Video Intelligence (VI) – Two Camera DVR
Hardware Installation Guide

January 2020
# 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>DVR and Cellular Antenna Installation</td>
<td>08</td>
</tr>
<tr>
<td>Camera Installation</td>
<td>14</td>
</tr>
<tr>
<td>Power Connection</td>
<td>19</td>
</tr>
<tr>
<td>DVR Provisioning Using the DVR Tool Kit</td>
<td>34</td>
</tr>
<tr>
<td>Tamper Proofing</td>
<td>40</td>
</tr>
<tr>
<td>LED Status Definitions</td>
<td>43</td>
</tr>
<tr>
<td>Installation and Customer Support</td>
<td>45</td>
</tr>
</tbody>
</table>
Trimble VI Solution features:
- Forward Facing Camera
- Optional Driver facing Camera
- 720p Resolution
- I/R Camera Available

DVR device
- 32 GB of Storage (up to 7 days)
- Up to 64 GB of storage
- 4G / LTE Cellular
- On and functional whenever the vehicle is on

Please note: if a Trimble TVG Telematics device is being installed in conjunction with the VI solution the telematics installation must be performed and tested, as a first step, before the VI solution can be installed.
DVR Serial Number

The VI DVR serial number is located here on the side of the device.

This is the alphanumeric identifier that will be entered into the DVR Tool Kit app for post installation testing. This serial number will also be recorded on the Trimble job sheet/workbook to be delivered to the customer.
DVR Status LEDs and SD Memory Card Slots

***NOTE*** - Please refer to page 35 of this guide for confirming LED status before device provisioning using the DVR Tool kit.
VI Hardware Kit – One Camera Default

1. DVR Hub Device (PN: E006-0597)
2. VI Camera (PN: E006-0615)
3. Power Cable (PN: L016-0666)
4. Camera Y-Cable (PN: L016-0660)
5. Antenna (PN: H055-0513)
6. Camera Mount (PN: H050-0538)
7. Camera Extension Cable (PN: L016-0669)
8. Camera Installation Kit
9. Power Connection Kit (PN: 908-0030-000)
10. Quick Install Guide – not shown
Driver Facing Camera Kit Hardware – Optional

1. VI Camera (PN: E006-0615)
2. Camera Mount (PN: H050-0538)
3. Camera Extension Cable (PN: L016-0669)
4. Memory Card (PN: E010-0508)
5. Camera Installation Kit
DVR and Cellular Antenna Installation

1. Located the: DVR, Camera installation kit, Power Connection kit and cellular antenna.

2. Find a suitable location to mount the DVR, this location is typically behind a dash panel either on the driver or passenger side of the vehicle that is not easily accessible to the driver of the vehicle.
Device Mounting – Included Hardware/Fasteners

“Do” mount the device:

1. Securely using the included:
   a. #6 Self Tapping screws (found in the Power kit)
   or
   b. VHB included in the camera installation kit (if mounted flat)
“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
Device Mounting – Location

The DVR device can be installed either behind the (a) kick panel (b) under the lower dash panel or (c) center console on either the driver or passenger’s side of the vehicle.

On larger, over the road vehicles, the DVR can be mounted in the overhead console.
The antenna (PN: H055-0513) must be securely mounted under a plastic panel at the top of the dash, with a clear view of the sky, on either the driver or passenger’s side of the vehicle.

Ensure that the panel is proper cleaned using the alcohol pad before securing the antenna.

The antenna lead will be routed carefully to the DVR to avoid pinch point and connected to the LTE port on the DVR. You will hear a snap when it is properly connected.
Camera Installation
Camera Pre-Installation Preparation

1. Find the VI Camera, Camera Mount and Camera Installation kit with the shipped equipment.

2. Thread the camera mount into the top of the camera.

3. Use the alcohol wipe, found in the kit, to clean the round base of the Camera mount, once dried adhere the round VHB tape to the base.

This process will have to be repeated if the optional second driver facing camera is installed.
1. For the forward facing camera, find a location, on the passenger side of the vehicle, behind the rear view mirror, in the wiper path to mount the camera. It is a best practice to find an area, that when the camera is installed on the window, it will not be visible to the driver. Once the location is identified, use alcohol pad to clean the surface and dry with a clean paper towel.

2. Remove the VHB mask from the base of the camera mount and adhere the mount of the forward facing camera to the window in the with firm pressure to the inside of the window.
Forward Facing Camera Installation

3. Once the camera is adhered to the glass, aim the camera forward and ensure that the assembly is tight and that the camera will not swivel in the bracket by ensuring that the camera is secure in the bracket and that the wing nut is tightened.

4. Connect the camera extension cable (PN L016-0669) to the matching port of the camera and route along headliner to the DVR mounting location. The forward facing camera will be connected to CH1 of the camera y-cable (PN: L016-0660).
Driver Facing Camera Installation

1. For the optional driver facing camera, find a location, on the passenger side of the vehicle, near the A-pillar of the vehicle, below the sun visor when it’s in the down position. Once identified, use alcohol pad to clean the surface and dry with a clean paper towel.

2. Remove the VHB mask from the base of the camera mount and adhere the mount of the driver facing camera to the window in the with firm pressure to the inside of the window.

3. Once the camera is adhered to the glass, ensure the assembly is tight as you did for the driver facing camera.

4. Connect the camera extension cable (PN L016-0669) to the matching port of the camera and route along headliner to the DVR mounting location. The driver facing camera will be connected to CH2 of the camera y-cable.

5. Additionally, ensure that SD card that is included with the second camera kit is inserted into the open SD Card slot on the DVR.
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 DVR required 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
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.
Constant and ignition power connection wire to wire

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
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
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
Ground Wire Connection Method

3. Drill the assembly into the grounding location
   - Do not over tighten

4. Ensure a secure connection by pushing on the assembly
Ground Wire Connection Method

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.
Power Connection Dos

Dos:
- Connect, wire to wire
- 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, 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.
DVR Provisioning

1. Connect the camera extension cables to the camera y-cable (PN: L016-0660) and connect the power cable, antenna and camera y-cable to the DVR. Ensure that the DVR is powered up by viewing the status LEDs on the device, if the DVR does not power up cycle the ignition key to the ON position.

2. Before the DVR can be provisioned with the DVR Tool Kit, please verify and confirm the LEDs are lit as shown.

   SOLID LEDs must be present for PWR, CH1 and LTE - CH2 will be SOLID if a second camera is installed

   FLASHING LEDs will be present for RUN.

   SD1/SD2 will either flash or remain solid depending on which slot the SD card/s are plugged into on the DVR
DVR Provisioning

3. From a Trimble issued tablet select the **DVR Tool Kit icon** or navigate to **dvr.trimblevi.com** using a smart phone.

4. From the dropdown at the bottom of the login screen, select **Trimble – Pulse (FSM)** and enter the **User Name** that was provided by the Trimble provisioning team with the password of **Password@123** and then **TAP LOGIN**.
5. **TAP** the bar code reader icon to scan the bar code serial number on the device (see page 4 for reference).

6. From the next screen verify the **aiming of the camera/s** and health of the **SD cards** and **TAP NEXT** if OK. If the camera needs to be adjusted, do so and TAP **TEST DVR** button to refresh the images. To zoom in on one of the camera’s views **TAP** on that camera’s image.
7. Enter the vehicle number and scan or hand enter the vehicle VIN on the lines above. Ensure that the correct camera configuration is selected and TAP PAIR.

8. If the DVR is successfully provisioned on the account DVR Paired successfully! will be displayed. If another DVR is to be provisioned click the YES button.
1. To remove and reinstall a DVR from one vehicle to another it must be first unpaired from the customer’s Pulse account. To do so log into DVR Tool Kit, scan the DVR serial number to be removed and select **DVR Options**.

2. **TAP UNPAIR** and follow the next prompt to complete. Use the **UPDATE** button to update the number of camera inputs used, if required. The **SWAP** button will be used to swap in a replacement DVR.
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
  - Power Plug (DC IN)
  - Camera Y-Cable
  - Antenna Port (LTE)
- Required per Trimble Hardware Warranty
### LED Status Definitions

<table>
<thead>
<tr>
<th>LED Status</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PWR LED – RED</strong></td>
<td><strong>OFF</strong></td>
</tr>
<tr>
<td><strong>LED Status</strong></td>
<td><strong>Device in sleep mode</strong></td>
</tr>
<tr>
<td></td>
<td><strong>ON Solid - GOOD</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Device powered on</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Flashing</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Device powering on</strong></td>
</tr>
<tr>
<td><strong>RUN – Green</strong></td>
<td><strong>OFF</strong></td>
</tr>
<tr>
<td><strong>LED Status</strong></td>
<td><strong>Device not powered on</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Flashing</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Camera not connected</strong></td>
</tr>
<tr>
<td><strong>CH1/CH2 LED – Green</strong></td>
<td><strong>OFF</strong></td>
</tr>
<tr>
<td><strong>LED Status</strong></td>
<td><strong>Camera connected DVR</strong></td>
</tr>
<tr>
<td></td>
<td><strong>ON Solid - GOOD</strong></td>
</tr>
<tr>
<td><strong>SD1/SD2 LED – Green</strong></td>
<td><strong>OFF</strong></td>
</tr>
<tr>
<td><strong>LED Status</strong></td>
<td><strong>SC Card installed in corresponding slot in</strong></td>
</tr>
<tr>
<td></td>
<td><strong>FLASHING/Solid - GOOD</strong></td>
</tr>
<tr>
<td><strong>LTE - GREEN</strong></td>
<td><strong>OFF</strong></td>
</tr>
<tr>
<td><strong>LED Status</strong></td>
<td><strong>device off or not registered</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Flashing</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Network found/connecting</strong></td>
</tr>
<tr>
<td></td>
<td><strong>ON Solid – GOOD</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Registered on Network</strong></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