# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solution and Default Hardware Overview</td>
<td>03</td>
</tr>
<tr>
<td>Vehicle Diagnostics</td>
<td>07</td>
</tr>
<tr>
<td>Power Connection</td>
<td>19</td>
</tr>
<tr>
<td>Device Mounting</td>
<td>35</td>
</tr>
<tr>
<td>I/O PTO Connection</td>
<td>41</td>
</tr>
<tr>
<td>Post Installation Testing – FM Installer App</td>
<td>44</td>
</tr>
<tr>
<td>Tamper Proofing</td>
<td>46</td>
</tr>
<tr>
<td>LED Status Definitions</td>
<td>49</td>
</tr>
<tr>
<td>Installation and Customer Support</td>
<td>51</td>
</tr>
</tbody>
</table>
Trimble TVG 675 GPS devices contains:

- GPS, Communication and Vehicle Diagnostics capture.
- Firmware
- On and functional whenever the vehicle is on
- The TVG 675 does **require** a connection to the vehicle’s bus to produce tracking information
TVG 675 Connections and Status LEDs

Red LED = Vehicle Diagnostics
Green LED = GPS Status
Blue LED = Bluetooth Status
Amber LED = Cellular Status

*** NOTE - Please refer to page 49 of this guide for LED Status definitions
TVG 675 Default Hardware

TVG 670 Default Hardware:

• TVG 675 Power Cable/Breakout cable (P/N: 907-1090-000)
• TVG 670/675 Installation Parts Kit (P/N: 908-0030-000)
Remove one of the device’s serial number labels that is affixed to the top of the device and adhere it in the driver’s side doorjamb in the vicinity of the VIN label. The second copy is to be left affixed on the top of the device.
OBDII - Light Duty

For TVG 675 devices the Light Duty Vehicle Diagnostics cable that is shipped for vehicles that have a OBDII port will be:

**OBDII Y- Cable with mounting bracket**

(P/N: 907-1098-100)
OBDII Cable Installation

Step #1
- Locate Factory Connector
- Commonly found on Driver’s side under the dash

Step #2
- Remove connector from factory mounting location
- Save fasteners for use with Trimble’s OBDII interface cable
OBDII Cable Installation

Step #3
- Plug Y-Cable securely into factory connector
- Secure connection with one wire tie

Step #4
- Install the remaining OBDII replacement connector into the factory mounting location
- Secure extra harness wiring to factory harness with wire ties
Heavy Duty J1939/Flange Mount

The Heavy Duty Vehicle Diagnostics cable that is shipped for vehicles that have a BLACK Flange Mounted 9 PIN port will be:

9 PIN Flange Mount J1939 Y-Cable (P/N: 907-1120-000 or 5C909M-2)
Flange Mount Y-Cable Installation

Vehicle Diagnostics Flange Mount Y- Cables will be installed by following the below instructions:

1. **Locate** the Deutsch plug mounted in the dash on the driver’s side of vehicle

   * It is common for the plug to be found under the dash on the driver’s side of the vehicle

2. **Remove** plug from it’s mounting location
Flange Mount Y-Cable Installation

With the plug removed:

3. **Connect** the Y Cable to the removed factory port, use the locking ring to ensure a tight connection.

4. **Replace** the factory connector with the remaining Deutsch plug of the Y-Cable, using the factory mounting hardware.
The Heavy Duty Vehicle Diagnostics cable that is shipped for vehicles that have a GREEN Bulkhead Mount (screw type) 9 PIN Deutsch for Type 2 J1939 will be:

**9 PIN J1939 Green Bulkhead mount Y-Cable**

(P/N: 5C709m-2 or 907-1121-000)

The Bulkhead style port is typically found on the lower portion or under dash on the driver’s side of the vehicle secured to the dash by a large nut.

It is commonly covered with a cap as shown here.
The Heavy Duty Vehicle Diagnostics cable that is shipped for 2013 + Volvo vehicles will be:

**Volvo Vehicle Diagnostic Cable** (P/N: 907-1100-000)

Please note - the RED ring terminal of this cable requires a connection to constant power and the BLACK ring terminal need to be connected to a ground source in the vehicle.

If the Volvo cable is being hardwired into the Deutsch plug connect as follows:

For vehicles with J1708 use the Blue wire (hi) and the White wire for (low)

For vehicles with J1939 use the wire set labeled as CAN1 and connect Yellow (hi) and Green (low)
The TVG 670 to TVG 675 vehicle diagnostics adaptor cable is a cable that can be used to adapt TVG 670 vehicle HEAVY DUTY (J1939) diagnostics cables for use with TVG 675 devices.

**TVG 670 to TVG 675 Adaptor Cable** (P/N: 5C823)
Verify that the vehicle diagnostic cable is connected properly and receiving information off the bus the RED status LED will light with the vehicle running once the vehicle is allowed to run with the device connected for about 5 minutes.
Vehicle Diagnostics Key Points

1. All cabling must be installed and secured throughout the vehicle in a manner that will not interfere with the safe operation of the vehicle

2. Verify that the vehicle diagnostic cable is connected properly and receiving information off the bus; the RED status LED will light with the vehicle running once the vehicle is allowed to run with the device connected for about 5 minutes
Fuse Holder Preparation

1. Find the tamper resistant stickers, found in the installation parts kit, and apply one each to the side of each fuse holders

2. Secure both fuses together with one wire tie
Power Harness Connections

The Trimble GPS system requires three connections to the vehicle’s electrical system:

1. **The RED wire = Constant power (+12 to 24 VDC)**
   - Refers to a power source that always supplies power no matter the position of the key

2. **The WHITE wire = Ignition power (+12 to 24 VDC)**
   - Refers to a **key controlled** power source that has power in both the Run and Start positions
   - Key controlled “Accessory Position” is never to be used

3. **The BLACK wire = chassis Ground**
   - Connection is sourced using the supplied ring terminal, star washer and a ½-inch self tapping screw
Testing with a Digital Multi-meter

Trimble requires that a digital multi-meter is used when testing for a power source in a vehicle as this device will not cause electrical damage on computer equipped vehicles.

Test Lights ARE NOT approved for use during Trimble installations as they create current draws that could very easily damage the vehicle which could result in a possible hazardous situation.
Poke and Wrap Power Wire Connection Method

1. Identify the ignition harness, following the main harness for the vehicle’s key
   ● Use a digital multi-meter to verify the correct wires

2. Remove insulation from the correct factory ignition wires using wire strippers
   ● Use a pick or multi-meter probe to carefully separate the strands

Constant and ignition power connection wire to wire
3. Strip about 1½ inch of insulation from each of the fuse leads
   - Feed the exposed fuse lead through the hole in the factory wire

4. Pinch the factory wire back together
   - Wrap the fuse lead around source wire at least 3 times
Poke and Wrap Power Wire Connection Method

5. If required by the customer, apply solder to the connection.

6. Insulate each power connection individually
   - Use a quality electrical tape (i.e. 3M Super 33+)
   - Minimum ½ on either side past the exposed wires
Poke and Wrap Power Wire Connection Method

7. Apply a wire tie over the tape at the connection point

8. Apply torque seal to the wire tie

9. Repeat steps 2 through 8 for the second power connection
Ground Wire Connection Method

Approved grounding methods

1. Find a suitable surface
   - Non-painted metal surface
   - Dash bracket

2. Strip the Black wire of the harness and crimp ring terminal and prepare self tapping screw and star washer in the order shown
3. Drill the assembly into the grounding location
   - Do not over tighten

4. Ensure a secure connection by pushing on the assembly
5. Apply orange Torque seal to ensure a tamper resistant connection

**NOTE**

Trimble *does not* approve connecting to factory grounds, all grounds must be sourced using the method outlined.
Once all power connections have been made secure the fuse holders to the ignition harness with wire ties and apply torque seal to each tie wraps and the wire tie that secures the fuse holder lids, as shown.

**Note:** It is recommended to tamperproof as a last step, **only after** the device passes the installation self test.
Ring Terminal method

- Trimble does approve “bus bar” connection method

- Trimble does not supply ring terminals

- Trimble recommends using water resistant, heat shrink ring terminals

- It is recommended that the ground is sourced using the included ring terminal, screw and star washer
Power Connection Dos

Dos:

- Connect:
  - wire to wire
  - ring terminal (buss bar)
- Fuse within 8” of the power source
- Use a digital multi meter for testing
- Insulate all power connections
- Use only known wires
- Use the included grounding hardware
- Route the harness safely to the device
Power Connections Don’ts

Do Not:

- Use mechanical, crimp over wire connection types, as shown on the right
  - Scotch Locks
  - T-Taps
  - Like connectors
Power Connection Key Points

1. Proper power cable preparation, as detailed, is required to ensure installation consistently.

2. Power connections must be made either wire to wire or to the bus bar ONLY; mechanical type power connections are not allowed.

3. Ground connections must be made using the included ring terminal, star washer and self-tapping screw; factory grounds must **NOT** be used.

4. Connect to only known power and ignition sources.

5. Use a digital multi-meter **ONLY** to test power source wires in the vehicle.
Device Mounting

For the system to operate properly, the internal antennas of the TVG 675 must be positioned properly.

- The GPS receiver is found underneath the TVG 675’s label and must be mounted so that it always has a **clear view of the sky** to receive information from the satellites. Position the TVG 675 label so that it always facing up towards the sky.

- The GPS receiver **must not be obstructed by any metallic objects**.

- Installed in a location that will not interfere with the safe operation of the vehicle

- Installed at least 18" away from any transmitting antenna (e.g., radio)
Device Mounting – Included Hardware/Fasteners

“Do” mount the device:
1. Securely using the included:
   a. the mounting bracket and #6 Self Tapping screws or
   b. with the bracket and 16” Tie wrap
“Do Not” mount the device:

1. To air lines or any vehicle cabling
2. In direct exposure to the elements
   - Excessive dust
   - Water (the device is not waterproof)
3. In excessive heat and cold areas
   - Refrigeration units
   - Exhaust manifolds
4. In high vibration areas
   - Engine compartments
   - Transmission
5. Near corrosive fluids and gases
2018 Kenworth
Mounting Location

• To the vent behind the instrument cluster

Secured

• Quick release bracket with three #6 X ½” Self-tapping screws
2011 Hino 268

Mounting Location

- Behind passenger side dashboard panel

Secured

- Quick release bracket with three #6 X ½” Self-tapping screws
I/O PTO Connection

The TVG 675 can monitor up to 4 inputs to the device using the bare wires leads of the standard Power/Breakout Cable. (P/N: 907-1090-000)

Each of the TVG 675 inputs that are connected to the device must be a **Positive Trigger** event.

The four positive inputs to the harness are as follows:

- **Input #1** = Blue Wire
- **Input #2** = Blue Wire with an Orange stripe
- **Input #3** = Violet Wire
- **Input #4** = Gray Wire if PTO is connected
I/O PTO Connection

When installing Statsensor to monitor the activity of PTO ON and OFF on the TVG the inputs provided must see a positive Trigger event.

In most cases the output of many of the switches in the vehicle are a positive DC output, but in some cases the wire’s output may be negative DC. If this is the case, the technician will be required to supply a common DC relay. This assembly will aid in inverting the switches negative polarity to a positive input. The below diagram can be referred to aid in the proper way to wire of the relay.

If there is any questions on the above information please contact your FOM immediately.
The **FieldMaster Logs Installer app** is what will be used to document the installation of the TVG 675 hardware. The app can be launched and run directly through an Android based tablet or run off a hard mounted TDI tablet when installing FieldMaster logs.

Please refer to the FM Installer App guide for detailed instructions
Tamper Proofing
Tamper Proofing

Tamper proofing is **required**

- For warranty purposes which helps guarantee a reliable installation and that the installation is not altered
  - Seal each termination; device and power connections
- Dries brittle, shatters if disturbed
- Extra tubes must be accounted for and retained
- Is be order through Trimble directly by submitting a Van Stock order
  - Tamper Seal Lacquer - 5 pack PN: 908-0033-000
Final Step: Tamper Proofing

“Torque Seal” is applied to
- All source power connections
  - Constant and ignition connection
    - Ground screw
    - All wire ties
- Device terminations
  - Vehicle Diagnostics port
  - Breakout Cable port
- Required per Trimble Hardware Warranty
LED Status Definitions
<table>
<thead>
<tr>
<th>LED Status</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLUE LED – Bluetooth</td>
<td></td>
</tr>
<tr>
<td>LED Status</td>
<td>Condition</td>
</tr>
<tr>
<td>OFF</td>
<td>Bluetooth OFF</td>
</tr>
<tr>
<td>ON Solid - GOOD</td>
<td>Bluetooth ON</td>
</tr>
<tr>
<td>AMBER LED – Cellular</td>
<td></td>
</tr>
<tr>
<td>LED Status</td>
<td>Condition</td>
</tr>
<tr>
<td>OFF</td>
<td>Modem Off</td>
</tr>
<tr>
<td>ON Solid - GOOD</td>
<td>Registered on Network</td>
</tr>
<tr>
<td>Slow</td>
<td>Connecting to available network</td>
</tr>
<tr>
<td>Solid - Fast Flash</td>
<td>Registered but no network</td>
</tr>
<tr>
<td>RED LED – Vehicle Diagnostics</td>
<td></td>
</tr>
<tr>
<td>LED Status</td>
<td>Condition</td>
</tr>
<tr>
<td>OFF</td>
<td>No Bus connection</td>
</tr>
<tr>
<td>ON Solid - GOOD</td>
<td>Connected to bus with RPM</td>
</tr>
<tr>
<td>Slow Blinking</td>
<td>Trying to connect to bus</td>
</tr>
<tr>
<td>Fast Blinking</td>
<td>Connected in passive mode</td>
</tr>
<tr>
<td>GREEN LED – GPS</td>
<td></td>
</tr>
<tr>
<td>LED Status</td>
<td>Condition</td>
</tr>
<tr>
<td>OFF</td>
<td>GPS off</td>
</tr>
<tr>
<td>ON Solid - GOOD</td>
<td>GPS fix</td>
</tr>
<tr>
<td>Slow Blinking</td>
<td>GPS but no fix</td>
</tr>
<tr>
<td>Fast Blinking</td>
<td>GPS time sync</td>
</tr>
</tbody>
</table>
Global Customer Support:

For Technical Support please utilize any one of the options based on your location:

North America: 1-877-428-7623 (option 1)
UK: +44(0)845 337 1661
Europe: +44 (0) 1332 267 600
Australia: 1 300 255 477
Trimble Field Operations Management Team

Manager: Field Operations
Hunter Garris
hunter_garris@trimble.com
703-638-2395

Field Operations: East
Erik Fehrenbach
erik_fehrenbach@trimble.com
201-376-6212

Field Operations: Central
Steven Boland
steven_boland@trimble.com
845-476-5766

Field Operations: West
Daniel Binder
daniel_binder@trimble.com
480-215-7784

Field Coordinator
Nephi Tanuvasa
nephi_tanuvasa@trimble.com
480-645-5049