



Service Information System

Previous Screen

Welcome: hopedowns

◀ Product: NO EQUIPMENT SELECTED
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 Configuration: NO EQUIPMENT SELECTED

Special Instruction

Procedure for Installing and Configuring Driver Safety System (DSS) v4.0 {7000}

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Procedure for Installing and Configuring Driver Safety System (DSS) v4.0 {7000}

SMCS - 7000

Articulated Truck

All

Machine Control and Guidance Products

CATSAFETY (S/N: SSX1-UP)

Mining Truck

ALL Large Mining Trucks

Off-Highway Truck/Tractor

All

Underground Articulated Truck

All

Introduction

Table 1

Revision History	
Revision	Summary of Changes
07	Added Group Effectivity
06	Modified text

Do not perform any procedure in this Special Instruction until you have read the information and you understand the information.

This Special Instruction outlines necessary procedure for installing and configuring Driver Safety System (DSS) In-Vehicle System (IVS) v4.0.

Refer to Operation and Maintenance Manual, "Driver Safety System" M0071030 for further information.

Important Safety Information

Do not perform any procedure in this Special Instruction until you have read this Special Instruction and you understand this information. Use only proper tools and observe all precautions that pertain to the use of those tools. Failure to follow these procedures can result in personal injury. The following procedures also should be observed.

Work safely. Most accidents that involve product operation, maintenance, and repair are caused by failure to observe basic safety rules or precautions. An accident can often be avoided by recognizing potentially hazardous situations before an accident occurs.

A person must be alert to potential hazards. This person should also have the necessary training, skills, and tools to perform these functions properly.

Therefore, the warnings in this publication and the warnings that are on the product are not all inclusive. Ensure that any tool, procedure, work method, or operating technique you use that is not recommended by Cat[®] is safe.

Ensure that the product will not be damaged or the product will not be made unsafe by the operation, lubrication, maintenance, or repair procedures used.

 **WARNING**

Personal injury or death can result from improper assembly procedures.

Do not attempt any assembly until you have read and understand the assembly instructions.

 **WARNING**

Accidental engine starting can cause injury or death to personnel working on the equipment.

To avoid accidental engine starting, disconnect the battery cable from the negative (–) battery terminal. Completely tape all metal surfaces of the disconnected battery cable end in order to prevent contact with other metal surfaces which could activate the engine electrical system.

Place a Do Not Operate tag at the Start/Stop switch location to inform personnel that the equipment is being worked on.

 **WARNING**

Failure to use an approved access system during installation and removal of components could result in slipping and falling which could result in personal injury or death. To prevent injury or death, use an approved access system to reach the appropriate mounting locations of the components. Do not climb on the machine. Maintain three-points of contact and/or use a safety harness.

 **DANGER**

Working with electrical circuits is hazardous. Bodily contact with electrical potential will cause personal injury or death. Ensure that personnel are trained in proper operating procedures in order to ensure safe operation.

The standard and optional parts available for the Driver Safety System (DSS) In-Vehicle System (IVS) are listed below.

Parts List

The standard and optional parts available for the Driver Safety System (DSS) In-Vehicle System (IVS) are listed below.

Table 2

Required Parts	
504-3340 Field Installation Gp	
500-8877	Camera
500-8878	Light
500-8879	Cable
504-3344	Bracket
3B-4504	Lockwasher
7G-7053	Grommet
8T-4138	Bolt
148-3626	Flat Head Screw
155-4098	Screw
344-5673	Nut
499-6728 Field Installation Gp	
513-5976	Electric Motor
500-8872	Cable
3B-4504	Lockwasher
3B-4505	Lockwasher
5P-9085	Clip
8T-4137	Bolt
9N-2061	Clip
9X-2027	Washer
032-2580	Tapping Screw
105-3487	Bolt
136-4184	Bolt
238-0251	Screw
344-5673	Nut
344-5674	Nut
344-5675	Nut
513-5961 Field Installation Gp	
6V-8225	Nut

8T-0275	Bolt
9X-8267	Washer
504-3339	Cable
513-5962	Module
495-3940 Installation Kit	
3B-4504	Lockwasher
6V-8225	Nut
6V-8490	Bolt
7X-3319	Hex Socket Screw
8T-2659	Locknut
510-1659	Modem As
508-9372 Field Installation Gp	
459-0786	Communication Electronic Control Module
525-9182	Control Harness As
8C-5607	Isolation Mount
8C-5608	Spacer
8C-8451	Bolt
9X-2038	Washer

Standard Parts

The standard parts are essential for the **DSS** operation and are supplied with every **DSS**.

550-3777 Control



Illustration 1

g06174620

550-3777 Control



Illustration 2
SIM Card Holder

g06188153

The control is a small form factor industrial PC with IP67 connectors and LED indicators.

The features of **550-3777** Control are listed below:

- Rugged industrial front panel connectors
- Power up and shut down controlled by ignition
- Solid-state design, no moving parts, silent operation
- Transient voltage and EMC resistant
- Vibration tested
- Wide supply voltage: 12V-30V
- Interfaces:
- 1 Power port
- 1 10/100/1000 MB LAN on front panel
- 2 USB 2.0 ports on the front panel
- 1 Speaker port
- 1 Serial port
- 2 GPIO ports with input, output, +12V, and +5V power output
- 1 × Vibration alert port
- 1 × WiFi antenna port
- 1 × GSM antenna port
- 1 × SIM Card Holder

Specs for the processing module are as follows:

- 1.91 GHz Intel Atom E3845 quad core processor
- 16GB of RAM
- Built-in GSM modem
- Built-in WiFi

Note: Use a T10 Security Torx bit to take out the SIM card access cover.

Note: When taking out a SIM card, slide the holder while pushing down to unlock, then lift. When inserting a SIM card, drop the holder and pushdown while sliding the holder to lock.

500-8882 Power Cable



Illustration 3

g06005185

500-8882 Power Cable

The power cable (AWG-13) for the main unit is a three line cable containing the battery line (red), ground line (black), and ignition line (yellow).

Camera



Illustration 4

g06180427

500-8877 Camera v4.0

The **DSS** is equipped with a small digital high dynamic range CMOS camera that has a USB interface. The **DSS** runs at a frame rate of 60Hz, and provides 640×480 gray scale progressive scan images. The camera comes with:

- 6 mm (0.24 inch) micro lens (mounted)
- (2) Infra Red (IR) lights
- IR-pass filter (mounted)
- 30 cm (11.81 inch) Molex connector cable attached to the camera
- 5 m (16.4 ft) long IP67 USB cable split Molex connector and GPIO connector
- Built in buzzer
- Built in test button (hold for 2 seconds until audio from speaker initiates "System Testing")

Note: Use a T10 security Torx bit for camera adjustment on bracket.

Infra Red (IR) Lights



Illustration 5

g06174671

500-8878 Light

Infra-Red (IR) lights provide even illumination of the face in dark or low light conditions. The wavelength of the light emitted is in the infrared range. Only a faint red glow inside the device is visible to the human eye. The emission cone of the light is ± 60 degrees which allows for even illumination across most seating positions.

Note: Twist both connectors on the camera and lights of a connection simultaneously when connecting or disconnecting the lights to the camera.

Note: When disconnecting the camera Molex connector, press the black button while gently separating the connectors to prevent breaking the lock tab inside the connector.

Note: A T6 Security Torx bit is required to remove cover of the light.

508-9371 Field Installation Gp Wifi/Bluetooth Antenna



Illustration 6

g06174672

508-9371 Field Installation Gp

The Wifi/Bluetooth Antenna is a high efficiency, high gain adhesive mount dual band wireless antenna, and IP67 waterproof. The high-quality low profile covert housing can be attached on glass or plastic. The Wifi/Bluetooth Antenna is designed for applications that require omnidirectional gain across both bands to ensure wide coverage area and constant reception and transmission for Wi-Fi and Bluetooth applications.

GPS Module



Illustration 7
513-5962 Module

g03871173



Illustration 8
500-8889 Antenna

g06174679

The GSM/WiFi Antenna is a heavy-duty, fully IP67 waterproof antenna. The GSM/WiFi combines a 2 in 1 Cellular (2G and 3G) and Wi-Fi in a compact format but yet durable even in extreme environments.

The GPS module provides information about vehicle speed and position. The system is typically configured to operate and generate alerts/events above a set speed threshold. This threshold is important when installing IVS (In Vehicle System) in commercial vehicles as operators often keep the engine idling while waiting on goods loading/unloading or while resting.

Note: When using the system in an office or simulator, the GPS module may not produce valid data. Ensure that you have enabled logging and alarms in the absence of valid GPS data by selecting "Enable Demo Mode".

500-8888 Field Installation Gp



Illustration 9
500-8886 Speaker

g06271083

The **500-8888** Field Installation Gp consist of a speaker and cable straps used to secure the wiring.

The speaker generates audio warnings in the case of fatigue or distraction events. To suppress noises from mobile phones and other electronic devices close to the speaker, the control uses differential sound transmission on the left and the right channel. The sound files that come with the software are modified in a way that the left channel of the stereo is the inversion of the right channel.

The IVS control is equipped with a differential amplifier. This inversion allows for negating of all noise induced by the electronics, the Wi-Fi interface, or external transmitters such as mobile phones, and provides clear and loud sound.

513-5976 Electric Motor (VIBRATION)



Illustration 10
513-5976 Electric Motor (VIBRATION)

g03871178

As noise in some vehicles can be excessive, the **513-5976** Electric Motor (VIBRATION) is used to vibrate the seat providing physical feedback to the operator.

510-4059 Bracket Preferred Vibration Motor Mounting Bracket

Note: Bracket is not used in all applications, will not be used when **508-9370** Bracket is used.



Illustration 11

g06286444

Preferred motor vibration mounting bracket and is the standard installation which is mounted on the slide plate of the standard seat.

508-9370 Bracket (Optional) Vibration Motor Mounting Bracket

Note: Bracket is not used in all applications, will not be used when **510-4059** Bracket is used.



Illustration 12

g06286440

90 degree vibration motor mounting bracket used for non-standard installation and mounted using the same mounting bolts as the arm rest.

500-8883 Plate and 500-8884 Bracket



Illustration 13

g03871187

500-8883 Plate, and 500-8884 Bracket

The **500-8883** Plate for the IVS control can be used in various vehicles. The IVS control is mounted vertically on the rear parcel shelf. This position provides the best air flow and access for maintenance.

500-8884 Bracket is used to attach the plate to the floor of the cab.

Note: The plate and bracket are pre-assembled for v4.0.

500-8885 Cover



Illustration 14
500-8885 Cover

g03871199

The **500-8885** Cover attaches directly to the IVS, and is designed to protect the cables and connections from physical damage as well as a deterrent to tampering with the equipment.

Optional Parts

Note: Optional parts are not included with the **DSS** kit.

This optional parts may help with installing, securing, or providing extra functionality to the system. These parts will need to be ordered separately.

495-3940 Modem



Illustration 15
495-3940 Modem Code Division Multiple Access (CDMA)

The modem is used when there is no Wi-Fi modem or reliable Wi-Fi signal available. For example, vehicles operating on the open road. The modem allows the IVS to upload event and diagnostic data to the "DSSi" servers and download software and configuration updates via the cellular network.

Note: The customer will be required to supply a data mini-SIM card on a minimum of 1GB a month plan.

Connector Panel

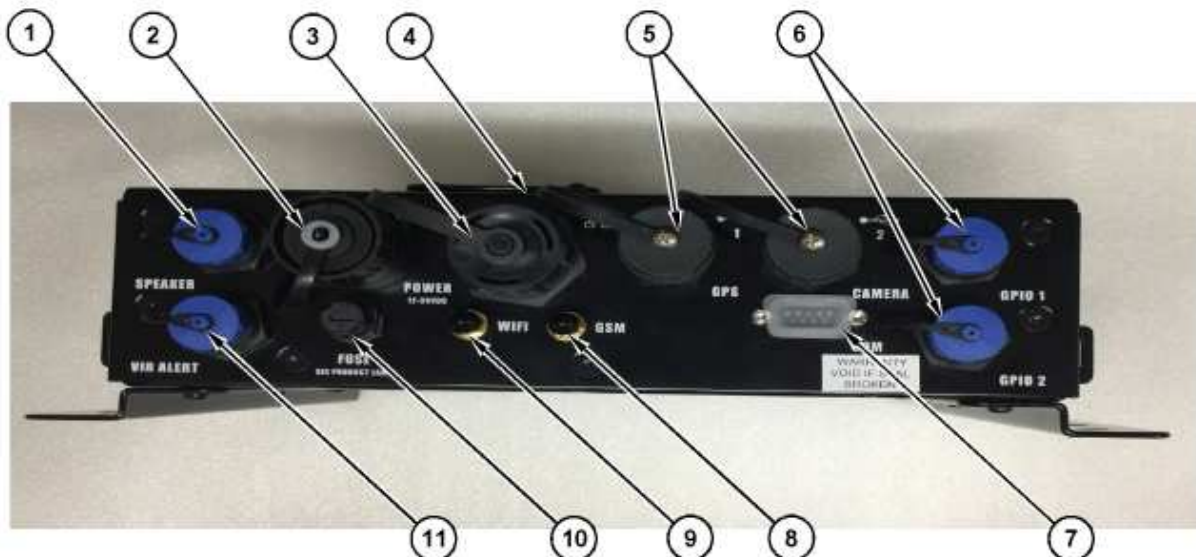


Illustration 16

- (1) Speaker
- (2) Power
- (3) SIM Card
- (4) Ethernet
- (5) USB
- (6) GPIO
- (7) COM
- (8) GSM
- (9) Wifi
- (10) Fuse
- (11) Vibration Alert

The connections on the front panel of the control are shown in Illustration 16.

Note: Check the connections on the system before continuing with configuration. Verify that the connector is matched to the correct port.

Installation

As there are many different vehicle types with different cockpits, this installation manual should be used as a guide only. The ideal position of components cannot always be achieved due to a given cabin layout and/or existing equipment. Additional information is provided for each component on the ideal installation position, other options, and the minimum requirements to be satisfied for operating the system.

Recommendations:

- Verify that cable lengths are checked to be able reach the **DSS** computer location before mounting any of the components.
- **Important:** Cables should be run through conduit wherever possible and run in such a way as to provide maximum protection. Avoid areas where cables may be regularly stepped on or damaged by falling rock. If the cables are going through a hole, make sure to use a cable gland or grommet through the hole to protect the cable from damage.

Note: When using the system in an office or simulator, the GPS receiver may not produce valid data. Make sure that you have enabled logging and alarms in the absence of valid GPS data by selecting "Enable Demo Mode".

Control

When positioning the control, meet the following criteria:

Ventilation - The computer must be located in a well-ventilated area. Check to make sure that the area is not affected by engine or other heat sources.

Cable length - Check that the cable from all the peripherals can reach the unit.

Weather - The unit is not suitable for outside installation. Ensure that the computer is protected from weather and possible water damage (from washing or rain).

Accessibility - Find a suitable position where the unit can be easily accessed for removal or maintenance.

Note: Install shock mounts between the control and plate at each corner

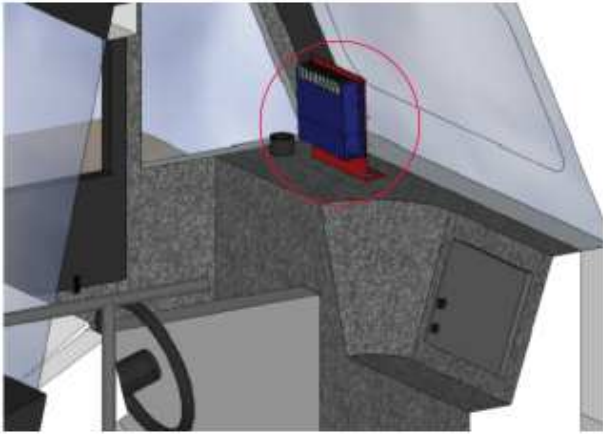


Illustration 17
Control location

g03871712

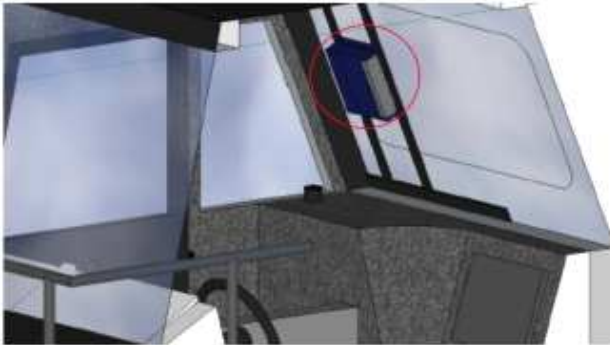


Illustration 18
Control location

g03871713



Illustration 19
Control mounted behind operator

g06220626



Illustration 20

g06220630

System control mounted in the ECM bay alongside another Control

Power

When positioning the control, meet the following criteria:

Battery Power (Red) - Can be 12V to 30V and constant battery power coming into the cab. The control should be protected with a 10A fuse as close to the power source as practical.

Ignition/Key Power (Yellow) - Can be 12V to 30V and should only have power when the ignition key is turned ON. The control should be protected with a 5A fuse as close to the power source as practical.

Ground (Black) - Should be connected to a grounding point or suitable ground that runs back to the battery or isolator if the vehicle is equipped with one. General grounding to the chassis is not recommended unless the grounding point is a dedicated grounding point. A general grounding point may not provide a low-resistance connection which can cause the system to shutdown or not turn ON.

Connect all wires to the appropriate connections.

Installing the Camera

Camera Position

The ideal position for the camera, is to be mounted is directly in front of the operator and low to obtain a clear view of the drivers head and eyes. In most vehicles, the steering wheel will not allow for this position so the sensor is typically installed either to the left, or the right of the steering wheel.

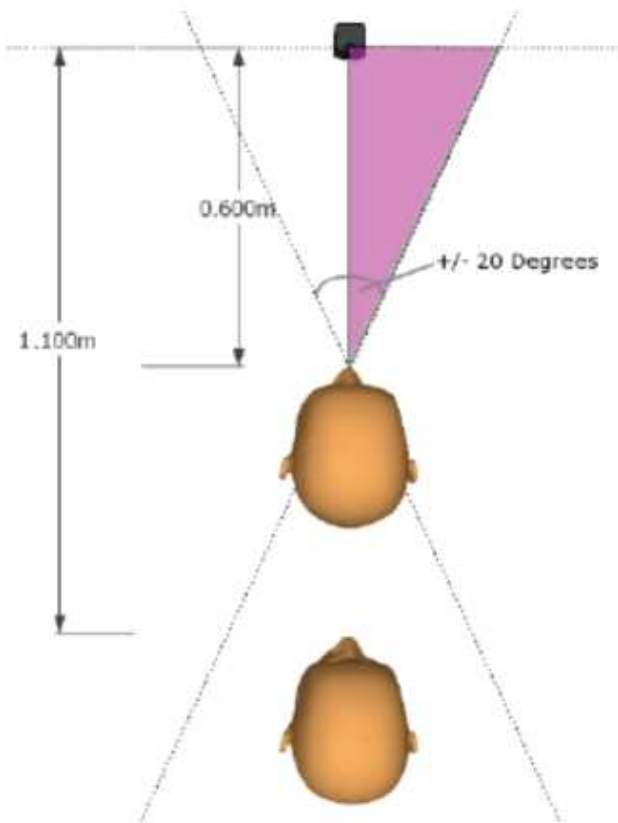


Illustration 21
Camera yaw and distance

g03871748

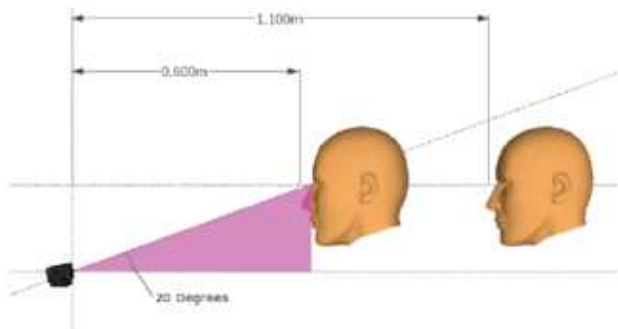


Illustration 22
Camera pitch and distance

g03871749

Distance - A normal distance range between the camera and the head of the operators head is 0.6 m (1.97 ft) to 1.1 m (3.61 ft). The software default configuration is set in line with these distances, as shown in Illustration 21. If this distance does not work for your vehicle, the min and max values can be changed in the configuration file.

Yaw - Camera should be placed within 20 degrees to the left or right of the operator as shown in Illustration 21.

Pitch - Camera should be placed between 10 degrees and 30 degrees below the operator. Pitch is calculated as the angle the camera is tilted upwards as shown in Illustration 24.

Obstructions - The sensor should be mounted clear of any obstructions from other equipment, the steering wheel, the operators hands, or arms.

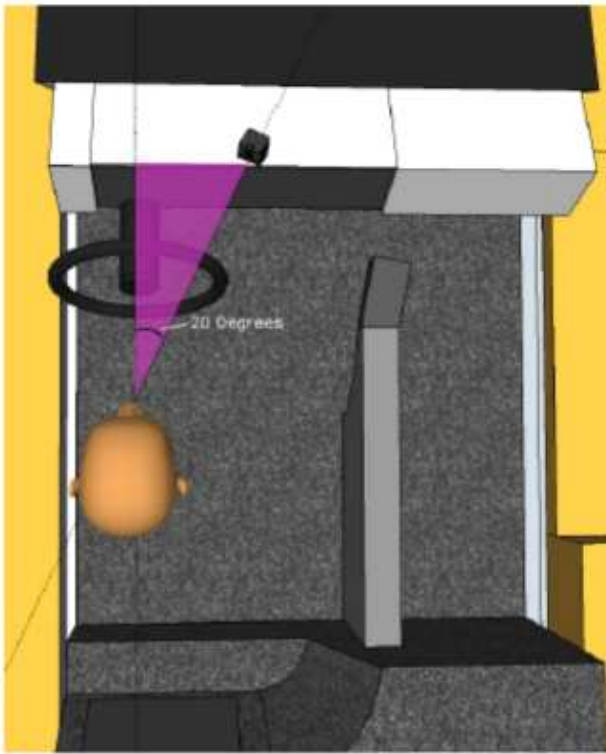


Illustration 23
Sensor placement yaw

g03871757

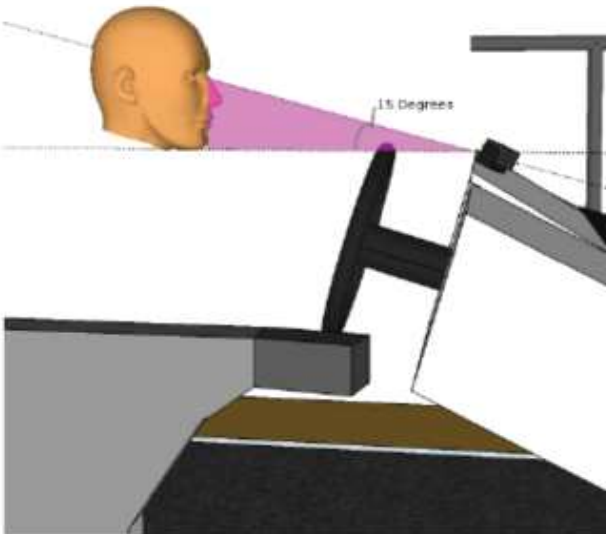


Illustration 24
Sensor placement pitch

g03871758

Mounting the Camera

Once an appropriate location has been chosen, the camera bracket can be loosely attached to the dash and the camera loosely attached to the bracket using only the rear mounting screws. The correct pitch and yaw angles will be set by checking the camera view with the maintenance monitor (the operators head should be in the field of view in all driving positions). Once the correct camera pitch and yaw were found, lock in the position by tightening all mounting screws.

Note: Measure the pitch and yaw angles and take note of the angles as these angles will be required when configuring the system.

Note: Before positioning the camera, ensure that the ferrite bead has enough space under the dash to reinstall the dash panel without flexing.

Note: Split the camera grommet before installing into the dash.

Running Camera Cable

To avoid heavy traffic areas, the most common place for running cables is into the dash behind the camera and underneath the floor, under the door sills or over the door frames. A hole should be made behind the camera large enough to run the IR light cables and the camera cable through. The cable can be run through the dash to the floor and underneath the flooring to the control location.

Note: When disconnecting the camera Molex connector cable, press down and hold the red button while separating the connectors apart.

Installing the IR Lights

IR Light Position



Illustration 25

g06235871

Camera and IR-Light Mounting

The IR lights are to be placed on the left and right of the camera to illuminate both sides of the face of the operator in low light conditions. The ideal positions for the IR lights are low and to the side (away from the frontal direction). Position the lights where the light glare from glasses does not reflect directly into the camera when looking forward. Minimize any shadows that may be cast from obstructions such as equipment (usually monitors or radio systems) currently installed in the vehicle or from the arms of the operator.

Note: When connecting the IR lights to the camera cable, align and twist both ends simultaneously until secured.

Mounting the IR Lights

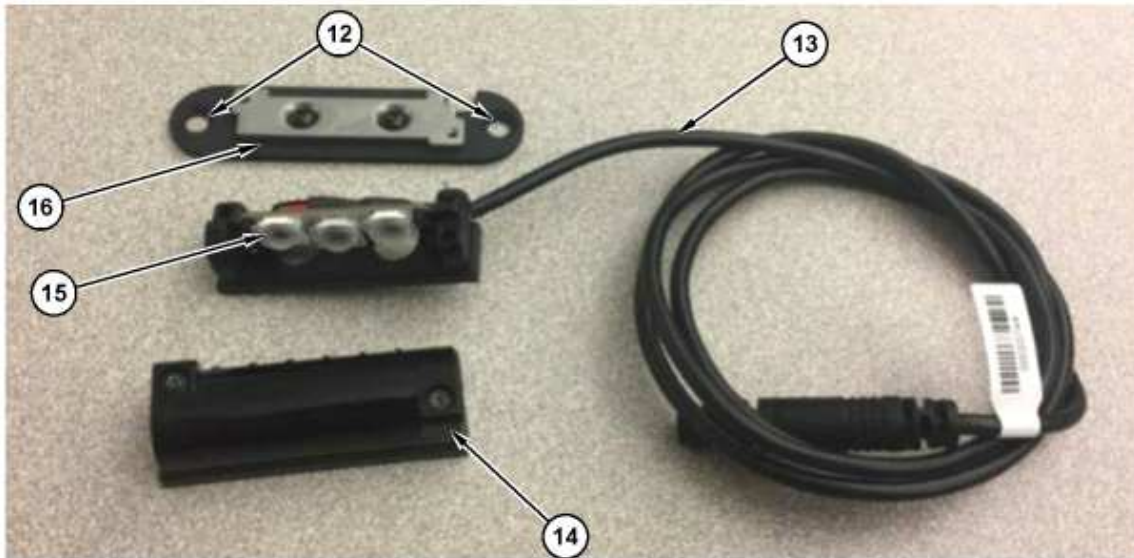


Illustration 26

g06275433

Exploded view of IR Lights

- (12) Mounting Holes
- (13) Cable
- (14) Cover
- (15) LED Lights/PCB
- (16) Mounting Plate

Once the position for the IR lights has been identified, the lights can be mounted using a suitable counter sunk screw through the two holes in the mounting plate and adjusted as needed.

Note: Point the LED towards the face of the operator by removing the IR light covers and adjusting.

Note: Do not use screws to mount to the ROPS (Roll Over Protection System) pillar. Use industrial grade double-sided tape or epoxy.

Wi-Fi/Bluetooth Antenna

Note: Antennas that are mounted outside of the cab, must have a 20 cm (7.9 inch) distance from another antenna to avoid interference.

The most common place to mount **508-9371** Field Installation Gp wi-fi/bluetooth antenna is under the dash. Run the cables underneath the floor, under the door sills or over the door frames, to the control.

GPS

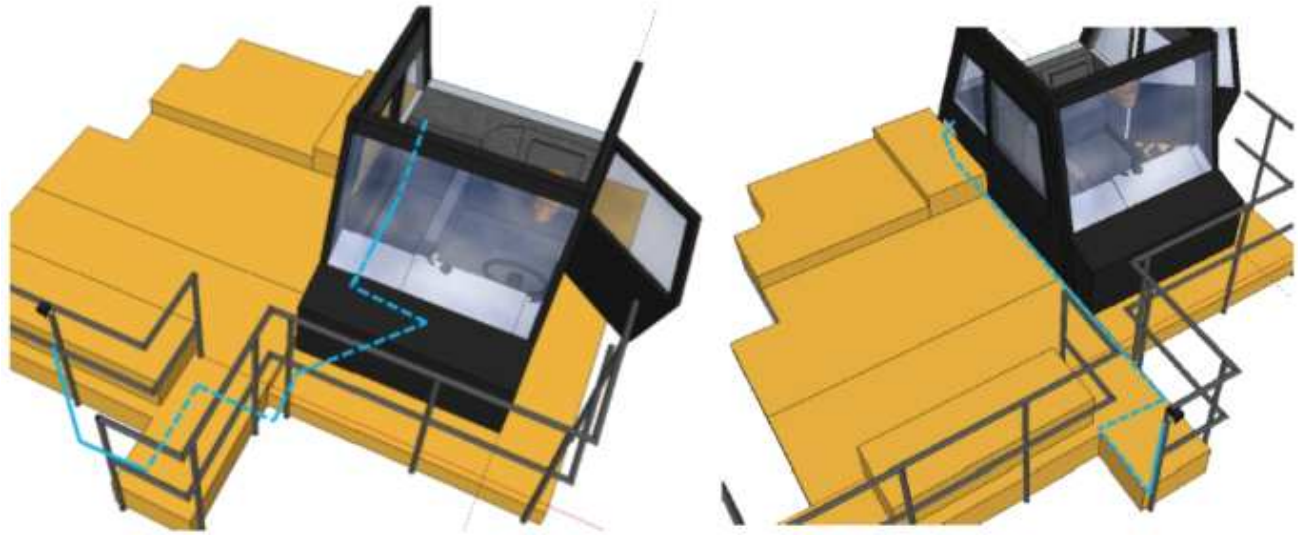


Illustration 27

g03871772

GPS cable run

Mount the GPS in a position to see the sky clearly. Mount in a location to be protected from rock fall or other physical damage as much as possible. Depending on the size and style of the truck bed/tray there may be many options. The most common option on a haul truck is on the front railing. Grab rails or mirror frames are often used in over the road vehicles. The GPS cable generally follows the same path as other cables on the truck running towards the electrical compartment.

GSM/WiFi Antenna

Mount the GSM/WiFi antenna to the outside of the cab on a handrail in a position to see the sky clearly. Mount in a location to be protected from rock fall or other physical damage as much as possible. The antenna should be mounted vertically and cable routing can follow the same routing as the GPS. GSM/WiFi antenna can also be installed side by side next to the GPS.

Note: Do not remove the double-sided adhesive backing under the antenna. The double-sided adhesive provides a seal for the screws underneath to be IP67 compliant. Warranty will be voided if the double-sided adhesive is removed.

Speaker

Mount the speaker in a location that will prevent damage and provide a strong audible alert to the operator. The speaker may be mounted with screws in the cab or bolted using (2) **3E-4313** Screw to attach the speaker bracket to the IVS control bracket.

Note: Speaker does not come with mounting screws. If mounted in the cab, use existing panel screws or customer supplied screws to attach speaker to desired location.

Note: Speaker volume defaults at 60. Customer can request to change volume during install.

513-5976 Electric Motor (VIBRATION)

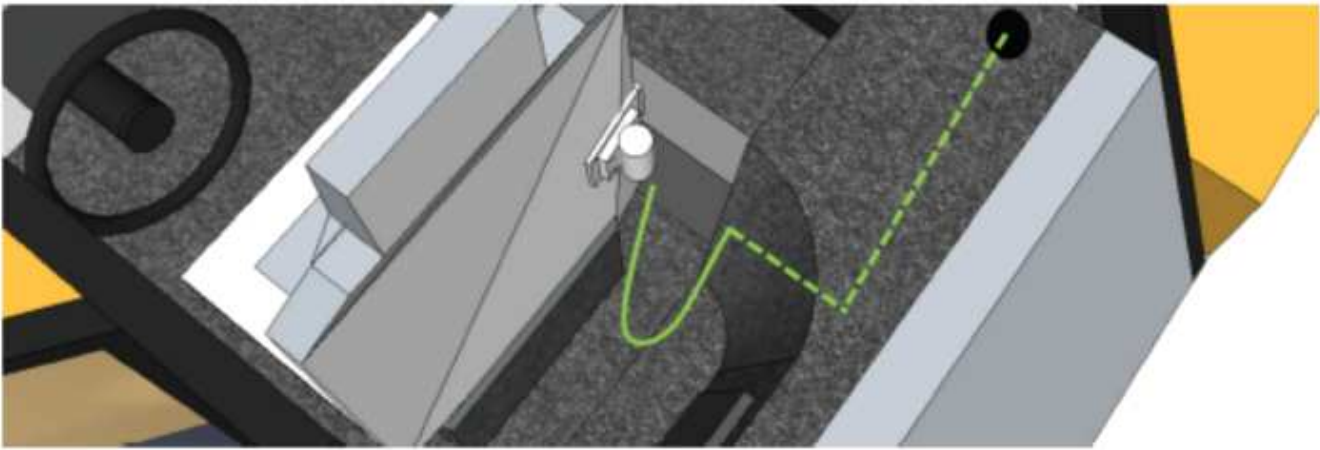


Illustration 28

g03871818

Illustrative vibration motor installation vibration motor routing using the arm rest bracket

The following should be considered when mounting the electric motor:

Location - Ensure that the electric motor cable will reach the control. Verify that the location of the electric motor will not impede the operation of the seat.

Screws - If using self-tapping screws to attach the motor directly to the seat of the operator, verify that the portion of the screw protruding through the metal will not cause discomfort or injury to the operator or interfere with the seats operation. This method of mounting should not be used for Cat seats or seats with fans or internal electrical components due to the risk of damaging these fans or components or associated wiring. Installing the motor with screws should be done in a manner to prevent any interference with a certified or safety device.

Cable - Leave sufficient cable length to allow the seat full range of operation movement without damaging the cable. Also protect the cable with split conduit where required.

Effectivity - Verify that the motor is mounted in a location that allows the operator to feel the vibrations through the seat. The motor should be mounted directly to the seat as opposed to the seats mounting bracket, and so on.

Preferred Standard Installation Using 510-4059 Bracket

Perform the following steps to install **513-5976** Electric Motor (VIBRATION) to the seat using the preferred standard installation, using **510-4059** Bracket:

Note: For non-standard seating installation, follow the optional installation instructions using **508-9370** Bracket to install motor to seat.



Illustration 29

g06045624

1. Route the cable for the **513-5976** Electric Motor (VIBRATION) through a gap in the lower panel, and up the right rear side of the seat.

Note: Verify that there is enough slack left in the cable for full range of seat movement. Insufficient cable slack could result in electric motor cable damage and possible void of warranty.

2. Raise the seat to the highest position, and slide the seat to the FULL back position.



Illustration 30

g06154796

3. Remove the front stop bolt from the base and slide the seat forward to remove seat to gain access of the undercarriage of the seat.

Note: Save the stop bolt for reuse.

Note: If you cannot slide the seat out of the rails due to limited space, drop the seat suspension all the way down.



Illustration 31

g06158653

Felt pad

4. Attach and secure **513-5976** Electric Motor (VIBRATION) to bracket **510-4059** Bracket, opposite of the felt pad with the cable on the underside using 4 **8T-0269** Bolt, 4 **3B-4504** Lockwasher, and 4 **344-5673** Nut.

Note: Installing **513-5976** Electric Motor (VIBRATION) to **510-4059** Bracket prior to installation on the seat base will ease installation.



Illustration 32

g06156102



Illustration 33

g06156086

5. Install bracket to the 2 outer holes closest to the edge of the plate on the right side of the seat. Install **238-0251** Screw through the bottom going up. Attach the bracket using **9X-2027** Washer and **344-5675** Nut.

Note: Leave bolts loose for adjustment.



Illustration 34

g06156106

6. Adjust bracket to seat base by pushing the pad to touch the seat base and tighten bracket bolts completely.

Note: Make contact between pad on the bracket and the seat base while still allowing for seat height adjustment.

7. Slide the seat back into the mount and reinstall the stop bolt.



Illustration 35

g06156110

8. Route the wiring under the seat belt buckle and secure to the seat with **5P-9085** Clip and a **8T-4137** Bolt.
9. Connect the motor wiring connector to harness connector.

Optional Installation of Vibration Motor on a COSS 2 Seat Using 508-9370 Bracket

Reference: Service Magazine, M0089605, "Rework Procedure for Driver Safety System (DSS) Vibration Motor Bracket is Now Available" for rework of **508-9370** Bracket.

Note: If the bracket does not install, refer to "Optional Installation of Vibration Motor on a COSS Seat Using 508-9370 Bracket"

Perform the following steps to install **513-5976** Electric Motor (VIBRATION) on COSS 2 seat, using **508-9370** Bracket:

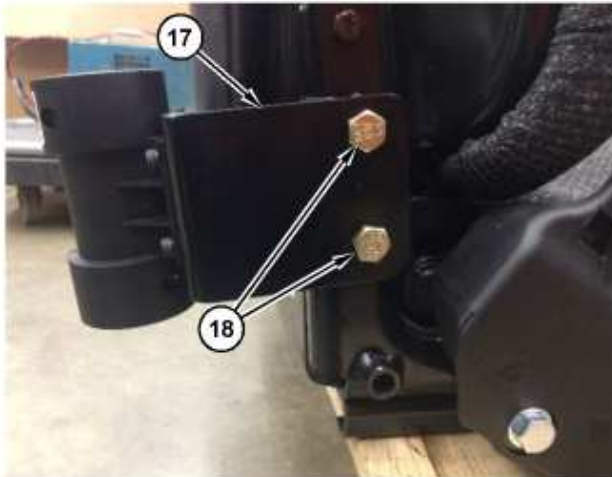


Illustration 36

g06285496

(17) Vibration motor bracket
(18) 8T-4137 Bolt



Illustration 37

g06285533

(17) Vibration motor bracket
(18) 8T-4137 Bolt

Note: If the side bracket does not have an arm rest, use two bolts (18) to place the vibration motor bracket (17) onto the side bracket. Otherwise, remove arm rest and bolt the bracket between the arm rest and side bracket.

Optional Installation of Vibration Motor on a COSS Seat Using 508-9370 Bracket

Perform the following steps to install **513-5976** Electric Motor (VIBRATION) to the seat with optional installation using **508-9370** Bracket:



Illustration 38
(19) Screws (padding)

g06286280

1. Remove four screws (19), to separate the padding from back plating.



Illustration 39
(20) Headrest guides

g06286284

2. Remove the two headrest guides (20) from the top of the seat.



Illustration 40
(21) Bolt

g06286290

3. Separate the padding from back plating of the seat. The upper bolt (21) of the side bracket will be visible. Tighten or loosen the bolt from the flange locknut as per the requirement.



Illustration 41
(21) Bolt

g06286322

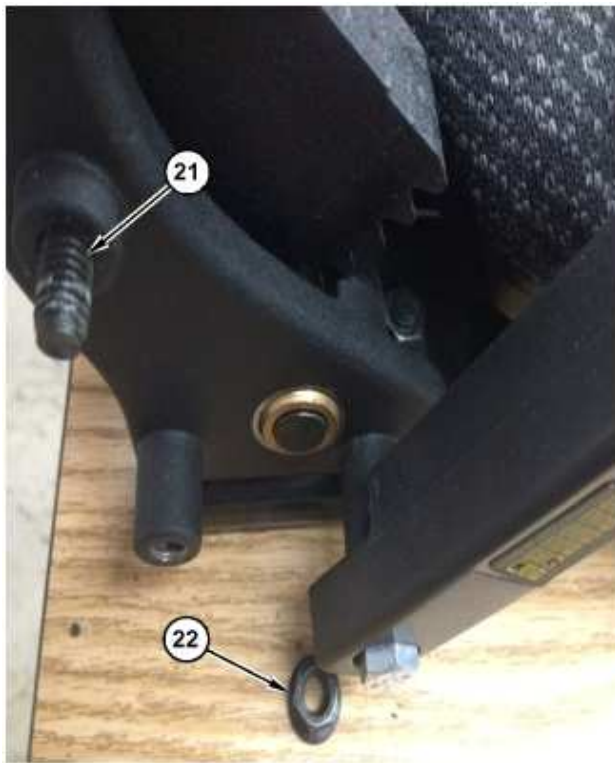


Illustration 42
(21) Bolt
(22) Nut

g06286325

4. Remove the arm rest from side bracket.
5. Remove side bracket from the seat plate by removing three bolts (21).

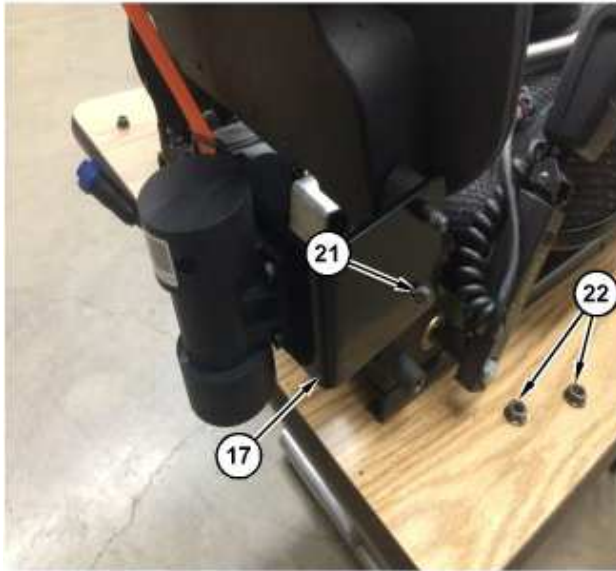


Illustration 43

g06286329

- (17) Vibration motor bracket
- (21) Bolt
- (22) Nut



Illustration 44

g06286340

- (17) Vibration motor bracket
- (21) Bolt

6. Remove the lower bolt. If the lower bolt is not long enough to hold arm rest and vibration motor bracket, replace the lower bolt with **0S-1591** Bolt and **198-2970** Locknut.

7. Install the side bracket to the base plate and then install vibration motor bracket (17).



Illustration 45

g06286343

- (17) Vibration motor bracket
- (21) Bolt
- (22) Nut



Illustration 46

g06286355

- (17) Vibration motor bracket
- (21) Bolt
- (22) Nut

8. After installing vibration motor bracket (17), install arm rest over vibration motor bracket (17) and tighten flange locknut (22).

Software Setup and Configuration

This section is a guide for setting up and configuring the **DSS** software after the **DSS** IVS system has been installed in the vehicle. The system assumes that the configuration file has been set up on the server or is available on a USB drive.

Note: The software interface is a single click interface, folders, and files open with a single click.

Pre-Requisites

- A copy of the approved master IVS configuration file. The IVS configuration file is an XML file and is called `ivsconfig.xml`. The configuration file may be available locally or may be downloaded from the data server.
- The IP address, subnet mask, and gateway address to be assigned to the IVS control for connection to the local network.
- A means of measuring the angles at which the camera is set regarding the approximate position of the drivers head.
- A maintenance monitor connected to the control and the vehicle ignition key turned ON to power the system.

Establish **DSS** Connection to PC via Ethernet

Perform the following procedure to connect the computer to **DSS** system via the Ethernet:

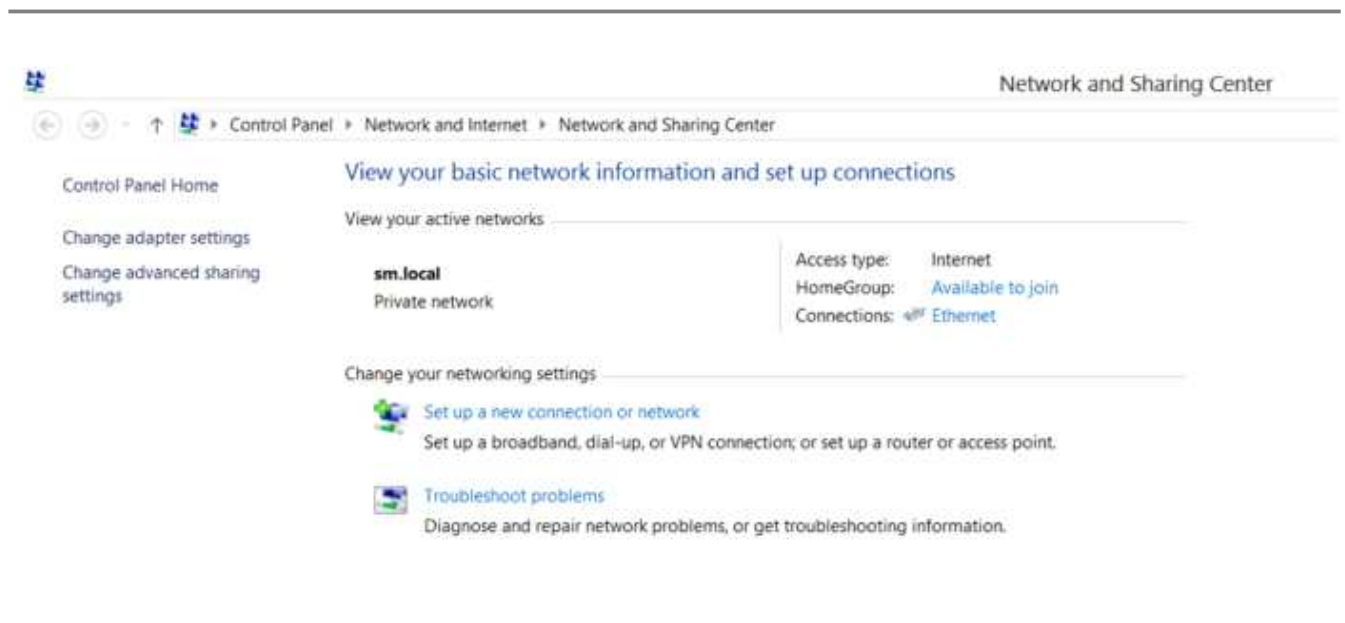


Illustration 47

g06050908

1. Open your "Network and Internet" settings tab in the Control Panel.
2. Select "Network and Sharing Center". Click the "Change adapter settings".

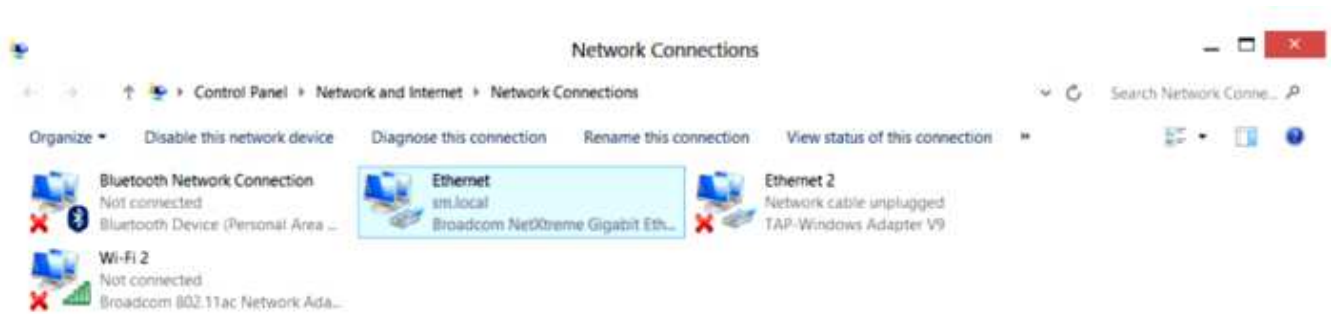


Illustration 48

g06050917

3. Open the "Network Connection" settings tab. Connections to the PC including the Ethernet connection to the **DSS** system will be available.

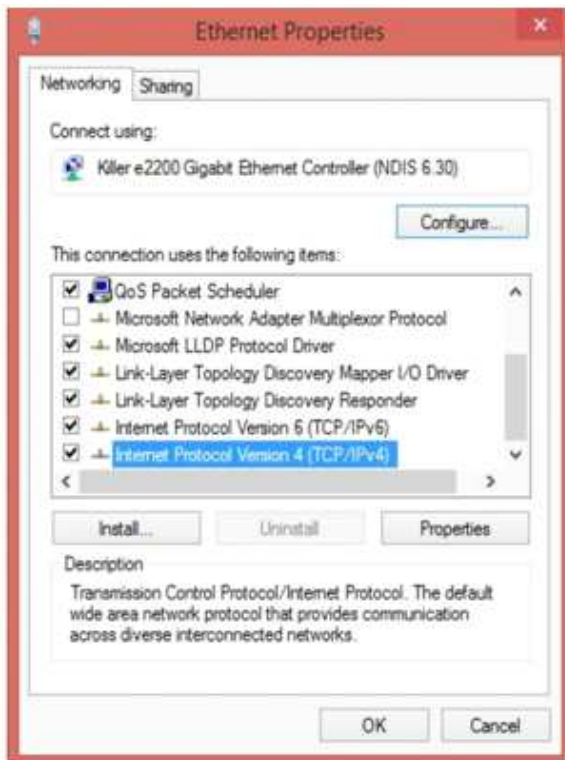


Illustration 49

g06050930

4. Right-click the Ethernet connection that leads to the **DSS** unit and select the "Properties" option. Then scroll down and select "Internet Protocol Version 4 (TCP/IPv4)". Refer to Illustration 49. Double-click the "Properties".



Illustration 50

g06050931

5. Click the option "Use the following IP address:" and input the following as shown in Illustration 50.
 - a. IP Address: 192.168.1.2
 - b. Subnet Mask: 255.255.255.0
6. Click "OK", the settings will be saved. Now the control will communicate with the PC over the Ethernet connection that has been established.

Performing Imaging Process

Note: If the control has yet to be imaged or flashed with a USB flash drive, refer to Step 1 through Step 13 of the following procedure. Proceed with "Performing Installation Configuration" when the system has been imaged or flashed with a recovery dongle.

To create a "Recovery Dongle" for imaging the control, that creates a bootable USB that will image the control with the desired software, perform the following procedure:

Note: Disable antivirus when creating a recovery dongle.

Note: A USB flash drive must be formatted prior to creating the IVS Recovery Dongle.

1. Go to:

<https://dealer.cat.com/en/products/technology/safety-technology/dss/c/dss-m.html>

2. Scroll to "Release Downloads & Documentation" and save latest software version to your computer.
3. Right-click and extract all from the saved zipped file.
4. Select "Recovery Dongle Creator" from the extracted folder, then extract all the "recoverydonglecreator" application in the same location.

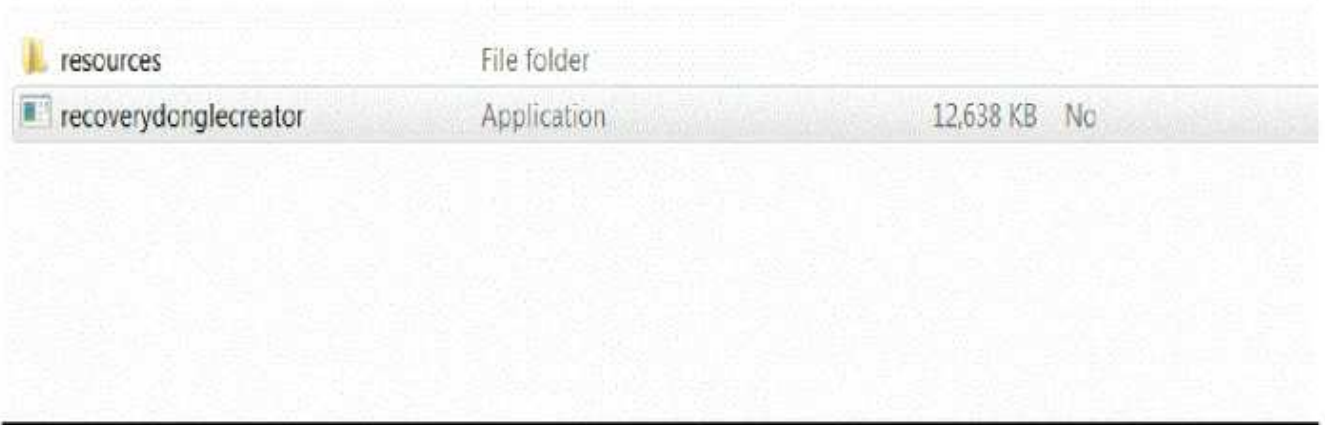


Illustration 51

g06145499

5. Plug USB into laptop or other PC that has the latest version of the RDC saved. Navigate to the folder that stores the RDC.

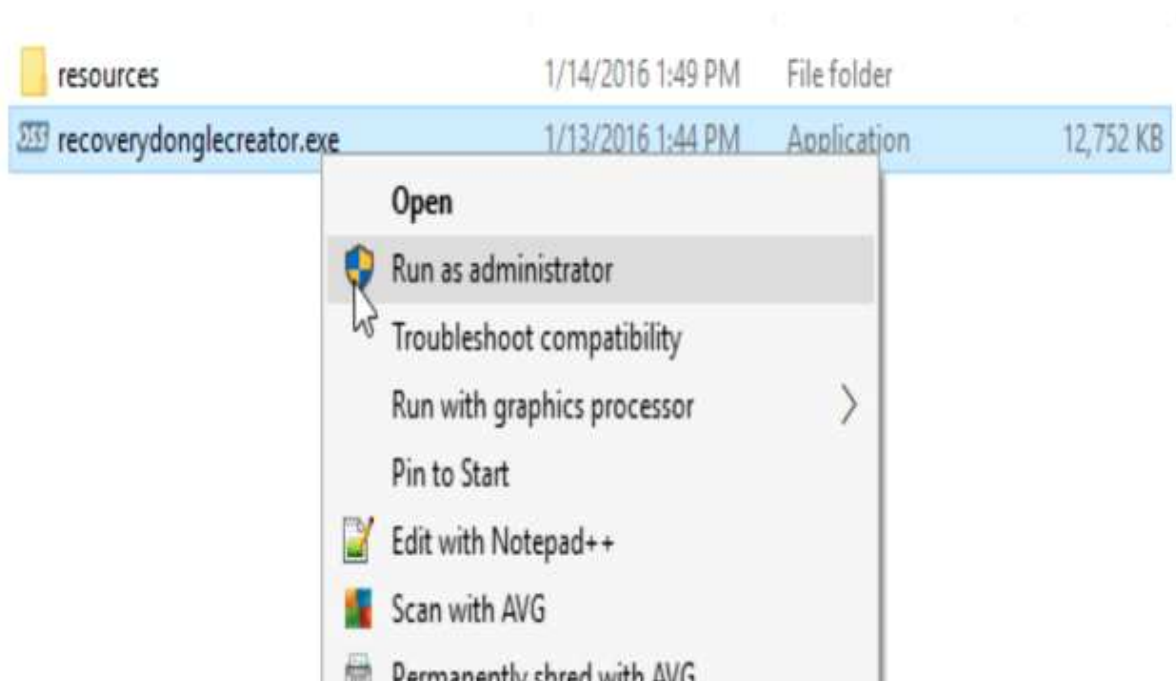


Illustration 52

g06145523

6. Open the most current version of RDC by right-clicking on the **DSS** icon and selecting "Run as Administrator".

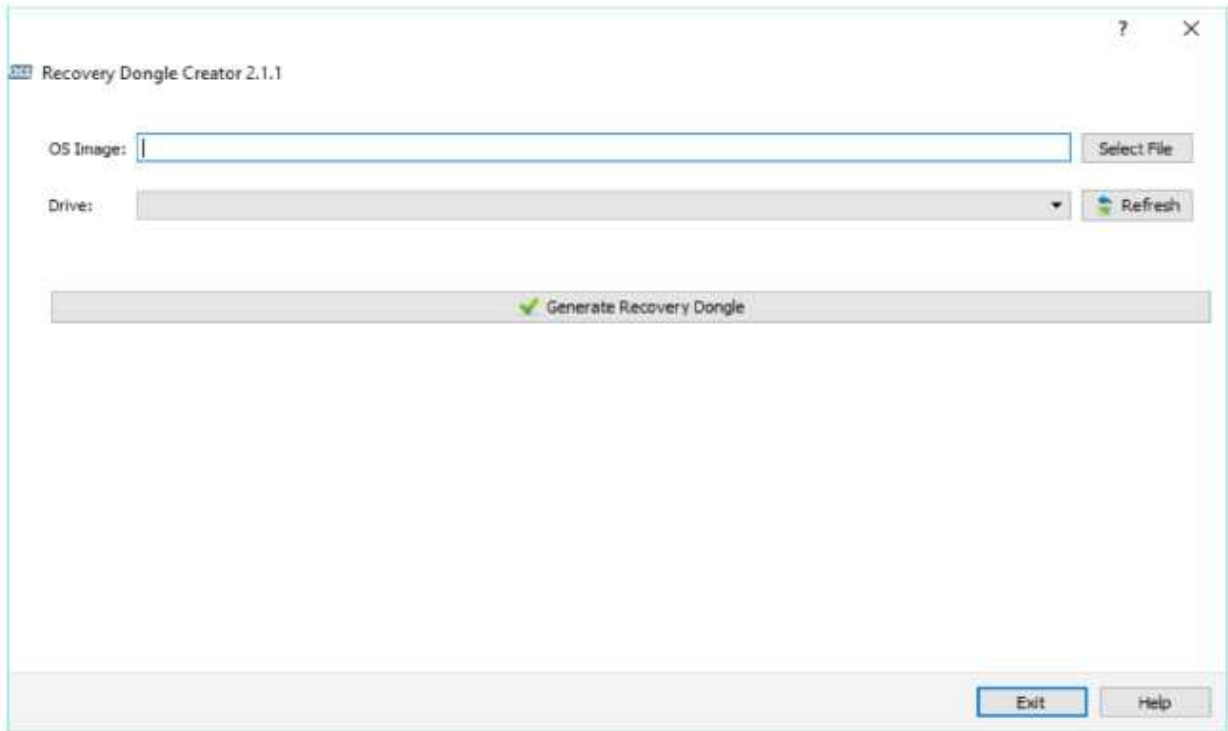


Illustration 53

g06145530

7. Use the latest version of the "Recovery Dongle Creator" after the application has been opened. You should see a screen similar to the one shown. Refer to Illustration 53.
8. Install the OS Image, the actual ISO on the system and the Drive which is the USB drive installed on the computer.
9. Navigate to the location of the current ISO using the "Select File" button.

Note: The Drive field should automatically update with the information on connected USB drive. Click "Refresh" if not present.
10. Click "Generate Recovery Dongle" to begin the process once the ISO is selected and the correct drive is chosen. A progress screen will be shown during running and will disappear once the process is complete.
11. Plug USB into an open USB port on the **DSS** unit with the power OFF. Power is OFF by disconnecting power from the master disconnect switch (isolation switch) and plugging the USB recovery dongle into the **DSS** USB port (use GPS port if none available) before powering back on.



Illustration 54

g06174803

- 12. Turn the power back on from the isolation switch to begin the imaging process. After power-up of the **DSS**, the PSU status will be solid "Green". Refer to Illustration 54.



Illustration 55

g06174798

- 13. The onboard diagnostic LEDs on the top on the unit will flash "Orange" during the imaging process. Refer to Illustration 55.

Note: Once the LEDs stop flashing "Orange" and the PSU status reverts to solid "Green", remove the USB drive and plug back in the component and connect your laptop to the **DSS** with an Ethernet cable.

Performing Installation Configuration

Once the image is deployed and the system boots from the newly installed application, you will be prompted to complete the device/site based configuration. Once the system is up and running, open a Chrome browser and navigate to 192.168.1.1 to begin the initialization process in the "**DSS** IVS Install wizard" web page. This page will allow you to complete the configuration settings for the device which are stored in the ivsconfig.xml file. Complete the following settings:

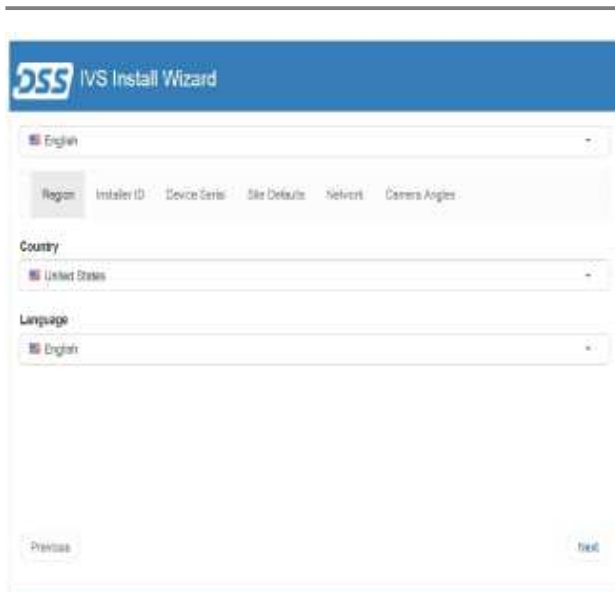


Illustration 56

g06236269

1. Input "Country" where the system is installed and the "Language" of preference.

The screenshot shows the 'Region' step of the DSS IVS Install Wizard. The language is set to English. The 'Installer ID' and 'PIN' fields are empty. Navigation buttons 'Previous' and 'Next' are visible at the bottom.

Illustration 57

g06236274

2. Input "ID" and "PIN". As of now, any characters may be used to fill the field. This ability will change in the future as installer IDs and PINs will be distributed.

The screenshot shows the 'Device Serial' step of the DSS IVS Install Wizard. The fields are filled with the following information:

- Vehicle ID: U887N00N
- Product Code: 00000000000000000000000000000000
- Serial: 00000000

Below the fields, two device labels are shown:

- Type 1:** DSS IVS COMPUTER, Model Number: DS-4NCL-0012, Power: 12-30V DC 100W MAX, 70A FAST BLOW.
- Type 2:** DSS IVS COMPUTER, Model Number: DS-ENG-VEE2, Power: 12-30V DC 100W MAX, 30A-Fast Blow.

Illustration 58

g06236279

3. "Device Serial": The device serial settings will configure that application to the following device-specific settings:

a. "Vehicle ID": This value will be the name of the device/vehicle that will be displayed in the Driver Safety System in-vehicle (DSSi) Monitoring application. This value is required and must include the vehicle type as part of the name. Examples include:

- Haul Truck
- Over the Road Heavy Truck
- Over the Road Light Truck
- Van

- Taxi
- Light Truck
- Other

- b. "Product Code": This value represents the Product Number and is displayed on the Product Tag on the **DSS** IVS device. Product Code corresponds to the Product Number of specific device. This value should be automatically interrogated from the hardware, but should be confirmed by inspection.
- c. "Serial": This value represents the device-specific serial number and is displayed on the Product Tag on **DSS** IVS device. Serial corresponds with Serial Number. This value should be automatically interrogated from the hardware, but should be confirmed by inspection.

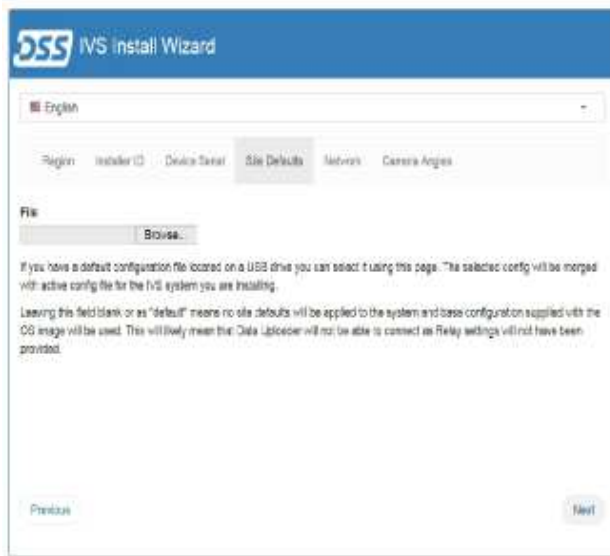


Illustration 59

g06236289

4. "Site Defaults": The site defaults allow the user to select a configuration file that includes site-specific settings. Such settings are Relay-Server connection, Real-Time Event server connections, and any other site-specific configurations. If no file is selected, the system will use the default configuration included with the install that corresponds to factory default settings.

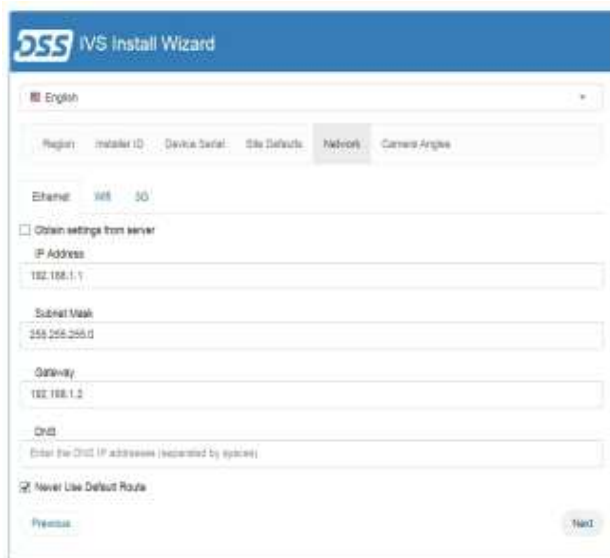


Illustration 60

g06236301

- "Network": This value is the location for the network settings including Ethernet, Wi-Fi, 3G, and CDMA connections. The credentials for each of the connections can be set to coincide with local area connections.

Use the Ethernet, Wi-Fi, and 3G tabs to move through each of the connection settings and input the needed information.

Illustration 61

g06236304

- Uncheck "Obtain Settings From Server" and check "Never Use Default Route" under the Ethernet tab in Network When using the built-in GSM Modem.
- Check "Obtain Setting From Server" and uncheck "Never Use Default Route" under the Ethernet tab in "Network". Click "Next" when using a CDMA modem.

Illustration 62

g06236308

- Navigate to the 3G tab and populate the Access Point Number (APN) given to you by your carrier provider and check "Roaming" (Cat recommended) and click "Next".



Illustration 63

g06236313

9. "Camera Angles": The camera angle corresponds to the position of the camera relative to the face of operator. Camera Angles include the following configurations:
- "Yaw": This value is the setting of the camera position in relation to face of operator horizontally (degree in angle to the left or right of the face of the operator). The default setting is 0 degrees, or at the center of the face of the operator.
 - "Pitch": This value is the position of the camera in relation to the face of operator laterally (degree in angle of the tilt of the camera, to the face of operator). The default setting is 10 degrees.
10. Click "Finish" after setting these fields.

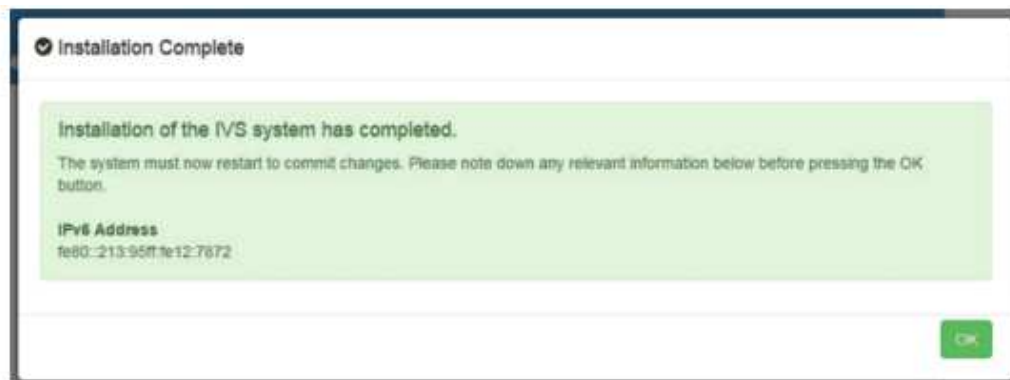


Illustration 64

g06051007

11. Display log will show the status of the installation. When completed successfully, there will be a printout of the IPv6 Route. Copy that down, this address will be the main route to unit if Ethernet IP address is set to 'Obtain settings from Server'.

Note: To retain configuration changes, disconnect power from the master disconnect switch (isolation switch) and wait for 30 seconds before powering back on.

Post Installation Connection and Camera Check

After the installation process, the unit can be reconnected to the PC via the Ethernet port on the device. The following are the two ways to connect via the Ethernet access point.

- "Static IP": The static IP is the default IP address used by the system. If the button with 'Obtain settings from server' is not selected, the default configuration is the 192.168.1.1. This IP must be set in the Chrome

URL bar. This IP will bring up the configuration page with the login information required.

- 2. "Non-Static IP": If the button for 'Obtain settings from server' is selected, then the 192.168.1.1 is no longer available. In the case, with an Ethernet connection, take the IPv6 route from the installation page and plug in to the URL of a Chrome browser with brackets around the URL.

a. Example: [fe80:213:95ff:fe12:7872]

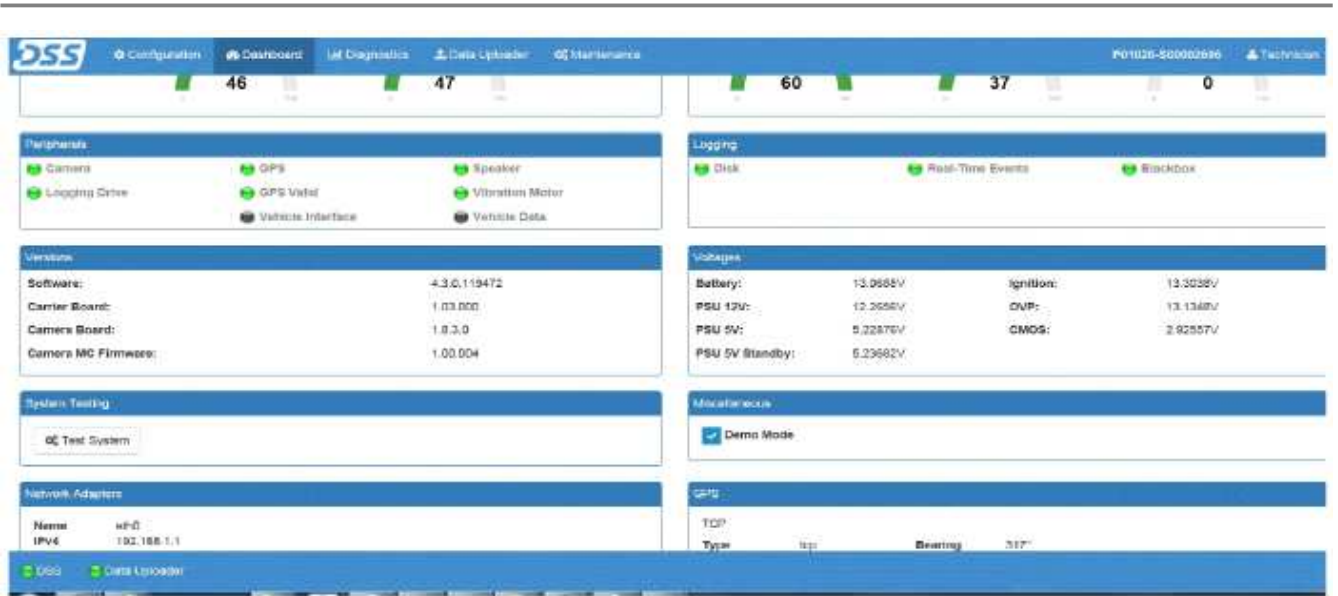


Illustration 65

g06198751

- 3. Log in to the DSS, go to "Dashboard" then check "Demo Mode".

Note: All v4.4 DSS software or later will be using the following credentials:

Username: dss

Password: catdss01

- 4. Mimic a distraction by glancing down, turning your head to the left and/or right until you trigger an event.
- 5. Close your eyes until you hear microsleep event trigger.
- 6. Uncheck "Demo Mode" before exiting.



Illustration 66

g06198836

7. Verify the "Pitch" and "Yaw" lines both fall at "0" in "Diagnostics".

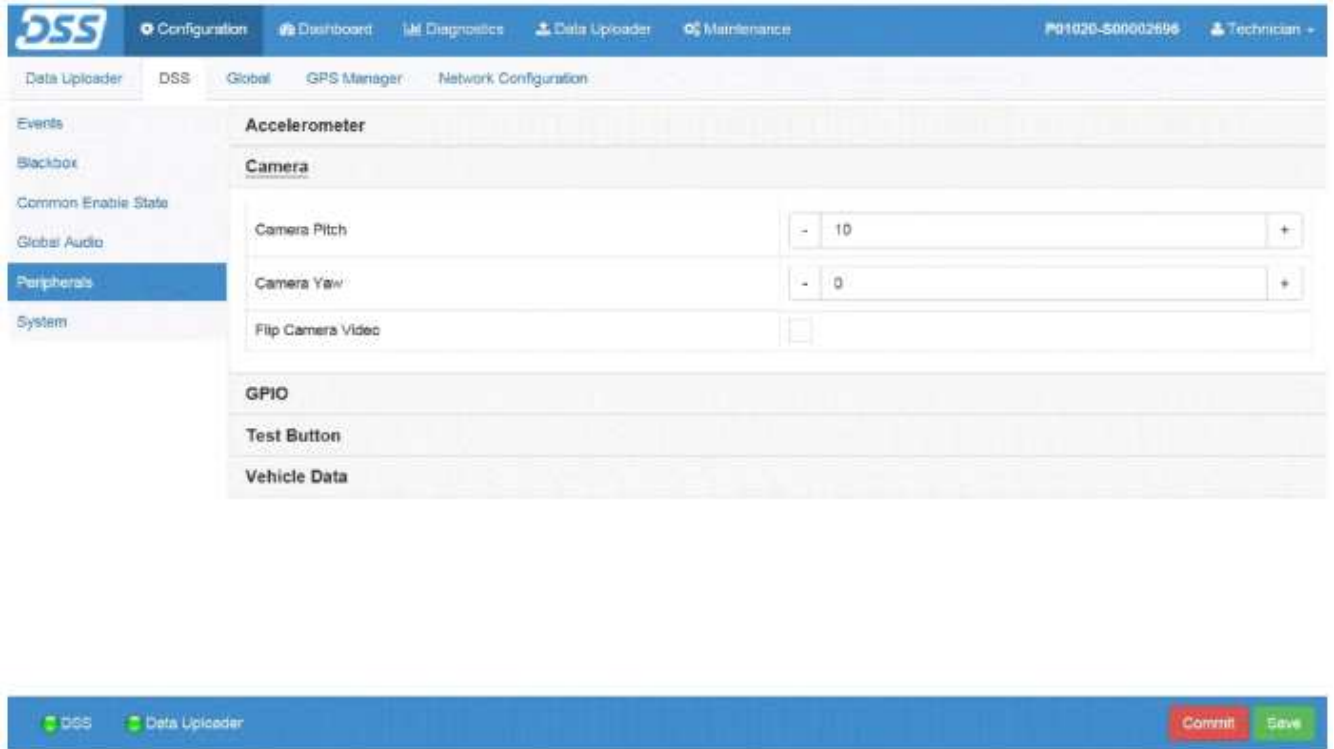


Illustration 67

g06198813

8. Go to "Configuration", "DSS", "Peripherals", and click "Camera" to adjust the "Pitch" and "Yaw". Adjust by subtracting the value if the line falls below "0". If the line falls above "0", you add to the value until the line falls at "0".

Note: Every values changed in the camera settings, you need to save and commit, the DSS will reboot and execute the settings inputted. You can verify your changes in the "Diagnostics" page.

Post Installation Network Configuration check

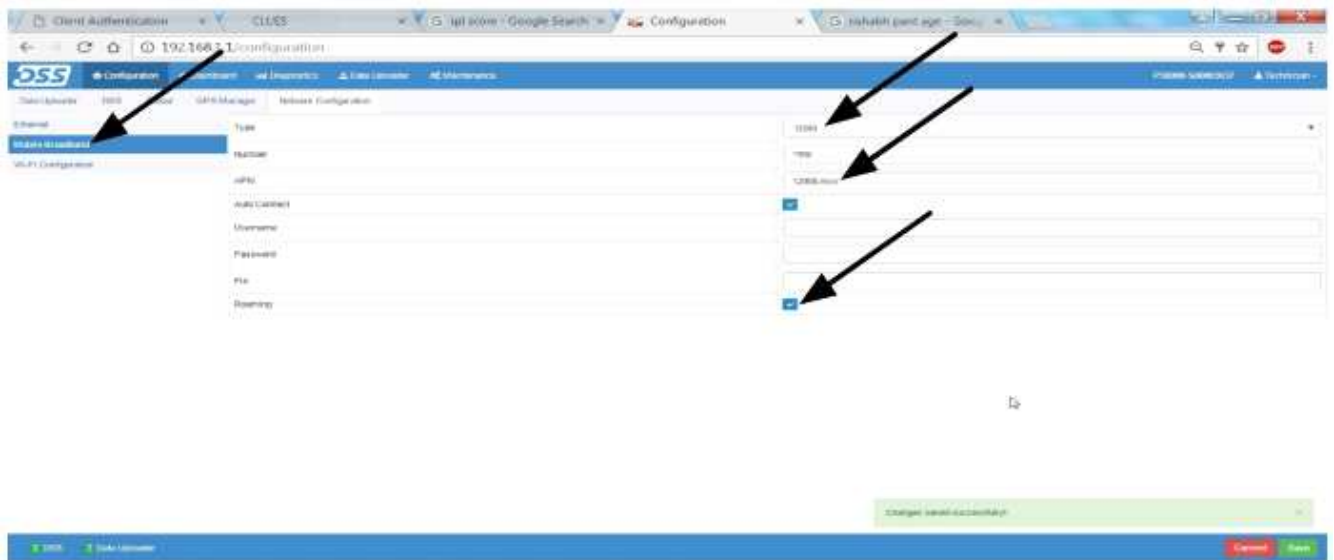


Illustration 68

g06205930

1. Go to "Configuration", "Network Configuration", "Mobile Broadband". Ensure that the type is "GSM" and the input is Access Point Name "APN" from your SIM card provider. "Roaming" should be checked.

2. "Save" changes.
3. Go to "Ethernet" category and verify "Never Use Default Route" is checked.
Note: When using CDMA Modem, uncheck "Never Use Default Route".
4. "Save" and "Commit" changes.

Configuring Driver Safety System with Multitech CDMA Modem

After inserting the SIM card into the router, and turning on the **DSS** unit, follow these steps:

1. Change the IP address to 192.168.2.10 and the "Gateway" should be 255.255.255.0
2. Ensure the **DSS** and the router are powered on and the blue Ethernet cable is plugged into the Ethernet port of the **DSS** and the router.
3. Open a browser, type `http://192.168.2.1` in the address bar, press "Enter".

Note: A warning page that the site is "untrusted", may appear. Click "Continue to this website (not recommended)".

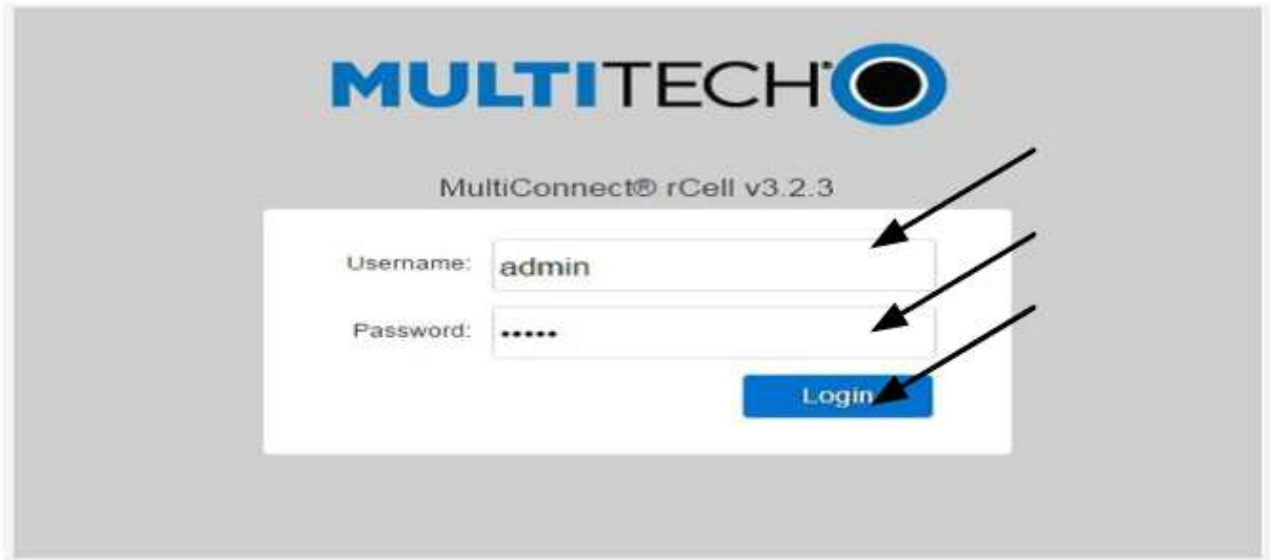


Illustration 69

g06206691

4. Log in to the "Multitech" systems page.

Note: Login name and password are both "admin" (all lower case).



Illustration 70

g06206694

5. Ensure "Network Router" is selected on the screen and click next.

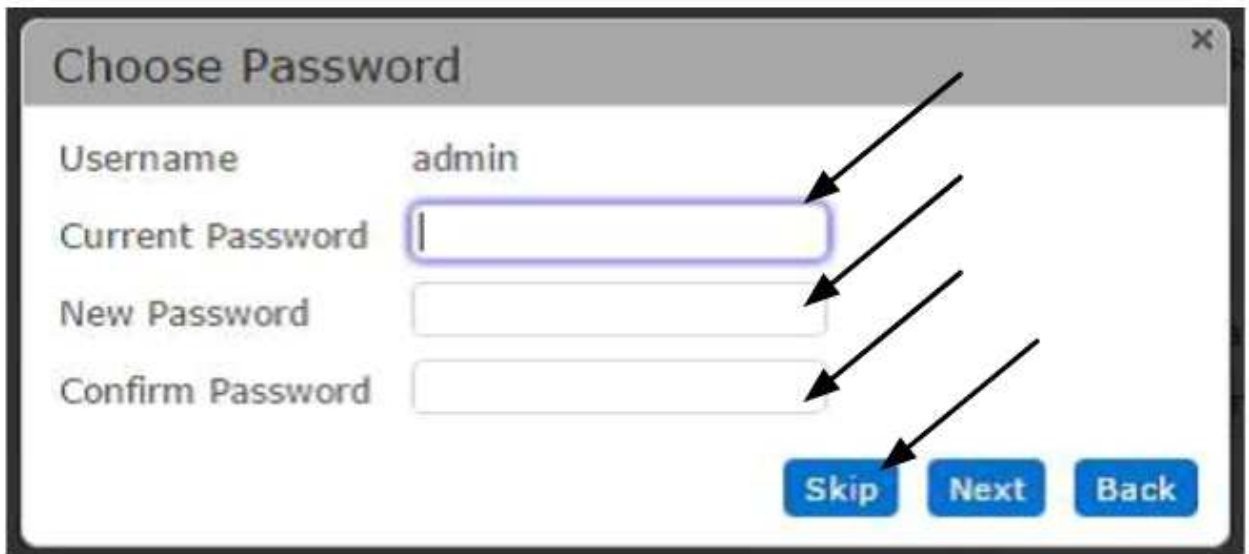
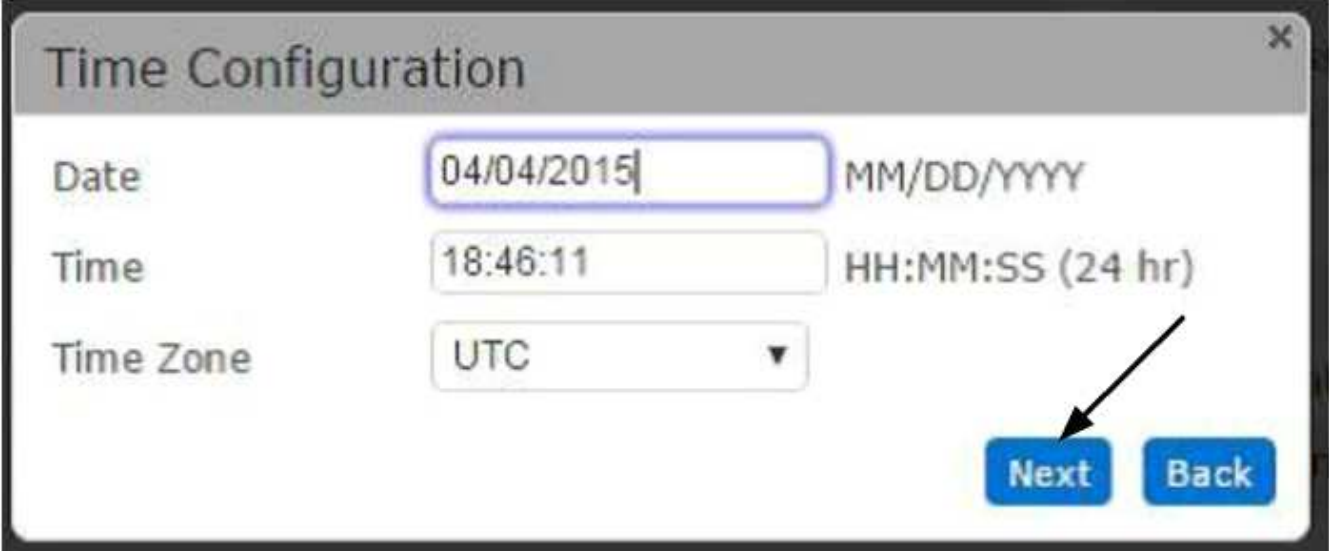


Illustration 71

g06206696

6. Leave all fields blank and click "Skip".



Time Configuration

Date MM/DD/YYYY

Time HH:MM:SS (24 hr)

Time Zone ▼

Illustration 72

g06206928

7. Ensure the proper "Time" and "Date" is set in the Time Configuration screen then hit next.



IP Setup

IP Address

Mask

Primary DNS

Illustration 73

g06206991

8. Leave the "IP Setup" screen as is and click "Next".

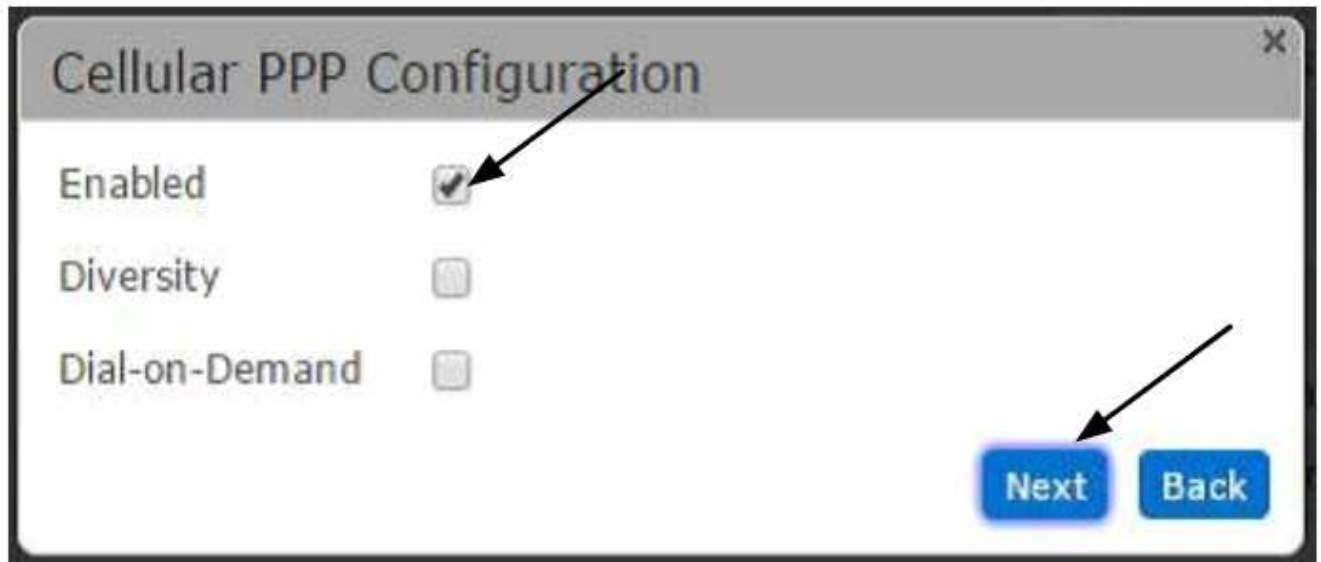


Illustration 74

g06207276

9. Check "Enabled" only and click "Next" on the Cellular PPP configuration page.

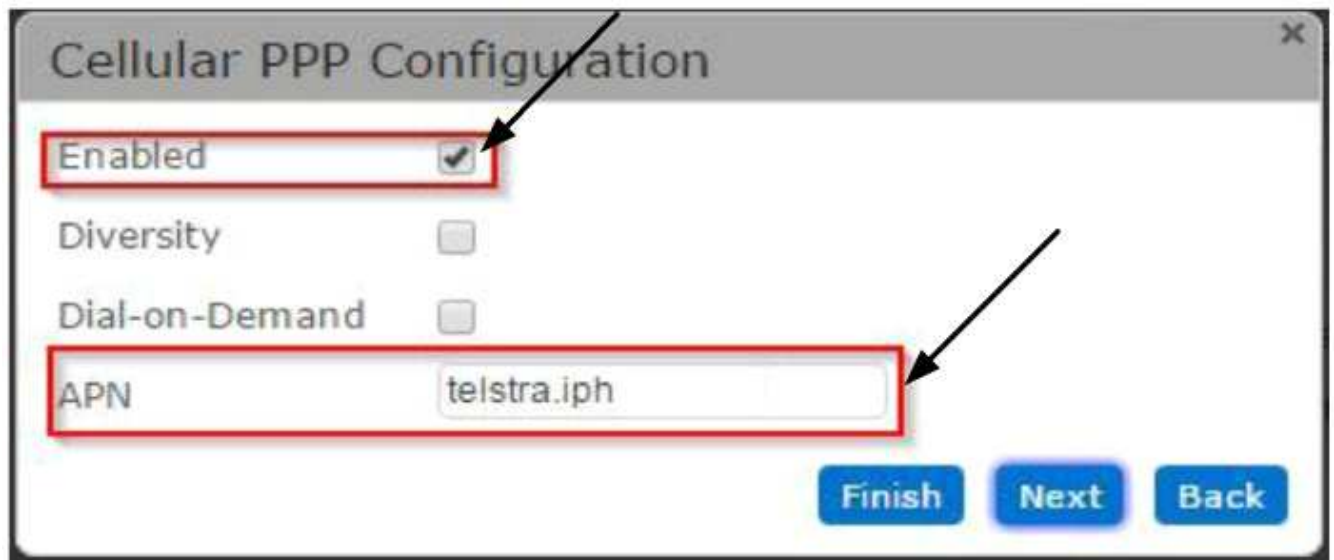


Illustration 75

g06207283

10. Check the field and type "APN" if needed.

Note: Applies to GSM only.



Illustration 76

g06207292

11. Select "None" and click "Finish" for PPP authentication.



Illustration 77

g06207295

12. Choose the "Save and Restart" from the menu on the left.

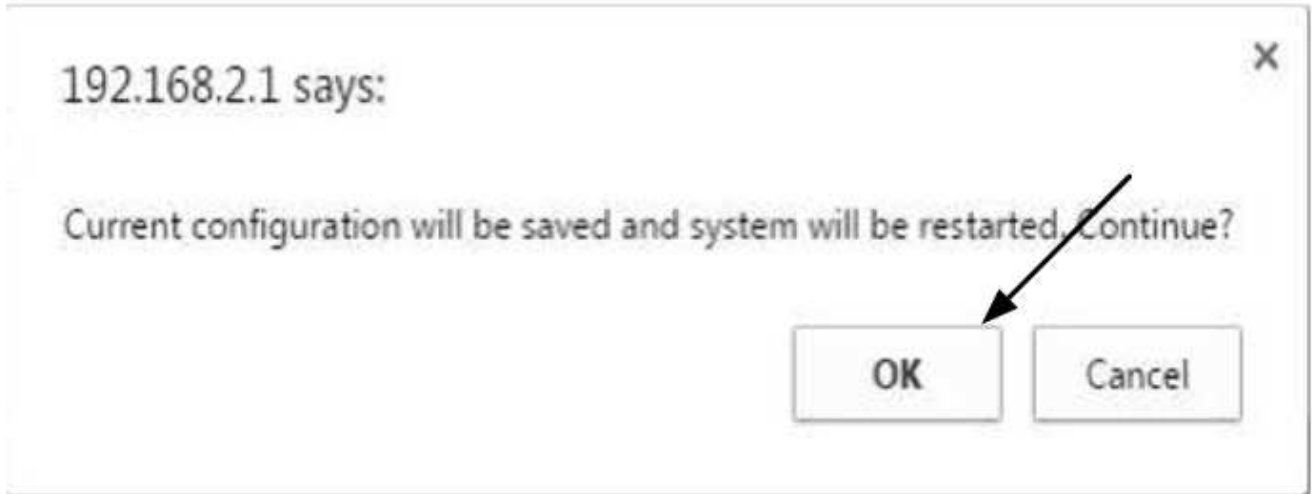


Illustration 78

g06207333

13. Click "OK" if prompted.



Illustration 79

g06207334

14. The router will reset.

15. Disconnect the blue Ethernet and reconnect to the **DSS** after the system resets.

16. Reset the **DSS** by unplugging and reconnecting the power cable.

Note: Once the **DSS** powers back on, the **DSS** should have a network connection. Connection will be viewable in "Data Up Loader" screen, and connection light on the **DSS** unit will be green.