I N S T A L L

M A N U A L

EQSS Model6253 – OverWatch™ JLG xxxLRT

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

DOCUMENT ABSTRACT:
This Installation Manual details the manufacturer's installation instructions for installing the Model6253 OverWatch™ on a JLG xxxLRT.

PRODUCT NAME:
Model6253 OverWatch™ Operator Detection System

REFERENCE DOCUMENTS:
DO001195 Model6253 OverWatch - User Manual

CURRENT DOCUMENT REVISION:
1.3

REVISION INFORMATION:

- 1.1 Initial Document Creation for installation on a JLG xxxLRT.
- 1.2 Update with new photo for bracket location.
- 1.3 Update on plug and play loom and inclusion of AS002286 harness drawing.

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in this publication regarding this device's applications and the like, is provided only for your convenience and may be superseded by updates.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.

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.

N23041

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	Metric sockets or spanners
8	Needle nose pliers
9	Screw drivers
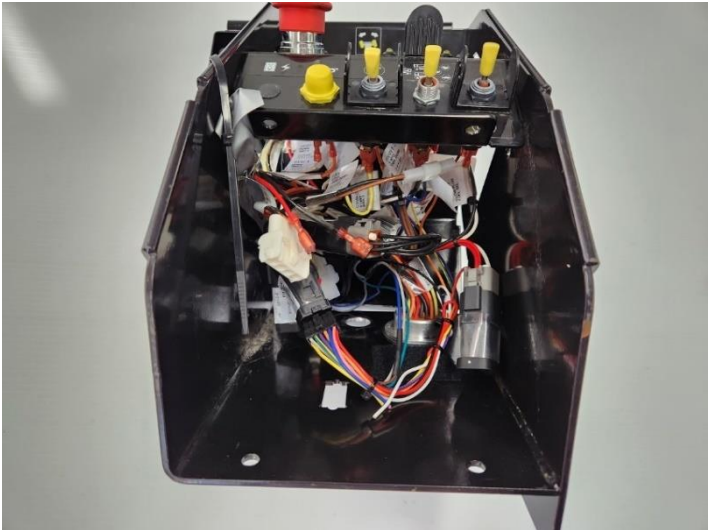
Installation Time

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

Task	Estimated Time (Minutes)
Open the operator control box	1
Drilling of all mounting holes for the various components	13
Mechanical assembly	10
Electrical assembly	10
Post installation system tests	10
Close the operator control box	1
Total	**45**

Installation Instructions

Operator Sensor

Step	Description	Diagram
1.	Separate the joystick from the outer metal enclosure.	
2.	Mount the operator sensor to the bracket by using M4 washers and security bolts as shown in the image. ME001813 – Sensor Bracket FA001417 – M4 x 12mm FA001235 – M4 Washers	

3.	Drill two **5mm** holes into the metal housing as shown in the location. These holes are required to mount the operator sensor bracket. **Hole 1# 16mm** distance from the left vertical edge to the centre of the hole. The distance between the two holes is **25mm**. **Note:** Use sensor bracket plate (ME001813) as a drilling template.	
4.	Mount the module in the located position using M4 washers, nuts, and security bolts. FA001188 – M4 X 16mm socket head screw FA001223 – M4 nuts FA001235 – M4 washers	
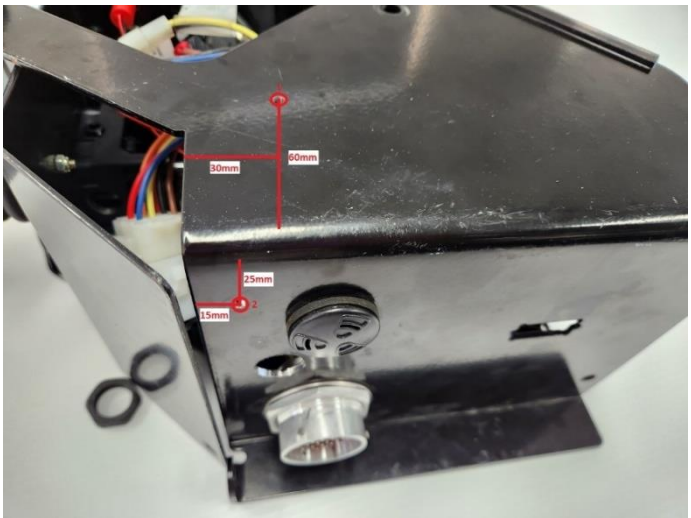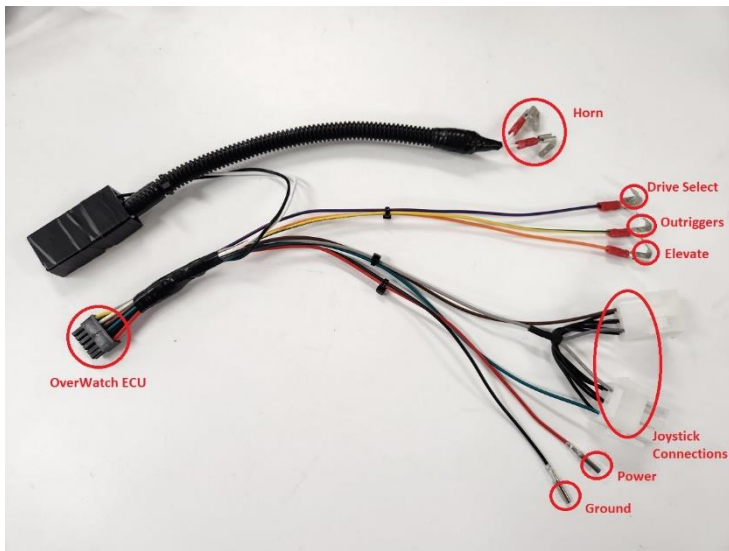
5.	Drill two **5mm** holes as shown in the location for the P-clip to secure the operator sensor cable to the metal enclosure. **Hole 1:** Horizontal distance **30mm** Vertical distance **60mm** **Hole 2:** Horizontal distance **15mm** Vertical distance **25mm**	
6.	Drill a **20mm** hole to run the operator sensor M20 gland into the metal enclosure. The position of the hole is detailed as in the image. Horizontal distance **27mm** Vertical distance **72mm**	
7.	Install the cable gland and route the operator sensor cable as shown in the image. Secure the cable to the metal enclosure by using the P-clips, M4 screws, washers, and nuts.	

Control Module

Step	Description	Diagram
1.	Wiring connections are made by the Plug and Play loom AS002286.	
2.	The connectors listed on the table on the right will need to be connected to the machine control box. Each connection will be further described in following steps.	(table below)

EQSS Wiring Harness Connection	EQSS Harness Cable Colour	JLG Cable Label	JLG Cable Colour
12v power	Red	PWR0 SPLICE Pin 1	
Ground	Black	GND1 SPLICE Pin1	
Joystick	Mixed		
Outriggers	Yellow/Green	SW5-4 AUTOLEVEL	Orange
Horn	White	SW2-1 HORN SW2-2 HORN	White Orange
Drive Select	Purple	SW5-6 DRIVE	Orange
Elevate Select	Orange	SW5-1 LIFT	Blue

3.	**Joystick Connections:** Disconnect the 9-pins connector from the joystick and install the OverWatch joystick connectors in between as shown in the image.	
4.	**Horn Connection:** At the back of the horn push button, disconnect white and orange cables **SW2-1 HORN** and **SW2-2 HORN.** Install two white wires from the OverWatch harness in between as shown in the image.	
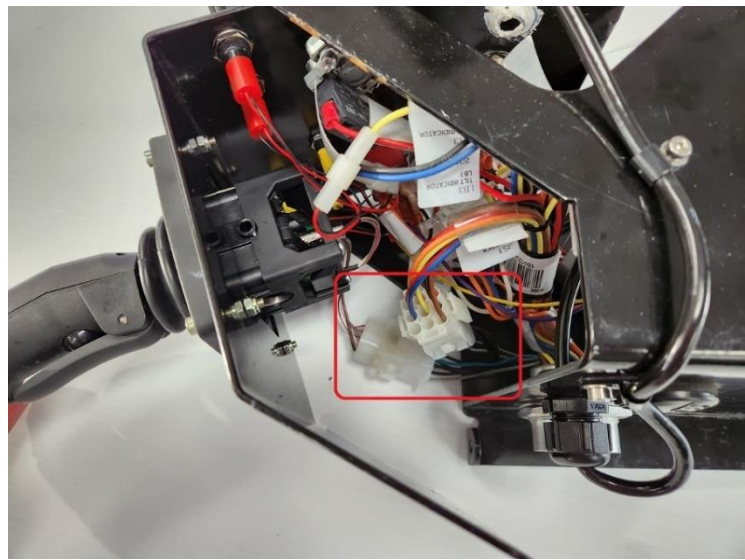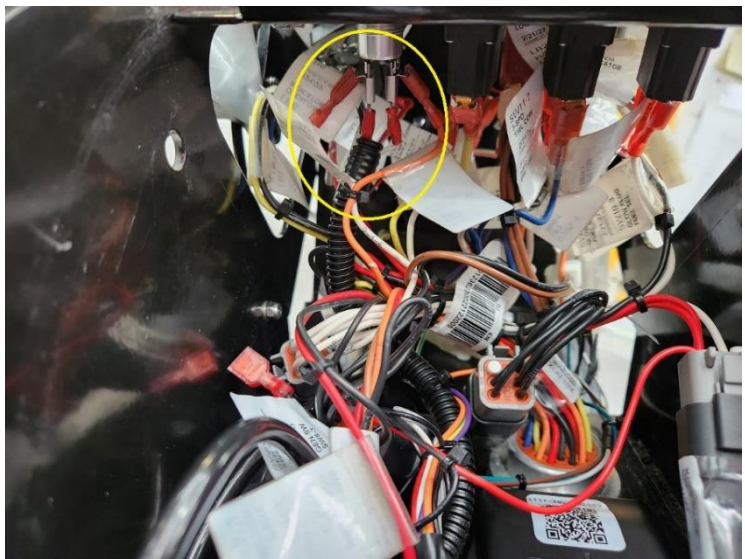
5.	**Drive Select Connection:** At the back of the Drive/Elevate switch disconnect the orange cable **SW5-6 DRIVE** and install the purple drive select cable in between as shown in the image.	
6.	**Elevate Connection:** Disconnect the blue cable **SW5-1 LIFT** and install the orange Elevate Select cable in between as shown in the image.	
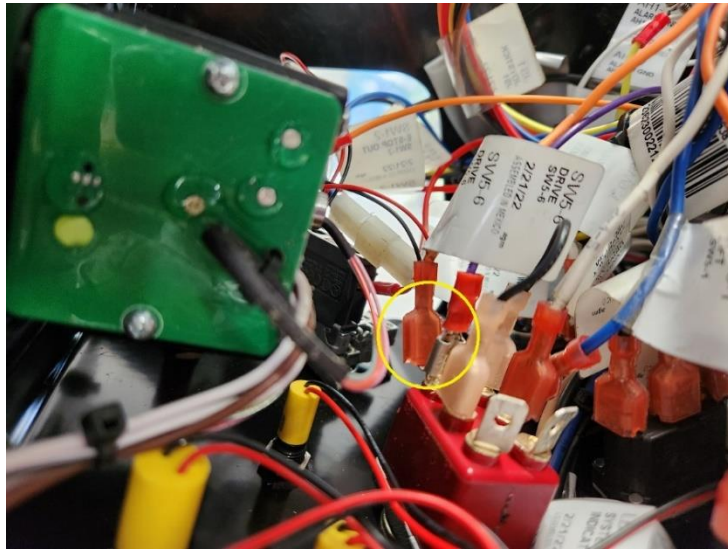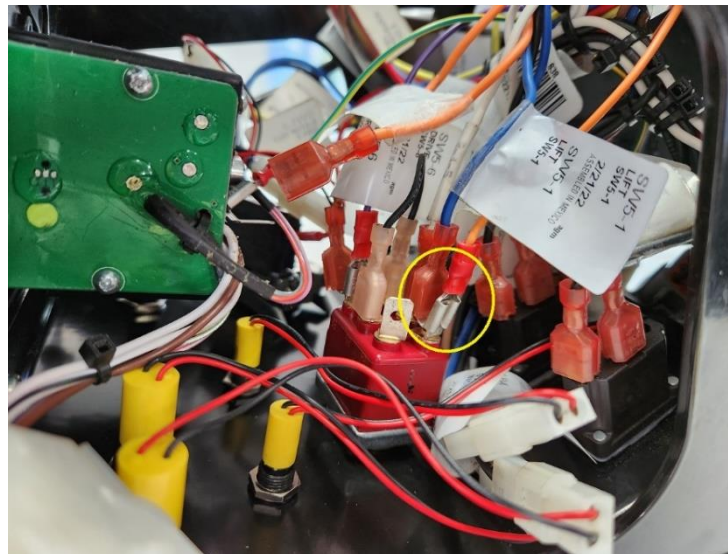
7.	**Outrigger Connection:** Disconnect the orange cable **SW5-4 AUTOLEVEL** and install the yellow/ green wire in between as shown in the image.	
8.	**Power Connection:** Install the power (Red) wire from the OverWatch harness into **PIN1** on the connector with ID **PWR0 SPLICE**.	
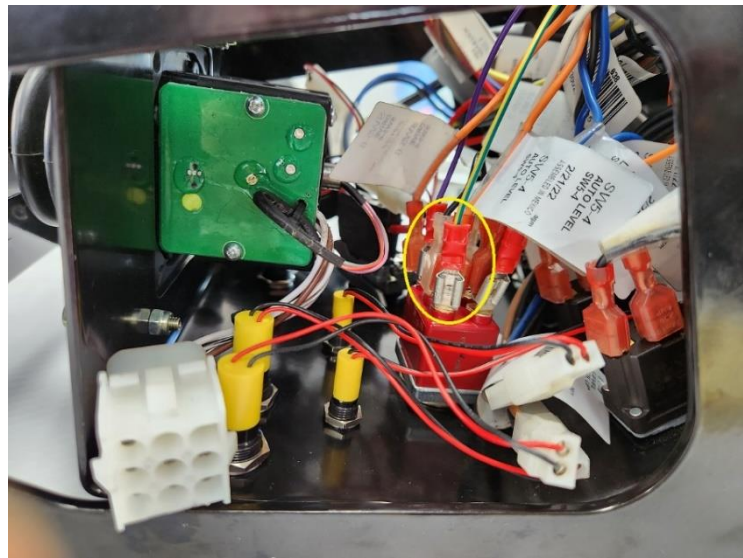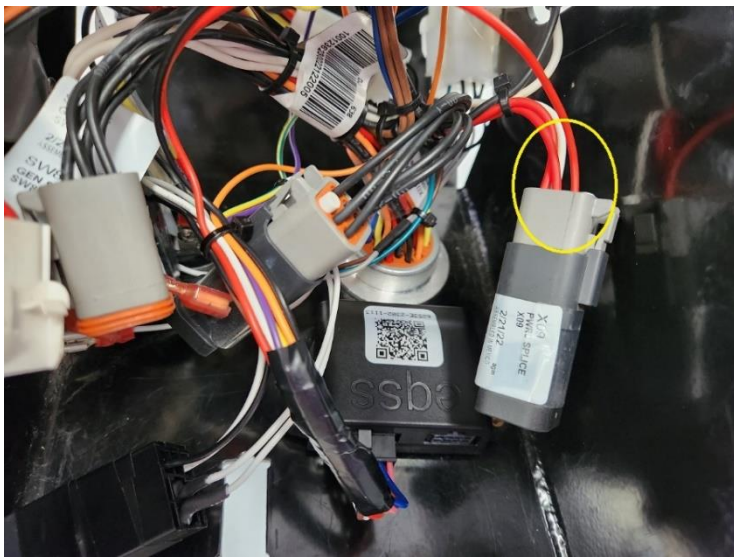
9.	**Ground Connection:** Install the ground (Black) wire from the OverWatch harness into **PIN1** on the connector with ID **GND1 SPLICE**.	
10.	Mount the Overwatch ECU inside the control box by using the supplied Velcro. Run the operator sensor cable through the predrilled 20mm hole and secure the cable gland. Connect the 8-pin connector from the operator sensor and the 12-pin connector from the machine connection harness, into the ECU. Make sure to tie the operator sensor cable and relay together by using a cable tie to avoid any damages during the closure.	 **Note:** To avoid any start up issues please make sure not to tie horn wires together with elevate, drive and outrigger wires.
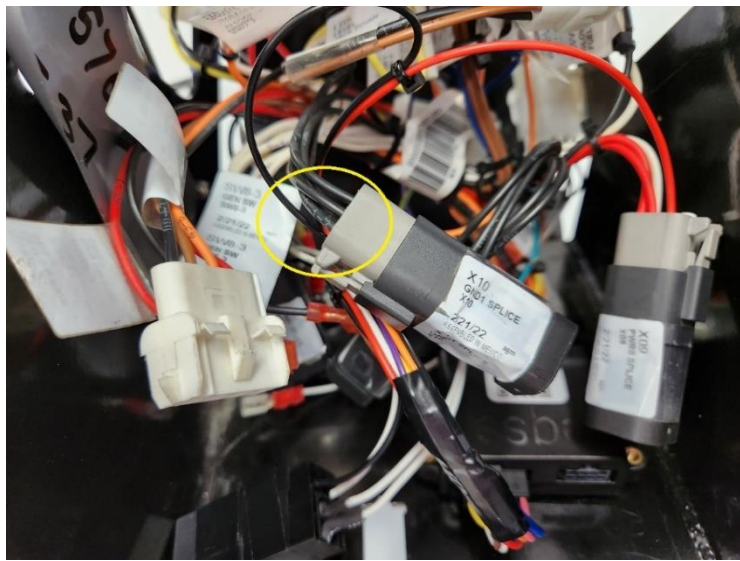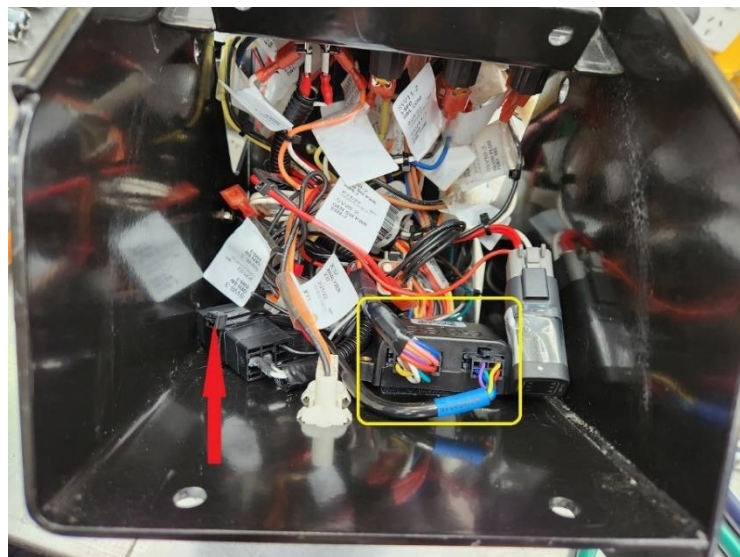
11.	Re-assemble the joystick control box and mount to the metal enclosure.	

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.
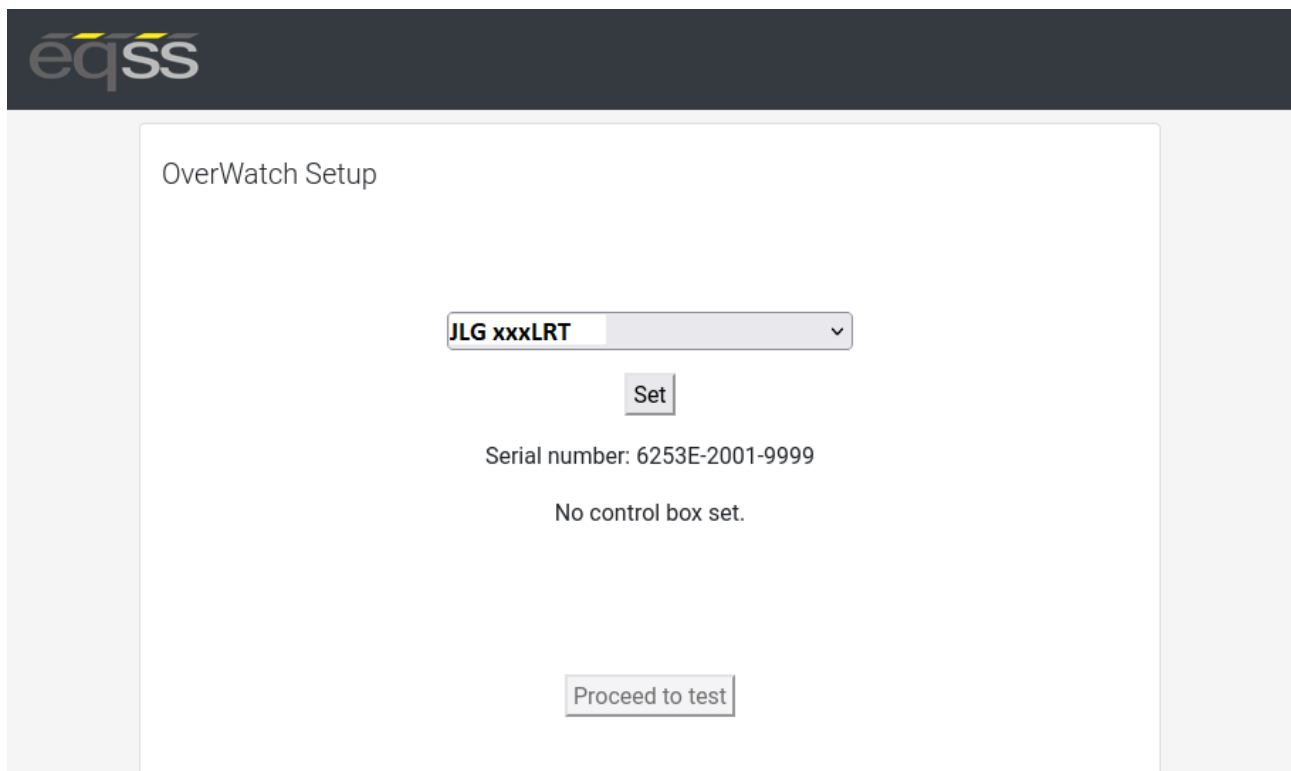
1. Power down the platform control box with the ESTOP.

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.
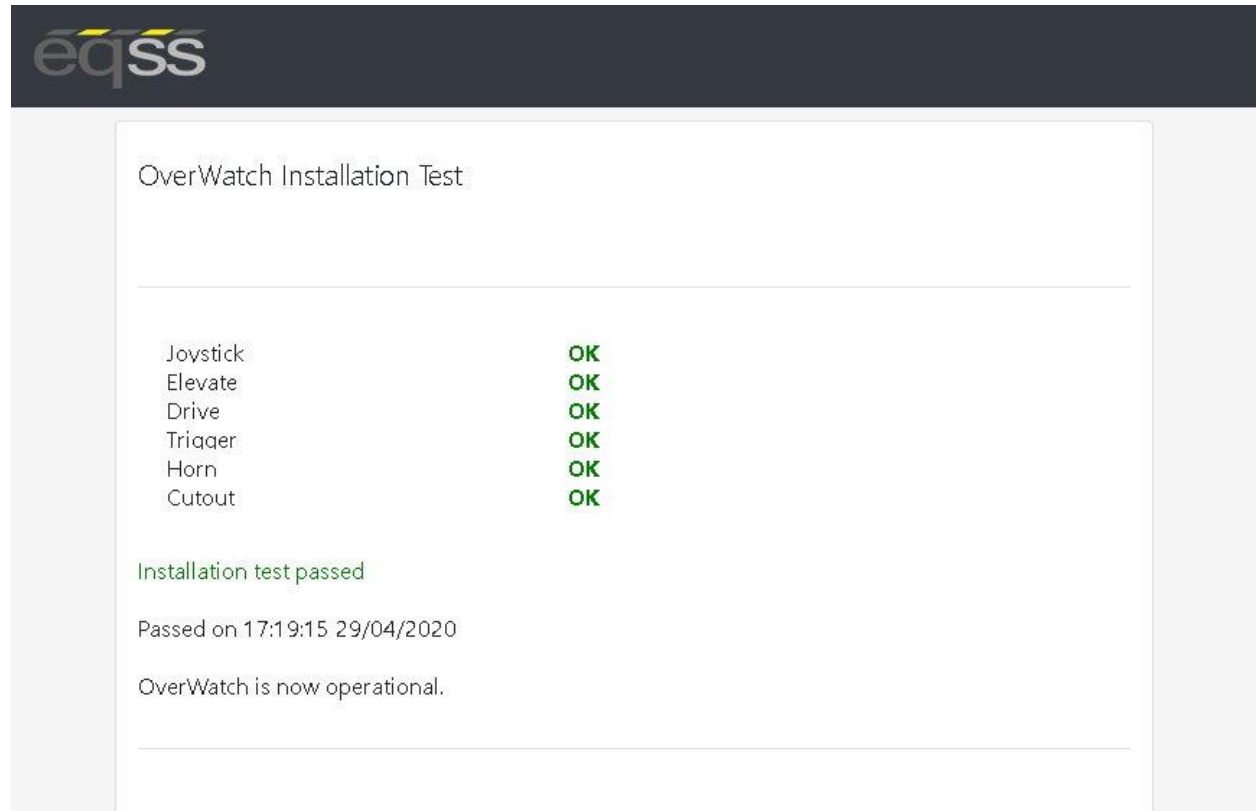
Installation Test

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.

Details

Name	John Smith
Email	john.smith@company.com
Phone	+61 9 9999 9999
EQSS Overwatch Serial Number	6253E-2004-0000
Scissor Lift Model	**JLG xxxLRT**
Hash	50244

OEM Special Configuration

Overview

When installing the OverWatch™ on a new model there are number of parameters which need to be adjusted or fine-tuned to suit a specific EWP model. The instructions below should be performed by the OEM of the EWP. Once the OverWatch™ settings have been set and tested, they will then be supplied to EQSS to be used for other installations.

Wi-Fi Connection & OEM Web Page Access

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

1. Press the emergency stop button to power off the EWP.

2. Cover the sensor with your hand.

3. While the sensor is still covered release the emergency stop button to power on the EWP

4. Leave your head over the sensor until it says, "Wi-Fi On".

5. On your Wi-Fi enabled device (laptop, tablet, smartphone, etc), show the available wireless networks.

6. Select the wireless network starts with "overwatch" to connect to the OverWatch™

7. When prompted, enter the password "12345678".

8. Open your preferred web browser (Chrome, Firefox, Safari, Internet Explorer)

9. Enter the following into the address bar http://192.168.4.1/oem.html to open the OverWatch™ OEM page.

10. Follow the instructions in OEM Password below to obtain the OEM login password.

OEM Password

The OEM settings are password protected. The OEM password is generated from the EQSS website. The EQSS website requires a login username and password. If you are an OEM and do not have a username and password, contact EQSS to register. Follow the instructions below to obtain an OEM 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 OEM

3. Enter your username and password.

4. Enter your name and contact details along with the serial number of the OverWatch™ then click Generate Hash

5. Enter the 5-digit hash password into the OEM password field.

Settings

The OEM Settings page allows modification of all the OverWatch™ parameters. See the sections below for details on each setting.

Setting Name	Description	Default
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.	90
max_safe_displacement	This is the maximum permitted distance in cm the operator may be away from the calibration position in drive mode.	40
max_safe_velocity_elevate	This is the velocity threshold for the cutout in cm/s. in elevate mode.	70
max_safe_displacement_elevate	This is the maximum permitted distance in cm the operator may be away from the calibration position in elevate mode.	40
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.	-0.6
fwdveladj	The coefficient to apply to the velocity when the displacement is toward the sensor.	-1.0
zone_obstruction	If the lidar sensor reading is below this, the lidar is considered to be obstructed (with paint or thick coat of dust) and the system is cutout until the obstruction is cleared.	5
zone_minimum	Any lidar reading below this will trigger a cutout with the message: "Operator Zone"	20
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 deadman 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 above this indicates the EWP is in elevate mode.	2200
adc_drive_threshold	For the drive ADC input, a reading above this indicates the EWP is in drive mode.	2200

Setting Name	Description	Default
adc_deadman_threshold	For the deadman ADC input, a reading above this indicates the deadman switch is pressed.	2000
adc_joystick_fwd_threshold	For the joystick ADC input, a reading above this indicates the joystick has been pushed forward.	1500
adc_joystick_bwd_threshold	For the joystick ADC input, a reading below this indicates the joystick has been pulled backward.	1400
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 needs to occur in order 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
deadman_fault_timeout	The amount of time in milliseconds a discrepancy between the deadman and the deadman 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
stuck_time	Period, after cutout to determine if the operator is not moving and is trapped	5000
time_before_welcome	Time after power on before welcome audio is played	250
stuck_time_long	After the stuck time this is the interval between horn alerts	10000
stuck_displacement	How much movement is considered to be non-operator movement / trapped	20
wifi_on_clicks_count	The number of times the deadman trigger is pressed to enter Wi-Fi mode.	10
wifi_on_clicks_time	The amount of time in milliseconds after power on to enter Wi-Fi mode.	10000
driving_state_timeout	Mode selection switch timeout	7000

REV 1.3	**31/10/2023**	**Model6253 OverWatch™ Installation Manual**	**Document # DO001633**

EQUIPMENT SAFETY SYSTEMS
75 Naxos Way, Keysborough 3173 Victoria Australia
P: +61 3 8770 6555   E: support@eqss.com.au

**JLG xxxLRT
Installation Manual**

Polarity and Input Style

The table below describes each setting.

Setting Name	Description	Default
joystick_drive_forward	Direction of joystick to move machine forward	forward
joystick_elevate_upward	Direction of joystick to move machine upwards	forward
joystick_neutral_move	Which direction requires monitoring when in neutral	forward
elevate_polarity	Direction of signal logic	low
drive_polarity	Direction of signal logic	low
deadman_polarity	Direction of signal logic	high
joystick_polarity	Direction of signal logic	high
driving_state_input	Direct or timer based	direct
neutral_safe	Safe or not safe	yes

Bypass

Setting Name	Description	
overwatch_state	Redundant	active
test_deadman_state	Test channel enabled for primary cutout	bypassed

Date and Time

Setting Name	Description
Date	Enter the current date to be saved into the OverWatch™
Time	Enter the current time to be saved into the OverWatch™
Set date and time	Press to store the displayed date and time into the OverWatch™
Read OverWatch date and time	Press to display the current date and time stored in the OverWatch™

EQUIPMENT SAFETY SYSTEMS
75 Naxos Way, Keysborough 3173 Victoria Australia
P: +61 3 8770 6555   E: support@eqss.com.au

JLG xxxLRT Installation Manual

| REV 1.3 | 31/10/2023 | Model6253 OverWatch™ Installation Manual | Document # DO001633 |

AS002286 Plug and Play Harness Drawing

Bill of Materials

Id	Description	Part Number	Quantity
1	Molex, Microfit-3.0, 12 Way, Female	CN001316	1
2	Automotive Relay Socket	CN001335	1
3	MATE-N-LOK, 9 Way, 3 Row, Male, 1-480706-0	CN001317	1
4	MATE-N-LOK, 9 Way, 3 Row, Female, 1-480707-0	CN001340	1
5	Male/Female 2.8mm Fork Terminal	CN001323	5
6	1062-16-0122 Deutsch DT Socket	CN001082	2
7	Micro-Fit 3.0, Female Terminals, 043030001	CN001331	9
8	Relay Socket Terminal, 4.8mm	CN001336	2
9	MATE-N-LOK, PIN	CN001328	7
10	MATE-N-LOK, SOCKET	CN001327	7
11	Relay Socket Terminal, 6.3mm	CN001359	2
	Corrugated Split Snake Tube I/D: 7.2mm OD: 10mm	PI001006	250 mm
13	SPDT 30A Horn Relay 12V	SW001081	1
14	HC0049, 20AWG, Brown	CB001077	320 mm
15	HC0049, 20AWG, Yellow	CB001056	50 mm
16	HC0049, 20AWG, Red	CB001054	300 mm
17	HC0049, 20AWG, Orange	CB001051	300 mm
18	HC0049, 20AWG, Green	CB001050	320 mm
19	HC0049, 20AWG, Black	CB001048	1000 mm
20	HC0049, 20AWG, White	CB001055	770 mm
21	HC0049, 20AWG, Violet	CB001057	300 mm
22	HC0049, 20AWG, Yellow/Green	CB001100	300 mm
23	HC0049, 20AWG, Grey	CB001053	390 mm
24	HC0049, 20AWG, Blue	CB001049	50 mm
25	HC0049, 20AWG, Pink	CB001052	50 mm

Final Assembly Photo: https://drive.google.com/file/d/1W8jvLmkeP_EqOGmCUaBJlwTQFiB1syye/view

Revisions

Rev.	Date	Author	Description
1.0	20/4/2023	Bhavani Kacharapu	Initial Design
1.1	31/10/2023	Bhavani Kacharapu	Updated description for xxxLRT

Coverings

Id	Assembly
[12]	

From	To	Conductor	Color	Notes
C8_STF_H_A.Housing	C4_RLY.30	W7.White		Horn Side-A
C9_STF_H_B.Housing	C4_RLY.87	W23.White		Horn Side-B

From	To	Conductor	Color	Notes
C10_DT_GND.Housing	S1_GND	W5.Black		GND
C11_DT_VCC.Housing	C1_OW.1	W9.Red		VCC

From	To	Conductor	Color	Notes
C4_RLY.30	C8_STF_H_A.Housing	W7.White		Horn Side-A
C4_RLY.85	C1OW.5	W8.White		Horn
C4_RLY.86	S1_GND	W6.Black		Relay GND
C4_RLY.87	C9_STF_H_B.Housing	W23.White		Horn Side-B

From	To	Conductor	Color	Notes
S1_GND	C1OW.2	W1.Black		GND
S1_GND	C4_RLY.86	W6.Black		Relay GND
S1_GND	C10_DT_GND.Housing	W5.Black		GND

From	To	Conductor	Color	Notes
C1OW.1	C11_DT_VCC.Housing	W9.Red		VCC
C1OW.2	S1_GND	W1.Black		GND
C1OW.3	C2_JM.2	W4.Green		Trigger Input
C1OW.4	C3_JF.2	W2.Brown		Trigger Output
C1OW.5	C4_RLY.85	W8.White		Horn
C1OW.6	S2_STR_END	W10.Yellow		Strobe
C1OW.7	S4_TL_END	W22.Pink		Test Input
C1OW.8	S5_TO_END	W15.Blue		Test Output
C1OW.9	C5_STF_ELE.Housing	W3.Orange		Elevate
C1OW.10	C6_STF_DRV.Housing	W11.Violet		Drive
C1OW.11	C7_STF_ORIG.Housing	W12.Yellow-Green		Outriggers
C1OW.12	S3_JOY	W13.Gray		Joystick Signal

From	To	Conductor	Color	Notes
C5_STF_ELE.Housing	C1_OW.9	W3.Orange		Link
C6_STF_DRV.Housing	C1_OW.10	W11.Violet		Link
C7_STF_ORIG.Housing	C1_OW.11	W12.Yellow-Green		Link

From	To	Conductor	Color	Notes
C2_JM.1	C3_JF.1	W17.Black		Link
C2_JM.2	C1_OW.3	W4.Green		Trigger Input
C2_JM.4	C3_JF.5	W19.Black		Link
C2_JM.5	C3_JF.5	W20.Black		Link
C2_JM.7	C3_JF.7	W16.Black		Link
C2_JM.8	C3_JF.8	W18.Black		Link
C2_JM.9	S3_JOY	W14.Gray		Joystick Male

From	To	Conductor	Color	Notes
C3_JF.1	C2_JM.1	W17.Black		Link
C3_JF.2	C1_OW.4	W2.Brown		Trigger Output
C3_JF.4	C2_JM.4	W19.Black		Link
C3_JF.5	C2_JM.5	W20.Black		Link
C3_JF.7	C2_JM.7	W16.Black		Link
C3_JF.8	C2_JM.8	W18.Black		Link
C3_JF.9	S3_JOY	W21.Gray		Joystick Female

From	To	Conductor	Color	Notes
S3_JOY	C1_OW.12	W13.Gray		Joystick Signal
S3_JOY	C2_JM.9	W14.Gray		Joystick Male
S3_JOY	C3_JF.9	W21.Gray		Joystick Female

From	To	Conductor	Color	Notes
S2_STR_END	C1_OW.6	W10.Yellow		Strobe
S4_TL_END	C1_OW.7	W22.Pink		Test Input
S5_TO_END	C1_OW.8	W15.Blue		Test Output

	Conductor	Color	Notes
	W9.Red		VCC
	W1.Black		GND
	W4.Green		Trigger Input
	W2.Brown		Trigger Output
	W8.White		Horn
	W10.Yellow		Strobe
	W22.Pink		Test Input
	W15.Blue		Test Output
	W3.Orange		Elevate
	W11.Violet		Drive
	W12.Yellow-Green		Outriggers
	W13.Gray		Joystick Signal

Notes

1. Small Cable Tie Here
2. Seal All Splice Joins Using Glue Heatshrink
3. Slotted Snake Tube - OD: 240mm - PI001006
4. Tape Snake Tube End
5. Electrical Tape over splice points

	Name	Date
Drawn By	B.Kacharapu	20/4/2023
Eng Approved	K.Grogan	20/4/2023
Mfg Approved	K.Grogan	20/4/2023
QA	A.Donegan	10/5/2023

This document contains confidential and proprietary information that cannot be reproduced or divulged, in whole or in part, without written authorization.

Title: Wire Harness
Description: JLG - RT xx94 and xxxLRT
Part Number: AS002286
Revision: 1.0