

International®

VIS (Vehicle Infotainment System)

User Operating Instructions

Model Numbers T8510, T8520



Read these instructions carefully before using this product.
Keep this manual for future reference.

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DISCLAIMER

THIS IS A DISCLAIMER OF LIABILITY AND DAMAGE RESPONSIBILITY AS REGARDS TO LECTRONIX, INC. RELATING TO YOUR USE OF THE LECTRONIX VIS SYSTEM. READ IT CAREFULLY. YOU ASSUME TOTAL RESPONSIBILITY AND RISK FOR USING THIS SYSTEM.

Failure to properly focus on the operation of your motor vehicle can result in death, serious injury and property damage. The T8500 product family should never be used at a time or in a manner that distracts you from focusing on the operation of the motor vehicle in which it is installed. Our concern is for your safety. We ask that you fully cooperate with and share that concern.

Always operate the vehicle in a safe manner and in full compliance with speed limits, road safety signs and all other laws and devices that regulate operation of a motor vehicle. Be aware of driving conditions at all times when using this system while operating a motor vehicle.

Operation of this unit, including its camera, navigation, audio and other features can be distracting to your operation of the motor vehicle. While the system is intended to provide both entertainment and vehicle and navigation information, it is not intended to, nor should you allow it to distract you from properly focusing on operating the motor vehicle in which it is installed. It is up to you to minimize or prevent such distraction.

Learn how to use this system before placing the vehicle in operation. Minimize the amount of time spent viewing the screen of the unit while driving. Do not attempt to adjust settings of the system or resolve any malfunction while driving. Instead, pull off the road in a safe and legal manner and then adjust its settings or deal with any malfunction. In the event of malfunction, disable the unit (turn power off or remove power from the system).

In addition to its multiple other functions, your VIS (Vehicle Infotainment System) is equipped with a navigation function. When navigating, carefully compare information displayed on the unit to all available navigation sources, including information from street signs, visual sightings, and maps. Do not enter destinations, change settings or access any functions requiring prolonged use of the controls of the unit while operating your motor vehicle. For safety, pull off the road before making any adjustments to the system or resolving any navigation discrepancies or questions.

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IMPORTANT SAFETY INFORMATION

Driver Responsibility

When behind the wheel, safe driving is your responsibility and should always be your first priority. It is your responsibility to know and to comply with the law in your area.

Safety Information

Read the operating instructions for the VIS (Vehicle Infotainment System) and all other components of the system carefully before using the system. They contain instructions about how to use the system in a safe and effective manner. **FAILURE TO OBSERVE THE INSTRUCTIONS GIVEN IN THIS MANUAL MAY CAUSE INJURY OR DAMAGE AND VOID THE WARRANTY.**

This manual uses symbols to show you how to use the product safely and to alert you to potential dangers resulting from improper connections and operations. The meanings of the symbols are explained below. It is important that you fully understand the meanings of the symbols in order to use this manual and the system properly.



Warning

This symbol intends to alert you to the presence of important operation instruction and installation instructions. Failure to heed the instructions may result in severe injury or death.



Caution

This symbol intends to alert you to the presence of important operation instruction and installation instructions. Failure to heed the instructions may result in injury or material damage.

Warnings



Warning

Observe the following warnings when using this unit.

- **The driver should not operate the system while driving.**
Operating the system will distract the driver from looking ahead of the vehicle and can cause accidents. Always stop the vehicle in a safe location and use the parking brake before operating the system.
- **Use the proper power supply.**
This product is designed for operation with a negative grounded 12 V DC battery system. Never operate this product with other battery systems, especially a 24 V DC battery system.
- **Do not disassemble or modify the unit.**
Do not disassemble, modify the unit or attempt to repair the product yourself. If the product needs repair, contact your International[®] dealer.
- **Do not use the unit when it is not functional.**
If the unit is not functional (no power, no sound) or in an abnormal state (has foreign objects in it, is exposed to water, is smoking, or smells), turn it off immediately and contact your International[®] dealer.
- **Refer installation and service to qualified personnel.**

IMPORTANT SAFETY INFORMATION

Cautions

Notes on Use: Liquid Crystal Display Panel and Touch Screen

The VIS display is a Liquid Crystal Display Panel, commonly known as an LCD. Over the surface of the LCD is a touch screen to allow the user to touch the screen and activate buttons and other controls. There are a number of considerations to keep in mind with any system using an LCD panel. The touch screen is subject to damage if it is not properly used. While both elements can take substantial use, they need to be treated with care. The following guidelines should be followed when using your unit. Refer to the Maintenance section of this manual for cleaning instructions.

- Do not cause impact to the liquid crystal panel/touch screen.
- Do not use a mechanical pointer to touch the screen, as it will damage the touch screen. Always use your finger so you can feel how much pressure is being applied to the screen.
- When the temperature is very cold or very hot, the image may appear unclear or may move slowly.

Getting Started

Understanding your Vehicle Infotainment System (VIS)

The VIS is designed to be installed in a double DIN mounting hole of the instrument panel (IP) of International and Caterpillar Trucks. The VIS Base unit (T8510) offers a comprehensive information processing and display navigation system for your International[®] and Caterpillar Trucks. It features a 6.5" color display and resistive touch screen for easy operation. It has the ability to connect to the vehicle's J1939 bus which provides the driver with engine and truck data as well as operating environment. The VIS Premium (T8520) system is similar to the base unit, but adds Wi-Fi connectivity.

Options include camera support for one camera and SmartWave[®] Tire Pressure Sensing System for tractor tires.

The VIS works in conjunction with the Delphi DEA350 & 355 Radio series to produce audio. Reference the Audio section of this manual for details on selecting audio sources from the VIS.

System Overview

- Integrated Vehicle Monitor and Trip Computer
- In-Dash Controller Unit with 6.5" Color TFT LCD Display with touch screen
- Wi-Fi⁽¹⁾

Vehicle Monitor

- Monitor Truck and Engine Data from Vehicle Busses
- Alerts for Fault and Out of Range Conditions
- Checklists for Tractor, Trailer and Cab tasks
- Maintenance Scheduling & Reminders
- Vehicle Bus Connections for J1939

Trip Computer

- Multiple Trip Odometers
- Speed and Distance Tracking
- Fuel Consumption

Camera Display

- Supports One (1) NTSC Camera

Integrated Navigation with Logistics

- Complete North American and Canadian Maps included
- 12+ million Points Of Interest
- Logistics Intelligently Routes Vehicle Around Roads with Restrictions based on Vehicle Cargo, Dimensions and Weight

Tire Pressure Monitoring System

- Teamed with the SmartWave[®] System, Continuously Monitors Tractor Tire Pressures
- Alerts Driver to Low Tire Pressure to avoid Tire Damage and Dangerous Driving Conditions

(1) Available on the T8520 Premium VIS model.

Controls

The front panel controls let you select the VIS's applications and functions. Buttons and controls are shown below.

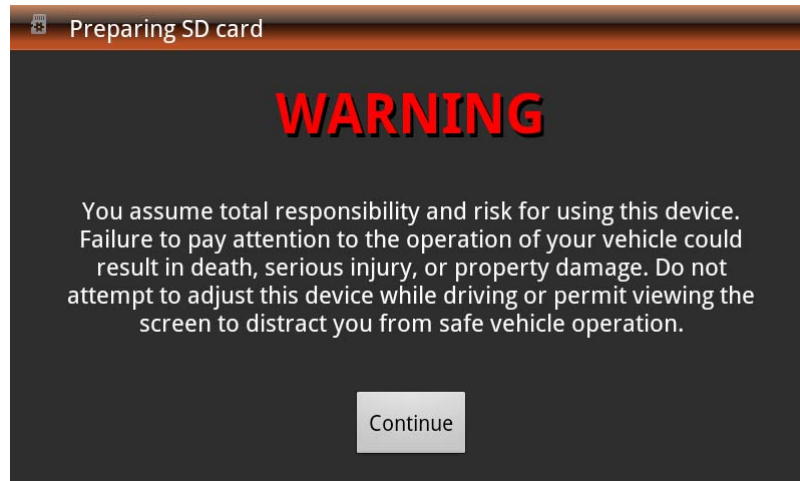


Front Panel Buttons & Features

- **Volume Up** – Increases the audio volume
- **Volume Down** – Decreases the audio volume
- **Home** – Displays the home screen
- **Menu** – Displays the menu options
- **Back** – Displays the previous screen
- **Brightness** – Adjusts the display brightness (off, low, medium and high)
- **Power** – The power button has the following functions
 - **Short Press** – blanks the screen, press again to restore the screen
 - **2 Second Press** – Mute/Unmute Sound or reset the unit
 - **5 Second Press** – (Reset & Restart if ignition is in the ON or ACC position) allows the user to reset/shutdown unit
- **Internal Speaker** – The internal speaker is used if no factory radio or compatible radio is installed in the vehicle
 - **Optimized for use with the DEA 300 & DEA 355 Delphi Radios Only.**
- **Micro SD Slot** – Additional memory can be added to store media
- **USB Port** – Used for software updates and media access

Turning the VIS On and Off

The VIS has been installed at the factory or at your International or CAT Dealership. The VIS will automatically turn on when the ignition of the vehicle is turned on. If the vehicle ignition has been off for more than two hours, the VIS will need approximately one minute to start up. A logo screen, then an advisory screen will be displayed during this start up time.



Touch the Continue button to proceed to the Home Screen.

If desired, the VIS may be turned off at any time while the vehicle ignition is on. While the system will appear off, it will actually be in a Standby low power state and can be immediately turned back on. To turn the system off, push and hold the **Power On/Off button** for approximately five seconds. The screen will go black and all functions will stop. Release the **Power On/Off button**.

To turn the system back on, push and release the **Power On/Off button**.

Standby Operation

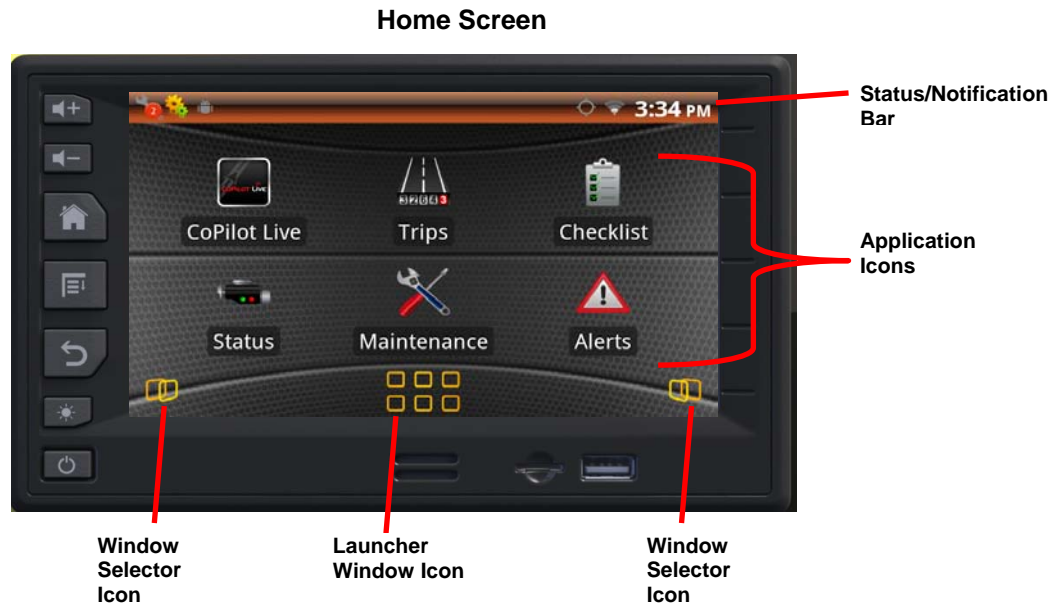
When the vehicle ignition is turned off, the VIS will enter a low power Standby state. The system will remain in Standby state for approximately two hours. At two hours the system will save all user settings and power off.

If the vehicle ignition is turned on before the two hour time limit, the system is immediately restored to the most recent function and display.

If the vehicle ignition is turned after two hours, the system will go through a full power up sequence as described above.

Home Screen

When the VIS is turned on for the first time, the Home Screen will be displayed.



Note: depending on the system configuration, not all applications may be available.

Home Screen Functions

- **Status/Notification Bar** – Displays time, ongoing activities with your device (i.e. system alerts, warnings or updates, application updates and external memory connectivity). It will also display Wi-Fi and Bluetooth connectivity and signal strength if applicable.
- **CoPilot Live** – This is the navigation application provided by ALK Technologies.
- **Trips Application** – Maintains a trip log consisting of Trip and Leg Segments. Allows for trip statistics to be collected, providing feedback on the efficiency of trip.
- **Checklists Application** – Provides a checklist of safety related tasks to remind the driver of items to check before departure.
- **Status Application** – Provides information on engine, electrical and fuel system status.
- **Maintenance Application** – Displays many vehicle maintenance items to remind driver or mechanic of recommended services.
- **Alerts Application** – Displays any active alarm.
- **Window Selector Icon** – Accesses additional application windows.
- **Launcher Window Icon** – Provides access to all system applications loaded such as access control, calculator, camera, clock, gallery, settings, tires, music and launcher icons.

Android Device Functions

The following Android terminology will be used in this manual:

- **Touch** – To activate items on screen touch icon with your finger with light pressure.
- **Touch & Hold** – Allows the activation of action by touching and holding finger until an action happens without lifting the finger until the action occurs.
- **Drag** – Touch & hold an item for a moment, then without lifting finger or removing pressure, slide finger on the screen until it reaches the target position.
- **Swipe or Slide** – Without pausing when the screen is touched, quickly move finger across the surface of the screen.
- **Screen to Screen** – Slide finger left to right or right to left across the home screen by applying light pressure.

To learn more about Android visit <http://www.lectronixinc.com/products/T8520.html> to get a copy of the Android 2.3.4 manual.

Audio

If the VIS is connected to the truck radio (Delphi DEA 300 or DEA 355), audio will be heard from the cab speaker system. If there is no radio in the truck then the VIS speaker will be used.

The truck radio functions can be used normally, but if the VIS is being used and the truck functions are accessed, the VIS functions will be overridden. If the VIS function is then selected, the radio will return to the VIS function.

The one exception is Navigation prompts. These will always be played from the truck radio.

Music Application (T8520 Only)

Use the Music application to play MP3 files from a USB stick. Place the USB stick with music into the USB slot and select the Music application. The music application will automatically detect MP3 files.

Press the menu button  for music playing options.



Caution

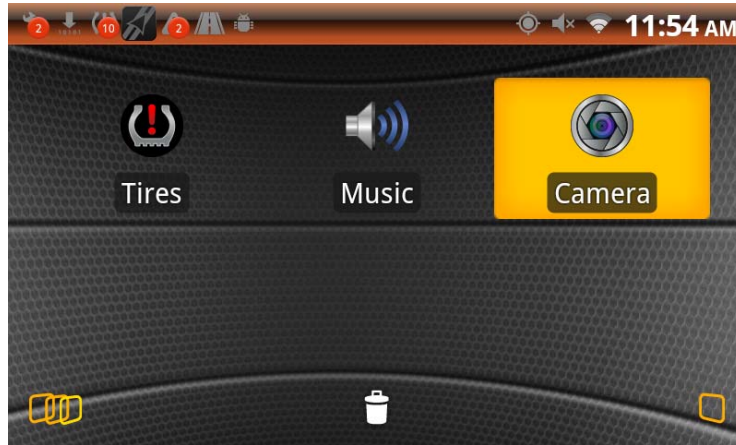
Carefully insert the USB memory stick in the vertical USB port. Do not force the memory stick into the slot. If it does not appear to fit, turn it 180 degrees and try again. Do not insert foreign objects into the USB port.

Gallery Application

The gallery application allows you to view pictures located on your USB stick. Selecting the gallery application will automatically search the inserted USB stick for pictures. Touch the gallery screen for viewing options.

Camera

The VIS supports one NTSC camera. An optional camera can be connected to the VIS. The camera is connected to the Fleet Management/Camera connector shown in the VIS Connector Definitions section.



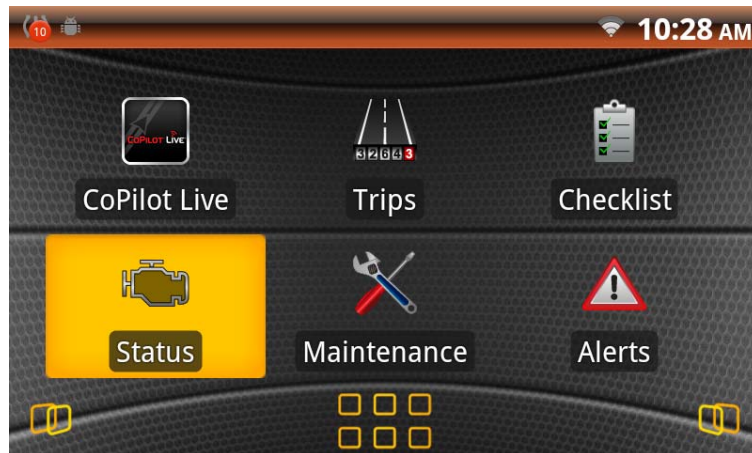
Contact Lectronix at the customer support number for Camera information. See Appendix A.

Applications

The home screen is where you will find the most used applications. To find additional applications, press the Launcher Window Icon at the bottom of the main screen.

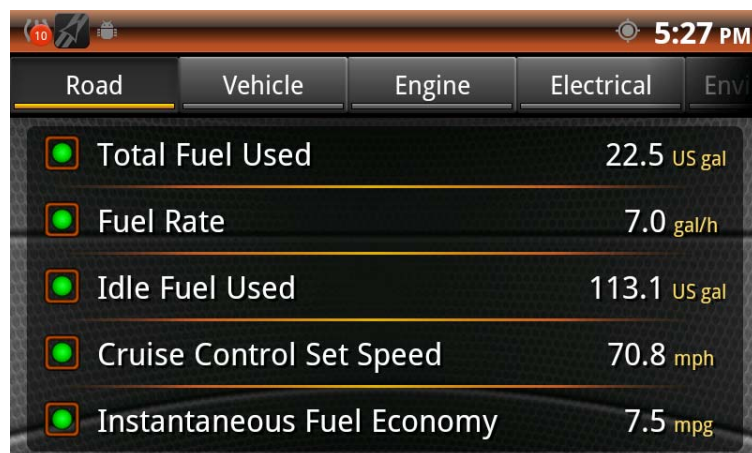
Status Application

The status application provides information about your vehicle.



Categories of information available are:

- **Road:** Speed, Average Fuel Economy, Fuel Level, Total Fuel Used, Fuel Rate, Idle Fuel Used and Total Distance (total distance the vehicle has traveled in it's lifetime)
- **Vehicle:** VIN, Make, Model, Serial number, Unit number
- **Engine:** Speed (RPM), Oil Temp, Oil Level, Oil Pressure, Coolant Temp, Coolant Level, Coolant pressure, Total Idle Hours, Total Hours, Transmission Oil Level, Oil Pressure, Oil Temp
- **Electrical:** Battery Voltage, Net Battery Current, Alternator Current
- **Environment:** Ambient Air Temp, Road Surface Temp, Barometric Pressure, Compass Bearing
- **Miscellaneous:** Washer Fluid Level, Percent Engine Load



The information displayed depends on the information available from the vehicle's communication bus.

Alerts

The VIS continuously monitors vehicle parameters and will show an alert when a parameter is outside of normal operating conditions.

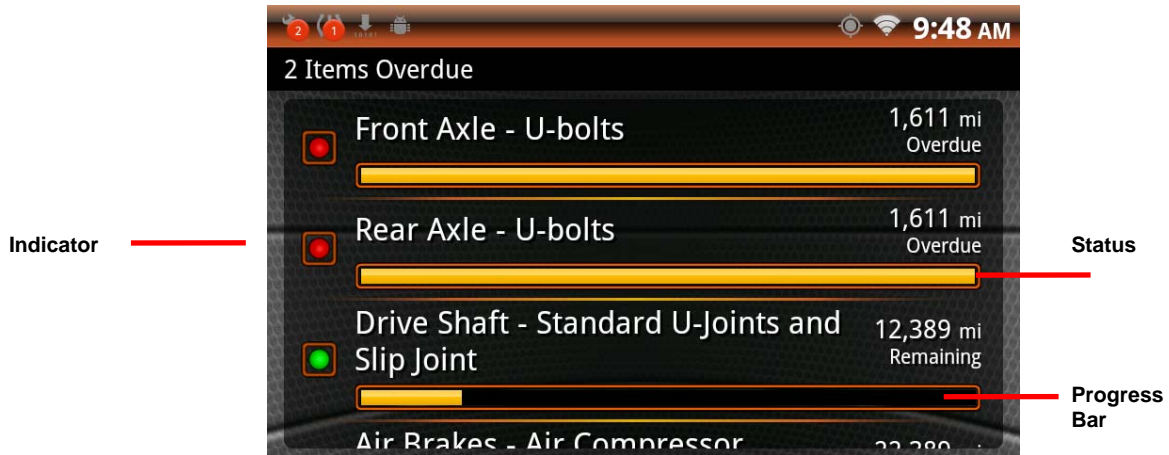


When there is an alert, the Alert application will automatically launch. It will show the conditions that may be of concern. You should take note of the alert and check your vehicle to correct the cause of the alarm.

To cancel a non-critical Alert, press the Acknowledge button. Critical Alerts cannot be cancelled and will go away only when the Alert condition is cleared.

Vehicle Maintenance

The vehicle Maintenance Information helps you track and monitor key vehicle maintenance items. To view and configure maintenance items, from the Info main screen, touch the **Maintenance icon**. The main Maintenance screen shows the items currently being monitored.



Configuring Maintenance

Items requiring maintenance are marked with a red indicator. Touch the maintenance item to learn more about the maintenance values and to reset the maintenance parameter.

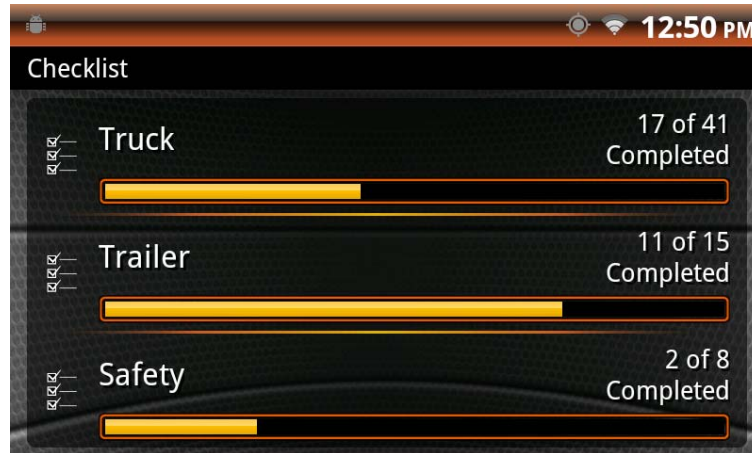


Caution

Ignoring a Maintenance Reminder may result in excessive wear to vehicle components. Once the reminder has been ignored, it will not be re-displayed.

Checklists

Four checklists are provided for Truck, Trailer, Safety and Driver. They contain items commonly checked before trips are made.

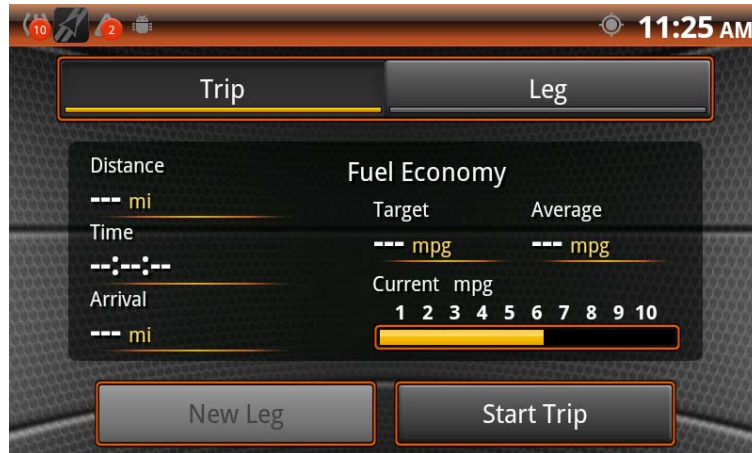


Selecting one of the four categories shows the items to check. Touching the item checks it.

To clear the item, touch it again. These lists are provided for convenience. Checking or not checking items will not result in Alarms or Reminders.


Trip Computer

The Trip Computer provides information about the current trip. This information includes travel time, gallons of fuel used, average miles per gallon, etc.



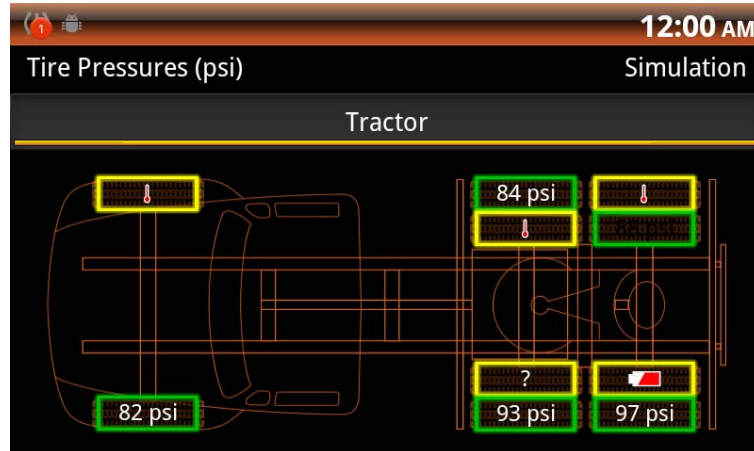
The **Trip** tab provides data for the overall trip. The **Leg** tab provides data for only the segment of the trip designated as a Leg (or portion) of a trip. A new leg can be started at any time and there can be up to 25 legs in each trip.

The Trip and Leg information screens are accessed by touching the **Trip** or **Leg** buttons tabs. Once a selection is made, all the information displayed under the Trip/Leg buttons relates to that selection.

Press the **Menu**  button to view trip history by touching the “**History**” button. Trip details are also available from this menu.









Tire Pressure

The **Tires** application allows you to view tire pressures when the vehicle is equipped with the optional SmartWave[®] tire pressure measurement system. This system consists of tire pressure sensors, a central control module and associated antennas. For information on configuring the Smartwave[®] system such as changing sensors and configuring, installing or removing sensors, refer to the SmartWave[®] Tire Pressure Monitoring System Owner's Manual, part number 710.0078 that came with the vehicle.



Tire pressures and temperatures can be monitored with the **Tires** application. The VIS can provide an alert of tire pressure or temperature problems as well as other sensor status. All pressures in a green background are within their normal range.

Tire pressure symbols with their meaning are shown below:

- | | |
|---|---|
|  | Normal. Tire pressure shown on green background |
|  | Low Sensor Battery. The sensor should be replaced. |
|  | Abnormal Tire Pressure. The tire pressure is more than 10% from the target pressure. This is calculated using the current tire temperature and adjusting accordingly. Stop, inspect the tire and make the necessary corrections. |
|  | Critical Low Tire Pressure. Tire pressure is more than 15% lower than the target pressure. Stop, inspect the tire and make the necessary corrections. |
|  | High Temperature Warning. The tire has exceeded 195 °F (90 °C). Stop, inspect the tire and make the necessary corrections. |
|  | Waiting for sensor. When programming new sensors, this symbol is displayed until the new sensor is recognized. |
|  | No Sensor. There is no sensor on this wheel. |
|  | Sensor Fault. Displayed when there is a sensor fault. Refer to the SmartWave [®] manual for diagnostics and troubleshooting information. |

Tire Details

When viewing the main Tire Pressure screen, details for each tire may be viewed by touching the icon for the tire of interest. The Tire Details screen shows the tire pressure, deviation from the target pressure and the temperature of the tire. Three options are available on this screen:

Tire Diagnostics

Touch this button to show information about the sensor on the tire. This information can be used to troubleshoot a sensor that is experiencing a problem.


Unassign Sensor

If a sensor needs to be removed from the vehicle, touch the **Unassign Sensor** button before removing the sensor. The icon on the selected tire will show an hourglass then a slashed circle which indicates the sensor has been deleted from the VIS.

Learn Sensor

When there is no sensor assigned to a displayed wheel, the Learn button is displayed. To add a sensor at the current wheel position, touch the Learn button then, using the SmartWave[®] handheld unit, go to the wheel on the vehicle with the new sensor and cause the sensor to broadcast its' presence (follow instructions in the SmartWave[®]

Configuration

When viewing the main Tire Pressure screen, press the menu button , then touch setting to configure the tire pressure monitoring system. The options available are:

Notifications

Notifications Enabled – enable or disable notifications

Notifications Sound – allows you to select your notification sound

Auto-Launch Applications – determine whether you want the alerts to launch automatically when a fault occurs

Wake System – determine if you want the system to wake up upon alert

Tractor Type sets the tire configuration for the tractor which can be 6x4 Duals, 6x4 Singles or 4x2 Duals

Adjust Target Pressures

Setting Target Pressures: a target tire pressure is set for each axle based on the proper inflation for those tires. The VIS and the SmartWave[®] system will use this target pressure to determine over/under-inflation conditions. To set target pressures, from the main Tire Pressures screen, touch the **Adjust Target Pressures button**. Each axle is now shown with the current target pressure for each. To adjust the target pressure, touch the **Up or Down Arrow icons** above and below each axle. The new target pressures will be shown. When finished, touch the **Accept** button at the bottom of the screen.

Display Options – configures the data to be shown on the main tire's graphic

Tire Pressure

Tire Temperature

Deviation from Target

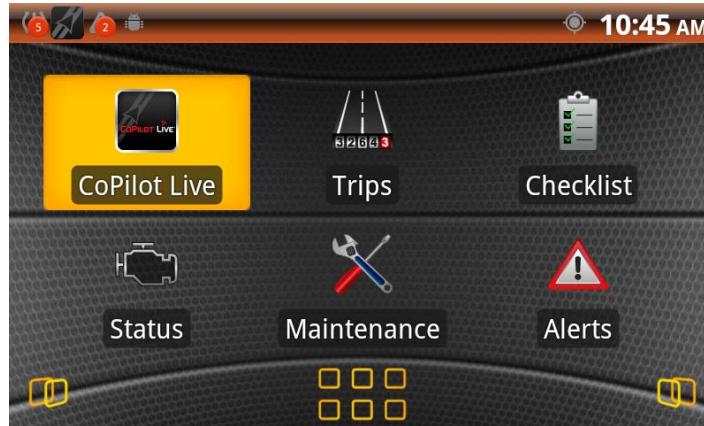
Installing or Removing Tire Pressure Sensors

In the event that it becomes necessary to remove, replace or install a tire pressure sensor, use the unassign and learn buttons noted above.

CoPilot Live Navigation

The VIS includes ALK Technologies CoPilot Live Navigation system. Included are over 12 million Points Of Interest (POIs).

For information on using CoPilot refer to <http://apphelp.copilotlive.com/truck/>



	Caution	When navigating, carefully compare information displayed on the unit to all available navigation sources, including information from street signs, visual sightings, and maps. Do not enter destinations, change settings or access any functions requiring prolonged use of the controls of the unit while operating your motor vehicle. For safety, pull off the road before making any adjustments to the system or resolving any navigation discrepancies or questions.
	Warning	You assume total responsibility and risk for using this device. Failure to pay attention to the operation of your vehicle could result in death, serious injury, or property damage. Do not attempt to adjust this device while driving or permit viewing the screen to distract you from safe vehicle operation.

To start navigating, press the CoPilot Live icon. Answer the CoPilot setup questions to configure CoPilot for your vehicle.


Press the area with 6 boxes in the lower left of your display to access the driving menu. From the driving menu set display options, get directions, find POIs, and calculate a driving route.

Language and Units selection

Languages available are English, Spanish and Canadian French. Units are automatically selected with the Language. The language and units available are:

Language	Units
English (Canada)	km/h
English (United States)	m/h
Espanol (Estados Unidos)	m/h
Espanol (Mexico)	km/h
Francais (Canada)	km/h


To select the language and units:

1. Press the **Menu button** 
2. Touch the **Settings** button
3. Select **Language and keyboard settings**

Clock

The VIS will automatically adjust the clock setting via the GPS receiver or from the WiFi connection (T8520 only).

To manually adjust the clock

1. Pressing the **Menu button** 
2. Touch the **Settings** button
3. Select **Date and time**
4. Change the Clock update source to Manual

Access Control Application

The VIS can be set to restrict changes to certain features to better maintain common settings across larger numbers of vehicles. Access Control, allows a maintenance person or system administrator to login to the VIS and make changes to features.

When the VIS is turned on after the vehicle ignition has been turned off, the system defaults to Operator mode.

Log in to Access Control to permit system configuration changes. The default password is **0000**. Be sure to Log Out when finished making changes to the system.

Two types of access control are available: **Admin** and **Maintenance**. The administrator can change any configurable parameter of the VIS. The maintenance user is allowed to perform any operation except changing the administrator password and enabling or disabling user access control.

Access control allows you to change/edit the Maintenance values and items as well as checklist items.

Maintenance


Your product is designed to minimize maintenance. If your unit requires cleaning, follow the guidelines below.

1. Keep the display clean of dust and debris.
2. Use a dry soft cloth for routine exterior cleaning. Never use benzene, thinner or other solvents.
3. Do not put or spray liquids directly on the screen. Avoid using ammonia-based cleaners and solvents such as acetone. Moisture intrusion into the unit may cause a malfunction.
4. Use a duster or a soft, lint-free cloth (no paper towels) to gently clean the display and front panel controls. When needed, slightly moisten a soft lint-free cloth with water and gently buff the screen.
5. To avoid damaging the unit, always use care when touching the screen, using a light pressure. The touch screen does not require a large amount of pressure to activate a function.
6. Avoid spilling liquids or food on the unit, as they may cause the system to malfunction.

Troubleshooting

If You Suspect Something is Wrong

Check and take steps as described below. If the described suggestions do not solve the problem, contact your dealer. Only qualified personnel should service the product. Always refer diagnostics and repair to professionals. Lectronix, Inc. shall not be liable for any accidents arising out of neglect or attempts to repair the unit.

	Warning	Do not use the unit if you suspect faulty operation. Never try to repair the unit by yourself.
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General Problems	Possible Cause	Possible Solution
Unit will not turn on	No power to the unit	Check the wiring and rear connectors on the unit and applicable fuses
	Vehicle ignition switch is off	Turn on vehicle ignition switch
	Vehicle batteries are run down	Recharge or replace batteries
No Sound	The vehicle radio is turned off or the volume is turned down	Turn on the radio and/or turn up the volume
	The speakers are not wired correctly, or there is a break or poor contact	Check the speaker wiring
	No communication between the VIS and the vehicle radio	Check J1939 connections in the truck to insure both units are connected
	Volume is set to low	Adjust the volume to the desired level
Noise is made in step with engine revolutions	Alternator noise comes from the vehicle	Change the wiring position of the ground lead and/or mount a noise filter on the power supply of the VIS or the radio
The speaker channels are reversed between right and left	The plus and minus terminals at right and left channels of speakers are reversed	Consult the wiring diagram and correct wiring problems
Some operations are not permitted	Some operations are not executable in particular modes such as menu mode Also, operations that require concentration, such as using the touch-keyboard, are not permitted when the vehicle is in motion unless the Speed Based Lockout is disabled	Read the operating instructions carefully and cancel the mode Disable Speed-Based lockouts if desired Warning: disabling speed-based lockouts should only be done if someone other than the driver is going to use the unit while the vehicle is in motion The driver should not be distracted attempting to use the unit while the vehicle is in motion
Units are in Metric instead of US or in US instead of Metric	The unit of measure is set to the opposite of what is desired	See Language and Units selection to make changes
Random Values appear in applications	Unit is set to demo mode	Disable demo mode in Settings then Accessibility

Camera Problems	Possible Cause	Possible Solution
No video	No camera connected, broken camera cable, defective camera, no power to camera	Check camera connections on the rear of the unit and in-line at the camera end or replace the cable or camera
Poor image on camera	Camera lens dirty	Clean camera lens. Be sure to follow the manufacturer's directions for cleaning.
	Camera lens has fogged internally	Defective camera. Have a service provider replace the camera

Navigation Problems	Possible Cause	Possible Solution
"Determining Current Position" is displayed	GPS antenna is not connected, GPS antenna cable is broken or the vehicle is under a structure which prevents satellite signals from reaching the antenna	Check antenna connection on the rear of the unit or replace antenna. Move the vehicle out from under a structure
No voice direction is given when navigating	Audio is set very low on the vehicle radio or the radio is off	Turn on the radio or increase audio volume on the radio

Display Problems	Possible Cause	Possible Solution
Screen is too dim or too bright	Brightness is not adjusted correctly	Adjust screen brightness by pressing the brightness button on the front panel

Audio Problems	Possible Cause	Possible Solution
Music from a USB stick will not play	Music is in a non-supported format (see audio section for supported formats)	Load USB stick with music in a supported format
No audio is heard even though the VIS shows it playing on the screen	The vehicle radio is not turned on or the volume is turned down	Turn on the radio or turn up the volume. Check to insure that the balance and/or fade controls are not set to speakers that do not exist in the vehicle

USB Problems	Possible Cause	Possible Solution
No playback - "No Songs" message appears	The USB stick has no audio files on it The USB stick has audio files in an unsupported format (refer to the USB audio section on supported file formats)	Add audio files to the USB stick that are in a supported format
Audio tracks do not play in anticipated track order	Shuffle mode is on and tracks are being played randomly	Turn off Shuffle mode
Audio tracks play over again when the last track is reached	Repeat mode is on	Turn off Repeat mode

Appendix A: Service and Technical Support

There are no user serviceable components within the VIS. Your International[®] or Caterpillar truck dealer provides technical Support and Service.

For software and downloadable manuals, visit www.lectronixinc.com/support.

For product support email support@lectronixinc.com or call (888) 423-1183.

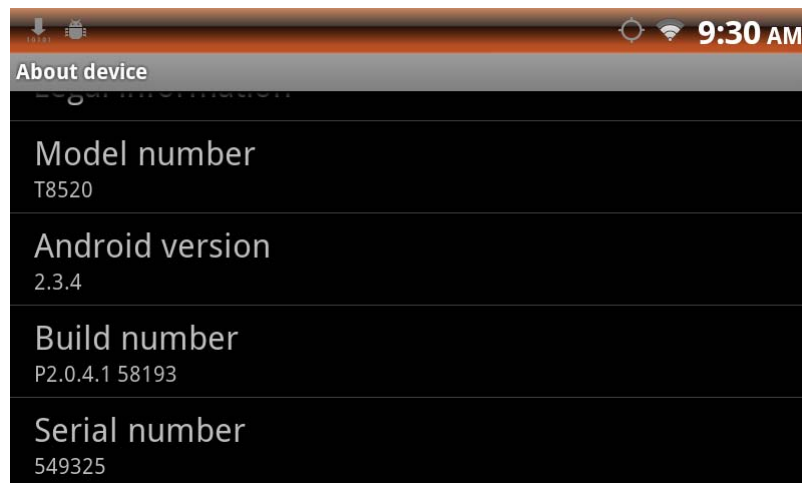
System Configuration

If requested, System information for your VIS can be obtained in the following manner:

1. Press the **Menu button** 
2. Touch the **Settings** button
3. Scroll down through the options and touch **About Device**

The system information screen appears similar to what is shown below.

About Device Screen



Appendix B: Software Notice

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Your T8510 or T8520 Vehicles Information Systems uses some GNU Public License (GPL) and Lesser GNU Public License (LGPL) open source software. The open source software used is shown in the following table.

Open Source Software Package	Package Version	Provided As	License Type
libasound	1.0.19	Source	LGPL
libwebcore	5.0.328.0	Source	LGPL
u-boot	2011.03-rcl	Source	GPL
X-Loader	Commit 495d3a64229272ee49ffe2cd4911fdd324e5f6f9 from http://gitorious.org/x-load-omap3/mainline.git	Source	GLP
Linux kernel	2.6.25	Source	GPL

CD copies of the source code shown in the above table can be obtained by sending a check in the amount of \$10.00 payable to Lectronix, Inc to:

T8500 Open Source Software
Lectronix, Inc.
5858 Enterprise Drive
Lansing, Michigan 48911

Make sure you include your return address. Your request will be processed within 8 to 12 weeks.

Appendix C: VIS Technical Specifications

The specifications noted herein are subject to change without notice.

Power and Grounding

Automotive nominal 12 volt, negative ground power

Mechanical Form Factor

Width	190 mm
Height	120 mm
Depth	70 mm

Environmental

The VIS is designed to meet J1455 standards

Normal operating range	-30 to 70°C
Storage range	-40 to 85°C

Operation at temperatures between -40 and -30°C may cause device not to perform as it does within the normal operating range. Any degradation in performance is considered within specification

Camera Inputs

- One (1) NTSC video input
- Video level 1 Vp-p (75 ohms).

Standard In-Dash Display

- Color TFT LCD Flat Panel
- Resolution: 800 x 480 pixels
- Diagonal size: 6.5 inch
- Luminance: 360 cd/m2 (typical)
- Response time: 22 msec (typical)
- Contrast ratio: 300 (typical)

GPS Performance (with NAV option)

- 50 Channel, L1 frequency
- Accuracy – 2.5m horizontal
- Acquisition time
 - Hot: < 1 sec
 - Warm: ~ 32 sec
 - Cold: ~ 32 sec
- Update Rate – 4 per second

Audio Out

- Stereo line out
- Audio On/Off request output (to external radio)

USB functionality

USB 2.0

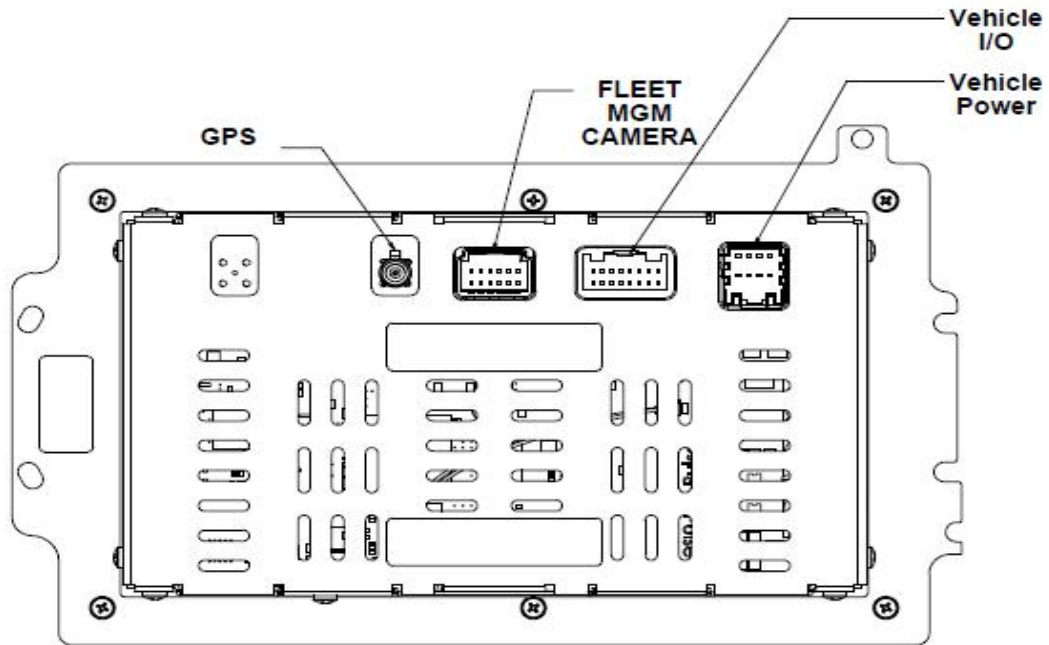
SD Card functionality

SDHC 2.0

Wi-Fi functionality (T8520 Only)

- 802.11 b/g/n
- Internal Antenna

Rear Panel Connections



Rear panel connections are shown in the following table.

External Connections (Rear)	
Antenna Input:	
GPS	GPS antenna
Fleet Management / Camera:	
Camera	One (1) NTSC composite camera input
RS232	Serial Communication
Ground	Earth & Digital ground
Vehicle Input / Output:	
Vehicle CAN Bus	One (1) primary J1939 / CAN network interface
Ground	Earth & Digital ground
Audio	Audio L+, R+, LR-, ON/OFF
Vehicle Power:	
VIN+&VIN-	Raw Vehicle Battery Voltage & Return
Accessory CAN Bus	One (1) secondary J1939/CAN network interface
Accessory	Input status for key accessory indications

Connector Definitions

Vehicle Power (Rear)

Connector: AMP 174971-2
Connector Mate: AMP 174044-2

Pin Number	Description	Pin Number	Description
1	VBATT+	5	EGND
2	VBATT-	6	ACC_CAN+
3	ACC_IN	7	ACC_CAN-
4	(reserved)	8	(reserved)

Vehicle I/O (MIC) (Rear)

Connector: AMP 1565476-1
Connector Mate: AMP 1717109-1

Pin Number	Description	Pin Number	Description
1	Digital Ground	9	(reserved)
2	(reserved)	10	Earth Ground
3	(reserved)	11	Audio_L+
4	(reserved)	12	Audio_R+
5	(reserved)	13	Audio_LR-
6	(reserved)	14	Audio_ON/OFF
7	(reserved)	15	Earth Ground
8	Vehicle CAN +	16	Vehicle CAN -

Fleet Management / Camera (Rear)

Connector: AMP, 1473898-1
Connector Mate: AMP, 1717106-1

Pin Number	Description	Pin Number	Description
1	Camera Input 1-	7	Earth ground
2	Camera Input 1+	8	No Connect
3	No Connect	9	(reserved)
4	No Connect	10	(reserved)
5	(reserved)	11	Earth ground
6	(reserved)	12	Digital ground

GPS Antenna (Rear)

Connector: Amphenol: FA1-NCRP-PCB-6A
Connector Mate: Amphenol, FA1-NCSJ-C04-0 (Female) or equivalent

Pin Number	Description	I/O
1	Center	Antenna
2-5	Outer Shell	GND

USB (Front)

Connector: Type A
Connector Mate: Type A

Pin Number	Description
1	USB +5V Power
2	USB -
3	USB +
4	USB GND