



Special Instruction

Installation Procedure for the Product Link™ PL645 System

SMCS Code: 7606

Machine Control and Guidance Products PRODUCT LINK (S/N: PL61-UP)

Revision History:

Table 1

Revision	Summary of Changes
21	Various updates, including Dealers Service Portal, configurations, and switched inputs details.
20	Added kit part numbers in Table 3 and content parts in Tables 12 , 13 , 14 , and 15 .
19	Updated Machine part tables.
18	Removed ECM Finder references.
17	Added a note to Device Replacement section.

Contents

Machine Control and Guidance Products PRODUCT LINK (S/N: PL61-UP).....	2
Revision History:.....	2
Introduction.....	2
Product Link™ Devices.....	3
PL645 Cellular Radios.....	3
Specifications.....	3
Important Safety Information.....	3
Machine-Specific Warnings.....	4
Engine-Specific Warnings.....	5
Generator-Specific Warnings.....	5
Weld Specifications and Qualifications.....	6
Proper Welding Procedure on Machines and Engines with Electronic Controls.....	6
Product Link Radio Offerings.....	10
Required Parts for Machines.....	10
Mounting the PL645 Cellular Radio.....	11
PL645 Mounting Requirements.....	11
PL645 Environmental Information.....	12
Warning Film Installation.....	12
Installing the PL645.....	13
J1939 Port Characteristics.....	16
Turn the Equipment Power ON.....	16
Flash the PL645 Using Winflash.....	16
Upload Configuration File.....	18
Set the Product ID on the Product Link Device.....	19
Set the Machine Serial Number on the PL645 Radio.....	21
Registering Product Link based on Engine Serial Number.....	22
Registering Product Link based on Product Link Serial Number.....	23
Setting Hours on the Product Link Device.....	23
Check the LED Lights on the Radio.....	23
LED Descriptions.....	23
LED Behaviors.....	23
Connect to the Web Configuration Home Page.....	25
Product Link Interface.....	28
Connected Devices.....	29

Communication Check.....	30
Download All Service Dashboard Data.....	31
Download System Watch.....	31
Perform the Communication Check.....	31
Subscribe the Equipment in the Dealer Services Portal.....	31
Optional Inputs and Hardware.....	31
Switched Inputs.....	31
Connecting a Computer to the Product Link System.....	34
Required Software.....	34
Supported Hardware Connections.....	34
Cat® Electronic Technician (Cat ET) Service Tool.....	34
Status Groups for Cat ET.....	35

Introduction

This Special Instruction will provide instructions for installing the PL645 Product Link™ hardware.

Product Link is a remote monitoring solution that enables efficient and effective equipment management. Product Link transmits the information via a cellular network or wifi or ble communications network.

Product Link provides location-based features, event, and diagnostic based features through close integration of Electronic Modular Control Panel (EMCP) Genset controllers and machine electronics.

The PL645 can be subscribed into VisionLink or other user interfaces (UI). Each UI enables easy access to view the health and status of equipment. The ability to view all the equipment in a secure web-based application allows the management of the equipment to be more efficient.

Product Link™ Devices

PL645 Cellular Radios

The Product Link PL645 send data to the user interface (UI) over a cellular network. The interval of communication is based on the subscription level that is set. The radio uses a cellular antenna for transmitting data and a Global Positioning Satellite (GPS) or Global Navigation Satellite System (GNSS) antenna for location services. When installed on a machine by itself ("Pro" installation), the radio records data over a CAT Datalink (CDL) or a J1939/CAN datalink and sends the data to the UI. When installed along with a Network Manager, making it an "Elite" PL installation, the radio receives machine information from the Network Manager and then sends that data to the UI.

There are two types of the PL645 cellular radios, one that has an internal cellular antenna and one that requires an external cellular antenna. The functionality of both types of the PL645 are the same.

Specifications

- The PL645 support 5G/4G/3G/2G Cellular, Wi-Fi and Bluetooth connectivity
- For regulatory compliance, the CMIIT ID information will be displayed on the device label.

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 should also 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 in order to perform these functions properly. Prior to cleaning the product, disconnect the power from the product.

This equipment is not suitable for use in locations where children are likely to be present.

Safety precautions and warnings are provided in this

instruction and on the product. If these hazard warnings are not heeded, bodily injury or death could occur to you or to other persons. Caterpillar cannot anticipate every possible circumstance that might involve a potential hazard.

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 Caterpillar is safe.

Ensure that the operation, lubrication, maintenance, or repair procedures used will not create an unsafe condition or damage the product.

WARNING

Personal injury or death can result when voiding this certification.

Structural damage, an overturn, modification, alteration, or improper repair can impair the Roll-over Protective Structure's (ROPS) protection capability thereby voiding this certification.

Do not drill holes in the ROPS. Do not weld on the ROPS unless welding is specified in the procedure. Place welds only at the locations that are specified in the procedure.

To avoid possible weakening of this ROPS, consult a Caterpillar dealer before altering this ROPS in any way. The protection offered by this ROPS will be impaired if it has been subjected to structural damage.

Consult a Caterpillar dealer to determine this structure's limitations without voiding its certification.

WARNING

Improper operation of an access platform could result in injury or death. Operators must carry out their duties properly and follow all instructions and guidelines given for the machine and access platform.

WARNING

Internal battery is not a serviceable component. Do not remove or replace the internal battery unless external power has been disconnected of the area is free of ignitable concentrations.

Machine-Specific Warnings

WARNING

Do not operate or work on this machine unless you have read and understand the instructions and warnings in the Operation and Maintenance Manual. Failure to follow the instructions or heed the warnings could result in injury or death. Contact any Caterpillar dealer for replacement manuals. Proper care is your responsibility.

WARNING

Failure to follow all safety guidelines prescribed in this document and by governing authorities and regulatory agencies could result in severe injury or death of personnel or machine damage.

WARNING

Sudden movement or accidental starting of the machine can cause personal injury or death to persons on or near the machine.

To prevent personal injury or death, perform the following:

Park the machine on a smooth level surface.

Lower the blade and or attachments to the ground.

Stop the engine and engage the parking brake.

Block the wheels and install the steering frame lock.

Turn the battery disconnect switch to the OFF position and remove the key.

Place a Special Instruction, SEHS7332, "Do Not Operate" tag at the battery disconnect switch location to inform personnel that the machine is being worked on.

WARNING

Personal injury or death can result from sudden movement.

Prevent possible injury by performing the following procedures before work begins:

Move the product or equipment to a smooth, level surface.

When applicable, lower equipment/work tools to the ground.

Engage the parking brake, system brakes and/or hydraulic lockout control. When applicable, stop the engine and remove the ignition key.

Release system pressure from pressurized systems.

If applicable, block the wheels/tracks.

Turn the battery disconnect switch to the OFF position and, if applicable, remove the battery disconnect key. If not equipped with a battery disconnect switch, disconnect all positive (+) and negative (-) battery cables. Install an appropriate battery cable lockout device and protect the battery posts to prevent accidental contact and shorting.

Attach a "Do Not Operate" or similar warning tag at the battery disconnect switch location and as defined by site rules and/or local regulations.



Illustration 1

g06276183

⚠ WARNING

Access to this service point may require climbing on the equipment. Slipping or falling while climbing on the equipment could result in personal injury or death. Refer to the Operation and Maintenance Manual, “Mounting and Dismounting” topic, for safety information.

Engine-Specific Warnings

⚠ WARNING

Do not operate or work on this engine unless you have read and understand the instructions and warnings in the Operation and Maintenance Manual. Failure to follow the instructions or heed the warnings could result in injury or death. Contact any Caterpillar dealer for replacement manuals. Proper care is your responsibility.

⚠ 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.

Turn the battery disconnect switch to the OFF position and lockout the battery disconnect switch with a safety lock.

Place a Special Instruction, SEHS7332, “Do Not Operate” tag at the start switch and battery disconnect location to inform personnel that the machine is being worked on.

Generator-Specific Warnings

⚠ WARNING

Do not connect generator to a utility electrical distribution system unless it is isolated from the system. Electrical feedback into the distribution system can occur and could cause personal injury or death.

Open and secure main distribution system switch, or if the connection is permanent, install a double throw transfer switch to prevent electrical feedback. Some generators are specifically approved by a utility to run in parallel with the distribution system and isolation may not be required. Always check with your utility as to the applicable circumstances.

⚠ WARNING

Only persons with training in electrical installations must carry connections to the generator.

The generator must be wired correctly. A fire or electrocution could result from wiring that is incorrect.

The generator is capable of generating high voltages. Ensure that the generator is not on while the connections are being made. Follow these steps in order to prevent accidental starting:

1. Isolate the machine from all external loads and sources.
2. Shut off the Engine.
3. Disconnect the battery supply lines and tape the leads.

⚠ WARNING

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

⚠ WARNING

Be sure all personnel are clear of the equipment while the equipment is being lowered.

Failure to stay clear of the equipment while the equipment is being lowered may result in personal injury.

WARNING

This machine is equipped with a Caterpillar Product Link communication device. When electric detonators are used, this communication device should be deactivated within 12 m (40 ft) of a blast site, or within the distance mandated under applicable legal requirements. Failure to do so could cause interference with blasting operations and result in serious injury or death.

DANGER

ELECTROCUTION HAZARD - Ensure proper grounding.

Avoid a buildup of hazardous live voltages on exposed surfaces by ensuring that all grounding wires/straps are always properly connected.

Disconnected grounding wires, including grounding wires/straps for hazardous-voltage components and electrical enclosures, must be properly reconnected before connecting equipment to the power supply.

Failure to follow these instructions will result in personal injury or death.

Weld Specifications and Qualifications

WARNING

Personal injury or death can result from fumes, gases and ultraviolet rays from the weld arc.

Welding can cause fumes, burn skin and produce ultraviolet rays.

Keep your head out of the fumes. Use ventilation, exhaust at the arc, or both, to keep fumes and gases from your breathing area. Wear eye, ear and body protection before working.

Protect yourself and others; read and understand this warning. Fumes and gases can be dangerous to your health. Ultraviolet rays from the weld arc can injure eyes and burn skin. Electric shock can cause death.

Read and understand the manufacturer's instructions and your employer's safety practices. Do not touch live electrical parts.

See "American National Standard Z49.1, Safety in Welding and Cutting" published by the American Welding Society.

American Welding Society
2501 N.W. 7th Street
Miami, Florida 33125

See "OSHA Safety and Health Standards, 29 CFR 1910", available from U.S. Department of Labor.

U.S. Department of Labor
Washington, D.C. 20210

Reference: Special Instruction, REHS1841, "General Welding Procedures" for more welding instructions.

Proper Welding Procedure on Machines and Engines with Electronic Controls

Proper precautions are necessary to prevent damage to electronic controls. When you weld on a machine with electronic controls, use the steps that follow:

1. Turn off the engine. Put the key start switch in the OFF position.
2. If the machine has a battery disconnect switch, open the switch. If the machine does not have a battery disconnect switch, disconnect the negative battery cable at the battery.
3. Connect the ground cable for the welder directly to the actual machine component that will be welded. Attach the clamp for the ground cable as close as possible to the area that is being welded. This connection will reduce the chance of damage from welding current to the components that follow: bearings, hydraulic components, and electrical components.

Regulatory Information and Notices

FCC Notice

This device complies with Part 15 of the FCC rules.

Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with FCC Part 22, Part 24, and with limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/tv technician for help

Changes or modifications to this device without the express approval of Caterpillar may void the users authority to use this device.

We, Caterpillar Inc., declare under our sole responsibility that the product PL645 complies with Part 15 Subpart B of FCC CFR47 Rules.

Note: All Product Link devices with an internal antenna and all devices with an associated transmitting antenna must be located more than 20 cm (7.874 inch) from the machine operator to comply with FCC Regulations for RF human body safety. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

Canada Notice to Users

This device complies with Industry Canada license exempt RSSs. Operation is subject to the following two conditions:

- This device may not cause interference
- This device must accept any interference, including interference that may cause undesired operation of the device.
- Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:
- l'appareil ne doit pas produire de brouillage;
- l'utilisateur de l'appareil doit accepter tout

brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

- The device shall be used in such a manner that the potential for human contact normal operation is minimized. This equipment complies with RSS-102 radiation exposure limits. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.
- Le dispositif doit être utilisé de manière à minimiser le potentiel de fonctionnement normal par contact humain. Cet équipement est conforme aux limites d'exposition au rayonnement RSS-102. Cet équipement doit être installé et utilisé avec une distance minimale de 20 cm entre le radiateur et votre corps. Cet appareil et son (ses) antenne (s) ne doivent pas être co-localisés ou utilisés conjointement avec une autre antenne ou un autre émetteur

sDoC

(Simplified Declaration of Conformity)



European Union

Caterpillar Inc. 100 NE Adams Peoria, IL 61629 USA

Hereby, Caterpillar Inc. declares this radio equipment is in compliance with directive "2014/53/EU". The full text of the European Declaration of Conformity is available at the following web address:

<https://www.cat.com/radio-compliance>



Great Britain

Caterpillar Inc. 100 NE Adams Peoria, IL 61629 USA

Hereby, Caterpillar Inc. declares this radio equipment is in compliance with the relevant statutory requirements. The full text of the Great Britain Declaration of Conformity is available at the following web address:

<https://www.cat.com/radio-compliance>

The Product is in conformity with Directive 2011/65/EU on Restriction of the use of certain Hazardous Substances in electrical and electronic equipment.

Specifications

The following Cat Product Link communication device specifications are provided to aid in conducting any related hazard assessment and to ensure compliance with all local regulations:

Cellular Frequency Information					
Uplink Frequency (MHz) (Transmit)	Downlink Frequency (MHz) (Receive)	Band	2G/3G/4G	Conducted Output Power (Nominal)	Class
1850-1910	1930-1990	GSM 1900	2G	30 dBm	Class 1
1710-1785	1805-1880	GSM 1800	2G	30 dBm	Class 1
824-849	869-894	GSM 850	2G	33 dBm	Class 4
880-915	925-960	GSM 900	2G	33 dBm	Class 4
1920-1980	2110-2170	1	3G	23 dBm	Class 3
1850-1910	1930-1990	2	3G	23 dBm	Class 3
1710-1755	2110-2155	4	3G	23 dBm	Class 3
824-849	869-894	5	3G	23 dBm	Class 3
880-915	925-960	8	3G	23 dBm	Class 3
830-845	875-890	19	3G	23 dBm	Class 3
1920-1980	2110-2170	1	4G	23 dBm	Class 3
1850-1910	1930-1990	2	4G	23 dBm	Class 3
1710-1785	1805-1880	3	4G	23 dBm	Class 3
1710-1755	2110-2155	4	4G	23 dBm	Class 3
824-849	869-894	5	4G	23 dBm	Class 3
2500-2700	2620-2690	7	4G	23 dBm	Class 3
880-915	925-960	8	4G	23 dBm	Class 3
699-716	729-746	12	4G	23 dBm	Class 3
777-787	746-756	13	4G	23 dBm	Class 3
788-798	758-768	14	4G	23 dBm	Class 3
704-716	734-746	17	4G	23 dBm	Class 3
815-830	860-875	18	4G	23 dBm	Class 3
830-845	875-890	19	4G	23 dBm	Class 3
832-862	791-821	20	4G	23 dBm	Class 3
1850-1915	1930-1995	25	4G	23 dBm	Class 3
814-849	859-894	26	4G	23 dBm	Class 3
703-748	758-803	28 (A and B)	4G	23 dBm	Class 3
N/A	717-728	29 (SDL)	4G	RX ONLY	N/A
2010-2025	2010-2025	34 (TDD)	4G	23 dBm	Class 3
2570-2620	2570-2620	38 (TDD)	4G	23 dBm	Class 3
1880-1920	1880-1920	39 (TDD)	4G	23 dBm	Class 3
2300-2400	2300-2400	40 (TDD)	4G	23 dBm	Class 3
2496-2690	2496-2690	41 (TDD)	4G	23 dBm	Class 3
3400-3600	3400-3600	42 (TDD)	4G	23 dBm	Class 3
3600-3800	3600-3800	43 (TDD)	4G	23 dBm	Class 3
3550-3700	3550-3700	48 (TDD)	4G	23 dBm	Class 3
1710-1780	2110-2200	66	4G	23 dBm	Class 3
663-698	617-652	71	4G	23 dBm	Class 3
1920-1980	2110-2170	N1	5G	23 dBm	Class 3
1850-1910	1930-1990	N2	5G	23 dBm	Class 3
1710-1785	1805-1880	N3	5G	23 dBm	Class 3
824-849	869-894	N5	5G	23 dBm	Class 3

2500-2570	2620-2690	N7	5G	23 dBm	Class 3
880-915	925-960	N8	5G	23 dBm	Class 3
699-716	729-746	N12	5G	23 dBm	Class 3
788-798	758-768	N14	5G	23 dBm	Class 3
832-862	791-821	N20	5G	23 dBm	Class 3
1850-1915	1930-1995	N25	5G	23 dBm	Class 3
814-849	859-894	N26	5G	23 dBm	Class 3
703-748	758-803	N28 (A and B)	5G	23 dBm	Class 3
N/A	2350-2360	N30 (disabled in USA)	5G	RX ONLY	-
2570-2620	2570-2620	N38 (TDD)	5G	23 dBm	Class 3
2300-2400	2300-2400	N40 (TDD)	5G	23 dBm	Class 3
2496-2690	2496-2690	N41 (TDD)	5G	23 dBm	Class 3
3550-3700	3550-3700	N48 (TDD)	5G	23 dBm	Class 3
1710-1780	2110-2200	N66	5G	23 dBm	Class 3
1695-1710	1995-2020	N70	5G	23 dBm	Class 3
663-698	617-652	N71	5G	23 dBm	Class 3
3300-4200	3300-4200	N77 (TDD)	5G	23 dBm	Class 3
3300-3800	3300-3800	N78 (TDD)	5G	23 dBm	Class 3
4400-5000	4400-5000	N79 (TDD)	5G	23 dBm	Class 3
Wi-Fi Frequency Information					
Uplink Frequency (MHz) (Transmit)	Downlink Frequency (MHz) (Receive)	Band	Operation Mode	Output Power	Class
2401-2484	2401-2484	802.11 b/g/n	WiFi 2.4 GHz	19 dBm	DTS
4900-5925	4900-5925	802.11 a/n/ac/ax	WiFi 5 GHz	17 dBm	DTS
BLE Frequency Information					
Uplink Frequency (MHz) (Transmit)	Downlink Frequency (MHz) (Receive)	Band	Operation Mode	Output Power	Class
2400	2483.5	N/A	BLE	16 dBm	1 BLE (DTS)
GNSS Frequency Information					
Uplink Frequency (MHz) (Transmit)	Downlink Frequency (MHz) (Receive)	Band	Operation Mode	Output Power	Class
N/A	1561.098-1610	L1, E1, G1, B1C	GNSS	RX ONLY	N/A

Product Link Radio Offerings

Table 2

Product Link Pro Radio Offerings				
Part Number	Part Name	Suffix Code	Connectivity	Antenna
661-9821	Electronic Control Gp (PL645)	008D	5G/4G/3G/2G Cellular Wi-Fi BLE	Internal
661-9822	Electronic Control Gp (PL645)	008D	5G/4G/3G/2G Cellular Wi-Fi BLE	External

Required Parts for Machines

The PL645 offer different varieties of installation, hardware, and options. There are kit part numbers that can be ordered that provide all the part numbers needed for installation. This publication contains information on how to install and utilize the PL645. The following installation instructions are for radio only installations, known as “Pro”. The harness for machine kits includes unshielded CAN/ J1939 wiring.

Block Diagram and System Components

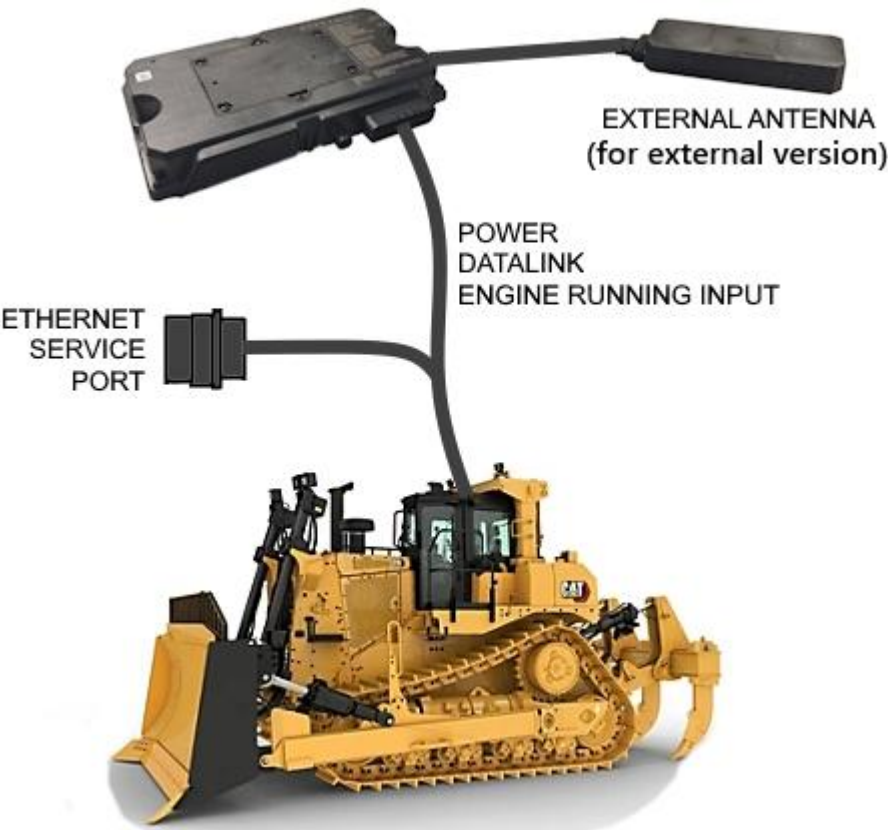


Illustration 6

g03731030

Mounting the PL645 Cellular Radio

PL645 Mounting Requirements

- When using PL645 radio with internal antenna, the radio should be mounted in a horizontal orientation.
- When using PL645 radio with internal antenna, the radio must be located more than 200 mm (7.87 inch) from the machine operator to comply with FCC regulations for RF human body safety.
- When using the PL645 radio with an external antenna, the antenna must be located more than 200 mm (7.87 inch) from the machine operator to comply with FCC regulations for RF human body safety.
- When installing a cellular radio with external antenna, ensure the external antenna, is mounted a minimum of 203.2 mm (8 inch) away from any metal structures that extend above the mounting plane. Any metal obstruction for the radio will create diminished cellular and GPS connectivity.
- When using PL645 radio with external antenna, the external antenna should be mounted in a horizontal orientation.
- The radio or antenna needs to have a clear line of sight of the sky. Usually, the canopy/container roof will provide an optimal view of the sky with minimal blockages.
- To utilize the GPS Signal, the cellular radio or antenna may be mounted under a non-metallic cover, but not a metallic one.

- Do not mount the radio or antenna in an area that will expose the radio or antenna to extreme conditions of heat. Exposure to high heat may make the radio or antenna inoperable. Refer to Table 25 .
- The maximum torque for the radio mounting bolts is 3.5 N·m (2.581 lb ft).
- Locate the radio and antenna so that the radio and antenna connectors are not exposed to high-pressure spray or underwater immersion. Exposure to high-pressure spray or underwater immersion may compromise the connector seals and lead to connection failure.
- Keep a distance of no less than 500 mm (19.68 inch) between the radio and other antennas that transmit a radio signal. The lists of radio antennas to maintain a distance from include the citizen band radio, data radio, and commercial communication radios.
- Keep in mind the routing of the radio and antenna cable. Route the cable such that the cable is not subject to abrasion or pinching. Do not route the cable near any source of extreme heat (exhaust). Do not mount the cable so that the limitations of temperature -40° C (-40.00° F) and 85° C (185.00° F) are exceeded.
- The coax wiring between the Product Link radio and the external antenna cannot exceed 4.5 m (14.76 ft).
- Route the coax antenna cable with a minimum bend radius of 49.5 mm (1.94 inch). Bend radius depends on the type of cable used. Do not bend the radius any less than ten times the diameter of the cable.

PL645 Environmental Information

Table 25

PL645 Environmental Information Table	
Parameter	Specification
Operating Temperature Range	-40 C (-40 F) to 60 C (140 F)
Vibration	TTT Profile XXII: 4.41 gRMS Engine Profile Va: 9.73 gRMS
Sealing	34.5 kPa +/- 3.5 kPa (5.03 +/- 0.507 psi)
Operating Voltage	9 VDC to 32 VDC
Jump-Start Voltage	18 VDC to 48 VDC
Non-Destructive Voltage Range	-32 VDC to 48 VDC

Warning Film Installation

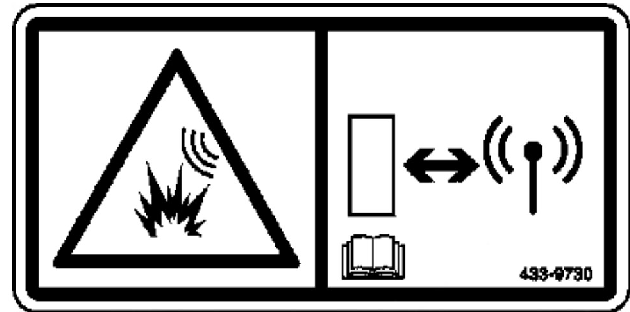


Illustration 8

g03356592

Film

Install the warning film in Illustration 14 in a location such as the dash or control panel. Ensure that the warning film is clearly visible to the operator during the normal operation of the equipment.

WARNING

This equipment is equipped with a Cat® Product Link communication device. When electric detonators are being used for blasting operations, radio frequency devices can cause interference with electric detonators for blasting operations which can result in serious injury or death. The Product Link communication device should be deactivated within the distance mandated under all applicable national or local regulatory requirements. In the absence of any regulatory requirements Caterpillar recommends the end user perform their own risk assessment to determine safe operating distance.

The blast site is defined as the area that handles explosive material during loading. Included is the perimeter that is formed by the loaded blast holes.

If required, the following are suggested methods to disable the Caterpillar Product Link communication device:

- Turn the Product Link radio disable switch to the OFF position.
- Remove the PL Radio from the machine

Note: If no radio disable switch is installed and the equipment will be operating near a blast zone, a radio disable switch may be installed. The switch will allow the Caterpillar Product Link communication device to be shut off by the operator from the equipment control panel. Refer to Special Instruction, REHS7339, Special Instruction, REHS8850, Special Instruction, REHS9111, and Special Instruction, REHS9757 for more details and installation instructions.

Installing the PL645

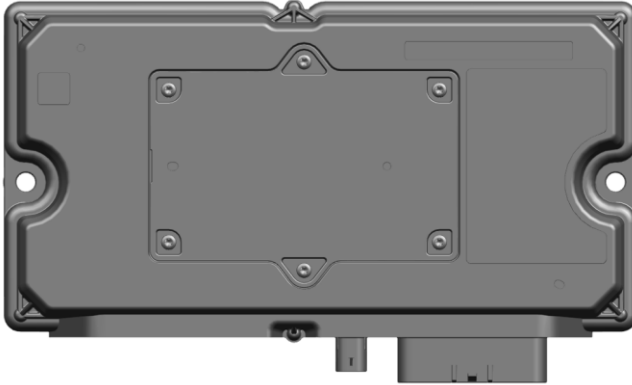


Illustration 9 g07838276
661-9821 Electronic Control Module (internal antenna variant)

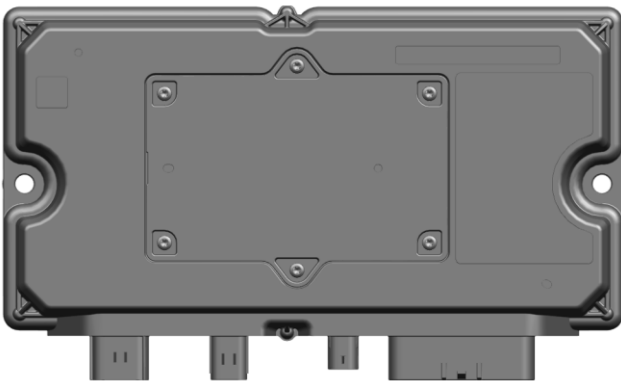


Illustration 10 g07838278
661-9822 Electronic Control Module (external antenna variant)

Table 26

PL645 Connections		
Connector	Contact	Function
4-pin AmpSeal	1	Cellular Diversity antenna connection
4-pin AmpSeal	2	Wi-Fi antenna connection
4-pin AmpSeal	3	Cellular main antenna connection
4-pin AmpSeal	4	BLE antenna connection
1-pin AmpSeal	1	GNSS antenna connection
2-pin eNet	1	2-wire Ethernet +
2-pin eNet	2	2-wire Ethernet -
26-pin TE	1	4-wire Ethernet Port 1 TX +
26-pin TE	2	4-wire Ethernet Port 1 TX -
26-pin TE	3	4-wire Ethernet Port 2 TX +
26-pin TE	4	4-wire Ethernet Port 2 TX -
26-pin TE	5	J1939 Port 1 High
26-pin TE	6	J1939 Port 1 Low
26-pin TE	7	Engine Running Input
26-pin TE	8	RS485 B
26-pin TE	9	Remote Disable Lamp
26-pin TE	10	Switched Input 1
26-pin TE	11	Switched Input 2
26-pin TE	12	Key Switch Input
26-pin TE	13	Batt +
26-pin TE	14	4-wire Ethernet Port 1 RX +
26-pin TE	15	4-wire Ethernet Port 1 RX -
26-pin TE	16	4-wire Ethernet Port 2 RX +
26-pin TE	17	4-wire Ethernet Port 2 RX -
26-pin TE	18	J1939 Port 2 High / CDL -
26-pin TE	19	J1939 Port 2 Low / CDL +
26-pin TE	20	RS485 Shield
26-pin TE	21	RS485 A
26-pin TE	22	Remote Disable Relay
26-pin TE	23	Switched Input 3
26-pin TE	24	Factory Reset
26-pin TE	25	Wireless Disable
26-pin TE	26	Batt -

5G Hard Mount Antenna

Parts Required for Hard Mount		
Qty	Part Number	Part Name
4	8T-4971	Bolts
8	9X-8256	Washers
4	129-3178	Locknuts

Note: Ensure that mounting location does not violate “Environmental Standards” from Table 25 .

Note: Installations of the adhesive mount external antenna will have difficulty acquiring the proper adhesive properties when both the antenna and the mounting surface are below certain temperatures. For installations on a metal surface, temperatures under -6.67°C (20°F) will cause improper adhesion. For installations on a non-metallic surface, temperatures under -1.11°C (30°F) will cause improper adhesion. Increase the temperature of the adhesive mount external antenna, and the mounting surface prior to installation if necessary. Apply direct force until the adhesive mount antenna can hold on its own. Full adhesion can take over 24 hours in colder climate.

1. Place the radio in the desired mounting location. Lay out the necessary hole pattern, keeping in mind the harness must extend outward from the radio.

Note: Refer to PL645 Mounting Requirements when considering the desired mounting location.

2. Lay out the necessary hole pattern.
3. Drill the holes.
4. Install the required bolts, washers, and locknuts to secure the radio.
5. Tighten the mounting bolts for the radio to $6.1\text{ N}\cdot\text{m}$ (4.50 lb ft).

Note: Do not connect the radio now.

6. Locate a clean dry location where the external antenna can be mounted horizontally with clear line of site to the sky.

Note: Ensure that the cable length of the external antenna is long enough to reach to the mounted location of the PL645 cellular radio.

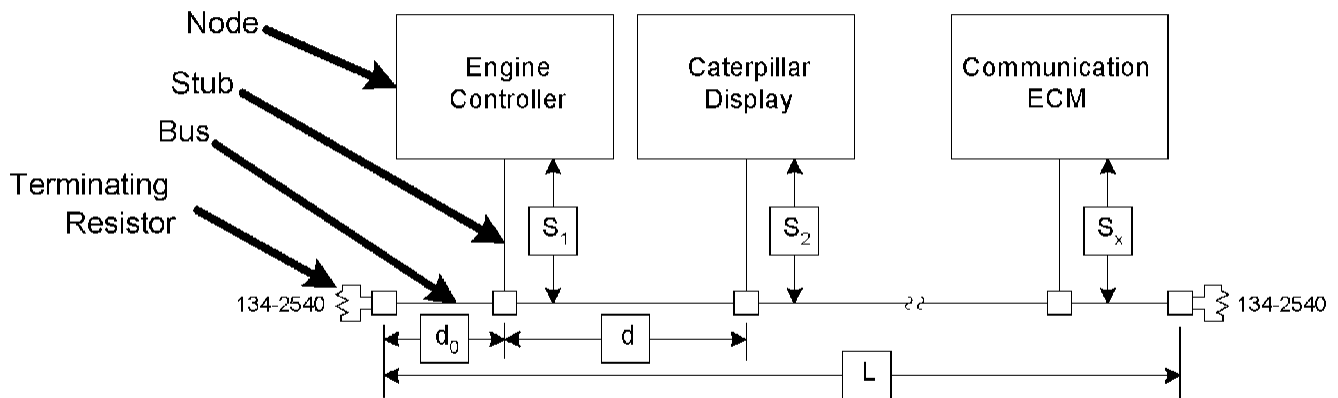
7. Install the antenna. For the adhesive mount antenna, refer to Step 7a. For the hard mount antenna, refer to Step 7b.
 - a. Remove the adhesive cover tab on the back of the Antenna As. This will expose the adhesive mounting surface of the external antenna. Apply the adhesive surface to the previously chosen clean dry surface.
 - b. Locate and drill a 19 mm (0.75inch) hole for the Antenna As. Install the antenna with the provided hardware.

Note: For antennas requiring an isolation mount refer to “Isolated Hard Mount Antenna Installation”.

8. Route the external antenna cables back to the location of the PL645 cellular radio. Connect the coax cables to the external antenna and the PL645 cellular radio.

Note: When connecting the J1939 / CAN wires from the Product Link device to the piece of equipment, ensure that the wires are connected to the CAN 1 / Local CAN wires on the equipment. Some pieces of equipment will have other connections labeled CAN 2/ Global CAN. If the Product Link device is connected to the wrong CAN connection, the proper data will not be recorded and sent to the User Interface.

J1939 Port Characteristics		
	Value	
Parameter	Shielded (SAE J1939 -11)	Unshielded (SAE J1939 -15)
Maximum Nodes (n)	30	10
Maximum length of the Bus (L)	40 m (131.23 ft)	
Maximum length of the Stub Wire (S)	1 m (3.28 ft)	3 m (9.84 ft)
Node Distance (d)	0.1 m (0.328 ft) to 40 m (131.23 ft)	
Minimum Distance to Terminating Resistor (d)	0.0 m (0.000 ft)	
Terminating Resistors	120 Ohm, 0.4 W	



Typical J1939 communications network layout

Turn the Equipment Power ON

Note: To avoid possible registration issues, do not apply power to the system until all hardware has been installed and all electrical connections are made.

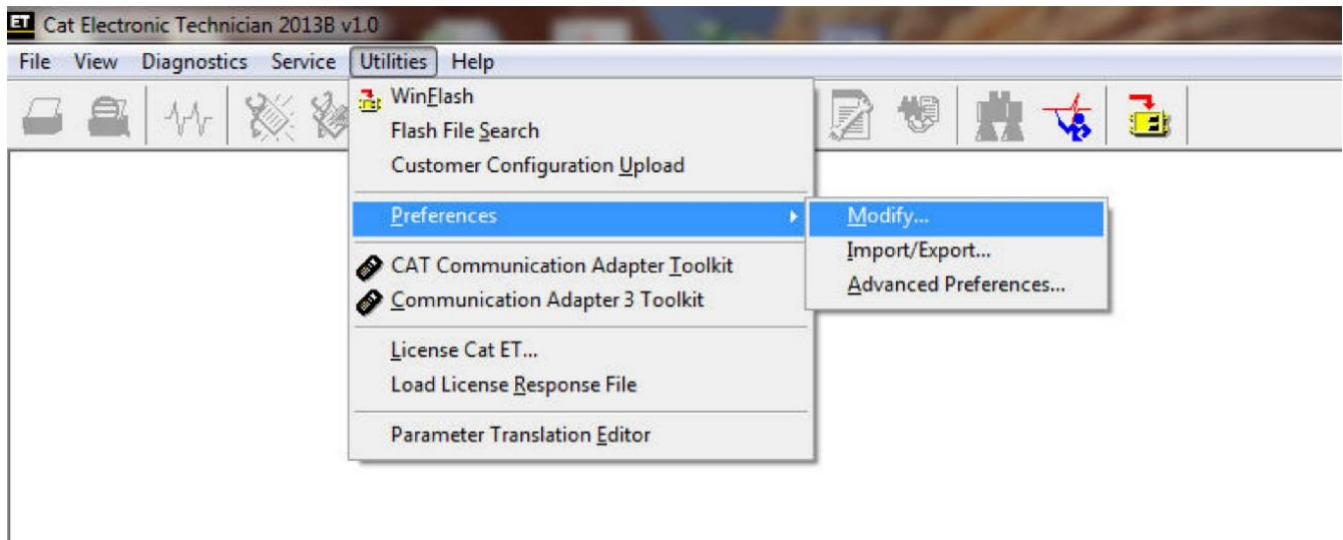
Once the radio has been connected, and the wires from the retrofit harness for battery positive, battery negative, and key switch power have been properly connected to the equipment, turn on the power to the equipment.

Flash the PL645 Using Winflash

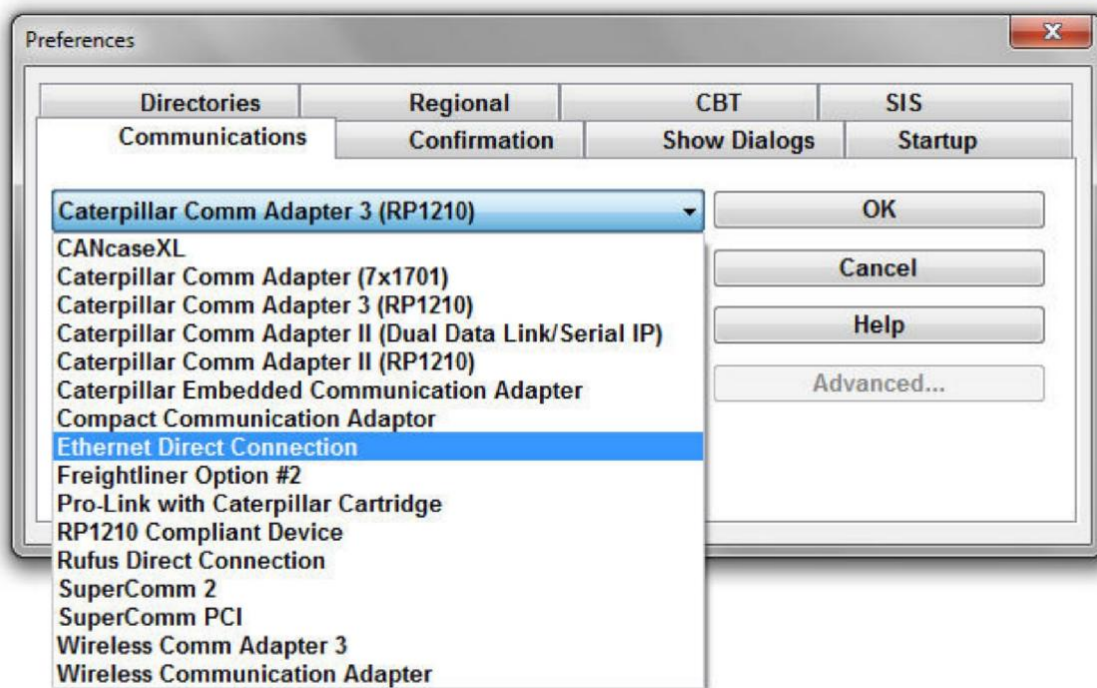
Perform the following procedure to flash the radio. The radio is flashed to upgrade the software. Flash programming of the radio must also be done if the radio has been replaced. The Cat Electronic Technician (Cat ET) contains the program WinFlash. WinFlash is used to load software into the radio. The following procedure is used to flash software into the radio.

1. If the asset does not use the 14-pin service connector, connect the 425-6889 Cable As to the laptop and 9-pin service port connector on the Product Link harness. If the asset uses a 14-pin connector, use a standard Ethernet cable and connect one end to the laptop and the other end to the back of the 457-6114 Cable As. Plug the 457-6114 Cable As into the 14-pin service port.

- a. Open Cat ET.



- b. Inside "Utilities" select "Preferences" then "Modify".



- c. Select the "Communications" tab and choose "Ethernet Direct Connection".

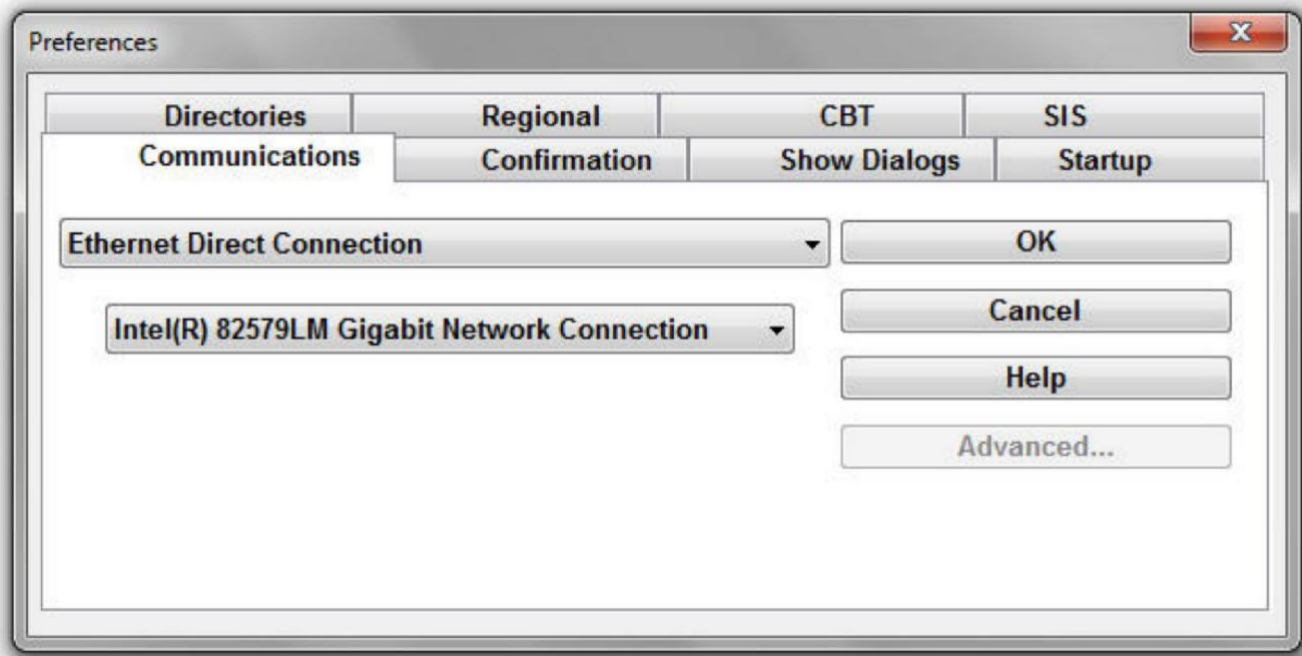


Illustration 29

g03396549

d. The drop-down under “Ethernet Direct Connection” will have multiple options based on the laptop being used. Select the option based on the wired Ethernet connection of the laptop.

e. Open and use WinFlash to load the software.

Note: Typical software flash can take up to 15 minutes, and may appear to stop at 45 percent. The flash will continue on its own. Actual flash times may vary.

Note: After the flash is complete reset the preferences that were changed in Step 1c.

Upload Configuration File

Note: Not all equipment has a standard Configuration File. All configuration file part numbers are listed in Special Instruction, M0170623, “Recommended Cat® Product Link™ Configuration Files for Certain Cat® Construction Machines”. If there is not a configuration file listed for your product, a Configuration File is not needed.

For equipment that has a configuration file created, it will be already installed on the product that was built with a PL645 Radio at the factory. A configuration will need to be installed if one of the following have been performed.

- Replaced a failed PL645
- Retrofit kit installation

If you are unsure of what configuration file you need for a retrofit installation, contact Cat Digital Support for assistance.

Complete the following steps to install the configuration file.

1. Connect to the “Web Configuration” home page using Cat ET. For instructions on how to use Cat ET refer to “Connect to the Web Configuration Home Page” in this document.

Product Link / VIMS Configuration Manager

Upload Configuration -

Select a configuration file(.cfg) and click Upload

Choose File

No file chosen

Upload

Configuration file can be generated and downloaded from [VIMS Config Tool](#)

Delete Configuration -

☐ Standard Config

☐ Engineering Config

☐ Customer Config

Delete

Illustration 30

g03824579

2. Once connected to the “Web Configuration” home page, under the Product Link drop-down, select “Upload / Delete Config” . This page allows you to upload new config files or delete existing config files. Refer to Illustration 30.
3. Choose the “Browse” button to upload the configuration file that is already stored on your computer.
4. Select the “Upload” button to upload the configuration file.

Note: The radio will need to power cycle before the configuration file part number is displayed in the “Product Link Interface” .

Set the Product ID on the Product Link Device

Note: The product ID should always be set for Caterpillar machines. The product ID should be the serial number of the prime product. The product ID must follow the standard 8-digit Caterpillar serial number format. For OEM equipment that does not follow that format, Refer to “Set the Machine Serial Number on the PL645”.

The Product Link system will automatically send a registration message to the UI when installed on a piece of Caterpillar equipment, if the Product Link device detects a Caterpillar engine on the datalink. The Product Link device will send a registration message to be subscribed in the UI based on the engine serial number. The PL645 system offers the option for the equipment to be subscribed under a different name or serial number. Use the following steps to change the equipment name or serial number.

1. Connect to the equipment service port connector using your Caterpillar Communication Adapter.
2. Choose the “Telematics ECM” .

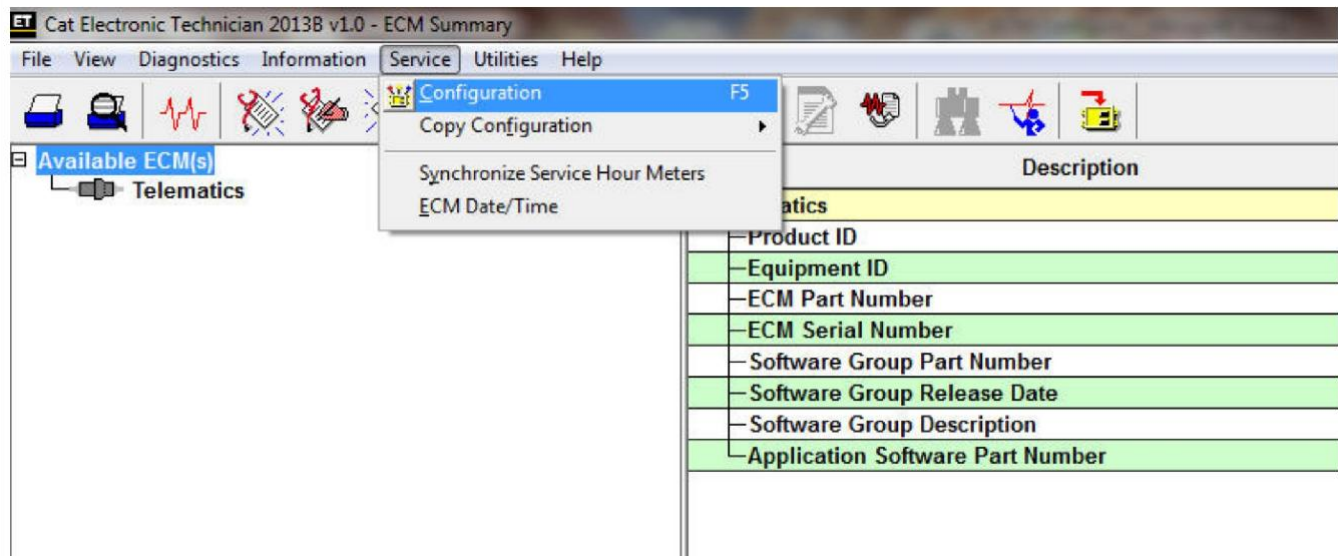


Illustration 31

g03514804

- Open the configurations screen by choosing "Service" and then "Configuration". Refer to Illustration 31.

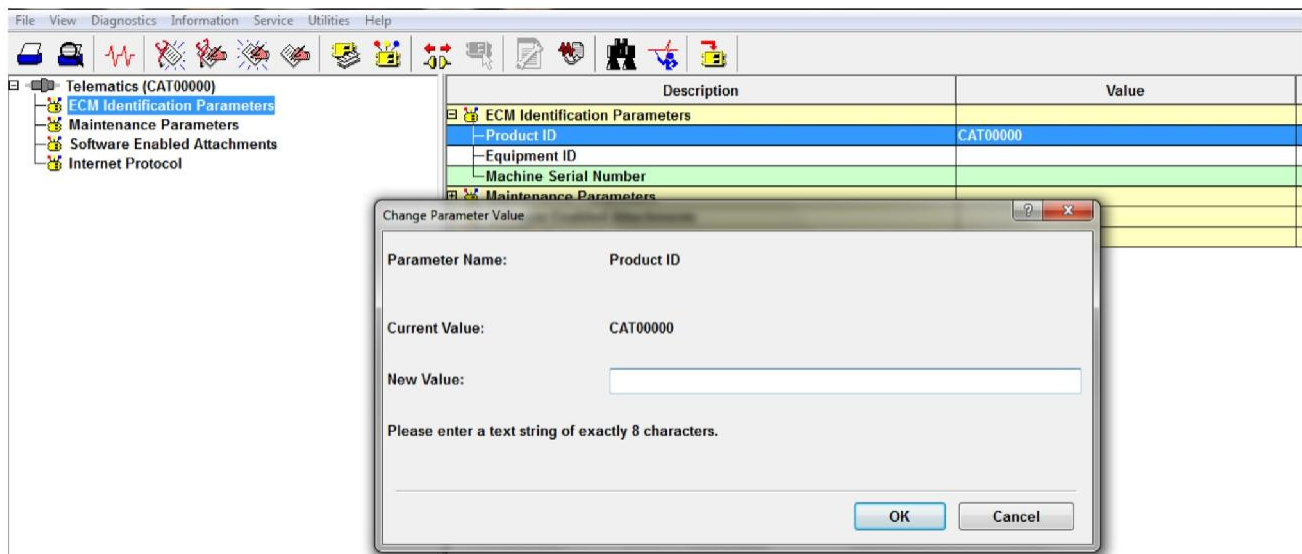


Illustration 32

g03705400

- The Product ID will show up in the "ECM Identification Parameters" and will be a default of "CAT00000". In the "New Value" field enter the serial number of the equipment. Refer to Illustration 32.

The PL645 will automatically generate a new registration message. Along with the new registration message the equipment will be subscribed in UI based off the Product ID entered.

Note: For Caterpillar machines, it should be the Product ID of the machine. For stand-alone engines, it should be the Product ID of the engine. Package serial number should be used for Electric Power Generators.

Note: For equipment not appearing in the Dealer Services Portal (DSP), verify that the Product Link ECM can be viewed by using a Com adapter on the equipment service port connector. The equipment will need to be detected on a CAN data link to appear in the DSP.

Set the Machine Serial Number on the PL645 Radio

Note: The machine serial number should be set anytime the desired serial number to be seen in the User Interface is not a standard Caterpillar serial number. The machine serial number is predominantly for OEM equipment. The machine serial number can be up to 17 characters long, and cannot contain any special characters.

The Product Link system will automatically send a registration message to UI when installed on a piece of equipment. The Product Link device will send a registration message to be subscribed in UI based on the engine serial number. The Product Link system offers the option for the equipment to be subscribed under a different name or serial number. Use the following steps to change the equipment name or serial number:

1. Connect to the equipment service port connector using your Caterpillar Communication Adapter.
2. Choose the telematics ECM.

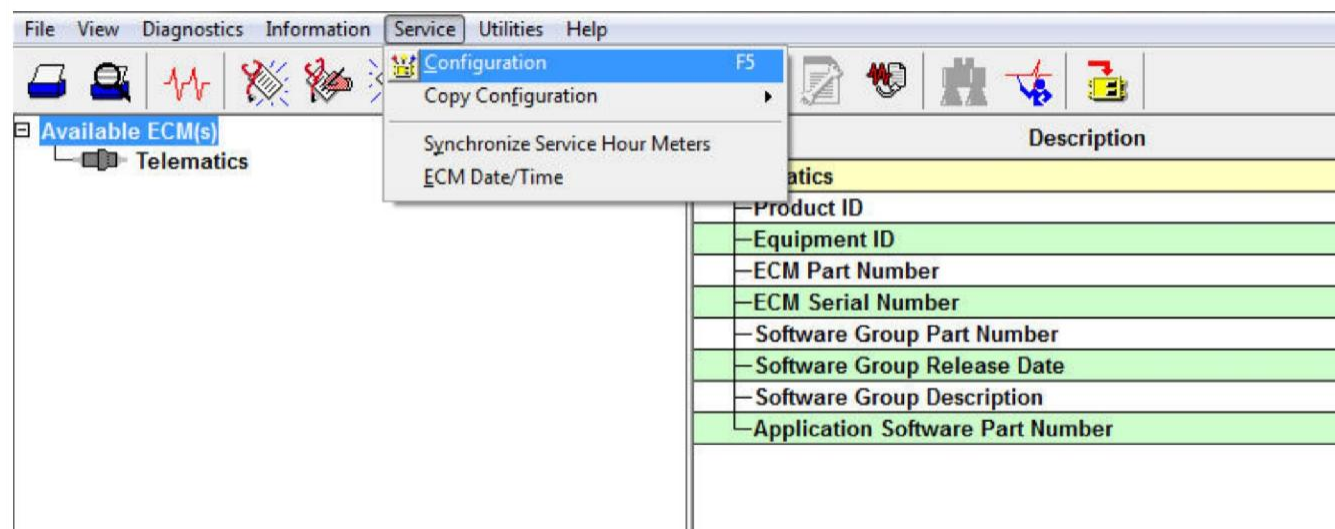


Illustration 33

g03794992

3. Open the configurations screen by choosing "Service" and then "Configuration". Refer to Illustration 33.

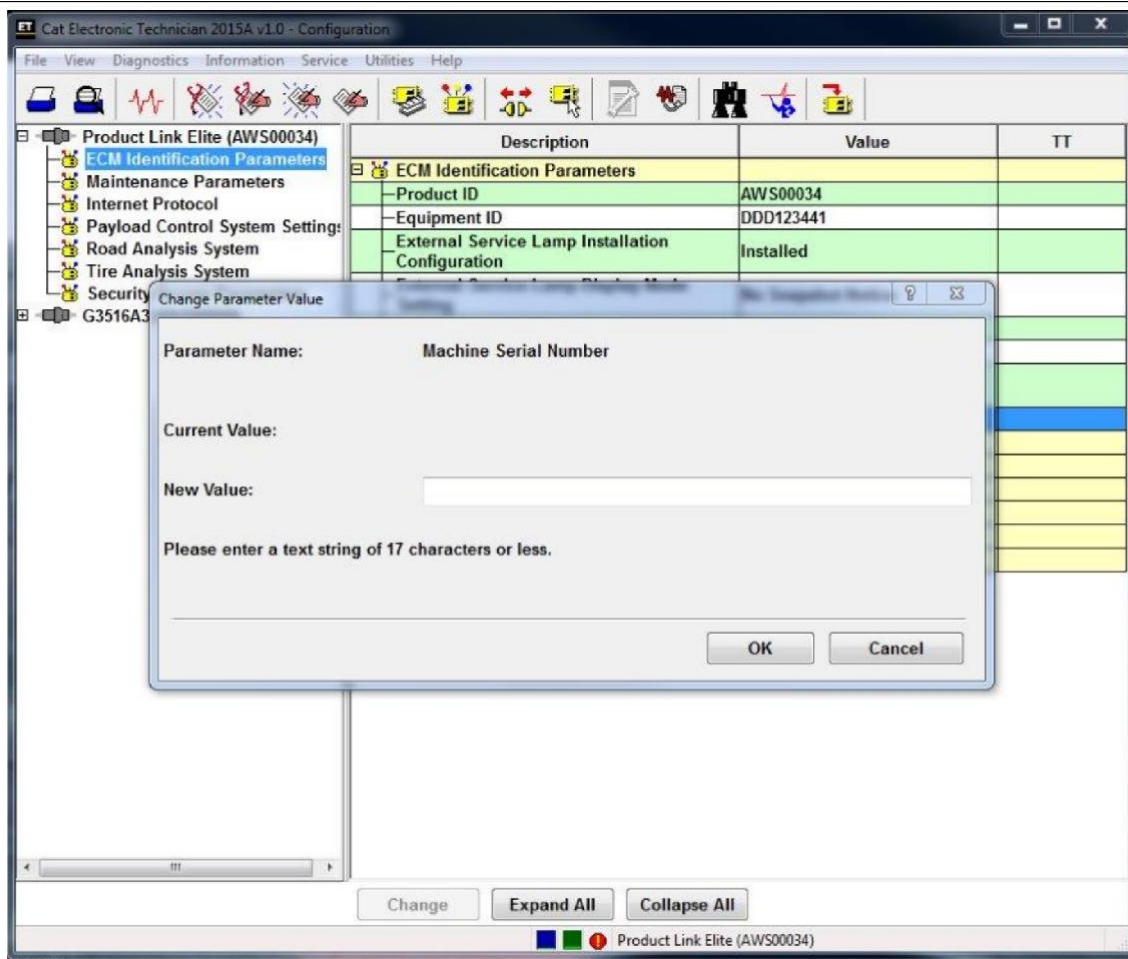


Illustration 34

g03837279

- The machine serial number will show up in the "ECM Identification Parameters" and will not have a value as default. In the "New Value" field enter the serial number of the equipment. Refer to Illustration 34.

The PL645 Radio will automatically generate a new registration message. Along with the new registration message, the equipment will be subscribed in the User Interface based off the machine serial number entered.

Note: To reset the machine serial number to its default value, enter 17 pound signs (#####). Users may encounter an error stating that special characters are not allowed, but the reset will be successful.

Registering Product Link based on Engine Serial Number

The Product Link device will automatically register based on the serial number of the engine on the datalink, either CDL or CAN/J1939. The Product Link device must be connected to the datalink in order for the Product Link device to register based on the serial number of the engine. The engine on the datalink must be a Caterpillar engine in order for the Product Link device to register based on the engines serial number. This is an auto detect field only, and cannot be programmed. If the equipment is registered based on the engine serial number, the product ID, or machine serial number can be set remotely from the Dealer Services Portal. If the product ID or machine serial number are set, they will override any engine serial number that is detected on the datalink. The equipment will then be found in Dealer Services Portal based on the product ID or machine serial number.

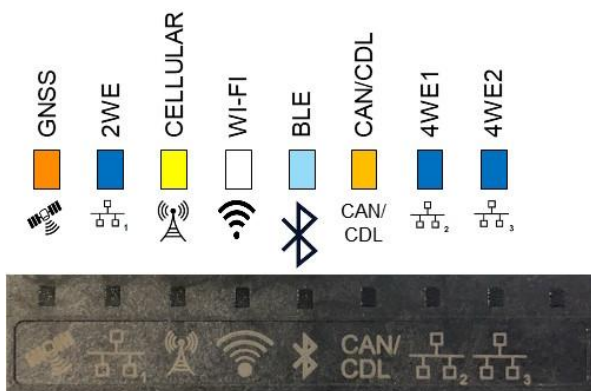
Registering Product Link based on Product Link Serial Number

If the product ID and machine serial number are not set, and there is not a Caterpillar engine on the datalink for the Product Link device to register, the Product Link device will send a registration message with the Product Link device information. This will allow the user to search the serial number of the Product Link device in the Dealer Services Portal, and then set either the product ID, or the machine serial number remotely.

Setting Hours on the Product Link Device

To ensure that the Product Link device is reporting accurate service meter hours values, navigate to the "Synchronize Service Hour Meters" page within Cat ET and validate that the hours currently set on the Product Link device are correct. For assets without Sync Clock, hours can also be set remotely from the VisionLink user interface. If setting hours remotely, users are encouraged to ensure that the asset is currently keyed ON when the command is sent to ensure a quick implementation of the update for data accuracy.

Check the LED Lights on the Radio



LED Descriptions

The PL645 are equipped with 8 LEDs that function when the asset's key switch is in the on position. These LEDs can be used to assist in troubleshooting or verifying radio functionality. From left to right the LEDs are:

- Orange (GNSS)
- Blue (2-wire Ethernet)
- Yellow (Cellular)
- White (Wi-Fi)
- Ice Blue (BLE)
- Amber (CAN/CDL)
- Blue (4-wire Ethernet Port 1)

LED Behaviors

LED Self-Test at Boot-Up:

Each time the PL645 boot up all the LED indicators, except the blue Ethernet indicators, will perform a self-test during which time the indicators should remain on for approximately 30 seconds. The indicators will then turn off until the boot-up process is complete. Once the boot-up process is complete and the PL645 is operational, the individual indicators will behave according to their specific function.

LED Behavior After Normal Shutdown (Key Switch off)

After the asset's Key Switch is turned off, and as long as the Master Disconnect remains closed, the PL645 should remain operational for approximately 5 minutes. During that time the indicators continue to operate as if the key were on, except for the amber CDL/J1939 indicator. Since all datalink traffic stops at key off, the amber indicator will turn off immediately.

LED Behavior During Low Power Mode (LPM) Wake-up

Approximately 5 minutes after the asset's key switch is turned off the PL645 will power down and enter Low Power Mode. While operating in LPM the PL645 will power up at scheduled intervals determined by the current subscription and remain on for approximately 5 minutes while it transmits any pending messages, checks the Caterpillar Back Office for waiting commands, etc. During the 5-minute powered on time, the indicators will operate as if the key switch were on, except the amber CDL/J1939 indicator. Since there is no datalink traffic during a LPM wake-up, the amber LED will remain off.

LED Behavior During Datalink-triggered Wake-up

The PL645 is designed to power up from LPM if it detects activity on the J1939 datalink. As long as datalink traffic is present the radio will remain powered up and the indicators will operate normally.

PL645 LED Behavior		
Color	Function	Behavior
Orange	GNSS	Off: GNSS antenna not found or Radio not powered Blinking: Insufficient GNSS satellites available for location fix On: Location established
Blue	2WE	Off: No ethernet connection or Radio not powered Blinking: Ethernet activity present On: Ethernet connected, but no activity detected
Yellow	Cellular	Off: Cellular antenna not found, Radio not powered, or Wireless Disable active Blinking at 1 Hz: Attempting to connect to a cell tower Blinking at 10 Hz: Wireless Disable activated but modem has not responded to command On: Cellular connection established and signal strength information available
White	Wi-Fi	Off: Radio not powered, Wireless Disable active, WiFi not configured, or WiFi configuration error Blinking at 1 Hz: WiFi configured, but no data connection Blinking at 10 Hz: Wireless Disable activated but modem has not responded to command On: WiFi connected
Ice Blue	BLE	Off: Radio not powered, Wireless Disable active, or Bluetooth disabled Blinking at 1 Hz: Actively receiving BLE packets, but no successful pairing Blinking at 10 Hz continuously: Wireless Disable activated but modem has not responded to command Blinking at 10 Hz at 6 second intervals: No BLE packet received in last 5 minutes On: Successful BLE pairing occurred
Amber	CAN/CDL	Off: Radio not powered Blinking at 1 Hz: Radio powered and Engine Speed detected on datalink Blink every 4 seconds: No Engine Speed detected on datalink Blinking at 2 Hz: Engine Speed and Total Fuel/Total Engine Fuel detected on datalink On: Engine Speed, Total Fuel/Total Engine Fuel, and Fuel Level detected on datalink
Blue	4WE1	Off: No ethernet connection or Radio not powered Blinking: Ethernet activity present On: Ethernet connected, but no activity detected
Blue	4WE2	Off: No ethernet connection or Radio not powered Blinking: Ethernet activity present On: Ethernet connected, but no activity detected

Connect to the Web Configuration Home Page

The “Web Configuration” home page is accessed by attaching the 425–6889 Cable As to the pro harness, and a laptop. Once a connection is made, the user can use the following Steps to access the “Web Configuration” home page.

Connect to the “Web Configuration” home page, through the “Browse Network Devices” option in 2014C or newer Cat ET.

1. Connect to the Product Link device with the 425–6889 Cable As.
2. Open Cat ET.

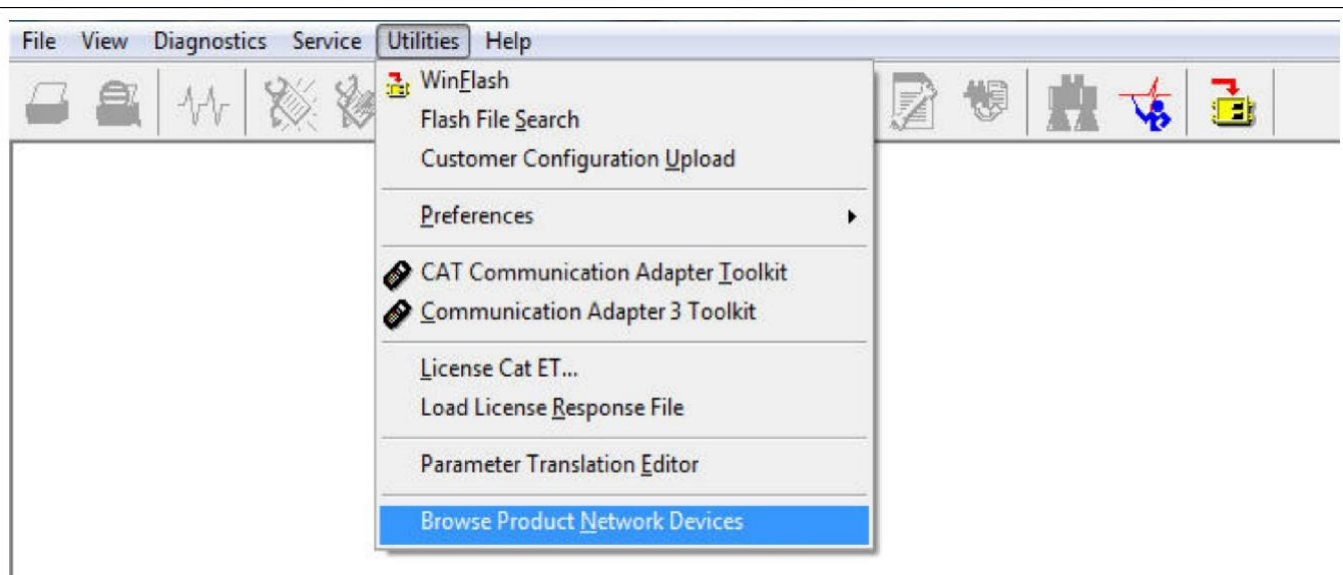


Illustration 36

g03795013

3. In the “Utilities” option, select “Browse Product Network Devices” . Refer to Illustration 36.
4. In the “Network Devices” drop-down menu, select the wired Ethernet port of your laptop. This selection may vary based on operating system and laptop.

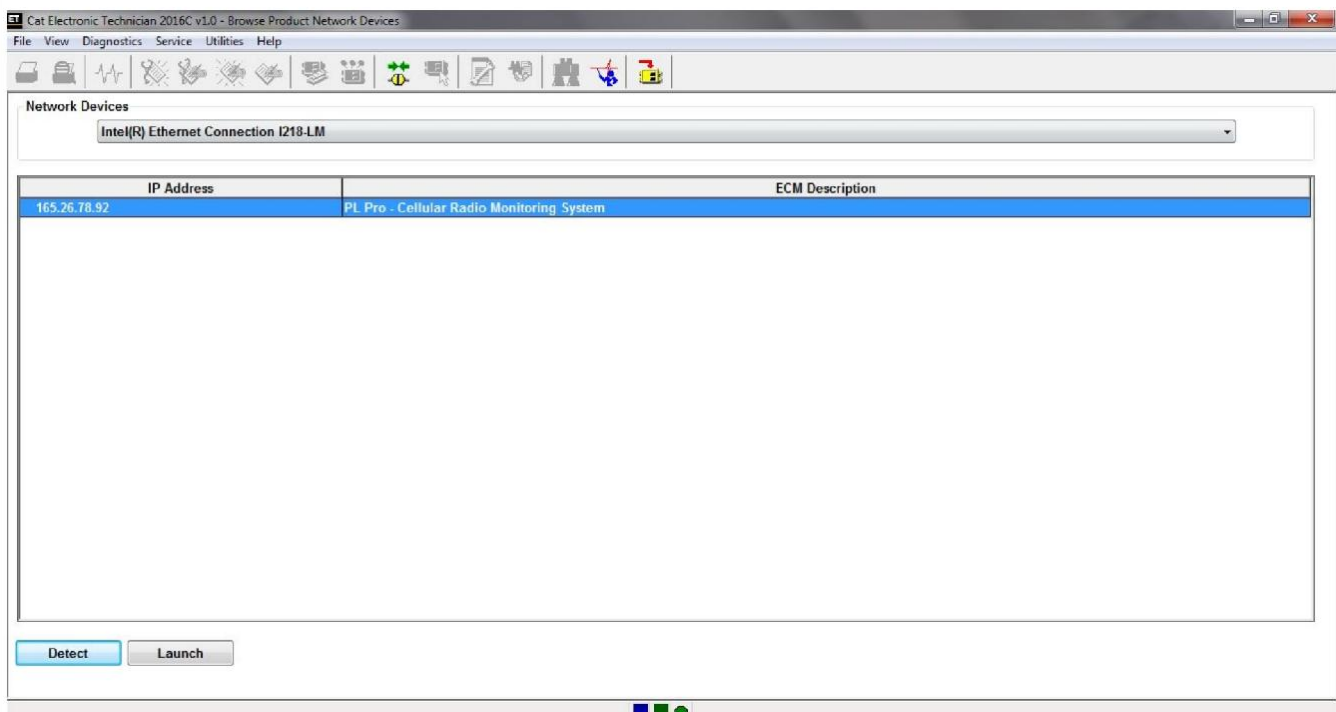


Illustration 37

g06154290

5. Detect ECMs on the Ethernet Datalink by using the “Detect” button. Refer to Illustration 37.

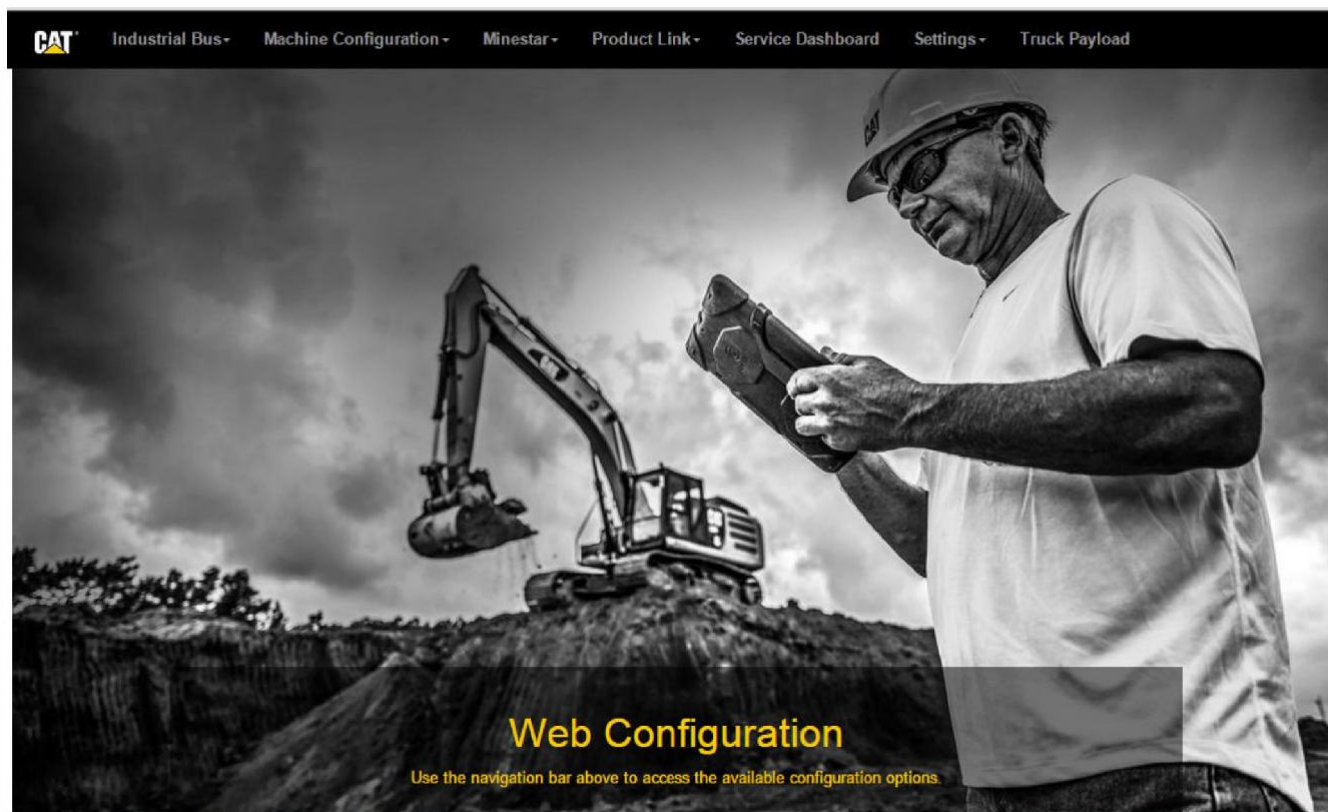


Illustration 38

g03794772

6. Once ECMs are detected, select an ECM and then click the “Launch” button. The “Web Configuration” home page will launch into your preferred network browser.

Product Link Interface

CATERPILLAR®

Product Link[Software Part Number: 4808560-00 Config-File Part Number: 7529397-99 Model Code: BHL C3.4 Config Product ID: CAT00000]SI Units ▾ ▾

HOMEINTERNAL PARAMETERSLISTSSITECOMMID OVERRIDECOMMUNICATORSERVICE DASH BOARD

Machine Info

Software Part Number	4808560-00
Config-File Part Number	7529397-99
Customer Config Description	N/A
Hardware Part Number	4590786-00
Model Code	BHL C3.4 Config
Product ID	CAT00000
Equipment Number	
Date	04/10/2015
Time	13:15:36
SMH	0.000000

Illustration 39

g03824586

The “Product Link Interface” page supplies basic system information about the Product Link device that is installed.

Connected Devices

CAT[®]

Industrial Bus - Machine Configuration - Minestar - Product Link - Service Dashboard Settings - Truck Payload

Service Dashboard

Data is current as of: Fri Apr 10 13:25:27 2015 UTC

Communication Check

Connection and File Transfer Log

Flash History Log

Expand All

Collapse All

Software Part Number

4808560-00

Connected Devices

Port 1	Cellular	Connected
Port 2		Disconnected
Port 3		Disconnected
Port 4	Service	Connected

General Information

Radio Information

GPS Information

Application Information

Ethernet Port Configuration

Ethernet Port Status

Download Service Dashboard

Download System Watch

Illustration 40

g03824619

The “Connected Devices” section of the service dashboard “Home” screen indicates which devices are connected properly on the Ethernet port of the Product Link device. Refer to Illustration 40.

Communication Check

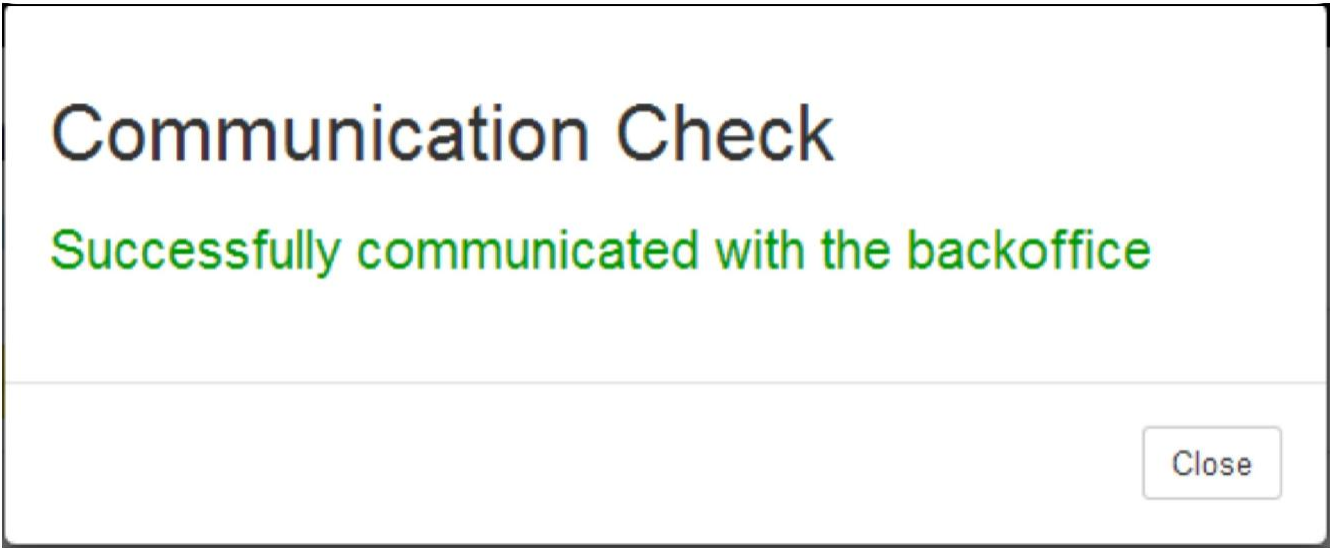


Illustration 41

g03703642

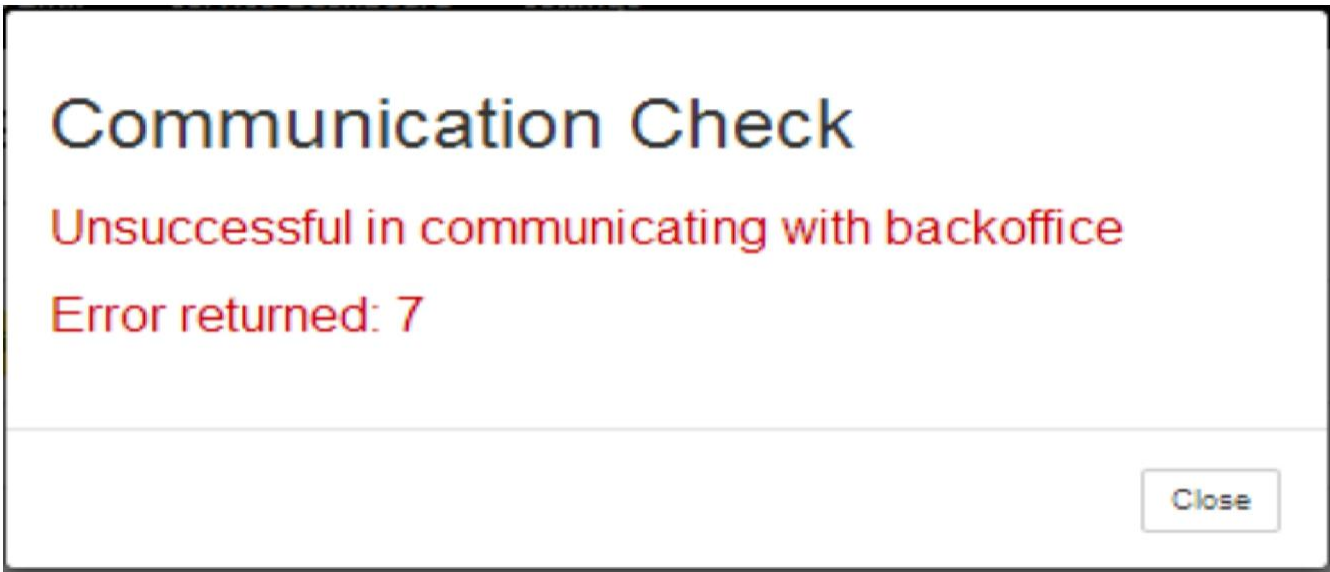


Illustration 42

g03703643

The “Communication Check” is an end to end test that verifies back-office server network. Once the “Communication Check” link is selected, the test automatically begins. The test will check end to end communication for up to 3 minutes. Once the test is complete, the user will receive a message that the test passed or failed. Refer to Illustration 41 and Illustration 42.

Download All Service Dashboard Data

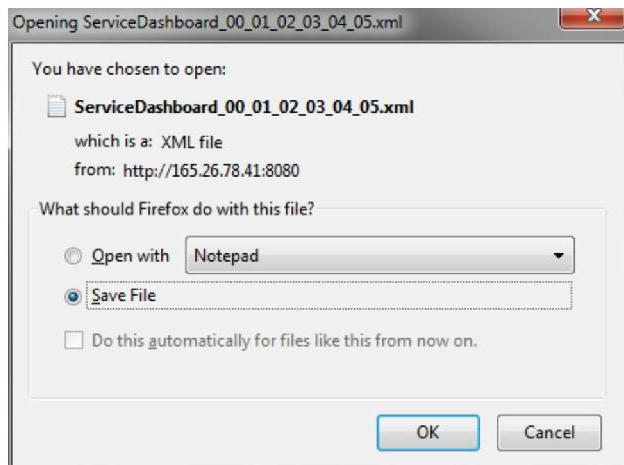


Illustration 43

g03394916

The “Download Service Dashboard” link allows you to save all information in the “Service Information Screen” into a single file. This file is useful when submitting a DSN ticket to Caterpillar for troubleshooting purposes. Choose “Save” file, and locate the file in a location you are familiar with.

Download System Watch

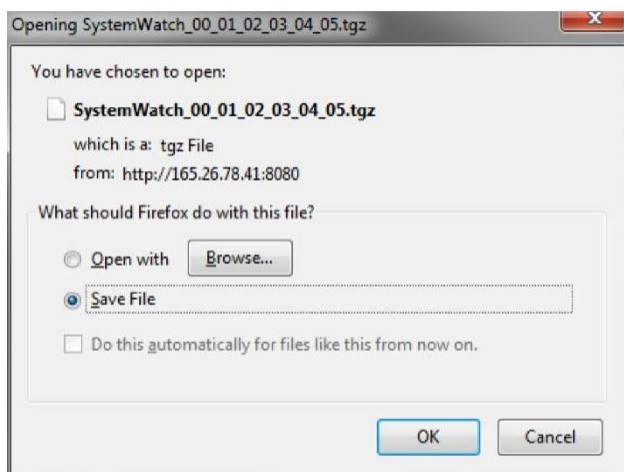


Illustration 44

g03394924

The “Download System Watch” link allows you to save the “System Watch File” which is used for troubleshooting. Submit this file with any CAT Customer Support ticket that is opened. Choose “Save” file and locate the file in a location you are familiar with.

Perform the Communication Check

Once all the hardware is installed, perform the “Communication Check” through the Service Dashboard. If the “Communication Check” is successful, the service dashboard will display “Communication Successful” icon. A successful communication check signifies a successful 2-way communication link between the device and the back-office network.

If the “Communication Check” fails for error code 22, the unit is provisioning. Wait 5 minutes, and attempt another “Communication Check”. If the “Communication Check” failure for error code 22 persists for greater than 20 minutes, or if it fails for an error code other than 22, refer to Systems Operation Troubleshooting Testing and Adjusting, UENR5824, “Cellular Radio Does Not Communicate, or Satellite Radio does not Communicate”.

Subscribe the Equipment in the Dealer Services Portal

Refer to the Dealer Services Portal (DSP) Help Center for information on how to register and subscribed Product Link devices.

Optional Inputs and Hardware

Switched Inputs

Note: Anytime a Product Link device is replaced, or swapped on a piece of equipment, the new Product Link device will not carry over the same “Switched Input Configurations”. The switched input information will need resent from the user interface to the Product Link device.

Note: Switched inputs can only be configured through VisionLink. VisionLink supports the configuration of switched inputs on the PL645. For more information on how to configure the switched inputs from the user interface, refer to the “Help” menus within VisionLink.

The PL645 radios provide 3 switched input to ground type inputs that can be used for alerting functions in a Product Link installation. This feature allows the radio to monitor a pressure, temperature, or level that is not normally provided through the equipment ECM.

Table 39 , Table 40 , and Table 41 show common sensors that can be used to alert on various pressures, levels, and temperatures.

Table 39

Pressure Switches					
Part Number	Actuation Pressure	Deactuation Pressure	Port Fitting	Connector Type	Normal State
168-7557	13780 kPa (1998.6 psi)	10335 (±689) kPa	9/16 - 18 THD	2-PIN DT REC	NC
140-9669	1206 kPa (174.92 psi)	700 (±103) kPa	3/4 - 16 THD	3-PIN DT REC	NC or NO
3E-7675	2550 kPa (369.85 psi)	1800 (±175) kPa	9/16 -18 THD	3-PIN DT REC	NC
173-7252	75 kPa (10.88 psi)	35 kPa	9/16 -18 THD	2-PIN DT REC	NO
107-0611	93 ± 21 kPa (13.49 ± 3.05 psi)	70 ± 21 kPa (10.15± 3.05 psi)	1/8 - 27 NPTF THD	2-PIN DT REC	NO
3E-2033	640 kPa (92.82 psi)	530 ± 40 kPa (76.87 ± 5.8 psi)	1/4 - 18 NPTF THD	2-PIN DT REC	NO
3E-2026	60 kPa (8.7 psi)	38 ± 20 kPa (5.5 ± 2.9 psi)	1/4 - 18 NPTF THD	2-PIN DT REC	NO
115-7103	93 ± 20.8 kPa (13.49 ± 3 psi)	68.9 ± 20.8 kPa (10 ± 3 psi)	9/16 - 18 NPTF THD	3-PIN DT REC	NO or NC

Table 40

Level Switches						
Part Number	Connector Type	Mounting Position	Rating	Mounting Fitting	Wire Length	Normal State
146-8437	None	Top	-40-85	1/2 NPT	169 mm (6.6535 inch)	NO or NC
141-0374	DT-3	Side	-40-85	1/8 - 27 NPTF	250 mm (9.8425 inch)	
174-1821	NONE	Top	-40-85	1/8 - 27 NPTF	155 mm (6.1 inch)	NO
1V-2727	NONE	Top	-40-85	1/8 - 27 NPTF	850 mm (33.46 inch)	NO
7C-6930	NONE	Top	-40-85	1/8 - 27 NPTF	2250 mm (88.58 inch)	NC

Table 41

Temperature Switches						
Part Number	Actuation Degrees	Deactuation Degrees	Port Fitting	Tube Length	Connector	Normal State
3E-7298	21.11° C (70° F)	12.78° C (55° F)	3/8 -18 NPT	31 mm (1.22 inch)	2-PIN DT REC	NC
124-8274	25° C (77° F)	15° C (59° F)	3/4 - 16 STO	17 mm (0.67 inch)	2-PIN DT REC	NC
104-7843	38° C (100.4° F)	27° C (80.6° F)	M16 X 1.5 STO	28 mm (1.11 inch)	2-PIN DT REC	NC
3E-6449	38° C (100.4° F)	27° C (80.6° F)	3/4 - 16 STO	28 mm (1.11 inch)	2-PIN DT REC	NC
3E-9350	52° C (125.6° F)	43° C (109.4° F)	3/4 - 16 STO	28 mm (1.11 inch)	2-PIN DT REC	NC
155-8998	65° C (149° F)	21.8° C (71.24° F)	3/4 - 16 STO	21.8 mm (0.858 inch)	2-PIN DT REC	NO
3E-6240	65° C (149° F)	57° C (134.6° F)	1/2 - 14 NPT	35 mm (1.378 inch)	2-PIN DT REC	NC
146-1762	68.3° C (155° F)	59.3° C (138.74° F)	3/4 - 16 STO	100 mm (3.94 inch)	2-PIN DT REC	NC
107-4927	82° C (179.6° F)	74° C (165.2° F)	3/4 - 16 STO	28 mm (1.1 inch)	2-PIN DT REC	NO
184-7245	92° C (197.6° F)	83° C (181° F)	3/8 - 18 STO	18 mm (0.7 inch)	2-PIN DT REC	NO
177-2313	100° C (212° F)	92° C (197.6° F)	3/4 - 16 STO	64.3 mm (2.53 inch)	2-PIN DT REC	NC
131-4135	102° C (215.6° F)	90° C (194° F)	3/4 - 16 STO	18 mm (0.71 inch)	2-PIN DT REC	NC
114-9235	107° C (224.6° F)	97° C (206.6° F)	1/2-14 NPT	28 mm (1.1 inch)	2-PIN DT REC	NO
3E-6451	107° C (224.6° F)	93° C (199.4° F)	3/4 - 16 STO	28 mm (1.1 inch)	2-PIN DT REC	NC
118-5144	107° C (224.6° F)	95° C (203° F)	3/4 - 16 STO	18 mm (0.71 inch)	2-PIN DT REC	NO
3E-2028	107° C (224.6° F)	93° C (199.4° F)	3/8 -18 NPT	31 mm (1.22 inch)	2-PIN DT REC	NC
3E-7504	107° C (224.6° F)	98° C (208.4° F)	3/4 - 16 STO	28 mm (1.1 inch)	2-PIN DT REC	NO
111-3194	108° C (226.4° F)	100° C (212° F)	1/2 - 14 NPT	28 mm (1.1 inch)	2-PIN DT REC	NO
130-5453	110° C (230° F)	102° C (215.6° F)	3/4 - 16 STO	18 mm (0.71 inch)	2-PIN DT REC	NC
130-3015	110° C (230° F)	96° C (204.8° F)	3/4 - 16 STO	18 mm (0.71 inch)	2-PIN DT REC	NC

(continued)

Temperature Switches						
Part Number	Actuation Degrees	Deactuation Degrees	Port Fitting	Tube Length	System or Display	State
177-2314	115° C (239° F)	106° C (222.8° F)	3/4 - 16 STO	84.3 mm (2.53 inch)	2-PIN DT REC	NC
113-8240	115° C (239° F)	106° C (222.8° F)	3/4 - 16 STO	28 mm (1.1 inch)	2-PIN DT REC	NC
155-8999	124° C (255° F)	117° C (242.6° F)	3/4 - 16 STO	84.3 mm (2.53 inch)	2-PIN DT REC	NC
9X-5602	125° C (257° F)	117° C (242.6° F)	3/4 - 16 STO	84.3 mm (2.53 inch)	2-PIN DT REC	NO
104-3007	129° C (264° F)	112° C (233.6° F)	3/4 - 16 STO	28 mm (1.1 inch)	2-PIN DT REC	NO
3E-6453	129° C (264° F)	118° C (244.4° F)	3/4 - 16 STO	28 mm (1.1 inch)	2-PIN DT REC	NC
149-8292	-0.5° C (31.1° F)	-1.7° C (28.94° F)	-15.25	17.3 mm (0.68 inch)	3-PIN DT REC	NO
139-6826	65° C (149° F)	56° C (132.8° F)	3/4 - 18 THD	100 mm (3.94 inch)	3-PIN DT REC	NC

Connecting a Computer to the Product Link System

Required Software

This system requires Cat[®] Electronic Technician (Cat ET) version 2014A or later.

Note: Caterpillar recommends that Cat ET to be updated to the latest version to access all the available functionality in this Product Link[™] system.

Supported Hardware Connections

The Product Link device is configured with Cat ET using the following communications interfaces:

- The 171-4400 Communication Adapter Gp or 466-6258 Communication Adapter Gp is connected between the machine service connector and the PC serial port or parallel port.
- The Cat ET Communications Interface Device is configured for Cat Communications Adapter II (RP1210) or Cat Communication Adapter 3 (RP1210).

Note: The configuration parameters for the "Communications Interface Device" are found in Cat ET under "Utilities", in the "Preferences" drop-down menu.

Cat[®] Electronic Technician (Cat ET) Service Tool

Cat ET is a software program that is used to access data. The service technician can use Cat ET to perform maintenance on the generator set. Some of the options that are available with Cat ET are listed below:

- The definition for each logged diagnostic code and each event is displayed

Status Groups for Cat ET

To access the status groups, follow the procedure that is listed below.

1. Select the “Information” tab on the menu bar in Cat ET.
2. Click “Status” or click the “Status” icon on the tool bar.

The status groups should be used to verify that the installation of the Product Link device module has been successful. There are only four screens available in Cat ET for verifying and servicing the Product Link system.

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26 February 2026