INSTALL MANUAL

EQSS Model6253 – OverWatch™
Swift xxxxSE Series

**** Failure to follow this installation manual will void warranty ****

AUTHORS:	AUTHORISED BY:	CHECKED BY:
Kieren Grogan	Kieren Grogan	Andrew Donegan

DOCUMENT ABSTRACT:
This Installation Manual details the manufacturer's installation instructions for installing the Model6253 OverWatch™ on a Swift xxxxSE Series electric slab scissor lift.

PRODUCT NAME:
Model6253 OverWatch™ Operator Detection System

REFERENCE DOCUMENTS:
DO0001195 Model6253 OverWatch™ User Manual

CURRENT DOCUMENT REVISION:
1.0

REVISION INFORMATION:

- 1.0 Initial Document Creation for installation on a Swift xxxxSE Series Scissor Lift

Important Information

Information contained in this publication regarding this device's applications and the like, is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that the application or our equipment meets with your specifications.

EQUIPMENT SAFETY SYSTEMS MAKE NO REPRESENTATIONS OR WARRANTIES OF ANY KIND, WHETHER EXPRESSED OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION, INCLUDING, BUT NOT LIMITED TO, IT'S CONDITION, QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR PURPOSE.

Equipment Safety Systems disclaims all liability arising from this information and its use. Use of Equipment Safety Systems' products as critical components in life support systems is not authorised except with express written approval by Equipment Safety Systems. No licenses are conveyed, implicitly or otherwise, under any Equipment Safety Systems intellectual property rights.

N23041

This is a class A product certified to AS/NZS CISPR 22:2006. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Table of Contents

Preparation

Required Tools

The OverWatch™ has been designed to be fitted using basic workshop tools. Shown below is a list of tools required to complete the installation.

Item	Tool / Description
1	Electric Drill
2	Centre punch
3	Hammer
4	Side Cutters
5	Drill 3.2mm
6	Drill 5.0mm
7	Step Drill (5 – 30mm)
8	Metric sockets or spanners
9	Needle nose pliers
10	Screw drivers
11	Paint – Red (Swift)

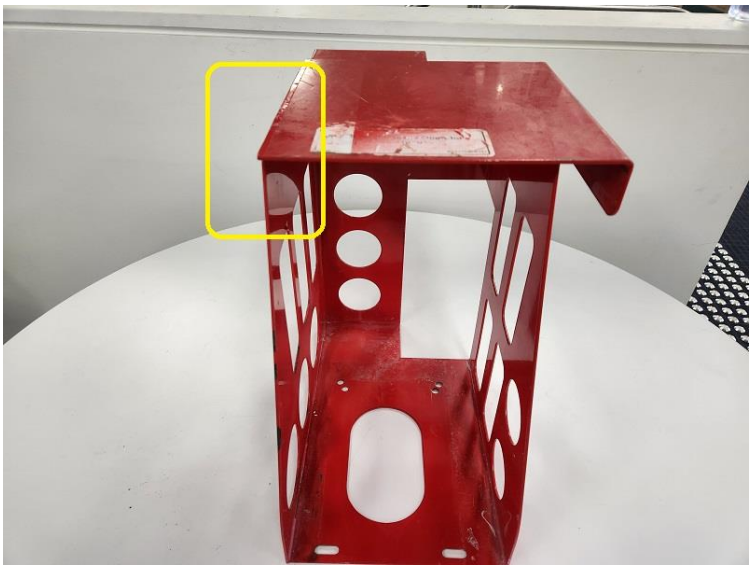
Installation Time

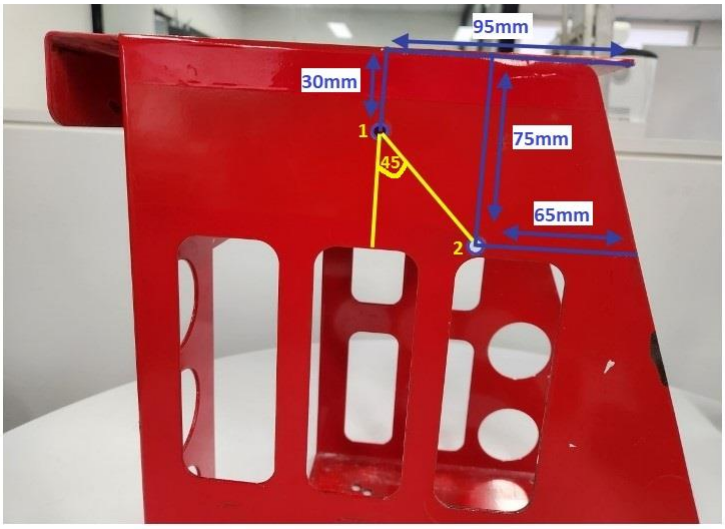
The suggested time required to install the OverWatch™ is as detailed below.

Task	Estimated Time (Minutes)
Drilling of all mounting holes for the various components	10
Mechanical assembly	10
Electrical assembly	10
Post installation system tests	10
Total	**40**

Installation Instructions

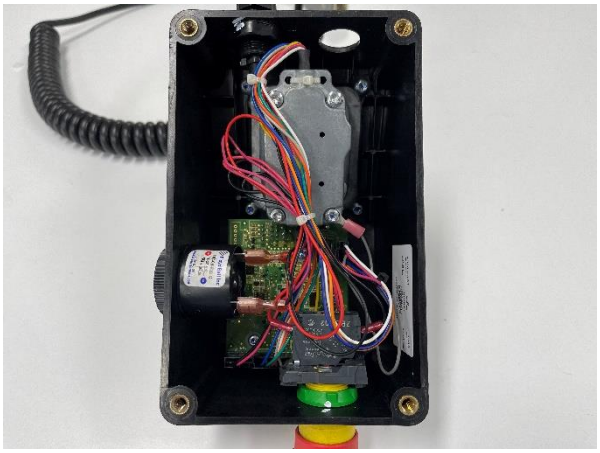
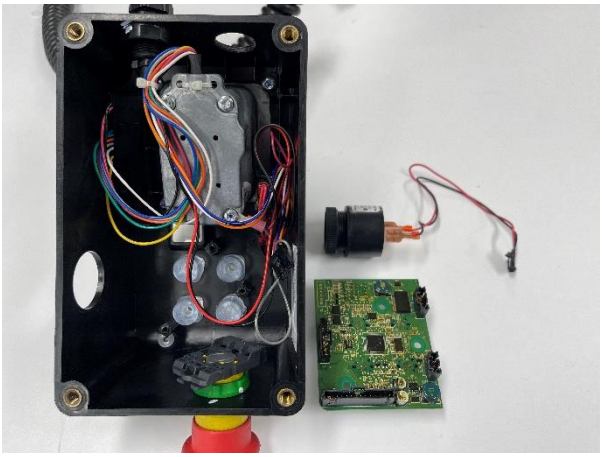
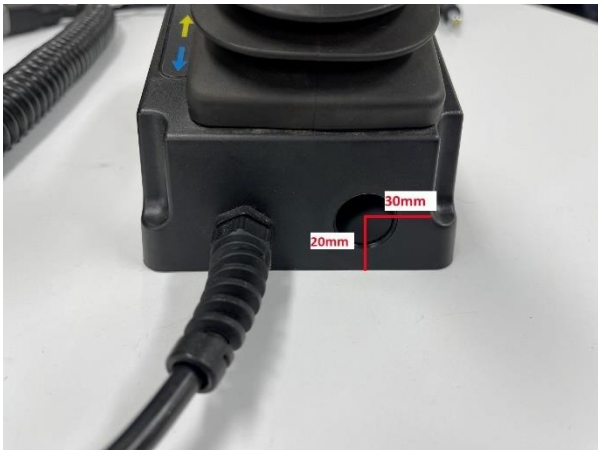
Operator Sensor

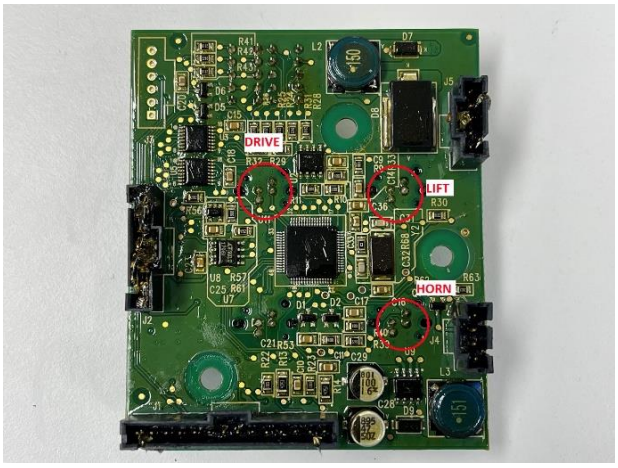
Step	Description	Diagram
1.	Remove the Joystick controller from the metal enclosure.	
2.	Modify the metal housing by removing the left-hand side mounting rail, trim the rail off and paint the cut joint. This needs to be done to make room for the OverWatch operator sensor.	

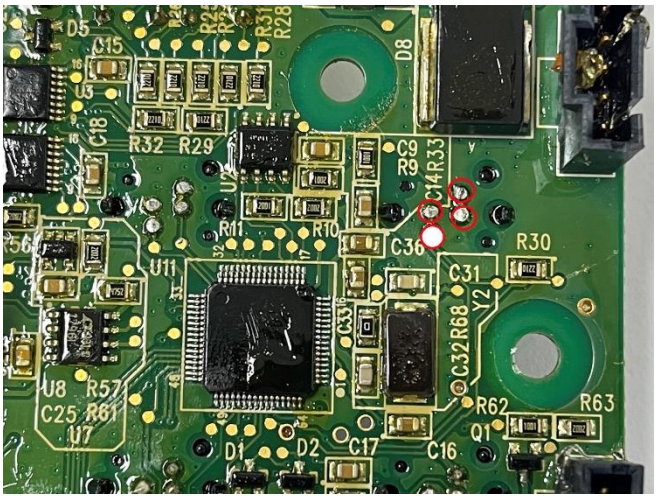
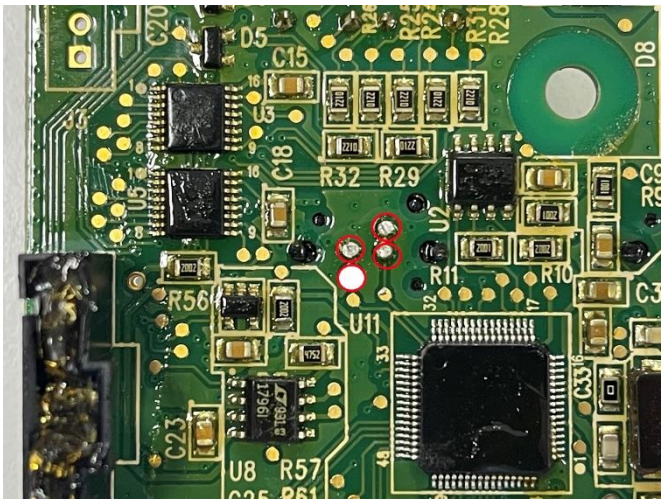
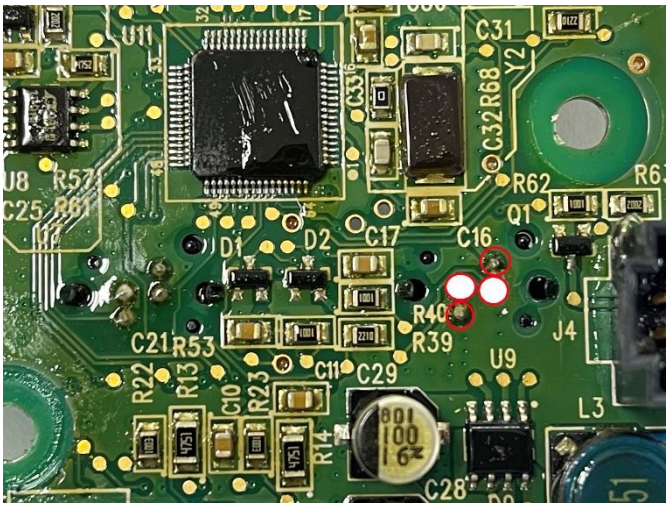
3.	Drill two **5.2mm** holes to mount the operator sensor on the outside of the metal enclosure as shown in the image. The distance between the two holes is **61mm**. **The position of the operator sensor is critical**, the angle of the sensor must be at an angle of **45 degrees**, and it must be mounted exactly as per the corresponding drawing.	
4.	Mount the operator sensor assembly to the metal enclosure by using M4 nuts and washers.	

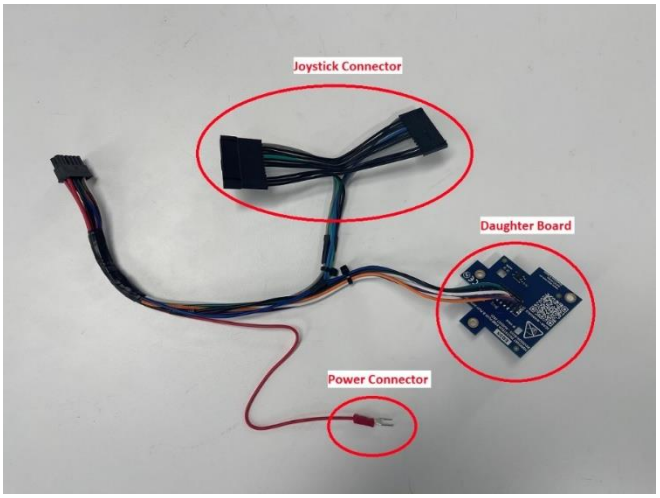
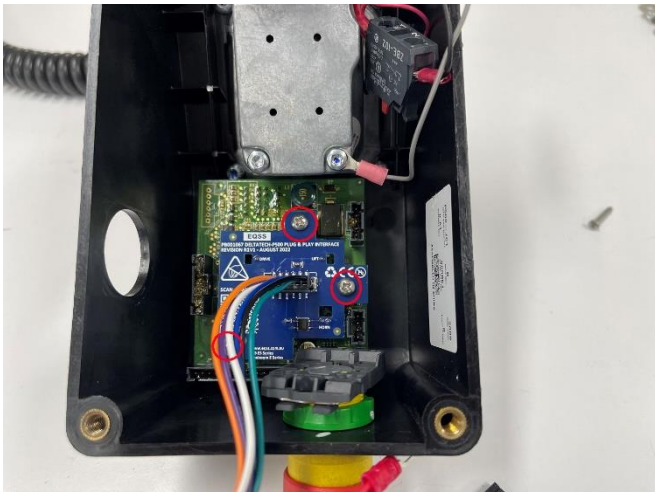
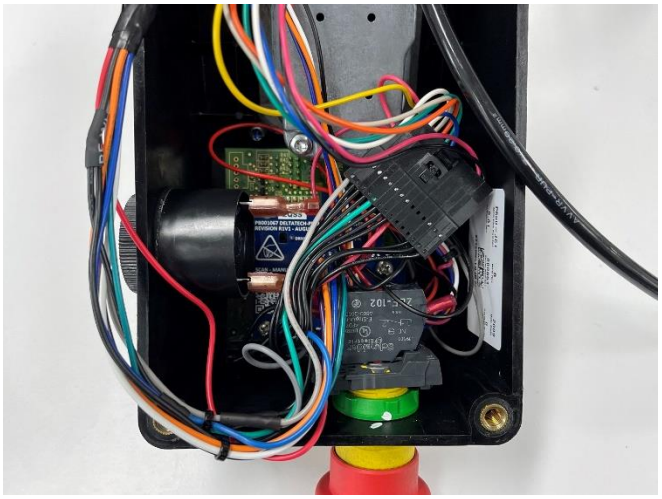
5.	Make sure that the sensor is on the 7.5-degree angle, such that it is twisted outwards from the joystick controller. **The 7.5-degree twist is achieved by rotating the sensor inside the assembly and using the bolt hole as show in the image.**	
6.	Route the operator sensor cable as shown in the image. Use cable ties to secure the sensor cable to the metal enclosure.	

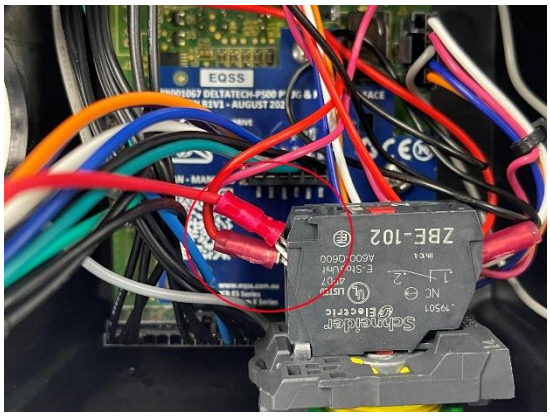
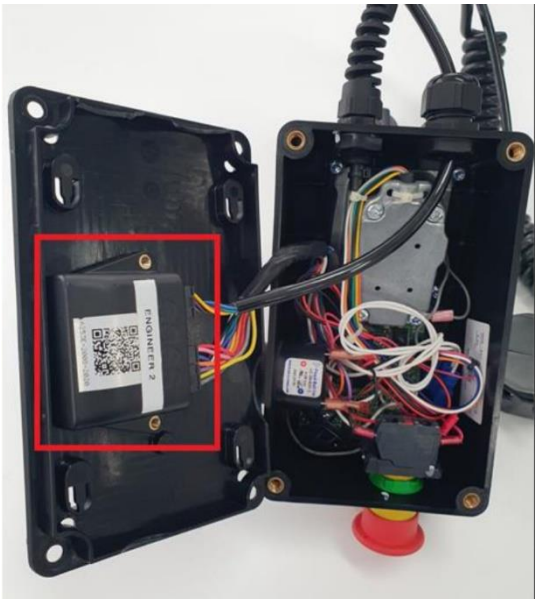
Control Module

Step	Description	Diagram
1.	Remove the bottom plastic cover from the joystick to expose the inside wiring and electronics.	
2.	Remove the Buzzer, E-Stop, and the controller circuit board from the plastic enclosure.	
3.	Drill a **20mm** hole to run the operator sensor M20 Gland into the plastic joystick enclosure. The position of the hole is detailed as in the image. It is recommended to use a step drill for this hole, as it is running through plastic material.	

4.	Use a fine metal pick to clean the area shown in the red circles, on the adjacent image, to allow access to the pins. This process removes the conformal coating on the PCB and allows electrical access to the drive, elevate and horn connections on the circuit joystick board.	
5.	Use a fine pair of side cutters to trim down the signal pins. These connections must be trimmed to be as flat as possible so that the spring pin from the plug and play board can make suitable contact with the terminal	

6.	Trim down the **Elevate** signal pin. This pin is located as displayed in the image. Using a fine pair of side cutters make sure that the pin is trimmed flat.	
7.	Trim down the **Drive** signal pin. This pin is located as displayed in the adjacent image. Using a fine pair of side cutters make sure that the pin is trimmed flat.	
8.	Trim down the two **Horn** signal pins. These pins are located as displayed in the adjacent image. Using a fine pair of side cutters make sure that the pins are trimmed flat.	

9.	Wiring connections are made by the AS002212 Plug and Play harness.	
10.	Mount the Overwatch circuit board on top of joystick circuit board. Using the provided screws and spacers in the kit. Make sure that the board is sitting in the correct position and the spring pins are contacting the joystick circuit board signal pins. Use the cut-outs next to each spring pin to inspect that the contact is solid with the joystick board.	
11.	Install the Overwatch joystick connectors in between the joystick and the control box circuit board. Visually check that all pins from the original joystick connector have a corresponding cable on the Overwatch harness. Reconnect the other connectors, which were disconnected in step 1 to the control box circuit board.	

12.	At the back of the Estop, install the OverWatch Red Power cable to terminal 1 of the E-Stop. *Note: this cable might need to be changed to terminal 2 if the Overwatch is powered with the E-stop pushed in.*	
13.	Mount the OverWatch ECU inside the joystick control box, the ECU is mounted to the plastic using the adhesive Velcro tape. Run the operator sensor cable through the predrilled 20mm hole and secure the cable gland. Connect the 8-pin connector from the operator sensor and the 12-pin connector from the overwatch loom to the ECU.	
14.	Re-assemble the joystick control box and mount to the metal enclosure. Make sure the operator sensor cable runs clear to the joystick enclosure and tighten the M20 gland to seal the cable entry point.	

Post Installation Configuration

Overview

After the OverWatch™ has been installed it must be configured with the parameters to suit the machine. Follow the instructions below to configure the OverWatch™.

Minimum system requirements

Any smart phone, tablet or laptop that meets the following requirements:

- The device can connect to a Wi-Fi access point
- The device has an up to date web browser installed (2019 onwards). Firefox or Chrome are recommended.

Wi-Fi Connection & Web Page Access

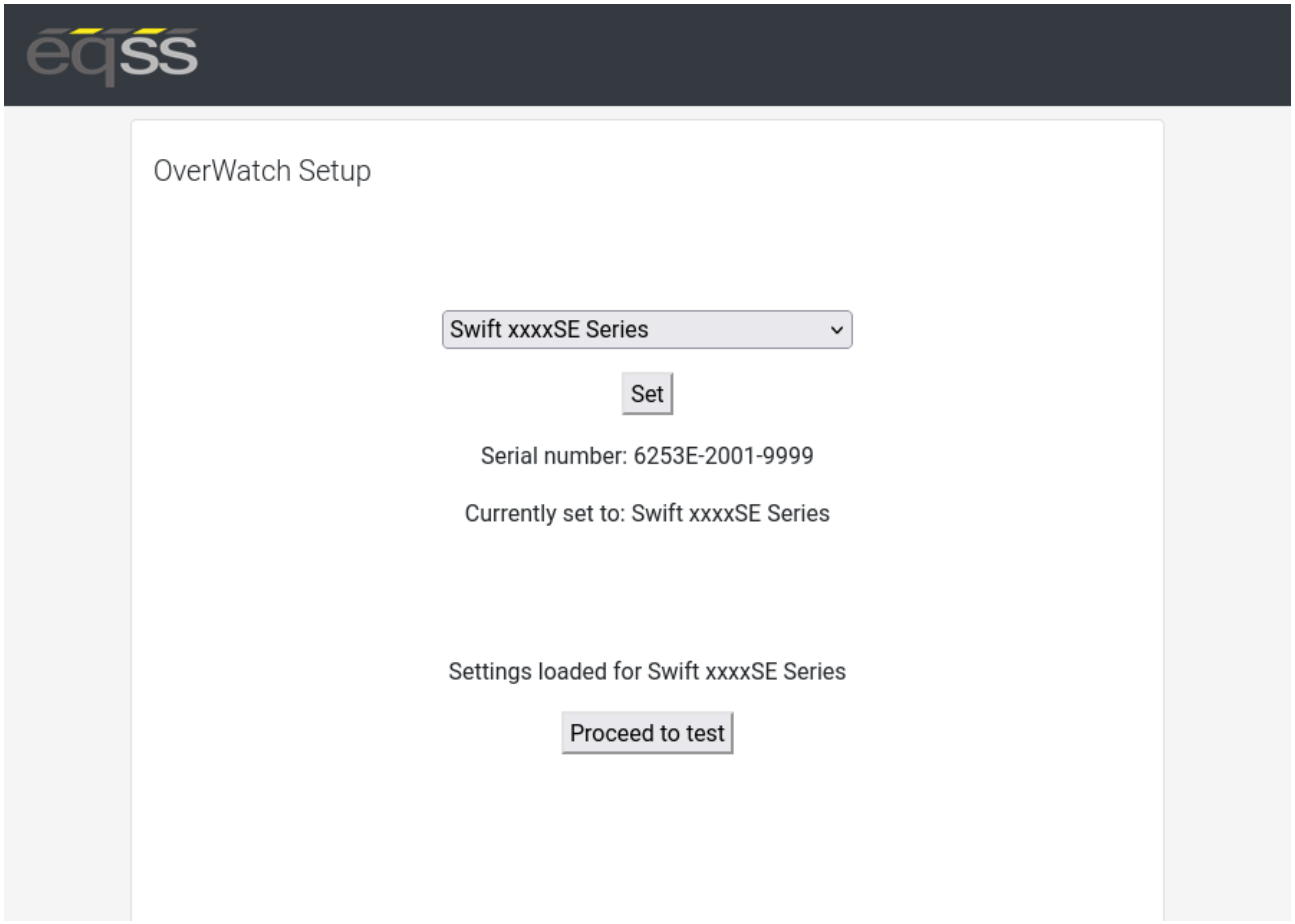
To enable the Wi-Fi connection on the OverWatch™ to complete the configuration follow the steps below.

1. Power down the platform control box with the ESTOP
2. Wait 10 seconds
3. Power up the platform control box with the ESTOP
4. While standing in the operator position, switch on the OverWatch™
5. As the welcome chime starts to play, cover the sensor. The LED will flash white then black to acknowledge.
6. Remove your hand from the sensor. The LED will flash white then black to acknowledge.
7. After covering then uncovering the sensor this way 2 more times, "Wi-Fi On" will be announced.
8. On your Wi-Fi enabled device (laptop, tablet, smartphone, etc), show the available wireless networks
9. Select the wireless network (starts with “overwatch”) to connect to the OverWatch™
10. When prompted, enter the password “12345678”
11. Open your preferred web browser (Chrome, Firefox, Safari, Edge)
12. Enter the following into the address bar http://192.168.4.1 to open the OverWatch™ main page

Machine Model Selection

Follow the instructions below to configure the OverWatch™.

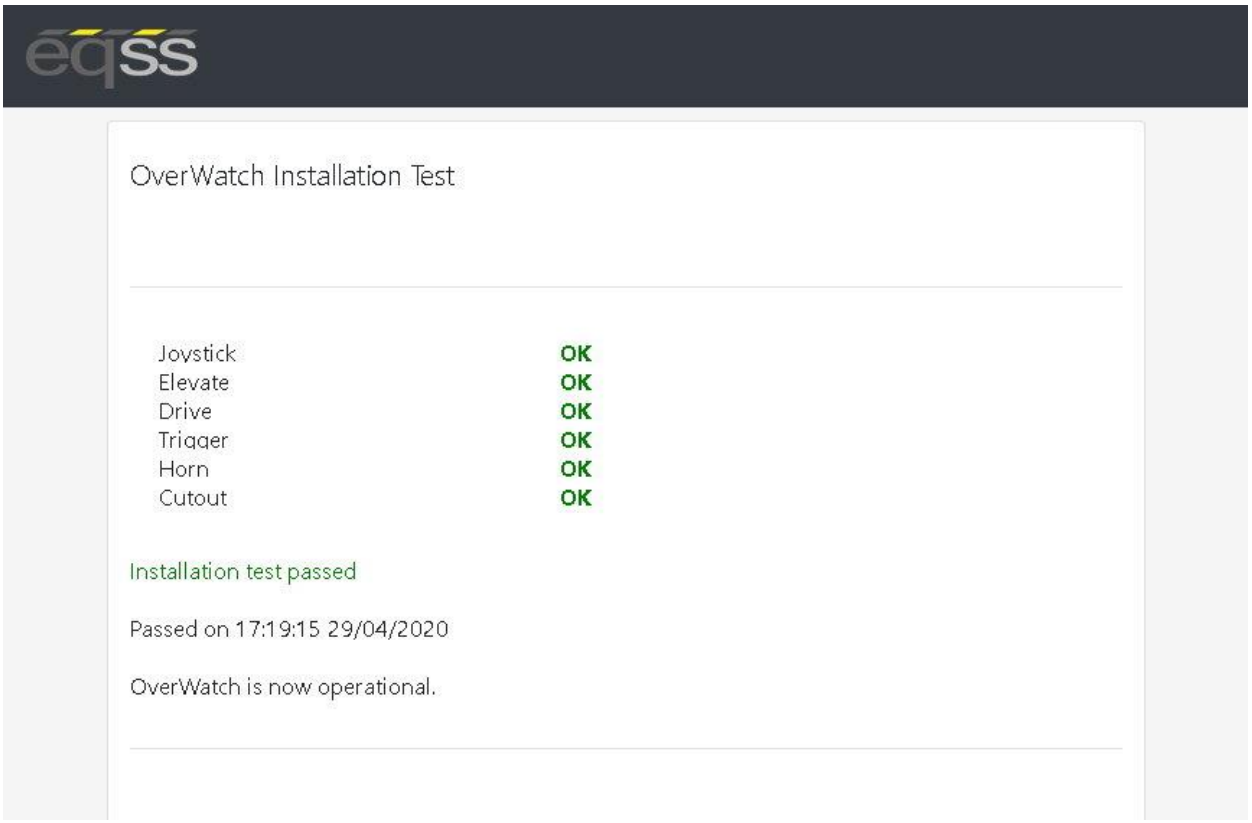
1. Select the Setup option
2. If there is a password field at the bottom of the page, follow the instructions in Change Model Configuration to obtain the password and enter the password field
3. Select the EWP Model from the drop-down list and click Set
4. Click on Proceed to Test to begin the installation test



Installation Test

After the model configuration has been set or updated an Installation Test must be performed. This will ensure the installation has been correctly performed and the OverWatch™ is functioning correctly.

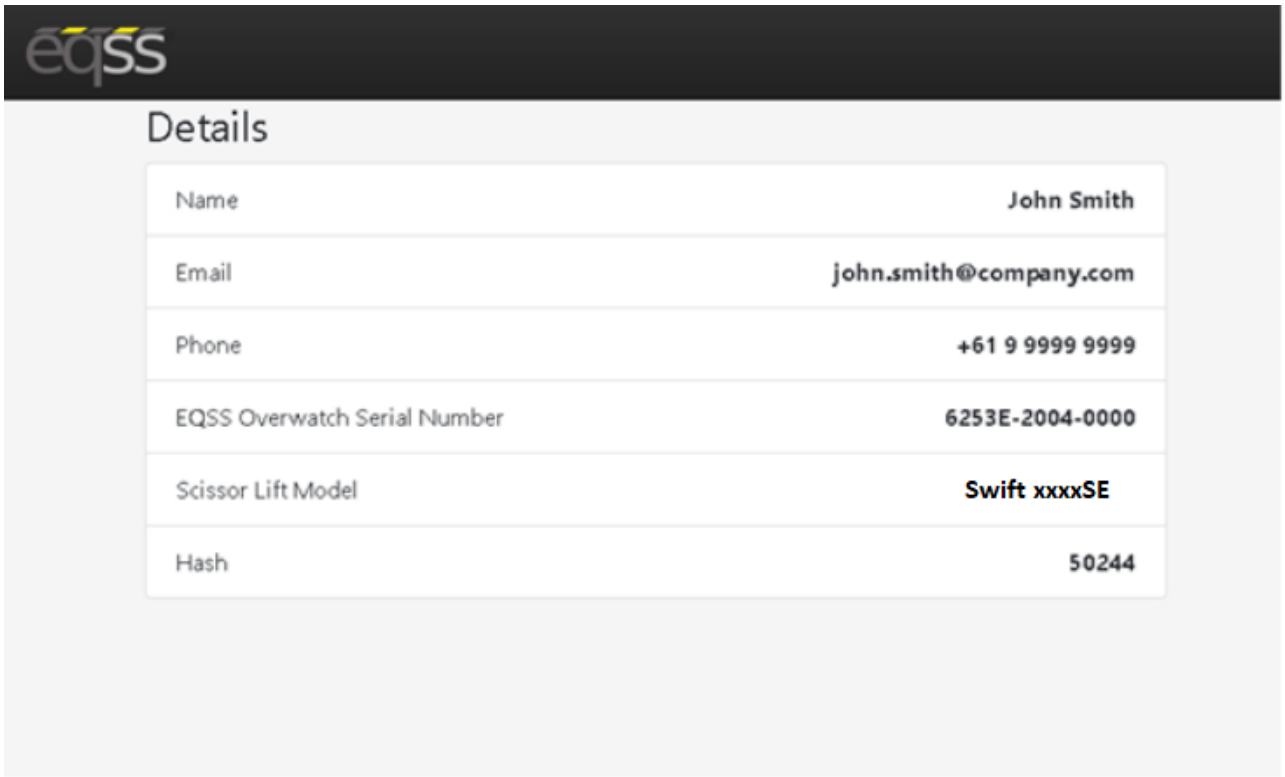
Follow the instructions on the web page to complete the Installation Test.



Change Model Configuration

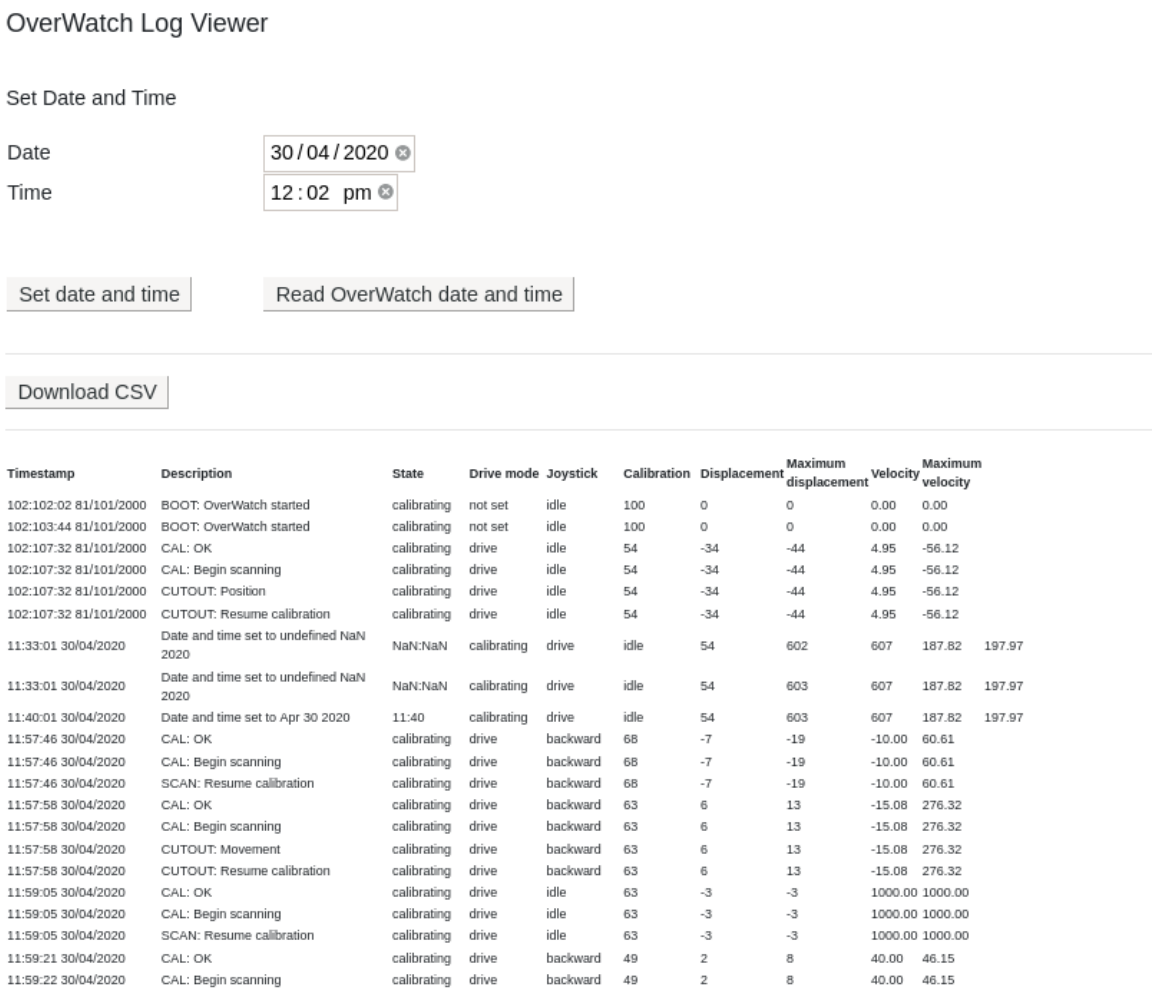
To reconfigure the OverWatch™ for a different model requires an authorisation password to be supplied by a service manager. The authorisation password is generated from the EQSS website. The EQSS website requires a login username and password. If you are a service manager and don't have a username and password, contact EQSS to register. Follow the instructions below to obtain an authorisation password.

1. Open your preferred web and enter the following into the address bar http://www.eqss.com.au/overwatch to open the Login page
2. Select Customer
3. Enter your username and password
4. Ask the service technician for the serial number shown on the Setup page or on the ECU module along with the owner details of the EWP and complete the details form then click Generate Hash
5. Provide the 5-digit hash password to the service technician



Set Date and Time

Date and time should be set accordingly. The date and time can be set on the log page. This page allows adjustment of the system's real time clock and calendar if required. Please note, any time or date change is logged and recorded.



OverWatch Log Viewer

Set Date and Time

Date 30 / 04 / 2020

Time 12 : 02 pm

Set date and time | Read OverWatch date and time

Download CSV

Timestamp	Description	State	Drive mode	Joystick	Calibration	Displacement	Maximum displacement	Velocity	Maximum velocity	
102:102:02 81/101/2000	BOOT: OverWatch started	calibrating	not set	idle	100	0	0	0.00	0.00	
102:103:44 81/101/2000	BOOT: OverWatch started	calibrating	not set	idle	100	0	0	0.00	0.00	
102:107:32 81/101/2000	CAL: OK	calibrating	drive	idle	54	-34	-44	4.95	-56.12	
102:107:32 81/101/2000	CAL: Begin scanning	calibrating	drive	idle	54	-34	-44	4.95	-56.12	
102:107:32 81/101/2000	CUTOUT: Position	calibrating	drive	idle	54	-34	-44	4.95	-56.12	
102:107:32 81/101/2000	CUTOUT: Resume calibration	calibrating	drive	idle	54	-34	-44	4.95	-56.12	
11:33:01 30/04/2020	Date and time set to undefined NaN 2020	NaN:NaN	calibrating	drive	idle	54	602	607	187.82	197.97
11:33:01 30/04/2020	Date and time set to undefined NaN 2020	NaN:NaN	calibrating	drive	idle	54	603	607	187.82	197.97
11:40:01 30/04/2020	Date and time set to Apr 30 2020	11:40	calibrating	drive	idle	54	603	607	187.82	197.97
11:57:46 30/04/2020	CAL: OK	calibrating	drive	backward	68	-7	-19	-10.00	60.61	
11:57:46 30/04/2020	CAL: Begin scanning	calibrating	drive	backward	68	-7	-19	-10.00	60.61	
11:57:46 30/04/2020	SCAN: Resume calibration	calibrating	drive	backward	68	-7	-19	-10.00	60.61	
11:57:58 30/04/2020	CAL: OK	calibrating	drive	backward	63	6	13	-15.08	276.32	
11:57:58 30/04/2020	CAL: Begin scanning	calibrating	drive	backward	63	6	13	-15.08	276.32	
11:57:58 30/04/2020	CUTOUT: Movement	calibrating	drive	backward	63	6	13	-15.08	276.32	
11:57:58 30/04/2020	CUTOUT: Resume calibration	calibrating	drive	backward	63	6	13	-15.08	276.32	
11:59:05 30/04/2020	CAL: OK	calibrating	drive	idle	63	-3	-3	1000.00	1000.00	
11:59:05 30/04/2020	CAL: Begin scanning	calibrating	drive	idle	63	-3	-3	1000.00	1000.00	
11:59:05 30/04/2020	SCAN: Resume calibration	calibrating	drive	idle	63	-3	-3	1000.00	1000.00	
11:59:21 30/04/2020	CAL: OK	calibrating	drive	backward	49	2	8	40.00	46.15	
11:59:22 30/04/2020	CAL: Begin scanning	calibrating	drive	backward	49	2	8	40.00	46.15	

System Settings

See the sections below for details on each of the Swift xxxxSE Series OverWatch™ system default settings.

Setting Name	Description	Value
deltaseek	This specifies which of the previous lidar reading to compare against the current one to calculate the speed.	20
max_safe_velocity	This is the velocity threshold for the cutout in cm/s. for drive mode.	95
max_safe_displacement	This is the maximum permitted distance in cm the operator may be away from the calibration position in drive mode.	50
max_safe_velocity_elevate	This is the velocity threshold for the cutout in cm/s. in elevate mode.	75
max_safe_displacement_elevate	This is the maximum permitted distance in cm the operator may be away from the calibration position in elevate mode.	50
max_safe_velocity_neutral	This is the velocity threshold for the cutout in cm/s. in neutral mode.	60
max_safe_displacement_neutral	This is the maximum permitted distance in cm the operator may be away from the calibration position in neutral mode.	40
fwddispadj	The coefficient to apply to the displacement when the displacement is toward the sensor.	-0.8
fwdveloadj	The coefficient to apply to the velocity when the displacement is toward the sensor.	-1
zone_obstruction	The lidar is considered obstructed if the lidar sensor reading is below this.	5
zone_minimum	Any lidar reading below this will trigger a cutout with the message: “Operator Zone”	15
zone_maximum	Any lidar reading above this will trigger a cutout with the message: “Operator Zone”	120
horn_count_max	The number of times the horn will sound when alerting the operator if the trigger remains pressed during the cutout.	2
horn_time_ms	The amount of time in milliseconds each individual horn should play.	200
adc_elevate_threshold	For the elevate ADC input, a reading below this indicates the EWP is in elevate mode.	500
adc_drive_threshold	For the drive ADC input, a reading below this indicates the EWP is in drive mode.	500
adc_trigger_threshold	For the trigger ADC input, a reading below this indicates the trigger is pressed.	100

Setting Name	Description	Value
adc_joystick_fwd_threshold	For the joystick ADC input, a reading below this indicates the joystick has been pushed forward.	900
adc_joystick_bwd_threshold	For the joystick ADC input, a reading above this indicates the joystick has been pulled backward.	1100
override_cooldown	The amount of time in milliseconds the system will wait before accepting another override request.	20000
override_time	The amount of time in milliseconds the override will last before it expires, and normal operation is resumed.	15000
override_listening_time	The amount of time in milliseconds the system will wait while the deadman is held down before considering it not to be part of the triple click override request.	300
override_reset_time	The amount of time in milliseconds the override system will wait before resuming listening after the deadman has been released at the end of an override period.	500
override_triple_click_time	The amount of time in milliseconds 3 clicks of the deadman need to occur to trigger the override.	2000
lidar_fault_timeout	The amount of time in milliseconds of silence from the sensor module before a fault condition is triggered.	1000
cutout_fault_timeout	The amount of time in milliseconds a discrepancy between the cutout and the cutout sensor is permitted before a fault condition is triggered.	3000
throttle_time	Period after the trigger is pressed, the system does not track velocity.	2000
time_before_welcome	Time after power on before welcome audio is played	250
stuck_displacement	While the operator is within this distance in cm of the position they were in when the cutout occurred, the operator is considered trapped.	20
stuck_time	The period in milliseconds the operator needs to remain still after a cutout to be considered trapped.	5000
stuck_time_long	After the stuck time this is the interval between horn alerts.	10000
wifi_on_click_count	The number of times the trigger needs to be pressed after start-up to enter Wi-Fi mode.	10
wifi_on_click_time	The timeout after start-up before OverWatch stops listening to the trigger click method of turning on the Wi-Fi	10000
wifi_on_gesture_count	The number of times to cover and uncover the sensor to enter Wi-Fi mode.	3
wifi_on_gesture_time	The timeout before OverWatch stops waiting for the next part of the gesture in milliseconds	3000

Setting Name	Description	Value
wifi_on_gesture_initial_time	The timeout after start-up before OverWatch stops waiting for start of the gesture in milliseconds	10000
driving_state_timeout	Mode selection switch timeout	7000

Polarity and Input Style

The table below describes each setting.

Setting Name	Description	Value
joystick_drive_forward	Direction of joystick to move EWP forward	forward
joystick_elevate_upward	Direction of joystick to move EWP upward	forward
joystick_neutral_move	Direction of joystick that requires monitoring when in neutral	forward
elevate_polarity	Direction of signal logic	low
drive_polarity	Direction of signal logic	low
trigger_polarity	Direction of signal logic	low
joystick_polarity	Direction of signal logic	low
neutral_safe	Monitor when no drive mode set	yes
driving_state_input	Direct, timer based or separate joysticks	direct

Settings specific to tilt alarm

OverWatch detects the tilt alarm by sensing that both elevate and drive are flashing in unison. In this situation, the OverWatch releases any cutout to permit the Swift control box to control the operability of the EWP.

Setting Name	Description	Value
passthru_charge_time	This setting is the time in milliseconds that elevate, and drive need to be active together before tilt alarm is detected.	10
passthru_discharge_time	This setting is the minimum time in milliseconds that elevate, and drive need to remain off before tilt alarm is no longer detected.	1000

AS002212 Plug and Play Harness Drawing