

MCP110 Diagnostic Guide

80-JB423-1 Rev. F October 2015 Omnitracs, LLC 717 N. Harwood Street, Suite 1300 Dallas, TX 75201 U.S.A.

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Glossary

Important Safety Information

Safety Definitions

The following Caution and Warning definitions are intended to advise the driver when it is safe to use a display unit.

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

Safety Advice

The following Safety Advice is provided for drivers, installers, and application developers who use and/or locate all types of display units.

If you are a Driver, do not use a display unit when the vehicle is in motion.

If you are an Installer, do not locate the display unit, including third-party devices, where it obstructs the driver's field of vision, distracts the driver from the driving task, or interferes with the driver's operation of controls or displays. The following is displayed when ignition is turned on.



If you are a Third-party Device Manufacturer or Application Developer, it is your responsibility to provide appropriate warnings regarding the safe use of your device(s) in conjunction with Omnitracs equipment. Applications should not require the driver to divert his attention from the road while driving a vehicle.

1 How the MCP110 Works

Topics in this chapter provide a basic overview of the MCP 110 Series and how its components interact to deliver effective, two-way information processing and other value-added services.

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For technical questions, contact Omnitracs Customer Support.

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

MCP110 Overview How the MCP110 Works

MCP110 Overview

MCP110 is a high bandwidth mobile computing platform designed to help increase customer service, reduce operating costs, enhance driver productivity, and ensure vehicle safety.

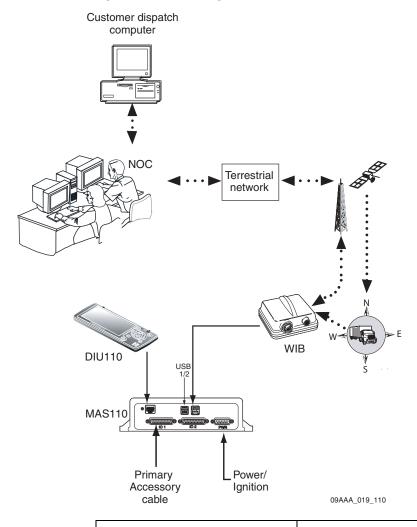
MCP110 offers cellular connectivity, optional WiFi, and delivers more processing power on the mobile unit, an increased number of hardware ports, and a Windows[®] Embedded Standard operating system.

Data processed through the MCP110 is backward compatible and interoperable with the host, so customers can access information across various Omnitracs platforms, such as MCP 100 Series, OmniTRACS Mobile Computing System, OmniExpress Mobile Computing System, and Untethered Asset Management Service.

Why MCP110 Makes Companies More Efficient

- Companies can maintain two-way contact with their vehicles and drivers 24 hours a day.
- Dispatchers can send pickup and delivery information directly to drivers, keeping vehicles on the road.
- Text-to-speech alerts drivers of incoming notifications and their importance, so drivers can choose to immediately listen to notifications without pulling off the road.
- Dispatchers know when vehicles are expected to arrive at locations, and can pass that information on to customers.
- Provides dispatchers with vehicle location and position history information by tracking the location of each MCP110 using latitude and longitude or distance and direction from landmarks (usually large towns and cities).
- Drivers can inform the dispatcher of road conditions or problems.
- Optional applications allow monitoring of driver performance, engine diagnostics, trailer locations, refrigeration status, and critical event reporting.
- Decision support software enables customers to optimize assets and inform shippers and consignees of load status.
- Over-the-air software upgrades allow drivers to remain on the road rather than having to stop at service centers.
- Display interface unit 110 (DIU110) provides a color graphical display, that integrates touchscreen functionality, extended temperature range, and improved clarity for delivering critical information to drivers.
- Hours of service data ensures regulatory compliance.
- On-board navigation application provides truck-specific route mappings.
- International Fuel Tax Agreement (IFTA) simplifies fuel reporting for inter-state operations.
- Helps with safety and accident prevention.
- Optimizes fuel management.

MCP110 Component Description



Component	Description
Network Operations Center (NOC)	 Responsible for processing and managing information traffic between dispatch center and fleet. Within the NOC is the Network Management Computer (NMC), which receives and handles information traffic. Located at Omnitracs, LLC in Las Vegas, NV.
Omnitracs Dispatch Software (QTRACS software/Services Portal)	 Software on the trucking company's dispatch computer and dispatcher's interface with the MCP110. Allows dispatcher to send and receive information, request MCP110 location information, and perform other dispatch functions. QTRACS/400 customers connect with the NMC with the NOC.

CDMA Wireless Network How the MCP110 Works

Code Division Multiple Access (CDMA) Wireless Network	Radio frequency (RF) signals are received from the antenna by the MCP110 via the wireless interface box (WIB110) from a wireless network.
Optional Data Satellite	Handles all two-way information traffic between the vehicle and the NMC if you are using a satellite data modem (SDM).
GPS Positioning Satellites	Uses 24 satellites to provide vehicle positioning information.
Mobile Computing Platform 110 (MCP110)	 Driver's interface with the Omnitracs platform and the component that resides in the vehicle. Allows the driver to send and receive information.

- The MCP110 includes the MAS110, which consists primarily of a microprocessor, a wireless modem module, and data storage.
- The user interface device (DIU110) is the driver's display terminal that enables the driver to read, write, and send information.
- The antenna (located inside the WIB110) relays information between dispatch and the driver.
- The antenna receives and delivers wireless information to and from the MAS110.
- The antenna interfaces with wireless networks. Information is passed through the
 Omnitracs NOC where it is distributed to the dispatch center. Dispatchers respond by
 sending a notification back to the Omnitracs NOC, where it is relayed to the PCS gateway
 and broadcast out to the wireless network to be picked up by the vehicle's antenna.

CDMA Wireless Network

- MCP110 uses CDMA technology to connect dispatchers and vehicles over the wireless airwaves.
- Wherever a cellular/terrestrial wireless network exists, drivers can send information to and receive information from dispatchers while traveling.
- Utilizes wireless digital roaming to enable many cellular networks.

WiFi Network (Optional)

- A wireless networking technology that uses radio waves to provide wireless high-speed internet and network connections.
- The MCP110 will connect and allow access to the internet when within range ("hotspot" area) of a specified wireless network.
- Uses IEEE 802.11 standards.

How the MCP110 Works GPS Network

GPS Network

 A worldwide radio-navigation system formed from a constellation of 24 satellites and their ground stations.

- Uses satellites as reference points to calculate positions accurate to a matter of meters.
- A standard feature of the MCP110 for positioning.
- MCP110 receives positioning data from the GPS receiver, which is integrated inside the antenna to determine location.
- Position data from the MCP110 is forwarded to dispatch whenever information is sent to a vehicle and acknowledged, and whenever a driver sends information.
- Position data is sent at regular intervals and is made available to dispatch.

Optional Data Satellite

- Used if equipped with a satellite data modem (SDM).
- Uses Ku-band signals to handle all two-way information traffic between the vehicle and the NMC.

MCP110 Mobile Components

Mobile part of the Omnitracs platform is installed in a customer's vehicle.



Each MCP110 has its own unique unit address which is the serial number on the MAS110.
 This address is used to route information to the correct vehicle.

Standard components:

- Wireless interface box (WIB110)—Contains terrestrial and cellular, and antenna that provide CDMA/GSM/UMTS connectivity.
- Mobile application server (MAS110)—Unit which contains the operating circuitry and memory for the MCP110. The "black box" of the platform.
- Display interface unit (DIU110)—Standard display unit for the MCP110, which the driver uses to connect with the dispatcher. Consists of a color graphical display that integrates touchscreen functionality, extended temperature range, and improved clarity for drivers.

Optional components:

- Wireless interface box (WIB200)—Contains terrestrial, cellular, WiFi, and antenna that provide CDMA/GSM/UMTS communication.
- Display interface unit (DIU200)—Standard display unit for the MCP200, which the driver uses to connect with the dispatcher. Consists of a color graphical display that integrates touchscreen functionality, extended temperature range, and improved clarity for drivers. Includes pull-out keyboard.

2 Best Practices

Topics in this chapter provide troubleshooting concepts and ideas. Read this chapter before you proceed to other chapters in this manual.

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Troubleshooting Guidelines

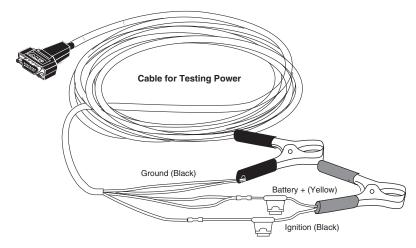
Keep Known Good MCP110 Component Spares in Shop

Spare parts should include:

- Mobile Application Server (MAS110)
- MAS backup battery
- Wireless Interface Box (WIB110)
- WIB110 cable
- Display Interface Unit (DIU110)
- · Display cable
- · Power cable
- · Accessory cable
- Power source (either a 12 volt battery or 12 volt power supply)
- · Speaker switch cable
- Speaker
- · Any accessory items typically used

To test for power and ground, use a power cable with large alligator-style clips on a test cart or the tractor. If you want to bypass the installed power cable, use the test cable connected to the tractor batteries:

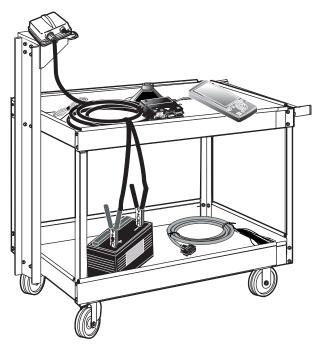
 Place one alligator clip on the ground (BAT RTN) and the other alligator clip on the power and ignition wires (BAT + and IGNITION).



Use a Test Cart to Perform Bad Part Verification/Double Checking

If a Omnitracs MCP110 part is diagnosed bad on a truck, insert the failed part on the test cart.

- If it continues to fail, the RMA process should be utilized to replace the part.
- If the suspect part does not fail on the test cart, further troubleshoot the MCP110.



Perform a Visual Inspection of the Installed MCP110

- Check for damaged cables, improper grounds, improper electrical connections, loose butt splices, and the integrity of the installation, particularly the antenna.
- Bad mounts can contribute to system problems.
- Loose antenna connections or an antenna not installed properly can allow excessive vibration which can affect system performance.
- Airdams with multiple layers of fiberglass, metallic logos, or metallic/lead based paints, and other devices such as metal wings can affect system performance.

Reseat All Cables

- Always inspect and reseat cable connectors prior to replacing any components.
- Inspect for corrosion and bent, broken, pushed, missing pins, and/or sockets.

Verify MAS110 LED Indicators Are in a Normal State

- · LED on the bottom is blinking blue.
- LED on the top is green.
- · See Chapter 10 for more information.

Check System Voltage Measurements and Grounding

Use the same ground reference that a particular circuit uses.

- Check the MAS110 light indicators.
- Verify that vehicle battery and cables are in good condition.
- Check voltages (see Appendix A for more information):
 - Power cable: you must use pin 8, 14, or 15 as the ground reference.
 - Display cable: you must use pin 1 or 8 as the ground reference.
- Verify grounds:
 - Run a jumper lead between the power cable ground connection and the battery negative (-) terminal.
 - Make sure the fastener is tight and the metal is free of paint or corrosion.
 - Make sure the grounding point is well-connected to the vehicle chassis ground or to the negative terminal of the battery.

Replace Only Faulty Parts

Typically, only one part is bad. Once the system is operating, you can substitute suspect parts back into the system to verify which part is bad, or use a test cart equipped with known good spare parts to retest suspect parts.

Install Parts Correctly

Refer to the MCP110 Installation Guide.

Determine If the Problem Is Intermittent

Check for:

- Bad or loose electrical connections including cable connectors, ring terminals, butt splices, and power/ground connections can contribute to intermittent system performance.
- Cables that run under the tractor are subject to harsh weather and road debris which can impact performance.

Preventive Maintenance Inspection

Topics in this chapter provide steps for inspecting the mobile application server 110 (MAS110), the display interface unit 110 (DIU110), the wireless interface box 110 (WIB110), the optional satellite data modem (SDM), and the Trailer Management system.

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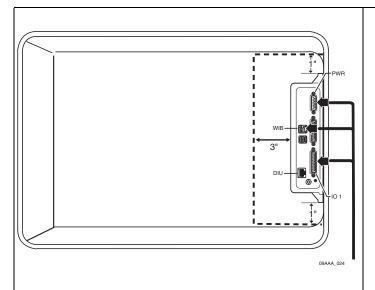
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- In Canada, call 800-863-9191

How Often Should Inspections Be Performed?

- Omnitracs recommends inspections be performed at least once every 90 days.
- During normally scheduled vehicle preventive maintenance inspections.

Inspecting the Mobile Application Server 110 (MAS110)



- Make sure the compartment where the MAS110 is installed has at least 1 inch of air space on each side for cooling and at least 3 inches of space for servicing the backup battery.
- Make sure there are 4 to 6 inches of air space on the connector side to allow for cable bends and servicing.
- Make sure tire chains, tools, and other equipment are not stored on top of the MAS110.
- **4.** Make sure the mounting hardware holding the MAS110 in place is tight and does not allow the MAS110 to vibrate.



Caution

Do not use a pneumatic tool as this could damage the hardware. Use extreme caution when working with power tools.

Make sure the MCP110 display unit, antenna, power, and accessory cables coming into the compartment have enough slack and are not pulling on the MAS110 connectors. Make sure the cables are not being chafed or cut by sharp edges.



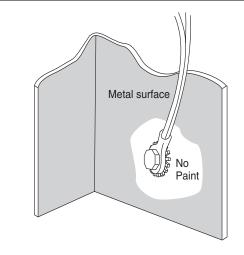
- 6. Make sure the cable connectors have not worked themselves loose from the MAS110. Hand tighten any thumb screw connectors.
- **7.** Verify that the strain relief bracket is installed and cables are secure.



Caution

DO NOT apply grease to the connectors.

8. Check to make sure the cables are stored securely with tie wraps and are stored out of the way.



9. Check the power connections, such as at the power distribution panel, to ensure they are tight and the wiring is secure.

Check all ground connections to make sure there is a good metal-to-metal contact and the wires are not strained or damaged. Ground wires should be attached to vehicle or sleeper surfaces connected to chassis ground.



Caution

Ground wires should not be connected to the MAS110 or mounting hardware.

Make sure there is no corrosion around the ground connection. If there is corrosion, take the connection apart, clean the connector and surface with a wire brush, and reconnect the parts.

Inspecting the Display Interface Unit 110 (DIU110)



- Verify proper DIU110 operation. From the Home screen, tap the **Diag** tab. Tap **Run All** button.
 - Verify at a minimum that Cellular, CDD, GPS, Battery Backup, and either J1587 or J1939 show green check marks with ignition ON.
 - Turn the IGN to the OFF position and verify that the status goes to **Ignition Off**.



2. Verify the DIU110 screen are clean.

Omnitracs recommends that you use a soft cloth and either plain water, glass cleaner, or mild soap to gently clean the surfaces of the DIU110 as well as the display screen.



Caution

The MDU is not watertight. Do not spray any liquid directly on the display screen.

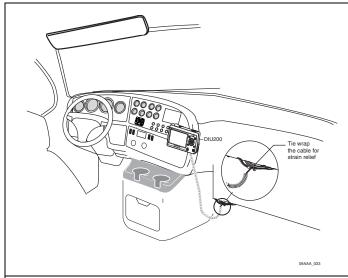
Heavily soiled DIU110s should be returned to Omnitracs using the RMA process for proper cleaning.

Caution

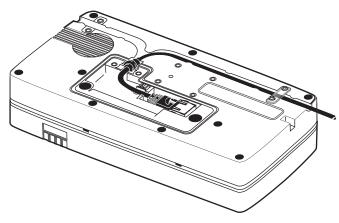
Use the PDA stylus, provided with the unit, or your fingers to navigate the DIU110.

Do not use pencils, pens, metal objects, or any other devices which could possibly scratch the touchscreen.

3. Verify the display screen is readable in any lighting condition.



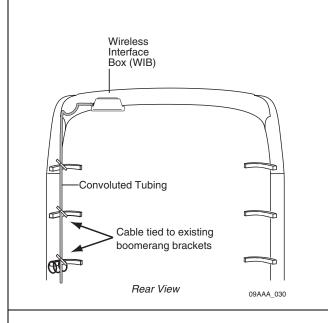
- **4.** Make sure the display cable has enough slack and is not being rubbed or cut by anything inside the cab.
- **5.** Remove the DIU110 from the holster and make sure the screws holding the holster in place are secure.



6. Inspect the underside of the DIU110 to make sure the tie wrap is securely tightened and the cable is not damaged.

The illustration to the left is the underside of the DIU110 showing the tie wraps.

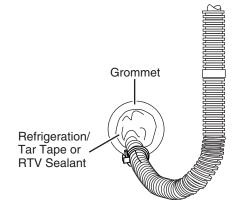
Inspecting the Antennas



1. Make sure all cables are protected with convoluted tubing and are in good condition.

Make sure cables have no kinks or bends and are not being pulled tightly against metal edges that can rub or cut the cables.

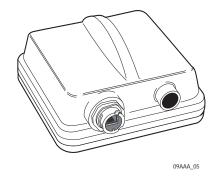
2. Make sure there are adequate service (drip) loops in the cables at the antenna and where they enter the vehicle.



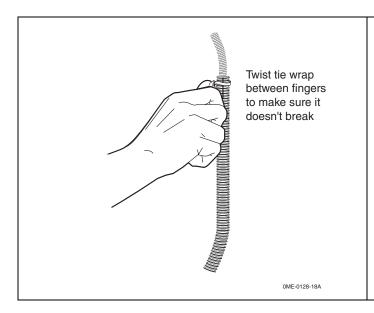
3. Make sure grommets are in place around any holes the cables pass through.

Make sure RTV sealant or refrigeration/tar tape is intact and provides a good seal on any holes that lead to the exterior of the vehicle.

Go to step 4. if you are inspecting a terrestrial unit.

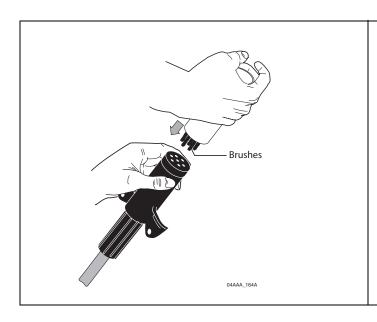


- 4. Make sure the antenna is securely attached to the mount. Check the mount hardware to make sure it is secure and does not show any signs of loosening.
- Check that the antenna cable connectors have not worked themselves loose from the MAS110.



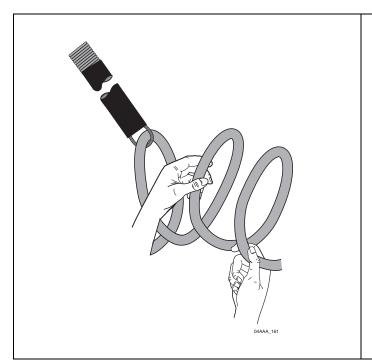
6. Visually inspect all tie wraps to make sure they are not brittle and do not break. If a tie wrap is damaged or brittle, replace it.

Verifying Trailer Management System Connections

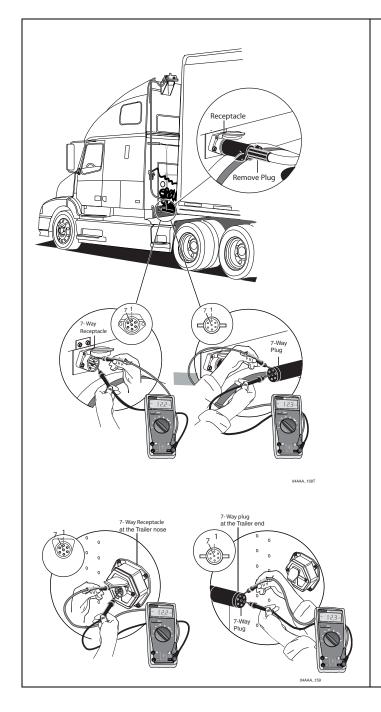


1. Make sure all 7-way connection points have been cleaned, inspected, and greased.

Omnitracs recommends that you use dielectric grease on the connection points.



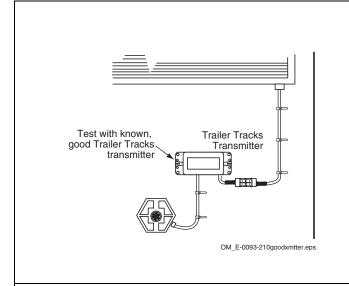
2. Check the 7-way coil cord for nicks, cuts, or abrasions. Replace the cord as necessary.



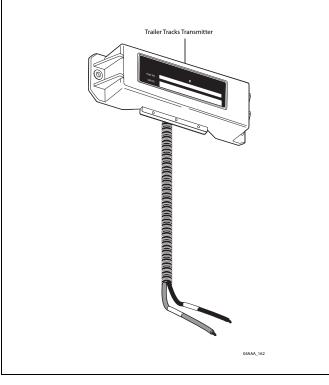
3. Make sure there is voltage (12–24V) on pin 7 at all 7-way connection points (on the tractor and trailer).

Make sure you connect to ground (pin 1) as well when performing this step.

The illustrations at left show the connection at the tractor and at the trailer.



- Connect a test transmitter to the truck.
- 5. Turn IGN to ON.
- **6.** Touch the **Trailer Management** button to access the Trailer IDs screen and verify that the transmitter's ID displays.



7. For refrigeration customers, do the following:

- Inspect both ends of the refrigeration cable for corrosion and clean if necessary.
- Turn IGN to ON.

Verify the refrigeration connection and data transfer by accessing the Refrigeration Status screen.

 With the refrigeration switch in the ON position, verify the REFRIGERATOR STAT# field is incrementing approximately once a minute. The manufacturer code for the unit should appear at the end of the refrigerator status number: "T" for Thermo King, or "C" for Carrier.

System Verification

Topics in this chapter provide information and procedures for performing a basic system verification.

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- In Canada, call 800-863-9191

For verifying the Performance Monitoring system, the Trailer Management system, and other accessories, see the appropriate chapter in this manual.

Note

GPS is required for **both** satellite and terrestrial networks.

What Is Basic MCP110 System Verification?

 A functional system check that should be performed after installation or service to verify that the MCP110 is operating properly.

How to Find the MCP110 Unit Address (UA)/Serial Number

Before you call Omnitracs Customer Support for assistance, write down the serial number of the mobile application server 110 (MAS110).

1. To view the MCP110 unit address on the display interface unit 110 (DIU110), use the right and left arrows to get to the **System** button, then tap the button.



2. Tap the **System** tab.



The MCP110 Unit Address is at the top of the page. The MAS also has the Unit Address written on the yellow label.

Performing System Verification

Shortly after you power up the MCP110, the MCP110 Home screen displays.



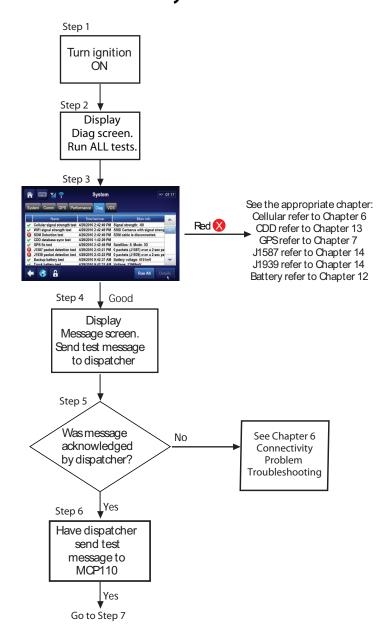
- System verification information has been stored on screens/buttons under the System button.
- Tap the left or right arrow to get to the **System** button. Tap the button to access the display screens shown on the following pages.

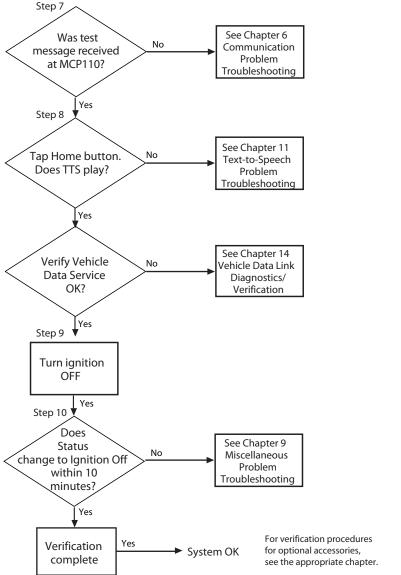


Tap the Run All button.



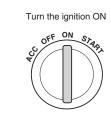
Flowchart—Basic MCP110 System Verification





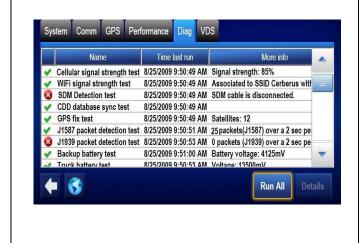
System_Flow_2_MCP110

Basic MCP110 System Verification Procedure

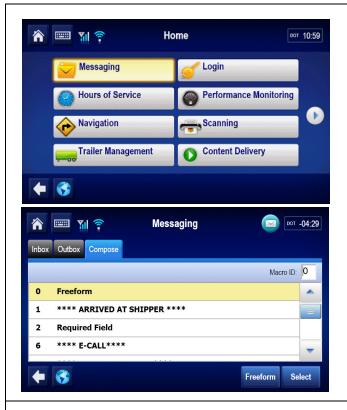


The steps in this procedure match the steps on the flowcharts on the previous pages. The steps are not always sequential—you may be instructed to skip steps.

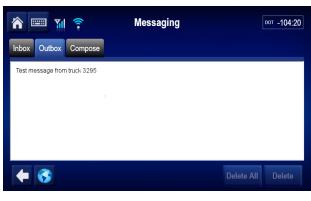
1. Turn the vehicle ignition ON; the engine does not have to be running.



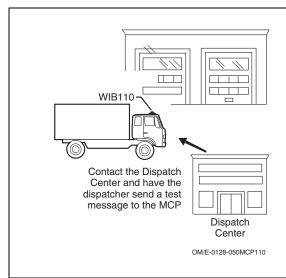
- **2.** Go to the Home screen and tap the **Diag** tab. Tap **Run All** button.
- **3.** Check for appropriate green checkmarks (\checkmark) .
 - At minimum, Cellular, CDD database, GPS, and Battery Backup should show green checkmarks.
 - If the MCP110 passed all the tests, go to step 4.
 - If the MCP110 failed any necessary tests, go to the appropriate diagnostic procedure for the failed item in this guide.
 - See MCP110 Diag Screen on page 4-14 for definitions of each name.



- **4.** Send a test message to the dispatcher. Go to the Home screen and tap the **Messaging** button.
 - Tap the Compose tab.
 - Type the message text including the truck number.
 - Send the message?
 - Tap Yes to send the message.



- 5. Tap the Outbox tab to display the message that was just sent. Orange "≒" (arrows) indicate the message is in transit; a green "√" (check mark) indicates the message has been acknowledged.
 - If the message is acknowledged, go to step
 6.
 - If the message is not acknowledged, see Chapter 6: Connectivity Problem Troubleshooting.



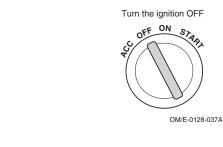
6. Have the dispatcher send a test message to the MCP110. If the dispatcher is not available, call Omnitracs Customer Support (800-541-7490) to have the message sent.



- 7. After a few minutes, the display's Message Waiting Light should come on, and a voice notification will tell you the message has been received. Tap the **Inbox** tab to display the dispatcher's message.
 - If the MCP110 received the message, go to step 8.
 - If the MCP110 did not receive the message, see *Chapter 6: Connectivity Problem Troubleshooting*.



- Verify that the message can be played using the center button on the 5-way key on the DIU110.
 - If the message can be played, go to step 9.
 - If the message cannot be played through TTS, see Chapter 11: Text-to-Speech Problem Troubleshooting.





- 9. Turn the vehicle ignition OFF.
- **10.** Make sure the display unit stays on with the ignition OFF.
 - If the display unit stays on, go to step 11.
 - If the display unit does not stay on, see Chapter 5: Display Problem Troubleshooting.
- 11. Tap the **System** button. Tap the **System** tab and verify that the STATUS field changes from **Good** to **Ignition Off** within one minute.
 - If the Status changes to Ignition Off, System Verification is complete.
 - If the Status does not change to Ignition Off, see *Chapter 9: Miscellaneous Problem Troubleshooting*.

For verifying the Performance Monitoring system, the Trailer Management system, and other accessories, see the appropriate chapter in this manual.

Version

MCP System Screens System Verification

MCP System Screens

MCP110 System Screen

• Tap the **System** tab to access system information about the MCP110.



Field	Description			
Unit Address	Also called the UNIT SERIAL NUMBER. This number is linked to the truck number in the dispatch software.			
Account	The NOC account number the unit is assigned. Currently not available.			
Connection	Connected or Disconnected. Indicates whether the logical PPP link between MAS and antenna is up and passing data.			
System Status	Good, Quiet, or an Error indication.			
Ignition	On or Off. Off displays within seconds after you turn the ignition OFF.			
Database State	 Out of Sync or Sync Complete. Indicates the MCP110's database status: Sync complete is displayed if customer and mobile unit (MCP110) information has been received by the MCP110 and is up-to-date. This is the desired state. Out of sync is displayed if the mobile unit (MCP110) information has not been received by the MCP110 and is waiting to be updated. 			
Last Sync	Indicates the date and time of the most recent Sync complete status for the MCP110.			
Last Boot	Indicates the date and time of the most recent bootup for the MCP110.			
Up Time	The amount of time the unit has been awake since the last boot up.			
Time Remaining	The time in hh:mm before the unit is scheduled to go to sleep. If ignition is on, N/A will be displayed.			

System Verification MCP110 Comm Screen

MCP110 Comm Screen

- Tap the **Comm** tab to access antenna information about the MCP110.
- This screen displays antenna information on the WIB110 (cellular and optional WiFi).



Field	Description				
Satellite (applies only if SDM is installed)					
Active/In Use	Green light shown when mode type is available. Black light means not Active/not In Use.				
Session	Time and date when last in use.				
Duration	Duration of last in use session.				
State	Indicates the physical state of the antenna.				
Terrestrial					
Active/In Use	Green light shown when mode type is available. Black light means not Active/not In Use.				
Session	Date and time the unit used that mode.				
Duration	Duration of last in use session.				
IP	The IP address that the unit has been given by the terrestrial network for the last/most recent terrestrial communication session.				
RSSI	Received Signal Strength Indication—The strength of a wireless network signal being received by the antenna. RSSI should be less than 110.				
Registered	Home network or Registered roaming.				
SID	System identification number of the cellular network.				
WiFi (optional)					
Active/In Use	Green light shown when mode type is available. Black light means not Active/not In Use.				
Session	Date and time the unit used that mode.				
Duration	Duration of last in use session.				
State	Indicates the physical state of the antenna.				
Signal	The signal strength of the associated/authenticated WiFi access point.				
SSID	Service Set IDentifier—The IEEE 802.11 wireless networking access point name.				

MCP110 GPS Screen System Verification

MCP110 GPS Screen

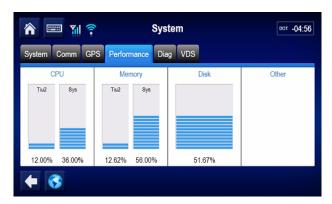
• Tap the **GPS** tab whenever you want to see basic GPS information.



Field	Description			
Last Update	The time of the last GPS update. This value should update every second.			
Latitude	The last received latitude value.			
Longitude	The last received longitude value.			
Altitude	The last received altitude value.			
Mode	 Indicates the MCP110's GPS status: 3-D is displayed if the receiver is able to view three or more GPS satellites. Under normal performance, a 3-D mode will be displayed. 2-D is displayed if the receiver is able to calculate a position, but has a limited view to the GPS satellites. NO FIX is displayed when the GPS satellites cannot be viewed. 			
Ground Speed	Speed calculated by GPS through a change in vehicle location.			
Precision	Measure of how accurate the GPS signals are that are being received. Values less than 4 gives best accuracy.			
Satellites	Number of GPS satellites the receiver is viewing at any given time.			
Messages	GPS statements received by the unit from a GPS source.			

MCP110 Performance Screen

• Tap the **Performance** tab whenever you want to see the basic configuration of the unit.



Field	Description
CPU	Shows MAS110 CPU usage.
Memory	Amount of memory used.
Disk	Amount of flash memory space used.
Other	Not currently used.

4-13

MCP110 Diag Screen System Verification

MCP110 Diag Screen

The Run All button, located at the bottom right of the screen. The system runs tests of all
possible connections to the MCP110 and then displays whether the connection is found
(green ✓), or not found (red X).



Name	Description
Cellular signal strength test	Will show a green checkmark when in good cellular network coverage. See Chapter 6: Connectivity Problem Troubleshooting.
WiFi signal strength test	Will show a green checkmark when in good WiFi network coverage. Note: WiFi is optional. See Chapter 8: WiFi Problem Troubleshooting (Optional).
SDM detection test	Will show a red X. NOTE: The SDM Satellite Date Modem is not optional at this time.
CDD database sync test	Will show a green checkmark when database has been synchronized with NOC (usually takes 3–5 minutes after unit is first powered up). See Chapter 13: Database Out of Sync.
GPS fix test	Will show a green checkmark if GPS network is detected. See Chapter 7: GPS Positioning Problem Troubleshooting.
J1587 packet detection test	Will show a green checkmark if accessory cable leads are connected to the J1587 databus, the vehicle's ignition is ON, configured for J1587, and it's getting data. See Chapter 14: Vehicle Data Link Diagnostic/Verification Procedures.
J1939 packet detection test	Will show a green checkmark if accessory cable/CAN bus repeater cable is connected to the J1939 databus, the vehicle's ignition is ON, configured for J1939, and it's getting data. See Chapter 14: Vehicle Data Link Diagnostic/Verification Procedures.
Backup battery test	Will show a green checkmark if the battery is installed in the MAS and has acceptable voltage (3.6VDC). See Chapter 12: Backup Battery Troubleshooting
Truck battery test	Will show a green checkmark if the truck's voltage is > 12VDC.

System Verification VDS Screen - Summary

VDS Screen - Summary

See Chapter 14: Vehicle Data Link Diagnostic/Verification Procedures for detailed information on the VDS screen.

Tap the VDS tab to access vehicle data services information.



Green dot: Configured and getting data Red dot: Configured but data is stale

Black dot: Not configured

VDS Screen - Details

 Tap the VDS details icon at the bottom of the screen to access vehicle data services information.



Omnitracs MCP110 System Verification Form

You can make copies of the System Verification Form on the following page and record important information you may want to keep concerning the vehicle and the MCP110.



Installation Verification Form - MCP110

Company Name:		Installation Daf	nte:
Installer #1:		Installer #2:	
Driver Name:	Truck #:	Year:	MFG/Model:
Driver ID:	Driver (Contact #:	
Unit Address (MAS S/N):	MAS S/	W Version:	WIB S/N:
Display (MDU/DIU S/N):		-	
Options: ☐ Panic Button ☐ Scanner ☐ Other_			RACS (tractor)
Communication Signals:	MATE:		
Cellular signal RSSI:	WiFi SSID:		
Database State: Sync Completed? Yes No Positioning: GPS Fix Test passed? Yes No			
Vehicle Data Source Verification :			
Databus Connections:	J1587) and/or 🚨 J19	939	
Packets Detected for J1587? YesN	No Packets	s Detected for J1	1939? Yes No
Backup Battery Test			
MAS Battery test passed? Yes No Text to Speech Verification: TTS responds to HOME button? Yes		, ,	e:Volts ? Yes No
Message Verification:			
Send test message with truck number -	Message Acknowledg	jed (shows greer	n checkmark)? Yes No
Ignition status: Does the ignition status	s correctly show ON/0	OFF key position	ıs?: Yes No
I find the service rendered and m completed in a satisfactory mann		connection with	h the above mentioned work to have been
Driver/Customer Signature:			Date:

Display Problem Troubleshooting

These topics are covered in this chapter:

DIU110 Overview	-2
Normal Performance	-2
Abnormal Performance	-3
DIU110 Display Touchscreen Lighting	-3
DIU110 Touchscreen Non-responsive/Calibration	-4
DIU110 Screen Is Dark or Blank	-5
DIU110 Stuck on Loading Screen or Error Message at Bootup 5	<u>-</u> 9

For technical questions, contact Omnitracs Customer Support.

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

DIU110 Overview

The DIU110 is a color graphic display that integrates touch screen functionality.

Normal Performance

- When the vehicle ignition is ON, an image appears on the display screen.
 - The brightness can be adjusted using the backlight control.
 - Touching the screen brings back the brightness of the touchscreen.
- When the vehicle ignition is turned OFF, the display screen stays on until the MCP110 power-down timer expires then it goes dark. The power-down timer is configured by the customers' dispatch system.
- The display alerts you that you have received one or more notifications when the message waiting light goes on.
- When the message waiting light is off, all the notifications have been read.
- If the message waiting light flashes constantly, an emergency message has been received.
- The touchscreen responds to presses,



Abnormal Performance

If any of the functions do not work as described in the previous section, there is a problem with one or more of the following:

- · Display controls are turned off or turned low
- · Touchscreen needs calibrating
- · Faulty display cable
- · Faulty display
- Faulty mobile application server 110 (MAS110)
- Bad system ground or power connection problem

DIU110 Display Touchscreen Lighting

The DIU110 has controls for the touchscreen backlighting.

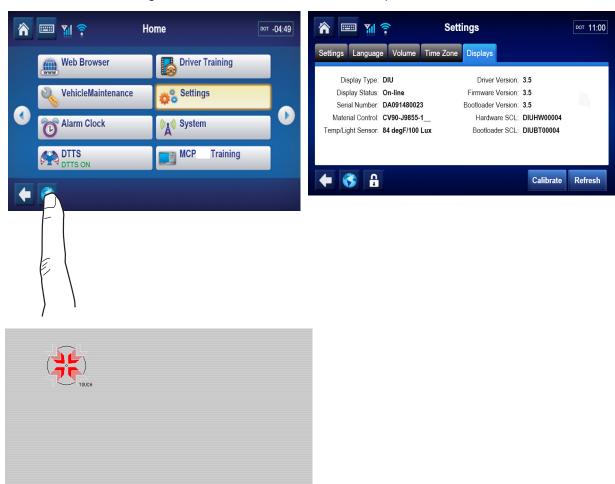


The brightness toggles the touchscreen backlighting up and down 20% for each press. When the backlight is completely OFF, the brightness control key will be in an amber color.

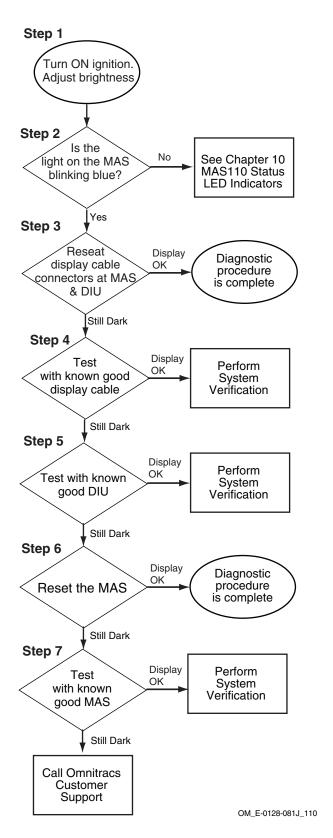
DIU110 Touchscreen Non-responsive/Calibration

If you are touching any of the buttons on the touchscreen and the screen is not responding quickly or the screen arrow is not where the screen was touched, the touchscreen may not be calibrated properly. To recalibrate the DIU110 touchscreen settings, from the Home screen:

- Touch the **Globe** button at the bottom of the screen.
- Using the Settings screen, touch the Displays button.
- Touch the Calibrate button.
- When the targets display, carefully touch and hold down each of the **targets (+)** in the center and release when instructed. It is best to use your finger to calibrate.
- When the last target is touched, the calibration is complete.



DIU110 Screen Is Dark or Blank

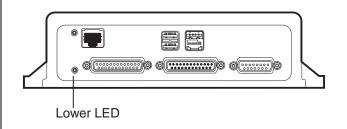


Diagnostic Procedure



The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

- **1.** Turn the vehicle ignition ON. Adjust the brightness controls. Does the display screen light up?
 - If **yes**, the screen is working properly. The diagnostic procedure is complete.
 - If the screen is dark or blank, go to step 2.

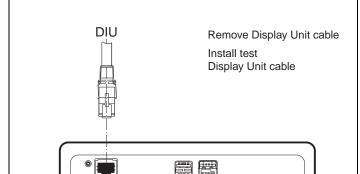


2. Is the lower LED on the MAS110 blinking blue every second?

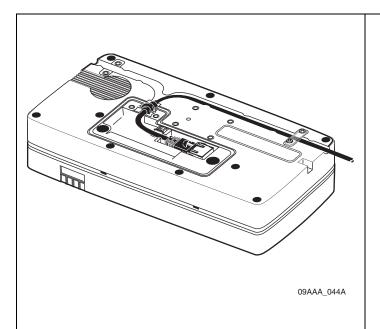
Note

The lower MAS110 LED blinks blue every second when the unit is awake and once every 12 seconds when it is asleep. For information concerning other LED colors and combinations, refer to Chapter 10.

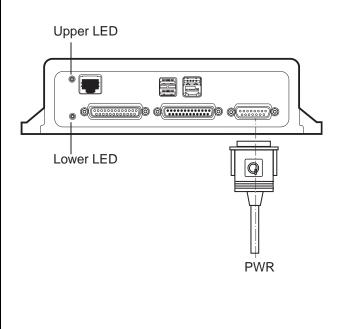
- If yes, the MAS110 has truck power and is in a normal state. Go to step 3.
- If no, go to Chapter 10: MAS110 Status— LED Indicators.



- **3.** Reseat the display connectors on the MAS110 and DIU110. Is the display working?
 - If yes, the diagnostic procedure is complete.
 - If no, go to step 4.
- **4.** Install a replacement display cable and recheck the display.
 - If the display is now working, the original display cable was bad. Replace the display cable and perform the system verification in Chapter 4: System Verification.
 - If the display is still not working, the original display cable is probably okay. Go to step 5.



- 5. Test with a known good DIU110.
 - If the display is now working, the original DIU110 is bad. Replace the DIU110 and perform the system verification in *Chapter* 4: System Verification.
 - If the display is still not working, the original MAS110 was probably okay, go to step 6.



6. Reset the MAS110 by disconnecting the power cable. Wait for the MAS110 LED indicators to go out.

Note

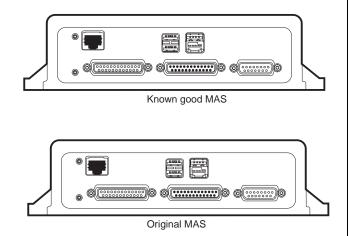
It usually takes about 5 minutes for the LED indicators to go out.

Once all LED indicators are off, reconnect the power cable to the MAS110 and turn ON the ignition. The unit will take 6 minutes to boot up.

Note

In a normal operating environment, the lower LED should be BLINKING BLUE and the upper LED should be GREEN.

If the display is still not working, go to step 7.



7. Test with a known good MAS110 as follows:

Disconnect all of the cables from the original MAS110 and attach them to the known good MAS110. Turn ON the ignition. The unit will take 5 minutes to boot up.

• If the display is now working, the MAS110 is faulty. Replace the MAS110.

Note

Before sending a faulty MAS110 back to Omnitracs, remove the backup battery and install it in the replacement MAS110. A replacement MAS110 does not come with a backup battery.

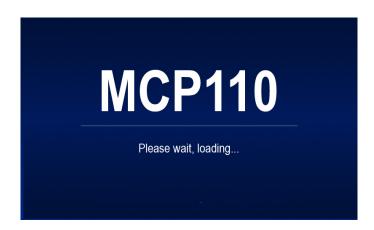
After the replacement MAS110 is installed, reconnect all components and perform the system verification procedure in *Chapter 4:* System Verification.

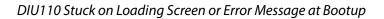
 If the display is still not working, call Omnitracs Customer Support:

US: 800-541-7490 Canada: 800-863-9191

DIU110 Stuck on Loading Screen or Error Message at Bootup

An MCP110 will show a loading screen during the bootup process. This screen should be displayed for no more than 3 minutes during a typical bootup. Periodically, when software upgrades are applied, the screen will be displayed for a little longer. If this screen is displayed for more than 6 minutes, please call Customer Support at: 800-541-7490.





Display Problem Troubleshooting

Connectivity Problem Troubleshooting

These topics are covered in this chapter:

Overview	6-2
Normal Performance	6-2
Abnormal Performance	6-2
NO SIGNAL Light On or Flashing	6-3

For technical questions, contact Omnitracs Customer Support.

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

Overview

An MCP110 unit has two possible methods to deliver and receive information:

- Terrestrial/Cellular
- WiFi (optional)

The WIB antenna is used to support terrestrial/cellular and WiFi methods.

Normal Performance

The MCP110 unit selects Cellular and WiFi connectivity methods to send or receive information. The icons are shown at the top left of the display.



The display's NO SIGNAL light is used to indicate when there are no connectivity methods available to use. It is normal for the NO SIGNAL light to occasionally go on when the vehicle is in motion. This is because the WIB110 antenna has temporarily lost a wireless network signal (tunnel, bridge, overpass).

Abnormal Performance

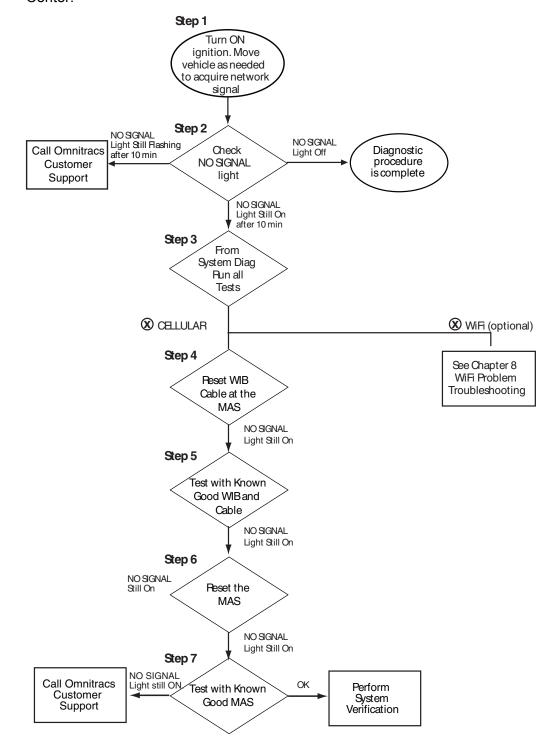


If the unit is unable to deliver and receive information, or if the NO SIGNAL light stays on or keeps flashing longer than a few minutes, the problem is usually caused by one or more of the following:

- · No cellular coverage at that location
- Loose or faulty WIB110 antenna cable
- Faulty WIB110 antenna
- Faulty MAS110

NO SIGNAL Light On or Flashing

When the NO SIGNAL Light is on, it means that none of the available connectivity methods are available. (Cellular, WiFi optional) If the NO SIGNAL light is flashing, it means the unit has connectivity signal but is unable to pass messages to the Omnitracs Network Operations Center.



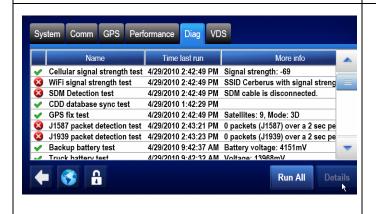
Diagnostic Procedure



The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

- **1.** Turn the vehicle ignition ON. Move the vehicle, as needed, to acquire a wireless network signal.
- Check the NO SIGNAL light on the display. After the MCP110 acquires a network signal, the NO SIGNAL light will go off.

It may take 5 minutes for the MCP110 to acquire a network signal.



3. Touch the **System Diag** Tab and then the **Run** All button.





Active/

In Use: Green indicator light shown when

Terrestrial mode is available. Black indicator light means not Active/not In

Use.

Session: Date and time the unit used mode last.

Duration: Duration of last in use session.

IP: The IP address that the unit has been

given by the terrestrial network for the

last/most recent terrestrial communication session.

RSSI: Received Signal Strength Indication.

The strength of a wireless network signal being received by the antenna. RSSI should between -40 and -110.

Registered: MCP110 terrestrial system checks

network coverage every 3 minutes. Indicates Home network or Roaming.

SID: System Identification Number. The

number that allows the unit to quickly register on the cellular network.

4. Use the MCP110 Comm screen for viewing details associated with Cellular/Terrestrial/ Cellular availability and signal strengths.

Reseat WIB Cable at the MAS and at the WIB. Allow a few minutes for the unit to acquire the cellular signal.

- If the RSSI value is blank, or -110 to -255, go to the next step.
- If the RSSI value is -40 to -110, check the NO SIGNAL light.
 If it is OFF, perform system verification.
 If it remains on, go to step 7.
- **5.** Test with a known good WIB110 antenna and cable.
 - Disconnect the original WIB110 antenna and cable from the original MAS110 and connect it to the known good WIB110 antenna and cable.

Allow a few minutes for the unit to acquire the cellular signal.

- The RSSI should be less than -110. If it is, perform the system verification procedure in Chapter 4: System Verification.
- If the RSSI is greater than -110, move the truck to a different location to pick up a better signal.

Optional





Active/

In Use: Green indicator light shown when WiFi

mode is available. Black indicator light

means not Active/not In Use.

Session: Date and time the unit used that mode.

Duration: Duration of last in use session.

State: Indicates the physical state of the

antenna.

Signal: The signal strength of the associated/

authenticated WiFi access point.

SSID: Service Set IDentifier. The IEEE 802.11

wireless networking number that allows the unit to quickly register on the WiFi

network.

6. Use the Comm tab for viewing WiFi signal strengths.

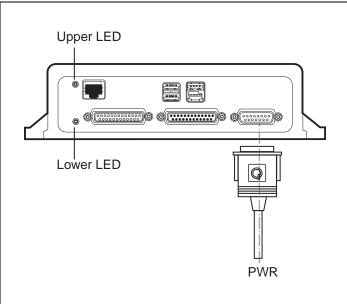
Note

A WIB antenna that is WiFi capable will have a white label. A WIB antenna that is NOT WiFi capable, will have a yellow label.

Since the WiFi antenna is in the WIB, if the unit is receiving terrestrial signal, it confirms the WIB and WIB cable are connected. In most cases, if the unit is not connecting to a WiFi access point, it is because a WiFi signal is not being broadcast at your location or the access point/SSID that is being broadcast is not configured to be used by the unit.

See Chapter 8: WiFi Problem Troubleshooting (Optional) for more information on configuring access points/SSIDs.

If you are reasonably sure that you are at a location that is receiving signals from a configured access point/SSID, go to step 7.



Reset the MAS110 by disconnecting the power cable. Wait for the MAS110 LED indicators to go out.

Note

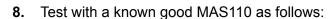
It usually takes about 5 minutes for the LED indicators to go out.

Once all LED indicators are off, reconnect the power cable to the MAS110 and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the lower LED should be BLINKING BLUE and the upper LED should be GREEN.

- If the NO SIGNAL light goes off, the diagnostic procedure is complete.
- If the NO SIGNAL light stays on, go to step 8.



Disconnect all of the cables from the original MAS110, attach them to the known good MAS110, and turn ON the ignition. The unit will take 5 minutes to boot up.

 If the NO SIGNAL light goes off, the original MAS110 was bad. Replace the original MAS110.

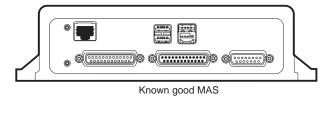
Note

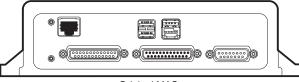
Before sending a faulty MAS110 back to Omnitracs, remove the backup battery and install it in the replacement MAS110. A replacement MAS110 does not come with a backup battery.

After the replacement MAS110 is installed, reconnect all components and perform the system verification procedure in *Chapter 4: System Verification*.

 If the NO SIGNAL light stays on, call Omnitracs Customer Support:

US: 800-541-7490 Canada: 800-863-9191





Original MAS

Cannot Send/Receive

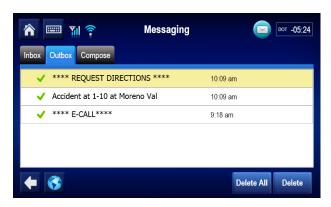
When the display's NO SIGNAL light is off, the mobile unit can deliver and receive information. A problem exists if the MCP110 is unable to deliver or receive information to/from dispatch when the NO SIGNAL light is off. This problem is usually caused by one or more of the following:

- The MCP110 unit address is not correct in the dispatch software
- The MCP110 unit address is not in the correct account at the Omnitracs Network Operations Center (NOC)

Typically, these situations arise when a new mobile application server 110 (MAS110) is installed on a vehicle.

When an MCP110 cannot deliver and/or receive information, the cause is usually not with the MCP110 but rather with the MCP110 account setup.

For both of these cases, notifications will appear with a green checkmark next to them in the outbox but dispatch will report not seeing them.

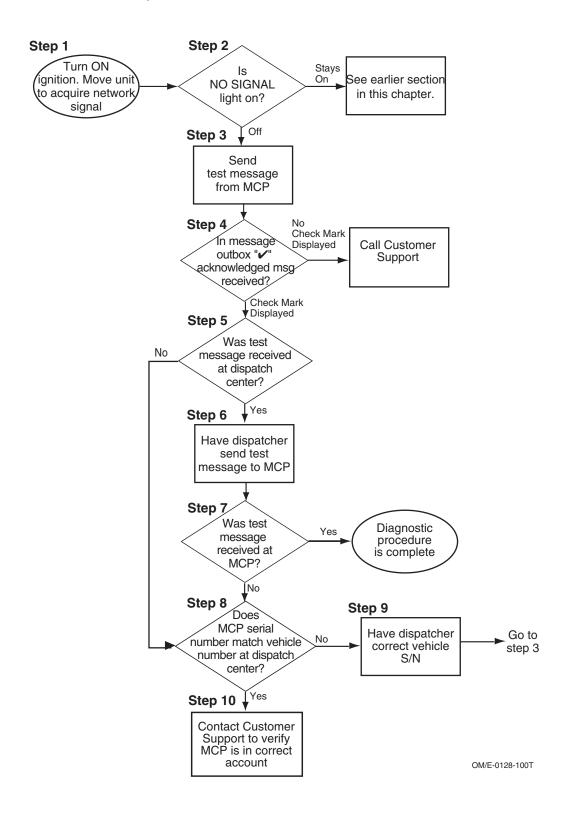


Another case where a unit may not be able to deliver and receive information is when it has the orange arrows show next to the messages in the outbox.



80-JB423-1 Rev. F

MCP110 Cannot Send/Receive



Diagnostic Procedure



- 1. Turn the vehicle ignition ON. Make sure the antenna has acquired a wireless network signal. Move the vehicle, if necessary.
- 2. Check the NO SIGNAL light on the display.
 After the MCP110 acquires the signal, the NO SIGNAL light goes off.

It may take a few minutes for the MCP110 to acquire the signal.

- If the NO SIGNAL light stays on or flashes, see page NO SIGNAL Light On or Flashing on page 6-3.
- If the NO SIGNAL light goes off, go to step 3.



- **3.** Send a test message to the dispatcher, as follows:
 - From the Omnitracs MCP110 Home screen, touch the **Messaging** button.
 - Touch the **Compose** tab. Create and send a free-form message.



4. Go to Messaging Outbox and check for message acknowledgement. Verify a "?" (check mark) appears next to the message in the Outbox.

Note

Orange "\(\sigma\)" (arrows) indicate message is in transit. When a green "?" (check mark) appears next to the message in the Outbox, a message was sent and acknowledged by the NOC.

A red "X" indicates the message failed to send.

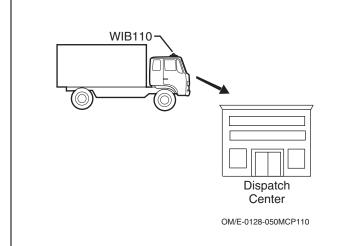
- If the green "?" (check mark) appears, go to step 5.
- If the orange arrows remain next to the message after 5 minutes, call Customer Support.



- **5.** Have the dispatcher verify that the test message from the MCP110 was received.
 - If the dispatcher received the message, go to step 6.
 - If the dispatcher did not receive the message, go to step 8.
- **6.** Ask the dispatcher to send a test message to the MCP110.
- **7.** After the MESSAGE WAITING light illuminates, go to the Inbox to display the dispatcher's message.
 - If the MCP110 received the message, the diagnostic procedure is complete.
 - If the MCP110 did not receive the message, go to step 8.



- **8.** Contact the dispatcher and verify that the unit address in the host software matches the number listed on the System screen.
 - If the numbers do not match, go to step 9.
 - If the numbers match, go to step 10.
- 9. Have the dispatcher change the host software MCP110 # listed for this vehicle to match the MAS110's serial number. Then, repeat step 3. through step 7. to verify that the MCP110 now sends and receives information.



10. Contact Omnitracs Customer Support and verify that the MAS110's serial number is in the correct customer account.

Low Cellular/Terrestrial Signal Strengths

What Is the RSSI Value?

- The RSSI value indicates the strength of the cellular network signal being received by the antenna.
- Typical RSSI value is in the -75 to -90 range. An RSSI of -100 to -110 is a poor signal.
- A poor signal- Low RSSI could cause messaging problems. If the value goes to an unacceptable level (-110 to -255), the MCP110 will lose the wireless network signal. When you lose the cellular signal, you cannot communicate information with the dispatcher.

How to Check the RSSI Value



To view the RSSI value, from the Omnitracs MCP110 Home screen, touch the **System** button, then touch the **Comm** tab. The center column shows the RSSI value.

Materials that Obstruct the Signal (Cellular and GPS)

Normally, the cellular/terrestrial signal can pass through thin layers of glass, fiberglass, and plastic with minimal signal loss. Thick layers or obstructions may block or degrade the cellular/terrestrial signal.

Common Obstructions: metal airdams, metal wings, metal side skirts, air conditioning units, and exhaust stacks.

Unsuitable Airdam Materials: multiple layers of fiberglass, glass, or plastic; areas with numerous bends in the fiberglass; metal and wood bracing; metallic paints and lead-based paints; and company logo decals that contain metal.

Corrective Action for Blocked Signal: If the signal is severely blocked because of airdam or other obstructions, re-install the antenna in a location with fewer obstructions.

Other Causes of an Unacceptable RSSI Value:

Faulty WIB110 antenna and WIB110 cable

For additional antenna installation recommendations, refer to the MCP110 Installation Guide.

GPS Positioning Problem Troubleshooting

These	topics	are	covered	in	this	chapter
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GPS Positioning System	7-2
Normal Performance	7-2
Abnormal Performance	7-3
GPS Positioning	7-4

For technical questions, contact Omnitracs Customer Support.

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

GPS Positioning System

- An MCP110 uses global positioning system (GPS), which provides current vehicle positioning with latitude and longitude updates to the MCP110 every second.
- In addition to positioning, GPS is used for message and timing. If GPS is not available, it may prevent the unit from messaging.

Normal Performance

- Normally the GPS positioning system will update positioning data every second at the MCP110, as shown in the Last Update field of the System/GPS tab.
- The desired value for the Mode field, is 2-D or 3-D, although No Fix may show when the antenna is temporarily blocked or in a garage.



To access more detailed information concerning the GPS screen use the GPS screen. From the Omnitracs MCP110 Home screen, touch the **System** button and then touch the **GPS** tab.

Field	Description
Last Update	 The time and date of the last GPS update. This value should update every second and be current.
Latitude	The last received latitude value.
Longitude	The last received longitude value.
Altitude	The last calculated altitude value.
Mode	 Indicates the MCP110's GPS status: 3-D is displayed if the receiver is able to view three or more GPS satellites. Under normal performance, a 3-D mode will be displayed. 2-D is displayed if the receiver is able to calculate a position, but has a limited view to the GPS satellites. NO FIX is displayed when the GPS satellites cannot be viewed.
Ground Speed	Speed calculated by GPS through a change in vehicle location.

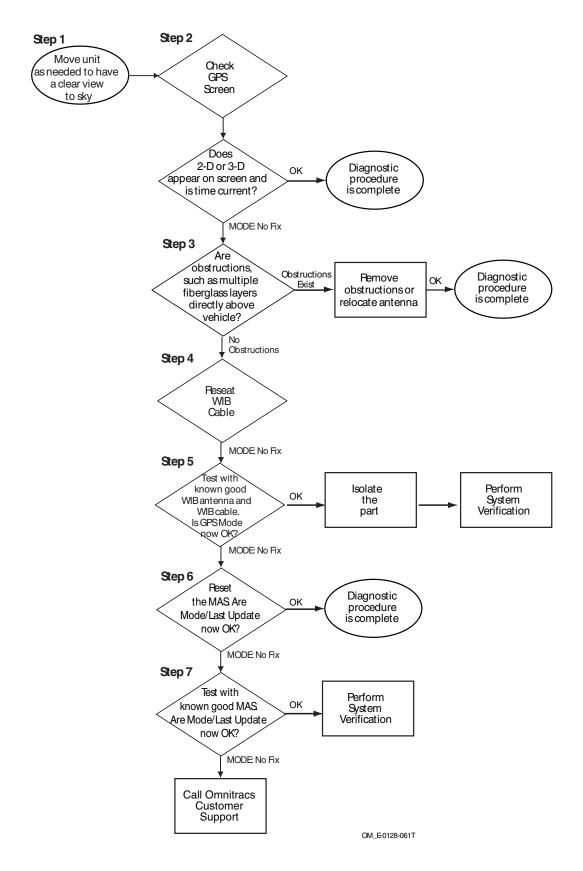
Field	Description
Precision	Measure of how accurate the GPS signals are that are being received. Values less than 4 give best accuracy.
Satellites	Number of GPS satellites the receiver is viewing at any given time.
Messages	GPS statements received by the unit from a GPS source.

Abnormal Performance

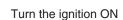
With a MCP110 unit, GPS is the only method available for positioning data. If the vehicle is in the open with a clear view of the sky, the mode should show 2-D or 3-D. If the mode shows NO FIX or the Last Update time is not current, there is a problem. The problem is usually caused by one or more of the following:

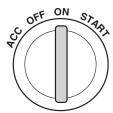
- The WIB antenna is in a location where the view to the sky is blocked or obstructed
- A faulty WIB antenna and/or WIB cable
- A faulty mobile application server 110 (MAS110)

GPS Positioning



Diagnostic Procedure





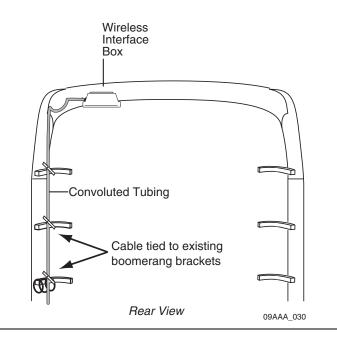
The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

- **1.** Turn the vehicle ignition ON.
 - Move the vehicle, if necessary, out of shop.

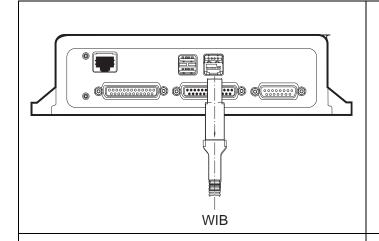


- 2. Check the GPS mode and that the Last Update time is current.
 - If No Fix appears or if the Last Update time is not current, go to step 3.
 - If 2-D or 3-D appears in the Mode field and the Last Update time/date are current, this is a good positioning status and the diagnostic procedure is complete.

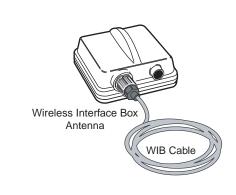
.



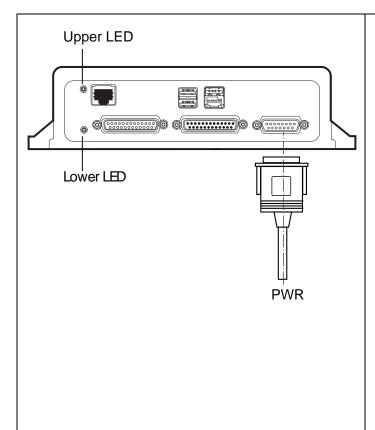
- Check for any obstructions that may block or degrade the GPS signals, such as multiple layers of fiberglass directly above the WIB antenna.
 - If there are any obstructions, remove the obstructions or relocate the antenna.
 - If there are no obstructions, go to step 4.



- 4. Reset WIB cable at MAS. Be careful not to damage tab on bottom side of connector. Reseat at WIB. Once reset, give the unit a few minutes to attempt to acquire the GPS signal.
 - If 2-D or 3-D appears in the Mode field and the Last Update time/date are current, perform system verification.
 - If No Fix appears or if the Last Update time is not current, go to step 5.



- 5. Test with a known good WIB antenna and cable. Give the unit several minutes to acquire GPS and then check the Mode and Last Update time/date on the GPS screen.
 - If 2-D or 3-D now appears in the Mode field, either the original antenna or cable were bad. Isolate which part was bad and replace as necessary then perform the system verification procedure in *Chapter 4:* System Verification.
 - If No Fix still appears, the original antenna and cable are probably okay. Go to step 6.



6. Reset the MAS110 by disconnecting the power cable. Wait for the MAS110 LED indicators to go out.

Note

It usually takes about 3 minutes for the LED indicators to go out.

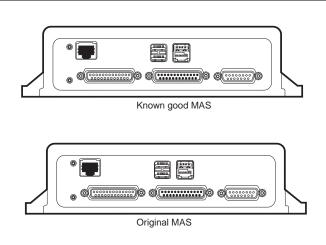
Once all LED indicators are off, reconnect the power cable to the MAS110 and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the lower LED should be BLINKING BLUE and the upper LED should be GREEN.

Check the Mode and Last Update fields again.

- If 2-D or 3-D now appears in the Mode field, the diagnostic procedure is complete.
- If No Fix appears or the Last Update time/ date is not current, go to step 7.



7. Test with a known good MAS110 as follows:

Disconnect all of the cables from the original MAS110 and attach them to the known good MAS110. Turn ON the ignition. The unit will take 5 minutes to boot up.

• If the 2-D or 3-D now appears, the MAS110 is faulty. Replace the MAS110.

Note

Before sending a faulty MAS110 back to Omnitracs, remove the backup battery and install it in the replacement MAS110. A replacement MAS110 does not come with a backup battery.

After the replacement MAS110 is installed, reconnect all components and perform the system verification procedure in *Chapter 4:* System Verification.

 If the display is still not working, call Omnitracs Customer Support:

US: 800-541-7490 Canada: 800-863-9191

WiFi Problem Troubleshooting (Optional)

These topics are covered in this chapter:

WiFi Overview	3-2
Normal Performance	3-3
Abnormal Performance	3-3
Steps to resolve access problems	3-3
1. Identifying when WiFi coverage is available	3-3
2. Open WiFi - How Access is Granted to the Unit	3-3
Configuring WiFi Web Browsing	3-4

For technical questions, contact Omnitracs Customer Support.

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-919

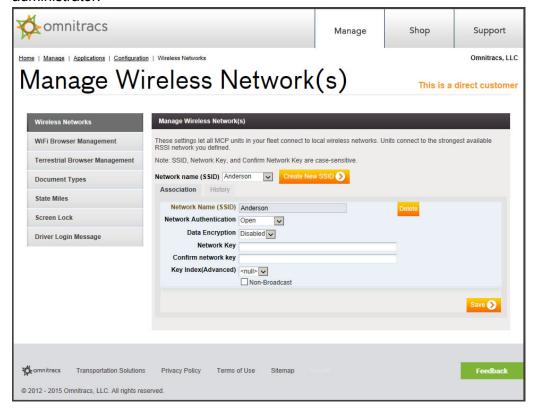
WiFi Overview

If a WIB antenna is capable of WiFi, it will have a white label and will be able to deliver and receive information over configured WiFi access points, also known as WiFi SSIDs. A unit must be properly configured to deliver and receive information using specific access points or unsecured/open WiFi SSIDs. A WIB antenna will have a white serial number label if it is capable of WiFi connections. If the WiFi icon does not show at the top of the screen, the antenna is not equipped for WiFi communication



Specific access points are configured using the Customer Portal. In the Customer Portal, go to: Manage >Applications >Configuration >Wireless Networks

Create New SSID and complete the necessary fields. An SSID is the name associated with any WiFi access points you would like to grant access to for your MCP systems. Create as many SSIDs as are needed. For more information, check with your company network administrator.



Units can be configured with Open WiFi access points as well. WiFi SSIDs defined will take priority over open access points. See 2. Open WiFi - How Access is Granted to the Unit on page 8-3 for more information.

Normal Performance

If the WiFi icon is displayed as available (no "X" or lock icon), the unit should be able to connect or allow the user to browse the Web using Web browsing application.

Abnormal Performance

WiFi is not performing properly if the WiFi icon shows available but the MCP110 unit is unable to use the WiFi connection and allow the user to web browse. This is most likely caused by: A problem with the access point/SSID being connected at the location.

Steps to resolve access problems

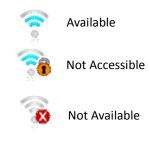
- 1. Verify WiFi is available.
- 2. Verify WiFi configuration.

1. Identifying when WiFi coverage is available

To identify when a MCP110 unit is connected to a configured SSID, look at the WiFi icon at the top of all the screens. This icon indicates that WiFi is connected and shows the signal strength in bars.

If the WiFi icon shows a lock, you might be able to browse but additional terms and conditions may be required. If the WiFi icon does not show available, WiFi signals are not being broadcast at your location or the unit is not configured to look for the broadcasting access point/SSID.





2. Open WiFi - How Access is Granted to the Unit

An operational profile service is assigned to a unit to allow access to any Open WiFi access point (SSID). Any unsecured access point can then be used to communicate and/or browse.

For customers with Open Access WiFi enabled, a locked WiFi icon displays if credentials or terms and conditions are needed to an open access point.

Configuring WiFi Web Browsing

For WiFi Web browsing, URLS are configured using the Customer Portal. The following steps must be completed to successfully setup WiFi Web Browsing.

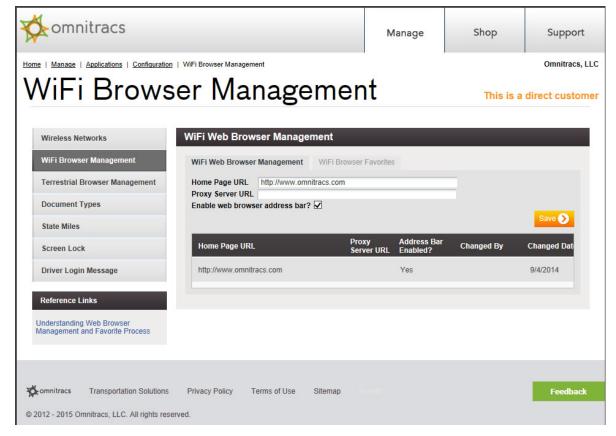
- 1. Ensure WiFi is active and configured.
- 2. Configure home page and favorites.

Note

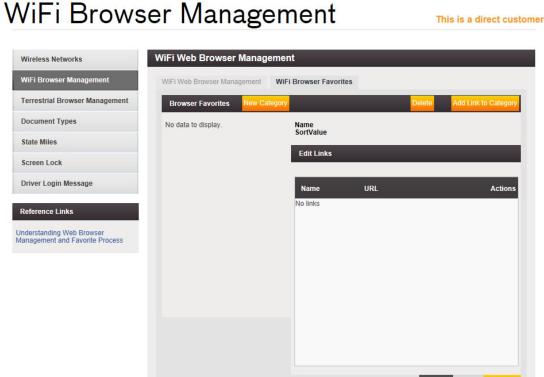
Configuring items in the Customer Portal is typically done by a company administrator.

In the Customer Portal, go to: Manage >Applications >Configuration >WiFi Browser Management

Enter a home page and/or proxy server URL. You can also check "Enable web browser address bar" if you want drivers to be able to use the address bar to type and go to any additional URLs.







3. Activate the Web Browser service in the Customer Portal, add the service to an Operational Profile, and move units into that Operational Profile.

All Web Browser configurations are done at the fleet level and effect all units. Customers can control which units have Web Browser access using Op Profiles.

Units will pick up the attributes of the Op Profile over the air.

9

Miscellaneous Problem Troubleshooting

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Application Icons Not Available - Grayed-out	9-2
Display Immediately goes Blank when Ignition is Turned Off	9-2
MCP110 Does Not Go to lanition Off	9-2

For technical questions, contact Omnitracs Customer Support.

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

Application Icons Not Available - Grayed-out

In most cases, if the application icon is not available, it means the unit is not assigned to an operational profile that has that application enabled. Check with your dispatch administrator to have the unit placed into the current operational profile.

Display Immediately goes Blank when Ignition is Turned Off

When vehicle ignition is turned OFF, the display should stay on for the period of time that has been configured by dispatch. This is the power down time. If the display screen immediately blanks out when the ignition is turned OFF, this could be caused by:

- The power cables BAT+ wire is incorrectly connected to a switched 12VDC source. The BAT+ wire should be connected to a constant 12VDC source.
- The MCP110's power-down time or total time is set to zero. Check the host software configuration.

MCP110 Does Not Go to Ignition Off

When the vehicle ignition is turned OFF, the Ignition Status on the System tab should show OFF.



If the System Status does not change to Ignition OFF after you turn OFF the ignition, the power cable's ignition wire is most likely connected to the wrong source. Verify that the ignition wire is connected to 12VDC ignition-switched power source.

10

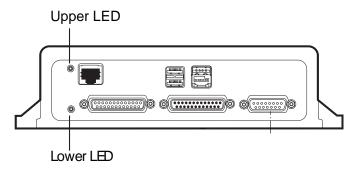
MAS110 Status—LED Indicators

For technical questions, contact Omnitracs Customer Support	
MAS110 Performance—LED Indicators	
These topics are covered in this chapter:	

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

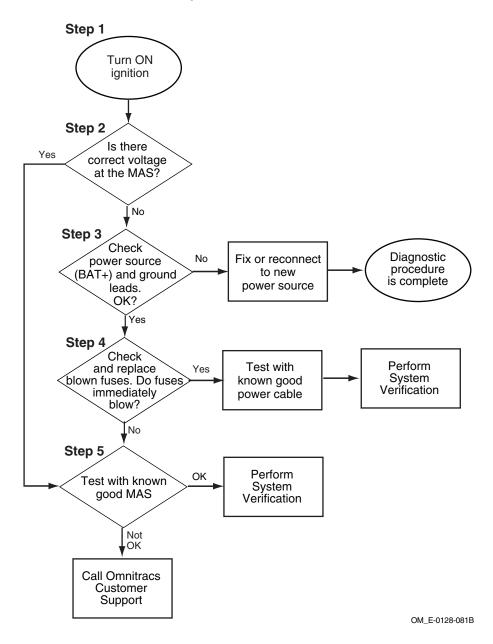
MAS110 Performance—LED Indicators



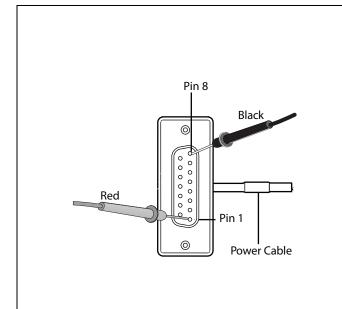
The following table lists the various states of the upper and lower LEDs. In a normal operating environment, the lower LED should be *BLINKING BLUE* and the upper LED should be *GREEN*. If you have technical questions, call Omnitracs Customer Support: for US customers call 800-541-7490; for Canadian customers call 800-863-9191.

Lower LED	Upper LED	State	Necessary Action
BLINKING BLUE every second	SOLID GREEN	The mobile application server 110 (MAS110) is awake and receiving truck power. The MAS110 is in a normal state.	None
BLINKING BLUE every 12 seconds	SOLID GREEN	The MAS110 is asleep because ignition is OFF and it is receiving truck power. The MAS110 is in a normal state.	None
BLINKING RED	SOLID GREEN	The MAS110 has lost truck power. At this time the MAS110 is shutting down and saving data.	Check power connections/vehicle power or wait approximately 5 minutes for MAS110 to complete shut down and save data.
OFF	OFF	If there are no LEDs present, the MAS110 does not have power.	Check power connections: power cable, power cable fuse.
BLINKING RED/ GREEN/BLUE	SOLID RED	First part of bootup. MAS110 is loading Windows.	This should last only 10 seconds. Call Customer Support if persists.
BLINKING GREEN/ RED	SOLID GREEN	Second part of bootup. MAS110 is loading applications.	This should only last a few minutes. Call Customer Support if persists.
BLINKING RED/BLUE	SOLID GREEN	MAS110 applications shutting down. May last 3 minutes.	Not typical. Indicates another issue. Call Customer Support if this happens regularly.
BLINKING BLUE/GREEN	SOLID GREEN	The MAS110 is rebooting and loading the applications. This should last no longer than 4 minutes.	If this persists/reoccurs, call Customer Support.
SOLID RED	SOLID GREEN or OFF	The MAS110 is either upgrading or has detected an internal problem.	Occurs for a minute or two during a software upgrade. If this persists, Call Customer Support.

No Power to MAS110—LEDs OFF/OFF

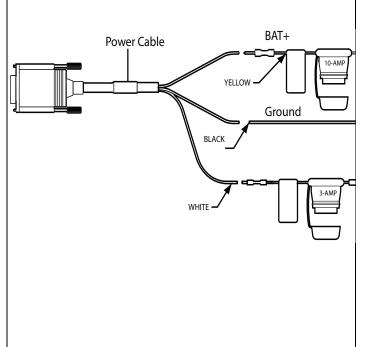


Diagnostic Procedure



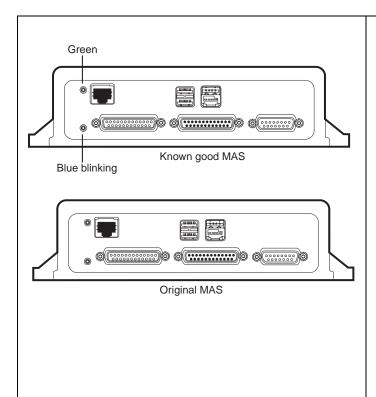
The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

- 1. Turn the vehicle ignition ON. Go to step 2.
- To determine if the correct power is supplied, disconnect the power cable at the MAS110 and use a digital voltmeter to measure voltages.
 - Is the voltage at MAS110 between 12 and 24 VDC for unswitched power? Test by using pin 8 (ground) and pin 1 (power).
 - If power is OK, go step 5.
 - If power is NOT ok, step 3.



- **3.** Check the power source and ground. Are the power source and ground OK?
 - If the power source and ground are OK, go to step 4.
 - If the power source and ground are not OK, reconnect to a new power source. Perform System Verification.
- 4. Check the 3-amp and 10-amp fuses at the end of the power cable (or the circuit breakers if the wiring is factory-installed). If the fuses are bad, replace them.
 - If the fuses blow immediately, the power cable may be shorted. Replace the power cable and perform the system verification procedure in *Chapter 4: System* Verification
 - If the all fuses are okay, go to step 5.

If the fuse holders show signs of overheating, such as discoloration or melting, replace the holders.



5. Test with a known good MAS110 as follows:

Disconnect all of the cables from the original MAS110 and attach them to the known good MAS110. Turn ON the ignition. The unit will take 5 minutes to boot up.

• If the unit is now working, the MAS110 is faulty. Replace the MAS110.

Note

Before sending a faulty MAS110 back to Omnitracs, remove the backup battery and install it in the replacement MAS110. A replacement MAS110 does not come with a backup battery.

After the replacement MAS110 is installed, reconnect all components and perform the system verification procedure in *Chapter 4:* System Verification.

 If the unit is still not working, call Omnitracs Customer Support:

US: 800-541-7490 Canada: 800-863-9191

11

Text-to-Speech Problem Troubleshooting

These topics are covered in this chapter:

Text-to-Speech Overview	11-2
Normal Performance	11-2
Abnormal Performance	11-3
Message Does Not Play	11-5
Message Plays but Volume Is Very Low	1-10
Message Plays but Sound Is Choppy or Breaks up	1-15

For technical questions, contact Omnitracs Customer Support.

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

Text-to-Speech Overview

With the Omnitracs MCP110 text-to-speech (TTS) feature, a driver can safely listen to incoming notifications through the audio system or a dedicated speaker without having to pull off the road. Alerts and notifications can also be configured to play via text-to-speech.

Speaker Requirements

There are two basic speaker requirements for best performance of the Omnitracs MCP110:

- Only one speaker can be connected to the MCP110 for text-to-speech play. If more than
 one speaker is connected for text-to-speech play, the volume will most likely be very low or
 there will be no volume at all.
- An 8-ohm speaker, such as a standard CB speaker, should be used for TTS play.

The MCP110 amplifier has an active safe operating area (SOA) protection on its output electronics. This protection is easily tripped at higher volume levels when connected to lower impedance speakers. This means that the MCP110 may produce sound into a 2 ohm speaker but will most likely shut off quickly when the volume is turned up even slightly (the protection circuit will trip).

Lower impedance speakers (2–6 ohm speakers) are more often used in higher-end, performance audio systems. These systems typically have separate amplifiers. If an audio system has an external amplifier separate from the radio head unit, this may indicate it has low impedance speakers. Check with the vehicle manufacturer for detailed specifications concerning speaker types.

Normal Performance

Notifications should be heard when a user selects a message from the Inbox to be played using the DIU 5-way keys. The truck's radio does not need to be on for TTS to work because the mobile application server 110 (MAS110) supplies about 10 watts of power to the speaker. The volume for TTS is controlled using the DIU volume keys and should be loud enough for the driver to hear while driving.

- When a message or alert is played using a shared audio speaker, the connected speaker should immediately stop all other communication coming from the audio system and play the message or alert. After the message or alert has played, control of the speaker returns to the audio system, i.e., radio or CB.
- When a message or alert is played using a **dedicated audio speaker**, only TTS notifications and alerts will be played on that speaker.
- A quick and easy way to test TTS is to turn the volume up and press the Home key. "Home Messaging" should be heard.



Abnormal Performance

If a message does not play as described in the previous section, there is a problem.

Message Does Not Play

There could be a problem with one or more of the following:

- TTS is not configured properly for the MCP110
- TTS volume is turned off or is too low to hear
- Audio speaker has failed
- Loose connections or faulty speaker switch cable
- Loose connections or faulty accessory cable
- MAS110 is not functioning properly
- Wired incorrectly using an incompatible speaker

Message Plays but Volume Is Very Low

There could be a problem with one or more of the following:

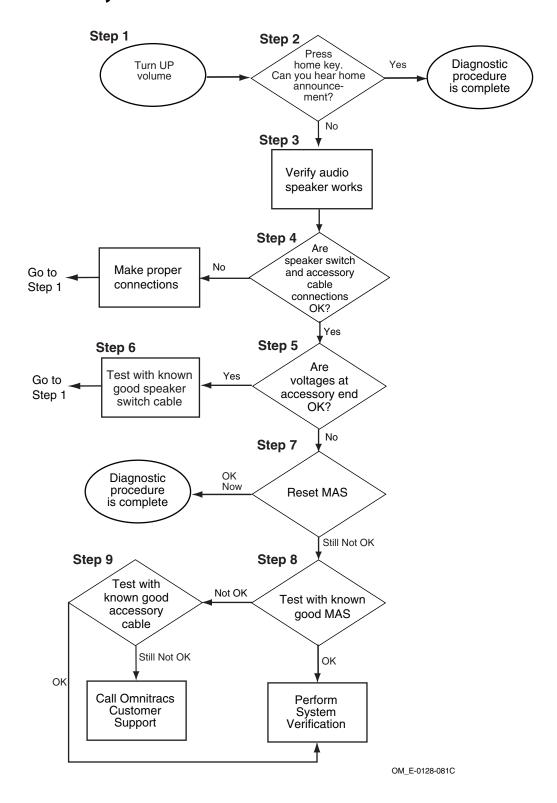
- · TTS volume is turned too low
- Loose connection
- Audio speaker is failing
- TTS is wired to more than one speaker
- Wired incorrectly (speaker switch cable connections)
- Speaker being used is incorrect resistance, i.e., less than 8 ohms

Message Plays but Sound Is Choppy or Breaks up

There could be a problem with one or more of the following:

- · Loose connection
- · Audio speaker is failing
- Wired incorrectly (speaker switch cable connections)
- · Accessory cable problem
- · Speaker switch cable is faulty

Message Does Not Play

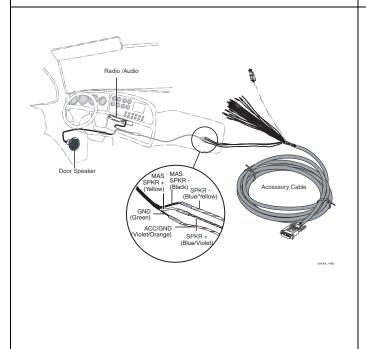


Diagnostic Procedure

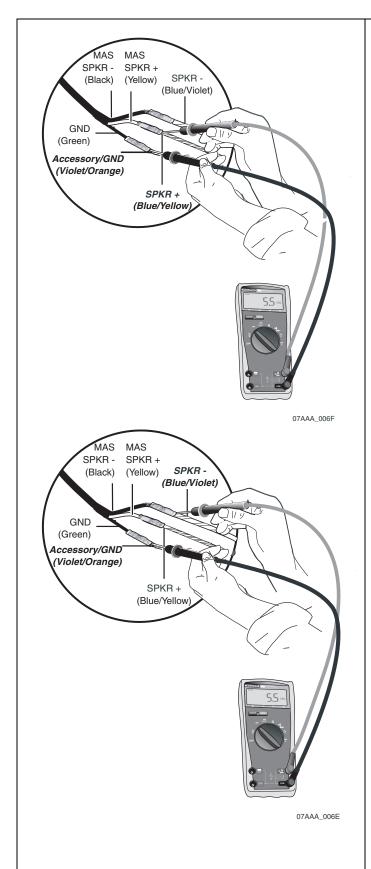


The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

- 1. Turn up the volume using the DIU.
- 2. Press the **Home** key. Can you hear the home announcement?
 - If you can hear the announcement, the diagnostic procedure is complete.
 - If you cannot hear the announcement, go to step 3.



- **3.** Verify that the speaker is working. If the MCP110 shares a speaker, use the radio to play sound through the speaker.
 - If the speaker is not working, replace the speaker.
 - If the speaker is working, go to step 4.
- 4. Verify that the speaker connections are correct. If the sound is low, it is possible that the speakers are wired in parallel and the MAS110 amplifier is supplying power to more than one speaker, or that the VEH AUDIO IN and SPKR OUT connections are reversed.
 - If the speaker connections are correct, go to step 5.
 - If the speaker connections are not correct, make the proper connections and return to step

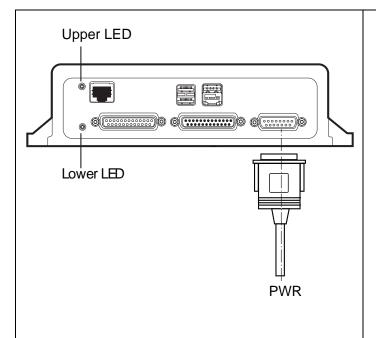


5. To isolate a problem with the speaker switch cable, measure voltages of TTS wires at end of the accessory cable, as follows:

First touch the positive lead of the voltmeter to the SPKR+ wire. Then touch the negative lead of the voltmeter to the accessory/GND wire. Now press the **Home**. The voltage should measure +5.5VDC momentarily while the unit attempts to play text-to-speech.

Now touch the positive lead of the voltmeter to the SPKR- wire and leave the negative lead of the voltmeter on the accessory/GND. Press the **Home** key. The voltage should measure +5.5VDC momentarily while the unit attempts to play text-to-speech.

- If the voltages are not okay, go to step 7.
- If the voltages are okay, go to step 6.



- **6.** Test with a known good speaker switch cable. Can you hear the announcement?
 - If you can now hear the announcement, the original speaker switch cable was bad.
 Replace the speaker switch cable and return to step 1.
 - If you still cannot hear the announcement, call Omnitracs Customer Support:

US: 800-541-7490 Canada: 800-863-9191

Reset the MAS110 by disconnecting the power cable. Wait for the MAS110 LED indicators to go out.

Note

It usually takes about 5 minutes for the LED indicators to go out.

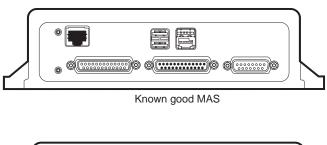
Once all LED indicators are off, reconnect the power cable to the MAS110 and turn ON the ignition. The unit will take 5 minutes to boot up.

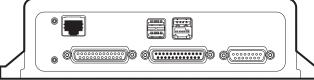
Note

In a normal operating environment, the lower LED should be BLINKING BLUE and the upper LED should be GREEN.

Test TTS by pressing the **Home** key. Can you hear the announcement?

- If you can now hear the announcement, the diagnostic procedure is complete.
- If you still cannot hear the announcement, go to step 8.





Original MAS

8. Test with a known good MAS110 as follows:

Disconnect all of the cables from the original MAS110 and attach them to the known good MAS110. Turn ON the ignition. The unit will take 5 minutes to boot up.

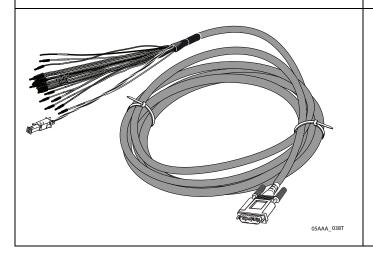
• If you can now hear the announcement, the MAS110 is faulty. Replace the MAS110.

Note

Before sending a faulty MAS110 back to Omnitracs, remove the backup battery and install it in the replacement MAS110. A replacement MAS110 does not come with a backup battery.

After the replacement MAS110 is installed, reconnect all components and perform the system verification procedure in *Chapter 4:* System Verification.

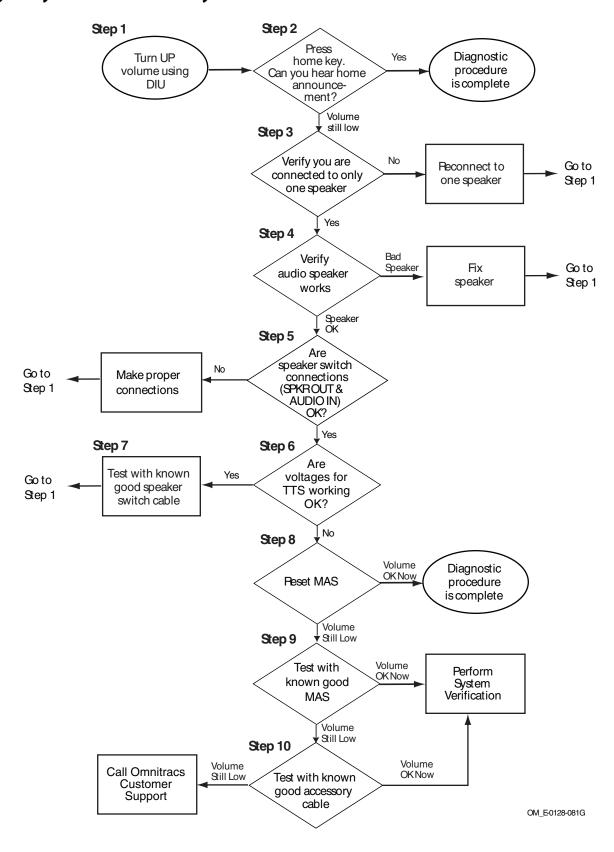
• If you still cannot hear the announcement, go to step 9.



- **9.** Test with a known good accessory cable. Can you hear the announcement?
 - If you can now hear the announcement, the accessory cable is faulty. Replace the accessory cable and perform the system verification in Chapter 4: System Verification.
 - If you still cannot hear the announcement, call Omnitracs Customer Support:

US: 800-541-7490 Canada: 800-863-9191

Message Plays but Volume Is Very Low

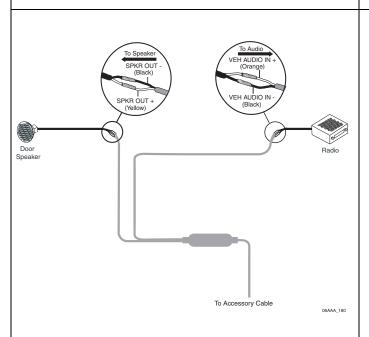


Diagnostic Procedure

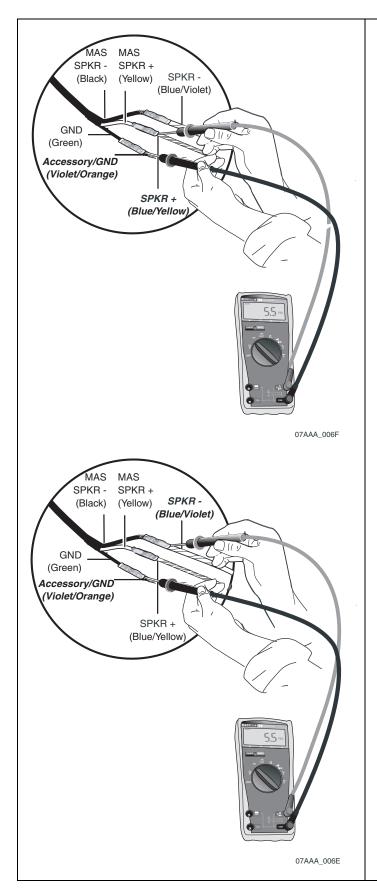


The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

- **1.** Turn up the volume.
- **2.** Press the **Home** key. Is the volume level okay?
 - If volume is acceptable, the diagnostic procedure is complete.
 - If volume is still low, go to step 3.
- **3.** Verify that you are connected to only one speaker. TTS supports only one speaker.
 - If you are connected to only one speaker, go to step 4.
 - If you are connected to more than one speaker, disconnect and reconnect so only one speaker is used and test for TTS volume. Return to step 1.



- **4.** Test with known good 8-ohm speaker.
 - If the volume with replacement speaker is okay, replace original speaker.
 - If the volume with replacement speaker is still too low, go to step 5.
- 5. Verify that the speaker connections are correct. If the sound is low, it is possible that the speakers are wired in parallel and the MAS110 amplifier is supplying power to more than one speaker, or that the VEH AUDIO IN and SPKR OUT connections are reversed.
 - If the speaker connections are correct, go to step 6.
 - If the speaker connections are not correct, make the proper connections and return to step 1.

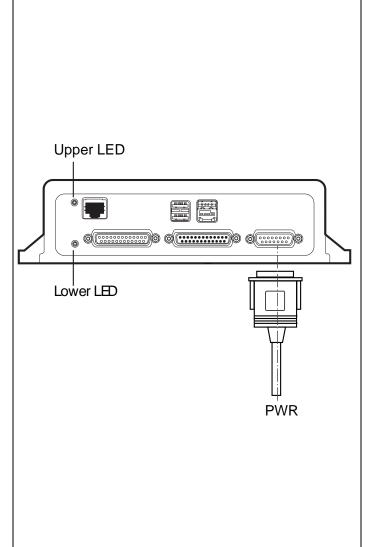


6. To isolate a problem with the speaker switch cable, measure voltages of TTS wires at end of the accessory cable, as follows:

First touch the positive lead of the voltmeter to the SPKR+ wire. Then touch the negative lead of the voltmeter to the accessory/GND wire. Now press the **Home** key. The voltage should measure +5.5VDC momentarily while the unit attempts to play text-to-speech.

Now touch the positive lead of the voltmeter to the SPKR- wire and leave the negative lead of the voltmeter on the accessory/GND. Press the **Home** key. The voltage should measure +5.5VDC momentarily while the unit attempts to play text-to-speech.

- If the voltages are not okay, go to step 8.
- If the voltages are okay, go to step 7.



- **7.** Test with a known good speaker switch cable. Is the volume level okay?
 - If the volume level is now okay, the original speaker switch cable was bad. Replace the speaker switch cable and return to step 1.
 - If the volume level is still not okay, call Omnitracs Customer Support:

US: 800-541-7490 Canada: 800-863-9191

8. Reset the MAS110 by disconnecting the power cable. Wait for the MAS110 LED indicators to go out.

Note

It usually takes about 5 minutes for the LED indicators to go out.

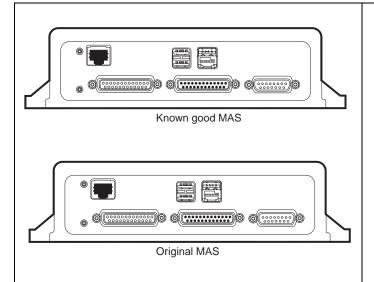
Once all LED indicators are off, reconnect the power cable to the MAS110 and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the lower LED should be BLINKING BLUE and the upper LED should be GREEN.

Test TTS volume. Is the volume okay now?

- If the volume is okay now, the diagnostic procedure is complete.
- If the volume is still not okay, go to step 9.



9. Test with a known good MAS110 as follows:

Disconnect all of the cables from the original MAS110 and attach them to the known good MAS110. Turn ON the ignition. The unit will take 5 minutes to boot up.

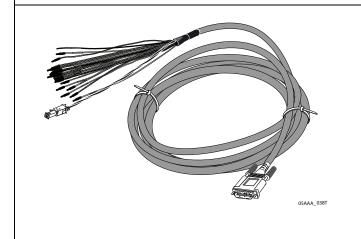
 If the volume is okay now, the MAS110 is faulty. Replace the MAS110.

Note

Before sending a faulty MAS110 back to Omnitracs, remove the backup battery and install it in the replacement MAS110. A replacement MAS110 does not come with a backup battery.

After the replacement MAS110 is installed, reconnect all components and perform the system verification procedure in *Chapter 4:* System Verification.

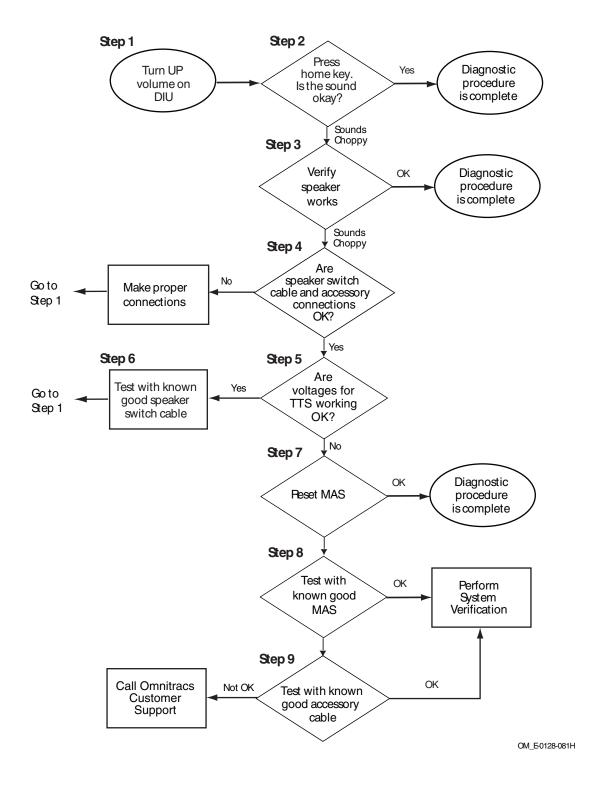
• If the volume is still too low, go to step 10.



- **10.** Test with a known good accessory cable. Can you hear the announcement?
 - If you can now hear the announcement, the accessory cable is faulty. Replace the accessory cable and perform the system verification in Chapter 4: System Verification.
 - If you still cannot hear the announcement, call Omnitracs Customer Support:

US: 800-541-7490 Canada: 800-863-9191

Message Plays but Sound Is Choppy or Breaks up

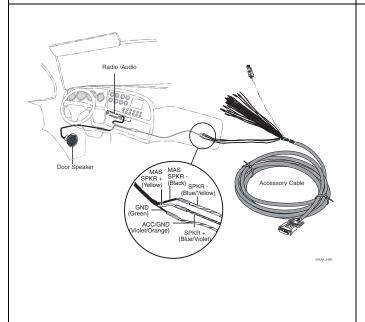


Diagnostic Procedure

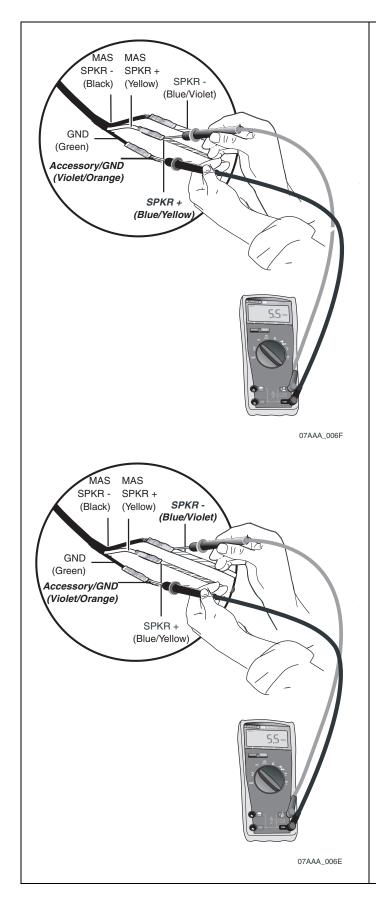


The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

- **1.** Turn up the volume.
- **2.** Press the **Home** key. Does the message sound choppy or does it break up?
 - If the message sounds okay, the diagnostic procedure is complete.
 - If the message does not sound okay, go to step 3.



- **3.** Test with known good 8-ohm speaker.
 - If the sound is good with the replacement speaker, replace the speaker. The diagnostic procedure is complete.
 - If the sound is still choppy with the replacement speaker, go to step 4.
- 4. Verify that the speaker connections are correct. Be sure the green GND wire from the speaker switch cable is connected to the accessory/GND wire from the accessory cable.
 - If the speaker connections are correct, go to step 5.
 - If the speaker connections are not correct, make the proper connections and return to step 1.

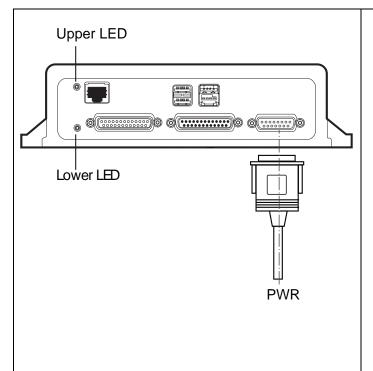


5. To isolate a problem with the speaker switch cable, measure voltages of TTS wires at end of the accessory cable, as follows.

First touch the positive lead of the voltmeter to the SPKR+ wire. Then touch the negative lead of the voltmeter to the accessory/GND wire. Now press the **Home** key. The voltage should measure +5.5VDC momentarily while the unit attempts to play text-to-speech.

Now touch the positive lead of the voltmeter to the SPKR- wire and leave the negative lead of the voltmeter on the accessory/GND. Press the **Home** key. The voltage should measure +5.5VDC momentarily while the unit attempts to play text-to-speech.

- If the voltages are not okay, go to step 7.
- If the voltages are okay, go to step 6.



- **6.** Replace the original speaker switch cable with a known good speaker switch cable.
 - If the sound is good with the new cable, the original speaker switch cable was bad.
 Replace the speaker switch cable and return to step 1.
 - If the sound is still choppy, go to step 7.
- **7.** Reset the MAS110 by disconnecting the power cable. Wait for the MAS110 LED indicators to go out.

Note

It usually takes about 5 minutes for the LED indicators to go out.

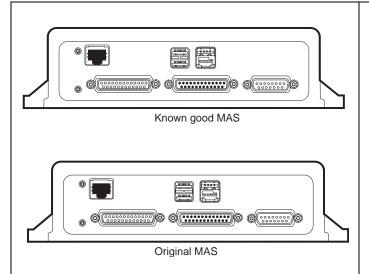
Once all LED indicators are off, reconnect the power cable to the MAS110 and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the lower LED should be BLINKING BLUE and the upper LED should be GREEN.

Test TTS sound again. Is the sound good?

- If the sound is now good, the diagnostic procedure is complete.
- If the sound is still choppy, go to step 8.



8. Test with a known good MAS110 as follows:

Disconnect all of the cables from the original MAS110 and attach them to the known good MAS110. Turn ON the ignition. The unit will take 5 minutes to boot up.

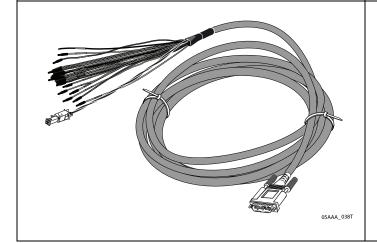
 If the sound okay now, the MAS110 is faulty. Replace the MAS110.

Note

Before sending a faulty MAS110 back to Omnitracs, remove the backup battery and install it in the replacement MAS110. A replacement MAS110 does not come with a backup battery.

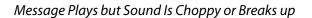
After the replacement MAS110 is installed, reconnect all components and perform the system verification procedure in *Chapter 4:* System Verification.

• If the sound is still not okay, go to step 9.



- **9.** Test with a known good accessory cable. Is the sound good?
 - If the sound is now good, the accessory cable is faulty. Replace the accessory cable and perform the system verification in Chapter 4: System Verification.
 - If the sound is still choppy, call Omnitracs Customer Support:

US: 800-541-7490 Canada: 800-863-9191



12

Backup Battery Troubleshooting

These topics are covered in this chapter:

About the MAS110 Backup Battery	12-2
Good Status	12-3
Bad Status	12-3
Manually Testing the Backup Battery	12-4
Bad Backup Battery	12-5

For technical questions, contact Omnitracs Customer Support.

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

About the MAS110 Backup Battery

The Omnitracs MCP110 battery has a normal operating life of 5 years. The purpose of the backup battery is to allow the MCP110 to gracefully shut down and save data when power from the truck is lost. The backup battery is critical to the operation of the system.

ALERT!

Unless specifically requested by a Omnitracs representative, Omnitracs MCP110 lead-acid batteries should NOT be sent back to Omnitracs. Proper disposal of defective or dead lead-acid batteries is the responsibility of the Omnitracs MCP110 owner/customer. Please dispose of defective or dead batteries at a local lead-acid battery recycling center.

If the backup battery needs replacing, DO NOT return it to Omnitracs unless specifically told to do so. A replacement battery can be ordered and shipped without Omnitracs receiving the defective battery. Please see *Appendix C* for more information on the Omnitracs Standard RMA Procedure.

If batteries are stored, Omnitracs recommends auditing the backup battery Open Circuit Voltage (OCV) every six months to ensure that it does not drop below 3.6V. If the storage temperature is greater than 85° F, the audits should take place more frequently. Immediately recharge the backup battery if it measures OCV < 3.6V. Batteries that sit for more than six months need to be recharged. The preferred method to recharge a backup battery is to install it into a MAS110 on a test bench for eight hours.

The mobile application server 110 (MAS110) will periodically test the backup battery to determine if the battery will accept a charge and retain a charge. This automatic test will happen every 60 days when the MAS110 is in operation. The backup battery can also be tested manually. If the backup battery is not detected or fails the test, an error will be displayed, System Status 12000 Bad Backup Battery or Battery Not Detected.

For backup battery installation procedures, see MCP110 Installation Guide.

Good Status

The MCP110 Diag screen, shown below, can be displayed by pressing the **Diag** tab at the Omnitracs MCP110 Home screen. Backup battery test has a green check mark which indicates that the status is good.



Bad Status

The MCP110 Diag screen, shown below, can be displayed by pressing the **Diag** tab at the Omnitracs MCP110 Home screen. Backup battery test has a red x which indicates that the status is bad.

If you see a red X or a pop-up icon displays, the MCP110 has a bad or missing backup battery, the backup battery needs replacing. The MCP110 also alerts the user if it does not detect a backup battery

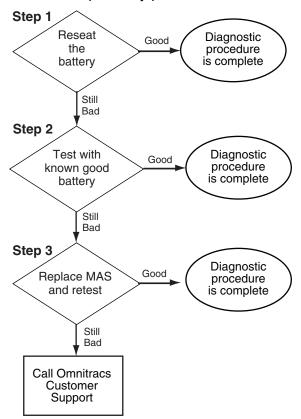


Manually Testing the Backup Battery

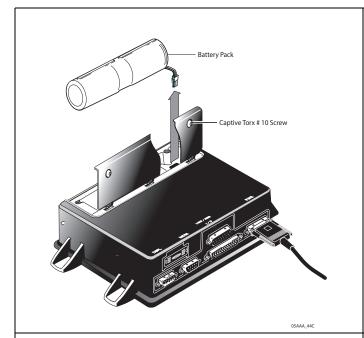
- 1. Go to the Home screen and touch the **Diag** tab.
- 2. Touch the Run All button.



If the Backup Battery portion of the Run All test fails, follow the steps below.



Bad Backup Battery



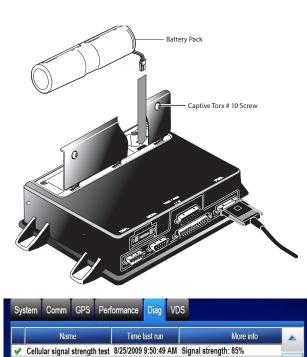
Reseat the battery.



Caution

IMPORTANT: Ensure the power cable to the MAS110 remains connected. If the power cable has been removed, wait until the MAS110 LED lights are out before removing the battery. This will prevent loss of data.

- Run All tests. If it fails, go to step 2.
- If everything OK, diagnostic procedure is complete.



WiFi signal strength test 8/25/2009 9:50:49 AM Associated to SSID Cerberus with

8/25/2009 9:50:49 AM Satellites: 12 J1587 packet detection test 8/25/2009 9:50:51 AM 25 packets(J1587) over a 2 sec pe J1939 packet detection test 8/25/2009 9:50:53 AM 0 packets (J1939) over a 2 sec pe

8/25/2009 9:50:49 AM

8/25/2009 9:50:49 AM SDM cable is disconnected.

8/25/2009 9:51:00 AM Battery voltage: 4125mV

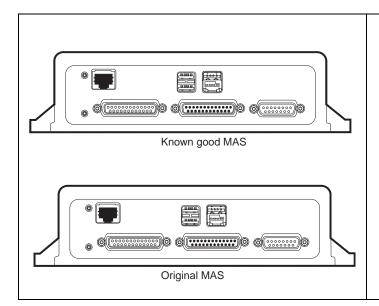
Run All

- Install a new battery into the MAS110 and run all tests.
 - If it fails again, go to step 2.
 - If everything OK, diagnostic procedure is complete.

SDM Detection test CDD database sync test

Backup battery test

GPS fix test



3. Test with known good MAS. If the battery still fails, call Omnitracs Customer Support.

13 Database Out of Sync

Th	ese	topics	are	covered	in	this	chapte	r
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Good Status	13-2
Bad Status	13-2
What to Do	13-2

For technical questions, contact Omnitracs Customer Support.

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

Good Status Database Out of Sync

Good Status

The MCP110 Diag screen, shown below, can be displayed by pressing the **Diag** tab at the Omnitracs MCP110 Home screen. CDD database sync test has a green check mark which indicates that the status is good.



Bad Status

The MCP110 Diag screen, shown below, can be displayed by pressing the **Diag** tab at the Omnitracs MCP110 Home screen. CDD database sync test has a red x which indicates that the status is bad. This indicates the NOC and the mobile unit have not completed passing configuration values between each other.



What to Do

Database State Will Not Go to Sync Complete

After an MCP110 is installed and powered up with good signal and line-of-sight to the GPS satellites, it usually takes about 10 minutes for it to get all the company-defined settings and configurations. Once it acquires all settings and configurations, it will go into the desired state of Sync complete.

If an MCP110 is installed and powered up and has not gone to a database state of Sync complete within 10 minutes, first check that the unit is able to connect. Refer to *Chapter 6: Connectivity Problem Troubleshooting* for more info.

If it is able to connect but will not go to a Sync complete state. Call Omnitracs Customer Support at 800-541-7490 for assistance.

14

Vehicle Data Link Diagnostic/Verification Procedures

These topics are covered in this chapter:

Vehicle Data Services (VDS) Overview	14-2
Vehicle Data Link Verification	14-3
J1708/J1587 Flowchart	14-6
J1939 Flowchart	14-9

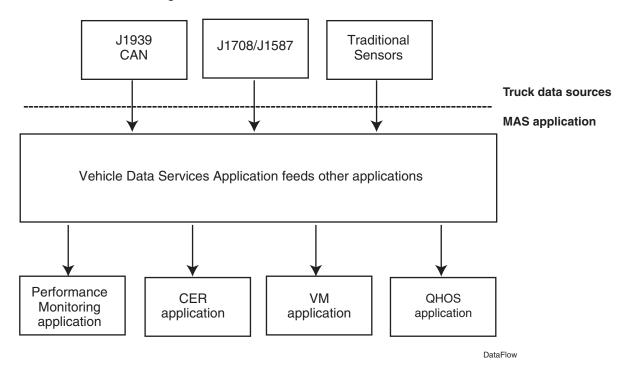
For technical questions, contact Omnitracs Customer Support.

Customer Support is staffed 24 hours a day, 365 days a year:

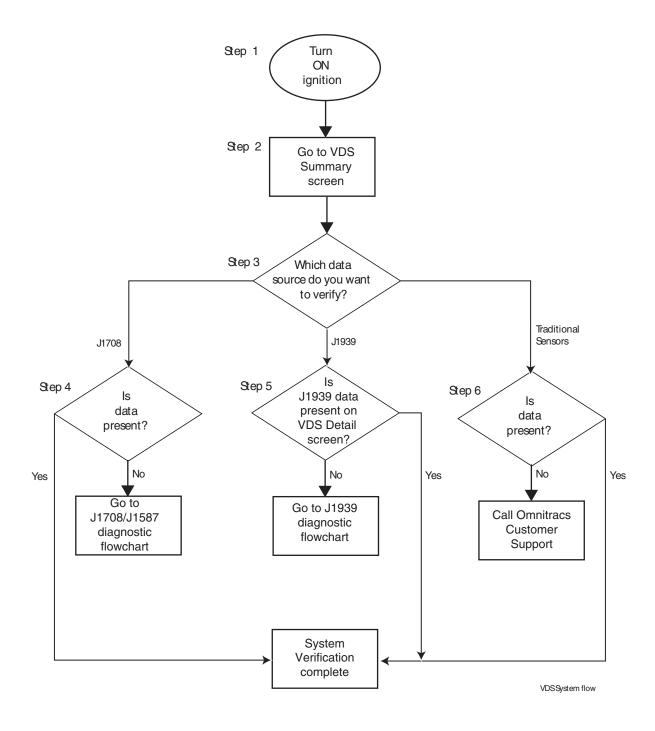
- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

Vehicle Data Services (VDS) Overview

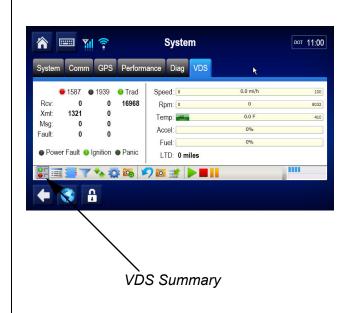
The VDS application receives vehicle data from J1939, J1587/J1708, and traditional data sources. It then makes the data available for applications that use vehicle data, such as Performance Monitoring, Vehicle Maintenance, CER, and QHOS.



Vehicle Data Link Verification



Verification Procedure



- 1. Turn the ignition ON.
- **2.** Go to VDS Summary screen by selecting the System Ign and then **VDS** tab.

Press the Traffic Lights icon located along the bottom of the screen to display the VDS Summary screen.

To verify data bus connectivity, check that the mobile application server 110 (MAS110) is enabled for J1939, J1708/J1587, and/or traditional sensors.

- Traditional sensors are used on most pre-1992 trucks.
- J1708/J1587 data bus is used on most 1992–2009 trucks.
- J1708/J1587 and J1939 data buses are available on 2007–2010 trucks.
- J1939 will be the only data bus used on EPA 2010 compliant trucks.

Check the data source and LED status.

 The light indicator is green when a data source is enabled and receiving data from that source.

Note

The indicator is black when a data source is not enabled or there is no data.

The indicator is red when the data source is enabled but the data is stale.

- The data source must be active to increment data counters.
- If data is not being passed with the key ON, see diagnostic flowchart for J1708/J1587 Flowchart on page 14-6 or diagnostic flowchart for J1939 Flowchart on page 14-9.

If you have any questions, contact Omnitracs Customer Support.



- **3.** Which data source do you want to verify?
 - If verifying J1708/J1587, go to step 4.
 - If verifying J1939, go to step 5.
 - If verifying traditional sensors, go to step 6.
- **4.** Is J1708/J1587 data present?
 - If yes, and data fields are showing green and incrementing, system verification is complete.
 - If no, go to the diagnostic flowchart for J1708/J1587 Flowchart on page 14-6.

Note

Press the **VDS Details** icon located along the bottom of the screen to display the VDS Details screen and note the data source.

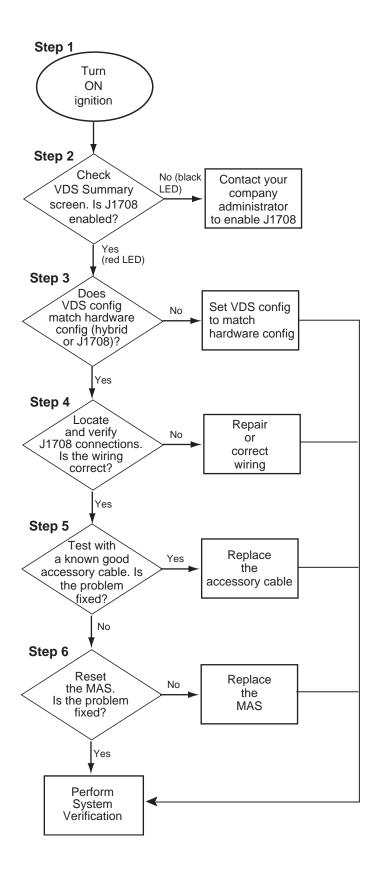
- **5.** Is J1939 data present on the VDS Detail screen?
 - If yes, and the following data fields are showing green and incrementing, system verification is complete:
 - Speed
 - RPM
 - Parking Brake
 - Accelerator
 - Distance LTD
 - Fuel LTD
 - Engine Time LTD
 - If no, go to the diagnostic flowchart for J1939 Flowchart on page 14-9.

Note

Press the **VDS Details** icon located along the bottom of the screen to display the VDS Details screen and note the data source.

- 6. Is traditional sensors' data present?
 - If yes, and data fields are showing green and incrementing, system verification is complete.
 - If no, contact Omnitracs technical support for assistance.

J1708/J1587 Flowchart



J1708/J1587 Diagnostic Procedure

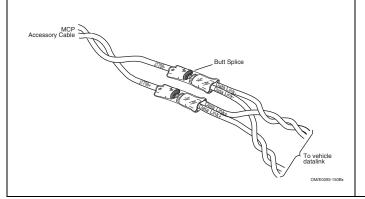


The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

- **1.** Turn the ignition ON.
- 2. Check the VDS Summary screen. Is J1708/ J1587 enabled?
 - If no and LED is black, you are not enabled. Call your company administrator to enable J1708/J1587.
 - If yes and LED is red, you are enabled but not passing data (Count field is not incrementing). Go to step 3.



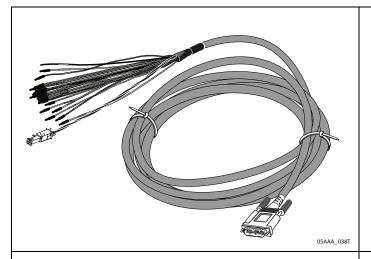
- 3. Check the VDS Configuration/Ports screen. Does the VDS configuration match the hardware configuration (hybrid or J1587/ J1708 only)?
 - If no, confirm that the hardware configuration is hybrid or J1587/J1708 only and set the VDS configuration to match it. Perform system verification.
 - If yes, go to step 4.



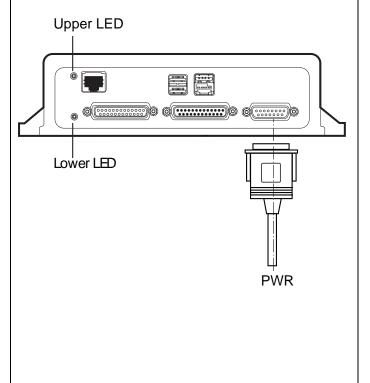
- **4.** Locate the J1708/J1587 connections:
 - · Check wire connections.
 - Check butt splices.
 - · Check polarity.

Is the wiring correct?

- If **no**, repair/correct the wiring. Perform system verification.
- If yes, go to step 5.



- **5.** Test with a known good accessory cable. Did this fix the problem?
 - If **yes**, replace the accessory cable. Perform system verification.
 - If **no**, go to step 6.



6. Reset the MAS110 by disconnecting the power cable. Wait for the MAS110 LED indicators to go out.

Note

It usually takes about 5 minutes for the LED indicators to go out.

Once all LED indicators are off, reconnect the power cable to the MAS110 and turn ON the ignition. The unit will take 5 minutes to boot up.

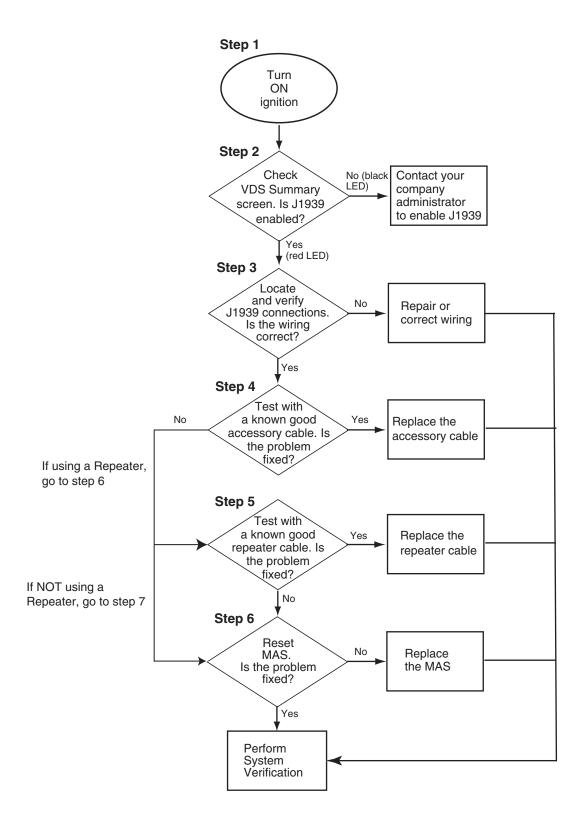
Note

In a normal operating environment, the lower LED should be BLINKING BLUE and the upper LED should be GREEN.

Did this fix the problem?

- If **no**, replace the MAS110. Perform system verification.
- If **yes**, perform system verification.

J1939 Flowchart



J1939 Diagnostic Procedure

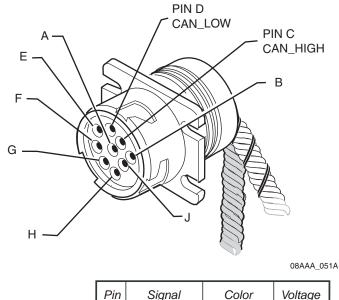


The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential you may be instructed to skip steps.

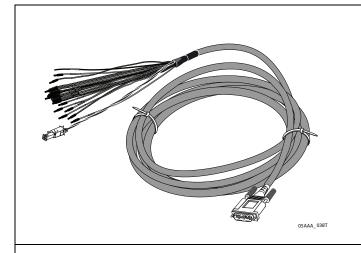
- Turn the ignition ON. 1.
- 2. Check the VDS Summary screen. Is J1939 enabled?
 - If no and LED is black, you are not enabled. Call your company administrator to enable J1939.
 - If **yes** and LED is **red**, you are enabled but not passing data (Count field is not incrementing). Go to step 3.
- 3. Check connections to J1939 bus:
 - Pins C and D on diagnostic connector: Verify resistance is 57–63 ohms (with no data bus activity).
 - CAN HIGH and CAN LOW: Verify voltage from pin C and/or pin D to ground is 1–3 VDC (with data bus activity).
 - CAN: Verify power/ground on 6-pin connector.

Is wiring correct?

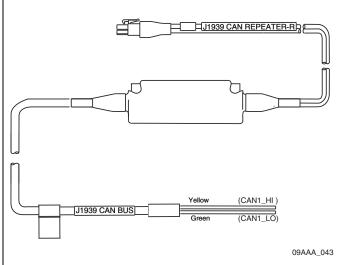
- If **no**, repair/correct the wiring. Perform system verification.
- If yes, go to step 4.



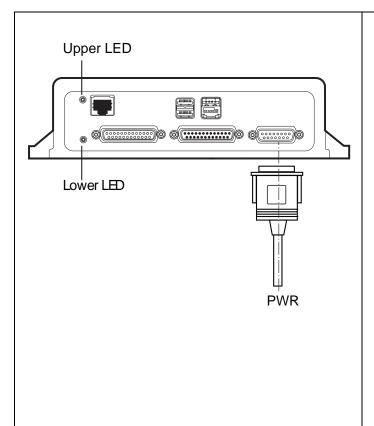
Pin	Signal	Color	Volta
1	CAN_1_HI	White/Blue	2.3
2	CAN_1_LO	Blue/White	2.3
3	CAN_PWR	White/Brown	4.92
4	CAN_GND	Brown/White	GND
5	SHIELD		.73
6	BLANK		



- **4.** Test with a known good accessory cable. Did this fix the problem?
 - If **yes**, replace the accessory cable. Perform system verification.
 - If no and you are using the CAN Repeater Cable, go to step 5.
 - If no and you are NOT using the CAN Repeater Cable (direct to CAN bus connection), go to step 6.



- **5.** Test with a known good repeater cable. Did this fix the problem?
 - If **yes**, replace the repeater cable. Perform system verification.
 - If **no**, go to step 6.



6. Reset the MAS110 by disconnecting the power cable. Wait for the MAS110 LED indicators to go out.

Note

It usually takes about 5 minutes for the LED indicators to go out.

Once all LED indicators are off, reconnect the power cable to the MAS110 and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the lower LED should be BLINKING BLUE and the upper LED should be GREEN.

Did this fix the problem?

- If **no**, replace the MAS110. Perform system verification.
- If **yes**, perform system verification.

15

Performance Monitoring Diagnostic/Verification Procedures

These topics are covered in this chapter:

System Overview	15-2
Normal Performance	15-2
Abnormal Performance	15-6
Diagnostic Flowchart for Data Not Available	15-6
Diagnostic Procedure for Data Not Available	15-7

For technical questions, contact Omnitracs Customer Support.

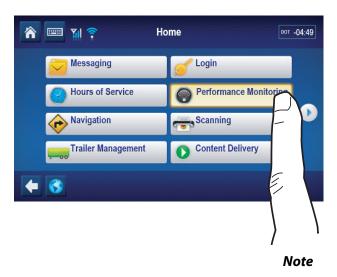
Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

System Overview

Connecting to the truck's data link is required for the Performance Monitoring application. The Performance Monitoring application records data from the vehicle such as speed, distance, RPMs, and fuel used. The data is retrieved from the truck by the host computer, either manually or automatically at preset intervals.

The hardware installation on the vehicle consists of connecting the MCP110 to the data link (J1587 or J1939)(see *Chapter 14: Vehicle Data Link Diagnostic/Verification Procedures*).



If the **Performance Monitoring** icon is grayed out, the Performance Monitoring application is not enabled. Call your **company dispatch** to have this application enabled.

Normal Performance

Once the connections have been made to a datalink and the company-defined parameters are sent and received by the unit, performance monitoring data will be recorded at the mobile and sent to the host system.

To confirm normal performance, first verify that performance monitoring parameters have been sent to the unit and received. Use the Parameters tab within the Performance Monitoring application and verify the tag field is not "0."



A tag of "0" indicates that the unit has not received it s parameters. Call your company dispatch administrator and ask for the parameters to be sent. A non-zero tag indicates that the unit has received parameters.

Next, with ignition in the ON position, use the Input Tab within the Performance Monitoring application to understand what data is being provided. Review data that is available listed under the **Data Item** column. Notice indicator lights.

Input Screen Example

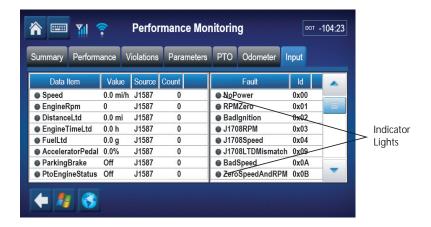


- Green indicator light means that those items are being received (this is good).
- Red indicator light means the data is stale and not currently available.
- Black indictor light means no data has been received for that item.

At a minimum, Performance Monitoring needs current data from Speed, EngineRPM, and DistanceLTD.

Understanding Performance Monitoring Faults

Certain types of conditions or faults can be monitored using performance monitoring. Faults can indicate causes of why data was not properly recorded. A table of available faults follows. Which faults are monitored is determined by the configuration a customer sends to a unit with the performance monitoring parameters.



Consult with your company's dispatch administrator with questions concerning monitoring faults.

- **Green** indicator light means that those items are being monitored.
- Red indicator light means the fault is active.
- Orange indictor light means that the fault was active but the condition cleared.
- Black indicator light means that the fault condition is not being monitored (turned off).

Performance Monitoring Faults and Descriptions

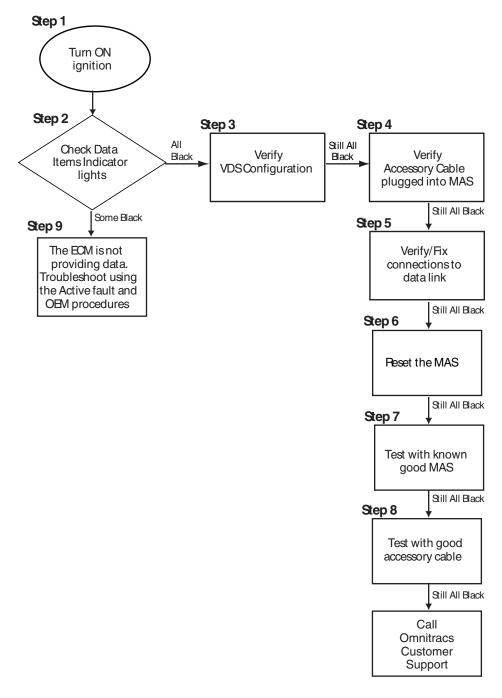
Active Fau	Active Fault Field Value Definitions				
Display Shows	Associated Fault	Description/Symptom	Possible Cause		
0	No Power (MCP110)	Power detected OFF for more than the wake-up time.	Main power was lost, causing the MCP to stay asleep longer than its wake-up interval.		
1	RPM Zero (MCP110)	RPM zero when speed is non-zero.	-RPM sensor or connection problemJ1708 selection parameter set wrongIn rare cases, no idle can be caused by faulty axle sensor input (e.g., wires reversed) causing a positive reading for speed while the vehicle is stationary.		

Active Fault Field Value Definitions (Continued)				
Display Shows	Associated Fault	Description/Symptom	Possible Cause	
2	Bad Ignition (MCP110)	Ignition OFF and speed or RPM non-zero.	Problem with MCP110's ignition line wiring or fuse.	
3	RPM Sensor (MCP110)	Engine posted PID (194) and PID (190).	RPM sensor or connection problem to the engine, detected by the engine's diagnostics.	
4	Speed Sensor (MCP110)	Engine posted PID (194) and PID (84).	Speed sensor or connection problem to engine, detected by the engine's diagnostics.	
9	LTD Mismatch (MCP110)	LTD mismatch with stored MCP110 data.	-Engine run with main power disconnectedEngine run with data link disconnectedEngine run with ignition line disconnected.	
А	Bad Speed (MCP110)	More than 2 hrs IGN = ON with Spd = 0, RPM greater than 1300.	-Speed sensor or connection problem—MCP110Speed sensor or connection problem—engineEngine speed sensor parameter not enabled.	
В	0 Spd and RPM (MCP110)	More than 2 hrs with IGN = ON with Spd = 0, RPM = 0.	-Disconnect of entire accessory cableJ1708 selection parameter set wrongData link connection problemDriver using ignition position for accessory operationMCP110 ignition line wired to accessory position.	
D	MCP110 Speed (MCP)	Speed signal constant for more than 5 minutes.	A pulse generator may have been connected to either the MCP110 or the engine.	
E	Hard Braking Event	Speed is suddenly decreased by more than 9 MPH/second (speed must be above 20 MPH for this fault to occur.	Driver is braking too quickly (hard braked).	

Abnormal Performance

If the unit has received its parameters (i.e. non-zero tag) and it is not recording data correctly, there is a problem. See the diagnostic procedure for Data Not Available starting below.

Diagnostic Flowchart for Data Not Available



OM_E-0128-291B

Diagnostic Procedure for Data Not Available



The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

1. Turn the ignition ON.



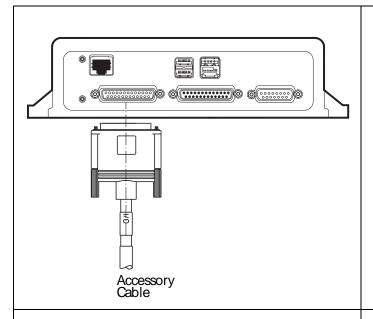
- 2. From the **Home** screen. Touch the **Performance Monitoring** button. Touch the **Input** tab. Verify the **Data Items**:
 - If all are black indicator lights, go to step 3.
 - If some are black indictor lights and some are green, go to step 9.



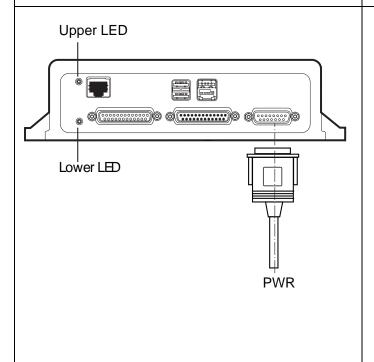
Verify the vehicle data source configuration.
 From the Home screen, touch the System button and then the VDS tab. The light indicators show what links the MCP110 unit will use to look for data.

Green:If configured and receiving data **Red**:If configured but vehicle data is stale **Black**:If not configured

- If the unit is not configured correctly, contact your company's dispatch to request the appropriate configuration.
- If the unit is configured correctly, go to step 6.



4. Verify that the accessory cable is plugged into the MAS. Reseat the accessory cable if needed then recheck input data items.



- Verify and fix the accessory connections to the data link. See Chapter 10 of the MCP110 Installation Guide for details.
- **6.** Reset the mobile application server 110 (MAS110) by disconnecting the power cable. Wait for the MAS110 LED indicators to go out.

Note

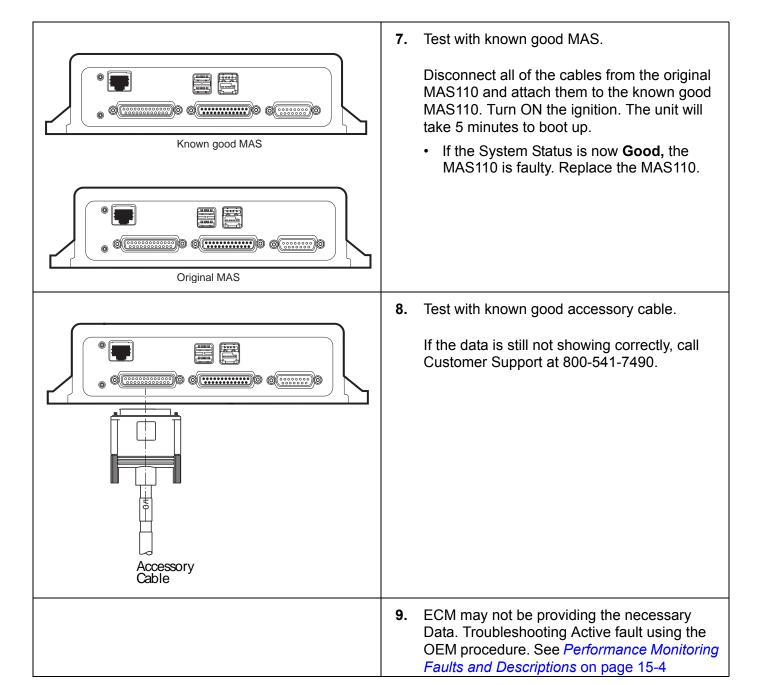
It usually takes about 5 minutes for the LED indicators to go out.

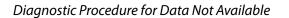
Once all LED indicators are off, reconnect the power cable to the MAS110 and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the lower LED should be BLINKING BLUE and the upper LED should be GREEN.

If the desired data link information is still not present, go to step 9.





Performance Monitoring Diagnostic/Verification Procedures

16

Trailer Tracks Asset Management Diagnostic/Verification Procedures

These topics are covered in this chapter:

Normal Performance	16-2
Abnormal Performance	16-2
Trailer Tracks Asset Management System Verification	16-3
A—Transmitter ID Not Displayed	16-7
A1—+12/24 VDC Is Not at Pigtail	6-12
B—Reefer Status Number Not Incrementing	6-14

For technical questions, contact Omnitracs Customer Support.

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

Normal Performance

The Trailer Tracks asset management system is an option that lets dispatchers monitor trailer connects and disconnects. Connects and disconnects are detected by the MCP110 and passed on to the dispatcher with the date, time, and location. Trailer Tracks asset management also lets you monitor trailer refrigeration units. This feature warns the driver when the reefer develops a problem and falls outside specific user-defined values.

The current Trailer Tracks transmitter works between +9 and 32 VDC. The Omnitracs MCP110 also works with the Omnitracs TT210 Untethered Trailer Tracks asset management system products.

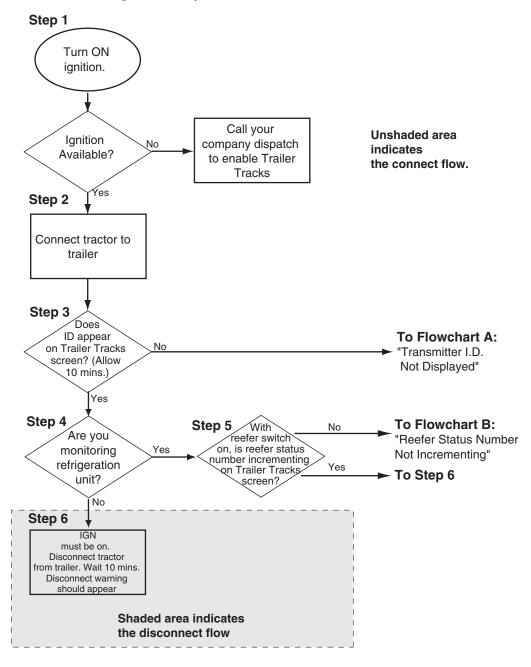
Abnormal Performance

If connects, disconnects, or refrigeration data is not being recorded properly, there is a problem. A problem is usually caused by one or more of the following:

- Trailer Tracks not Enabled for MAS
- · Truck's wiring not providing voltage to transmitter
- Trailer's 7-way not connected properly to Trailer Tracks transmitter or 7-way corroded
- · Faulty Trailer Tracks transmitter
- · Loose or faulty accessory cable
- Faulty MAS

The flowcharts and diagnostic procedures in this chapter cover data reporting problems and reefer problems.

Trailer Tracks Asset Management System Verification



Verification Procedure

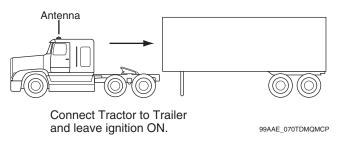


The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

- Turn ignition ON. Verify that the Trailer Tracks asset management system is enabled. If you can view the Trailer Tracks screen, Trailer Tracks asset management is enabled.
 - From the Home screen, touch the Trailer
 Management button to display the Trailer
 IDs screen.

Note

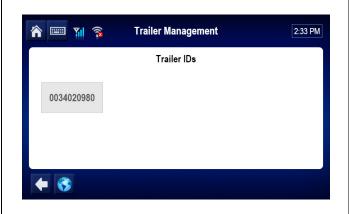
If the screen does not appear, call your company to have Trailer Tracks asset management enabled. Have the MCP110 number ready when you call. The unit will need to be added to the appropriate operational profile.



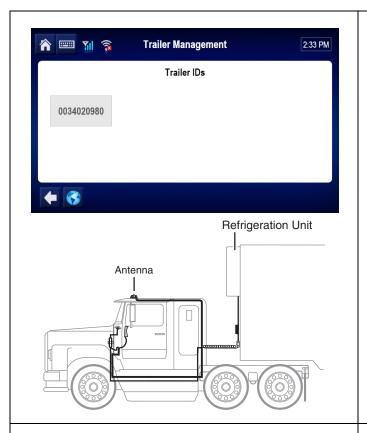
2. Connect the tractor to the trailer and leave the ignition ON.

Connect the tractor 7-way pigtail to the trailer.

This powers the Trailer Tracks transmitter and initiates sending the ID.



- Verify a trailer is connected. When a trailer is connected, the Trailer Tracks Transmitter ID number shows on the Trailer IDs screen. If multiple trailers are connected, the ID from each transmitter will be displayed.
 - For dry vans, if the Trailer ID appears, go to step 6.
 - For reefer units, if the Trailer ID appears, go to step 4.
 - If the Trailer ID does not appear, go to Flowchart A "Transmitter ID Not Displayed" on page 16-7.



4. Is a refrigeration unit being monitored?

Note

If a refrigeration unit is detected, a snowflake will appear above the transmitter ID box.

- If yes, go to step 5.
- If no, go to step 6.



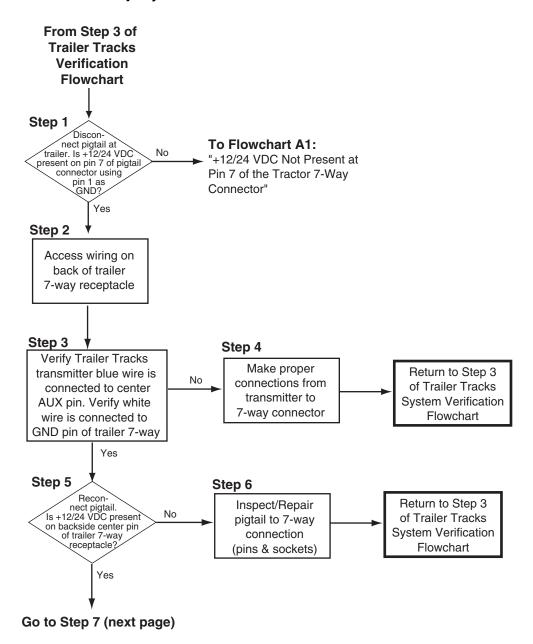
- 5. With the reefer turned on, check that the Refrigerator Stat # is incrementing on the Trailer Tracks screen. This number should increment approximately once a minute.
 - If it is incrementing, go to step 6.
 - If it is not incrementing, go to Flowchart B "Reefer Status Number Not incrementing" on page 16-14.



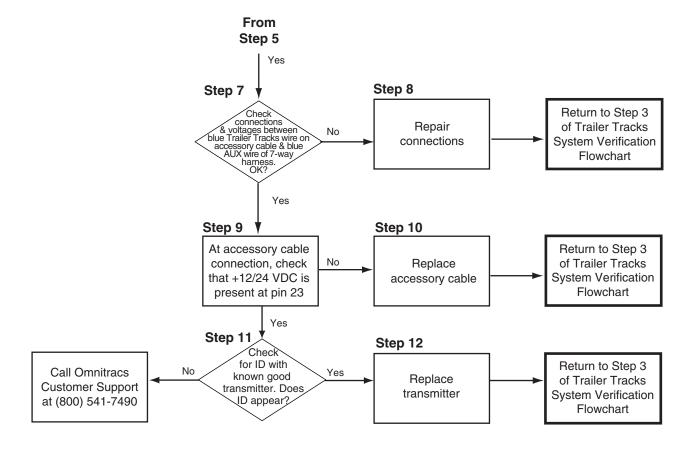
- Disconnect the tractor from the trailer, leave the ignition ON, and wait for the disconnect message as shown at left. (Allow up to 10 minutes.)
 - When the disconnect message appears on the display screen, Trailer Tracks asset management system verification is complete.
 - If disconnect message does not appear (allow up to 10 minutes), call Omnitracs Customer Support:

US: 800-541-7490 Canada: 800-863-9191

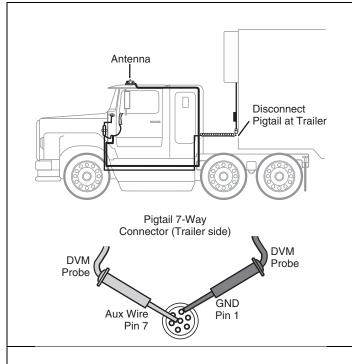
A—Transmitter ID Not Displayed



A—Transmitter ID Not Displayed (continued)



Diagnostic Procedure A—Transmitter ID Not Displayed

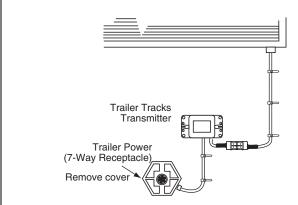


The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

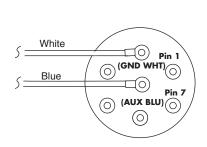
1. Disconnect the pigtail at the trailer.

Is +12/24 VDC present at pin 7 (center pin) of the pigtail connector using pin 1 as ground?

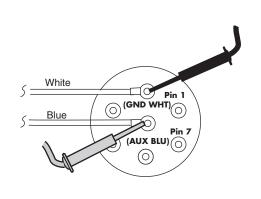
- If yes, go to step 2.
- If no, go to Flowchart A1 on page 16-12.



2. Access the wiring on the back of the trailer 7-way receptacle. You will have to remove the front cover.



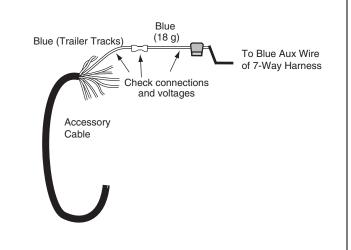
- Verify that the Trailer Tracks transmitter blue wire is connected to the center aux pin of the 7-way receptacle. Verify that the white wire is connected to the ground pin of the 7-way receptacle.
 - If both wires are correctly connected, go to step 5.
 - If the wires are not correctly connected, go to step 4.
- **4.** Make proper connections from the Trailer Tracks transmitter to the 7-way receptacle and return to step 3. of the Trailer Tracks asset management system verification flowchart.



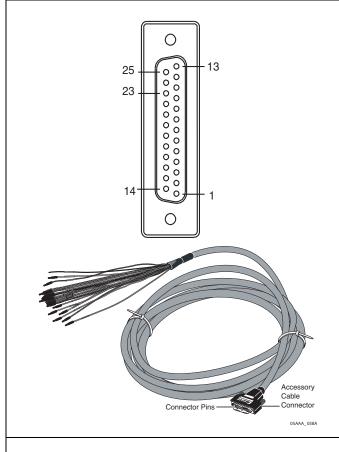
5. Reconnect the pigtail to the front cover of the 7-way receptacle.

Is +12/24 VDC present on the backside center pin of the trailer 7-way receptacle?

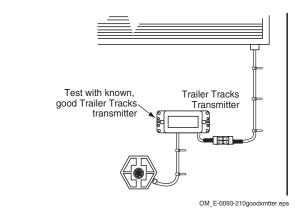
- If +12/24 VDC is not present, go to step 6.
- If +12/24 VDC is present, reconnect the cover and go to step 7.
- **6.** Inspect and/or repair the pigtail to the 7-way connection (pins and sockets).
 - · Reconnect the cover.
 - Return to step 3. of the Trailer Tracks asset management system verification flowchart.



- 7. On the tractor, check connections and voltages between the blue Trailer Tracks wire (labelled Trailer Tracks) of the accessory cable and the blue aux wire of the 7-way harness.
 - · Check fuse on end of Trailer Tracks wire.
 - If the connections and voltages are OK, go to step 9.
 - If the connections and voltages are not OK, go to step 8.
- **8.** Repair the connections.
 - Return to step 3. of the Trailer Tracks asset management system verification flowchart.

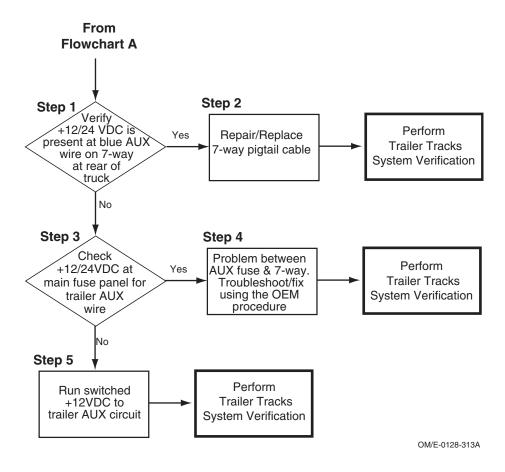


- **9.** At the accessory cable, check that +12/24 VDC is present at pin 23 and using chassis ground.
 - If +12/24 VDC is not present at pin 23, go to step 10.
 - If +12/24 VDC is present at pin 23, go to step 11.
- **10.** Replace accessory cable and return to step 3. of the Trailer Tracks asset management system verification flowchart.

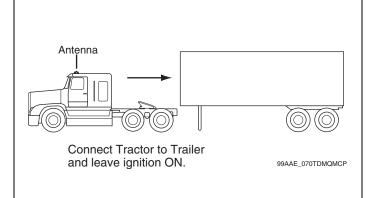


- **11.** Check for Trailer Tracks ID with a known good Trailer Tracks transmitter.
 - If the ID appears, go to step 12.
 - If the ID does not appear, call Omnitracs Customer Support at 800-541-7490.
- **12.** Replace the Trailer Tracks transmitter.
 - Return to step 3. of the Trailer Tracks asset management system verification flowchart.

A1—+12/24 VDC Is Not at Pigtail



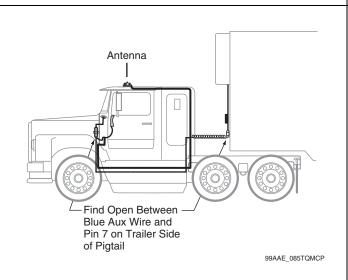
Diagnostic Procedure A1—+12/24 VDC Is Not at Pigtail



- 1. With the ignition ON, verify that +12/24 VDC is present at the blue aux wire (10-gauge) of the 7-way harness on the truck.
 - If there is voltage present at the aux wire, go to step 2.
 - If there is not voltage present at the aux wire, go to step 3.

Note

The power being supplied to the trailer aux wire should be protected by a 30A circuit breaker.



2. Locate and repair the open between the blue aux (10-gauge) wire of the 7-way harness and pin 7 on the trailer side of the pigtail.

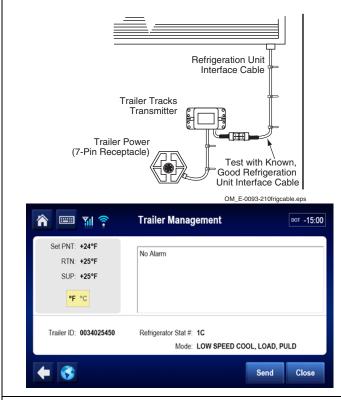
Return to step 3. of the Trailer Tracks asset management system verification flowchart.

- 3. Check that +12/24 VDC is present at the main fuse panel for the blue aux wire (10-gauge).
 - If there is voltage present at the main fuse panel, go to step 4.
 - If there is not voltage present at the main fuse panel, check the fuse and replace the fuse if necessary.
 - If there is still not voltage after replacing the fuse, go to step 5.
- 4. There is a problem between the aux fuse and the 7-way harness. Troubleshoot and fix the problem using the OEM procedure and return to step 3. of the Trailer Tracks asset management system verification flowchart.
- Run switched +12VDC to trailer aux circuit and return to step 3. of the Trailer Tracks asset management system verification flowchart.

B—Reefer Status Number Not Incrementing

From Step 5 of **Trailer TracksVerification Flowchart** Step 1 Test Return to Step 5 with known Replace good reefer cable. of Trailer Tracks Yes Reefer status reefer cable System Verification number incre-Flowchart menting? No Step 2 **Test** Return to Step 5 with known, Replace good Trailer Tracks of Trailer Tracks Yes **Trailer Tracks** transmitter. Reefer System Verification status number transmitter Flowchart incrementing? No Step 3 See qualified Return to Step 5 refrigeration unit Have refrigeration No of Trailer Tracks unit technician technician to verify System Verification reefer is service reefer Flowchart transmitting data

Diagnostic Procedure B—Reefer Status Number Not Incrementing



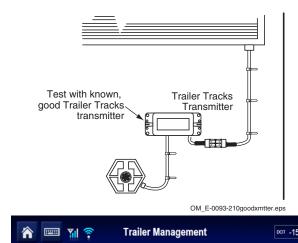
1. Test with a known good reefer cable.

Is the reefer status number incrementing? It should be incrementing approximately once a minute.

- If yes, replace the reefer cable and return to step 5. of the Trailer Tracks asset management system verification flowchart.
- If **no**, go to step 2.
- 2. Test with a known good Trailer Tracks transmitter.

Is the reefer status number incrementing?

- If yes, replace the Trailer Tracks transmitter and return to step 5. of the Trailer Tracks asset management system verification flowchart.
- If **no**, go to step 3.
- **3.** See a qualified refrigeration unit technician to verify the reefer is sending data.
 - If the refrigeration unit is sending data, call Omnitracs Customer Support at 800-541-7490
 - If the refrigeration unit is not sending data, have the refrigeration unit technician service the refrigeration unit. Then return to step 5. of the Trailer Tracks asset management verification flowchart.







17 Critical Event Reporting

These topics are covered in this chapter:

Overview	17-2
Normal Performance	17-2
Abnormal Performance	17-2
Event Not Triggered	17-2
Events Triggered in Error	17-5

For technical questions, contact Omnitracs Customer Support.

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

Overview

Critical Event Reporting (CER) captures and reports vehicle critical event information (e.g., hard braking, vehicle speed, location, stability control (VDC), lane departure warning (LDW), and panic button events. With each hard braking event, five minutes of speed information is recorded and sent to the CER host system. Events are processed two minutes after it occurs.

Normal Performance

In order for the CER feature to function, the MCP110 must be connected to the vehicle's data link wires.

Critical events can be triggered by a:

- hard brake event
- Stability Control (VDC) event (if available)
- lane departure warning (LDW) (if option is installed)
- panic button event
- manually triggered CER event.

Text-to-speech (TTS) can be enabled so CER events can be audibly conveyed to the driver.

Abnormal Performance

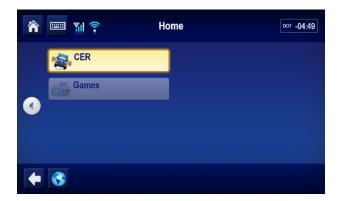
If any of the above items do not trigger a CER event, or if a critical event is reported in error, there is a problem. A problem is usually caused by one or more of the following:

- · The unit is misconfigured
- Loose or bad connection to the data link
- · Loose or faulty accessory cable
- Faulty MAS
- Intermittent data supplied by ECM of vehicle

Event Not Triggered

CER Verify Configuration

Access CER information, go to the Home screen and tap the CER button. If the CER buttons is grayed out, then CER service for the unit must be enabled from the Customer Portal.



From the Main CER screen, press the **D** key and go to the **General** tab. Select one of the tabs for stability control or lane departure information.







Field	Value
CER Enabled/Disabled	If enabled, the MCP captures CER events.
Speech Enabled/Disabled	If enabled, the text in the alert pop-ups is spoken.
Hard Braking Minimum Speed	The speed at which mobile unit detects hard brake events.
Hard Braking Deceleration Rate	The rate of deceleration that triggers a hard brake event (Default = 9 MPH/SEC).
Stability Control (VDC) Enabled/ Disabled	Stability control is enabled/disabled.
Minimum Speed	Minimum speed at which mobile unit detects events.
On/Off Threshold	Number of notifications that must be seen in a row before an event is considered to be in progress.
VDC/LDW Bits Tracked	Setting that determines which bits the mobile unit tracks to monitor stability control events: Brake bits only, Engine bits only, Brake or Engine bits (Default), Brake and Engine bits
Lane Departure Enabled	Lane Departure Warning is enabled.
Bus	J1587 or J1939
VDC/LDW Data	Available or not seen
LDW Events Count	Number of LDW events that occur within the LDW Time Threshold before CER sends a notification.
LDW Events Time (mins)	Number of minutes that pass before LDW events are detected and CER sends a notification.

CER Verify Data Link Critical Event Reporting

CER Verify Data Link

To access vehicle data services (VDS) information, use the scroll bar and touch the VDS (Status) tab.



With the ignition turned ON, the indicator light associated with the 1587 and/or 1939 is:

- · GREEN, if configured and receiving current data
- · RED, if configured but data is stale
- · BLACK, if not configure

Hard braking gets information from either J1708/1587 or J1939. One of the two indicator lights must be green to record hard braking events correctly. Some filtering is done to prevent erroneous CER events due to faulty truck speed sensors. Check *Chapter 14: Vehicle Data Link Diagnostic/Verification Procedures* if a problem exists.

Sending a CER Event

1. Go to the CER screen.



Note: The CER message is sent to the NOC.

Verify that the host receives the CER event message and that data is present.

If the message is not received at the host application, then the NOC account could be set up incorrectly. Call Omnitracs Customer Support at 800-541-7490.

Events Triggered in Error

• For panic events triggered in error, refer to Chapter 19: Panic Button Diagnostic Procedures.

- For hard braking events triggered in error, verify configuration values, hard braking minimum speed and hard braking deceleration rate.
- For stability control events triggered in error, verify configuration values minimum speed and on/off threshold.

Events Triggered in Error

18

Vehicle Maintenance

These topics are covered in this chapter:

Overview	18-2
Normal Performance	18-2
Abnormal Performance	18-2
Verify Configuration Settings	18-2
Verify Data Link Connections to Connect to J1939 Data Link	18-3

For technical questions, contact Omnitracs Customer Support.

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

Overview Vehicle Maintenance

Overview

The MCP vehicle maintenance service is a vehicle diagnostics tool that alerts the driver and the fleet of active vehicle diagnostics' conditions.

- The vehicle maintenance service only supports conditions from the J1939 datalink.
- The conditions listed below can be monitored.

Description	Source	PGN	SPN	FMI
Engine power supply voltage (low)	0	65226	627	004
Auxiliary water pump pressure (high)	0	65226	073	003
Auxiliary water pump pressure (low)	0	65226	073	001
Fuel delivery pressure (high)	0	65226	094	003
Engine oil pressure (high)	0	65226	100	003
Engine oil pressure (low)	0	65226	100	001
Engine coolant temperature (high)	0	65226	110	000
Engine coolant temperature (low)	0	65226	110	004
Engine coolant level (high)	0	65226	111	003
Engine coolant level (low)	0	65226	111	001
Engine fuel temperature (high)	0	65226	174	003
Engine oil temperature (high)	0	65226	175	003
Engine oil temperature (above normal)	0	65226	175	000
Brake ABS valve (high)	11	65226	795	003
Brake ABS valve (low)	11	65226	798	004

Normal Performance

When a configured vehicle condition becomes active, the driver is alerted via the VEHICLE MAINTENANCE icon by displaying in orange, the number of active conditions. An e-mail notification is also sent to a pre-subscribed list notifying fleet personnel of the active condition.

Abnormal Performance

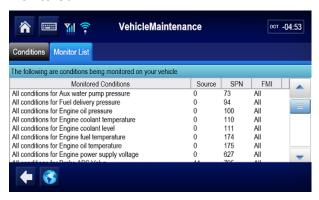
If a vehicle condition becomes active and an alert is not sent, a problem exists. A problem is usually caused by one or more of the following:

- · Unit is misconfigured
- · Loose or faulty connection to the J1939
- · Loose or faulty accessory cable
- · Faulty MAS

Verify Configuration Settings

A customer selects which conditions to monitor using the Vehicle Maintenance host software.

 Select the Monitor List tab from the Vehicle Maintenance screens to see which are monitored.



Verify Data Link Connections to Connect to J1939 Data Link

Use the Display screens to verify vehicle maintenance:

 Go to the Vehicle Data Service (VDS) status screen. Press the HOME key and scroll down to the SYSTEM icon. Touch the SYSTEM icon and press the VDS tab.



Various screen fields are described below.

Field	Value
RCV	These are the packets of data being received on the data bus.
XMT	These are the packets of data being received on the data bus as requested (sent) packets.
MSG	These are the packets of data being received on the data bus that are of longer length than the normal data packet size.

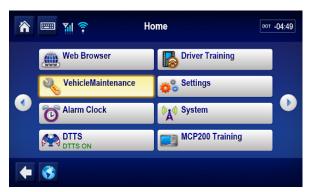
With the ignition ON, verify the following on the VDS (Status) screen:

- · Ignition has a green indicator light during this test.
- J1939 has a green indicator light. This confirms that the J1939 is enabled for the unit. The Rcv value should be constantly increasing.
 - If the J1939 indicator light is red, there is an error.
 - If the J1939 light is dark, the unit is not enabled for J1939.

Note

If these items do not show correctly, refer to the Chapter 14: Vehicle Data Link Diagnostic/ Verification Procedures.

2. Press the **Home** button and scroll down to the **Vehicle Maintenance** button.



Note

If the Vehicle Maintenance button is **not** highlighted, the service is not enabled for the unit and must be turned on via the Customer Portal.

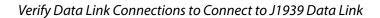
3. Simulate an engine condition. The number of conditions you create should appear in orange on the Vehicle Maintenance **Conditions** tab.





- · Red indicator lights are active conditions.
- Gray indicator lights are inactive conditions.
- The simulated condition should have Red indicator lights.
- Conditions must be active 40 seconds before they are reported.

- 40 seconds after a condition becomes inactive the indicator light for that condition turns gray.
- 40 minutes after the condition has been inactive, it is removed from the list.
- **4.** Verify e-mail notification goes out upon detection of condition. The e-mail notification is sent to the person(s) identified by the host vehicle maintenance application. If the appropriate person does not receive e-mail notification, contact Omnitracs Customer Support at (800) 541-7490.



19

Panic Button Diagnostic Procedures

These topics are covered in this chapter:

Normal Performance	19-2
Abnormal Performance	19-2
False Panic Message	19-3
No Panic Message	19-6

For technical questions, contact Omnitracs Customer Support.

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

Normal Performance

The panic button allows the driver to notify the MCP110 NOC and the company dispatcher when an emergency situation exists. When the driver presses the panic button, a priority message is sent to the NOC and the company dispatcher.

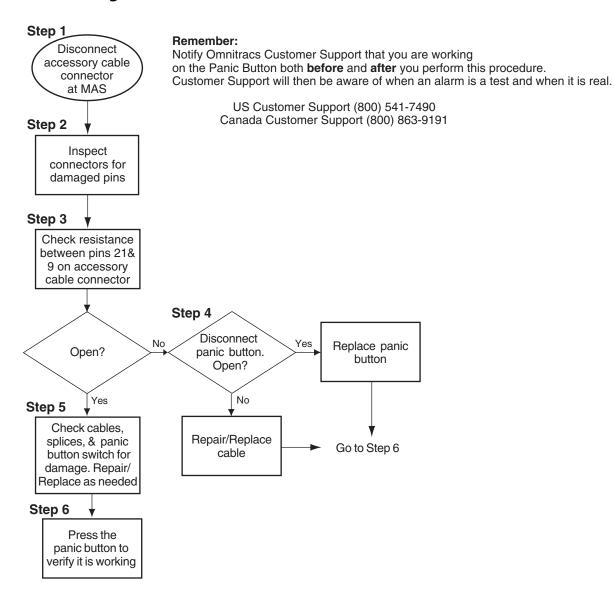
Abnormal Performance

If the panic button does not work properly, it will either send a false panic message when the panic button is **not** pressed or no panic message will be sent when the panic button is pressed.

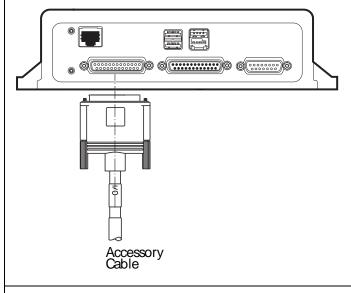
The problem is most likely caused by one or more of the following:

- · Panic button is not enabled
- · Faulty accessory cable wiring
- Faulty wire connections
- Faulty panic button

False Panic Message

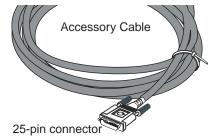


Diagnostic Procedure

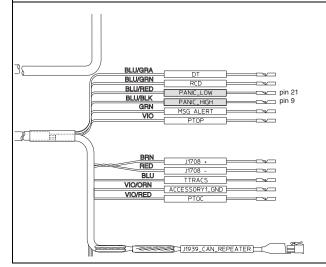


The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

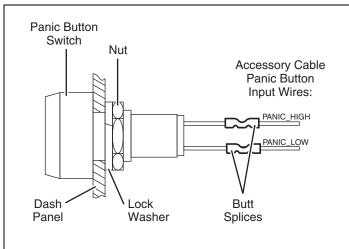
I. Disconnect the accessory cable connector at the mobile application server 110 (MAS110).



2. Inspect the accessory cable connector pins for damage or corrosion.



- Using a digital voltmeter (DVM), check the resistance between pins 9 and 21 on the accessory cable connector at the MAS110.
 - If the circuit is open, go to step 5.
 - If the circuit is closed, go to step 4.

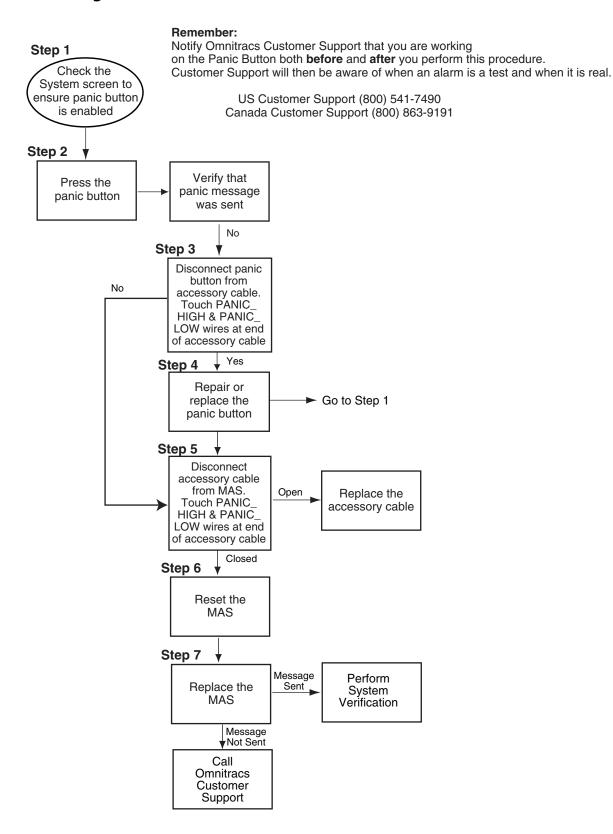


- **4.** Disconnect the panic button from the accessory cable and check the resistance again.
 - If the panic button circuit is open, repair or replace the panic button and go to step 6.
 - If it is closed, replace the accessory cable and go to step 6.
- 5. Check the cables, wire splices, and panic button for damage. Any of these could cause intermittent false panic notifications. If there is damage, repair or replace the part(s) as necessary and go to step 6.



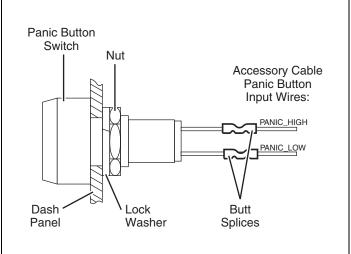
- **6.** Press the new or repaired panic button. Does it work properly?
 - If yes, perform the system verification procedure in Chapter 4: System Verification. Notify Omnitracs Customer Support that you are finished with the test.
 - If **no**, notify Omnitracs Customer Support about the problem.

No Panic Message

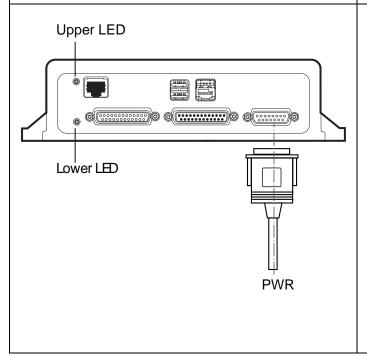


Diagnostic Procedure

The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential you may be instructed to skip steps. 1. From the Home screen, touch the **System** button. Touch the **Config** tab. Check that PANIC is enabled and Panic Config is 2-wire. Call Omnitracs Customer Support to let them know you will be testing the panic button. Press the panic button. Message should show in Outbox and a TTS notification will play. Was the message sent? If **yes**, perform the system verification procedure in Chapter 4: System Verification. • If **no**, go to step 3. BLU/KED Disconnect the panic button from the PANIC_LOW **BLU/BLK** PANIC_HIGH _~ accessory cable and touch the PANIC_HIGH GRN MSG ALERT VIO and PANIC_LOW wires together. PTOP If the panic message was sent, go to step 4. 11708 + If no panic message was sent, go to step 5. J1708 -BLU TTRACS VIO/ORN ACCESSORY1_GND VIO/RED PTOC J1939_CAN_REPEATER



- **4.** Repair or replace the panic button. Return to step 1.
- 5. Disconnect the accessory cable from the MAS110. With PANIC_LOW and PANIC_HIGH still shorted together, check the resistance on the MAS110 end of the accessory cable—pins 28 and 30.
 - If the circuit is open, replace the accessory cable and retest.
 - If the circuit is closed, go to step 6.



6. Reset the MAS110 by disconnecting the power cable. Wait for the MAS110 LED indicators to go out.

Note

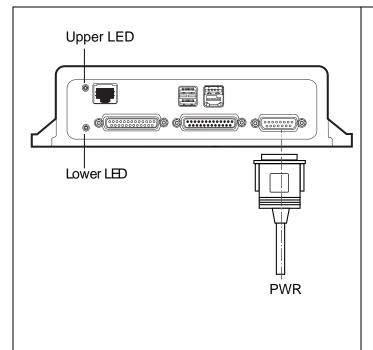
It usually takes about 5 minutes for the LED indicators to go out.

Once all LED indicators are off, reconnect the power cable to the MAS110 and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the lower LED should be BLINKING BLUE and the upper LED should be GRFFN.

Go to step 7.



7. Test with a known good MAS110 as follows:

Disconnect all of the cables from the original MAS110 and attach them to the known good MAS110. Turn ON the ignition. The unit will take 5 minutes to boot up.

Press the panic button. Was the panic message sent?

 If the panic message was sent, the MAS110 is faulty. Replace the MAS110.

Note

Before sending a faulty MAS110 back to Omnitracs, remove the backup battery and install it in the replacement MAS110. A replacement MAS110 does not come with a backup battery.

After the replacement MAS110 is installed, reconnect all components and perform the system verification procedure in *Chapter 4:* System Verification.

• If the panic message was not sent, call Omnitracs Customer Support:

US: 800-541-7490 Canada: 800-863-9191

20

In-Cab Scanner Diagnostic Procedures

These topics are covered in this chapter:

Overview	20-2
Abnormal Performance	20-2
RMA Process	20-2
Troubleshooting	20-3

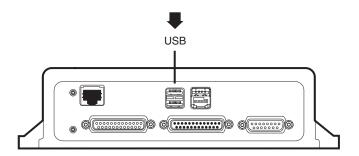
For technical questions, contact Omnitracs Customer Support.

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

Overview

The scanner is used to scan and send documents using the connected MCP110 system. The scanner is connected to the MAS using a USB cable.





Normal Performance

Once a document is scanned and accepted, the user can sends a scan of lading or other paperwork associated with pick-ups and deliveries. The scanner is connected to the MAS using a USB cable and sends the image to the host application.

Abnormal Performance

If the scanner is not detected by the application or doesn't scan a document, there is a problem. A problem is most likely caused by one or more of the following:

- Loose USB cable connecting
- · Fault scanner or scanner cable
- Faulty MAS

RMA Process

RMAs are used whenever equipment must be returned to BCS Solutions:

• Website: bcssolutions.com/465q/rma

Troubleshooting

First, check the scanning application. It indicates whether or not the scanner is detected.



If not detected, reseat the cable at both ends (scanner and MAS).

Next, If the scanner is detected, run the calibration process and then try scanning a document again.

If still not working, reset the MAS.

If still not working, the scanner must be RMAd.

A

Wiring Diagrams and Charts

Topics in this appendix provide wiring diagrams and pin description charts for the Omnitracs MCP110 and accessories.

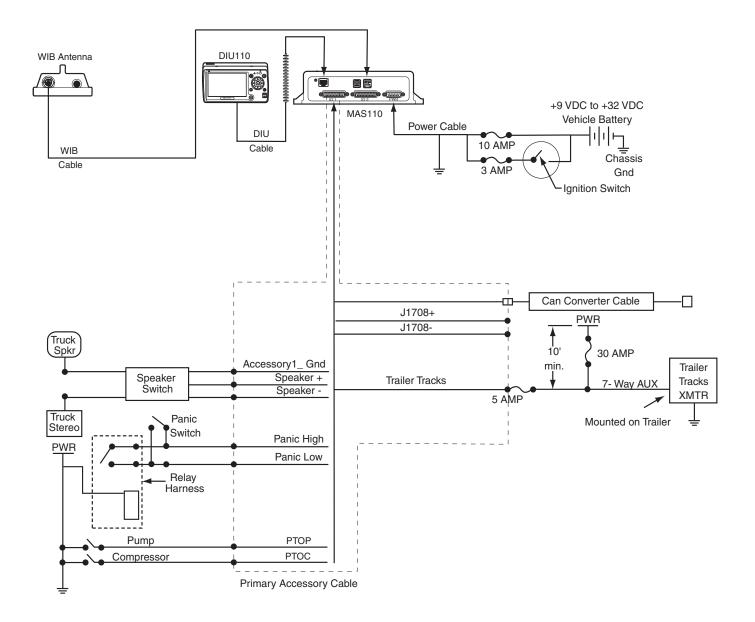
Omnitracs MCP110 Electrical Diagram	A-2
Omnitracs MCP110 Wiring Diagram	A-3
Power Cable Connector Pin Callouts	A-4
Wireless Interface Box (WIB) Cable Connector Pin Callouts	A-5
Primary Accessory Cable Connector Pin Callouts	A-7
MCP100 to MCP200 Accessory Adapter Cable	A-8
Display Interface Unit 110 (DIU110) Cable Connector Pin Callouts	A-9
Six-pin Data Link Connector Pin Callouts	A-10
Nine-pin Data Link Connector Pin Callouts	A-11
Radio Connector Pin Callouts	A-12
CAN Repeater Cable Pin Callouts	A-13

For technical questions, contact Omnitracs Customer Support.

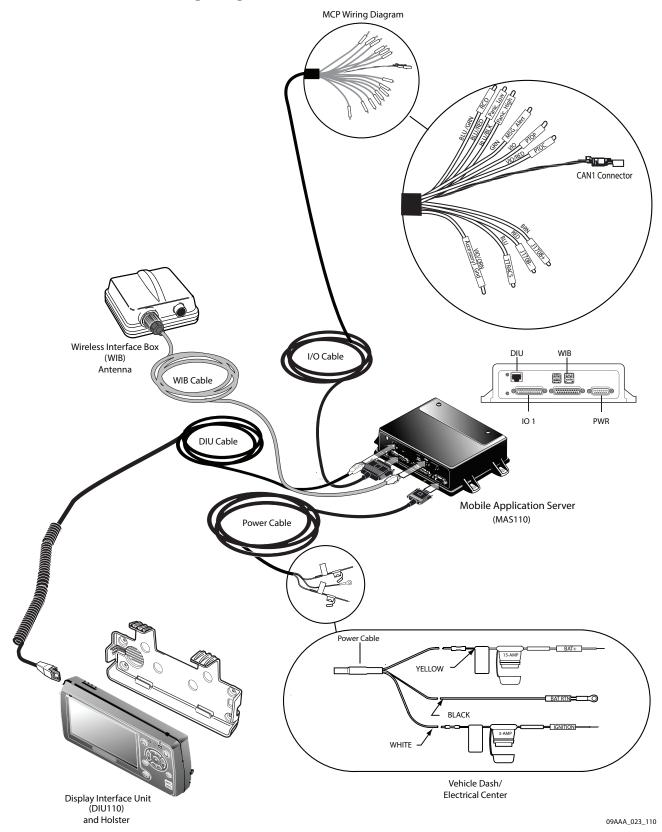
Customer Support is staffed 24 hours a day, 365 days a year:

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- In Canada, call 800-863-9191

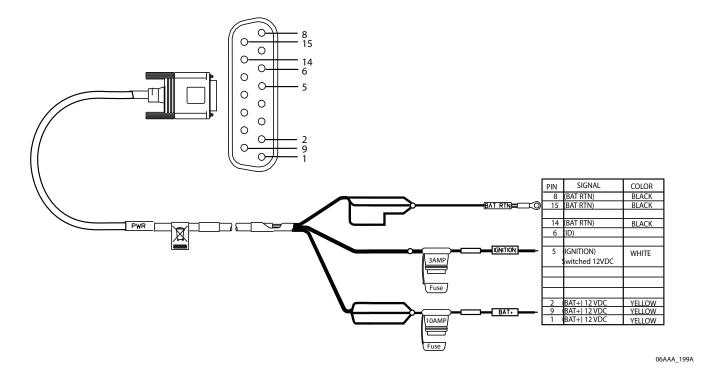
Omnitracs MCP110 Electrical Diagram



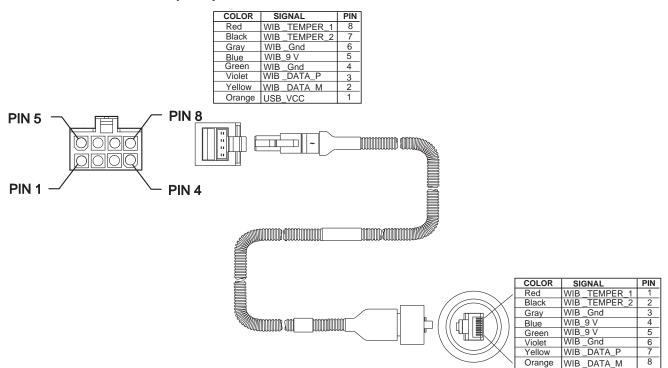
Omnitracs MCP110 Wiring Diagram



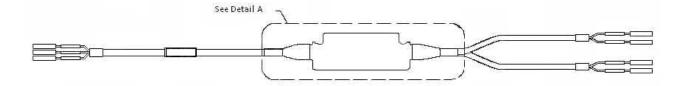
Power Cable Connector Pin Callouts

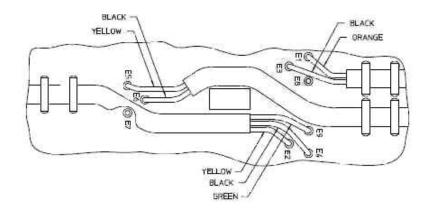


Wireless Interface Box (WIB) Cable Connector Pin Callouts

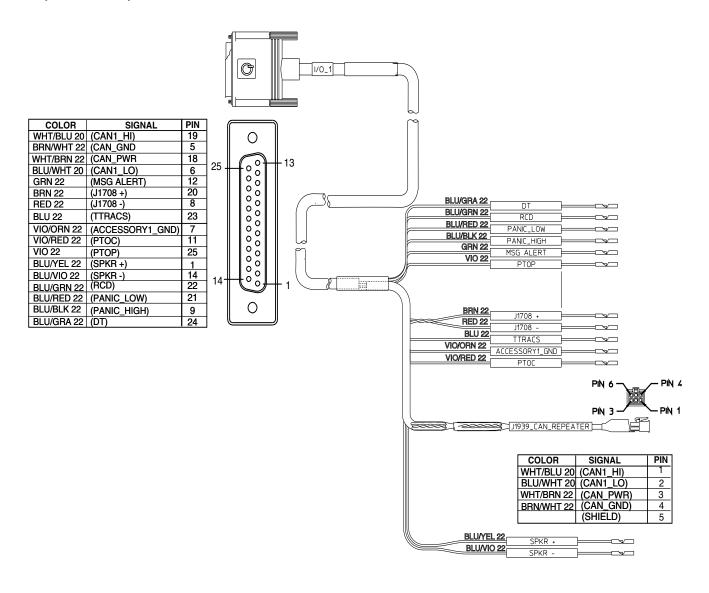


Speaker Switch Cable



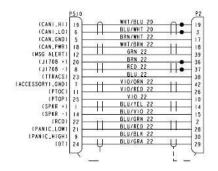


Primary Accessory Cable Connector Pin Callouts



MCP100 to MCP200 Accessory Adapter Cable

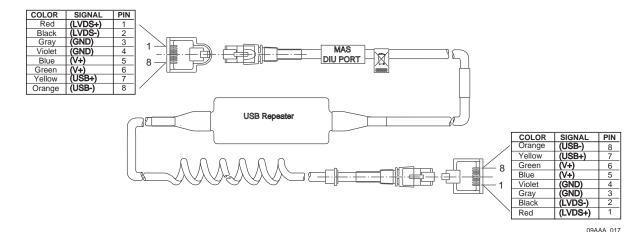




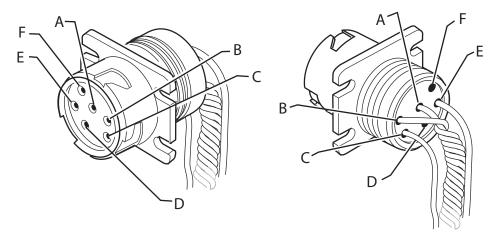
MCP100 to MCP200 Accessory Cable Adapter Cable

- If the MCP100 accessory cable uses the CAN1 converter cable to connect to J1939, this cable can
 be reused in conjunction with a MCP100 to MCP200 accessory adapter cable, however the
 J1939 connectivity will be lost.
- If the MCP100 accessory cable is connected directly into the J1939 data link (common with
 most prewired) or uses the CAN repeater cable, this cable can be reused and will retain
 connectivity to the J1939 data link.

Display Interface Unit 110 (DIU110) Cable Connector Pin Callouts

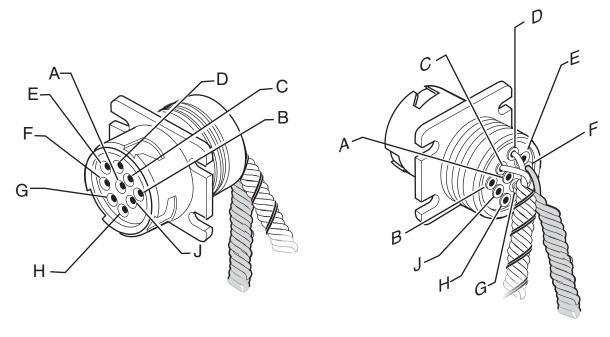


Six-pin Data Link Connector Pin Callouts



SIGNAL	PIN
J1708/J1587 DATA LINK+	А
J1708/J1587 DATA LINK-	В
+12VDC	С
PLUG P/N:23507136	D
BATTERY GROUND	E
PLUG P/N:23507136	F

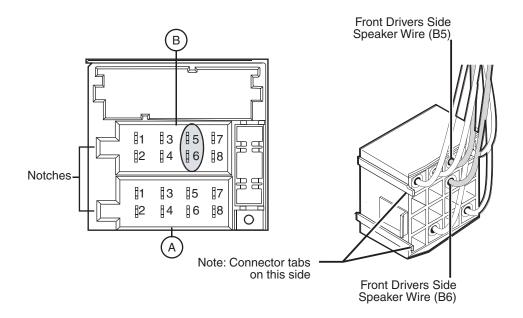
Nine-pin Data Link Connector Pin Callouts



SIGNAL	PIN
BATTERY GROUND	А
+12VDC	В
J1939 DATA LINK+	С
J1939 DATA LINK-	D
J1939 SHIELD	Е
J1708/J1587 DATA LINK+	F
J1708/J1587 DATA LINK-	G
PLUG	Н
PLUG	J

Radio Connector Pin Callouts

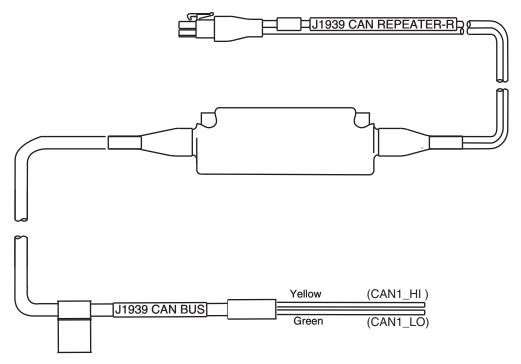
Common Radio and Harness



PIN	SIGNAL	PIN	SIGNAL
A1	N/C	B1	RR + SPEAKER
A2	N/C	B2	RR - SPEAKER
A3	PARK LIGHTS	B3	RF + SPEAKER
A4	IGN CONTACT	B4	RF - SPEAKER
A5	PWR ANT OUTPUT	B5	LF + SPEAKER
A6	PWM/ANALOG DIM	B6	LF - SPEAKER
A7	BATTERY - MAIN	B7	LR + SPEAKER
A8	GROUND	B8	LR - SPEAKER

06AAA_179A

CAN Repeater Cable Pin Callouts



B

Environmental and Power Requirements

Topics in this appendix provide environmental and power requirements for the Omnitracs MCP110 and accessories.

For technical questions, contact Omnitracs Customer Support.

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

MCP110 Environmental and Power Requirements

Condition	Requirement
Extended Operating Temperature	-40° C to 70° C (-40° F to 158° F)
Vibration/Shock	Mobile application server 110 (MAS110) does not have a shock tray.
	Neither the wireless data box 110 (WIB110) nor optional satellite data modem (SDM) should be mounted to any member/support directly connected to the chassis, such as a headache rack.
Humidity	
WIB110	Weatherproof.
MAS110	Not watertight. DO NOT get wet.
Display interface unit 110 (DIU110)	Not watertight. Turn over immediately if liquids are spilled on it.
Power	+12 to +32 Volts DC
Operating at +12V (WIB and DIU)	MCP110 draws a maximum of 1.5 amps.
Asleep	MCP110 draws 30mA.

C Standard RMA Procedure

For customers, to return failed equipment, go to Omnitracs Customer Portal at https://customer.omnitracs.com

For service centers only, please return equipment to Omnitracs at the following address. Make sure that the RMA number is marked clearly on the outside of the box.

Omnitracs, LLC - RMA Receiving c/o Baja Freight Forwarders, Inc. 8662 Siempre Viva Road San Diego, CA 92154 RMA #: _____(800) 541-7490

To prevent damage during shipment and handling, carefully package all equipment being returned. If the original shipping container and packing material are available, please use them to return the equipment.

C-1

D

Upgrading the MCP110 Using USB Memory Sticks

An MCP110 is normally upgraded with software by sending it over-the-air using satellite connectivity. However, there may be occasions when upgrades are necessary using USB memory sticks.

Topics in this appendix include:

Checking the Software Versions Installed	D-2
Upgrading Only the MAS110 Software	. D-3
Upgrading the MAS OS and MAS Software	D-4

For technical questions, contact Omnitracs Customer Support.

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- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

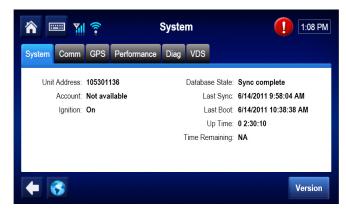
Checking the Software Versions Installed

Shortly after you power up the MCP110, the user interface screen displays.

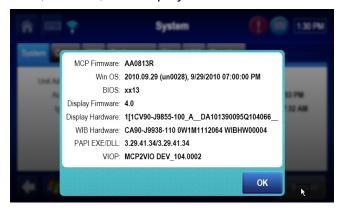
1. Use the left arrow to get to the **System** button. Tap the **System** button.



2. Tap the **System** tab. Tap the **Version** button at the bottom right to access system information about the MCP110.



MCP, Win OS, and Display firmware version numbers are listed here.



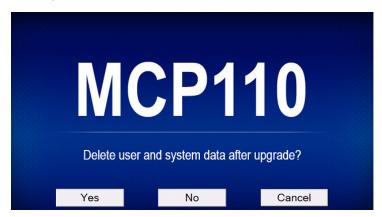
Upgrading Only the MAS110 Software

MAS110 should be powered ON, ignition ON.

1. Insert the MAS110 software memory stick into one of the USB ports on the MAS or into the memory stick slot on the side of the DIU.



a. Within one minute after the MAS110 software stick is installed, the DIU screen will display a prompt.



- b. Select **No** to keep data or **Yes** to delete data.
- c. During the upgrade process, the unit will reboot. Once the unit comes back up after the reboot, "Upgrading" will show. This takes about ten minutes.
- 2. After the upgrade finishes, the DIU screen will show the Driver Warning screen. Remove the memory stick and confirm the upgrade is complete by checking the MCP110 software version on the Version screen.





Perform system verification.

Upgrading the MAS OS and MAS Software

A properly formatted and configured Omnitracs USB memory stick is needed. This stick is designed to reload the OS and software on a MAS110.

IMPORTANT!

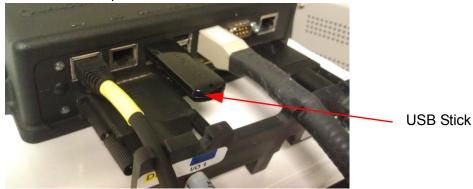
All user data on the MAS will be removed.

CoPilot® Truck™ (ALK) Mapdata will be removed and will need to be reloaded (if used) after the OS is installed.

Do NOT disrupt power or remove the USB stick during the upgrade process as this will cause the unit to be inoperable. The entire process takes about 1 hour to complete.

Starting with an MCP110 system that has had power removed – no MAS LEDs on, do the following:

1. Put the USB memory stick in a UBS port on the MAS. This process will NOT work using the DIU USB port.



- 2. A USB keyboard will need to be attached to a USB port on the DIU or MAS. Be ready to press the **F11** key.
- 3. Power up the unit and wait for the large logo with a black background to appear (usually only a matter of seconds for it to appear). Press and hold the **F11** key while the logo is shown on the screen.
- **4.** Once the window shows that allows selection of the available boot devices, release the F11 key and down arrow and select to boot off the USB memory stick. Then press the **Enter** key. If the pop-up window does not show, you'll need to remove power, wait for all the MAS LEDs to go off, and start over at step 2.



MCP110/200 OS Installer Ver 1.04 Install Summary Platform: MCP200 Locale: HW SCI · AMCPHW00005 OS Ver: UN0029 BIOS Ver: R013 (02/26/2009) 4 Manuf Num: CA90-J9937-200 Src Files: **Dst Folders:** 4651 UA105304868 Serial Num: 16794 Dst Files: Status Ready to install Abort Install

Within a minute the unit will start the OS upgrade. The screens below will be displayed.



The OS upgrade will automatically start. At about 30 minutes, the system will reboot after the OS components are copied and verified. A SQL install process will take place. The SQL build process takes about 10 minutes. Do NOT touch the screen or any of the prompts that may be displayed. The OS installation will be complete when the screen noted below is displayed.



5. A keyboard will show in the forefront. Close it out by tapping the red circle at the bottom left. Verify both bars are green. If both bars are green, go to the next step. If either of the bars are red, tap the Fix Message Queuing button and ensure both bars turn green before proceeding.

6. At the System Check screen, press the **Install Application** button. This will start the software application installation.



When the application software installation is complete, the screen will show a Driver Warning (takes about <u>15 minutes</u>).



7. Now, run a complete system verification (e.g. System/Diag - Run All, verify tests show appropriate green check marks, successfully send test message, successfully receive test message, verify volume for text-to-speech).

NOTE

The logs of the OS installation will be stored in a folder on the unit. In the event of a problem, this log file can be viewed at C:\OsUpdate\Osupdate.txt.

Accessory Cable. See Primary Accessory Cable and Secondary Accessory Cable.

Black Box. See Mobile Application Server 110.

Calibration. Calibration is performed when the MCP110 cannot use the J1708/1587 data link for Performance Monitoring input. After sensor calibrations have been determined, the dispatch computer operator needs to send the calibration numbers to the MCP110. See RPM Calibration and Speed/Distance Calibration.

Comm Screen. This screen shows the signal strength being received by the satellite (if using the optional SDM), and the terrestrial and WiFi modems. To get to the Comm screen, touch the System button, then press the Comm tab.

Display Cable. The display cable connects the display interface unit 110 (DIU110) to the mobile application server 110 (MAS110).

Display Interface Unit 110 (DIU110). The standard display unit for the MCP110. It consists color TFT LCD display.

DIU110. See Display Interface Unit 110.

Global Positioning System (GPS). Provides current vehicle positioning with latitude and longitude updates displayed on the MCP110.

GPS. See Global Positioning System.

GPS Screen. This display unit screen shows the status of the MCP110 satellite positioning. To get to the GPS screen, touch the System button, then press the GPS tab.

Holster. The container that holds the DIU110 when it is not in use.

Input Screen. MCP110 screen that displays information you will need to check the performance monitoring data items. To get to the Input screen, touch the Performance Monitoring button, then press the Input tab.

Installation Planning Worksheet. A worksheet on which you can plan your installations.

J1708/1587 Network. The MCP110 is able to monitor critical vehicle data from this low speed, bi-directional data bus. The data posted to this bus are provided by a single electronic control unit (ECU). See J1939 Network and Traditional Sensors Network.

J1708 Enabled. "J1708 enabled" means that the MCP110 has been set up to look at J1708 data via the J1708/1587 data link. The dispatch computer operator must send a message to the MCP110 that "tells" it to understand input from the J1708/1587 bus and define driving thresholds.

J1939 Network. The MCP110 is able to monitor critical vehicle data from this high speed data bus. The data posted to this bus are provided by multiple electronic control units (ECUs). SAE J1939 message protocol and controller area network (CAN) bus represent the prevalent on-vehicle networking for most construction equipment manufacturers. See J1708/1587 Network and Traditional Sensors Network.

J1939 Enabled. "J1939 enabled" means that the MCP110 has been set up to look at J1939 data via the J1939 data link. The dispatch computer operator must send a message to the MCP110 that "tells" it to understand input from the J1939 bus and define driving thresholds.

MAS110. See Mobile Application Server 110.

Material Control Number (MCN). The Omnitracs part number.

MCN. See Material Control Number.

MCP110. See Mobile Computing Platform 110.

MCP110 Serial Number (Unit Address). Located on the connector plate of the mobile application server 110 (MAS110). The MCP110 System screen also has this information.

Memory Stick. A small card that allows the driver to upgrade the MCP110 over-the-air and load applications. It fits into any of the three USB ports on the mobile application server and a slot on the side of the display interface unit.

Mobile Application Server 110 (MAS110). The mobile application server contains the operating circuitry and memory for the MCP110 system. The unit does not require operator access. The MAS110 is commonly referred to as the black box.

Mobile Computing Platform 110 (MCP110). A two-way, mobile information system that allows dispatchers and drivers to send and receive text notifications, and also provides vehicle location and performance data. The MCP110 is mounted in the vehicle and consists of the following components:

- Mobile application server 110 (MAS110)
- Display interface unit 110 (DIU110) and its holster
- Wireless interface box 110 (WIB110)
- Cables

Network Management Computer (NMC). Computer at the Network Management Facility that receives and handles the information traffic between the dispatch center and the fleet.

Network Operations Center (NOC). This facility is responsible for processing and managing the information traffic between the dispatch center and the fleet. Within the NOC is the Network Management Computer (NMC), which actually receives and handles the information

traffic. In the continental United States, the NOC is located at Omnitracs, LLC in Las Vegas, NV.

NMC. See Network Management Computer.

NOC. See Network Operations Center.

NO SIGNAL Light. An indicator light on the display that comes on if the MCP110 has lost contact with the data satellite and is searching for the satellite signal.

Odometer Screen. The MCP110 display unit screen that displays the life-to-date (LTD) value and sensor calibration information. To get to the Odometer screen, touch the Performance Monitoring button, then press the Odometer tab.

Omnitracs Customer Support. Call 24-hour Customer Support for information and additional help at any time, including holidays. In the United States, call 800-541-7490; in Canada, call 800-863-9191.

Omnitracs Dispatch Software (QTRACS system). The software on the trucking company's dispatcher computer. This is the dispatcher's interface with the MCP110. It allows the dispatcher to send and receive information, request MCP110 location information, and perform other dispatcher functions. The dispatch computer communicates with the NMC via a modem over a commercial or leased telephone line.

Optional Accessories. Any of these may be installed for the MCP110:

- Panic button
- Printer (product of O'Neil Product Development, Inc.)
- Scanner (product of BCS Solutions)
- Vehicle information systems (Performance Monitoring system and Trailer Management system)

Panic Button. Allows the driver to notify the Omnitracs Network Management Computer and the company dispatcher when an emergency situation exists.

Parameters Screen. The screen that displays information you will need to verify the speed and RPM calibrations. To get to the Parameters screen, touch the Performance Monitoring button, then press the Parameters tab.

Performance Monitoring System. An accessory of the MCP110 that allows companies to collect vehicle trip and performance data.

Positioning System. See Global Positioning System.

Power Cable. Connects the vehicle 12/24 volt power source and system ground to the mobile application server 110.

Primary Accessory Cable. Connects the MCP110 to the J1708/1587 data link and the J1939 data link, as well as other vehicle inputs and optional system devices. This cable provides the necessary wiring for **all** optional system features such as display screen

disabling, Performance Monitoring system, Trailer Management system, panic button, TTS, Printer, Scanner, Axle, RPM, and PTOP/PTOC. See Appendix A for details on pinouts.

Printer. Provides the driver with a hard copy of the MCP110 forward or return message screen display.

Received Signal Strength Indication (RSSI). The strength of the wireless network signal being received by the antenna during forward link acquisition to the wireless network provider. The RSSI should be less than 105.

Repeater Cable. Connects the J1939 to the primary accessory cable.

Return Material Authorization (RMA). An order used to authorize, schedule, and track the return, repair or replacement, and shipment of equipment.

RL C/No Value. Measures the energy from the mobile application server 110 (MAS110) to the satellite.

RPM Calibration. Used to determine the engine RPM when RPM data comes from the RPM sensor instead of the J1708/1587 data link.

RSSI. See Received Signal Strength Indication.

Scanner. Provides drivers a way to send documents to their home office for back office processing without having to leave their truck.

Secondary Accessory Cable. Connects the MCP110 to the J1708/1587 data link, as well as other vehicle inputs and optional system devices. This cable provides the necessary wiring for optional system features such as display screen disabling, Performance Monitoring system, Trailer Management system, panic button, TTS, Printer, and Scanner. It does not support J1939 wiring. See Appendix A for details on pinouts.

Software Version. See MCP110 Comm Screen.

Speed/Distance Calibration. Used to determine the road speed and/or distance when the speed or distance data comes from the speed sensor instead of the J1708/1587 data link.

System Screen. The System screen displays MCP110 unit information. To get to the System screen, touch the System button, then press the System tab.

System Verification. A functional system check that should be performed after installation and periodically to verify that the MCP110 is operating properly.

Text-to-Speech (TTS). A feature of the MCP110 that converts text notifications or alerts to spoken words which are then played through an audio speaker.

Total Distance. The accumulated distance traveled by a vehicle during its operation. The MCP110 collects distance data in one of three ways:

- Modern electronic truck engines provide distance data via the engine controller module (ECM).
- In some older electronic engines, total distance is not available through the ECM and the MCP110 uses input from the speed sensor and the available J1708/1587 data to calculate distance.
- In non-electronic trucks, the speed sensor provides both speed and distance data.

Traditional Sensors Network. The MCP110 monitors speed directly via the speed transducer on the transmission and RPM via the transmission fly wheel. *See* J1708/1587 Network and J1939 Network.

Traditional Sensors Enabled. "Traditional sensors enabled" means that the MCP110 has been set up to look at traditional sensors via the traditional sensors data link. The dispatch computer operator must send a message to the MCP110 that "tells" it to understand input from the traditional sensors and define speed and RPM.

Trailer Management System. An optional MCP110 feature that allows dispatch to monitor trailer connects and disconnects. The Trailer Management system can also monitor the refrigeration unit of the trailer.

Trailer Tracks System. See Trailer Management System.

TTS. See Text-to-Speech.

Unit Address. See MCP110 Serial Number (Unit Address).

Vehicle Information Systems (VIS). See Performance Monitoring system and Trailer Management system.

WIB110. See Wireless Interface Box 110.

WIB110 Cable. The WIB110 cable connects the WIB110 to the mobile application server 110.

Wireless Interface Box 110 (WIB110). Communicates with the PCS receiver for data transmission and the GPS receiver for positioning information.