

INSTALLATION GUIDE

SMARTRACK® GLOBAL VDI 4458



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Contents

Overview	5
Installation Guide	5
Kit Contents	5
Mounting of Hardware	6
– Telematics Module	6
– Display Unit	6
– Antenna	6
– Impact Sensor	7
– Loom	7
– Weight Feature	7
Battery Supply Connection	7
VDI 4458 Gateway Connection	7
System Test	7
SmarTrack® Global VDI 4458 External Wiring (717h)	8
Installation and Commissioning Wizard	9
– Language Selection	9
– Communications Check and Updates	9
– VDI 4458 Machine Selection	10
– Output Testing	10
– Weight Feature	11
– GPS Testing	11
– Testing Access Control and Impact Sensor	12
– Test Review	12
Appendix	13
Communications Check for Wi-Fi Versions	13
Glossary	15
Warranty	17
Revision History	17

Table of Figures

Figure 1 Antenna Lead Plug Identification..... 6

Figure 2 Identification of Antenna Lead Connections on Fleet Controller 6

Figure 3 VDI 4458 Gateway Connection Block Diagram 7

Figure 4 Drawing 717h – SmarTrack Global VDI 4458 External Wiring 8

Overview

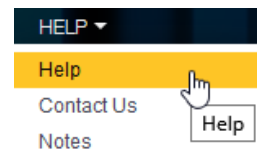
The following installation guide is to assist the installer of the SmarTrack® Global VDI 4458 kits. It includes a list of the kit contents, as well as a basic guide on the mounting and connection of components.

Important Note

For the latest specifications and configuration information, download the SmarTrack Product Manual and Installation Wizard information by following these instructions using your web browser:

You must be an existing registered SmarTrack web portal user to access this information.

1. Go to SmarTrackglobal.com and log into the web portal (existing users only).
2. Visit the Help section.
3. Download the SmarTrack Product Manual and Installation and Commissioning Wizard instructions as required.



If you have difficulties logging in or downloading, please contact your company's internal SmarTrack product administrator first. If you still experience issues, email smartracksupport@rct-global.com.

Installation Guide

Kit Contents

Part No.	Description	Qty.
11505, 15847, 16423 or 16424	Controller SmarTrack Global	1
15799	Loom VDI 4458 SmarTrack Global	1
15913 or 15084 or 15901	Display SmarTrack Global	1
15266 or 15267	Cable Display SmarTrack Global	1
13855	Sensor Impact SmarTrack	1
10284 or 15905	Dual-antenna GSM and GPS, or Wi-Fi and GPS	1
4723	Antenna Mount (Wi-Fi only)	1
8460	Ram Double Socket Arm 3"	1
8492	Ram Base 2½" Diameter Base	1

Mounting of Hardware

Caution

Disconnect the battery before commencing any work.

Telematics Module

1. The SmarTrack® Global telematics module can be installed in a horizontal or vertical position under the instrument panel or in a convenient location allowing the loom to reach desired connection points.
2. The module can be mounted via two 6 mm diameter holes with centres being 102 mm apart. Careful consideration should be given to the location of these holes before drilling to ensure adequate accessibility to the electrical connections located on the module.

Display Unit

1. The recommended location for the display unit is in the operator's cabin in clear view and within easy reach of the operator. Proximity to the operator is important, as the display unit requires input from the operator for a number of functions.
2. Fit the RAM mount to the rear of the display unit using the supplied screws.
3. Mount the RAM base to a rigid surface and attach the display unit using the supplied RAM arm.
4. Secure the loom using cable ties at even intervals avoiding any pinch points and sharp bends. Coil excess length and secure with cable ties—do not bunch up.

Antenna

1. The antenna should be mounted horizontally, ideally on top of the machine and clear of electrical devices such as flashing lights.
2. The body or panels of the machine should not obscure the antenna.
3. The antenna must be no closer than 500 mm to the 11505 or 15589 module.
4. The antenna connectors are different so take care to mate the correct plug.
5. Tighten using an SMA finger wrench (RCT part number 10472). Do not over-tighten - FINGER TIGHT ONLY.

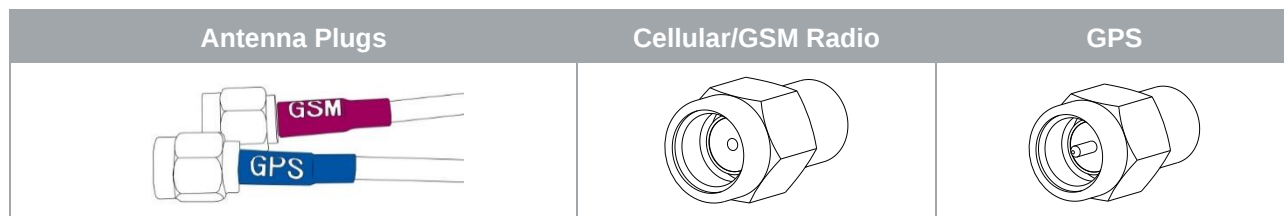


Figure 1 Antenna Lead Plug Identification

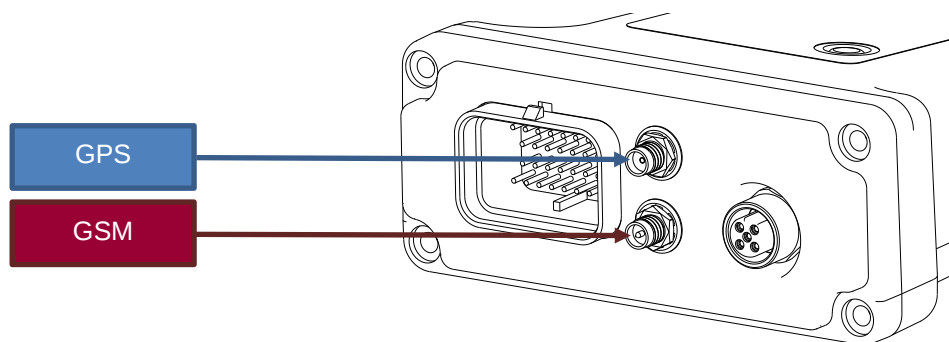


Figure 2 Identification of Antenna Lead Connections on Fleet Controller

Impact Sensor

1. Locate a flat surface that is part of the machine's main chassis. This surface needs to be rigid. The location needs to be away from sources of heat.
2. Check there is accessibility to the electrical connector of the sensor.
3. Clean the surface with the provided wipe to ensure it is free from grease and oil.
4. Stick the sensor to the surface using the attached double-sided adhesive.

Loom

1. Check the latest SmarTrack® product manual for all maximum voltage and frequency thresholds before making any wiring connections to power sources.
2. Refer to the wiring table in drawing 717h on page 8 to wire up the control unit.
3. It is recommended that the wiring loom be installed alongside the OEM engine wiring, ensuring that it is secured at regular intervals. This will provide protection from heat and abrasion, and any other excess damage that may occur with extended machine operation.
4. When securing the loom to the OEM engine wiring, ensure that the loom is away from moving machine parts which could lead to loom damage and avoid proximity to sources of high current and/or high voltage.

Weight Feature

If the optional weight feature is used, an additional pressure sensor and associated hydraulic fittings will be required—a suitable sensor kit for this is RCT part number 15917.

Battery Supply Connection

The SmarTrack VDI 4458 loom requires connection to a battery source. The power output from the VDI 4458 gateway, as per the VDI 4458 standard, is not sufficient to power the SmartTrack system. This connection needs to be made through a constant, fused battery power circuit (not a switched ignition circuit) using the recommended fuse as per the table below.

Recommended Fuse	
12 V	5 A
24 V	3 A
48 V	2 A

VDI 4458 Gateway Connection

Connect the four-pin SAAB-JPT VDI 4458 interface connector into the gateway port. This port provides the CANbus interface, including a signal voltage to wake the SmartTrack system.

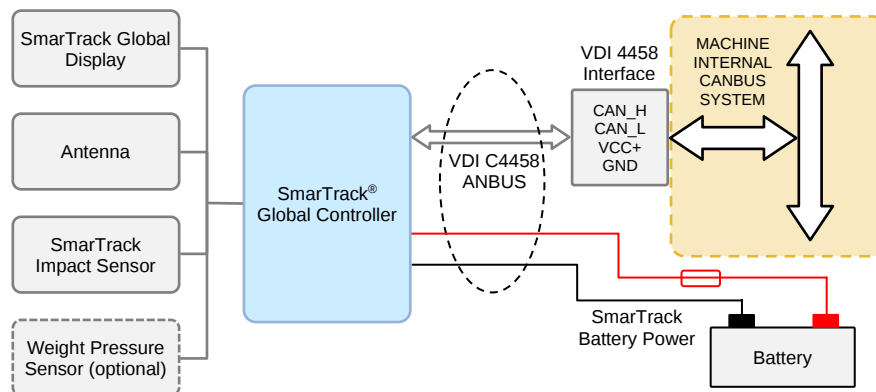


Figure 3 VDI 4458 Gateway Connection Block Diagram

System Test

After successfully completing the hardware installation, you must power the system up for the first time and complete the installation and commissioning wizard, which will guide you through a complete system test including testing all inputs.

1. Connect the battery, switch off any battery isolation.
2. Turn the key switch (ignition) on.
3. Follow the installation and commissioning wizard prompts.
4. Once the installation and commissioning wizard has been successfully completed, use the commissioning PIN 555555 to login.

SmarTrack® Global VDI 4458 External Wiring (717h)

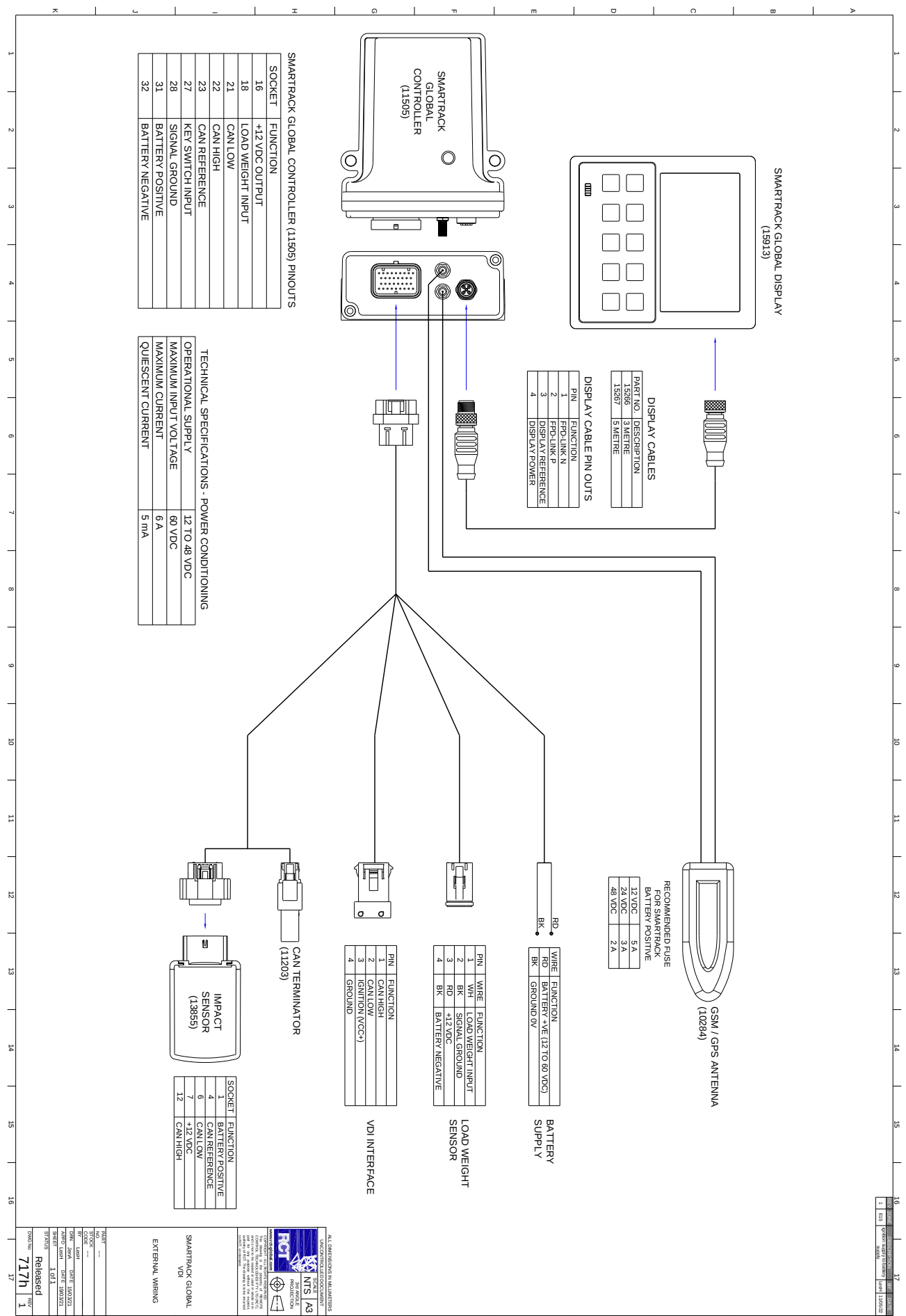
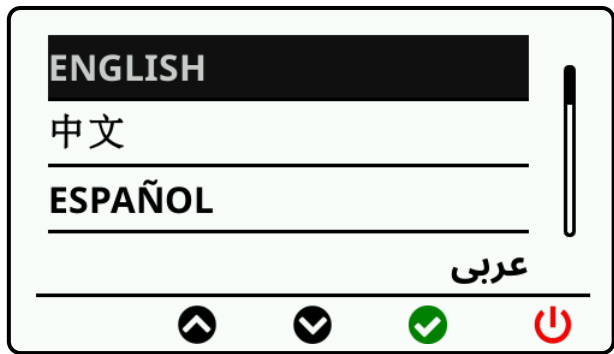


Figure 4 Drawing 717h – SmarTrack Global VDI 4458 External Wiring

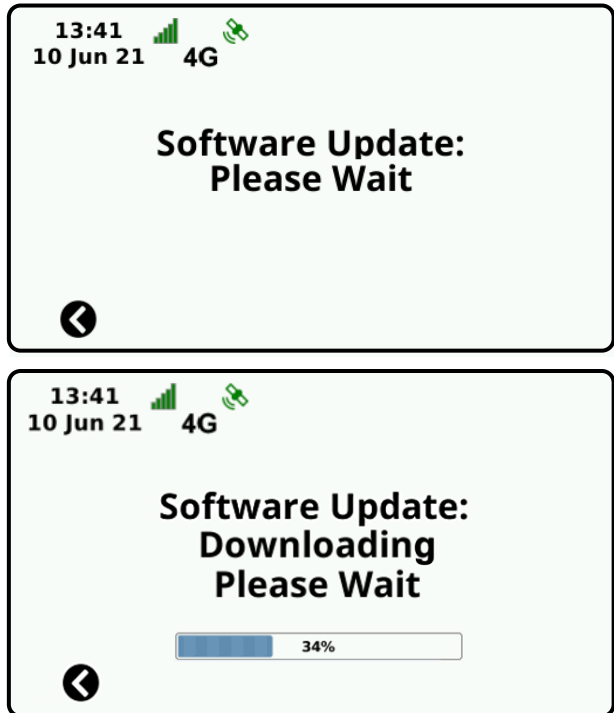
Installation and Commissioning Wizard

Language Selection

1.	Select the language you wish to use while completing the commissioning wizard. Note This language selection is only for the commissioning wizard. The operator language is controlled from the web portal.	 The screenshot shows a language selection interface. At the top, 'ENGLISH' is highlighted in a black box. Below it are '中文' and 'ESPAÑOL'. At the bottom right, 'عربي' is visible. At the bottom, there are four icons: a left arrow, a right arrow, a green checkmark, and a red power button.
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Communications Check and Updates

The wizard will check the network connection between the machine and the SmarTrack® server. The settings here are not to be changed unless you have been instructed otherwise. The following are the communication check and updates for the LTE version. (For Wi-Fi version, see *Appendix, Communications Check for Wi-Fi Versions* on page 13.)

2.	Communications Settings Screen Note ❗ Do NOT change these settings unless you have been instructed otherwise. Press ➡ to go to the next screen.	 The screenshot shows the 'Communications Settings' screen. It displays the following information: Serial: 09553, Ver: 5.3.2.77 ST, Modem: EG25, ICCID: 8944500602199988998, RAT: AUTO, APN: nextm2m, and SERVER: SMARTRACK_AU. At the bottom, there are three icons: a left arrow, a gear icon, and a right arrow.
3.	The system will check for the latest software updates and automatically download the new software, if available. 🕒 Wait for the download progress bar to finish.	 The screenshot shows two screens for software updates. The top screen displays '13:41 10 Jun 21 4G' and 'Software Update: Please Wait' with a left arrow at the bottom. The bottom screen displays '13:41 10 Jun 21 4G' and 'Software Update: Downloading Please Wait' with a progress bar at 34% and a left arrow at the bottom.

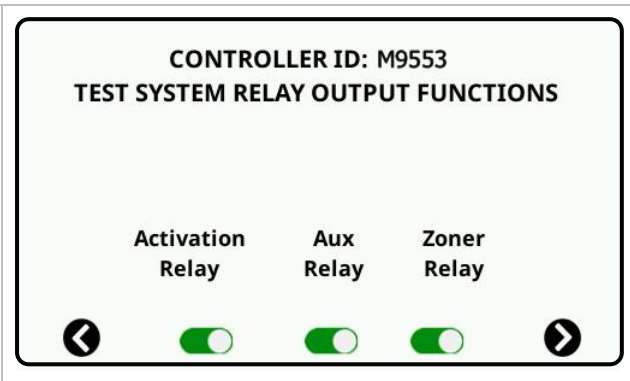
VDI 4458 Machine Selection

4.	Select the machine type from the list, and then select VDI-4458.	Select Machine Type - Controller ID: M9553 Battery Electric Internal Combustion ← ↑ ↓ ✓ Select CAN Bus Interface Type - Controller ID: M9553 None VDI-4458 ← ↑ ↓ ✓
5.	Do not use the Momentary Switch type with the VDI 4458 interface selected as this is unsuitable for this interface. Select Latched Switch if the VDI 4458 interface VCC+ is OFF when the key switch is OFF. Select Latched Switch with Logoff Button if the VDI 4458 VCC+ remains ON when the key switch is OFF.	Select Start Switch Type - Controller ID: M9553 Momentary Switch Latched Switch Latched Switch with Logoff Button ← ↑ ↓ ✓
6.	The VDI 4458 interface is now scanned and the available VDI 4458 features are verified.	09553 5.2.2.77 Creep Speed Check ✓ Lift Limit Check ✓ Truck Speed Check ✓ Testing Completed ← →

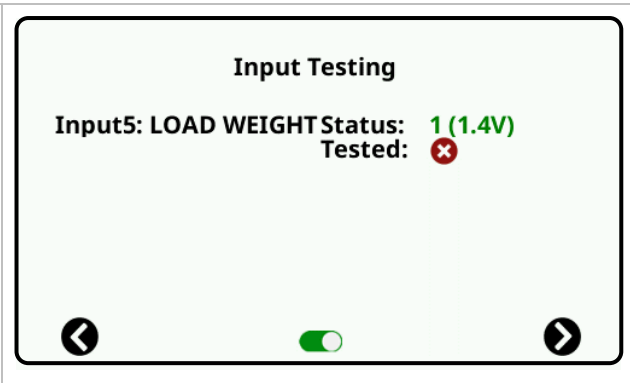
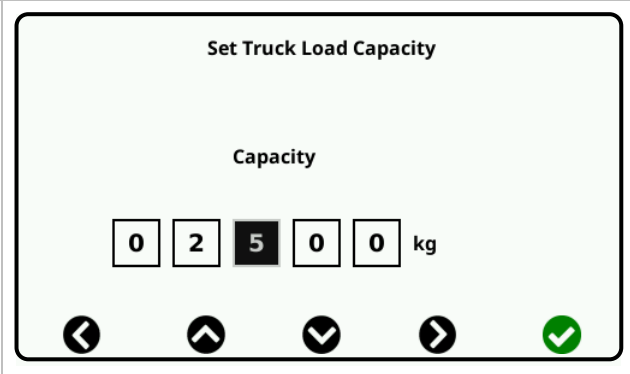
Output Testing

Note

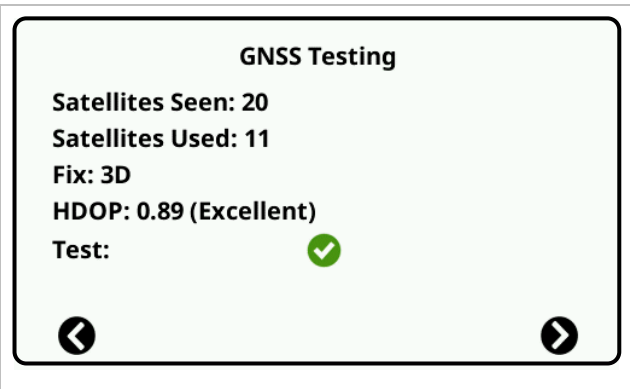
When VDI 4458 is selected, there is no requirement to configure the inputs for SmarTrack®. The typical input configuration steps in the wizard are skipped.

7.	System Relay Testing This will allow the testing of the system relay circuits. The activation, aux, and zoner relay circuits can be tested. Note The testing of the activation relay will apply power to the machine. Ensure the machine is safe to operate and you are prepared.	
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Weight Feature

8.	The weight feature can be enabled if this is in use. This feature is not handled by the VDI 4458 interface and requires the pressure sensor to be connected to the SmarTrack system.	
9.	Truck Capacity Setting for the Weight Feature If the weight feature is not in use then the setting of this value is not required (leave as default). This setting determines the thresholds for load detection and weight violations. The value entered should be the load capacity of the machine as indicated on the load weight plate at a load centre typical for use in the machines application.	

GPS Testing

10.	Testing the GPS ideally requires the machine to have clear and visible access to the sky (the machine must be outside the building, not inside). Although this may not always be possible, it may be possible to obtain a GPS fix near open doorways where partial sky is visible. If the GPS fix is taken in a doorway or inside a building, the result may be of very poor quality, that is, the HDOP (horizontal dilution of position) will be high.	
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Testing Access Control and Impact Sensor

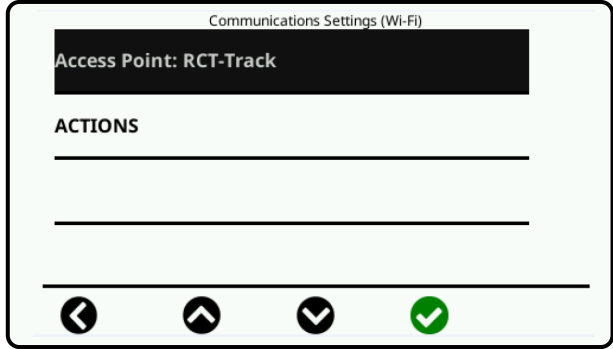
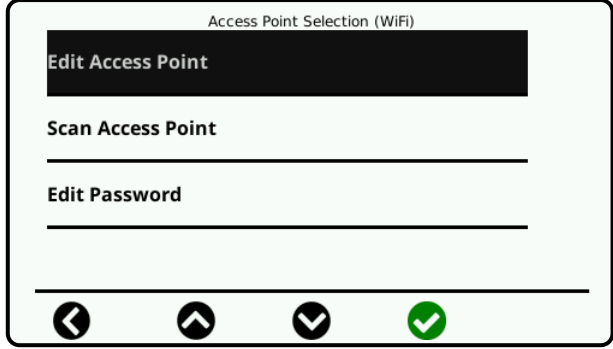
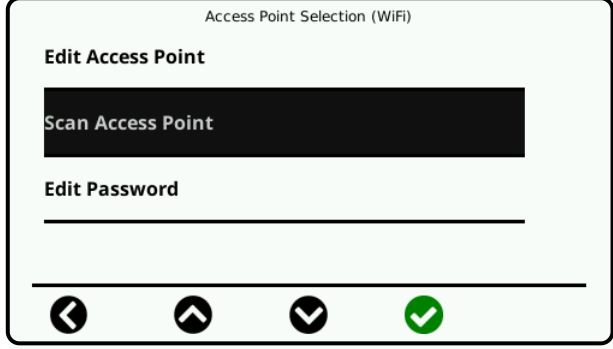
11.	Hold an access card to the display to test the swipe card function. The code from the card will be displayed. The impact sensor testing checks connectivity of the sensor only.	Card Reader and Impact Testing Swipe Card To Test Tested: 95 Impact Sensor: V02.00.00 Tested:
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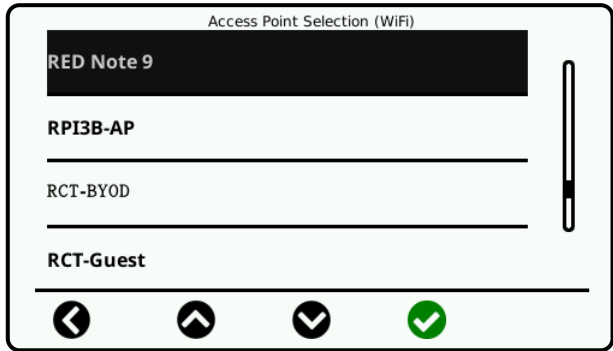
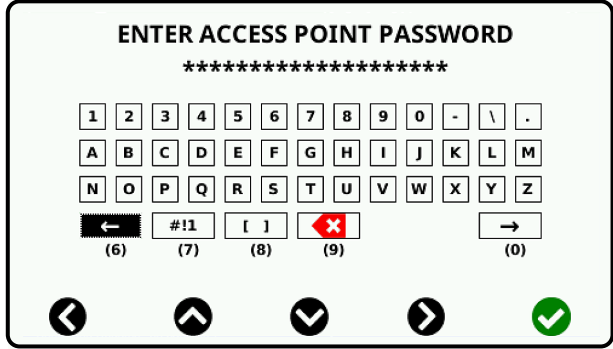
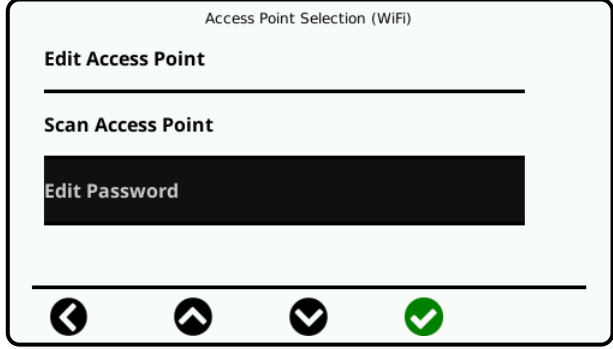
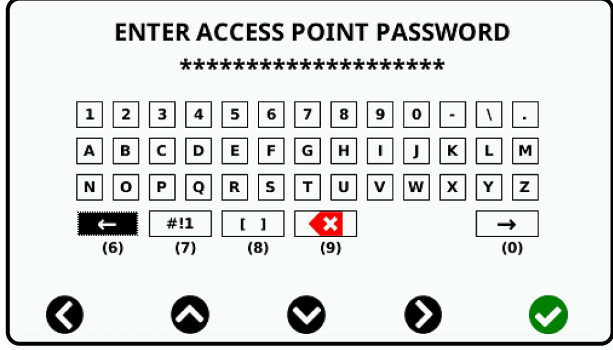
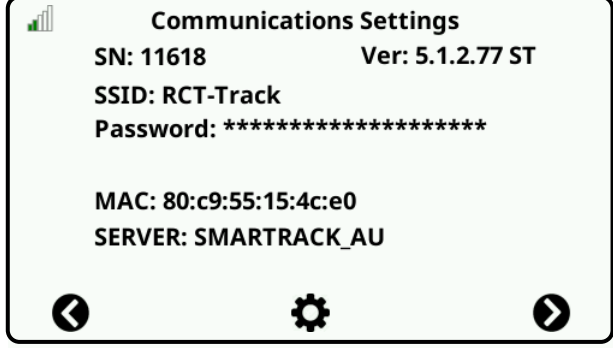
Test Review

12.	Ensure that the tests have been verified by the presence of a green tick mark. Use the UP and DOWN direction keys to scroll through the list of tests. Note When VDI 4458 is active, most inputs will be shown as disabled. This indicates that the machine voltage and frequency inputs are disabled only. Operational data will be available through the VDI 4458 interface as normal. Checked Disabled	Input3: WORK1 Input4: WORK2 Input7: WORK3 Input6: SEAT BELT CARD READER IMPACT SENSOR GNSS VDI
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Appendix

Communications Check for Wi-Fi Versions

Communications Screen To connect to your Wi-Fi, you must change the SSID and password to your network credentials. Press the  button to edit the communications settings.	 The screenshot shows the 'Communications Settings' screen. At the top, there is a signal strength indicator. Below it, the title 'Communications Settings' is followed by 'SN: 11618' and 'Ver: 5.1.2.77 ST'. The 'SSID: RCT-Track' and 'Password: *****' are displayed. Below these, 'MAC: 80:c9:55:15:4c:e0' and 'SERVER: SMARTRACK_AU' are shown. At the bottom, there are three navigation buttons: a left arrow, a gear icon, and a right arrow.
Setting the Access Point Press the  button to enter the Access Point (AP) setting.	 The screenshot shows the 'Access Point Selection (Wi-Fi)' screen. It has a title bar 'Communications Settings (Wi-Fi)'. Below it, 'Access Point: RCT-Track' is displayed in a black box. Under the heading 'ACTIONS', there are three horizontal lines for input. At the bottom, there are four navigation buttons: a left arrow, an up arrow, a down arrow, and a green checkmark icon.
If you know the SSID, select Edit Access Point and press the  button. Continue to step 6.	 The screenshot shows the 'Access Point Selection (Wi-Fi)' screen. It has a title bar 'Access Point Selection (Wi-Fi)'. Below it, 'Edit Access Point' is displayed in a black box. Under the heading 'Scan Access Point', there is a horizontal line for input. Below that, 'Edit Password' is displayed with a horizontal line for input. At the bottom, there are four navigation buttons: a left arrow, an up arrow, a down arrow, and a green checkmark icon.
If you do not know the SSID, you can connect to another access point. Press the  button to scroll down to select Scan Access Point and press the  button.	 The screenshot shows the 'Access Point Selection (Wi-Fi)' screen. It has a title bar 'Access Point Selection (Wi-Fi)'. Below it, 'Edit Access Point' is displayed. Under the heading 'Scan Access Point', there is a black box. Below that, 'Edit Password' is displayed with a horizontal line for input. At the bottom, there are four navigation buttons: a left arrow, an up arrow, a down arrow, and a green checkmark icon.

Press the  or  buttons to scroll up or down the list to select the SSID you want. Press the  button to select your choice of access point. Continue to step 7.	
Enter the SSID using the onscreen keyboard. (Use the navigation buttons to move the cursor to the character or key you want and press the  button to enter the character.) When done, press the (0) or  key.	
Entering the Password Go to the Access Point Selection screen. Press the  button to scroll down to select Edit Password and press the  button.	
Enter the password using the onscreen keyboard. (Use the navigation buttons to move the cursor to the character or key you want and press the  button to enter the character.) When done, press the (0) or  key.	
After entering the SSID and password, you will be returned to the Communications Settings screen. Press the  button. The system will check for the latest update. (Refer to step Error! Reference source not found. of 'Error! Reference source not found.', on page Error! Bookmark not defined.)	

Glossary

<i>Access control</i>	A PIN code and swipe card system that allows an operator to access the machine.
<i>Activation Output</i>	A wired feature that allows a machine to become operational.
<i>AusProTec®</i>	The specialised electrical equipment product brand of RCT.
<i>Auxiliary Output</i>	Dry contacts that are activated by critical events.
<i>Buckle</i>	Refers to the latching mechanism used on a seat belt. Also known as Seat Buckle.
<i>Buzzer</i>	An audible annunciator. Also known as an Alarm.
<i>Bypass Key</i>	A key switch designed to activate the machine effectively, overriding the fleet management system.
<i>Cable ties</i>	Also known as hose tie or zip tie. Used as a fastener to hold items together e.g. wires.
<i>Controller Area Network (CAN / CAN bus)</i>	A robust vehicle bus standard designed to allow devices to communicate with each other. Also known as CAN bus.
<i>Category</i>	A group of machines on a site with user configurable machine settings. Typically used to group machines by type.
<i>Cellular</i>	Cellular/Mobile communications network that can include 2G, 3G, and 4G networks.
<i>Checklist</i>	A questionnaire that is completed prior to machine activation to check that the machine is free from defects and safe for operation.
<i>Cloud</i>	Secure on demand data storage.
<i>Company</i>	A business entity owning a number of sites.
<i>Controller ID</i>	SmarTrack® Controller serial number.
<i>ControlMaster®</i>	The Automation and control technology product brand of RCT.
<i>Critical Impact</i>	An impact that happens on the machine that is equal to above the critical impact threshold configured.
<i>Critical Output</i>	Feature to notify operator when an unexpected failure/output occurs during operation of the machine. Logically coupled to the auxiliary output.
<i>Dash</i>	Instrument cluster of a machine or vehicle.
<i>Department</i>	A group of operators and machines on a site.
<i>Draw Zones</i>	Allows the user to draw and name the type of speed zone that can be selected and assigned to machine on site.
<i>EarthTrack®</i>	The mining information systems product brand of RCT.
<i>Email Alerts</i>	An email message sent to recipients when an alert is triggered on the SmarTrack® system.
<i>Electromagnetic Fields (EMF)</i>	A magnetic field of force produced by electric current flow.
<i>Electromagnetic Interference</i>	A disturbance generated by an external source that affects an electrical circuit by electromagnetic induction, electrostatic coupling, or conduction.
<i>Fleet</i>	Group of machines on a site.
<i>Fleet Controller</i>	Hardware installed to a machine to provide the electrical interface to the machine for activation and monitoring.
<i>Fleet Number</i>	A name assigned to a machine to uniquely identify the machine.
<i>Fleet Management System (FMS)</i>	A collection of devices installed into a fleet of machines coupled to a central reporting and management system.
<i>Global Operators</i>	Essentially technician access having a single access code for all devices across all companies and sites.
<i>Global Navigation Satellite System (GNSS)</i>	A group of synchronized satellites working in concert (collectively called constellations) used for Position Navigation and Time (PNT) solutions on a global basis. The main constellations are Global Positioning System (GPS) (USA) - Glonass (Russia) - Galileo (EU) and Beidou (China).
<i>GPS Zoning</i>	A GNSS feature used with a Speed Limiter device to control machine speed through geo-location.
<i>Input/Output (I/O)</i>	An electrical signalling interface between an electronics control module and the physical machine electrical circuits.
<i>ICT Department</i>	Department of a business that supervises technologies that provide access to information through telecommunications.
<i>Impact Sensor</i>	A device that detects whether a physical shock or impact has occurred.

<i>Installation and Commissioning Wizard (I&C)</i>	A guided test, configuration and verification process after installation of all components before delivery to site for use.
<i>Latched</i>	An electrical switch circuit that remains in its set state after being actuated. For example, an ignition key switch.
<i>License/Permit</i>	Operator code/Swipe card that provides access to the machine.
<i>Load Weight</i>	A configurable feature to act as a weight indicator. Can be configured to report and alert violations.
<i>Loom</i>	A group of pre-terminated wires to provide an electrical connection to a machine. Also known as a Harness.
<i>Machine</i>	Any piece of motorised equipment being either mobile or fixed plant.
<i>Message of the day</i>	Daily customised message that displays on the machine operator screen for each day of the week.
<i>Momentary</i>	An electrical switch circuit that returns to its previous state after being actuated. For example, a horn button.
<i>Muirhead®</i>	The machine and personnel protection product brand of RCT.
<i>Normally Closed (N/C)</i>	Switch contacts in a circuit are normally closed in their OFF state.
<i>Normally Open (N/O)</i>	Switch contacts in a circuit are normally open in their OFF state.
<i>Out-of-Service (OOS)</i>	A feature that can be used to lock out the machine in the event of a service or operational fault.
<i>Operator</i>	A person who would use a machine.
<i>Operator Display</i>	The SmarTrack® screen on the machine.
<i>Plug & play</i>	Looms and components that do not require any additional wire or modifications to be fitted to the machine.
<i>RAM mounts</i>	A brand of equipment mounting used by SmarTrack®.
<i>Radio-Frequency Interference (RFI)</i>	See <i>Electromagnetic Interference</i> .
<i>Radio-Frequency Identification (RFID)</i>	Uses radio transmission to identify operator tags and cards.
<i>Seat Input</i>	Used to monitor operator presence and can be configured to generate alerts and violation reports should an operator vacate during machine operation.
<i>Sign ON/OFF</i>	The process of log in/log off from a machine by an operator with an access code/card.
<i>Site</i>	A geographical location with machines and operators belonging to a company.
<i>Site Champion</i>	A person located at a site who takes responsibility for the management of the fleet management system locally.
<i>SMA finger wrench</i>	A tool used for tightening and loosening the SMA antenna connectors.
<i>SmarTrack®</i>	The industrial fleet management product brand of RCT.
<i>SmarTrack® Global</i>	Latest fleet management product range from RCT.
<i>Subscription [SmarTrack®]</i>	Periodic payment by customers for each active machine on SmarTrack®.
<i>Supply Company (OEM)</i>	A provider of machines to companies.
<i>Swipe Card</i>	Identification card using RFID technology to provide access to the machine.
<i>Telemetry Data</i>	An automated communications process by which measurements and other data are collected at remote or inaccessible points and transmitted to receiving for monitoring.
<i>Traction</i>	Movement of a machine forward/backward.
<i>User</i>	A person with access to the SmarTrack® web portal.
<i>Web portal</i>	The user interface accessed by users from a web browser for SmarTrack® administration and reporting.
<i>Wi-Fi</i>	Wireless data communications.
<i>Work Input</i>	A signal input to the fleet controller from the machine, which indicates the machine is in operation. Signals can indicate a combination of traction and lifting.

Warranty

Please see the RCT standard warranty, available on our website - www.rct-global.com

Revision History

Rev	Date	By	Details of change
1.0	19/03/2021	LesH	Initial document draft and approval.
1.1	31/03/2022	RSD	Updated <i>Installation Guide</i> section. Added <i>Appendix</i> .
	11/05/2022	LesH	Updated <i>Battery Supply Connection</i> , <i>System Test</i> and <i>VDI 4458 Machine Selection</i> sections.
	23/05/2022	LesH	Updated <i>drawing 717h</i> .
1.2	27/06/2022	RSD	Updated <i>Installation Guide</i> and <i>Appendix</i> sections.
1.3	4/07/2022	MI	Updated VDI 4458 terminology throughout.
1.4	06/06/2023	RSD	Updated <i>Installation Guide</i> and <i>Appendix</i> sections.
1.5	16/10/2023	RSD	Updated <i>Installation and Commissioning Wizard</i> section.



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sales@rct-global.com

AUSTRALIA:	+61 (0) 8 9353 6577
AFRICA:	+27 (0) 83 292 4246
CANADA:	+1 705 590 4001
RUSSIA / CIS:	+7 (910) 411 11-74
SOUTH AMERICA:	+56 3 5229 9409
USA:	+1 801 938 9214

