webtech wireless®

WT7000 Locator Series

Installation Guide

WT7000 Series Locators use FreeRTOS. Source for this component is available on request.

Updated versions of this manual are available on the customer portal at www.webtechwireless.com.

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Contents

Section 1

Introducing the WT7000 Locator Series

Features

The WT7000 Locator Series contains three models: the WT7000E, WT7000H, and WT7000H+.

General Features for all models

The WT7000 Locator include all the functionality of the WT5000 Locator Series, most of the WT6000 Locator Series 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
- Dedicated processor to support new features
- Two LEDs
- Integrated 1-wire interface for peripheral connectivity
- Integrated EDGE modem for increased communications speed
- Memory expansion for extended Geofences, trip recorder, and other features
- External GPS and GSM antenna
- J1587/J1708 (JBus) support

The WT7000E

The WT7000E contains a GPRS modem, and is designed to operate on 2.5G networks.

The WT7000H

The WT7000H contains a HSDPA modem, and is designed to operate on 3G networks (although it can also operate on 2.5G networks).

The WT7000H+

Like the WT7000H, the WT7000H+ contains a HSDPA modem, and is designed to operate on both 2.5G and 3G networks. However, unlike the WT7000H, the 7000H+ is approved for AT&T networks. If your fleet uses a 3G network and is in the United States, you will likely need the WT7000H+.

Board Layouts

In addition to the model number, the WT7000 is available with two different board layouts: 6.2 and 6.3. The primary difference between these two boards is that the 6.3 board includes a 2.5mm audio jack and can be used in installations requiring voice audio (calling) features.

The WT7000E and WT7000H are available with both 6.2 and 6.3 boards. The WT7000H+ is only available with a 6.3 board.

Note that when ordering the WT7000, you do not need to specify which board layout you need; your account manager should assess your requirements and send you the appropriate Locators with the correct board layout.

Section 2

Installing the WT7000

The following describes the equipment that comes with a WT7000 Series Locator and provides step-by-step installation instructions. The WT7000E, WT7000H, and WT7000H+ Locators are provided with the same equipment and install in the same way.

Tools and Materials

Kit Contents

The WT7000 Series Locator is shipped with:

- A mounting bracket
- A GSM stubby antenna
- A GPS antenna and cable
- A cable with DB15(HD) connector including telemetry and JBUS / CanBus wiring options.
- Internal battery (optional)

Figure 2-1 (1) WT7000 Series Locator with mounting bracket (2) GSM stubby antenna (3) DB15 cable (4) GPS antenna and cable (5) optional internal battery.

Distinguishing the WT7000E, WT7000H, and WT7000H+

Before installing the Locator, be sure that you have the correct Locator model. Both the WT7000E, WT7000H, and WT7000H+ look very similar, but a sticker on the side of the Locator distinguishes the two models.

Find the black and white sticker on the left side of the Locator, beside the GSM (stubby) antenna connector. The sticker will state whether the Locator is a WT7000E,WT7000H, or WT7000H+.

Required Tools and Materials

You will require the following tools and materials to install the Locator:

- Wire cutters and strippers
- Soldering iron and solder
- Power drill with drill bits and driver bits
- 3/16" box end wrench
- 10A fuse and fuse holder
- Locator mounting materials (self tapping screws, self adhesive velcro pads, or long tie wraps)
- Heat shrink
- Electrical tape
- Tie wraps

Step-by-step Installation

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. 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" box end wrench to give it another 1/8 turn. If you are using a torque wrench, set the wrench to 6 inch-pounds.

Step 2. Plug DB15 cable connector into Locator's DB15 port.

- Connect the cable DB15(HD) connector to the Locator DB15 port. This cable provides all leads and ports required when installing the Locator and for connecting accessories to the Locator.

Step 3. 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.

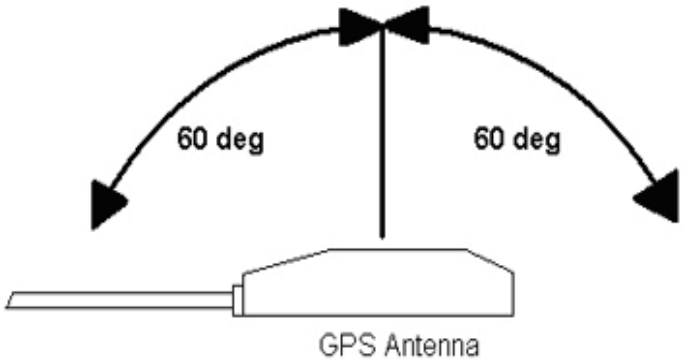


Figure 2-2 Minimum field of view for a GPS antenna

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 4. 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 WT7000 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 5. 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 C-24 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.
Consult the customer before drilling any holes in any vehicle component.

- 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.
- In non-covert installations, allow access to the Locator's connectors and try to place the Locator so that one of the LEDs is visible

Step 6. Wire Locator to vehicle

1. Splice, solder, and insulate the **+12V/+24V** (red) wire to the **+12V/+24V** vehicle wire. Make sure that the positive voltage is between 9 and 30 Volts.
2. Splice, solder, and insulate the **ground** (black) wire to the **vehicle ground**.
3. Splice, solder, and insulate the **ignition** (yellow) wire 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" box end wrench to give it another 1/8 turn. If you are using a torque wrench, set the wrench to 3 inch-pounds.

Step 7. Complete optional connections and installations

The WT7000 series has many possible accessories and configurations, most of which are covered in the appendices of this manual. Consult the table of contents to see if the accessory or configuration you require is listed.

If the accessory you need to install is not listed in the table of contents (as is the case with the WT1900 Satellite Modem, MDT2000 series, and MDT3100), the device has its own, separate installation guide. For additional installation documentation, go to `http://resources.webtechwireless.com` and log in using the generic installer account (user name: installer, password: installer).

Step 8. Activate Locator by installing fuses.

Installing the fuses enables the Locator to power up.

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 3-10.

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 K-53. 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.

Section 3

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 3-1 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.

Table 3-2 Locator LED troubleshooting checkpoints

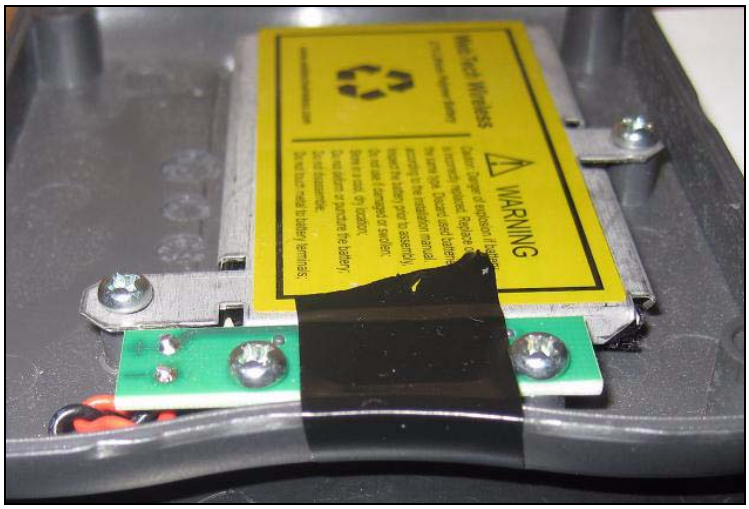
LED Status	Locator Status and Troubleshooting
LED has a solid RED light	**The device has cell network activation but no GPS network visibility.** • Ensure that the GPS antenna is properly connected to the device and has a clear view to the sky.
LED is flashing ORANGE and GREEN	**There is a problem with 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 3-2 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.

Section 4

Safety Precautions

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 Safety Precautions

Read these guidelines before preparing the harness.

- 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. For example, 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. Use a multi-meter to confirm +12 V DC or +24 V DC (9 to 30 Volts) power. Do not use a test lamp.

Battery connection (red wire)

- 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).
- Connect to a continuous +12 V DC or +24 V DC (9 to 30 Volts) supply.
- 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.

Negative ground (earth) connection (black wire)

- Always connect directly to a dedicated earth point within the vehicle's electrical system.
- Use a unique earth point.
- When required, create a suitable earth 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 connection (yellow wire)

- To prevent incorrect operation, make sure that you connect to the correct vehicle ignition wire. Ignition voltage must not be interrupted (drop under 9Vdc) at any time while cranking the engine. Ensure that you connect to an ignition wire which goes positive +12 V DC or +24 V DC (9 to 30 Volts) when the key is in the **run** position, and is removed or goes to ground when the key is in the **off** position.

Solder connections

Important 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.

Make sure that the wiring is correct

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

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:

- Are not good for critical power supply connections.
- Cut into the connected wire, reducing the life of the wire and reducing both its voltage and current-handling capabilities.
- Increase the risk of corrosion and crush-type wiring failures.

Don't leave cut wires exposed

- 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 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.

Section 5

WT7000 Locator Series Wiring

Connecting Telemetry Wiring

Figure 5-1 Telemetry wires on the Locator's 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 Table

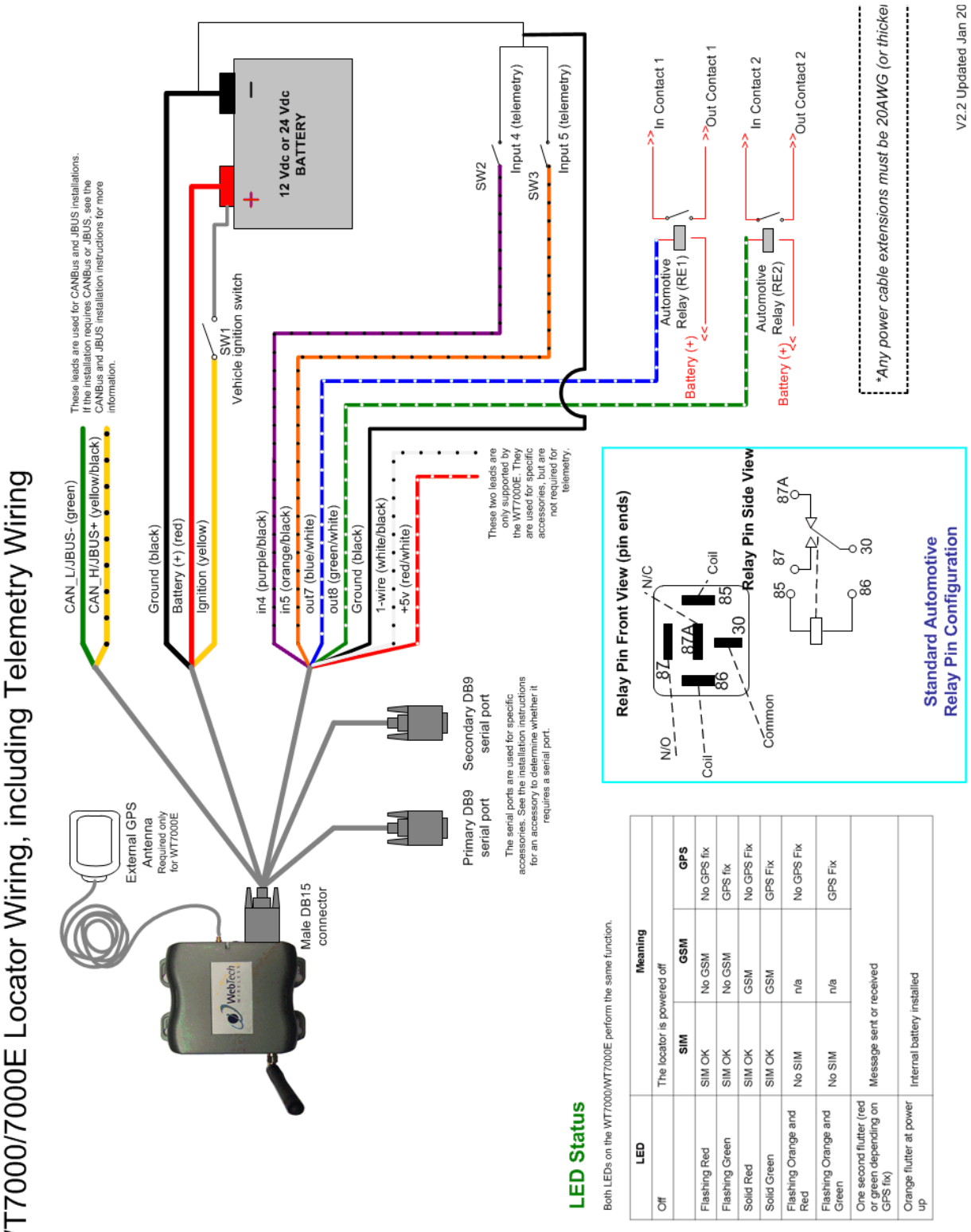
Color	Label	General Description	Usage
Power Leads			
yellow	Ignition	Ignition	All Installations
red	+12V/ +24V 9 to 30 Volts	Power Supply	All Installations
black	Ground	Ground connection for Locator	All Installations
Accessory Leads			
blue/ white	Out7	Ground pulse output (200-milliamps)	Telemetry
green/ white	Out8	Ground pulse output (200-milliamps)	Telemetry
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
white/ black	1-wire	1-wire accessory connection	1-wire accessories (Temperature Monitoring Kit and Driver ID Kit)
black	Ground	Additional ground connection	Specific accessories
red/ white	+5v	Used to power addition devices. Note that this lead has a maximum 50mA current draw.	Specific accessories
CANBus / JBus Leads			
yellow /black	CAN_H/JBUS+	CANBus / JBus positive lead	CANBus / JBus
green	CAN_L/JBUS-	CANBus / JBus negative lead	CANBus / JBus

Table 5-3 WT7000 Locator Series 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.

WT7000 Series Locator Wiring Diagram



LED Status

Both LEDs on the WT7000/WT7000E perform the same function.

LED	Meaning		
Off	The locator is powered off		
	SIM	GSM	GPS
Flashing Red	SIM OK	No GSM	No GPS fix
Flashing Green	SIM OK	No GSM	GPS fix
Solid Red	SIM OK	GSM	No GPS Fix
Solid Green	SIM OK	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		

Appendix A

Installing the SIM card

Most installations will not require changing a SIM card, as the Locator comes with the intended SIM card installed. However, occasionally you may need to switch out the SIM card for another.

Important The Locator must be remotely configured to use a particular SIM card, so unless you are performing the 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. Unscrew the four screws on the bottom plate.
2. Open the SIM card holder by gently sliding the metal bar in the direction of the arrow that points towards the **Open** position.
3. Lift up the top latch cover to expose the plate 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 facing up.
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 four 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

Table A-4 Summary of Locator LED Definitions for SIM card install

LED	Meaning		
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 A-4 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 B

The Internal Battery

You may order the Locator with an internal battery. The following instructions explain how to install it.

Battery Safety Information

The WT7000 series optional internal battery is a rechargable lithium polymer battery.

Important If the battery is appears damaged, do not install it. If the battery is damaged at any point, dispose of it. Damaged batteries may catch fire or explode if used.

- Do not dispose of the battery in fire.
- Do not puncture the battery. This may cause the battery to ignite or explode.
- If the battery is leaking, do not allow the battery's internal electrolyte to come into contact with eyes or skin. If this happens, thoroughly wash the affected areas with water and seek medical attention.

Installing the Internal Battery

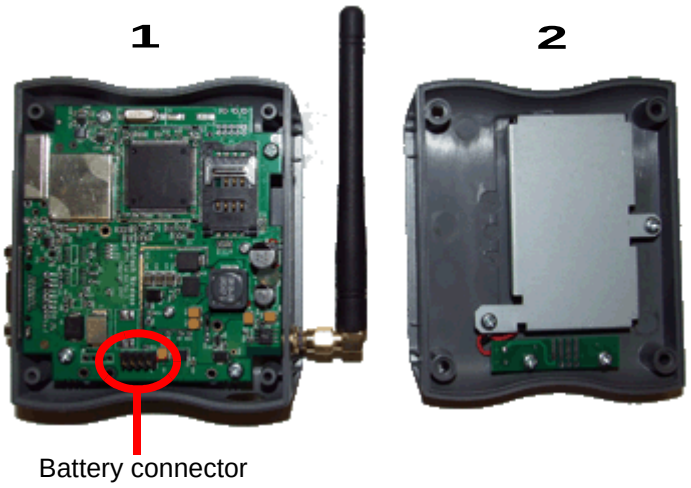


Figure B-2 (1) Locator top with circuit board showing battery connector, (2) internal battery base

1. Place the Locator with the WebTech-logo side down on a flat, clean surface. Unscrew and remove the four screws on the bottom plate of the Locator.
2. Gently remove the existing bottom plate.

3. The battery connector protective cover must be removed in order for the battery to function. Remove the battery connector protective cover (see Figure B-2 for the location of the battery connector).

   Important The battery connector protective cover is not obvious; it is small, black like the connector, and appears to be part of the connector itself. The protective cover is removed only if the battery connector contacts are fully exposed; i.e., you can easily touch them with your finger.

4. Align and attach the new bottom plate that contains the internal battery to the circuit board. There is only one way that the two parts can fit together.
5. Screw the 4 screws back into the bottom plate.
6. Connect the Locator to a power source, then wait 4 to 5 minutes until the battery is charged to a level that lights the LED.

Confirm operation by powering-up the Locator. If the battery is correctly installed, the LED flutters orange at power up.

Appendix C

Installing a Locator with the Accelerometer Option

The Accelerometer, which is available for the WT7000 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 D

Installing the OBDII Gateway

The WT7000 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.

In virtually all cases, the OBDII Gateway will be installed on the Locator's secondary serial port (as reflected in the following instructions). However, depending on what other accessories must be installed, the Locator can be configured to connect the OBDII Gateway on the primary port. To ensure that you are installing the Gateway on the correct port, take note of any special installation instructions that may come with your hardware.

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

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 D-3 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 D-3) 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 D-3) 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 D-3) 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 D-3) into the OBDII Gateway port labelled **Vehicle** and tighten the screws.

Figure D-4 OBDII Gateway with OBDII Y-Cable attached

Step 3. Plug the OBDII Gateway into the Secondary Port

Plug the Locator cable secondary DB9 serial connector into the OBDII Gateway port labelled **Host**. Ensure you use the secondary Locator port; the primary port will not properly interface with the OBDII Gateway without special Locator configuration and a null modem adaptor. Tighten the screws.

Figure D-5 OBDII Gateway with 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 D-3).
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 D-3) 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

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 D-6 Example of an OBD connector (female 16-pin J1962) in the access panel after Locator and OBD installation

Appendix E

Installing the 1-Wire Temperature Probe

The WT7000's integrated 1-Wire feature supports up to five temperature probes. The following describes how to install and configure it.

Figure E-7 1-wire sensor with 1M cable

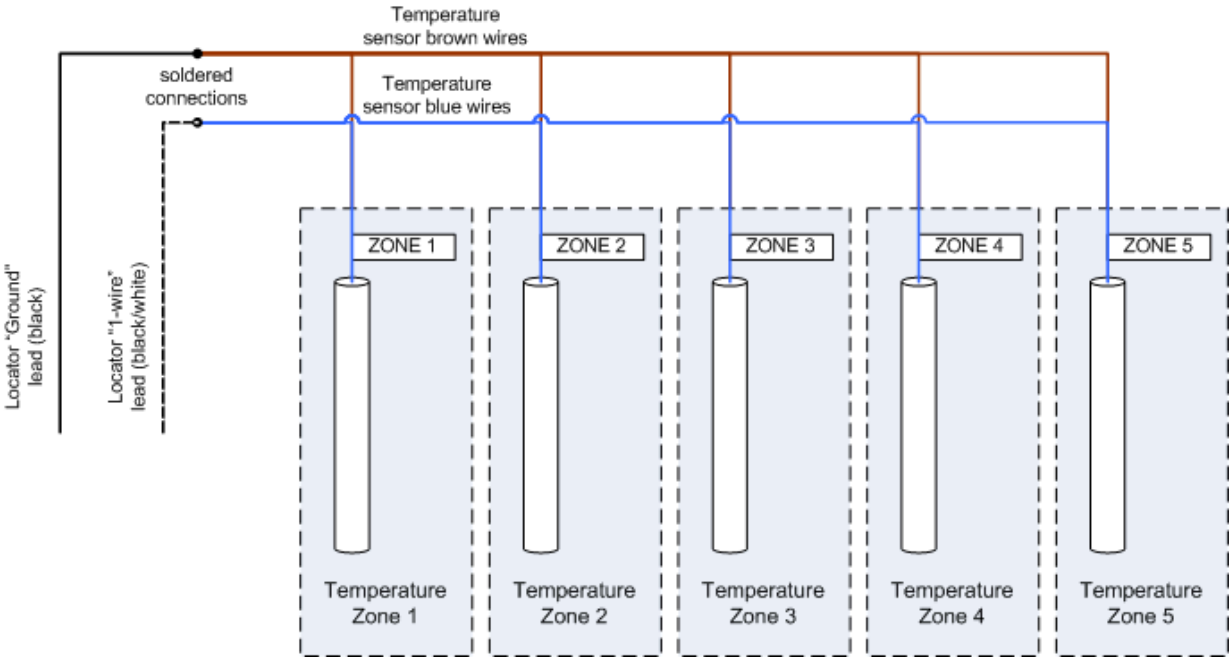
Installation Requirements:

- Temperature monitoring kit for WT7000 Series Locator. This includes up to 5 temperature sensors: one for each temperature zone monitored.

Connecting 1-Wire to the Locator:

1. Locate the 1-WIRE (black with white stripe) and GROUND (black) leads on the WT7000 cable harness. There are two GROUND leads; both are identical electrically, so use whichever one is more convenient.

2. Connect the blue wire(s) from the temperature sensor(s) to the 1-WIRE (black/white) lead of WT7000 cable harness
3. Connect the brown wire(s) from the temperature sensor(s) to the GROUND (black) lead of cable harness. Use suitable extension wire if required. Solder the connections.



Note All temperature sensors are connected to the same two leads on the Locator harness; the Locator is capable of differentiating the readings that come from each sensor. Note that the sensors are dedicated to a particular temperature zone within the vehicle at the point of manufacturing. Each sensor is labelled with its zone number. Be sure to install each sensor in its intended zone, as the sensor configuration cannot be easily changed once it is shipped.

Appendix F

Installing JBUS J1587, CANBUS J1979 and J1939

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

What are JBUS and CANBUS?

JBUS J1587, 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. JBUS and CANBUS protocols are defined by number; the WT7000 Series Locators support J1587, 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 JBUS 1587, CANBUS 1979, or CANBUS 1939, as each protocol requires a unique Locator configuration to support

General Guidelines

- JBUS J1587 is commonly found on North American heavy trucks made before 2007.
- 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.

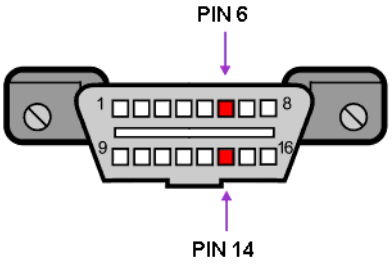


Figure F-8 J1962 OBDII connector

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.

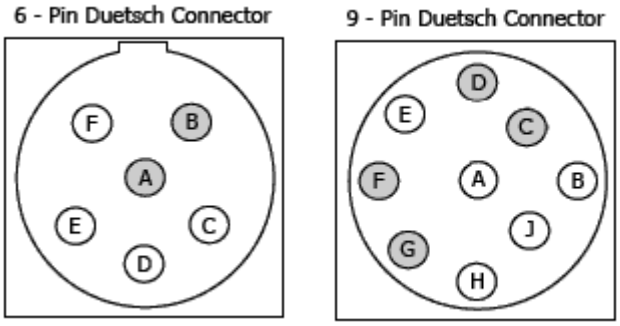


Figure F-9 6 and 9-pin Duetsch connectors

If the vehicle has a 6-pin connector, then the vehicle supports JBUS J1587. If the vehicle has a 9-pin connector, then the vehicle likely supports both JBUS J1587 and CANBUS J1939. To confirm, check which pins are populated (you may have to look at the back of the connector). If pins F and G are populated, JBUS J1587 is supported. If pins C and D are populated, CANBUS J1939 is supported.

Installing JBUS J1587

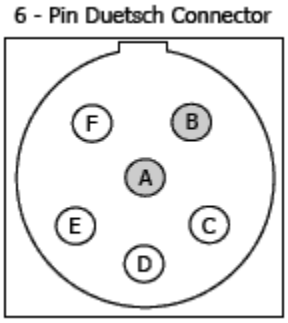
The following describes how to locate the JBus data wires necessary for splicing into the existing wires.

Important When installing JBUS or 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 6 or 9-pin Duetsch connector and get access to the vehicle wires leading into the connector.
2. Use tables F-5 and F-6 on page 34 to determine which two vehicle wires must be connected to leads on the Locator cable.
3. Without disconnecting them from the Duetsch 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/JBUS+ and CAN_L/JBUS- leads.
5. Wrap the stripped CAN_H/JBUS+ and CAN_L/JBUS- leads around the appropriate vehicle wire (consult tables F-5 and F-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

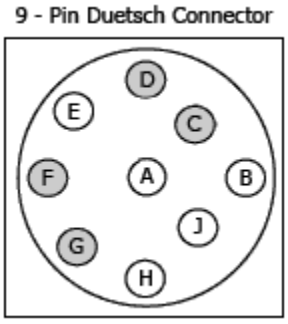
Duetsch 6-pin connector



Function	Pin	Locator Wire Color	Locator Wire Name
Datalink(+)	**A**	**yellow / black**	**CAN_H/JBUS+**
Datalink(-)	**B**	**green**	**CAN_L/JBUS-**

Table F-5 Duetsch 6-pin connector JBUS J1587 connections

Duetsch 9-pin connector



Function	Pin	Locator Wire Color	Locator Wire Name
J1587+	F	yellow / black	CAN_H/JBUS+
J1587-	G	green	CAN_L/JBUS-

Table F-6 Duetsch 9-pin connector JBUS J1587connections

Installing CANBUS J1939 and J1979

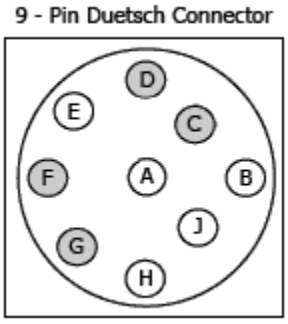
The following describes how to locate the CANBUS data wires necessary for splicing into the existing wires.

Important When installing JBUS or 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 J1962 OBDII connector and get access to the vehicle wires leading into the connector.
2. Use tables F-7 and F-8 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/JBUS+ and CAN_L/JBUS- leads.
5. Wrap the stripped CAN_H/JBUS+ and CAN_L/JBUS- leads around the appropriate vehicle wire (consult tables F-7 and F-8 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

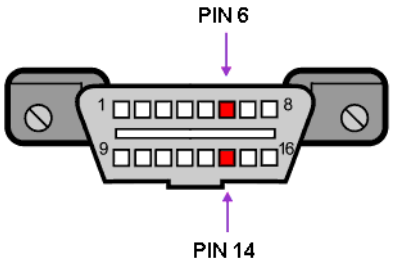
Duetsch 9-pin connector (CANBUS J1939)



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

Table F-7 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/JBUS+
CAN low(-)	14	green	CAN_L/JBUS-

Table F-8 J1962 OBDII connector CANBUS J1979 connections

Disconnecting JBUS and CANBUS

When disconnecting a Locator with JBUS or CANBUS connections from the vehicle:

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

Appendix G

Installing the 1-Wire I/O Board

The 1-Wire I/O Board is an accessory that adds four inputs and four outputs to the Locator, increasing the total to six inputs and outputs. These new inputs and outputs may be used for telemetry connections just like those on the standard cable harness.

The 1-Wire I/O Board may be installed even if the Locator already has another 1-wire device installed. The Locator's 1-wire port can support multiple 1-wire devices simultaneously. However, you may only connect a single 1-Wire I/O Board at any given time.

Figure G-10 1-Wire I/O Board

Voltage requirements for telemetry connections:

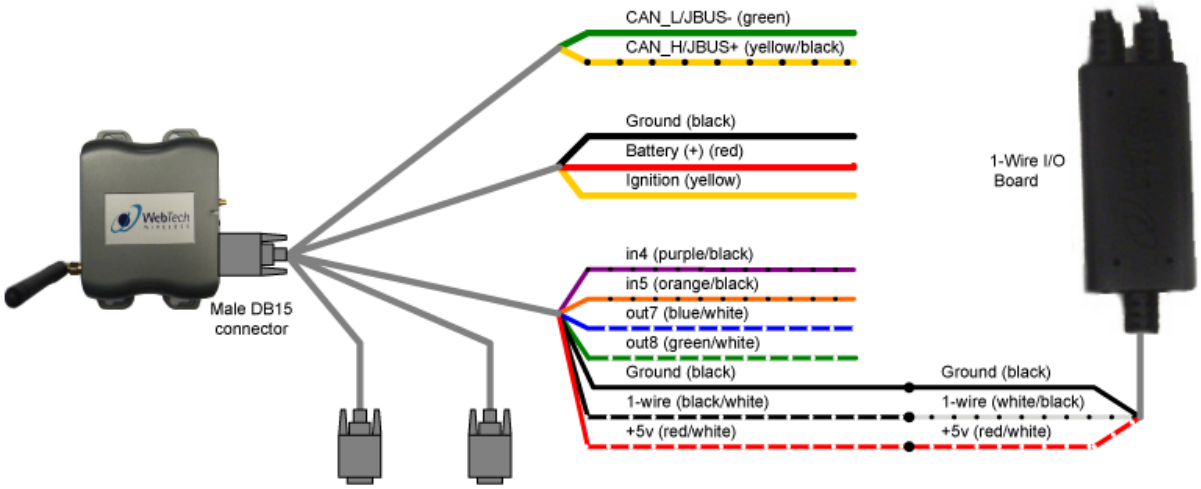
When you connect the I/O Board's inputs or outputs to any vehicle system, keep the following in mind:

- When turned on, telemetry outputs provide a low (or ground) connection.
- For inputs 8 and 9, an input of less than +0.06 V (for low) or greater than +3.32V (for high) will change the state of a telemetry input.
- For inputs 6 and 7, an input of less than +0.59 V (for low) or greater than +2.06V (for high) will change the state of a telemetry input.

Installation

Connecting 1-Wire I/O Board to the Locator:

1. On the WT7000 cable harness, locate the 1-WIRE lead (black with white stripe), the +5V lead (red with white stripe), and Ground lead (black). There are two Ground leads; both are identical electrically, so use whichever one is more convenient.
2. Three cables extend from the 1-Wire I/O Board. One cable has only three leads: 1-wire (white with black stripe), +5V (red with white stripe), and Ground (black). Connect these to the Locator 1-WIRE, +5V, and Ground leads. Solder and insulate the connections.



Connecting the 1-Wire I/O Board to the vehicle

The inputs and outputs are connected to vehicle systems requiring telemetry. How they are connected depends on the vehicle system, but the following hold true in any case:

- Each cable extending for the 1-Wire I/O Board has a black Ground lead to be used to provide a base state (Low state). All Ground leads are electrically identical.
- Ensure that you are connecting the correct input or output to the vehicle system, as Quadrant will be already set up to monitor/control that particular lead. If you received no specific instructions as to which input or output to use, be sure to note which one you connect.

Appendix H

Installing a Locator with the Garmin Nüvi Option

The Garmin Nüvi personal navigation device is compatible with WT7000 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.

Installing the Garmin Nüvi in conjunction with the WT7000 requires a custom cable. This cable is provided with the Garmin Nüvi when ordered from WebTech Wireless, but is not part of the standard accessories when the Garmin Nüvi is purchased off the shelf at a local retailer. In this case, the custom cable may be purchased separately.

Required components

You require the following components:

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

Figure H-11 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 WT7000 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 frame 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 I

Installing the WT0130 HID Card Reader

The WT0130 Prox II HID Reader is an accessory that connects to the Locator that enables a fleet to use HID cards for driver authentication. Many companies already issue HID cards to their staff to enable them to access buildings, yards, or other facilities, and the WT0130 enables those company to leverage its existing card system within the context of their vehicles.

There are two ways to install the WT0130 HID Card Reader depending on what will happen if a driver operates the vehicle without logging in. If the optional buzzer is included, the buzzer sounds to remind the driver to log in. If the buzzer is not included, then the vehicle generates an email notification when the vehicle is operated without the driver logging in. In this case, an e-mail address must be provided to technical support.

Tools and Materials

Kit Contents

The WT0130 Prox II HID Reader comes with the following items:

- HID Reader
- HID Reader Cable
- Buzzer (optional)

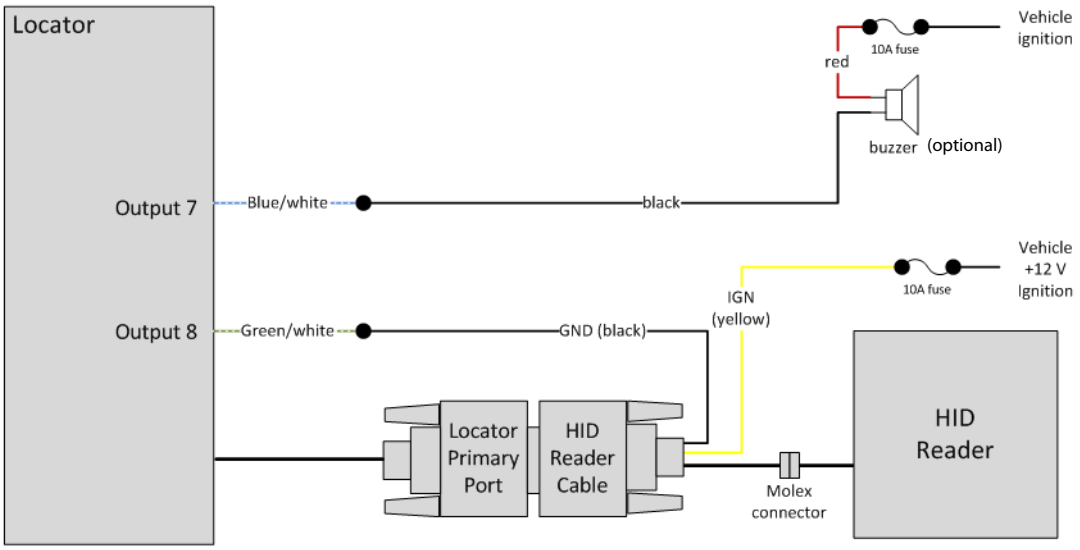
Figure I-12 Shown: HID Reader(1), Buzzer(2)
Not shown: HID Reader Cable

Required Tools and Materials

In addition to the tools and materials you require to install the WT7000 Locator, you also need:

- Two additional in-line fuse holders with 10 amp fuses. Note that these are not required if you can tap into the downstream side of the fuses installed with the WT7000 Locator wiring.
- Buzzer and Card Reader mounting materials (self adhesive velcro pads, double sided adhesive foam strips, or #8 x 3/4" self-tapping screws)
- 26 bit HID Card for testing. You must know the HID card number of this card.
  The Webtech Wireless Field Services team will provide these cards for Webtech Wireless managed WT0130 installations. Self installers must provide their own 26 bit card and have a fleet manager add it to the Quadrant system before installation.

Installation



Note that if you can tap into the downstream side of the fuses installed with the WT7000 Locator wiring, you do not need to install additional fuses for the WT0130. If this is the case, ignore the instructions below regarding adding additional fuses.

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.
Consult the customer before drilling any holes in any vehicle component.

Installing the Buzzer (optional)

If your WT0130 HID Card Reader installation includes the buzzer, use the following procedure to install it.

1. Connect one end of a fuse holder to the **buzzer red wire**. Solder and insulate the connection.
2. Connect the **buzzer black wire** to the WT7000 cable **Out7** (blue/ white) wire. Solder and insulate the connection.
3. Connect the opposite end of the **buzzer red wire** fuse holder to the **vehicle ignition**. Solder and insulate the connection.
4. Use double sided adhesive foam strips or self adhesive velcro pads to mount the buzzer inside the dashboard. The buzzer is light and can be mounted wherever is convenient (including to the Locator itself), but it must be mounted securely. One good way of mounting the buzzer is to strain relief the buzzer wires by securing it so that remains still relative to the wiring harness.

Installing the Card Reader

1. Find a suitable location to mount the HID Reader. The HID Reader should be visible and easily accessible to the driver while seated, and should not be mounted beneath the ignition (to avoid situations where an HID-enabled keyfob connected to the driver's key chain may unintentionally be detected).
2. Route the cable extending from the HID Reader inside the dashboard such that the molex connector is not visible to the driver. Drill a hole at or near the mounting location if needed, but be sure to avoid damaging dashboard electronics.
3. Make the electrical connections. Connect the HID Reader Cable **GND** (black) wire to the WT7000 cable **Out 8** (green/ white) wire. Solder and insulate the connection.
4. Connect the HID Reader Cable **IGN** (yellow) wire to the second fuse holder. Solder and insulate the connection.
5. Connect the other end of the **IGN** fuse holder to the **vehicle ignition** wire. You must use the same vehicle ignition wire as the Locator is connected to. Solder and insulate the connection.
6. Connect the HID Card Reader to the HID Reader Cable using the molex connectors. Ensure the connection is secure.
7. Connect the HID Reader Cable to the WT7000 cable Primary Port. Ensure the connection is secure; use tie wraps if necessary.
8. Install both fuses. If there is any danger of the fuses coming loose, secure them with tie wraps.

Testing the WT0130 Prox II HID Reader

Once both the Locator and HID Reader are installed, you must test the installation to confirm that the WT0130 Prox II HID Reader is correctly installed.

Testing an Installation with the Buzzer

1. Turn on the vehicle ignition.
   The HID Reader should beep and the LED on the device turns red.
2. Wait a few seconds. The buzzer should start sounding.

3. Swipe your HID card.
   - The HID Reader should beep and the LED flashes green. This confirms that the HID Reader is operating correctly.
   - In addition, if the Locator is installed correctly and connected to the HID Reader, and the customer's system is configured to recognize your HID card, the buzzer should stop sounding.

Once you have tested the HID Reader, contact technical support for an installation check as normal. Make sure to inform them that you are installing a WT0130 Prox II HID Reader. Technical support will ask for your HID card number as part of the installation check.

Testing an Installation without the Buzzer

1. Turn on the vehicle ignition.
   The HID Reader should beep and the LED on the device turns red.
2. Swipe your HID card.
   The HID Reader should beep and the LED flashes green. This confirms that the HID Reader is operating correctly.

Once you have tested the HID Reader, contact technical support for an installation check as normal. Make sure to inform them that you are installing a WT0130 Prox II HID Reader. Technical support will ask for your HID card number as part of the installation check. If you were provided the notification email address for this vehicle, inform technical support so that they can configure the vehicle now.

Appendix J

Installing a Locator with Hands Free Audio

The WT0110 Hands Free Audio Kit gives the WT7000 series Locator the ability to transmit and receive voice audio, i.e., enables the driver to make and receive calls through the Locator. There are a number of install configurations involving the WT0110, but the following instructions cover installations that do **not** involve an MDT. If your hand free audio installation includes an MDT, please see the appropriate MDT installation guide for installation instructions.

Required components

Note that in order to install the WT0110 Hands Free Audio Kit with a WT7000 series Locator, you require a WT7000 with a 2.5mm audio jack (6.3 board layout). If the Locator does not have an audio jack, contact your account manager.

In addition to the Locator kit, you require the following components:

- WT0110 Hands Free Audio Kit, including:
  - MUX
  - speaker
  - microphone
- WT7000 Audio Cable

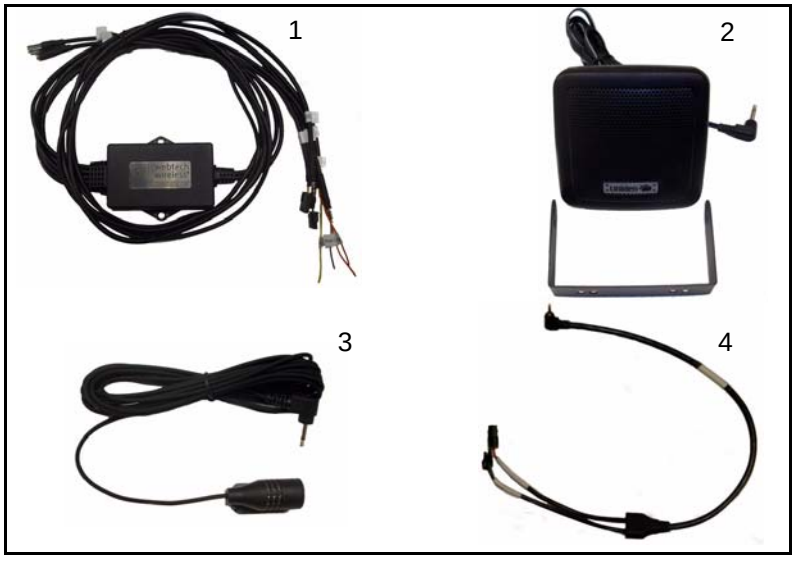


Figure J-13 Shown: MUX (1), Speaker (2), Microphone (3), WT7000 Audio Cable (4).

Installation Procedure

Set the MUX Switch

Before installation, you need to ensure that the switch on the MUX is set correctly.

There is a tiny switch (dipswitch) located on the bottom of the MUX enclosure. Ensure the switch is set to **WT51XX**, which is appropriate for installation with WT7000 series and WT5100 series Locators.

Select Mounting Locations

Speaker

The speaker has no controls and does not need to be easily accessible to the driver. It must be mounted so that the driver can easily hear it while facing forwards, but it must not obscure the driver's view. The speaker and microphone must not be installed too close or facing one another to avoid feedback.

Microphone

Like the speaker, the microphone has no controls and does not need to be easily accessible to the driver. However, the microphone must be close to the driver for good audio, idealy within 2.5 feet of the driver's head. The speaker and microphone must not be installed too close to one another to avoid feedback, and the microphone must also be kept away from areas of strong airflow, such as in front of vents. Finally, the microphone should be pointed at the driver's head for best reception.

Suggested locations for the microphone:

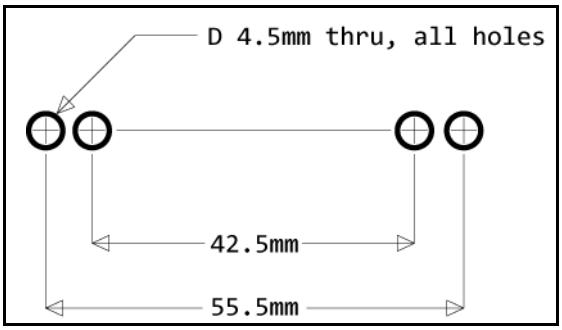
- above the driver side door
- attached to the driver side visor

MUX

The MUX has no user interface and does not need to be visible or accessible to the driver. You can install the MUX anywhere that is convenient, including under or within the dashboard. That said, the MUX is an in-line component between the Locator, microphone, and speakers, so it must have cable routing to all four components. Furthermore, while robust, the MUX has cable connections that should not be disconnected at any time. Install the MUX where it is unlikely to be kicked or otherwise abused.

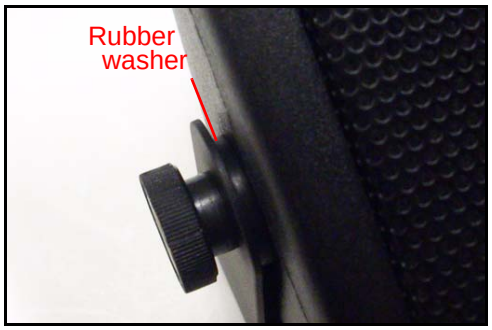
Mount the Speaker

The speaker includes a bracket that must be mounted to the dashboard using screws or bolts.The bracket has four holes in the bottom of the bracket for this purpose, positioned as shown:



The bracket holes are not threaded. Use at least two fastening points (one on the left and one on the right) in order to ensure that the bracket is mounted securely.

1. Drill or punch holes in the dashboard according to the above diagram.
2. Secure the speaker bracket with nuts and bolts or self-tapping screws.
3. Secure the speaker on the speaker bracket using the mounting screws (included).
   Thread a rubber washer (included) between the bracket and speaker to ensure the speaker stays in place.



Mount the Microphone

You can mount the microphone in one of two ways:

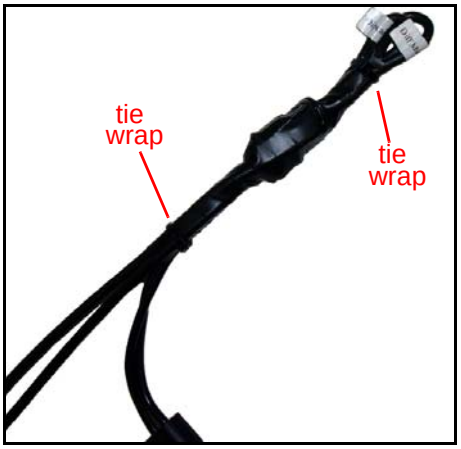
- Use the incorporated microphone mount to screw the microphone to a surface. To do this, drill or punch a hole in the surface, then secure the microphone with a self-tapping screw.
- Use the included peel-and-stick Velcro pad to secure the microphone to a surface.

Use your discretion on which method to use.

Connect Audio Components

1. Remove the dashboard panels until the Locator power cables are exposed.
2. Solder the red MUX **+12/+24V** wire to Locator red constant power wire before the fuse. Insulate the connection with heat shrink.
3. Solder the yellow MUX **Ignition** wire and the orange MUX **Mode Control** wire to the Locator yellow ignition wire before the fuse. Insulate the connection with heat shrink.
4. Solder the black MUX **Ground** wire to Locator black ground wire. Insulate the connection with heat shrink.
5. Plug the microphone into the MUX **Mic Plug In** jack.

6. Plug the speaker into the MUX **Speaker Plug In** jack.
7. Plug the WT7000 Audio Cable **Diff Mic** molex connector into the MUX **Mic Out** molex connector.
8. Plug the WT7000 Audio Cable **Diff Speaker** molex connector into the MUX **Spkr Out** molex connector.
9. The **Diff Mic** / **Mic Out** and **Diff Speaker** / **Spkr Out** molex connectors are small so that they can be passed easily through holes, but their small size means that there is a danger that their connections will come apart when subjected to sufficient force. These connections must be reinforced. Double back the cable around this connection, tape the area, and secure with tie wraps.
10. Plug the WT7000 Audio Cable 2.5mm audio plug into the WT7000 Locator 2.5mm audio jack.

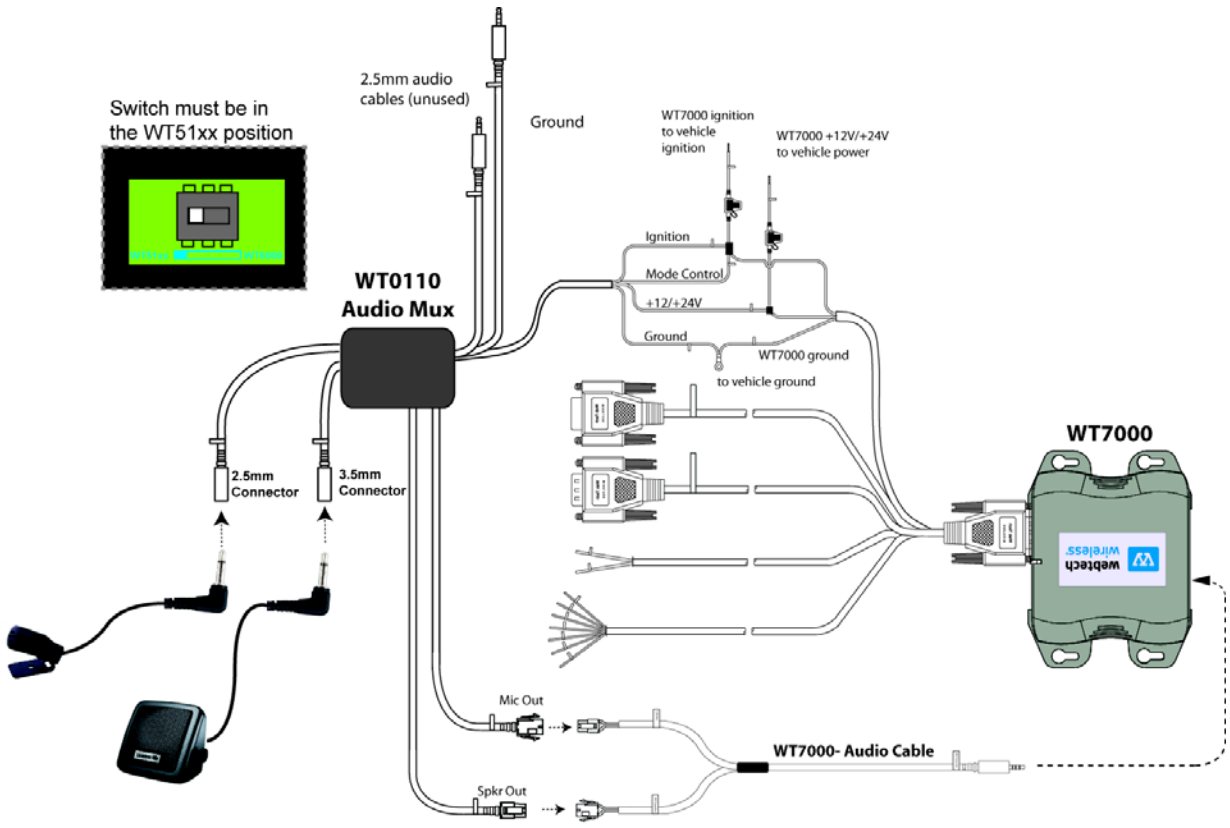


Test Locator and Audio Components

As part of the Locator test (see Step 10. Perform Installation Test on page 7), test that the audio components are functioning as required.

Secure Remaining Components and Clean Up

1. Clip or tie back unused leads.
2. Secure the MUX in place. You may use tie wraps, or mount the MUX using self-tapping screws through the two holes in the plastic housing.


Switch must be in
the WT51xx position
2.5mm audio
cables (unused)
Ground
WT7000 ignition
to vehicle
ignition
WT7000 +12V/+24V
to vehicle power
Ignition
Mode Control
+12/+24V
Ground
WT7000 ground
to vehicle ground
WT0110
Audio Mux
2.5mm
Connector
3.5mm
Connector
WT7000
Mic Out
Spkr Out
WT7000- Audio Cable

Appendix K

Support Information

Contacting Technical Support

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

- **E-mail**: support@webtechwireless.com
- **Phone**: +1 (604) 419 8163
- **Toll Free (US/Canada)**: +1 (866) 945 4568

Technical Support Hours of Operation

- Monday - Friday: 6:00 am - 5:00 PM PT
- Saturday: 8:00 am - 4:30 PM PT

Returning the Locator

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

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.