webtech wireless®

WT5100 Series Locator

Installation Guide

Version: 3.1, September 2013

Contents

Introducing the WT5100 Series Locators

The WT5100 series, consisting of the WT5100, WT5110, and WT5130 Locators, are fully-featured Locators that expand considerably on the capabilities of the 5000 Series.

TheWT5100 and WT5110 both contain GPRS modems but differ in their antenna arrangements: the WT5110 Locator has external GPS and GSM antennas, whereas the 5100 has internal antennas. The WT5130 has external antennas like the 5110, but contains an HSDPA modem, enabling it to connect to 3G networks.

Features

The WT5100 Series Locators include all the functionality of a WT5000 Series Locator, most of the WT6000 Series Locator functionality, plus new features. Highlights include:

- Higher GPS sensitivity for covert installs and new applications
- External serial port for traditional peripheral and vehicle applications
- Telemetry inputs/outputs for traditional telemetry applications
- Integrated CANBus J1979 and J1939 for light-duty and heavy-duty vehicles
- Status LED
- Audio buzzer
- Memory expansion for extended Geofences, trip recorder, and other features
- Integrated accelerometer

Locator	GPS and GSM antennas	Network (Modem type)
WT5100	internal	2G (GPRS)
WT5110	external	2G (GPRS)
WT5130	external	3G (HSDPA)

Table 1-1 Locator antenna and network summary

Safety Precautions and Wiring Guidelines

Personal Safety Precautions

- Do not install or operate a Locator in areas where explosive atmospheres may be present.
- Do not install a Locator in any vehicle that is powered by liquefied petroleum gas or governed by petrochemical regulations without additional operational safety precautions being taken.
- Do not install a Locator near life support or other sensitive equipment that may be affected by radio transmissions. If required, consult the equipment manufacturer for guidance.
- During car and truck installations, we recommend that you block vehicle tires to prevent roll-back during installation.
- Consult vehicle manufacturer guidelines regarding disconnecting the vehicle battery or when making supplementary electrical connections.
- Remove or cover any jewellery when working on live electrical systems.

Electrical Wiring Guidelines

Read these guidelines before installing the Locator.

General Guidelines

- Before disconnecting a battery, understand the consequences to that vehicle, e.g. which radio codes need to be available. Also, make sure that you know the reset procedure for airbag systems, ECUs, etc.
- Don't test electrical circuits using a test lamp. Instead, use a high impedance multi-meter with both voltage and resistance ranges.
- Don't tamper with or disconnect the air bag or SRS electrical harness.

Use appropriate pick-up points for power wiring

Don't splice into individual lines going to other electrical devices that exhibit substantial momentary voltage drops. Wires going to heating mirrors or to a vehicle's charging indicator are especially susceptible to this.

If possible, wire to a power bar or suitable common terminal connection point.

+12V wire (red)

- Connect to a continuous +12 V DC supply.
- Make sure that there is uninterrupted power to the Locator when the engine is being started (i.e., make sure that the supply voltage does not fall below 9 V DC). Use a multi-meter to confirm +12 V DC power. Do not use a test lamp.
- Take from the secondary side of the main distribution fuse of the vehicle battery. Do not share a fused supply to any other equipment.
- Fuse the line at source to provide protection against shorting of the wiring harness. Note that the Locator is internally protected.

Ground wire (black)

- Always connect directly to a dedicated ground point within the vehicle's electrical system.
- Use a unique ground point.
- When required, create a suitable ground point where no corrosion occurs. A duplicate connection with other systems could cause a build up in contact resistance. Also, note that supply voltage problems can occur, resulting in erratic Locator operation.
- Avoid earth points that also serve engine management ECU, ABS, or air bag systems, etc.

Ignition wire (yellow)

It is critical that the ignition wire is connected to the vehicle ignition wire and not connected to the battery

To prevent incorrect operation, make sure that power is not interrupted for more than 5 seconds when the engine is started (supply voltage under 9Vdc).

- Connection to an ignition signal which goes positive +12 V DC when the key is in the **run** position and is removed or goes to ground when the key is in the **off** position.

Make solid connections

Soldering

Soldering is the preferred method for all electrical connections. When soldering, ensure your connections are well soldered, not dry soldered.

Ring Connectors

Ring connectors are ONLY acceptable for a ground point and when connecting to power bars with screws. No other crimp connectors are acceptable.

- Wire should be fully inserted into the connector with insulation intact. Don't leave bare wire exposed.
- If wires are combined, make sure that the connector can handle the resulting gauge.
- Be sure to crimp the connectors properly using the correctly sized crimp tool. Confirm that the physical connection is solid.
- Solder the wire to the crimped connection.
- Use toothed washers when bolting connectors to the vehicle. Make sure that the ground connection is solid and reliable.

Don't use Quick Taps

Vehicle vibrations eventually separate quick-tapped wires from the Locator, causing a lost connection to the unit. Quick taps also cut into the connected wire, reducing the life of the wire and reducing both its voltage and current-handling capabilities.

Insulate connections

Don't leave cut wires exposed. All connections must be properly insulated.

- Check for accidentally cut wires. These can damage vehicle wiring or devices; they can also cause a fire.
- Tape or heat-shrink all wire cuts so there is no risk of shorting or corrosion. If you use tape, secure the tape using a tie wrap so that it cannot come unwrapped.
- If a splice is necessary, strip-away a small portion of the insulation, solder the wires, and reinsulate them using electrical tape.
- Don't leave free connector contacts or pins exposed. Tape or properly terminate all connectors.

Route cables properly

- Never put cabling where it can be stepped on (e.g., under rugs).
- Never wire areas that retain moisture. For example, insulation under a carpet holds water, which means that it can become damp. This makes wiring connections highly susceptible to corrosion.
- Never put cable where either a passenger's or a driver's feet could rest on top of the wires.
- Never run the GPS antenna cable through the vehicle's door to its roof. The vehicle door will eventually sever the cable.
- Wherever possible secure the wiring in the wiring channel that is provided by the vehicle manufacturer. Use split looms and grommets where appropriate.
- Tie wrap and tape cables (or cable tie mounts) to keep secure.

Installing the WT5100

The following describes the equipment that comes with the WT5100 and provides step-by-step installation instructions.

This procedure is for installing the Locator in 12V vehicle systems. To install the Locator in a 24V system, you must first install a WT0120 converter as detailed in " Adapting the Procedure for 24V Installations" on page 5-17.

WT5100 Kit Contents

The WT5100 Locator kit contains:

- The WT5100 Locator
- The WT5100 cable.

Figure 3-1 (1) WT5100 Locator (2) WT5100 Cable

Depending on what options you purchase when you order your Locator, the Locator may include an internal battery. If purchased, the battery will already be installed within the Locator, but a battery tab on the right side of the Locator indicates its presence.

SIM Card

By default, Locators are provided with a SIM card already installed. However, you may purchase Locators without SIM cards. In this case, you must insert the SIM card into the Locator before installation.

Step-by-step Installation

Please read the Safety Precautions and General Guidelines on page 2-2 before installing the WT5110.

For all installations, the last step is applying power to the Locator. Make sure that all cabling has been completed before installing the Locator's fuses.

Step 1. Insert SIM card into Locator (if needed)

If your Locator was purchased without a SIM card, insert one now. See the instructions in "Installing the SIM card" on page D-34.

Step 2. Plug 20-PIN Micro-Fit cable connector into Locator.

- Connect the cable male 20-pin Micro-Fit connector to the Locator female 20-pin Micro-Fit port. This cable provides all leads and ports required when installing the Locator and for connecting accessories to the Locator.

Step 3. Identify best place to mount Locator inside the vehicle

Determining where to mount the WT5100 Locator requires careful consideration as the internal GPS antenna must be correctly oriented in order to receive signals.

The internal GPS antenna is located on the "top" of the board inside the Locator, and must face upwards. This means that when mounting the Locator, the Webtech Wireless logo must face the sky. Ensure the Locator

lays as flat as possible.

The antenna's "field of view" should be at least 120 degrees, and unobstructed. When determining the antenna's field of view, note that the GPS antenna can receive transmission through glass, fiberglass, and plastics, but not metal. Metallic paint and films may also block the signal, such as a front windscreen with metal heating film.

Some good locations for mounting the WT5100 are:

- On top of the dashboard
- Inside the dashboard (which is usually transparent to GPS signals)

Step 4. Mount Locator in vehicle

If you are installing a Locator that will be using the Accelerometer option, please see "Installing a Locator with the Accelerometer Option" on page A-25 for further information.

The Locator may be fixed in place using any method you care to use, but note that it must be mounted securely. The recommended method is to secure the Locator using screws.

- Situate the Locator so that the risk of physically damaging it is minimized.
- If you're using screws, mount the Locator on the mounting bracket and secure the Locator to the bracket with the tie wraps provided. This ensures that the Locator can not be knocked off the bracket.

Don't do any drilling unless you know exactly what you are drilling into. For example, find out if there are any wires in the area that you are going to drill into.

- If you're using Velcro, make sure that the mounting surface is clean. Velcro installations must not be used for installation requiring the accelerometer.
- You may mount the Locator directly to the vehicle using tie wraps. If you use this method, be sure that you mount the Locator securely, preferably to the vehicle frame or something similarly solid. Note that the bottom half of the Locator shell has slots specifically for threading tie warps.
- In non-covert installations, allow access to the Locator's connectors and try to place the Locator so that the LED is visible

Step 5. Wire Locator to vehicle

1. Connect the Locator power. Splice, solder, and insulate the Locator **+12V** wire (red) to:
   - the **+12V** vehicle wire for 12V vehicle installations.
   - the WT0120 **12V OUT power** wire (red/ white) for 24V vehicle installations.

   Make sure that the positive voltage is between 9 and 16 Volts.
2. Splice, solder, and insulate the **ground** wire (black) to the **vehicle ground**.
   - the **vehicle ground** for 12V vehicle installations.
   - the WT0120 **12V OUT ground** wire (black) for 24V vehicle installations.
3. Splice, solder, and insulate the **ignition** wire (yellow) to the **vehicle ignition**.

Make sure that the ignition wire is connected to the vehicle true ignition wire. Use a multimeter to test the vehicle ignition; a true ignition wire reads 12V throughout the crank, but 0V while the ignition is off. Check that the ignition wire voltage remains constant regardless whether the vehicle is in gear or not.

Step 6. Complete optional connections and installations

1. For telemetry connections, see "Connecting Telemetry Wiring" on page 7-22.
2. For CANBUS installations, see "Installing CANBUS J1979 and J1939" on page B-27.

Note For additional hardware accessory installations, refer to the particular device's installation guide (e.g., WT1900 Satellite Modem or Starter Disable).

Step 7. Activate Locator by installing fuses

Installing the fuses enables the Locator to power up.

Step 8. Remove battery tab (if present)

If the Locator features an internal battery, a red battery tab will be sticking out the side of the housing. Pull and remove this tab now to enable the battery.

Step 9. Visually confirm Locator operation with LED

The Locator has two LED indicators on it: one on the front, the other on the back. Both allow you to confirm the Locator's operation.

1. Move the vehicle to a location where a GPS fix can be obtained with an unobstructed view to the sky.
2. Turn the ignition ON.
3. Wait a few minutes, then check to see if the LED on the Locator is solid green. If it is, this confirms that the Locator is operating correctly and has a GPS fix.
4. If the LED is not solid green or you cannot see one of the two LEDs, contact Technical Support to help troubleshoot the installation.
   - For a complete listing of Locator LED definitions, see "Summary of Locator LED Definitions" on page 6-19.

Step 10. Perform Installation Test

This examines Locator records to make sure that it is properly sensing and transmitting data. There are two ways to perform it:

1. **Use the Installation Test Tool** if you have access to it to confirm that the Locator has been installed and configured correctly.
   - The Test Tool is part of the Quadrant Portal, so you must have access to the internet in order to use it.
   - For further instructions on how to use this tool, see the **Installation Test Tool User Guide**, which is available through the Quadrant Portal Customer Support Center.
2. **Call Technical Support** and have them walk you through the test procedure. For contact information, see page F-40. Provide the following information to Technical Support
   - Locator serial number
   - Unique vehicle identifier (e.g. vehicle name)
   - Telemetry information about the activated inputs and outputs (where applicable).

Step 11. Close up panels and clean up installation area

1. After the installation check, close up and replace all the vehicle panels removed during installation.
2. Clean up the installation area and throw out any garbage.
3. Give any installation manuals or other paperwork included with the product to the customer.

Installing the WT5110 / WT5130

The following describes the equipment that comes with the WT5110 / WT5130 and provides step-by-step installation instructions.

This procedure is for installing the Locator in 12V vehicle systems. To install the Locator in a 24V system, you must first install a WT0120 converter as detailed in " Adapting the Procedure for 24V Installations" on page 5-17.

Identifying WT5110 vs. WT5130 Locators

The WT5110 and WT5130 Locators share identical plastic shells, ports, and antennas. The only visible difference is the sticker on the bottom of the Locator; the model number is printed on the sticker.

WT5110 / WT5130 Kit Contents

The WT5110 / WT5130 Locator kit contains:

- The WT5110 or WT5130 Locator
- A GSM stubby antenna
- A GPS antenna and cable
- The WT5110 / WT5130 cable.

Figure 4-2 (1) WT5110 / WT5130 Locator (2) GSM stubby antenna (3) WT5110 / WT5130 Cable (4) GPS antenna and cable.

Internal Battery

Depending on what options you purchase when you order your Locator, the Locator may include an internal battery. If purchased, the battery will already be installed within the Locator, but a battery tab on the right side of the Locator indicates its presence.

SIM Card

By default, Locators are provided with a SIM card already installed. However, you may purchase Locators without SIM cards. In this case, you must insert the SIM card into the Locator before installation.

Step-by-step Installation

Please read the Safety Precautions and General Guidelines on page 2-2 before installing the WT5110.

For all installations, the last step is applying power to the Locator. Make sure that all cabling has been completed before installing the Locator's fuses.

Step 1. Insert SIM card into Locator (if needed)

If your Locator was purchased without a SIM card, insert one now. See the instructions in "Installing the SIM card" on page D-34.

Step 2. Screw GSM antenna into connector on side of Locator

- Make sure that the stubby antenna is vertical and, if possible, is perpendicular to the locator. Also, make sure that it is securely connected to the Locator.
- Don't mount it near any radio frequency (RF) equipment or in-vehicle speakers.
- To tighten it: finger tighten until snug, then use a 1/4" open end wrench to give it another 1/8 turn. If you are using a torque wrench, set the wrench to 6 inch-pounds.

Step 3. Plug 20-PIN Micro-Fit cable connector into Locator.

- Connect the cable male 20-pin Micro-Fit connector to the Locator female 20-pin Micro-Fit port. This cable provides all leads and ports required when installing the Locator and for connecting accessories to the Locator.

Step 4. Mount external GPS antenna

1. Determine the best external location for the GPS antenna.
   - The GPS antenna must face upwards to the sky.
   - The field of view should be at least 120 degrees. When determining the antenna's field of view, note that the GPS antenna can receive transmission through glass, fiberglass, and plastics, but not metal. Metallic paint and films may also block the signal, such as a front windscreen with metal heating film.
   - Both the antenna and antenna cable are weatherproof, so the GPS antenna may be mounted on the exterior of the vehicle. Mounting the antenna on the top of the cab is one of the best ways to ensure a clear sky view.

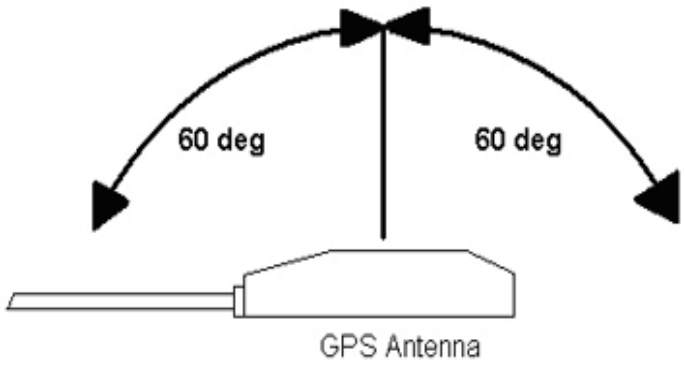


Figure 4-3 Minimum field of view for a GPS antenna

2. Secure the antenna to the chosen mounting area with an adhesive, (such as silicone), or consider using a through-hole mount antenna.
3. Secure antenna cables to the Locator using cable ties and mounts where applicable.

Step 5. Identify best place to mount Locator inside the vehicle

For the most part, you may install the Locator in any place where it is likely to be secure, dry, and out of harm's way. The only major concern is the stubby GSM antenna on the side of the Locator; in order for the GSM antenna to transmit efficiently it should be oriented vertically (pointing upwards or downwards). The GSM transmissions are much stronger than GPS transmissions, so it is not essential that the GSM antenna has a "sky view".

Some good locations for mounting the Locator are:

- Under or behind the dashboard
- Under or behind the steering column
- Under a parcel shelf.

Note that while the GSM antenna may be mounted on the side of the Locator, the GPS antenna's location is not restricted by the Locator's position. Take advantage of the GPS antenna's cable; that's what it's there for.

Step 6. Mount Locator in vehicle

If you are installing a Locator that will be using the Accelerometer option, please see "Installing a Locator with the Accelerometer Option" on page A-25 for further information.

The Locator may be fixed in place using any method you care to use, but note that it must be mounted securely. The recommended method is to secure the Locator using screws.

- Situate the Locator so that the risk of physically damaging it is minimized (e.g., put it under or behind the dashboard).
- If you're using screws, mount the Locator on the mounting bracket and secure the Locator to the bracket with the tie wraps provided. This ensures that the Locator can not be knocked off the bracket.

Don't do any drilling unless you know exactly what you are drilling into. For example, find out if there are any wires in the area that you are going to drill into.

- If you're using Velcro, make sure that the mounting surface is clean. Velcro installations must not be used for installation requiring the accelerometer.
- You may mount the Locator directly to the vehicle using tie wraps. If you use this method, be sure that you mount the Locator securely, preferably to the vehicle frame or something similarly solid. Note that the bottom half of the Locator shell has slots specifically for threading tie warps.
- In non-covert installations, allow access to the Locator's connectors and try to place the Locator so that the LED is visible.

Step 7. Wire Locator to vehicle

1. Connect the Locator power. Splice, solder, and insulate the Locator **+12V** wire (red) to:
   - the **+12V** vehicle wire for 12V vehicle installations.
   - the WT0120 **12V OUT power** wire (red/ white) for 24V vehicle installations.

   Make sure that the positive voltage is between 9 and 16 Volts.
2. Splice, solder, and insulate the **ground** wire (black) to the **vehicle ground**.
   - the **vehicle ground** for 12V vehicle installations.
   - the WT0120 **12V OUT ground** wire (black) for 24V vehicle installations.
3. Splice, solder, and insulate the **ignition** wire (yellow) to the **vehicle ignition**.

Make sure that the ignition wire is connected to the vehicle true ignition wire. Use a multimeter to test the vehicle ignition; a true ignition wire reads 12V throughout the crank, but 0V while the ignition is off. Check that the ignition wire voltage remains constant regardless whether the vehicle is in gear or not.

- Connect the GPS antenna cable to the Locator. Finger tighten until snug, then use a 3/16" open end wrench to give it another 1/8 turn. If you are using a torque wrench, set the wrench to 3 inch-pounds.

Step 8. Complete optional connections and installations

1. For telemetry connections, see "Connecting Telemetry Wiring" on page 7-22.
2. For CANBUS installations, see "Installing CANBUS J1979 and J1939" on page B-27.

Note For additional hardware accessory installations, refer to the particular device's installation guide (e.g., WT1900 Satellite Modem or Starter Disable).

Step 9. Activate Locator by installing fuses

Installing the fuses enables the Locator to power up.

Step 10. Remove battery tab (if present)

If the Locator features an internal battery, a red battery tab will be sticking out the side of the housing. Pull and remove this tab now to enable the battery.

Step 11. Visually confirm Locator operation with LED

The Locator has two LED indicators on it: one on the front, the other on the back. Both allow you to confirm the Locator's operation.

1. Move the vehicle to a location where a GPS fix can be obtained with an unobstructed view to the sky.
2. Turn the ignition ON.
3. Wait a few minutes, then check to see if the LED on the Locator is solid green. If it is, this confirms that the Locator is operating correctly and has a GPS fix.
4. If the LED is not solid green or you cannot see one of the two LEDs, contact Technical Support to help troubleshoot the installation.
   - For a complete listing of Locator LED definitions, see "Summary of Locator LED Definitions" on page 6-19.

Step 12. Perform Installation Test

This examines Locator records to make sure that it is properly sensing and transmitting data. There are two ways to perform it:

1. **Use the Installation Test Tool** if you have access to it to confirm that the Locator has been installed and configured correctly.
   - The Test Tool is part of the Quadrant Portal, so you must have access to the internet in order to use it.
   - For further instructions on how to use this tool, see the **Installation Test Tool User Guide**, which is available through the Quadrant Portal Customer Support Center.
2. **Call Technical Support** and have them walk you through the test procedure. For contact information, see page F-40. Provide the following information to Technical Support
   - Locator serial number
   - Unique vehicle identifier (e.g. vehicle name)
   - Telemetry information about the activated inputs and outputs (where applicable).

Step 13. Close up panels and clean up installation area

1. After the installation check, close up and replace all the vehicle panels removed during installation.
2. Clean up the installation area and throw out any garbage.
3. Give any installation manuals or other paperwork included with the product to the customer.

Adapting the Procedure for 24V Installations

In order to install the 5100 or 5110 Locator in a 24V vehicle, the installation procedure must be modified to accommodate a special 24V to 12V converter, the WT0120. This device is only required for 24V installations.

WT0120 Converter Kit Contents

The WT0120 converter kit contains:

- The WT0120 Converter

Installing the WT0120 Converter

In order to install a WT5100 or WT5110 Locator in a 24V vehicle, you must first install the WT0120 converter. Once the converter is installed, you may proceed with the Locator installation process as described in previous sections of the manual.

1. The 5100/5110 Locator will be installed within the vehicle cab somewhere, so the converter must also be located within the cab. Access a vehicle +24V power wire and vehicle ground within the dashboard.
2. Splice, solder, and insulate the WT0120 **24V IN power** wire (red) to the **+24V** vehicle wire.
3. Splice, solder, and insulate the WT0120 **24V IN ground** wire (black) to the **vehicle ground**.
4. Mount the WT0120 to the vehicle.Use the four screw holes on the WT0120 housing to secure the device to the vehicle with self-tapping screws.

   Note that the WT0120 gets hot as part of normal operation. Mount the device where the heat it produces it will not cause nearby plastic to discolour, warp, or smell, and where the driver cannot easily touch it.

Don't do any drilling unless you know exactly what you are drilling into. For example, find out if there are any wires in the area that you are going to drill into.

5. Proceed with the WT5100/5110 Locator installation, described in previous chapters of the manual.

Troubleshooting

If you are having any difficulties, use the following tables to resolve the problem. If the problem persists, contact Webtech Technical Support.

Summary of Locator LED Definitions

LED	Meaning		
Off	The Locator is powered off		
	SIM	GSM	GPS
Solid Green	SIM OK	GSM	GPS Fix
Solid Red	SIM OK	GSM	No GPS Fix
Flashing Red	SIM OK	No GSM	No GPS fix
Flashing Green	SIM OK	No GSM	GPS fix
Flashing Orange and Red	No SIM	n/a	No GPS Fix
Flashing Orange and Green	No SIM	n/a	GPS Fix
One second flutter (red or green depending on GPS fix)	Message sent or received		
Orange flutter at power up	Internal battery installed		

Table 6-2 Summary of Locator LED Definitions

Locator LED Troubleshooting Checkpoints

Based on the Locator's LED status, use the following table to troubleshoot a basic installation.

LED Status	Locator Status and Troubleshooting
LED has a solid GREEN light (i.e., the Locator is working correctly)	**The Locator has both GPS and GSM network coverage.** • If messaging is activated, log on to the Quadrant Location Services Portal on the Webtech Wireless web site (**www.Webtechwireless.com)**. Poll the vehicle (or vehicles) that has the new Locator installed.
LED is flashing GREEN one second off and one second on	**The device has GPS activation but no cell network.** • Make sure that the wireless antenna is properly attached to the device and that the vehicle is in an area with cell network coverage.
LED is flashing RED one second off and one second on	**The Locator has neither a GPS fix nor GSM cell coverage.** • Make sure that the GPS antenna has a clear line of sight to the sky and that the vehicle is in an area that is within a GSM network.
LED has a solid RED light	**The device has cell network activation but no GPS network visibility.** • Ensure that the GPS antenna is properly connected to the device and has a clear view to the sky.
LED is flashing ORANGE and GREEN	**There is a problem with the SIM.** • Ensure the SIM card is correctly in place. Also make sure that the SIM is correctly enabled for the wireless network.
LED is flashing ORANGE and RED	**There is a problem with the SIM and there is no GPS network visibility.** • Make sure that the SIM card is correctly in place. • Check that the SIM is enabled for the wireless network. • Make sure that the GPS antenna is properly connected to the device and has a clear view of the sky
LED flutters ORANGE at power up	**The internal battery is installed.** • If this Locator is battery-powered and the LED does not flutter at start up, then the battery is not properly connected. • Check the battery's connection and power. • In some cases, the battery is not charged when it is shipped. After both the battery and unit are connected to a power source, wait 4-5 minutes until the battery is charged to a level that can light the LED.

Table 6-3 Locator LED troubleshooting checkpoints

Returning the Locator

If you have a non-functional Locator, contact Technical Support. They will guide you through the process of returning it.

1. Secure the back plate in place with at least one screw prior to packaging the Locator for return shipment. Note that this differs from the way the Locator was shipped to you (in two halves).
2. If the Locator has the internal battery option, insulate the battery contacts with electrical tape.
3. Ideally, return the Locator in its original box. If the original box is not available, ensure that whatever packaging you use is robust enough to keep the Locator safe in transit.
4. Technical Support will provide an RMA number, which is critical for returning the Locator. Be sure to print the RMA number prominently on the return packaging. Locators returned without an RMA number cannot be processed as returns.

WT5100 Series Locator Wiring

Connecting Telemetry Wiring

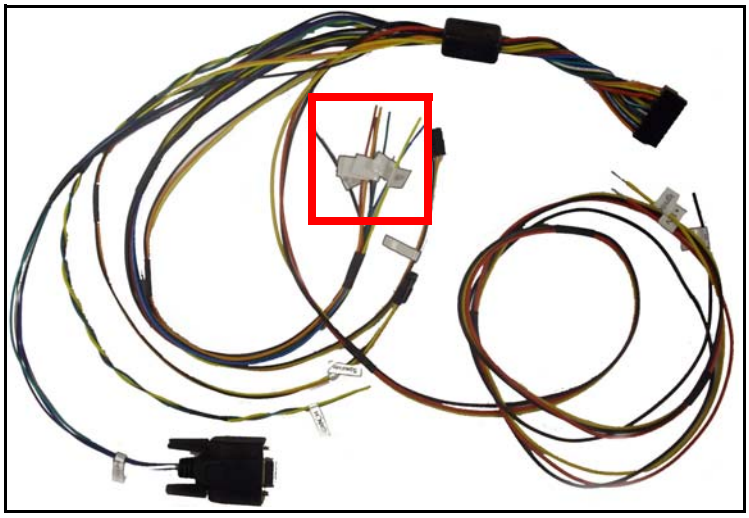
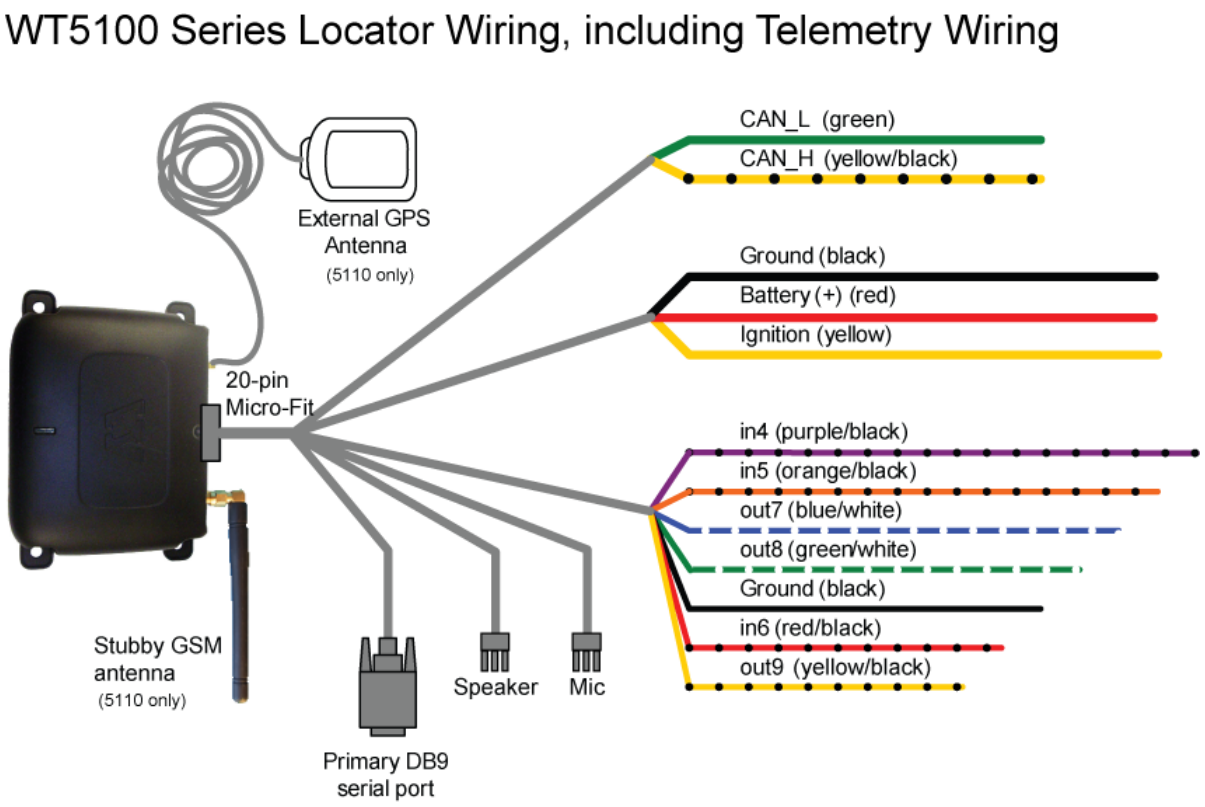


Figure 7-4 Telemetry wires on the Locator cable

1. Use the following table (specifically the Accessory Leads group on the table) to figure out which wire to connect to the vehicle's telemetry inputs/outputs. Note that the wires described below are standard for every Locator cable.
2. During the installation check, Technical Support will set up and enable Quadrant's corresponding telemetry features.
3. The customer's telemetry requirements are detailed on the shipping list that is included with the Locator.

Locator Wiring Diagram and Table



Color	Label	General Description	Usage
Power Leads			
yellow	**Ignition**	**Ignition**	**All Installations**
red	**+12V**	**Power Supply**	**All Installations**
black	**Ground**	**Ground connection for Locator**	**All Installations**
Telemetry Leads			
blue/ white	**out7**	**Ground pulse output (200-milliamps)**	**Telemetry**
green/ white	**out8**	**Ground pulse output (200-milliamps)**	**Telemetry**
yellow / black	**out9**	**Ground pulse output (200-milliamps)**	**Telemetry**

Table 7-4 WT5100 Series Locator wiring

purple / black	**in4** *See note below	**Input detecting ground contact closure (protected up to 30 V)**	**Telemetry**
orange /black	**in5**	**Input detecting ground contact closure (protected up to 30 V)**	**Telemetry**
red/ black	**in6**	**Input detecting ground contact closure (protected up to 30 V)**	**Telemetry**
black	**Ground**	**Additional ground connection**	**Specific accessories**
Serial Port			
DB-9 connector	**Primary Port**	**Primary serial port**	**Specific accessories**
CANBus Leads			
yellow / black	**CAN_H**	**CANBus positive lead**	**CANBus**
green	**CAN_L**	**CANBus negative lead**	**CANBus**
Audio Leads			
3-pin female micro-fit	**Speaker**	**Speaker connection**	**Audio**
3-pin male micro-fit	**Mic**	**Microphone connection**	**Audio**

Table 7-4 WT5100 Series Locator wiring

Important ***in4**: This input is used for the Snooze/Wake telemetry feature. This is when a Locator is required to immediately wake-up and send a notification of an event. Also, the same input is configured to put the Locator back into snooze mode once the notification is completed.

Note that this functionality is used with the Panic Button Kit, door-sensor telemetry, and vehicle-alarm notifications.

Appendix A

Installing a Locator with the Accelerometer Option

The Accelerometer, which is available for the WT5100 Series, is used to monitor driver behavior including excessive acceleration, hard braking, and frequent lane changing.

Installing a Locator with Accelerometer

Important For installations with the accelerometer, it is extremely important that the Locator be securely attached to the vehicle chassis. If it is able to move independently of the vehicle, the accelerometer reading will not be reliable.

- During calibration, the Locator must be at or near room temperature in order to calibrate properly. Store the accelerometer at room temperature before installation, and perform the installation indoors (in a bay) if possible.
- Ideally, mount the Locator to the vehicle using the mounting bracket and screws. Attach the Locator to the mounting bracket, and secure it in place using tie wraps. Then, attach the bracket to the vehicle using a speedi-screw (or self-tapping sheet-metal screw) for each of the 4 Locator mounting holes.
- Alternately, secure the Locator to the vehicle frame using tie wraps, ensuring that it cannot shift in place.

Calibrating the Accelerometer:

The calibration procedure has been greatly simplified since the introduction of the accelerometer such that it occurs largely automatically. However, you must start the process manually, and you must be parked to initialize the process. Before starting:

1. Make sure that the Locator is securely affixed to the vehicle.
2. Park the vehicle on a level surface.
3. Make sure that the Locator has been powered up.
4. Ideally, the Locator should be at or near room temperature.

You may proceed with the calibration either by calling technical support, or by using the Installation Test Tool.

Calibration using Technical Support

Phone Webtech Wireless technical support to perform a standard install check, but make sure to mention that you are installing a Locator with the Accelerometer option. Technical Support will initialize the calibration once the install check is complete, at which point you can use the vehicle.

Calibration using the Installation Test Tool

If you have access to the installation test tool, you may use it to calibrate the accelerometer yourself. See the Installation Test Tool documentation for more information.

If Calibration Fails

Some possible reasons calibration could fail:

- Hard breaking during the calibration may produce vibrations that confuse the accelerometer, particularly if the vehicle has anti-lock breaks. Avoid hard breaking during calibration.
- Calibration may fail if you drive over a rough road, rumble strips, potholes, or speed bump during the process. Ensure that the area where you perform the calibration is level and relatively smooth.
- Excessive vibration during idling or while moving creates “noise” that makes it difficult for the accelerometer to detect real movement. If the vehicle vibrates noticably while the engine is on, this may be the cause of failure. Talk to technical support if you think this is likely the issue.

Appendix B

Installing CANBUS J1979 and J1939

The following sections describe how to install a Locator to interface with a vehicle's CANBUS protocols.

What is CANBUS?

CANBUS J1979 and CANBUS J1939 are vehicle diagnostic communication protocols, a method by which a vehicle can communicate their readings from their internal diagnostic systems. This information is useful in diagnosing engine issues, tracking driving habits, and scheduling preventative maintenance. CANBUS protocols are defined by number; the WT5110 Locator supports J1939, and J1979. Note that vehicles may support multiple protocols as well.

Webtech Locators also support OBDII, a protocol commonly found in smaller (consumer) vehicles. OBDII installation requires additional hardware, and the process is covered elsewhere.

Determining what protocol a vehicle supports

Before installation, you must determine whether the installation is for CANBUS 1979 or CANBUS 1939, as each protocol requires a unique Locator configuration to support

General Guidelines

- CANBUS J1979 is commonly found on North American light vehicles made in 2008 or after, and in select European light vehicles.
- CANBUS J1939 is commonly found on North American heavy trucks made in 2008 or after, and in select European heavy trucks.

Examining the Connector

The best way to determine what protocol a vehicle supports is to look at the connector to the vehicle's diagnostic system.

Light Vehicles

If you are examining a North American light vehicle (i.e., a consumer vehicle, not a tractor), look for a J1962 OBDII connector, located somewhere near the steering column, likely beneath the dashboard.

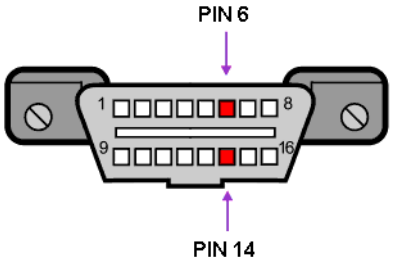


Figure B-5 J1962 OBDII connector

Examine the connector and determine if pins 6 and 14 are populated (that is to say, if the holes contain metal contacts). If pins 6 and 14 are populated, then the vehicle most likely supports CANBUS J1979.

Tractors and Heavy Trucks

If you are examining a North American class 8 tractor, look for a circular Duetsch connector. The connector will be located in the cab, either to the left of the steering column or behind the B-pillar. The connector will have either 6 or 9 pins.

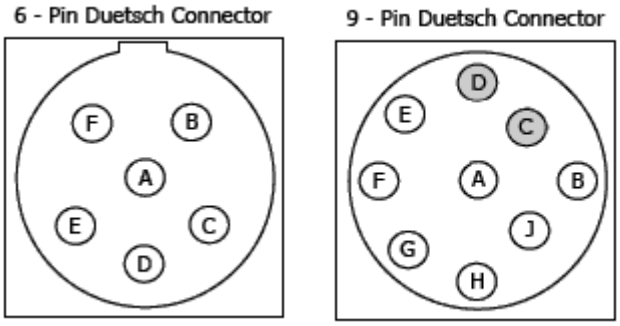


Figure B-6 6 and 9-pin Duetsch connectors

If the vehicle has a 9-pin connector, then the vehicle likely supports CANBUS J1939. To confirm, check which pins are populated (you may have to look at the back of the connector). If pins C and D are populated, CANBUS J1939 is supported.

If the vehicle has a 6-pin connector, then the vehicle supports JBUS J1587 (which is not supported by the WT5110).

Installing CANBUS J1939 and J1979

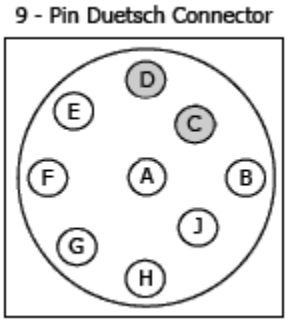
The following describes how to locate the CANBUS data wires necessary for splicing into the existing wires.

Important When installing CANBUS, you must ensure that the vehicle ignition is turned off. Failure to turn off the ignition during installation can damage the hardware.

Installation procedure

1. Locate the 9-pin Duetsch connector or the J1962 OBDII connector and get access to the vehicle wires leading into the connector.
2. Use tables B-5 and B-6 to determine which two vehicle wires must be connected to leads on the Locator cable.
3. Without disconnecting them from the Duetsch connector / J1962 OBDII connector, strip a one half inch section of insulation from each of the two vehicle wires.
4. Strip one half inch of insulation from the ends of the Locator cable's CAN_H and CAN_L leads.
5. Wrap the stripped CAN_H and CAN_L leads around the appropriate vehicle wire (consult tables B-5 and B-6 as needed).
6. Solder the connections, and ensure the result is not a cold solder joint.
7. Wrap with soldered joint with electrical tape, and secure the tape with a tie wrap to ensure the tape remains secure.

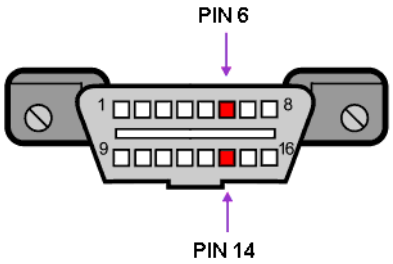
Duetsch 9-pin connector (CANBUS J1939)



Function	Pin	Locator Wire Color	Locator Wire Name
J1939+	C	yellow / black	CAN_H
J1939-(-)	D	green	CAN_L

Table B-5 Duetsch 9-pin connector CANBUS J1939 connections

J1962 OBDII Connector (CANBUS J1979)



Function	Pin	Locator Wire Color	Locator Wire Name
CAN high(+)	6	yellow / black	CAN_H
CAN low(-)	14	green	CAN_L

Table B-6 J1962 OBDII connector CANBUS J1979 connections

Disconnecting CANBUS

When disconnecting a Locator with CANBUS connections from the vehicle:

1. Ensure that the vehicle ignition is turned off.
2. Disconnect the CAN_H and CAN_L leads before disconnecting the Locator power and ground leads.

Appendix C

Installing a Locator with the Garmin Nüvi Option

The Garmin Nüvi personal navigation device is compatible with the WT5100 Series Locators, allowing Webtech Wireless functions to be performed on the Garmin unit. The Garmin Nüvi may be installed simultaneously with the Locator or after the fact.

Not all Garmin Nüvi models are compatible with the 5100 Locator. Webtech Wireless will provide a list of recommended units on request.

Installing the Garmin Nüvi in conjunction with the WT5100 Series Locator requires a custom cable which is not part of the standard accessories provided with the Garmin Nüvi. The custom cable must be ordered from Webtech Wireless.

Note that Webtech Wireless does not sell Garmin units; they must be independently sourced.

Required components

You require the following components:

- Webtech-approved Garmin Nüvi model
- Custom cable lower half
- Custom cable upper half
- Garmin Nüvi mounting bracket and suction cup

Figure C-7 Shown: Garmin Nüvi (1), custom cable lower half (2), custom cable upper half (3). Not shown: mounting bracket and suction cup.

Installation Procedure

Select a location for the Garmin Nüvi

Select a location for the Garmin Nüvi. Ensure that the Nüvi will be easily visible and within reach of the driver. Keep in mind that the custom cable has to be run from the Locator to the back of the Garmin.

Wire the lower half of the custom cable

The lower half of the custom cable is meant to concealed beneath the dashboard, invisible to the driver.

1. Plug the custom cable's lower half DB9 connector into the Locator primary serial port. Secure connection using the connector thumb screws. If there are no thumb screws for whatever reason, secure the connection using a pair of tie wraps in an X pattern around the Locator.
2. Solder the custom cable red wire to the vehicle ignition. Ensure that the soldered connection is well soldered, not dry soldered. Insulate the connection with shrink tubing or electrical tape, and secure the tape with a tie wrap.

Make sure that the red wire is connected to the vehicle true ignition wire. Use a multimeter to test the vehicle ignition; a true ignition wire reads 12V throughout the crank, but 0V while the ignition is off. Check that the ignition wire voltage remains constant regardless whether the vehicle is in gear or not.

3. Connect the custom cable black wire to the vehicle ground using one of the following methods:
    a. Splice the custom cable black wire to the Locator ground wire already connected to the vehicle ground. Ensure that the soldered connection is well soldered, not dry soldered. Insulate the connection with electrical tape or shrink wrap, and secure the tape with a tie wrap.
    b. Add a ring terminal to the end of the custom cable black wire. Secure the ring terminal to the vehicle chassis using an existing bolt, or use a self-tapping screw to secure it to a new location.

Route the upper half of the custom cable

1. Route the upper half of the custom cable through or around the dashboard. The USB connector must reach the theoretical location of the Garmin Nüvi, and the Molex connector reaches the lower half's Molex connector.
2. Join the two halves of the custom cable using the Molex connectors. The join should be under the dash.

Mount Garmin Nüvi and complete connections

1. Finalize the placement of the Garmin Nüvi. Mount the Garmin Nüvi using the mounting bracket and suction cup.
2. Plug the custom cable USB connector into the USB port on the back of the Garmin Nüvi.

3. Secure loose cables using tie wraps.
4. Clean up: remove loose ends of tie wraps, replace dash panels, clean up site.

Appendix D

Installing the SIM card

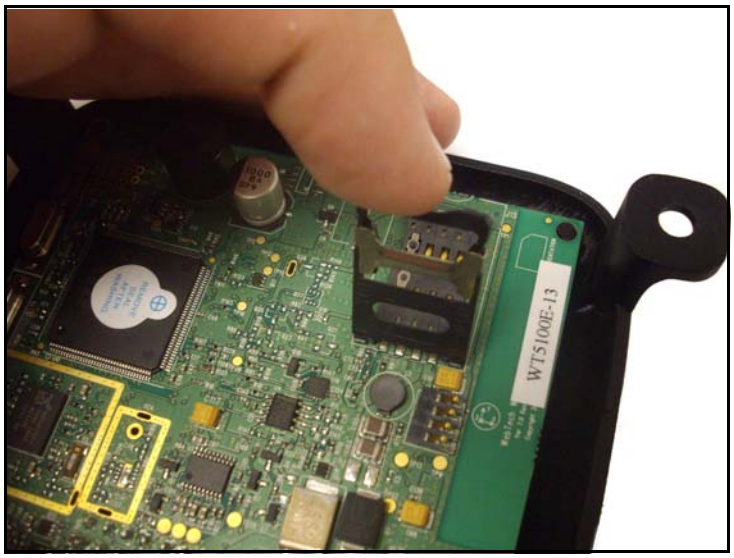
Most installations will not require inserting a SIM card, as by default the Locator comes with a SIM card installed. However, you can purchase the Locator with no SIM card.

Important — The Locator must be remotely configured to use a particular SIM card, so unless you are performing the SIM installation/switch on Technical Support's instruction, be sure to inform them if you are switching out the card. You must provide the new SIM card's ICCID number (20 digits).

Important — Before installing the SIM card, make sure that you are properly grounded, and take care to avoid introducing dirt or other contaminants into the housing.

SIM card installation

1. Turn the Locator over and unscrew the three screws holding the two halves of the Locator shell together. Remove the lower shell.
2. The SIM card holder is located at the top right corner of the circuit board. Unlock the SIM card holder by gently sliding the metal bar in the direction of the arrow that points towards the **Open** position (towards the center of the Locator).
3. Lift the SIM card holder to expose the contacts underneath.



4. Remove the existing SIM card, if one is present.
5. With the contacts face down, slide the SIM card into the holder. The SIM card's bevelled edge should be at the top left; refer to the diagram beside the SIM card holder if there is any confusion.

6. Lock the SIM card holder by gently sliding the metal bar in the direction of the arrow that points towards the **Lock** position. Note that the latch must be fastened all the way down. If the latch doesn't snap into place, the SIM card is not correctly installed.

7. Slide the bottom plate back into the Locator. Make sure that the SIM holder side of the circuit board is facing down.
8. Secure the bottom plate by screwing in the three screws.
9. Connect the Locator to a power source.
10. Use the following table to the confirm the SIM card's operation. Note that at power-up time it takes 20-60 seconds for the Locator to detect the SIM card.

LED	Meaning		
	SIM	GSM	GPS
Solid Green	SIM OK	GSM	GPS Fix
Solid Red	SIM OK	GSM	No GPS Fix
Flashing Red	SIM OK	No GSM	No GPS fix
Flashing Green	SIM OK	No GSM	GPS fix
Flashing Orange and Red	No SIM	n/a	No GPS Fix
Flashing Orange and Green	No SIM	n/a	GPS Fix

Table D-7 Summary of Locator LED Definitions for SIM card install

11. If there are any problems, contact Technical Support and provide the following information:
    - the Locator's serial number
    - the SIM card's ICCID number (20 digits).

Appendix E

Installing the OBDII Gateway

The WT5100 Series Locator optionally comes with the OBDII Gateway, an accessory that enables the Locator to access to the vehicle's OBDII data. This appendix describes how to install the OBDII Gateway.

Gateway models

There are two models of the OBDII Gateway: the newer, smaller Gateway (model number LDVDSV2 - S), and the older, larger Gateway (model number WTWLDVDS - S). As the older Gateway is no longer available, the following procedure covers the newer Gateway.
If you require installation instructions for the older Gateway, please contact Webtech Wireless documentation at: documentation@webtechwireless.com

Locator Firmware Requirements

In order to use the OBDII Gateway, the Locator must have version .45 firmware or better. If your Locator was shipped with an OBDII Gateway, it should have the correct firmware.

OBDII Gateway Kit contents

The OBDII Gateway kit contains the following:

- OBDII Gateway (model number LDVDSV2 - S)
- OBDII Gateway Y-cable
- male to male null-modem adaptor

Required Tools and Materials

To complete this installation, you will need to provide the following materials in addition to the contents of the OBDII Gateway kit:

- wire cutters and stripper
- soldering iron
- solder
- electrical tape or heat shrink
- tie wraps

Installation Procedure

Step 1. Prepare the OBDII Y-Cable and Connect to the Vehicle

Figure E-8 OBDII Y-cable (1) male 16-pin J1962 connector (2) DB15 serial connector (3) female 16-pin J1962 connector (4) Fail-safe wire

1. Locate the vehicle's OBD connector under the dashboard. Every vehicle is different, but it is usually on the driver's side near the steering wheel.
   If you have difficulty locating the OBD connector, go to the National OBD Clearing House website for a database containing descriptions and diagrams to help locate the vehicle's OBD connectors:
   `http://obdclearinghouse.com/oemdb/`
   The search is based on vehicle manufacturer, model and year.
2. Disconnect any accessories or cables currently connected to the OBD connector, if there are any.
3. Unmount the vehicle OBD connector by unscrewing it from its housing.
4. Mount (where applicable) or loosely place the OBDII Y-cable, female 16-pin J1962 connector (#3 in Figure E-8) in place of the vehicle OBDII female connector. This OBDII connector replaces the vehicle OBDII connector to allow other diagnostic tools to have access to the vehicle diagnostic data.

   Whenever possible, hard mount the OBDII Y-cable female connector (#3 in Figure E-8) in the same location and orientation as the original vehicle manufacturer.
   - If the mounting bracket does not fit correctly, it is permissible to drill holes ONLY if the installer can guarantee no damage to the vehicle.
   - Alternatively, loose fit the connector and place several tie-wraps behind the dashboard to ensure the connector does not fall onto the driver's side floor where the driver may step on it or it gets caught on the pedals.
5. Plug the OBDII Y-cable, male 16-pin J1962 connector (#1 in Figure E-8) into the vehicle's original OBDII female 16-pin J1962 connector (the one unscrewed from its housing).

Step 2. Plug the OBDII Y-Cable into the OBDII Gateway

Plug the OBDII Y-cable DB15 serial connector (#2 in Figure E-8) into the OBDII Gateway port labelled **Vehicle** and tighten the screws.

Figure E-9 OBDII Gateway with OBDII Y-Cable attached

Step 3. Plug the WT5110 Primary Port into the OBDII Gateway

1. Attach the orange null-modem adaptor to the **Host** port on the OBDII Gateway. Tighten the screws.
2. Plug the Locator cable primary DB9 serial connector into the other side of the null-modem adaptor. Tighten the screws.

Figure E-10 OBDII Gateway with null-modem adaptor and Locator cable attached

Step 4. Connect Fail-Safe Lead

Connecting the fail-safe lead enables the Locator to turn the OBDII Gateway on and off, allowing the dispatcher to reboot the device in case of an issue.

1. Strip and tin the end of the green OBDII Y cable Fail-safe wire (#4 in Figure E-8).
2. Solder the Fail-safe wire to the Locator cable **out8** (green/white) wire. Ensure that the connection is well soldered, not dry soldered.
3. Insulate the connection with heat shrink or electrical tape. If you use electrical tape, wrap the tape with a tie wrap to keep it in place.

Step 5. Reconnect any other OBDII Cables / Accessories

1. If you disconnected any cables or accessories from the vehicle OBD connector at the beginning of the installation, use the OBDII Y-cable male 16-pin J1962 connector (#1 in Figure E-8) to

reconnect them. This connection is effectively the same as connecting directly to the vehicle OBD connector.

2. Secure the connection as required.

Step 6. Complete Locator and OBDII Gateway installation

Important Continue Locator installation, ensuring that the OBDII Gateway box, Locator and all wiring is neatly placed under the dash out of the way of the driver. Tie wrap the OBDII Y-cable to ensure it does not fall into footwell.

Figure E-11 Example of an OBD connector (female 16-pin J1962) in the access panel after Locator and OBD installation

Appendix F
Contact Information

If you have any questions, please contact Webtech Wireless Technical Support at:

North America and international

All subscribers have access to support Monday to Friday from 06:00 to 17:00 and Saturday 08:00 to 16:30 Pacific Time (UTC -8 and UTC Daylight Saving -7).

Email: support@Webtechwireless.com

Phone: 1-866-945-4568 or 604-419-8163

Europe

European Technical Support personnel are available Monday to Friday, 09:00 to 17:00 Coordinated Universal Time (UTC or Greenwich Mean Time + 00:00 hour).

Email: supporteur@Webtechwireless.com

Phone:

- In the UK: 0118 925 4966
- Rest of world: +44 118 935 4966