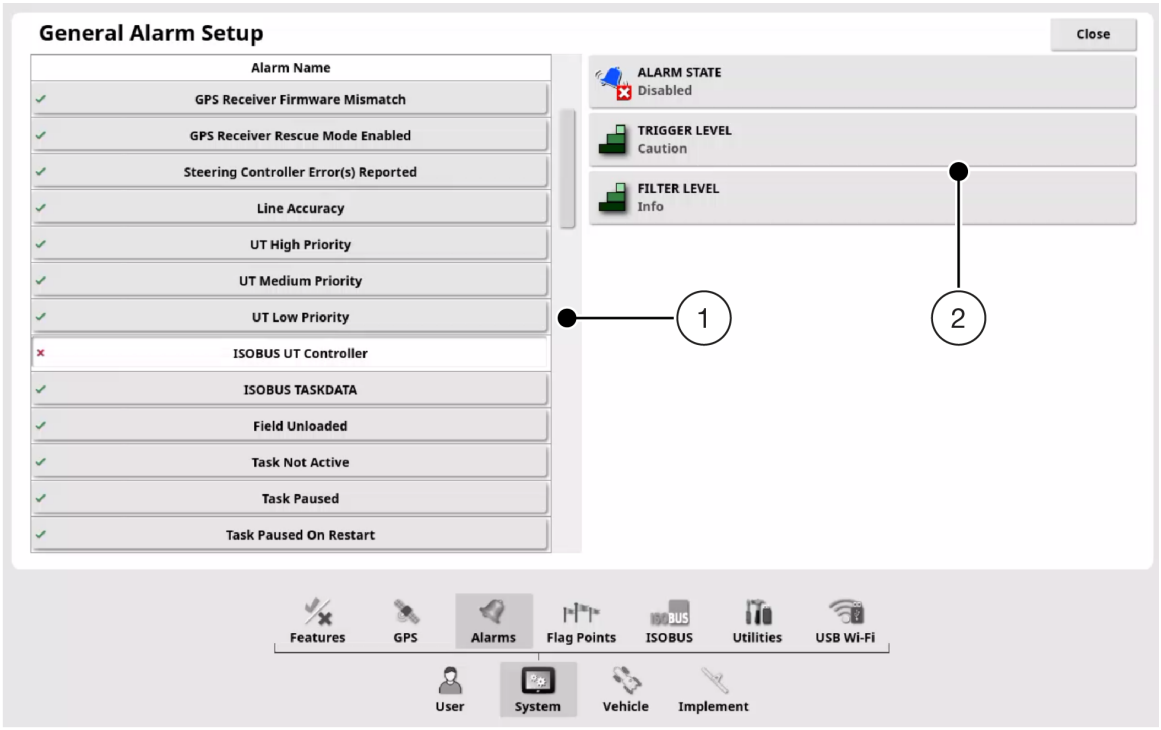
GPS output	Select receiver to output messages via the AUX serial connection. Set to **Disabled** if not being used
Baud rate	Select output baud rate. Must match expected rate of messages on external device
Maximum rate	Set the maximum output frequency
Output precision	Set output precision
VTG legacy mode	Enable output of data in VTG Legacy Mode
Position mode	Define position of output data
Sentence	Select the output data strings

Note: Settings depend on connecting device. Refer to the device's manual and set the above settings accordingly.

Alarms

To set alarm settings:

1. Select > (**System > Alarms**).
2. Select an alarm.
3. Select an alarm setting.



1 Alarms 2 Alarm settings

Note: The audible Steering Engage/Disengage alarm cannot be disabled.

End of row

Audible and visual alert when vehicle approaches user-defined distance from boundary.

First distance	Distance from the boundary at which the alarm alerts. Measured from the vehicle to the boundary along the wayline (guideline)
Second distance	Distance from the boundary at which the second alarm alerts of need to immediately take control of the vehicle
Look ahead distance	Look-ahead distance for vehicle response

Excluded regions

Audible and visual alert when vehicle approaches excluded region.

Warning distance	Distance from the excluded region at which the alarm alerts

Headland turns

Audible and visual alert when vehicle approaches headland for an autosteer headland turn.

Note: The headland turn alarm can be shown manually if required. See Headland turns, page 94.

Distance to Headland	Distance from headland at which headland alarm alerts
Turn Options	Show edit headland turns options on the visual headland alarm

ISOBUS UT controller

Audible and visual alert when there is a UT communication issue.

Trigger level	Set the level of importance at which the alarm alerts
Filter level	Set the alarm display set-point

ISOBUS taskdata

Audible and visual alert when there is a task data issue (e.g. data corruption).

Trigger level	Set the level of importance at which the alarm alerts
Filter level	Set the alarm display set-point

Topnet near expiry detection

Notify this many days before expiry	Set the duration before expiry at which the alarm alerts

Flag point nearby

Audible and visual alert when vehicle is within user defined distance of a flag point.

Trigger when flag point within	Distance from the flag point at which the flag point alarm is triggered

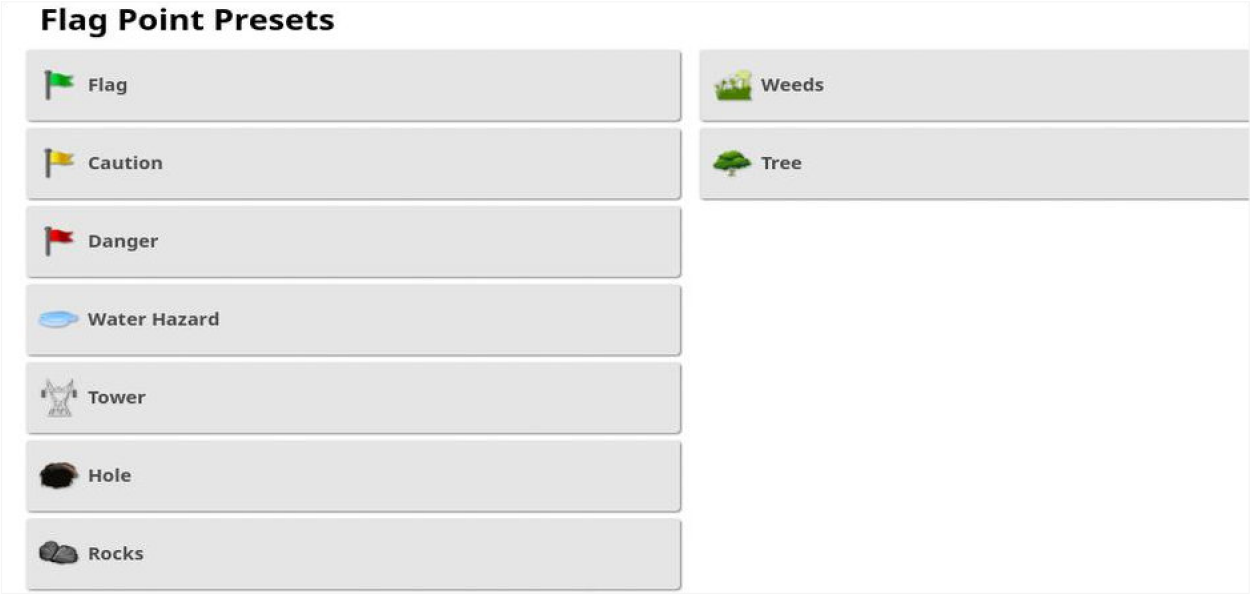
Registration expiring

Visual alert when licensed feature will expire within user-defined time frame. Time frame can be between 5 and 366 days.

Flag points

To set flag point names and symbols:

1. Select > (**System > Flag Points**).
2. Select a flag point preset.



3. Select a new symbol or change the flag point name if required.

ISOBUS

To set ISOBUS settings:

1. Select > (**System > ISOBUS**).
   Make sure the TC or UT menu options are not selected.
2. Select a settings tab.

ISOBUS enabled	Set to Automatic to use the UT with a virtual implement. Only set to Force Enabled to temporarily overcome ISOBUS-related issues at the direction of a dealer

Universal terminal

To set the UT settings:

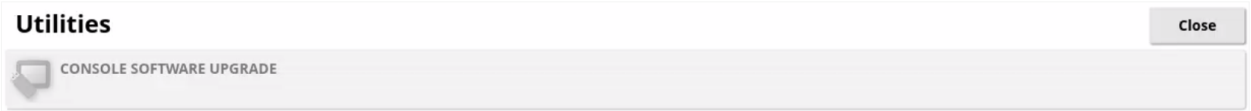
1. Select > >
2. Select a settings tab.

Universal terminal	Toggle the UT server online/offline
UT version	Set the ISO-11783-6 UT specification version supported by the UT server. Do not change this setting from **Latest VT(VT5)** unless UT issues occur
UT number	Set the unique UT number for the console. UT-1 is the default UT
Configure Aux-N client behaviour	Enable/disable Aux inputs. Only use where more than one UT is connected to the system. If **Auto** is selected, AUX inputs are enabled when Universal Terminal is set to online and the UT number is set to 1
Clear pool cache	Clear the UT pool cache. Use only when a UT error occurs
Soft keys per column	Set the number of available softkeys on the UT interface
Soft key location	Set the location of the softkeys on the UT interface and the number of columns

Utilities

To set utilities settings:

1. Select > (**System > Utilities**).
2. Select a settings tab.



To update the console software:

1. Copy the installation files to the root directory of a USB storage device and insert it into a running console.
2. Select >
3. Select **Console software upgrade** tab. The console restarts and automatically begins installation.

Wi-Fi

Connect to Wi-Fi

1. Connect the Wi-Fi dongle to the console.
2. Select > (**System > USB Wifi**).
3. Select **Connection type > Client** and follow the on-screen prompts to select and join an available Wi-Fi network.

Create wireless network

1. Plug the CL-20 into the USB port on the console.
2. Select >
3. Select the **Wireless Hotspot** tab and enable the hotspot.

Wireless hotspot	Enable the hotspot
SSID	Enter the display name shown on wireless devices (hotspot identity)
Key	Password for the wireless device to connect to a hotspot when encryption is in use. WPA key length must be 8 - 63 ASCII characters. WEP key length must be 5 or 13 ASCII characters (or 10 or 26 hexadecimal digits for 64 bit/128 bit security respectively)

Wireless hotspot is used to connect to the CL-20 device. Data cannot be provided to a connected device using this method.

The last five access points and keys are stored to quickly connect to frequently used devices.

The dashboard icon flashes when system is connecting.

Topcon Agriculture Platform (TAP)

TAP is Topcon's farm management and information platform. Data can be transferred between Horizon Lite and a TAP account (internet connection required). Licenses for optional features purchased from Dealers can be activated on TAP.

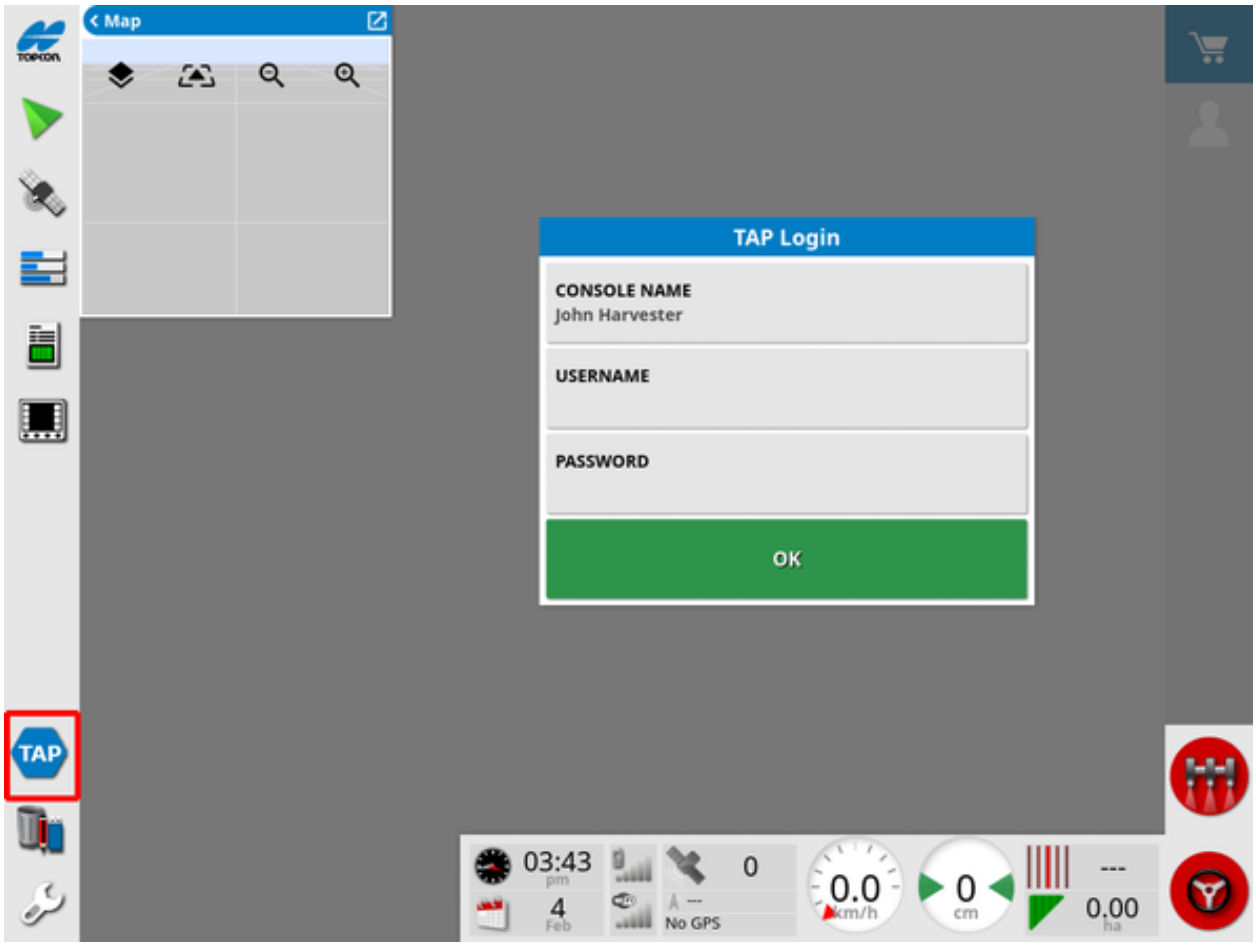
Enable TAP

To enable TAP:

1. Select > > (**System > Features > Console**).
2. Select the **Cloud Based Services** tab.
3. Select **TAP - Topcon Agriculture Platform**, and then select **OK**.

Log in to TAP

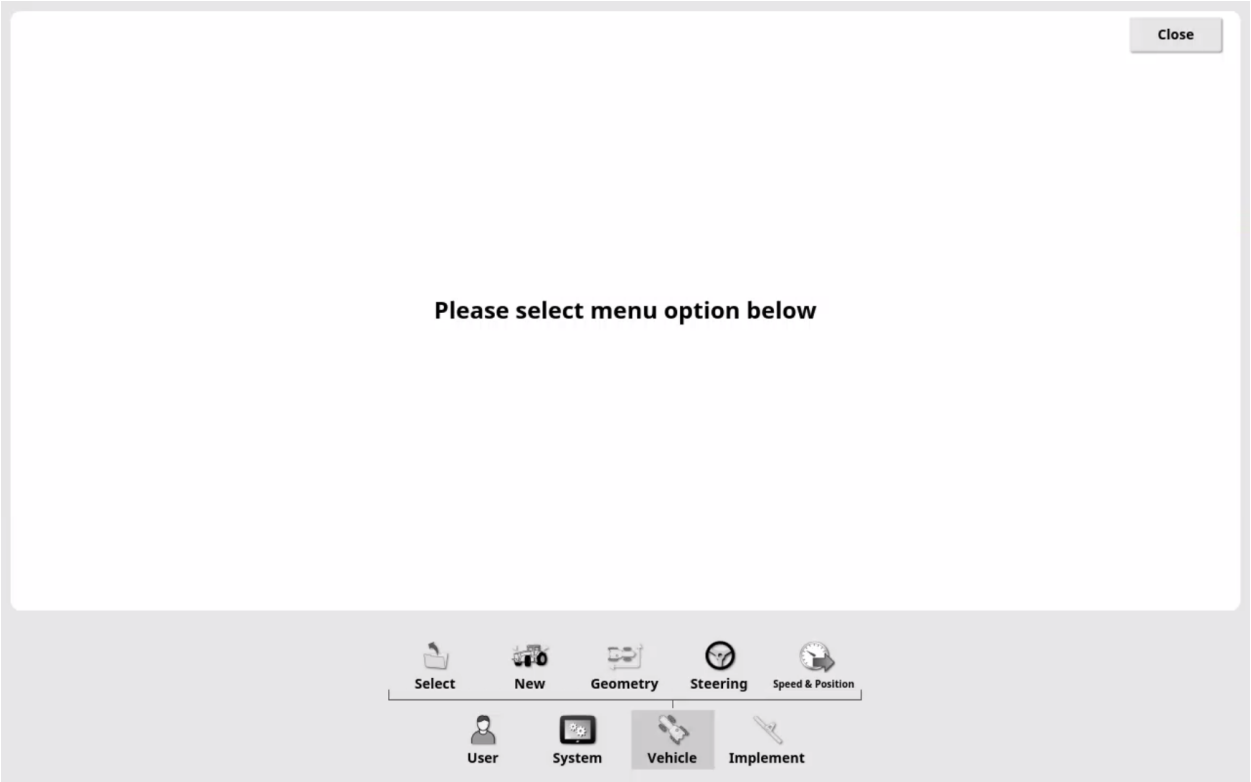
1. From the **Operation** screen, select TAP
2. Enter the username and password for a TAP account, and then select **OK**.



Vehicle settings

To configure the vehicle settings:

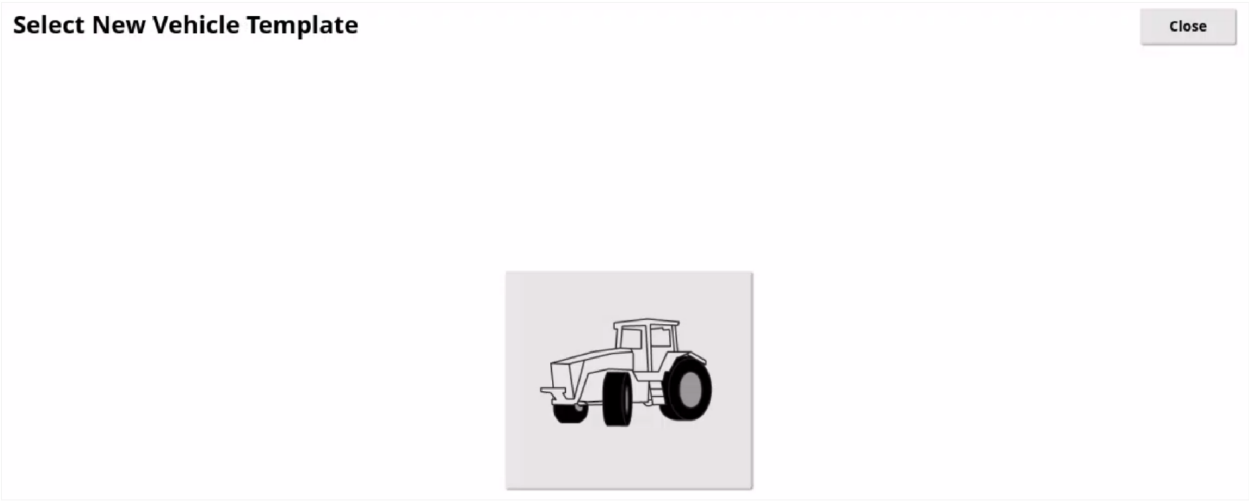
1. Select (**Setup**) to view the **Setup** screen.
2. Select (**Vehicle**) from the **Setup** menu.
3. Select a Vehicle menu option (e.g. Select).



New vehicle profile

To create a new vehicle profile:

1. Select > (**Vehicle > New**).
2. Select a new vehicle template by selecting a vehicle button in the middle of the screen.

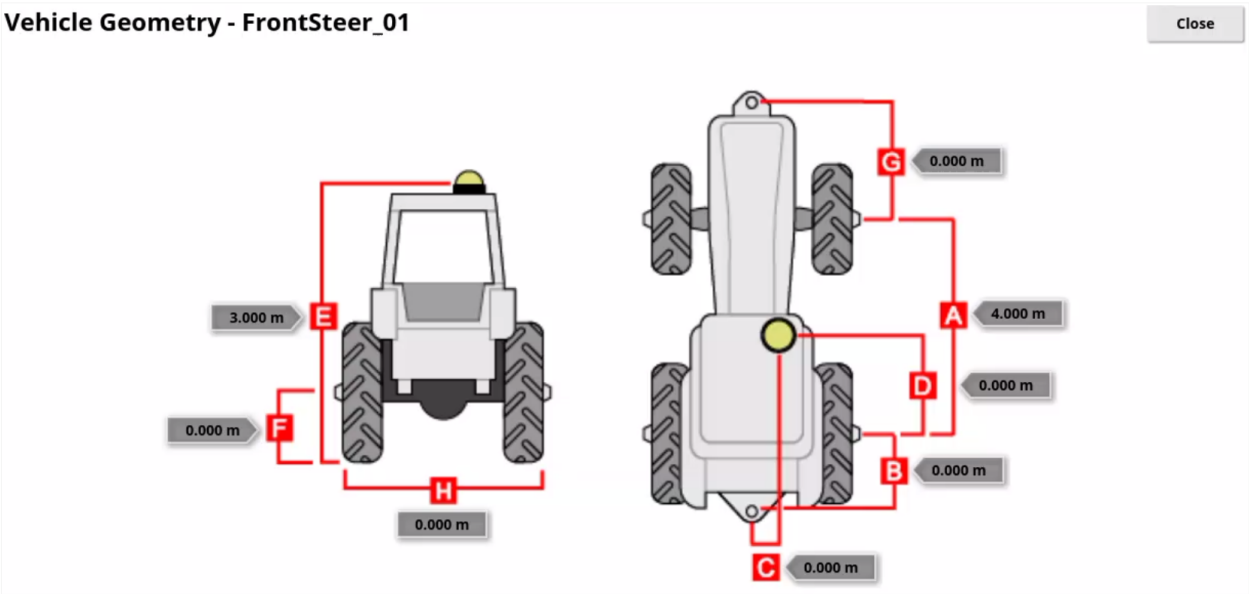


3. Enter a vehicle name and select **OK** to create the new profile.
   The **Vehicle Geometry** screen appears.

Vehicle geometry

To configure the vehicle dimensions:

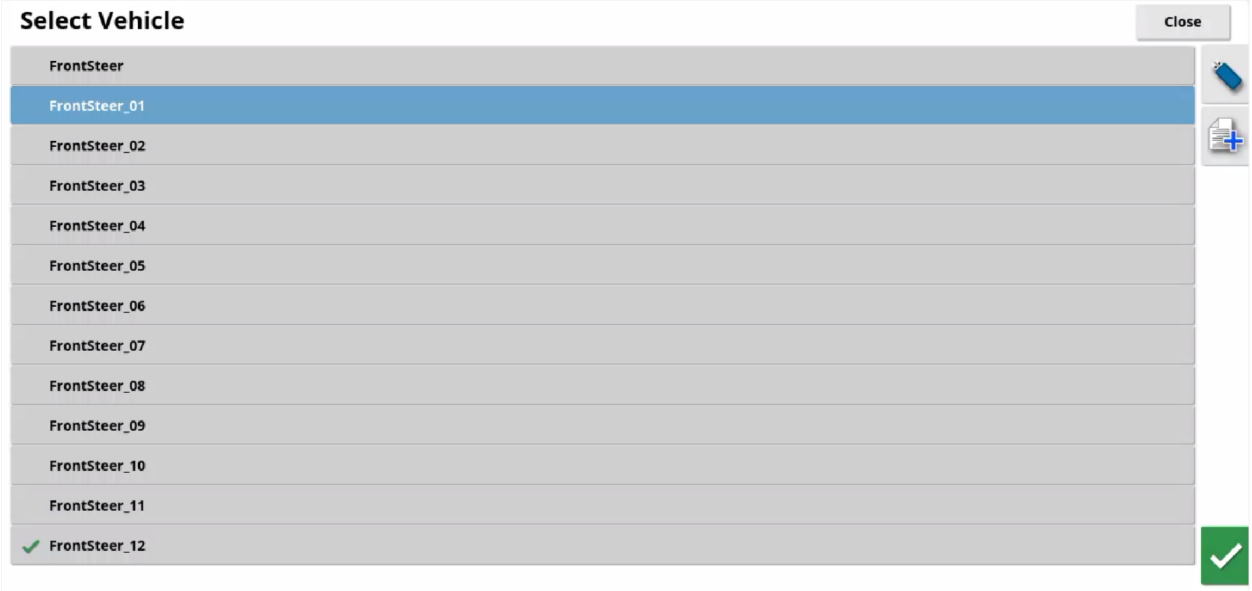
1. Make sure vehicle dimensions have been measured.
   Refer to Vehicle/implement measurements, page 13
2. Select > (**Vehicle > Geometry**).
3. Select an implement dimension tab.
4. Enter the recorded measurement and confirm.



Select vehicle

To select the active vehicle from existing vehicle profiles:

1. Select > Select (**Vehicle > Select**).
2. Select a vehicle profile (highlighted).
3. Select to confirm selection as new active profile.
   The current active profile is shown by the tick icon ✓ next to the profile name.



Import profile from USB

To import a vehicle profile from a USB storage device:

1. Insert the USB storage device into the console.
2. Select
3. Select a vehicle profile and confirm.
   The profile will appear in the **Select Vehicle** list.
4. Select imported profile and confirm.
   Profile is now active (shown by ✓ next to the profile name).

Copy profile

To copy a vehicle profile:

1. Select > (**Vehicle > New Vehicle as Copy**).
2. Select a vehicle profile to copy.
3. From the **New Vehicle as Copy** window, enter a new profile name and confirm.
4. The profile appears in the **Select Vehicle** list.
5. Select imported profile and confirm.
   Profile is now active (shown by ✓ next to the profile name).

Steering controller

To configure the steering controller:

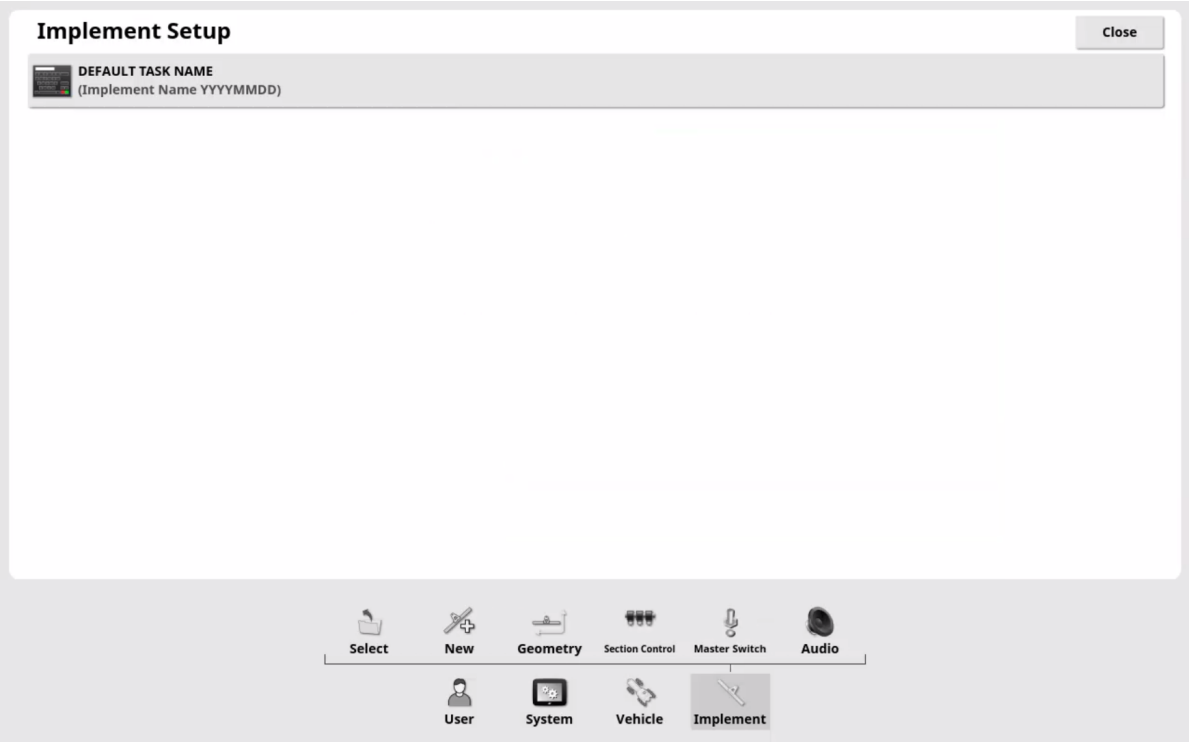
1. Select > (**Vehicle > Steering**).
2. Select a settings tab.

Wheel angle sensor	Select physical WAS or virtual WAS
Steering engage	Select 'Virtual' to use the **Auto Steer** button to operate steering. Select 'Virtual and External' to use a separate physical switch to operate steering (e.g. foot switch). The **Steering Engage** button on the XW-1 steering wheel will operate auto steering regardless of this setting

Implement settings

To configure the implement settings:

1. Select (**Setup**) to view the **Setup** screen.
2. Select (**Implement**) from the **Setup** menu.
3. Select an Implement menu option (e.g. Select).



Implement setup

To set up the implement:

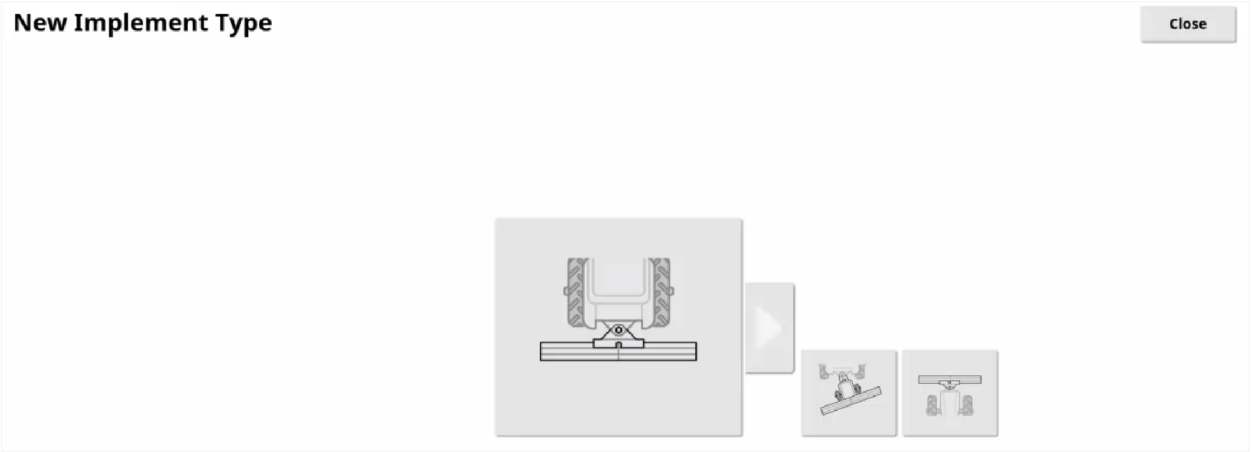
1. Select (**Implement**).
   Make sure no other menu option is selected.
2. Select the **Default Task Name** tab.
   Skip this step to use the default name.
3. Enter a task name and confirm.
4. Select the **Implement Model** tab.
5. Select either actively steered or trailed model.

Default task name	Task name used when a task is automatically created while using this implement
Implement model	Changes the steering model used to compensate for an actively steered implement (pivoted implements only, typically this should remain as trailed)

New implement

To create a new implement profile:

1. Select > (**Implement > New**).
2. Use the arrows and buttons to select an implement type.
   The **New Implement** window appears.



Implement Types

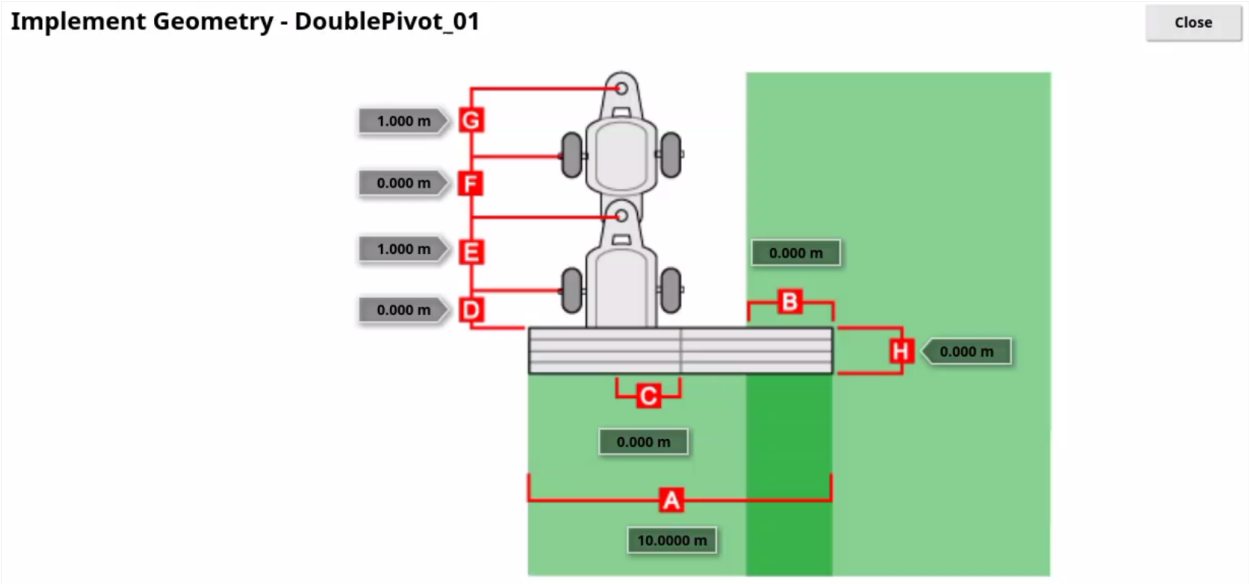
Rigid	**Front mount**	**Pivot**	**Double pivot**

3. From the **New Implement** window, enter an implement name and confirm.
   The **Implement Geometry** screen appears.

Implement geometry

To set the implement dimensions:

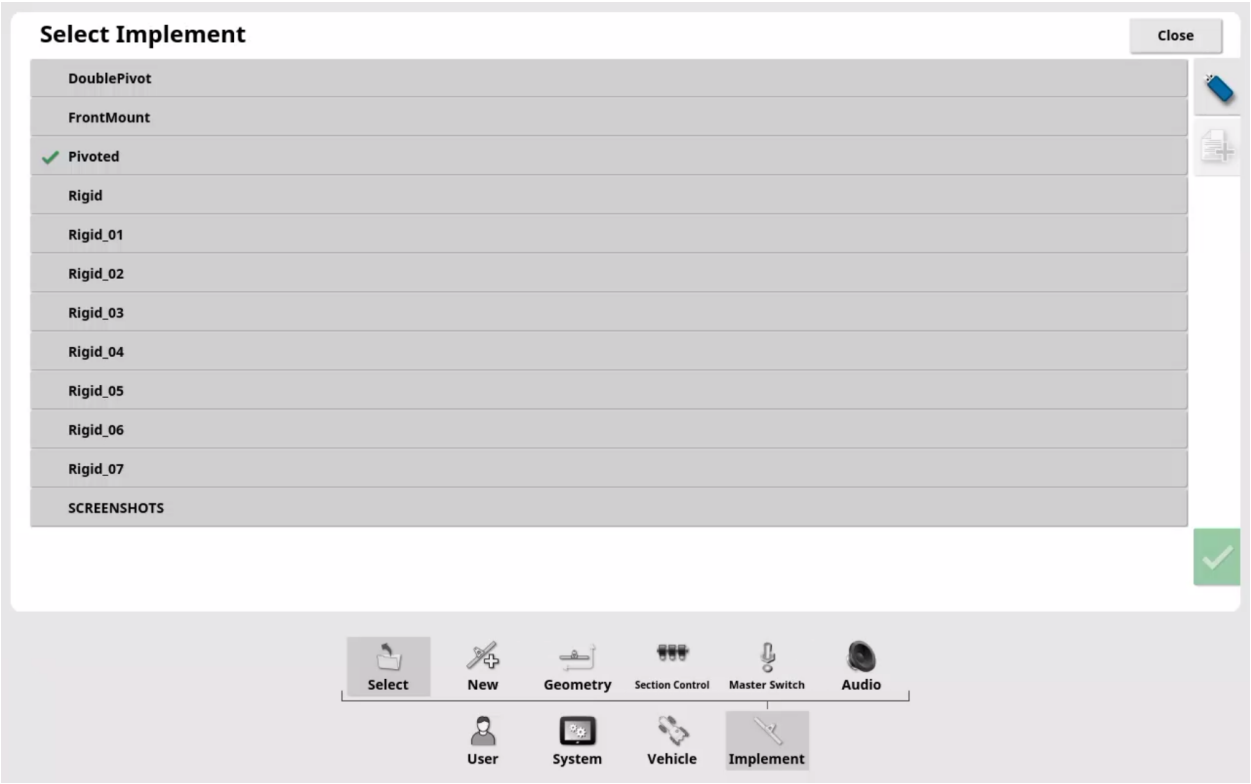
1. Select > (**Implement > Geometry**).
2. Select an implement dimension tab.
3. Enter the recorded measurement and confirm.
4. If the implement is pivoted and has active steering, make sure active steering is selected.



Select implement

To select the active implement from existing implement profiles:

1. Select > Select (**Implement > Select**).
2. Select an implement profile (highlighted).
3. Select to confirm selection as new active profile.
   The current active profile is shown by ✓ next to the profile name.



Import profile from USB

To import an implement profile from a USB storage device:

1. Insert the USB storage device into the console.
2. Select
3. Select an implement profile and confirm.
   The profile appears in the **Select Implement** list.
4. Select imported profile and confirm.
   Profile is now active (shown by ✓ next to the profile name).

Copy profile

To copy an implement profile:

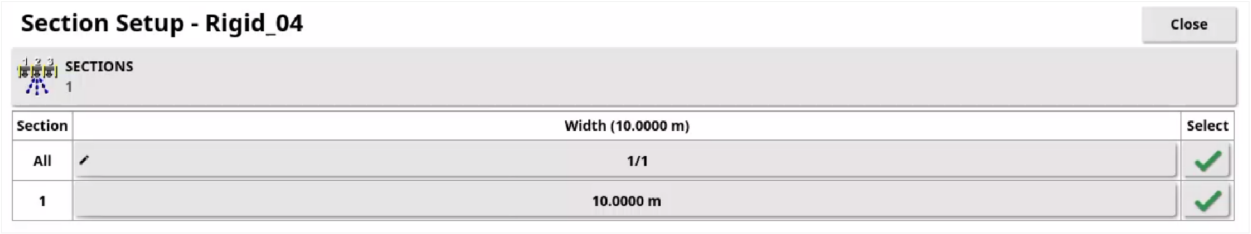
1. Select **>** (**Implement > New Implement as Copy**).
2. Select an implement profile to copy.
3. From the **New Implement as Copy** window, enter a new profile name and confirm.
4. The profile appears in the **Select Implement** list.
5. Select imported profile and confirm.
   Profile is now active (shown by ✓ next to the profile name).

Section control

Section control is a mapping function for the virtual implement. The settings do not change or control the output of any attached physical implement.

To configure the section control settings:

1. Select > > (**Implement > Section Control > Sections**).
2. From the **Section Setup** screen, select



2. Enter the number of sections and confirm.
4. Select the **Width** tab for each section and enter the width.

Section timing

Section timing is the delay between switching a section on and the section outputting product.

To set the response time:

1. Select > > (**Implement > Section Control > Timing**).
2. Select the **ON TIME** tab and enter the switch on delay.
3. Select the **OFF TIME** tab and enter the switch off delay.

Set up the master switch

The **Master Switch** allows control of the active implement from the console and external switches.

To set how the **Master Switch** is controlled:

1. Select or create the required implement profile.
2. Select **>** (**Implement > Master Switch**).
3. Select the **Master Switch** tab.
4. Select a control method and confirm.

Virtual	Controlled by selecting the **Master Switch** button
Steering engage and virtual	**Master Switch** turned on/off by the virtual **Auto Steer** button or a remote steering engage switch. The **Master Switch** can be used to toggle the master switch state without changing the steering engage state

Steering calibration

For GNSS positioning to work correctly, the system must be calibrated for each vehicle profile.

WARNING: Do calibrations on a level area, away from people and obstacles, and with sufficient space to drive in circles.

NOTICE: Do calibrations under open sky visibility and away from sources of interference.

CAUTION: Remove trailed, pivoted type implements before calibration to avoid interference with the implement draw bar.

To view the steering calibrations options:

1. From the **Setup** screen, select **Close**.
   The **Operation** screen appears.
2. Select >
   The **Steering Calibration** window appears.
3. Select a steering calibration tab.

Correct vehicle direction

To calibrate the vehicle direction:

1. Select >
   The **Steering Calibration** window appears.
2. Select **Correct Vehicle Direction**.
3. Move the vehicle forward.
3. Select **Moving Forward Now** when the vehicle is moving.

Note: This message appears each time the system is turned on.

Wheel angle sensor

Wheel angle sensor (WAS) calibration is only required when using the optional physical WAS. It should be done every 6-12 months.

WARNING: Make sure there is sufficient space for the upcoming maneuver before selecting NEXT.

WARNING: The wheels automatically move to the required position.

It is recommended that the vehicle is positioned on flat ground with at least 20 meters of clear area in front and behind the vehicle when the calibration process is started. Make sure enough distance is available on each side to drive a circle at full lock in each direction.

To calibrate the wheel angle sensor:

1. Make sure the WAS is connected.
2. Make sure the WAS has been enabled.
3. Select >
   The **Steering Calibration** window appears.
4. Select **WHEEL ANGLE SENSOR**. If the component reports as calibrated, still complete the calibration procedure if the receiver has not been calibrated.
5. Resolve any errors before proceeding.
6. Drive the vehicle forward at 2 kph (1.2 mph) and start the calibration. Maintain 2 kph (1.2 mph) throughout the calibration.
7. Select
   The system turns the wheels full lock to the left and completes 1.5 turns.
8. When prompted, select
   The system turns the wheels full lock to the right and completes 1.5 turns.
9. Turn the steering wheel as close to the center position as possible.
10. Drive in straight line and select
11. Once completed, select **OK**.
    The system saves the calibration data.

Mounting bias

Mounting bias is the initial offset from horizontal at which the GNSS receiver is mounted on the roof of the vehicle.

It is affected by:

- Tires (pressure, tension, sizing, duals)
- Cabin suspension and repairs (suspension and mounts)
- Receiver (removal/refit, changed mounting location)

Mounting bias calibration should be done if any of the above change or every 6-12 months.

The need for a mounting bias calibration depends on the GNSS correction source being used. The system may indicate the calibration is not required. However, performance may be improved by performing the calibration, depending on how the receiver has been installed.

The mounting bias calibration requires the vehicle to be driven by the auto-steering system in a straight line for at least 70 meters . A U-turn is performed and the vehicle steered back to the starting point following the same guideline. It may be necessary to repeat this process multiple times.

WARNING: Make sure the vehicle has sufficient space to travel in a straight line for at least 70 m (230 ft) and turn at each end of the guideline.

To calibrate for mounting bias:

1. Select **>**

   The **Steering Calibration** screen appears.
2. Select the **MOUNTING BIAS** tab.
3. Position the vehicle in an open area.
4. When ready to start, select to mark the ‘A’ waypoint.
5. Drive forward in a straight line.
   The ‘B’ waypoint is created automatically at 70 m (230 ft).
6. Make sure the vehicle speed remains at 2 km/h for the remainder of the procedure.
7. Turn the vehicle around and acquire the A-B guideline before the 'B' point so the vehicle drives through the point (track number should read ‘0’).

8. Select to steer on the guideline. When auto steering is engaged, the guideline turns green and auto steering engaged alarm alerts.

   If steering does not engage, the **Steering Status** window appears. Resolve all issues before proceeding.

9. Drive the vehicle over the ‘B’ point.
10. Steer along the guideline to the ‘A’ point.

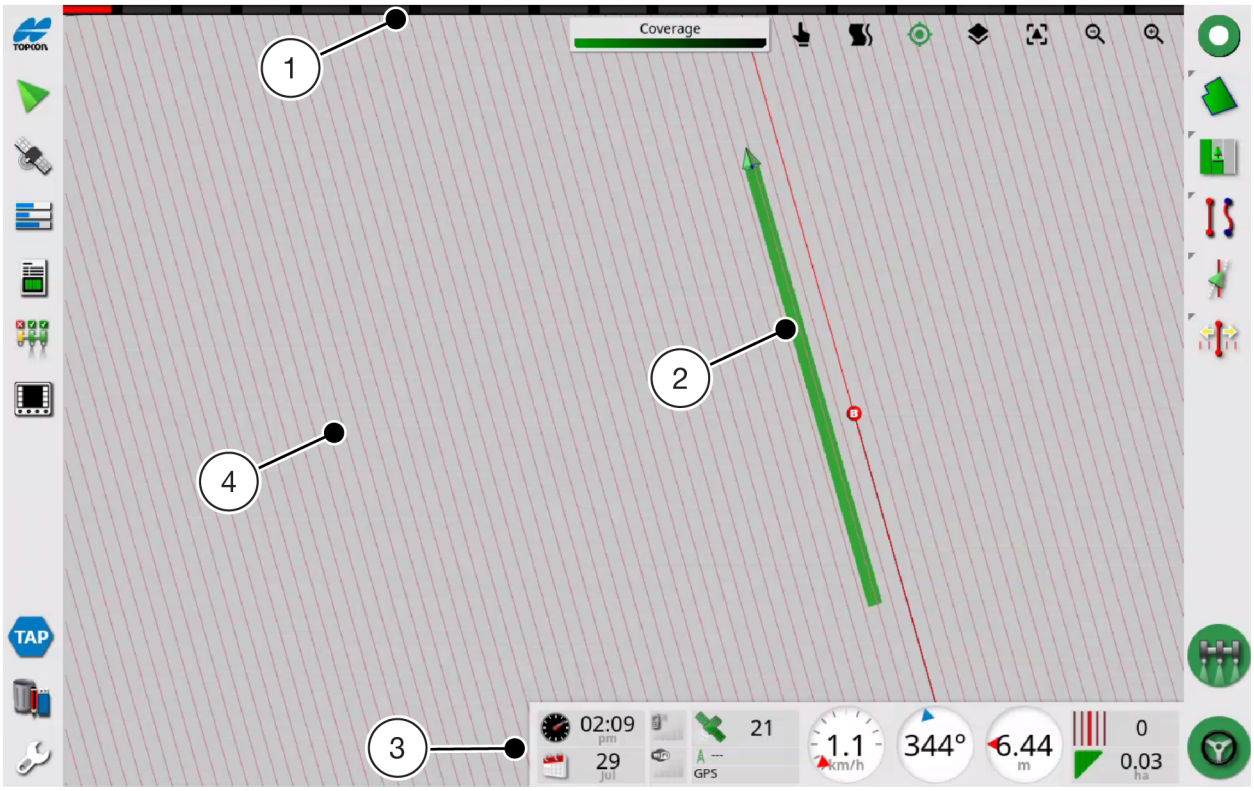
    When the **Distance To A** indicates 50 m, the blue bar on the **Calibration Progress** window increases. At 50%, progress stops to indicate the first stage of calibration is complete.

11. When the ‘A’ waypoint has been crossed, turn the vehicle around and acquire the track ‘0’.
12. Drive the vehicle over the 'A' point.
13. Select
14. Steer along the guideline to the ‘B’ point.
    When the **Distance To B** indicates 50 m, the blue bar on the **Calibration Progress** window increases. At 50%, progress stops to indicate the first stage of calibration is complete.
15. When the ‘B’ waypoint has been crossed, stop the vehicle.
    Mounting bias calibration is complete.
16. Select **OK**.

Operation basics

The **Operation** screen is the interface for using the system. It has the following main elements.

On-screen icons	Access system features and tools. Icons shown depend on licensed features, user access level, and system configuration
Guidance map	Shows fields, guidelines, vehicle location and direction, and task completion (coverage)
Virtual lightbar	Shows vehicle deviation (distance and direction) from active guideline
Dashboard	Shows system and vehicle information



1 Virtual lightbar 2 Coverage 3 Dashboard 4 Guidance map

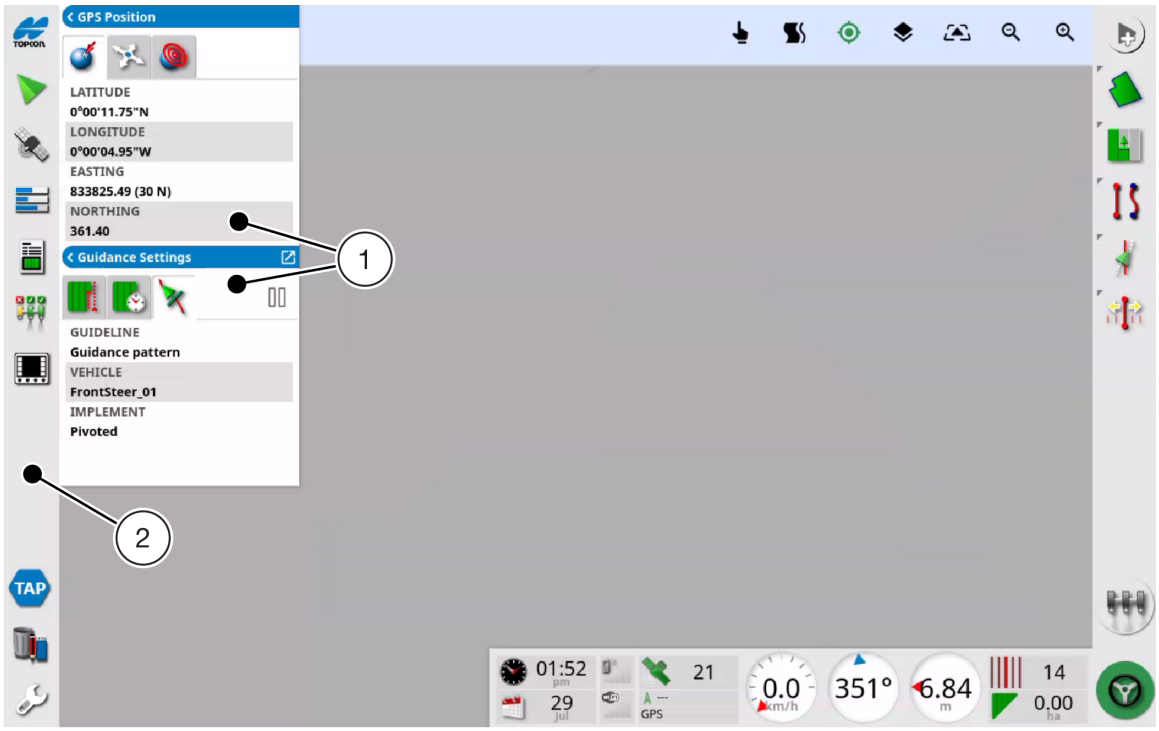
System tools

The **System** tools icons open mini-view windows showing system information and diagnostics, auto section control, and the Universal Terminal.

Swipe right to left on a mini-view window to close.

Most mini-view windows can be expanded to full screen view:

- Select in the corner of the window.
- Swipe left to right on the window.

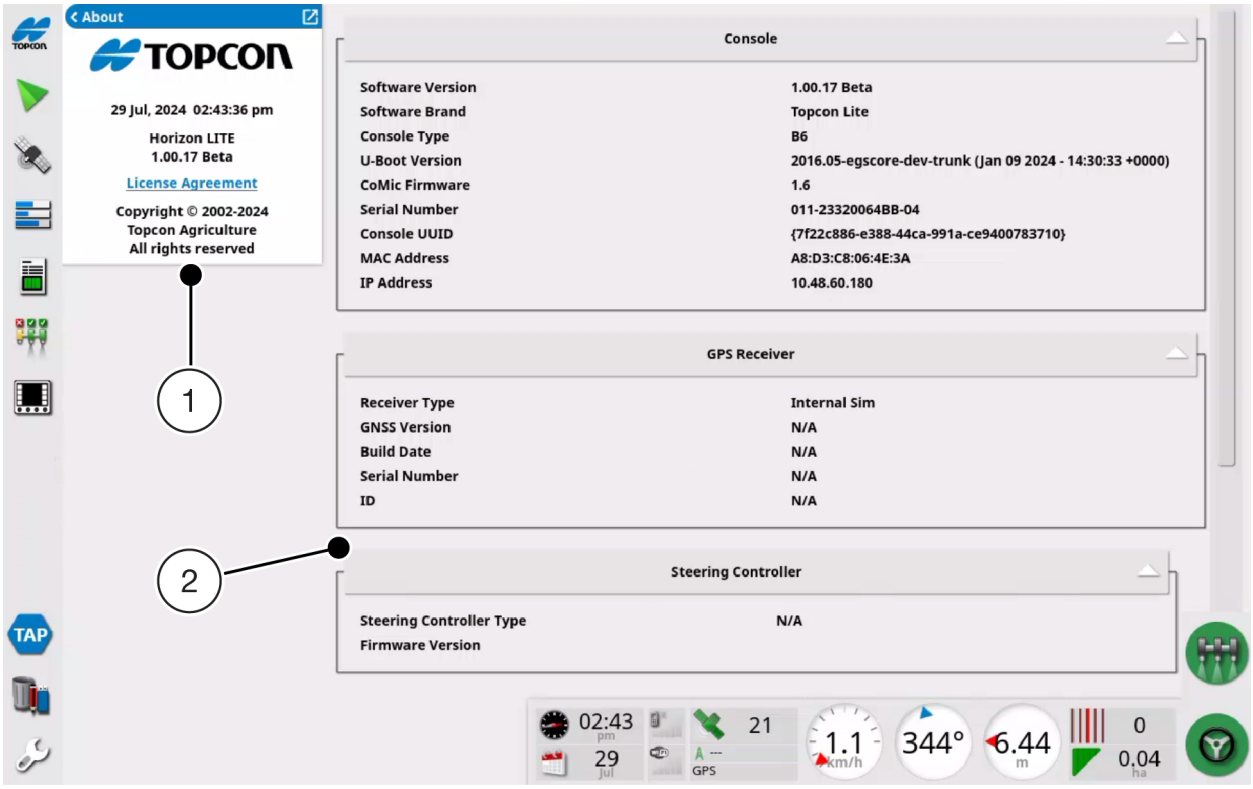


1 Mini-view windows 2 Navigation tools

System information

To view information about the system, including console, GNSS receiver, steering controller:

1. Select
   The **About** mini-view window appears and shows software version and current date/time.
2. Select to view more system information.

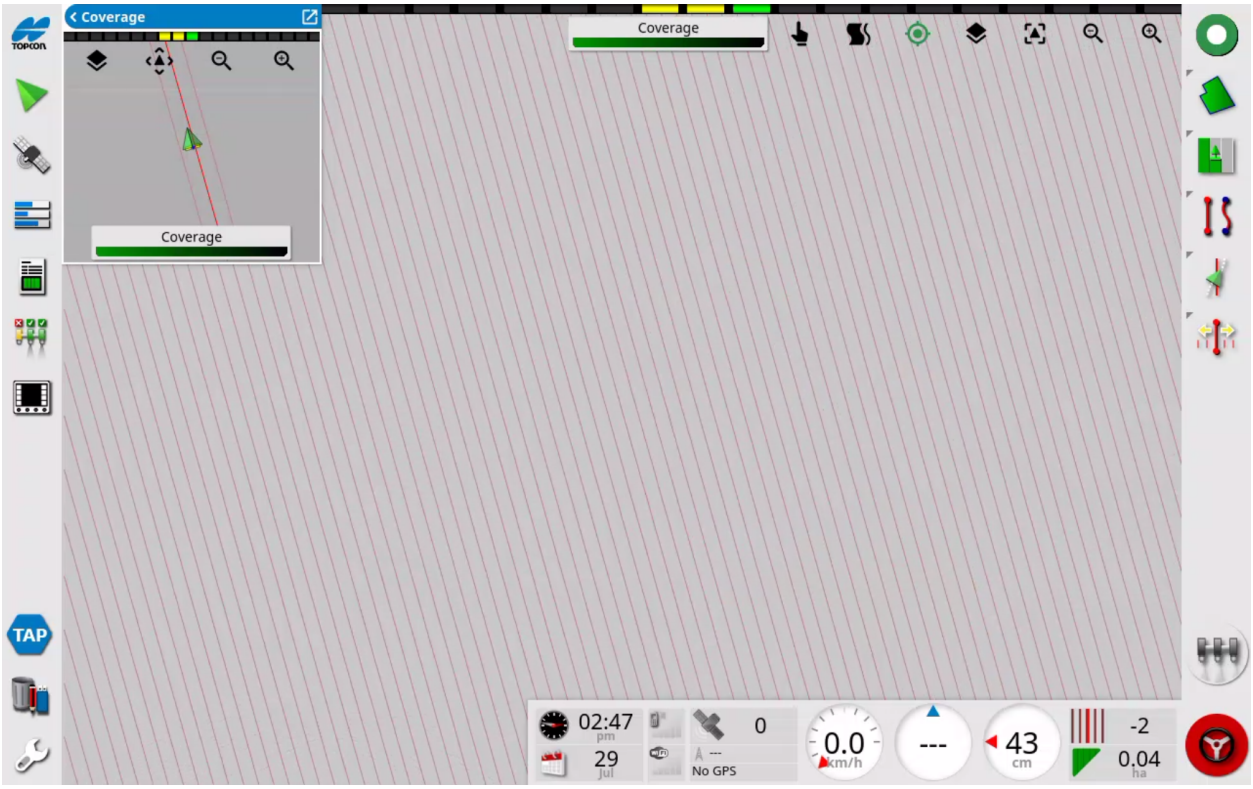


1 **About** mini-view 2 Detailed system information

Guidance

To view a window showing the guidance screen, lightbar, and **Map** tools:

1. Select
   The **Coverage** mini-view window appears.
2. Select to view the full guidance map.



The Guidance map uses the following color scheme.

Grey	Field	**Dark red**	Inactive guideline
Light grey	Grid lines	**Red**	Steer line
Dark blue	Boundary of currently selected field	**Orange**	Headland
Medium grey	Boundary of non-current field		

GNSS information

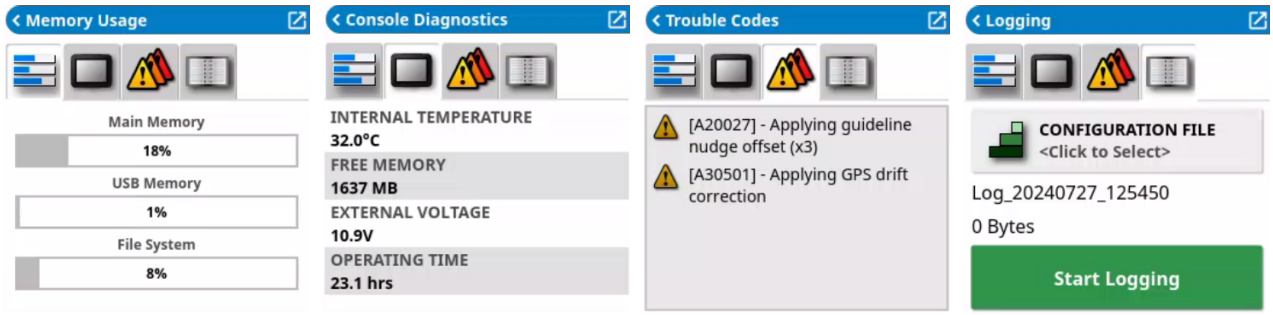
To view GNSS information:

1. Select
   A mini-view window appears.
2. Select a tab at the top of the window to view information.

Diagnostic

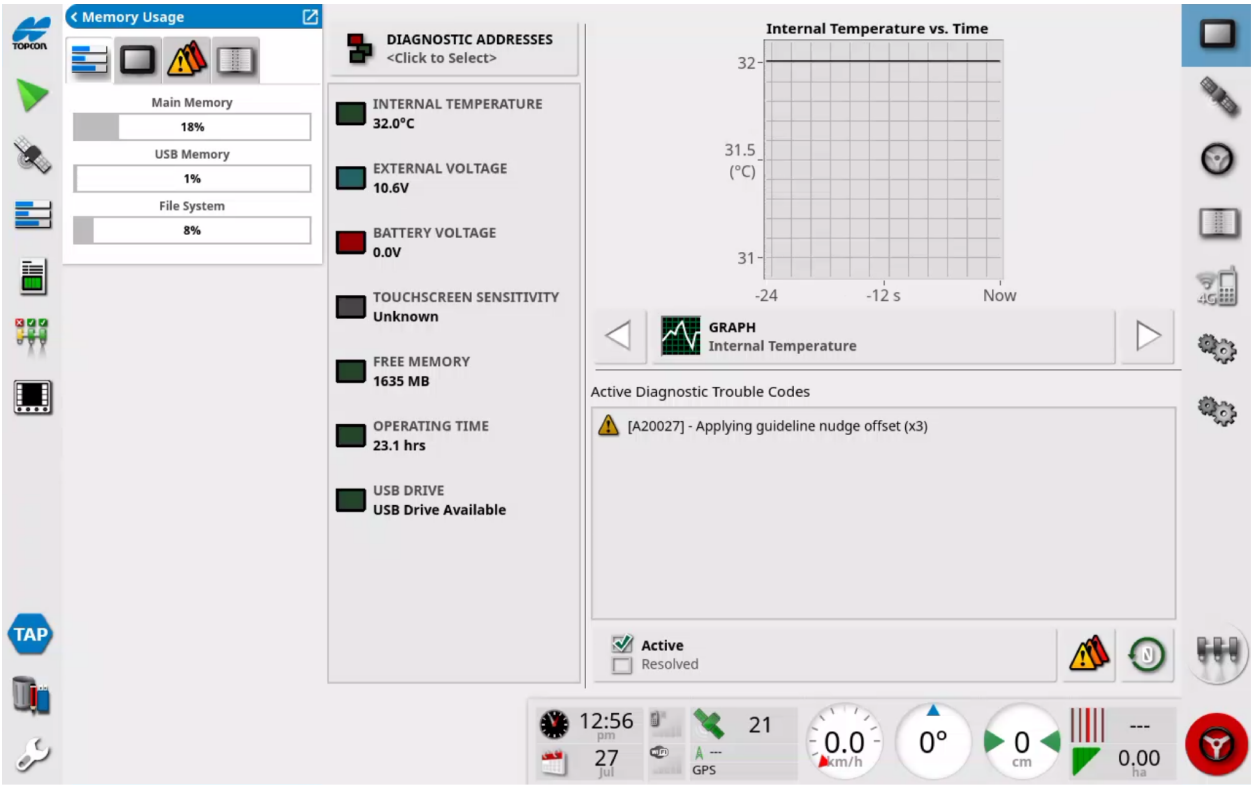
To view system diagnostics:

1. Select
2. A mini-view window appears.
3. Select a tab at the top of the window to view information.



Note: Use the **Logging** window to import (USB) configuration files sent by Topcon support.

4. Select on any mini-view to view more diagnostic information.

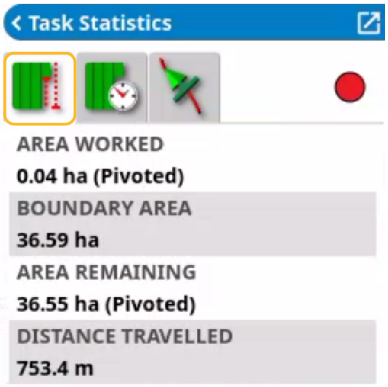


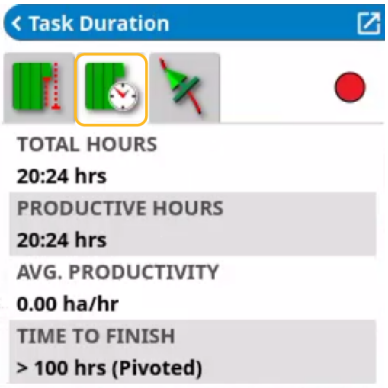
Use this screen to view the steering tuning values once the vehicle is calibrated.

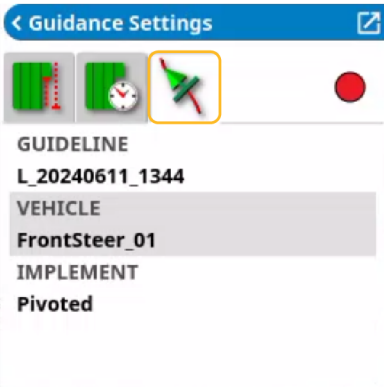
Tasks

To view information about the current task:

1. Select 
   A mini-view window appears.
2. Select a tab at the top of the window to view information.



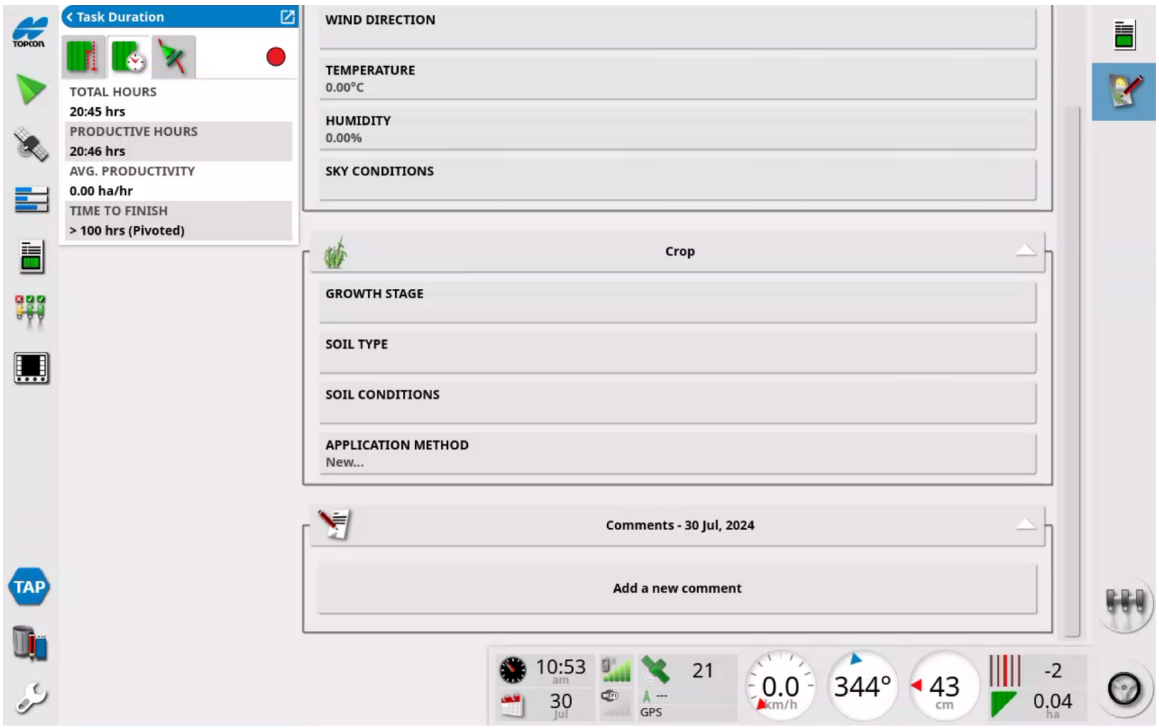




3. Select  on any mini-view window to show more information.

Details can be entered for the active task:

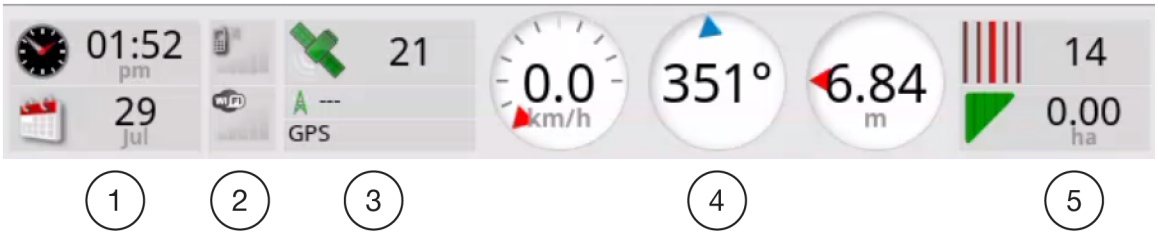
1. Select 
2. Maximize the mini-view window.
3. Select 
4. Select a tab to enter details.



Dashboard

To customize the dashboard:

1. Select anywhere on the dashboard.
2. Select an element to show (highlighted when selected) and confirm.



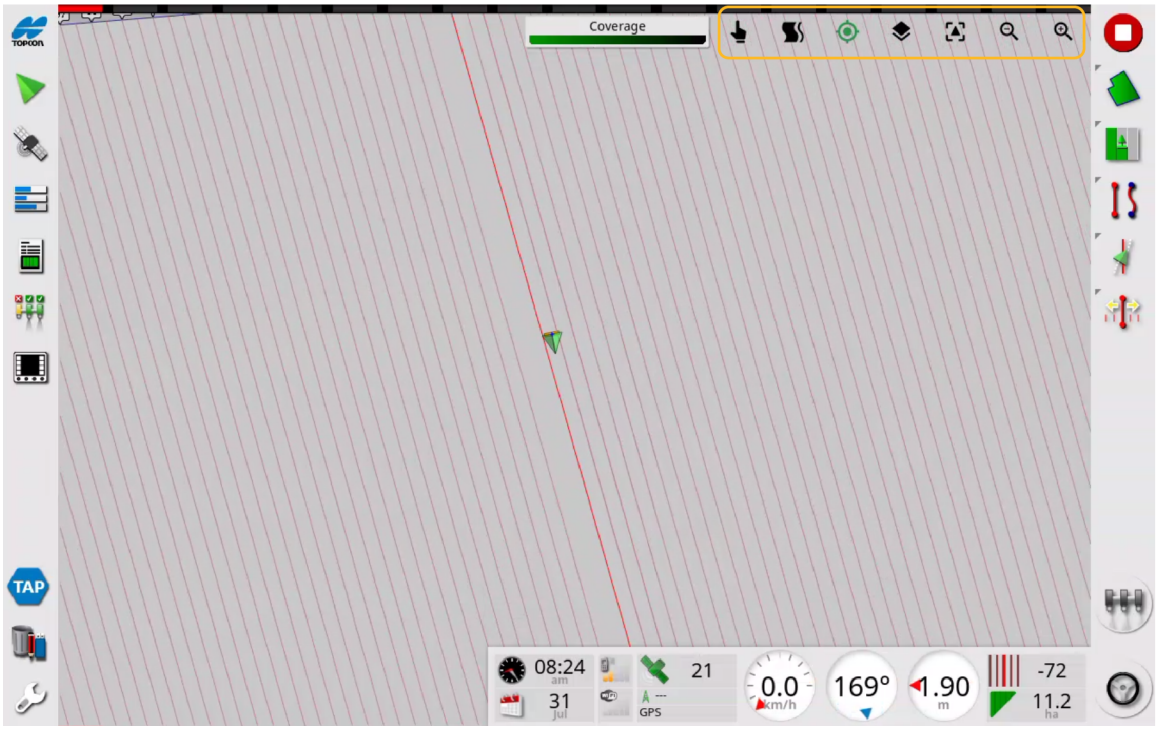
1	**Time/date**	Current time/date
2	**Signal strength**	Cellular and wireless signal strength
3	**GNSS and correction source**	System readiness and number of satellite signals Correction quality and position accuracy Correction source (RTK etc.)
4	**Guidance**	Cross track error, speed, heading
5	**Task**	Show swath, area worked or area remaining

The icons use color to indicate system status.

Grey	No correction source, no signal
Red	GNSS: poor accuracy Correction: correction source different from configuration
Yellow	GNSS: average accuracy Correction: correction source received but not accurate enough to engage auto-steering. Check differential correction and position accuracy on steering status
Green	GNSS: Good accuracy Correction: correction source has converged for auto steering engage

Map tools

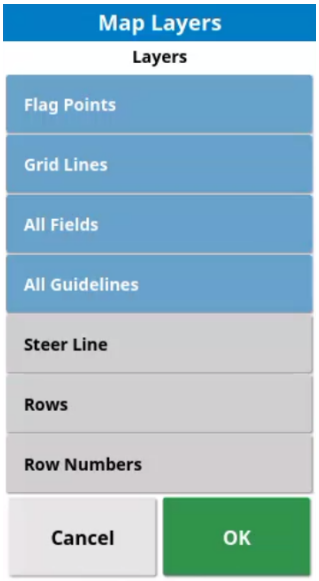
Use the **Map** tools at the top of the **Operation** screen to select how the guidance map is shown.



	Pan mode	Select and drag on the Guidance map to move the map. Default mode
	Select mode	Select and hold on the screen, then drag to select boundaries, flag points or guidelines on the Guidance map. Icon is green when active and pan mode is disabled
	Guidelock mode	Enable/disable guidelock mode. Generate a guidance line following the nearest swath of coverage
	Headland turn	Display options for next headland turn
	Center map on vehicle	Center the guidance map on the vehicle icon
	Select map layers	Select information to show on Guidance map
	Toggle map view mode	Toggle view between perspective, north up, and heading up
	Zoom out/in	Zoom in or out on the Guidance map

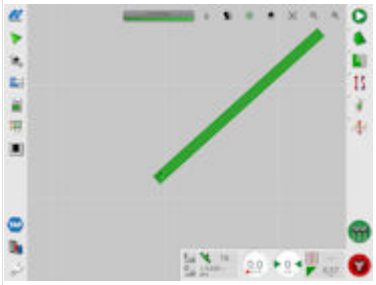
To select the information to show on the Guidance map:

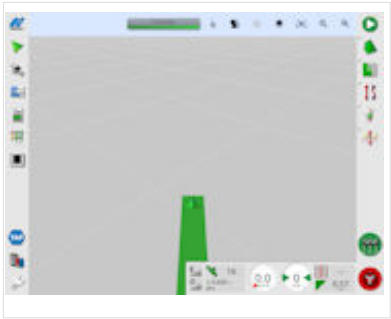
1. Select
   The **Map Layers** window appears.
2. Select the objects to show on the Guidance map and confirm.



To change the guidance map orientation:

1. Select to toggle between map orientations.

	**North view** Top of the screen is North
	**Overhead view** Top of the screen is vehicle's current direction



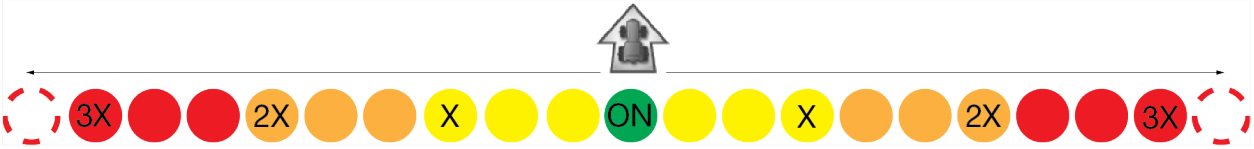
Perspective view

Perspective orientation in vehicle's current direction with virtual horizon

Virtual lightbar

The virtual lightbar can be shown on-screen to show deviations from the active guideline. It mimics the lightbar integrated into the XW-1 electric steering wheel although the virtual lightbar has three lights of each color instead of one.

As the vehicle moves away from the guideline, colored lights progressively appear on the virtual lightbar as the vehicle exceeds the user-defined distance (**X**) entered during lightbar setup. Once the cross track exceeds three times (x3) the user-defined distance, all LEDs turn off except for the last red LED on the sides of the virtual lightbar.



The virtual and XW-1 steering wheel lightbars differ in the number of colored lights. The XW-1 lightbar has only one light of each color which lights as the user-defined distance (X) is exceeded. The virtual lightbar has three lights of each color which light as one-third of the user-defined distance (X) is exceeded.

Fields

Fields are used to group objects such as guidelines, boundaries, and flag points. It is recommended a new field is created for each physical working area.

A field is created automatically when either a task is started or a guideline, boundary or flag point is created, and there is no active field.

Fields can also be created manually.

Additional boundaries, flag points, and guidelines can be added to a field within a radius of 15 km.

Create field

Manual

To manually create a new field:

1. Select >
   The **New Field** window appears.
2. Select the **Field Name** tab.
3. Enter a name for the field and confirm.
   The newly created field is now the active field.

Automatic

A new field is created automatically if there is no active field selected and a task is started or a field object is created.

A window showing the default field name appears when a field is automatically created.

The default field name can be edited from the Inventory Manager

Select field

Fields can be selected automatically or manually.

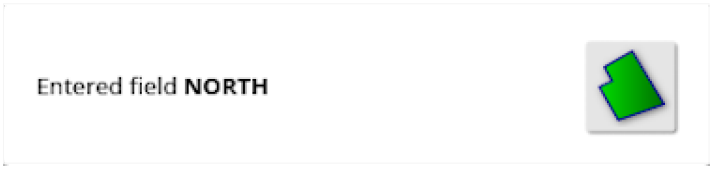
Automatic	Turn on console while in an existing field
	Drive vehicle into field when no field is active or task is running
Manual	Select and hold boundary on map
	Select from the **Field** menu

Automatic

When the vehicle enters a field and there is no currently active field, the system automatically makes the entered field active.

If a field is active and the vehicle enters another field, a pop-up window appears on the **Operation** screen alerting a new field has been entered. If a task is active, the window does not appear.

Select in the window to make the newly entered field active.

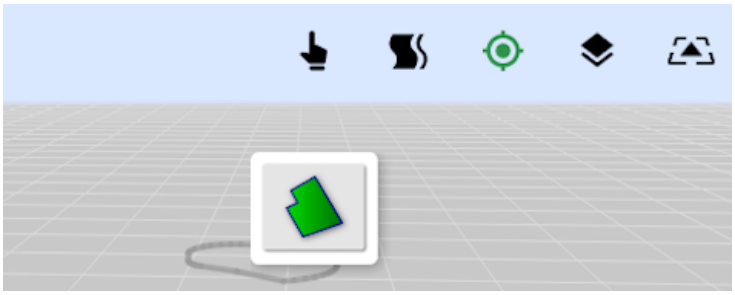


Manual

To select a field using the Guidance map:

1. Select and hold on the boundary of the field, then release.

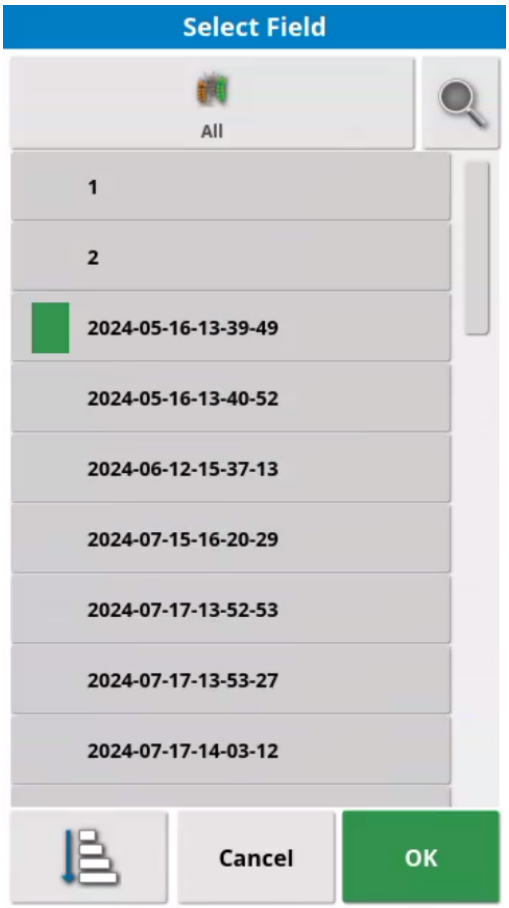
   The icon appears.



2. Select to make the field active.

Fields can also be selected using the **Field** menu:

1. Select >
   The **Select Field** window appears.



2. Select the field, and then select **OK** to confirm.

Fields can be sorted by name or distance:

1. Select
   The **Sort Options** window appears.
2. Select the parameter to sort by (Name or Distance), then select **OK** to confirm.

Fields can be filtered by crop variety, crop type, and city:

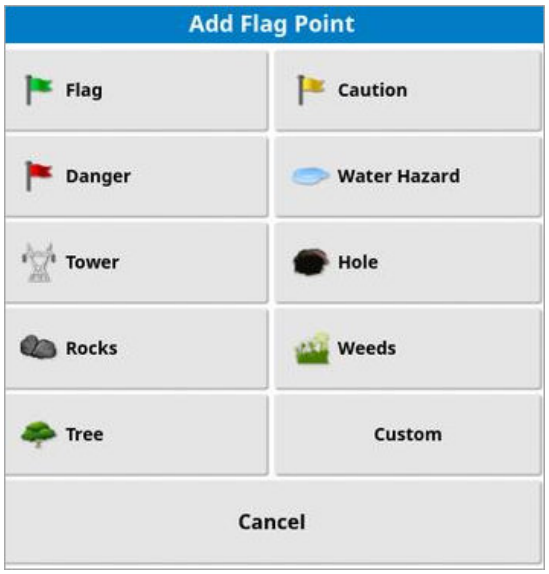
1. Select
   A window appears.
2. Select the parameter to filter by (crop variety, crop type, city), then select **OK** to confirm.

Flag points

Flag points are used to identify physical objects on the Guidance map.

To place a flag point:

1. Drive the vehicle to the object's location.
2. Select >
   The **Add Flag Point** window appears.
3. Select a flag symbol.



Modify flag points

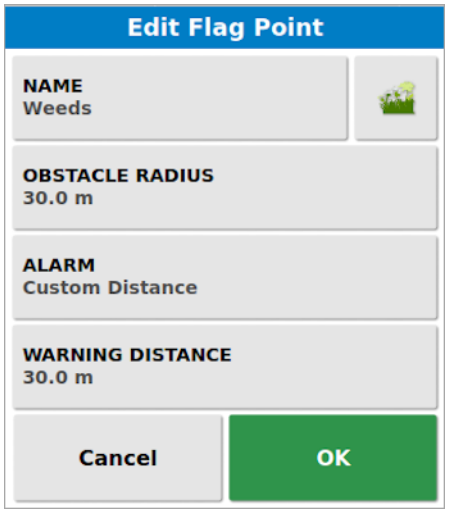
To modify existing flag points:

1. Select and hold the flag point marker on the Guidance map.
   A pop-up menu appears showing options.
2. Select an option.

	Edit flag point		**GPS drift correction** Move the vehicle to the flag point location to compensate for GPS drift. Maximum drift correction is -100 to 100 meters
	Change flag location Move the flag point by pressing and dragging to a new location		**Delete flag point**

To edit an existing flag point:

1. Press and hold the flag point marker on the Guidance map.
2. Select 
   The **Edit Flag Point** window appears.
3. Select a settings tab.
4. Select the desired setting and confirm.



Name	Edit flag point name or icon
Obstacle radius	Radius around the flag point
Alarm	Turn flag point alarm on/off and select the default or a custom trigger distance. Not visible if the alarm is disabled
Warning distance	Distance from flag at which the flag point alarm is triggered. Measured from the edge of the obstacle radius. Overrides the **Flag Point Nearby** setting

Boundaries

Boundaries are used to set the perimeter of a field or a section of a field. Multiple boundaries can be created for a field and can overlap.

Boundaries are created by driving the vehicle around the boundary while recording vehicle position. They can also be imported from shapefiles.

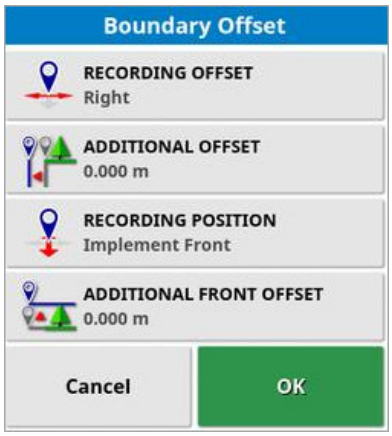
The interior of boundaries are defined as a 'work region'; however, any boundaries created within that boundary are defined as an 'excluded region' (shown as grey). These properties can be edited.

A boundary recording offset may be specified to control where the boundary is recorded in relation to the vehicle. This can be used to allow for fences and other obstacles that prevent the vehicle following the boundary exactly.

Create boundary

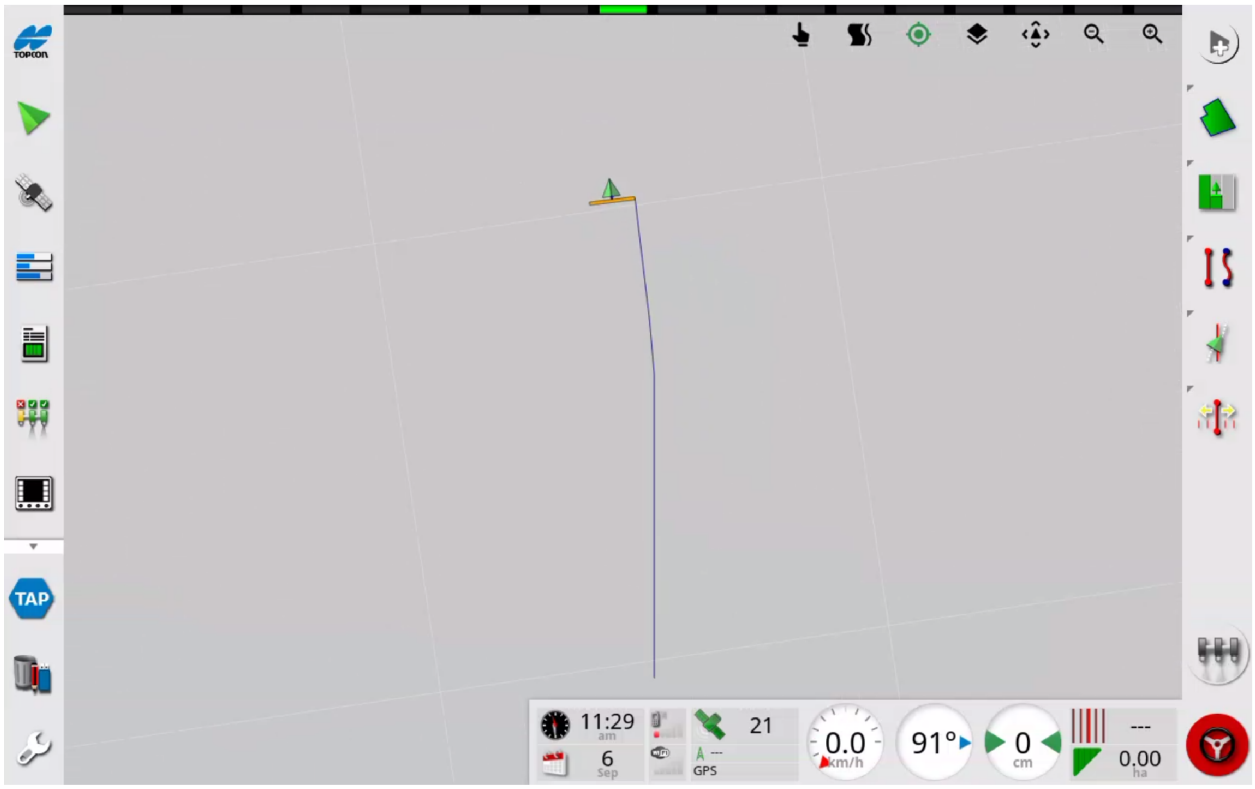
To create a boundary:

1. Drive the vehicle to the edge of the field.
2. Select >
   The **Boundary Offset** window appears.
3. Select a setting tab.
4. Enter the setting and select **OK**.



Recording offset	Position the offset on the left or right of the implement
Additional offset	Positive value extends the offset beyond the edge of the implement. Negative value positions the offset within the implement extents
Recording position	Record the boundary from the front or rear of the implement, or from the vehicle
Additional front offset	Move the recording position forward (positive value) or backward (negative value)

5. Select > to start boundary recording.
6. Drive the vehicle around the boundary of the field.
   A blue line appears on the Guidance map showing the recorded boundary, taking into account any boundary offset.



7. Select > to automatically complete the boundary recording. The boundary is completed by drawing a straight line between the current location and the boundary start point.

Pause recording

The pause recording feature can be used to create a straight segment between the locations the recording is paused and unpaused. When recording is paused, the boundary is shown on-screen as a dashed line and previews what will be created when recording is unpaused.

To pause boundary recording:

1. Select > to pause recording.
2. Select > to resume recording. A straight line is added between the point at which recording was paused and resumed.

Boundary recording can be set to automatically pause when the **Master Switch** is turned off.

Boundary from coverage

Boundaries can be created around the outside edge of existing coverage. The newly created boundaries are added to the current field.

1. Select >
   The **Boundary from coverage** window appears.
2. Set the boundary settings.

Smoothing	Minimum gap size that is automatically filled
Minimum coverage area	Minimum coverage area for creating a boundary
Distance from coverage	Expand the boundary the specified distance from the coverage
Excluded regions (on/off)	Automatically create excluded regions from any gaps in coverage that are within the total coverage area
Minimum excluded area	Minimum size of gap in coverage for creating an excluded region

3. Select **OK** to preview the boundary.
4. Select to create boundary.

   If the previewed boundary is not suitable, select to return to the **Boundary from Coverage** window and re-configure the settings.

Create boundary/excluded region from shapefile

Boundaries and excluded regions can be imported from a shapefile by USB storage device or TAP.

To create a boundary or excluded region area from shapefile:

1. Insert the USB storage device with the shapefile into the console or connect the console to TAP.
2. Select >
3. Select **Import as** and then select the appropriate option:

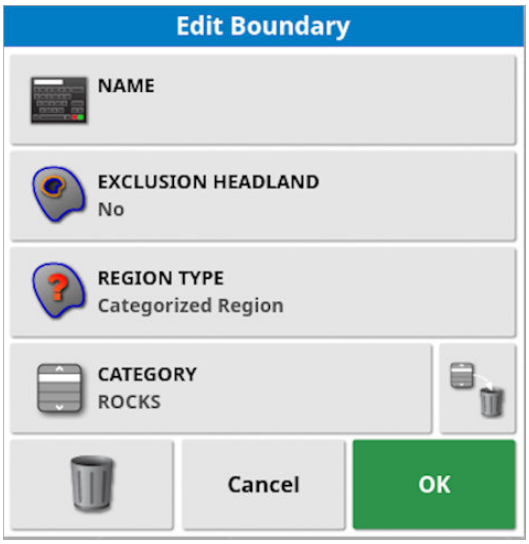
- **Auto**: automatically detect and import the boundary as a work region or excluded region
- **Work regions**: import as a work region boundary
- **Excluded regions**: import as an excluded region

4. Select or TAP
5. Select the shapefile, and then confirm.

Edit boundary settings

To edit boundary settings:

1. Select and hold on the boundary, then release.
   A pop-up menu appears.
2. Select 
   The **Edit Boundary** window appears.



Name	Optional boundary name
Exclusion Headland	Set the exclusion zone boundary edges as a headland (see Working headland , page 76)
Region Type	Work regions indicate areas where product is applied if section control is used Excluded regions indicate areas where product will not be applied if section control is being used
	Delete the selected boundary
	Delete the boundary category

Configure edges

Segments are utilised when using advanced headland management.

Select **Configure Edges** to modify the edge segments.

Points can be moved, added or deleted to modify the edges.

Delete boundary

Note: Deleted boundaries are permanently erased.

To delete a single boundary:

1. Select and hold on the boundary on the Guidance map, then release.
   A pop-up menu appears.
2. Select 
   The **Edit Boundary** window appears.
3. Select  to delete the boundary.

Unload field

The **Unload field** icon  de-selects the currently active field and associated objects (e.g. flag points, boundaries).

If the active field is not unloaded, an alert appears when the vehicle has moved more than 15 km away and the active field is deactivated.

To exit and deselect the active field:

1. Select  **>** 

Working headland

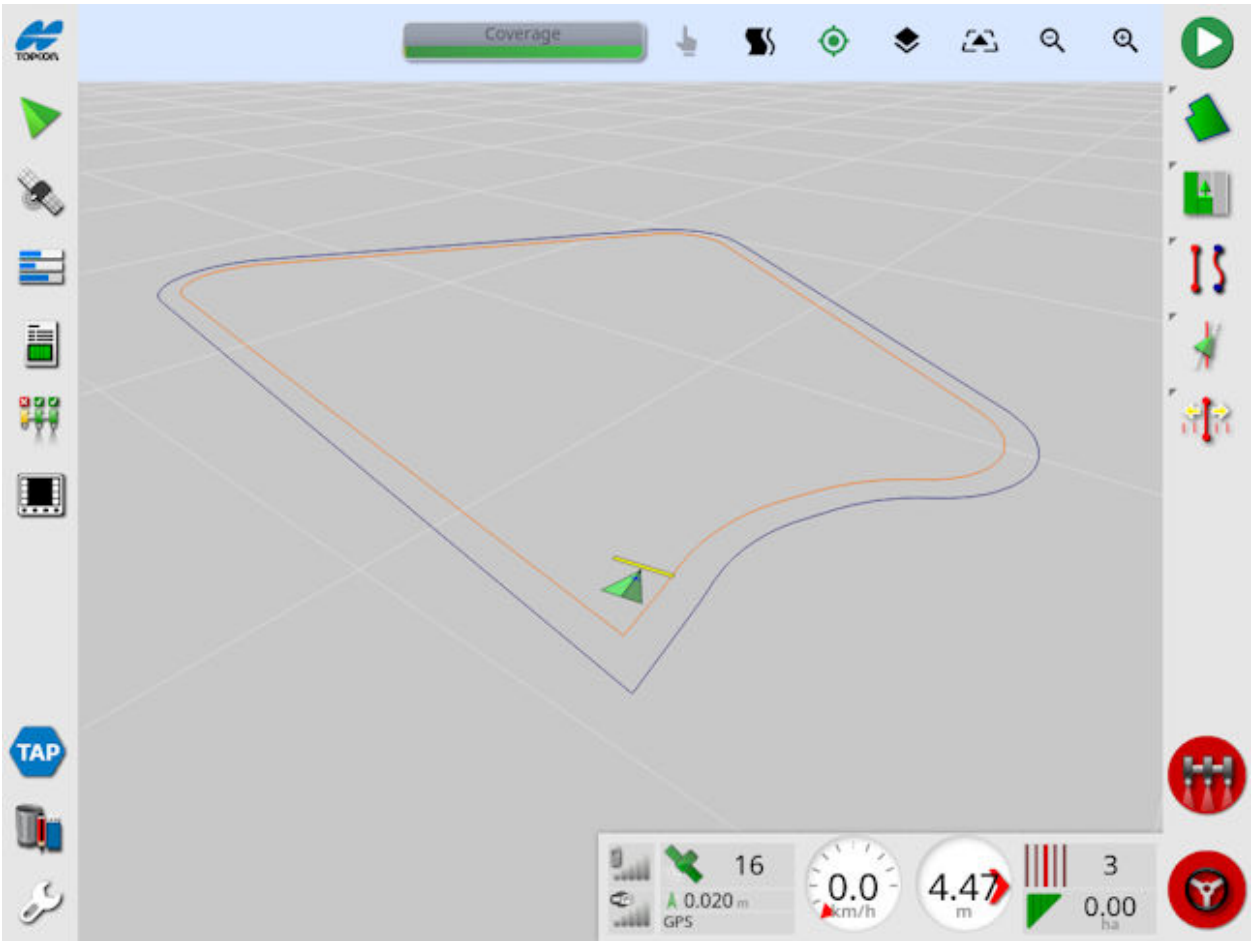
A headland is a zone inside the boundary that can be worked independently. A headland can only be created once a boundary has been recorded.

A working headland must be set for the headland turns feature to function.

Note: Headland data is stored with the active implement profile, allowing each implement to have different headland options.

The headland is shown in orange inside the boundary on the Guidance map.

When the vehicle approaches the headland, any headland action that has been configured is triggered.



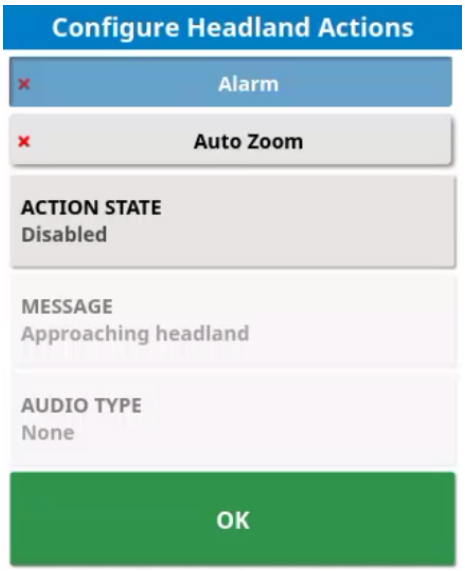
Set working headland

To set a working headland:

1. Select >
   The **Headland Options** window appears.
2. Make sure **Headland** is enabled.

The headland width can be set using Headland Width (Swathes), Headland Offset or both settings together. If both settings are used, they form the total headland width.

3. Set the headland width.
4. Select the **Look Ahead** tab, then enter and confirm the distance in front of the vehicle the system responds.
5. Select the **Configure actions** tab.
   The **Configure Headland Actions** window appears.



6. Select the desired headland action (Alarm, Auto Zoom).
7. Select the action state (Enabled, Disabled).

8. For alarm actions, select the alarm message and audio type.
   For Auto Zoom actions, select the zoom level and enter the distance at which auto zoom is triggered when approaching a headland.
9. Select **OK**.

Configure headland to boundary edges

Multiple headlands can be created independently within the same field, each with different distances from the boundary edges. Headland width can be increased or decreased on an edge or the headland offset increased on an edge.

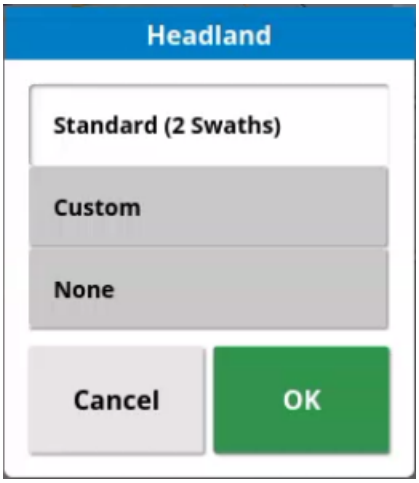
To configure headlands to individual boundary edges:

1. Select >
   The **Headland Options** window appears.
2. Make sure **Headland** is enabled.

3. Select the **Advanced** tab.
   The **Advanced Headland Options** window appears.
4. Select **Configure Edges**. The **Configure Boundary Edges** window opens and the boundary shows a series of points.
   The **Configure edges** option is not available if edges have already been configured. Instead, the **Advanced Headland Options** window appears.
5. Select and hold on a point and then move or delete the point as required.

6. If additional edge segments are required, select and hold on the edge segment to split, then select the **Add Point** icon to add an additional point.
7. If boundary edges required modification, select and hold the boundary, then edit the boundary settings.
8. Select **OK**.
   The **Advanced Headland Options** window appears.

5. Use the left/right arrows to select the numbered edge to configure. The selected edge and edge points are highlighted.
6. Select the **Headland** tab.
   The **Headland** window appears.



7. Select the headland options for the selected edge:
   - **Standard (2 Swathes)**: set the headland on the selected edge to the standard settings. Shows the settings in swaths and offsets, if applicable.
     If the standard headland width is changed in the **Headland Options** window, all edges using "standard" change.
   - **Custom**: return to the **Advanced Headland Options** window to set Custom Headland Width (Swaths) and Custom Headland Offset. Applicable for that edge only.
   - **None**: remove the headland from the selected edge.
8. Select **OK**.
   The **Headland Options** window appears.
9. Select **OK**.

Tasks

Tasks are used to associate job information such as coverage with a field.

An active task is necessary to record and show coverage on the Guidance map.

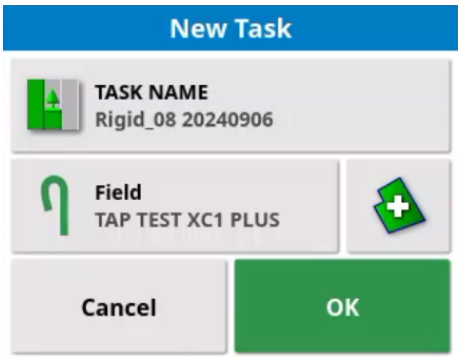
Create a task

Tasks can be created using the **Task** button and the **Task** menu icons.

Selecting the **Task** button starts a new task without needing to set a task name and field. Default names are applied to the task and the automatically created field. A notification showing the task name appears. Select the blank area of the notification window to hide.

To create a task using the **Task** menu:

1. Select >
   The **New Task** window appears.



2. Select the **Task Name** tab to enter task name.
3. Select the **Field** tab to select an existing field to group the task with or select to create a new field.
4. Select **OK** to confirm the new task settings.

Master switch

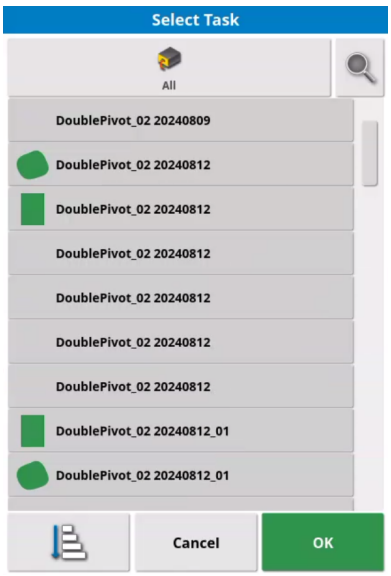
Selecting the **Master Switch** when no task is running automatically creates and starts a new task using the current field and default task name.

If a task is in the paused state when the **Master Switch** is selected, a window appears. Select **Resume** to start the paused task or **New** to add a new task.

Select task

Drive to the field and follow the steps to choose an existing task.

1. Select >
   The **Select Task** window appears.



2. Select the task, and then select **OK** to confirm.

Tasks can be sorted by distance, age or date:

1. Select
   The **Sort Options** window appears.
2. Select the parameter to sort by (Name or Distance), then select **OK** to confirm.

Tasks can be filtered by crop variety, crop type, and city:

1. Select
   A window appears.
2. Select the filter (e.g. field, implement), then select **OK** to confirm.

Start task

If the system is not ready to start the selected task, the **Task** button icon is red. Select the Task button to show the issues preventing task start.

To show the start status:

1. Select the **Task** button
   The **Start Task Status** window appears.
2. Select to show information on the start-up issue.

To start a task when the system is ready:

1. Make sure the **Master Switch** is enabled.
2. Make sure system is ready to start task.
3. Select the **Task** button

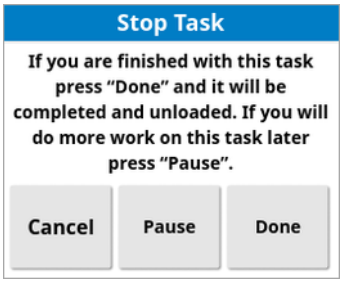
Pause task

Tasks can be paused (e.g. when the vehicle leaves the field).

Pausing a task stops the productive time counter. To aid the accuracy of the average productivity figure, make sure tasks are paused when work is not being done.

To pause a task:

1. Select the **Task** button
   The **Stop Task** window appears.
2. Select **Pause**.
3. Select the **Task** button to unpause the task.


Stop Task
If you are finished with this task press “Done” and it will be completed and unloaded. If you will do more work on this task later press “Pause”.
Cancel
Pause
Done

Complete task

When a task is completed and stopped, it is saved for future use or export.

To complete a task:

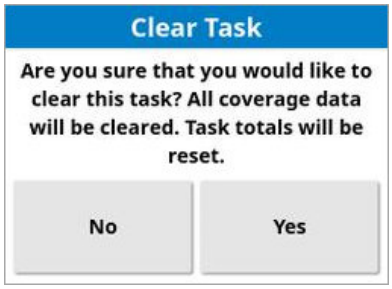
1. Select the **Task** button
   The **Stop Task** window appears.
2. Select **Done**.
   The task is saved.

Clear task

Clearing a task removes recorded coverage and task data only. It does not clear the associated field data or guidelines.

To clear the active task:

1. Select >
   The **Clear Task** window appears.



2. Select **Yes** to clear the task data or **No** to keep the data.

View task information

The page 61 show recorded task information (i.e. statistics, duration, guidance settings).

Import/export

Tasks can be imported and exported using the **Inventory Manager**.

Task button

The **Task** button gives quick access to task features.

The color and shape of the **Task** button icons show the current task status.

	System not ready, loaded task cannot be started. Select to show the **Task Status** window
	Loaded task is ready to start. Select to start task
	No loaded task. Select to create and start a new task
	Task is running. Select to pause task
	Task is paused. Select to unpause task
	Task is completed (loaded but not running). Select to save task

Guidelines

Guidelines are used to define the path for the vehicle to follow through the field. Guidelines are shown on the Guidance map as a series of lines spaced an implement width apart. They are propagated by the system from the active guideline.

Create guideline

Up to 20 unique guidelines can be created for each field.

They are created using the **Guideline** menu .

They can also be created using the XW1 electric steering wheel.

Several types of guideline can be created.

	AB line.		Center pivot guideline
	Identical curve guideline		Manual AB line entry (window)
	Boundary steering		Guidelock mode
	Cycle guidance modes		

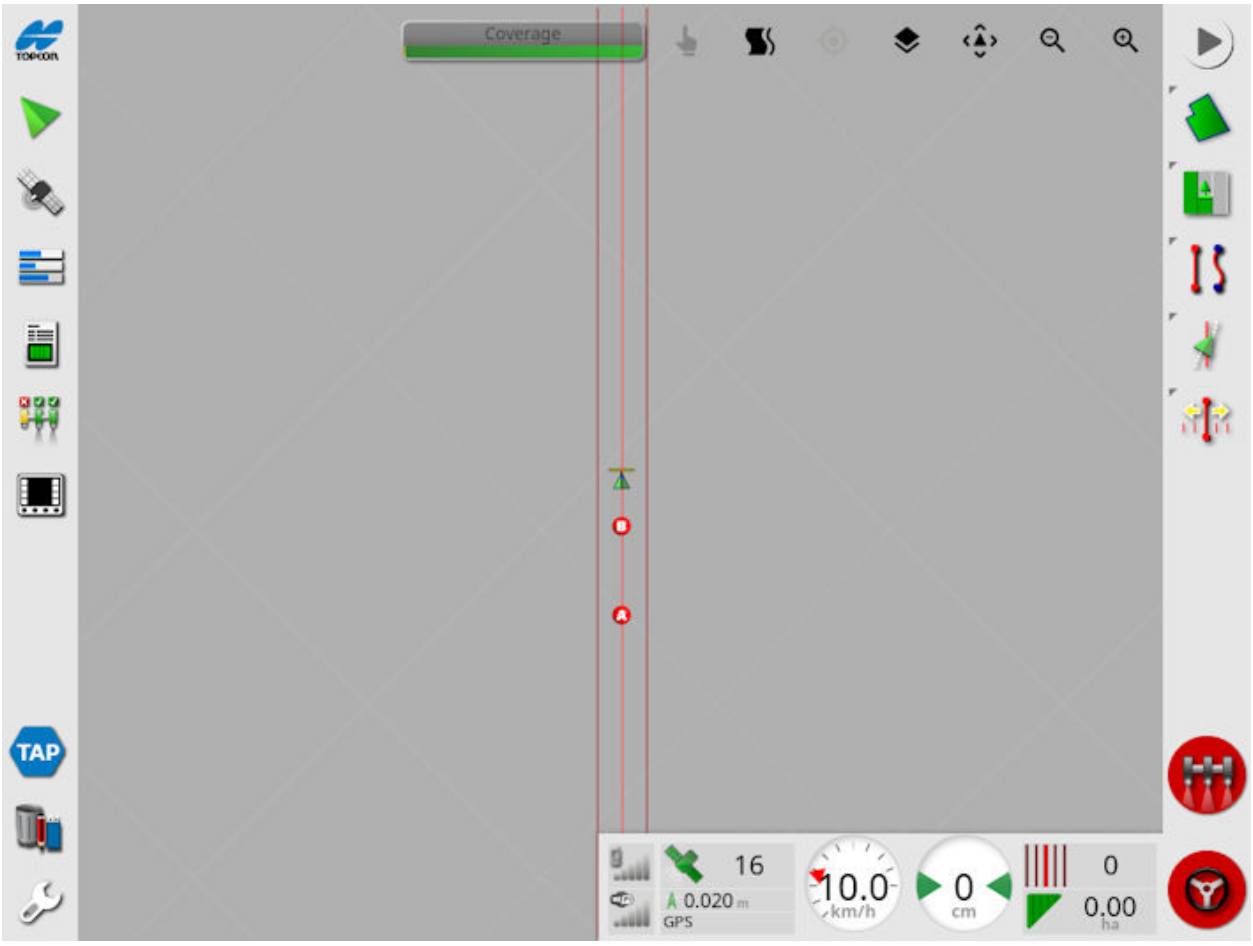
AB line

Use the AB line guideline to create parallel (straight) lines within a field.

Make sure the AB line is set near the headland line. This allows guidelines to evenly propagate across the working area.

1. Select > >
2. Position the vehicle at the start of the AB line.
3. Select to set the 'A' point.
4. Drive along the required swath.
5. At the end of the required swath, select to set the 'B' point.
   The new guideline is automatically selected as active even if another guidance line is actively being steered.

An option to rename the new guideline is displayed.



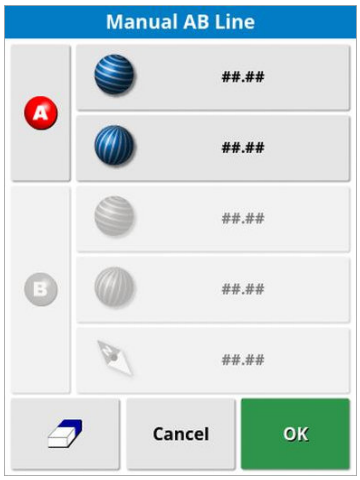
To view the AB line across the field, select from the top of the screen and then select **Rows** (this requires a field boundary).

Manually set AB lines

AB lines can also be created using coordinates:

1. Select > > >

   The **Manual AB Line** window appears.



2. Set the ‘A’ point using one of the following:
   - Drive to the desired location and select 
   - Enter the latitude/longitude of the ‘A’ point.
3. Set the 'B' point using one of the following:
   - Drive to the desired location and select 
   - Enter the latitude/longitude of the 'B' point.
   - Enter the Heading of the AB Line. A ‘B’ point will be placed to create an AB line of the desired heading, relative to the ‘A’ point.

Select  to delete a guideline.

Identical curve guidelines

Use identical curve guidelines for fields with a curved or shaped boundary. .

To create identical curve guidelines:

1. Select  >  > 
2. Position the vehicle at the start point of the curve and select 
3. rive along the curved swath. A black line appears behind the vehicle on the map to indicate the curve that is being recorded.
4. Use the pause function to record a straight portion of the curve. If the 'B' point is dropped while the recording is paused, the paused portion of the line will not be saved. To finish the curved guideline with a straight portion, unpause the recording, then drop the 'B' point.
5. At the end of the curved swath, select  to indicate the end of the curve recording.
   The new guideline is automatically selected as the active guideline even if another guideline is actively being steered to.

Center pivot guidelines

Curved guidelines can be created around a center pivot point.

CAUTION: Consider the turning circle of the vehicle and implement when driving the first arc.

To create a center pivot guideline:

1. Select > >
2. Position the vehicle at the start point of the curve.
3. Select
4. Drive around the center of the field. A pivot accuracy bar appears and shows guideline progress.
   When the necessary accuracy to create the pivot is reached, the recording stops automatically.

   Alternatively, select to approximate the pivot that has been driven so far.

   Once the system detects the arc, circular guidelines are created, based on the width of the implement.
5. Select the new guideline as active.
6. Rename the new guideline if required.

Select guideline

To select a guideline:

1. Select and hold on the guideline on the map.
2. Select to activate the line.

Alternatively, select in the **Guidelines** menu to toggle between guidelines.

To show all guidelines associated with the current field, select , then select "All guidelines".

The **Select Guideline** option can also be used:

1. Select
2. Select the required guideline mode, then select
   The **Select Guideline** window appears and shows all guidelines in the current field.

3. Select the required guideline and confirm.

Edit guideline

Guidelines can be managed by selecting a specific guideline from the Guidance map.

To edit a specific guideline:

1. Select and hold on the guideline on the Guidance map, then release.
   Guideline options appear.
2. Select a guideline option.
3. Configure the guideline setting and confirm.

	Activate selected guideline for auto steering and guideline propagation
	Edit the guideline name
	Enable guideline propagation from the active guideline across the entire field. The active guideline is closest to the vehicle's current position. Disable propagation when the loaded guideline should only be followed on swath zero
	Disable guideline propagation
	Delete the selected guideline

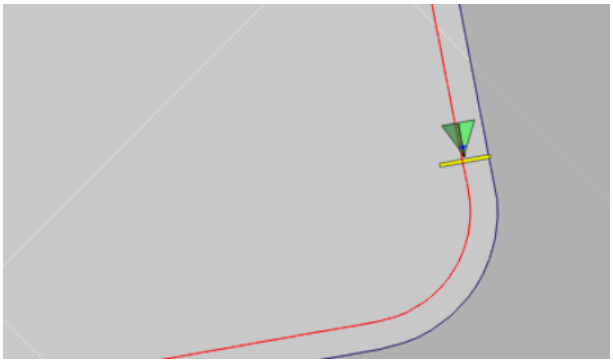
Guidelines can also be edited by selecting the Guidelines category in the **Inventory Manager**.

Import guidelines

Guidelines can be imported from ISOXML files via TAP and USB storage device using the **Inventory Manager**.

Boundary steering

This feature generates a guideline following the boundary inside its perimeter. By default, the guideline is offset by half an implement width from the boundary. This width can be adjusted using the **Nudge** menu.



Make sure the guideline is a sufficient distance away from the boundary to avoid colliding with fences etc.

As the vehicle moves towards the center of the field, more guidelines are created. Guidelines are spaced one implement width apart.

To use this option, a boundary must be created:

1. Make sure **Boundary Steering** is enabled.
2. Select and hold the boundary on the Guidance map.
   A pop-up menu appears.
3. Select
   Alternatively, select from the **Guideline** menu. The icon changes to when boundary steering is enabled.

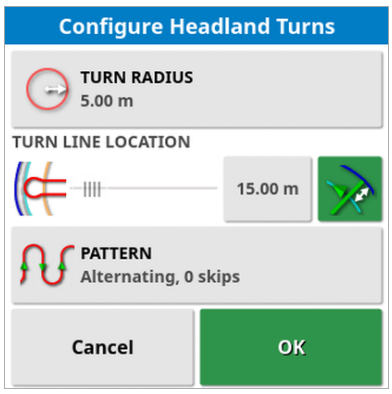
This option can also be used to steer around the boundary of exclusion zones if Exclusion Headland is set to 'Yes'.

Headland turns

Automatically steer headland turns when using AB lines or identical curve guidelines.

A boundary must be created for the active field to automatically perform headland turns.

1. Make sure **Headland Turns** feature is enabled.
2. Make sure a boundary has been created.
3. Make sure a headland has been enabled and configured from the **Field** menu.
4. Select **>**
   The configure headland turns icon are not shown in the **Guidelines** menu unless a straight AB or identical curve guideline is currently selected as the active guideline.
5. The **Configure Headland Turns** window appears.
6. Select the setting tabs and enter the necessary settings.
   These settings are saved to the implement profile.



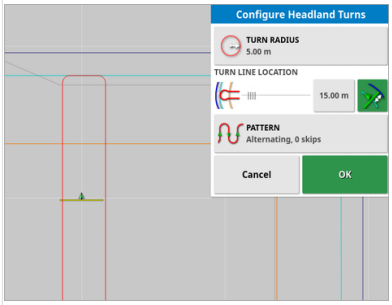
When the **Configure Headland Turns** window appears, a light blue line is shown inside the boundary, indicating where headland turns will occur.

Drive the vehicle to a location close to the headland to view the shape and position of the turn as settings are adjusted.

Turn radius

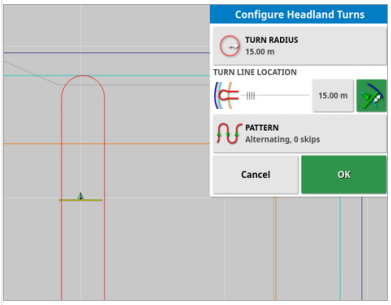
WARNING: The turn radius must be set high enough to allow the vehicle and implement to perform the turn. Setting this value too low may cause the vehicle to jackknife resulting in damage to equipment.

Start with a conservative turn radius. Adjust the turn radius as required to optimize the turn.



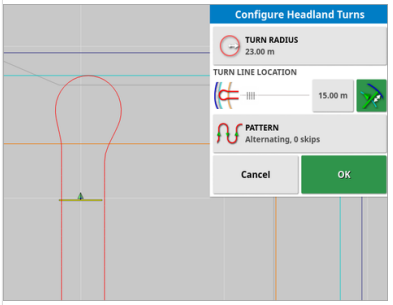
Small turn radius

Rectangle shaped turn with rounded corners



Half implement width turn radius

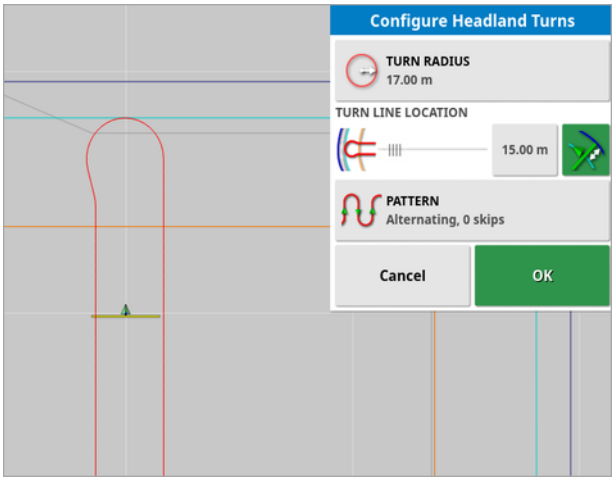
Smooth, round turn



Large turn radius

Keyhole shaped curve

The shape of the curve can result in the vehicle initially moving away from the next line to avoid overshooting. This is intentional and helps avoid coverage gaps.



Turn line location

Set the distance from the boundary the headland turn is done. This is indicated by the light blue line. This is measured from the boundary to the centre of the implement, this measurement can be manipulated using the slider or a specific distance may be entered.

If the implement geometry has an in-line offset entered, this may move the position from which the distance is measured.

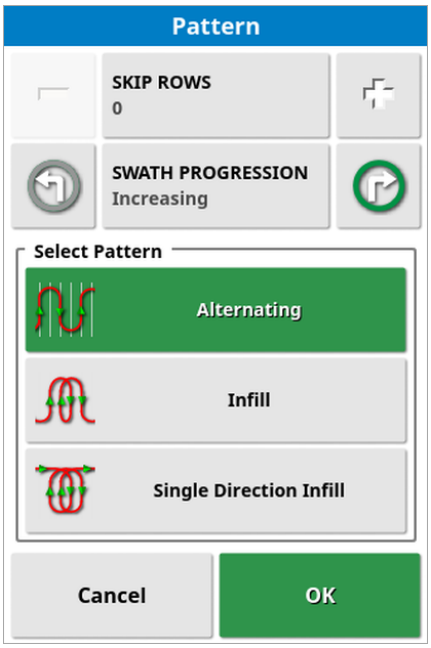
Start with the turn location set to the implement width to make sure there is sufficient clearance from the boundary. Once the turn is done successfully, reduce the turn location to be closer to the boundary.

When "Constrain Turn line location" is turned on, , the minimum turn line location is restricted to half the implement width to prevent the implement from colliding with a physical fence

Start with the turn location set to the implement width to ensure sufficient clearance from the boundary. Once the turn is performed to satisfaction, reduce the turn location to be closer to the boundary.

Pattern

Opens the **Pattern** screen.



Select the pattern used by the vehicle to travel through the field.

- **Skip rows**: skip one or more rows at each turn.
- **Swath progression**: travel progresses through increasing or decreasing swath numbers displayed on the guidelines.

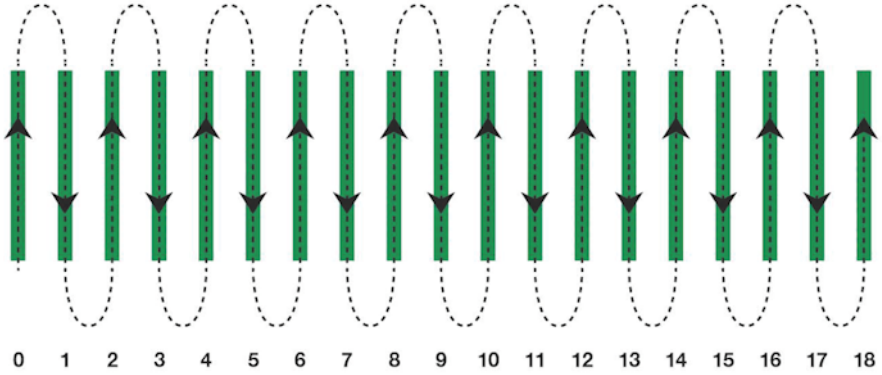
  To view all guideline numbers across the field (if using AB lines), select from the top of the screen and then select **Row Numbers**.

Select pattern

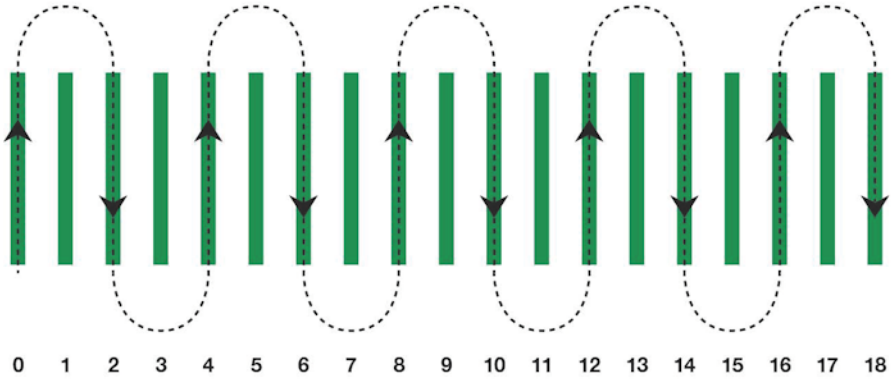
Alternating

Vehicle travels up one row and down the next. Skip rows can be used if the implement is too large to make the turn onto the adjacent row.

Zero rows skipped



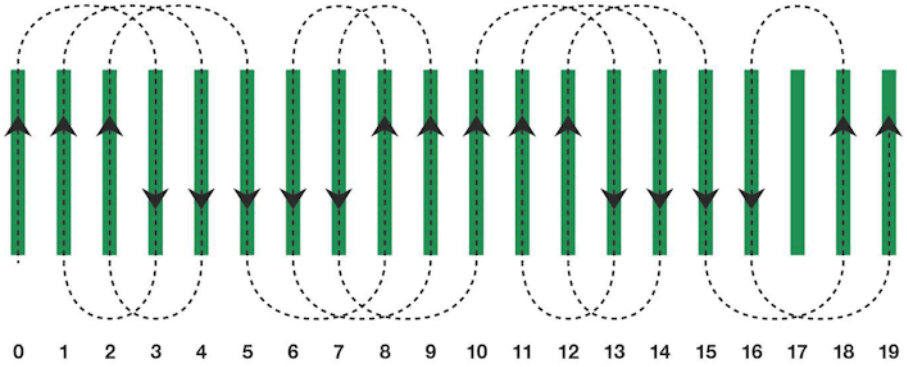
One row skipped



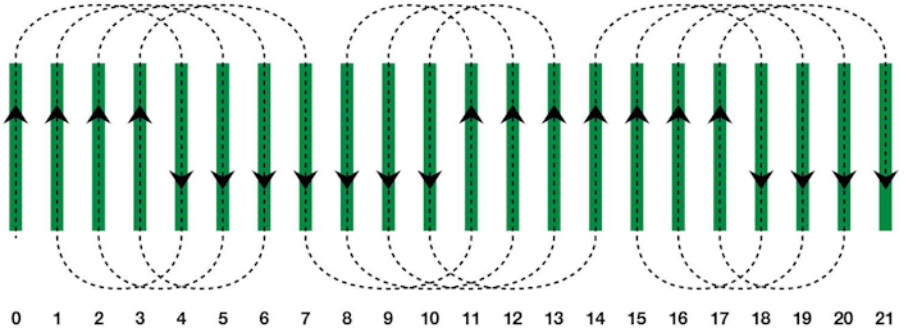
Infill

Vehicle skips a row and then turns back to fill in the skipped row. More than the defined number of rows can be skipped to complete the pattern.

One row skipped



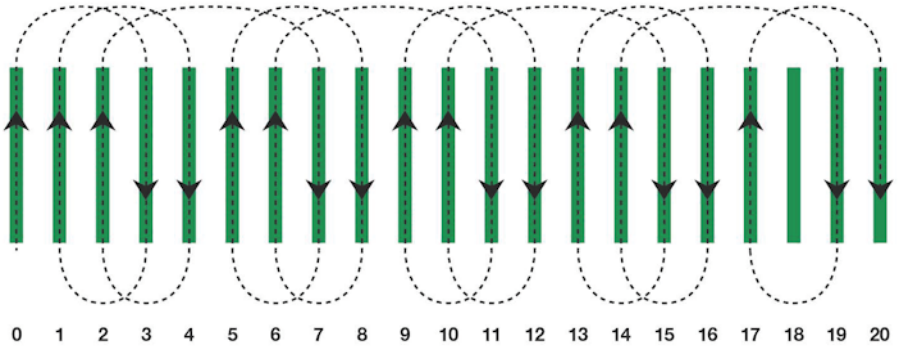
Two rows skipped



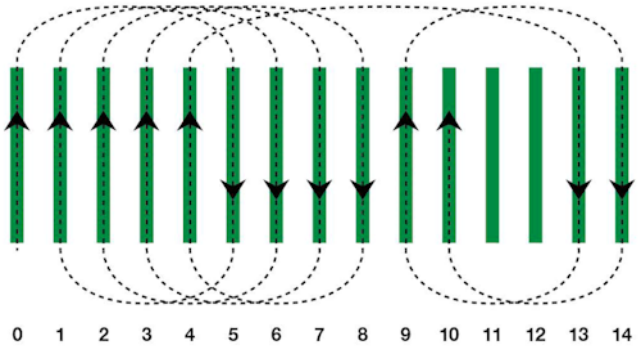
Single direction infill

Vehicle only turns in the same direction (left or right) at the end of each row. More than the defined number of rows can be skipped to complete the pattern.

One row skipped

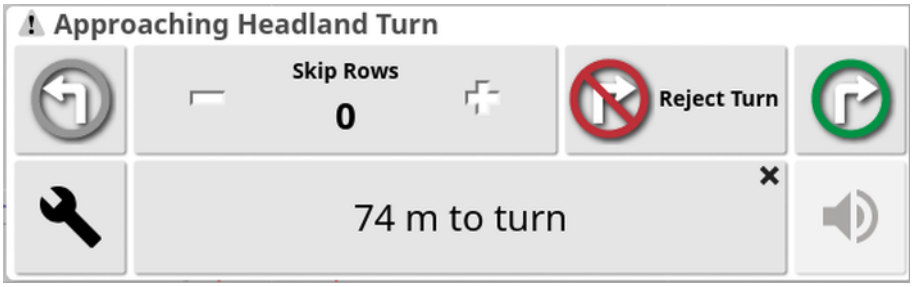


Three rows skipped



Edit headland turns via alarm

The headland alarm can be used to change the direction of the headland turn, change the number of rows to be skipped, or reject the upcoming turn. Selecting the alarm accepts the upcoming headland turn.



The alarm can be displayed manually by selecting button at the top of the guidance screen. The alarm icon changes to show the next action.

Guidelock mode

Guidelock is a coverage-based guidance mode. It generates a curve based on existing coverage, regardless of when that coverage was laid.

To engage guidelock mode:

1. Select the Guidelock icon
   A black or white icon indicates that guidelock mode is off; a colored icon indicates guidelock mode is on.

   Alternatively, select from the **Guideline** menu.

   The icon changes to when guidelock is enabled (available if boundary steering is enabled).

A temporary guideline is shown on-screen to indicate the path that the vehicle will take.

Auto steering

Auto steering is operated using the **Auto steer** button on the console or the **Steering Engage** button on the XW1 electric steering wheel.

Before engaging auto steering, do the following:

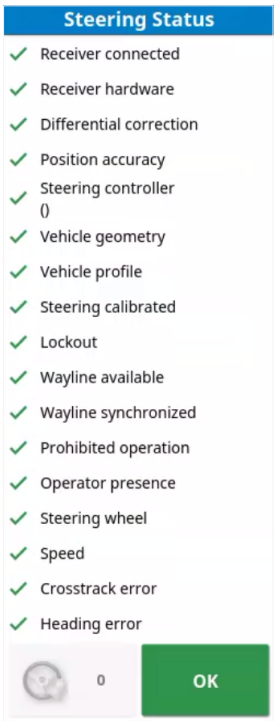
1. Enable auto steering.
2. Calibrate auto steering if required.
3. View the **Auto Steer Status** window.
4. Make sure all items on the window are ready to start.
5. Set the auto steer tuning to suit the vehicle and task.

Steering status

The **Steering Status** window displays the status of the preconditions for engaging auto steering.

To view the window:

1. Select >
   The **Steering Status** window appears.



Select to view steering alarms.

Engage auto steer

To engage auto steering:

1. Position the vehicle at the desired starting point.
2. Zoom and pan on the screen until the vehicle is in the center of the screen and at a comfortable size for viewing.
3. Correct any issue displaying red in the **Steering Status** window (work through issues displayed from the top to the bottom of the screen).
4. Confirm the **Auto Steer Engage** button is white, indicating ready to engage.
5. Drive slowly to meet a guideline, heading in the desired direction.
6. Select **Auto Steer Engage**. The button icon turns green. The vehicle steers to the nearest guideline.

Auto steer button

	Ready to engage Select when white to start auto steering		Delayed engage (flashing) If conditions preventing auto steering engaging are easily resolved (e.g. speed), select twice (double tap) when green to delay auto steer engage. The icon flashes indicating auto steer will engage if conditions are met within 15 seconds. If conditions are not met, the icon returns to red
	Engaged and active Select when green to return to manual control		System cannot engage Select to show the **Steering Status** window

Disengage auto steering

Auto steering can be stopped manually or automatically when the necessary pre-conditions shown on the **Steering Status** window are no longer met.

To manually disengage auto steering:

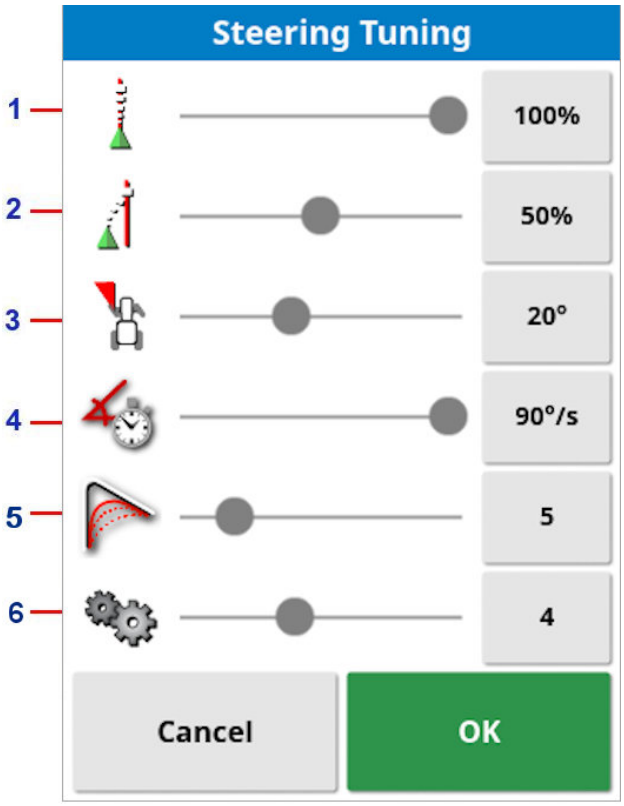
1. Turn the steering wheel manually. The force required to disengage can be changed by modifying the "disengage threshold" value.
2. Select to disengage auto steering.
3. If using an external steering switch, disengage using the switch.

Tune auto steering

Auto steering tuning can assist in improving system performance.

To tune the auto steering:

1. Select **>**
   The **Steering Tuning** window appears.
2. Select a setting to modify.
3. Use the slider or number button to configure the setting.



Online aggressiveness		Sets how aggressively the system attempts to follow the guideline. High values may make the system consistently move the wheels back and forth. Low values may make the vehicle not follow the guideline closely
Approach aggressiveness		Sets how rapidly the vehicle attempts to acquire a guideline. High values may result in sharp turns and the vehicle approaching too quickly resulting in overshoot of the guideline. Low values may take excessive time for the vehicle to accurately follow the guideline
Maximum steering angle		Maximum allowable steering angle. Limits the maximum steering angle of the wheels. High values allow tighter turns and more reactive steering. High values may become too reactive or dangerous at higher speeds
Maximum steering rate		Degrees per second the wheels can turn
Smoothing radius for curve waylines		Sets how closely the vehicle will follow curved guidelines. Low values follow the curved guidelines closer
Wayline selecting aggressiveness		Uses the Maximum Steering Angle and the swath spacing to determine which guideline is selected next. If set to 10, the guideline closest to the vehicle is selected. If set at 0, the guideline selected next may be a few swaths away to ensure a gentle approach. The default value is 4

Nudge

Guidelines may need adjustments (nudges) due to changing conditions, GNSS drift, or corrections errors.

Guidelines can be nudged left or right by a user-defined distance or to the vehicle's position using the **Nudge** menu.

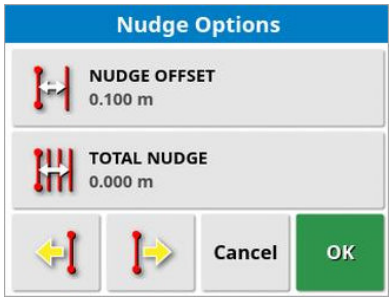
Nudge options are available for AB lines, straight guidelines, center pivot guidelines, identical curves, and boundary steering.

To view nudge options:

1. Select
   The **Nudge** menu appears.

Nudge options

1. Select >
   The **Nudge Options** window appears.
2. Select the **NUDGE OFFSET** tab.
3. Enter the desired nudge distance.



3. Select **TOTAL NUDGE** and enter distance to move the guideline that distance from its original position.
   Entering 0 resets the guideline to its original position.
4. Select or on the **Nudge Options** window or **Nudge** menu to nudge guidelines left or right by the nudge offset distance.
6. Select to save the guideline in the nudged position.
   If the name is unchanged, a pop-up window appears alerting the name will be overwritten. If done, the original guideline cannot be retrieved unless the nudge distance is remembered. Enter a different name for the guideline to save a copy in the nudged location.

Nudge to vehicle position

To align the guideline to the vehicle's current position:

1. Select  > 

When nudging a curve or pivot, the size of the curve (or radius of the pivot) changes.

GNSS drift compensation

GNSS drift can occur over time, commonly when using low accuracy correction sources.

It can result in a difference between the position of a physical object in the field and the position of that object previously logged in Horizon Lite (e.g. fence line). This is most obvious when observing the distance between vehicle position and artefact onscreen compared to the real position of these items in the field.

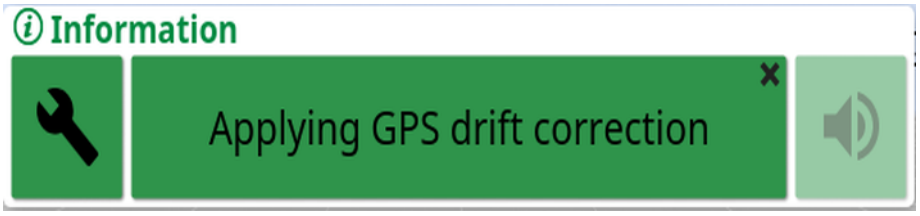
To compensate for GNSS drift:

1. Make sure the GNSS signal and correction source are ready.
2. Position the vehicle at an easily identifiable location or landmark (such as gates or previously used wheel tracks)
3. Select  > 
4. From the **GPS Drift Options** window, enter a GPS drift increment distance.
5. Enter a north compensation distance if required (positive value for north; negative value for south).
6. Enter a east compensation distance if required (positive value for east; negative value for west
7. Select  to remove the current drift compensation values if required.

Using flag points for GPS drift compensation

Flag points can be used to easily set the GPS drift compensation.

1. Position your vehicle in a location that is easily identifiable and repeatable then place a flag point. e.g. align the vehicle with a well used and visible set of wheel marks and also have the front wheel over a defined marker point, or the front of the vehicle just touching a permanent marker post.
2. When returning to this field at a later date, when drift compensation is required to be used, place the vehicle back at the exact physical location as used previously to create the initial flag point.
3. Once the vehicle is located in the proper physical position you should see a minor discrepancy between the vehicle position on screen and the flag point created previously.
4. Select and hold on this flag point to view the flag point options menu.
5. Select  , and then confirm to apply the GPS drift compensation.
6. The appropriate gps drift compensation is automatically be applied to align the flag point with the current vehicle position.
7. Enter the GPS drift options from the **Nudge** menu and press the eraser icon to clear the gps drift compensation applied.
8. When restarting a console, compensation may no longer be accurate if conditions have changed
9. An alarm appears after the system starts to alert GNSS drift correction is active.



High accuracy correction sources

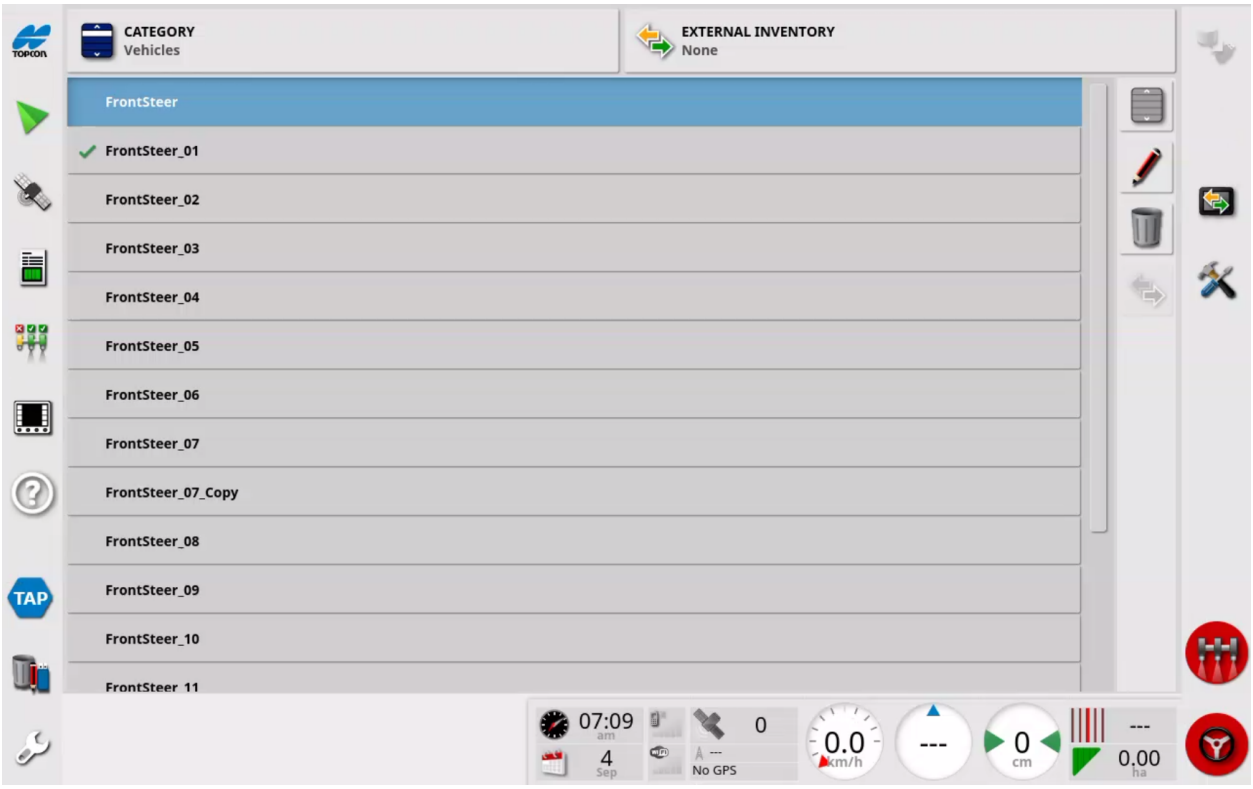
GPS drift compensation should not be necessary with higher accuracy correction sources (e.g. RTK).

Where it is used, it must be reset to zero using the **GPS Drift Options** window.

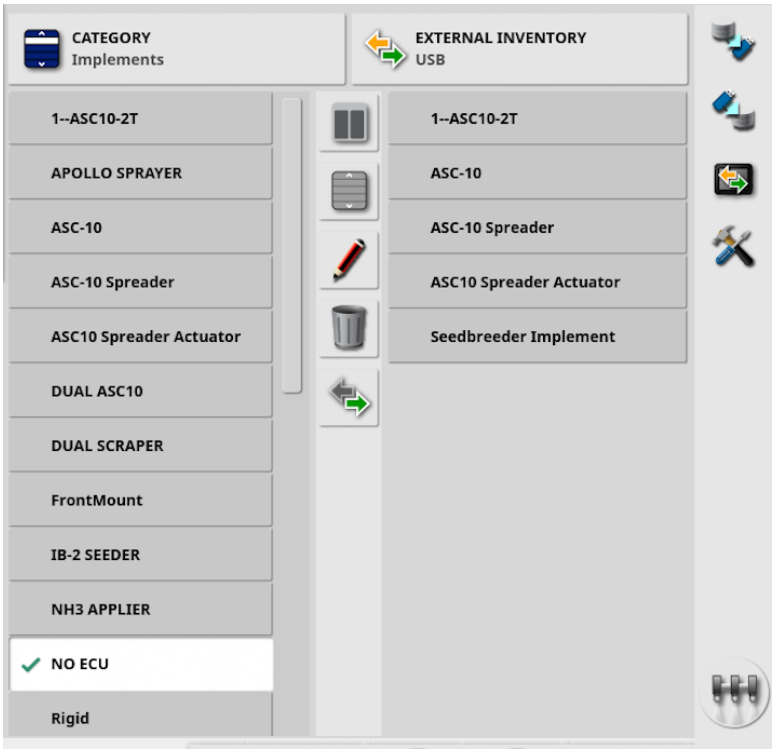
Inventory manager

To view the **Inventory Manager**:

1. Select
   The **Inventory Manager** window appears.



2. Select **Category**. If a USB is inserted, or the console is connected to TAP, select an option from the **External Inventory** drop-down list.



When the split view is displayed, the list on the left shows data stored on the console. The list on the right shows data stored on the external device selected in the **External Inventory** drop-down list, which corresponds to the selected **Category**.

- **USB**: Show items on the USB. These items can be selected, renamed, deleted, or copied to the console.
- **Select from USB**: Select a zip file (containing task data) or a TASKDATA.XML file directly, on the USB device and import to the console.
- **Select from TAP**: Select a zip file containing task data from TAP and import to the console.

If the split view is not showing (the list on the right is not visible after a selection has been made from the **External Inventory** drop-down list), make sure the **Inventory Manager** is full screen.

Some items show additional filter options when selected from the **Category** drop-down list.

Select to show the filter options. The filters are applied to both lists if split view is in use.

Note: When filtering by implement , a list of implements associated with the tasks on the system is shown, not a list of the implement profiles on the console.

	Show local view/split view
	Select all itemsin the current list
	Edit selected item
	Delete selected items
	Import selected items to console. Import is performed in the direction of the highlighted arrow
	Choose sort option to sort the lists (both lists are sorted by the same criteria)
	Back up all inventory items or user settings to USB device. Existing data on the USB device is deleted
	Restore all inventory items or user settings from USB device. Restoring all inventory items or user settings overwrites any data on the system and is used to restore content from a backup USB. Used by service personnel
	Collect diagnostic logs
	Exchange task data. Use to import/export to USB device and export to TAP

Import

Import task from USB storage

1. Insert the USB storage device into the console.
2. Select  .
3. Select **Tasks** from the **Category** drop-down list.
4. Select **USB** from the **External Inventory** drop-down list.
5. Highlight the task/s to be imported in the **External Inventory** list on the right, then select **Import selected items to console**  .

Import task data from USB storage

This option enables a selection of task data to be imported from a task data backup on a USB storage device.

1. Insert the USB device into the console.
2. Select .(Inventory Manager).
3. Select **Select from USB** from the **External Inventory** drop-down list.
4. Navigate to the location on the USB device containing the required task data and select **OK** to confirm.

   The column on the right shows task data on the USB that corresponds with the **Category** selected on the left.
5. Highlight the data to be imported in the External Inventory list on the right, then select **Import selected items to console** .

Exchange task data

CAUTION: Doing this operation deletes the existing task data set on the console, including all field boundaries, guidelines etc.

1. Insert the USB storage device into the console.
2. Select (**Inventory Manager**).
3. Select (**Exchange task data**), then select **Import from USB**.

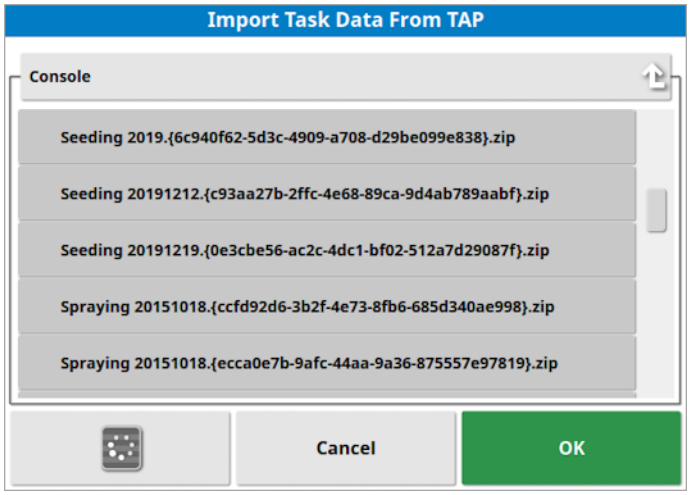
   The toggle button may be used to automatically search the top-level TASKDATA directory (if it exists), on the USB and list 'taskdata.xml' files. The USB device can also be browsed manually to select the required file.
4. Select the required task data set.

Importing a task data selection from TAP

This option enables a selection of task data to be imported from TAP.

Before using this option, enter a console name and log in to TAP.

1. Select
2. Select **Select from TAP** from the **External Inventory** drop-down list.
3. Select the required *.zip file and confirm. The zip file is automatically unzipped once it has been imported.



The refresh button can be used to update the list of files displayed from TAP, if required.

4. Highlight the data to be imported in the External Inventory list on the right, then select **Import selected items to console** .

   The column on the right shows task data from TAP corresponding to the **Category** selected on the left.

Export

A task is the work done at one time in a field.

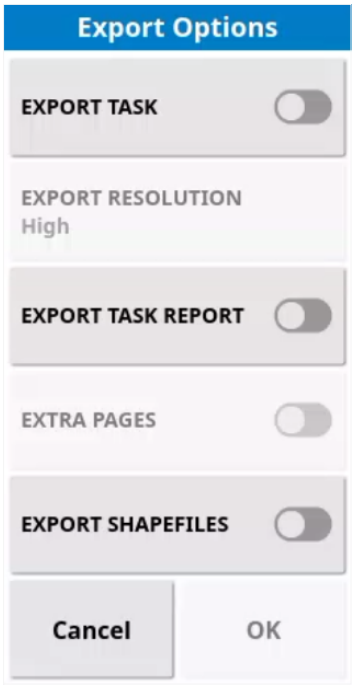
A task data set is a collection of tasks, as well as the data used to complete the task, such as field boundaries and guidelines.

Exporting tasks to USB device

Individual tasks can be exported to a USB storage device to be transferred to another Topcon console or to be imported into a Farm Management Information System.

The exported tasks are added to the task data set on the USB device.

1. Insert the USB device into the console.
2. Select
3. Select **Tasks** from the **Category** drop-down list.
4. Select **USB** from the **External Inventory** drop-down list.
5. Select the tasks to be exported in the **Category** list on the left.
6. Select
7. Select **Export task,** and then select **OK**.



Export task	Enable to export task
Export resolution	Used to reduce the file size of data being exported from the console
Export task report	Enable to export task report
Extra pages	Enable to export extra pages
Export shapefiles	Select to generate coverage, guideline group, boundary, and elevation shapefiles, if this map layer is configured for the task. Saved in 'USB:\Reports' under a date/time stamped folder with the name '<implement_ name><taskname>_Elevation_<units>.shp'. Note that pivots are not included in exported guideline shapefiles

Exporting task reports to a USB

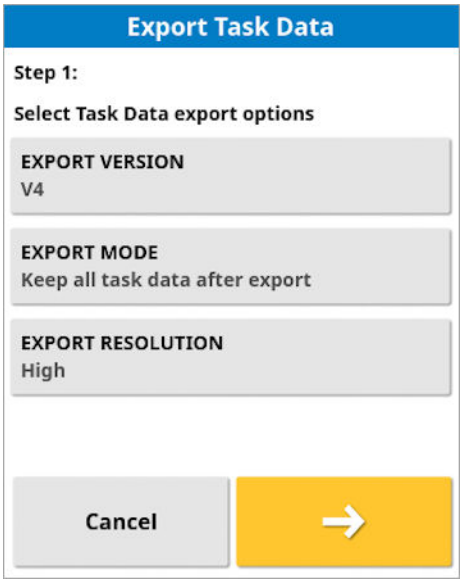
Exporting task reports to USB places the PDF reports in USB:\Reports.

1. Insert the USB device into the console.
2. Select
3. Select **Tasks** from the **Category** drop-down list.
4. Select **USB** from the **External Inventory** drop-down list.
5. Select the required task/s for PDF reports in the **Category** list on the left.
6. Select
7. Select **Export task report**.
8. Select **Auto adjust ranges** if required: If data exists that used a color legend, the colors used in the report map shading are altered so that the maximum variation in colors is used to illustrate yield rates.
9. Select **Export shapefiles** to generate coverage, guideline and boundary shapefiles. These are saved in USB:\Reports under a date/time stamped folder.

Exporting a task data set to a USB

1. Insert the USB into the console.
2. Select
3. Select , then select **Export to USB**.

   The **Export Task Data** screen appears.



The task data set is exported as ISO XML. The export version may be changed to V3, if required.

4. Select the required export mode:

- **Keep all task data after export**: All task data is retained on the console.
- **Delete only tasks after export**: Tasks are deleted from the console but data such as fields and implements is kept.
- **Delete all task data after export**: All task data is deleted from the console.

  If required, **Export resolution** can be used to reduce the file size of data being exported from the display. This is achieved by transferring fewer data points, resulting in lower resolution coverage data.

5. Select  and select the location on the USB to save the data.
6. Select  to confirm the export.

Exporting a task data set to TAP

Task data sets may be exported to TAP. The task data includes the field (boundaries, flag points, AB lines, curves and pivots) and task (including logged data).

Before using this option, enter a console name and login to TAP.

1. Select 
2. Select  **>** 
3. Select the required **Export mode**:
   - **Keep all task data after export**: all task data is retained on the console.
   - **Delete only tasks after export**: tasks are deleted from the console but data such as fields and implements is retained.
   - **Delete all task data after export**: all task data is deleted from the console.
4. Select the **Export resolution** (used to reduce the file size of data being exported from the console by transferring fewer data points, resulting in lower resolution coverage data).
5. Select **OK** to confirm export.

System diagnostics export

An export diagnostics logs tool is available via the **Inventory Manager**.

1. Select
2. Select
3. Select **USB** or **Console** for the **Destination**.

   Select to transfer logs saved to the console to USB.

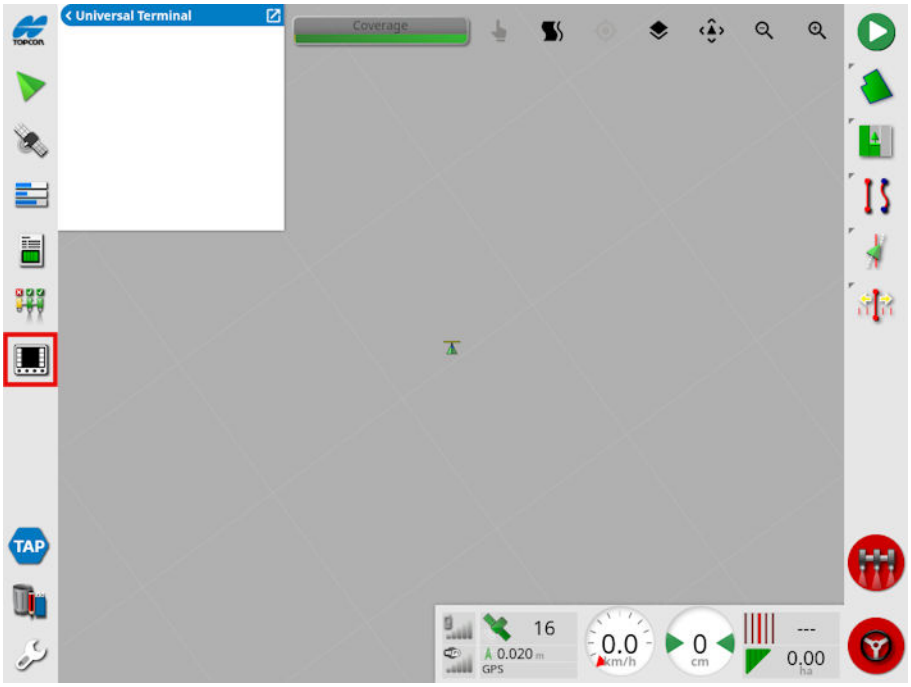
   Select to upload to the Topcon FTP server.

If required, logs can be renamed by selecting **Diagnostics** from the **Category** drop-down and selecting .

Universal terminal

Interact with ISOBUS compliant ECUs via the Universal Terminal client.

1. Open the **Operation** screen.
2. Select
   The **Universal Terminal** mini-view window appears.
3. Select to expand the mini-view window.



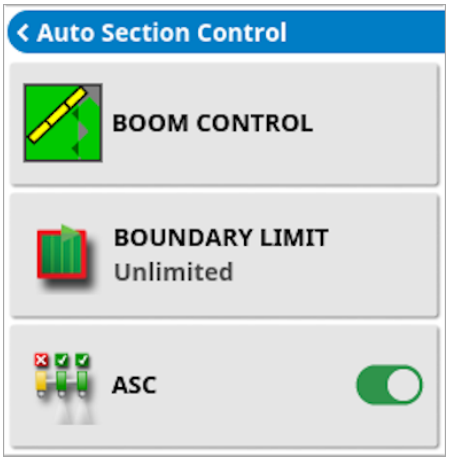
1 2 3	Open the **Aux-N Assignment** window
	Move to the previous input or button
	Move to the next input or button
	Cycle through the connected UT working sets
ESC	Exit an editing operation or acknowledge a UT alarm if present
OK	Activate the highlighted input or button

Auto section control

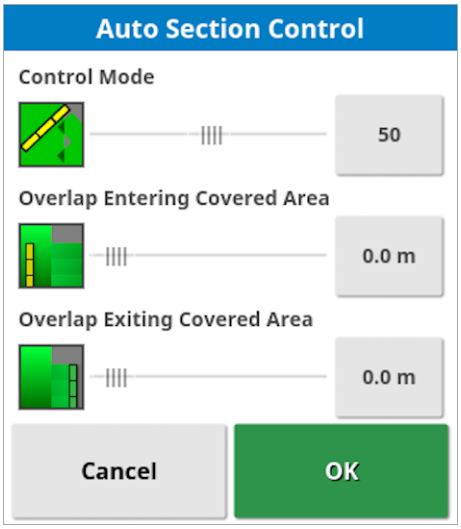
Auto section control (ASC) can be used with the virtual implement to change how coverage mapping is applied.

To set the auto section control settings:

1. Make sure Auto Section Control is page 29.
2. Open the **Operation** screen.
3. Select  .
   The **Auto Section Control** mini-view window appears.
4. Select a settings tab and enter desired settings.



Boom control



Control mode	Select the slider or number button to set coverage control mode to overlap (0) or avoid gaps (100). Note that some spaces may occur when avoiding gaps and some overlap is likely near boundaries. The default value (50) is a compromise between the two
Overlap entering covered area	Set the overlap when entering an area that already has coverage
Overlap exiting covered area	Set the overlap is achieved when exiting an area that already has coverage

Boundary limit

Select the type of boundary limit used to stop recording coverage.

Unlimited	Coverage recorded in all areas of the map; recording stops in areas where coverage has already been recorded
Field Boundary	Coverage only records within the field boundary; coverage stops recording in exclusion zones and outside field boundaries
Headland	Coverage not recorded when the vehicle enters the headland zone

Engage auto section control

To toggle ASC on and off:

1. Select the ASC button.

Turn ASC off to record coverage at all times, including when areas are overlapping.

XW1 electric steering wheel

Auto steering and guidance features can be controlled directly from the XW1 electric steering wheel.

The dashboard includes LED lights showing system and feature status, a lightbar showing guideline deviation, and buttons to operate guidance and auto steering.

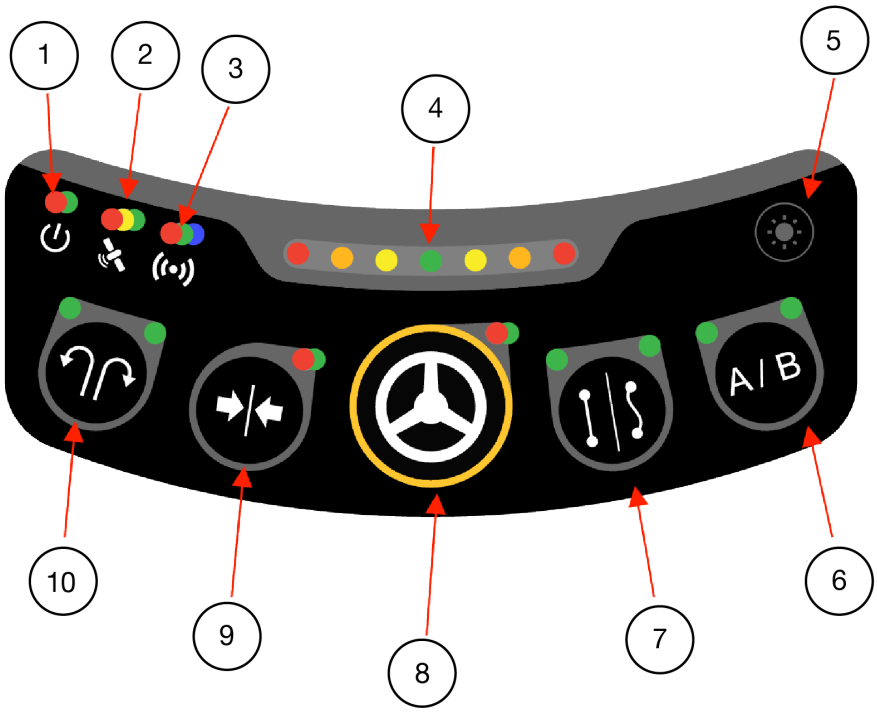
Power

To power on the XW1 steering wheel:

1. Switch on the rocker switch on the side of the dashboard.
   The power LED illuminates and indicates connectivity status (green = ready to use).

LED lights and buttons

XW1 electric steering wheel - dashboard



1	**Power**	Shows system power and status. 🟢 Power on, connected 🔴 Power on, not connected
2	**GNSS**	Shows GNSS connection and correction status 🟢 Sufficient satellites and correction source fully converged 🔴 No GNSS connection 🟡 Insufficient satellites or non converged correction source
3	**Connectivity**	Shows WiFi/Bluetooth connection and signal pairing status. 🟢 Connected 🔴 Connection failed
4	**Lightbar**	Configurable cross track error (distance and direction). Refer to Lightbar
5	**Brightness**	Toggle LED brightness
6	**A/B**	Drop A and B points
7	**Line type**	Select guideline type and create guideline
8	**Steering engage**	Operate auto steering. Set pre-engage mode
9	**Nudge to here**	Nudge guideline to vehicle position
10	**Headland turns**	Toggle the upcoming headland turn direction

Create guideline

To create a guideline:

1. Long press (press and hold) the **Line Type** button until both LEDs flash.
2. Single press the **Line Type** button to select the line type.
   The LED above the selected line type is lit.
3. The LED above 'A' on the **A/B** button flashes indicating this is the next action. Drive vehicle to the start of the line recording and single press the A/B button to drop the 'A' point. Once the 'A' point is dropped, line type cannot be changed.
4. When the 'A' point is dropped, the 'A' LED is lit solid green and the 'B' LED flashes indicating this is the next action. Drive vehicle to the 'B' point and single press the A/B button to drop the 'B' point. The 'B' LED is lit solid green indicating the guidance line is created.

Auto steering

To engage auto steering:

1. Make sure the system is ready to engage auto steering.
2. Press the **Steering Engage** button once.
   The status LED is lit green showing auto steering is engaged.

To disengage auto steering:

1. Press the **Steering Engage** button once.

Auto steering can be set to engage automatically when the vehicle starts moving (pre-engage mode).

To set auto steering to pre-engage mode:

1. Press and hold (long press) the **Steering Engage** button.
   Status LED flashes green to show active state. Auto steering engages as soon as the vehicle moves.

Pre-engage mode times out after 15 seconds with no vehicle movement.

Nudge guideline

To nudge active guideline to current vehicle position:

1. Press and hold (long press).
   Status light flashes to show active state.

Headland turns

1. Press to change direction of upcoming headland turn (left/right).
   Status lights show upcoming turn direction

Lightbar

The XW-1 lightbar is integrated with the virtual dashboard on the console.
Refer to Lightbar, page 20

The spacing for each XW-1 lightbar LED can adjusted. Each LED on the XW-1 lightbar corresponds to the three LEDs of the same color on the virtual lightbar.

Alarms

Audible and visual alarms are used to alert of system issues.

Alarm windows appear at the top of the **Operation** screen to provide an alarm description.

Select center of alarm window	Acknowledge and clear the alarm
Select	Mute alarm volume
Select	Open the alarm settings or relevant setup screens
Drag center of alarm window up	Scroll through multiple active alarms
Drag center of alarm window down	Show additional details (only where **Drag down for details** is shown)

Alarm descriptions

Alarm	Description
Active field far away	The active field is more than 8 km (5 miles) away. Make sure the correct field is loaded or create a new field
Base station location mismatch	The location of the base station used to create a guidance pattern doesn't match the current base station position
End of row	The vehicle is approaching the boundary and the operator should soon take control
Exclusion map distant	The exclusion map is too far from the current GPS position. The exclusion map is unloaded automatically
Fallback	The selected GPS correction source is not available and the system must use a less accurate correction source temporarily
Field unloaded	Field has been exited due to current distance from the selected field

Alarm	Description
Firmware version mismatch/outdated	Select the alarm window spanner icon to update the firmware
GPS drift correction	Triggered on start-up to remind GPS drift correct is applied. GPS drift varies with time and may need to be recalculated
GPS lost	GNSS signal lost but the receiver is still connected
GPS receiver firmware mismatch	Select to update the firmware
Headland turns	Vehicle is approaching the headland for an autosteer headland turn
Invalid vehicle profile	The selected vehicle profile contains invalid parameters. Create a new vehicle profile or contact dealer for assistance
Invalid/obsolete profile loaded	Invalid/obsolete vehicle/implement profile is active
Low resources	System resources (memory) are more than 90% full
Master switch off	Triggered when the vehicle passes over an area that is untreated on the coverage map with the master switch off. Prevents runs being started with the master switch off and coverage not recorded
Max guideline length exceeded	Length of the recorded line exceeds the maximum number of points (typically several kilometres, but will vary based on how complex the curve is)
No comms	Console is unable to communicate with the implement ECU
No GPS	GNSS connection is lost
No GPS time	GNSS receiver is not configured to send time messages (ZDA NMEA messages)
No ground speed	Auto steering is on and there is zero ground speed
No SIM detected	Modem is detected with no SIM card
NTRIP failure	GNSS correction source failure
Parameters mismatch	Vehicle geometry parameters do not match the geometry configuration in the steering system. Re-select the vehicle on the **Setup** screen or ensure the vehicle geometry in the vehicle geometry screen is correct

Alarm	Description
Path too far away	Triggered if the active guideline (AB line, curve or pivot) is too far away from the current vehicle position.
Prescription map / guidance shapefile load fail	Triggered if the file being loaded is invalid or corrupted
Receiver disconnected	The GPS receiver is not responding. Check the receiver connections
Registration expiring	Registered feature expires within the next <days until expiry> days. Please contact your dealer to renew registration
Resources exhausted	Triggered if the system resources (memory or space on the file system) are more than 97% full
RTK base sync failure	Triggered if the console fails to synchronise with the RTK base station
Steering disengage (visual)	Triggered when the steering has been disengaged. This may be due to losing satellites, losing the guideline or manually turning the steering wheel
Steering engage (visual)	Toggle the visual Steering Engage/Disengage alarms on/off. Audible alarm cannot be suppressed
Steering profile mismatch	Selected vehicle profile parameters do not match the vehicle configuration in the steering subsystem. Select the correct vehicle profile
Steering restart needed	Steering subsystem needs to be power cycled
Steering unable to engage	Toggle the **Steering Status** window on/off
Unregistered feature	Enabled feature is no longer registered (registration expired) and feature is disabled
UT high priority	Universal Terminal high priority alert. Urgent issue on the UT that must be addressed immediately
UT medium priority	Universal Terminal medium priority alert. Important issue on the UT that should be addressed as soon as possible
UT low priority	Universal Terminal low priority alert. Issue on the UT that should be addressed
Vehicle ISOBUS is unstable	ISOBUS is unstable or broken. Typically occurs when the bus is incorrectly terminated, or a device on the bus

Alarm	Description
	has malfunctioned
Wireless connection	Wireless network connection is no longer in range

Precautions

Taking proper care of the console, especially the touchscreen, will prolong the life and performance of the device.

CAUTION: The touchscreen on this device is made of glass. The screen may be damaged if dropped on a hard surface or hit with hard or sharp objects.

Prolonged exposure to abrasives, oil, dust, and chemicals can affect the performance of the touchscreen over time.

To help protect the console:

- Clean the touchscreen regularly
- Do not use metal or sharp objects to operate the touchscreen
- If equipment is unused for a length of time, store away from water and direct heat sources

To help protect data:

- Do not disconnect the console suddenly when formatting, uploading, or downloading
- Use the rocker switch incorporated into the harness to power down the Value Line system
- Avoid unplugging connectors or disconnecting from battery terminals while system is actively running
- Do not remove the USB storage device while data is transferring as it may be corrupted
- Always use the USB eject function before removing the USB storage device
- Back up data regularly
- Be aware of file format compatibility. Discuss compatible formats with Topcon/dealer

To clean the console:

- Shut down the console and disconnect it from external power
- Clean using a soft, lint free cloth dampened with water or a diluted mild detergent. Make sure all residue is removed

CAUTION: Do not use alcohol, thinner, or benzene to clean the touchscreen surface.

Troubleshooting

When troubleshooting the system:

1. View trouble codes to identify common issues
2. Perform suggested actions
3. Request remote support
4. Contact dealer if issue is not resolved

Trouble codes

Trouble codes can be viewed by:

- Steering status window
- Diagnostics window
- Troubleshooting tab

Troubleshooting guide

See the following tables for descriptions of common issues and recommended actions.

Start task

Error condition	Actions
GPS available	Confirm the correct GNSS receiver is selected. Check the receiver is powered on, is the status light on the receiver illuminated? If the status light is NOT illuminated, make sure the system power rocker switch is turned on and the 12-pin Deutsch connector is properly connected to the receiver. Check system power fuse on harness. Make sure good system power connection on battery terminals. Make sure the BroadR-Reach connection (M12 thumb screw connector) between the receiver and console is fully connected. Check the connection at the receiver and also on the back of the console.
Console ready	Power cycle system using the system rocker switch.
Vehicle ready	Make sure the correct vehicle profile is selected in the vehicle setup menu. Note: Profile can take several seconds to load after being changed.
Implement ready	Make sure the correct implement profile is selected in the implement setup menu. Note: It may take a few second for the profile to fully load after being changed.

Steering status

Error condition	Actions
Receiver connected	Confirm the correct GNSS receiver is selected in **Setup** menu. Check the receiver is powered on, is the status light on the receiver illuminated? If the status light is NOT illuminated, make sure the system power rocker switch is turned on. Make sure the 12-pin Deutsch connector is properly connected to the receiver. Check system power fuse on harness. Make sure good system power connection on battery terminals. Make sure the BroadR-Reach connection (M12 thumb screw connector) between the receiver and console is fully connected. Check the connection at the receiver and on the back of the console.
Receiver hardware	Confirm the correct GNSS receiver is selected in the **Setup** menu. Confirm the correct correction source is selected under the GPS corrections setup screen. Confirm the appropriate OAF has been purchased for the receiver. OAFs can be purchased through dealers via the TAP platform.
Differential correction	Confirm the correction received matches the expected correction configured in setup. If using a subscription based correction (Starpoint, Skybridge, Realpoint etc.), confirm current subscription is active. Subscriptions to corrections services can be purchased via your dealer utilising the TAP platform. Confirm correct region/frequency has been set for the correction service you are attempting to access (if applicable).
Position accuracy	Confirm the number of satellites shown on the dashboard is 4 or greater and the satellite icon is green. Allow time for convergence.
Steering controller	Make sure the XW-1 steering wheel is powered on. Is the power light illuminated on the XW-1? Make sure the switch on the right-hand side of the XW-1 is turned on.

	If already powered on, power cycle the XW-1 independently of the system using the switch on the right-hand side of the unit. If the XW-1 power light is red, power cycle XW-1 using the switch on the right-hand side of the XW-1.
Vehicle geometry	Make sure the correct vehicle profile is selected in the vehicle setup screen. Make sure the geometry set in the vehicle profile setup screen is correct. If problem persists, select and load a different vehicle profile, then re-select and load the correct vehicle profile.
Vehicle profile	Re-select the vehicle profile. Select and load a different vehicle profile, then re-select and load the correct vehicle profile.
Steering calibrated	Check the calibration status within the steering options menu on the Guidance toolbar. Do any required calibrations. Make sure there is sufficient clear space to perform the calibrations.
Lockout	Power cycle the XW-1 wheel independently of the rest of the system using the rocker switch on the right hand side of the XW-1. If using a physical wheel angle sensor, this may need re-calibrating. Disable the wheel angle sensor under the steering setup screen and attempt to engage steering again. If issue returns when wheel angle sensor is re-enabled, then re-calibration is required
Guideline available	Make sure guideline is created and selected (highlighted bright red). Make sure a guideline is visible on the screen. Make sure vehicle is next to previously worked area if using guidelock mode. Make sure vehicle is inside boundary if using boundary steer.
Wayline synchronized	Allow time for synchronisation between console and receiver. If problem is persistent: Select different guideline then re-select desired guideline. Cycle guideline modes. Power cycle system using system rocker switch.
Prohibited operation	Steering cannot be engaged if certain menu screens are active. Return to the **Operation** screen and attempt to engage steering again.
Operator presence	System is receiving a 12V signal through the seat switch connector. If using a seat switch, return to the seat. If not using the seat switch, troubleshoot harnessing to ensure there is not a short circuit on the seat switch

	connector or wires.
Steering wheel	System is sensing resistance or movement on the steering wheel when attempting to engage steering. Make sure no force is applied to the steering wheel when attempting to engage the autosteer system.
Speed	Steering will not engage below a certain speed, depending on system configuration. Increase speed before attempting to engage. Steering will not engage above a certain speed, depending on system configuration. Decrease speed before attempting to engage
Cross track error	System will not engage auto steering if the vehicle is too far from the active guideline. Manually position vehicle closer to the active guideline before engaging steering.
Heading error	System will not engage auto steering if the approach angle to the guideline is too severe. Reduce approach angle and try again.

Calibration

Fault	Actions
Steering controller not initialized	The steering subsystem is not turned on or is not ready for use. Check the steering subsystem is powered on and ready for use.
Steering profile mismatch	Selected vehicle profile parameters do not match the vehicle configuration in the steering subsystem. Select the correct vehicle profile for the vehicle.
Parameters mismatch	Vehicle geometry parameters do not match the geometry configuration in the steering system. Re-select the vehicle on the **Setup** screen and make sure the vehicle geometry shown on the vehicle geometry screen is correct.
Receiver disconnected	The receiver has shut down, lost power, or the connection between the receiver is broken or not connected properly. Check power supply to the receiver, is there a status light illuminated? If not ensure power is reaching the receiver via the 12 pin connector. If the receiver has power but is still not communicating ensure the BroadR -Reach screw connectors at the receiver and console are both connected fully.
Wheel angle sensor calibration failed	Repeat procedure and ensure the steering axle moves through the complete range.

	Confirm WAS position information moves when steering axle is turned. Confirm WAS harnesses and connections. Check wheel sensor condition. Failed wheel angle sensor.
Receiver firmware version is out of date	Update the receiver using the bundled receiver firmware via the GPS setup screen. If you have been issued a specific receiver firmware for use by a dealer or Topcon support, this alarm can be ignored or disabled.

Trouble codes

Fault	Fault	Actions
A50807	Vehicle ISOBUS is unstable	Check harnessing for ISOBUS system, ensure correct termination. Force disable the ISOBUS via the ISOBUS setup screen to temporarily fix this issue. Caution: this may affect function of the ISOBUS system.
A20028	Farm data has been lost	Export the corrupted data from the **Inventory Manager** diagnostics category for analysis by Topcon Support. Contact dealer.
U1052	Steering subsystem firmware version is incorrect	Upgrade XW-1 firmware via the steering setup screen.
U1054	Steering subsystem is in fault mode	Power cycle XW-1 using switch on the side of the unit.
U1055	Steering controller needs to be reset	Power cycle XW-1 using switch on the side of the unit.
U1056	Steering controller configuration error	Repeat WAS calibration.
U1061	Tractor parameter settings not found in steering subsystem	Select a different vehicle profile, then re-select the vehicle profile.
U1062	Mounting bias calibration required	Perform mounting bias calibration procedure within the steering calibration menu. This allows the system to compensate if the receiver is not level on the cabin roof.
U1065	Wheel angle sensor calibration required	Commonly caused by change of tires (not the only possible cause). Confirm vehicle measurements and recalibrate WAS.
U1068	Vehicle profile does not match steering subsystem settings	Confirm XW-1 is turned on. Select different vehicle profile, then re-select the vehicle profile.

U1075 - U1078	CAN receive or transmit errors	Confirm connections on the CANBUS circuit. Check CANBUS terminators.
U1079	Wheel angle sensor disconnected	System is set to use a physical WAS. Make sure physical WAS is connected to the system. Make sure harnessing for physical WAS is not damaged.
U1080	Wheel angle sensor has short-circuited	Check WAS harnessing for damage causing short circuits. Wheel angle sensor may have failed internally requiring replacement.
U1082	Compact flash file system has less than 1% space remaining	Confirm memory usage in the Diagnostics mini-view. It may be necessary to remove or transfer old files using the **Inventory Manager** to free up memory.
U3001	Transfer failed	Try exporting or importing the file from USB storage again.
U4001	Wayline initialization error	Select a different guideline, then re-select the desired guideline. Power cycle the XR-1 wheel.
U4006	Valid system calibrations do not exist	Do any system calibrations required on the steering calibrations screen.
U5001	Steering subsystem not detected	Confirm that the XW-1 wheel is turned on Make sure the XW-1 is connected properly. Power cycle the.entire system.
U5002	Implement and wayline are not defined	Confirm implement profile is selected. Make sure wayline is available and selected.
U5003	Could not engage due to steering controller lockout	Confirm road switch is OFF. Power cycle the XW-1 wheel.
U5004	Implement is not defined	Confirm implement profile is selected. Select a different implement profile, then re-select the desired implement profile .
U5007	Row spacing (implement overlap subtracted from implement width) is too small	Overlap set is too large. Change overlap on implement geometry screen.
U6905	Unknown machine type	Return to **Setup** screen, select a different vehicle profile, then re-select the desired vehicle profile.
U8505	Factory calibration not present	Calibrate compass, wheel angle sensor, and mounting bias.

Regulatory

General warnings

1. Read and become familiar with the machine manufacturer's operator's manual, including safety information, before installing or using Topcon components.
2. Use extreme caution on the job site. Working around heavy construction equipment can be dangerous.
3. DO NOT attach Topcon brackets, cables, or hose connections while the machine is running.
4. DO NOT allow any Topcon components to limit the visibility of the operator.
5. Use cable ties to keep hoses and cables secured, and away from possible wear or pinch points.
6. Use eye protection when welding, cutting, or grinding on the machine.
7. Protect yourself at all times, and wear protective clothing when working on or near hydraulic lines. Hydraulic lines can be under extreme pressure, even when the machine is turned off

DANGER: Relieve all pressure in the hydraulic lines before disconnecting or removing any lines, fittings, or related components. If injury occurs, seek medical assistance immediately.

DANGER: Disconnect all Topcon system electrical cables prior to welding on the machine.

DANGER: DO NOT weld near hydraulic lines or on any equipment when in operation.

CAUTION: All mounting bracket welds must be secure and strong to prevent the sensor equipment from vibrating excessively, or from detaching at the weld during operation.

CAUTION: This product should never be used after disabling safety systems or altering the product or contrary to applicable laws, rules, and regulations.

CAUTION: When welding, use appropriate precautions and practices. After welding, all affected areas should be painted with a rust inhibitor.

WARNING: TPS products should never be used in dangerous environments. Use in rain or snow for a limited period is permitted.

WARNING: Tampering with the unit by the operator or non-factory authorized technicians will void the unit’s warranty:

DANGER: Do not attempt to open the unit and modify any of its internal components.

RF radiation warning

To ensure compliance with FCC and ISED Canada exposure requirements, this device must be installed in a location where the antennas of the device will have a minimum distance of at least 20 cm from all persons. Using higher gain antennas and types of antennas not certified for use with this product is not allowed. The device shall not be located with another transmitter.

Installez l'appareil en veillant à conserver une distance d'au moins 20 cm entre les éléments rayonnants et les personnes. Cet avertissement de sécurité est conforme aux limites d'exposition définies par la norme CNR102 at relative aux fréquences radio.

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.

Regulatory information

The following sections describe the FCC and ISED Canada statements.

FCC statements

This equipment complies with FCC radiation exposure limits set forth for uncontrolled equipment and meets the FCC radio frequency (RF) Exposure Guidelines in Supplement C to OET65. This equipment has very low levels of RF energy that it deemed to comply without maximum permissive exposure evaluation (MPE). But it is desirable that it should be installed and operated with at least 20 cm and more between the antenna and person’s body (excluding extremities: hands, wrists, feet and ankles).

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. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed

and used in accordance with the instruction manual, may cause harmful interference to radio communications. 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 his own expense.

If this equipment does cause interference to radio or television equipment reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Move the equipment away from the receiver
- Plug the equipment into an outlet on a circuit different from that to which the receiver is powered
- Consult the dealer or an experienced radio/television technician for additional suggestions

ISED Canada statements

This Class A digital apparatus complies with Canadian ICES-003.

The term “IC:” before the radio certification number only signifies that ISED Canada technical specifications were met.

Under ISED Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by ISED Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that necessary for successful communication. This device complies with ISED Canada license exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device. Under ISED Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by ISED Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that necessary for successful communication.

Déclaration de conformité ISED Canada

CAN ICES-3(A)/NMB-3(A)

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Conformément à la réglementation d'ISED Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par ISED Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (PIRE) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante. Ce matériel respecte les standards RSS exempt de licence d’ISED Canada. Son utilisation est soumise aux deux conditions suivantes: (1) l’appareil ne doit causer aucune interférence, et (2) l’appareil doit accepter toute interférence, quelle qu’elle soit, y compris les interférences susceptibles d’entraîner un fonctionnement non requis de l’appareil. Selon la réglementation d’ISED Canada, ce radio transmetteur ne peut utiliser qu’un seul type d’antenne et ne doit pas dépasser la limite de gain autorisée par ISED Canada pour les transmetteurs. Afin de réduire les interférences potentielles avec d’autres utilisateurs, le type

d’antenne et son gain devront être définis de telle façon que la puissance isotrope rayonnante équivalente (PIRE) soit juste suffisante pour permettre une bonne communication.

EMC statement (Australia and New Zealand)

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

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 TPS 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 TPS dealer for assistance.

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

This product was tested for EMC compliance using TPS 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.

Product conformity

Hereby, Topcon declares that the XR-1 GNSS receiver is in compliance with the essential requirements (electromagnetic compatibility and other relevant provisions described in EMC Directive 2014/30/EU). The full text of the EU declaration is available in the myTopcon NOW! app/website (https://mytopconnow.topconpositioning.com)
(requires login and search for “Compliance Documents”).

Therefore, the equipment is labeled with the CE-marking.

EU Declaration of conformity (EMC Directive 2014/30/EU)

esky [Czech]	Topcon prohlašuje, že XR-1 jsou v souladu s požadavky a dalšími příslušnými ustanoveními směrnice 2014/30/ES.
Dansk [Danish]	Topcon erklærer hermed, at XR-1 er i overensstemmelse med kravene og andre relevante bestemmelser i direktiv 2014/30/EF.
Deutsch [German]	Topcon erklärt hiermit, dass XR-1 mit den Anforderungen und anderen einschlägigen Bestimmungen der Richtlinie 2014/30/EG im Einklang stehen.
Eesti [Estonian]	Topcon deklareerib käesolevaga, et XR-1 on kooskõlas direktiivi 2014/30/EÜ nõuete ja muude asjakohaste sätetega.
English	Topcon hereby declares that XR-1 are in accordance with requirements and other relevant provisions of Directive 2014/30/EC.
Español [Spanish]	Topcon declara que XXXXX están de acuerdo con los requisitos y otras disposiciones pertinentes de la Directiva 2014/30/CE.
Ελληνικά [Greek]	Topcon δια του παρούσα δηλώνει ότι XR-1 είναι σύμφωνα με τις απαιτήσεις και άλλες σχετικές διατάξεις της οδηγίας 2014/30/ΕΚ.
Français [French]	Topcon déclare par la présente que XR-1 sont conformes aux exigences et autres dispositions pertinentes de la directive 2014/30/EC.
Italiano [Italian]	Topcon dichiara che XR-1 sono conformi ai requisiti e ad altre disposizioni pertinenti del direttivo 2014/30/CE.
Latviski [Latvian]	Topcon ar šo deklarē, ka XR-1 ir saskaņā ar prasībām un citiem attiecīgiem direktīvas 2014/30/EK noteikumiem.
Lietuvi [Lithuanian]	Topcon pareiškia, kad XR-1 atitinka Direktyvos 2014/30/EB reikalavimus ir kitas atitinkamas nuostatas.
Nederlands	Topcon verklaart hierbij dat XR-1 in overeenstemming zijn met de eisen en andere relevante bepalingen van Richtlijn 2014/30/EG.

[Dutch]	
Malti [Maltese]	Topcon b ' dan tiddikjara li XR-1 huma skont ir-rekwi żiti u dispożizz-jonijiet rilevanti oħra tad-Direttiva 2014/30/KE.
Magyar [Hungarian]	Topcon kijelenti, hogy (a XR-1) összhangban van a 2014/30/EK irányelv követelményeivel és egyéb vonatkozó rendelkezéseivel.
Polski [Polish]	Topcon niniejszym oświadcza, że XR-1 są zgodne z wymogami i innymi odpowiednimi przepisami dyrektywy 2014/30/WE.
Português [Portuguese]	Topcon declara que XR-1 estão de acordo com os requisitos e out-ras disposições pertinentes da Diretiva 2014/30/CE.
Slovensko [Slovenian]	Topcon izjavlja, da so XR-1 v skladu z zahtevami in drugimi ustrezn-imi določbami Direktive 2014/30/ES.
Slovensy [Slovak]	Topcon týmto vyhlasuje, že XR-1 sú v súlade s požiadavkami a inými relevantnými ustanoveniami smernice 2014/30/ES.
Suomi [Finnish]	Topcon vakuuttaa, että XR-1 ovat direktiivin 2014/30/EY vaatimusten ja muiden asiaa koskevien säännösten mukaisia.
Svenska [Swedish]	Topcon förklarar härmed att XR-1 är i enlighet med krav och andra relevanta bestämmelser i direktiv 2014/30/EG.

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