Trimble DUO Installation Guide

March 21, 2018

DUO Components

These parts are required for a standard DUO install

DUO Fixed Mount			
DUO Stand Alone Kit M010-0637	**DUO Cable L016-0649**	**RAM Mount H-050-0013**	**Screw Packs**
			H-048-0523 RAM to DUO **H-048-0510 RAM to Vehicle**

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System Overview

DUO connected to Deutsch style connector
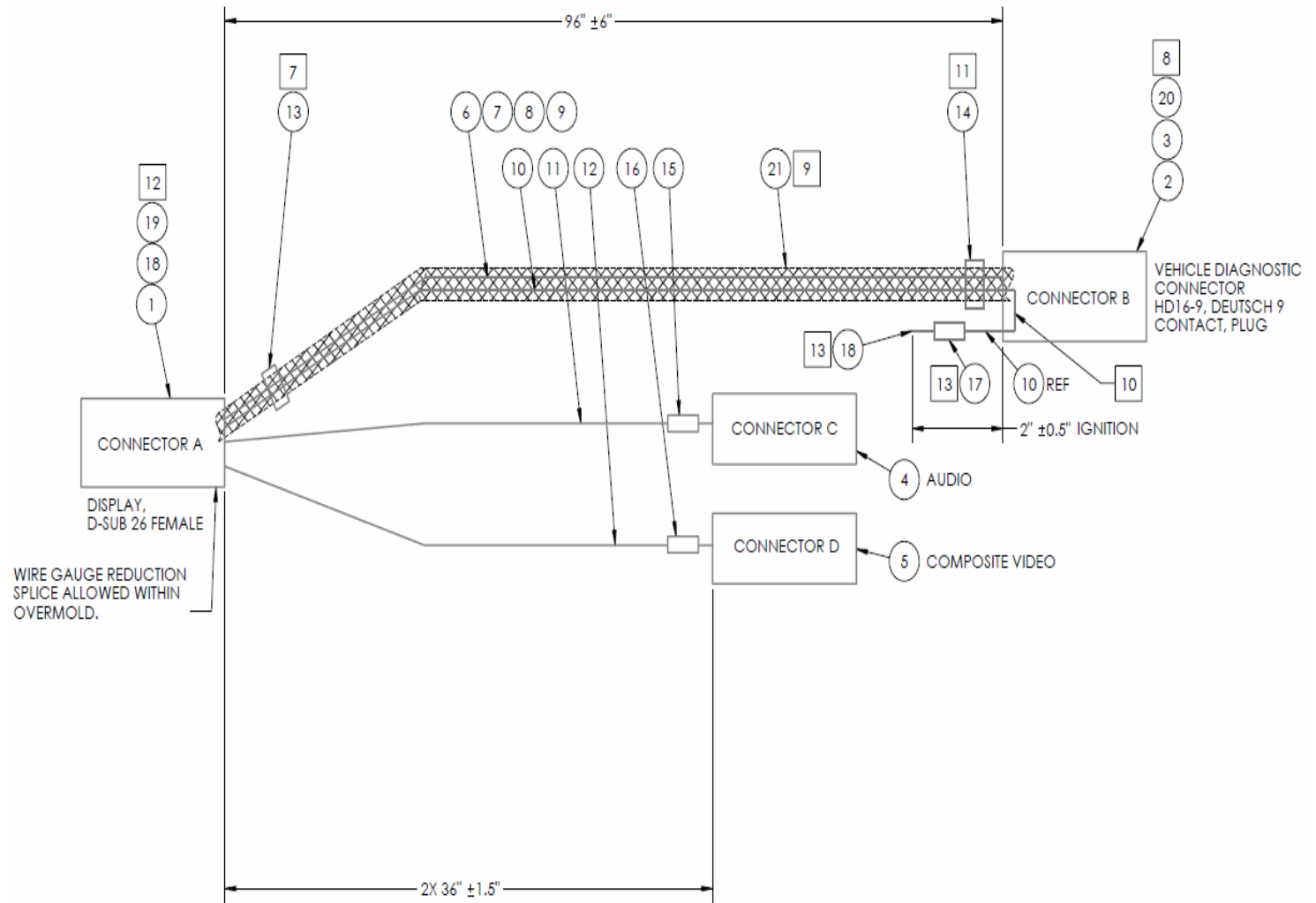
Function Summary

- The DUO Main Cable connects to the vehicle diagnostic plug. It works with both Black (pre-2016) and Green (2016-and-later) diagnostic connections
- From that connection, the DUO draws Power, Ground, and Engine Data
- The J1939 Engine Data is used for engine data tracking as well as the boot command on most vehicles
- Where the engine data boot command, called Wake-On-Can, is not available, the system will boot off the engine-start power fluctuations

- Where neither auto-boot option works, a white ignition sense lead is provided and can connect to the vehicle's ignition circuit to trigger boot
- The DUO uses the input power dip and loss of engine data when the engine is turned off to initiate its sleep timer. Once in sleep, the power draw is 2 milliamps
- The DUO case includes the GPS receiver for location data and the cellular modem and antenna for communications
- Antennas - Internal antennas for the various communications modules:
  - (1) Cellular modem
  - (2) Wi-Fi
  - (3) GPS
  - (4) Bluetooth
- Input power
  - Main input power to the Tduo Display connected to the vehicle battery
- Vehicle communication interface
  - J1939 (CAN 2), 250 and 500Kbit/sec communication interfaces
- High speed USB 2.0 ports
- Micro SIM card slot
  - 1 3FF SIM card slot for the LTE cellular modem
- SDIO card slot –
  - 1 full SDIO card slot for SDXC memory cards.
- Wireless communication interfaces:
  - Bluetooth w/ BLE 4.2 (Bluetooth Low Energy) – minimum requirement.
  - LTE cellular modem with GPS.
  - Wi-Fi networking with hotspot support.
- Ambient Light Sensor
- Video Inputs
  - 1 composite CVBS video camera inputs with maximum D1 (720 x 480) resolution.
- Internal forward-facing speaker
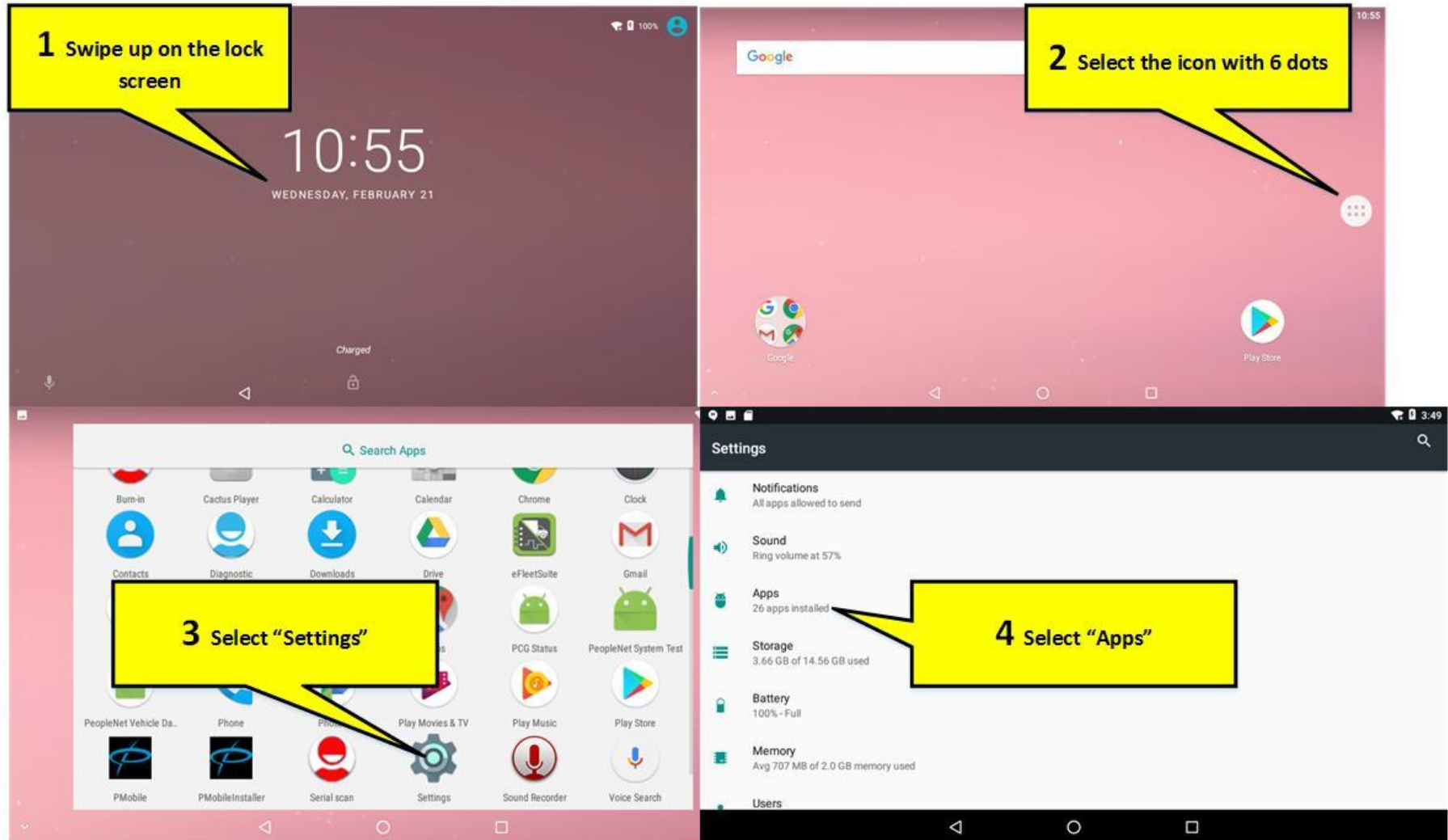- Integrated microphone on the front of the unit

Standard Installation Steps

1. Turn the vehicle OFF
2. Note the DUO DSN number. This number will be needed later
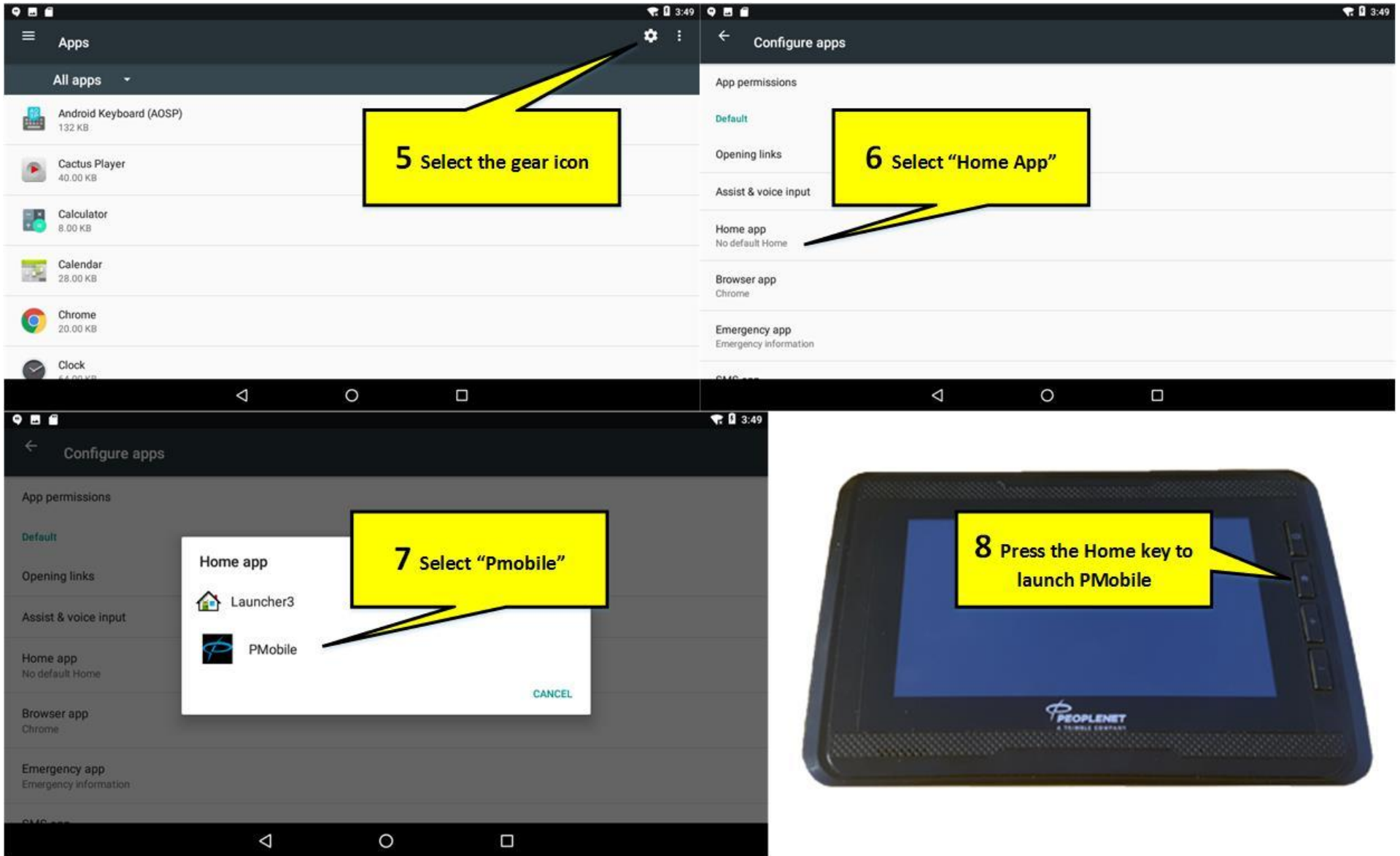3. Identify a location on the dash where the display can mount.

3.1.   The location should be sturdy enough to support the DUO over time. Metal is preferable. If mounting to plastic, always use bolts with a backing plate or large washers

3.2.   The location should be within easy reach of the driver

3.3.   The location should be within the driver's sightlines but must not infringe on the view over the dash

3.4.   The location must not interfere with access to, or safe operation of, any cab controls

4. Mount one RAM mount base to the vehicle and attach the other base to the display using the provided screws

5. Attach the RAM swivel arm, angle the display so it faces the driver, then tighten the arm

6. Route the cable into the dash, making sure to avoid pinch or wear points

6.1.   NOTE: The Video and Audio connectors will not be used on most installs. Secure them in the dash

6.2.   Connect the DUO Main Cable to the DUO, tighten the thumb screws, making sure the pins seat squarely and the thumb screws are evenly tightened

7. Connect the DUO Main Cable diagnostic connector to the vehicle diagnostic plug

8. Install ELD stickers.

9. Turn the vehicle ignition ON and verify the device boots

9.1.   If it does not boot automatically, press the power button on the top/right of the face

9.2.   The Power button is also a battery charge indicator, with Solid Green indicating Charging, Solid Blue indicating the device is booted but not charging (as when it is unplugged), and Blinking Green indicating an issue with the battery or imminent loss of battery power

10.   NOTE: PeopleNet recommended connection recommendations can be found on the PeopleNet Online Support Center http://peoplenet.custhelp.com/

Setting PeopleNet "PMobile" to Default

The DUO will arrive without PeopleNet as the default boot mode. Follow these steps to set it so PMobile boots automatically on future starts.


1 Swipe up on the lock screen

2 Select the icon with 6 dots

3 Select "Settings"

4 Select "Apps"

Setting PeopleNet "PMobile" to Default

5 Select the gear icon

6 Select "Home App"

7 Select "Pmobile"

**8** Press the Home key to launch PMobile

Pairing/Initialization Procedure

- When PMobile boots for the first time, it will indicate that it needs an installation.
  - If your DUO (PeopleNet Connected Tablet) is already paired to a PMG (PeopleNet Mobile Gateway) or DUO (PeopleNet Mobile Gateway) which we will refer to as an OBC (On Board Computer)
  - You can manually start the installation process by going to default home -> settings -> information -> admin -> password 9238 -> installation.
- Enter "9238" for the admin password, and click "OK".
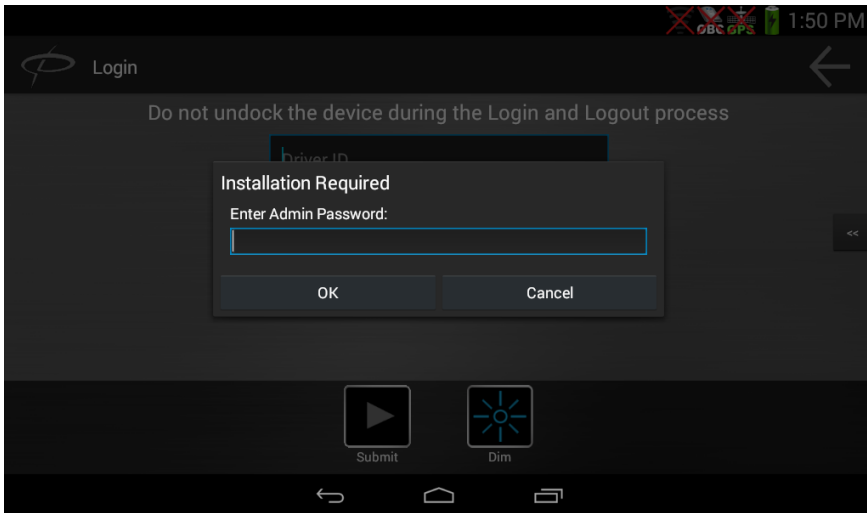
- You will be prompted to enter the DSN (Device Serial Number) of the OBC. The serial number is on a white sticker above the power LED.
  - The serial number starts with a 1 and is 8 digits long. Example: 11000682
- Enter the serial number of your OBC and click "OK".
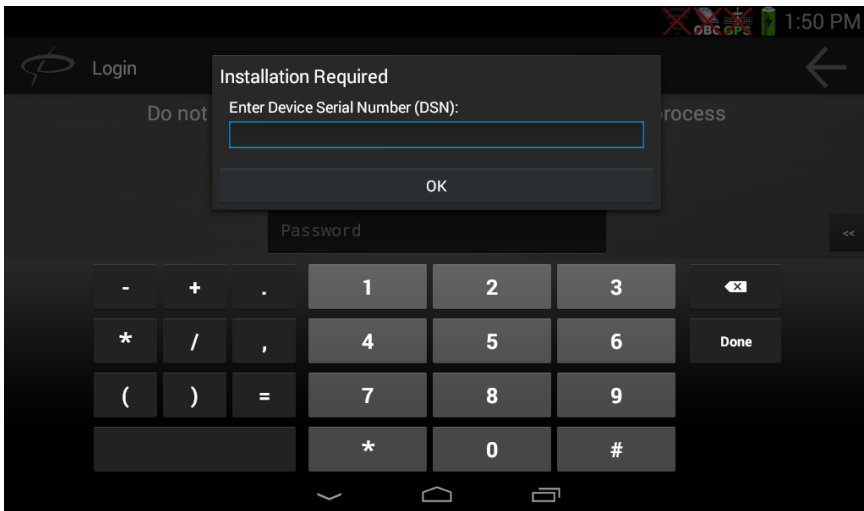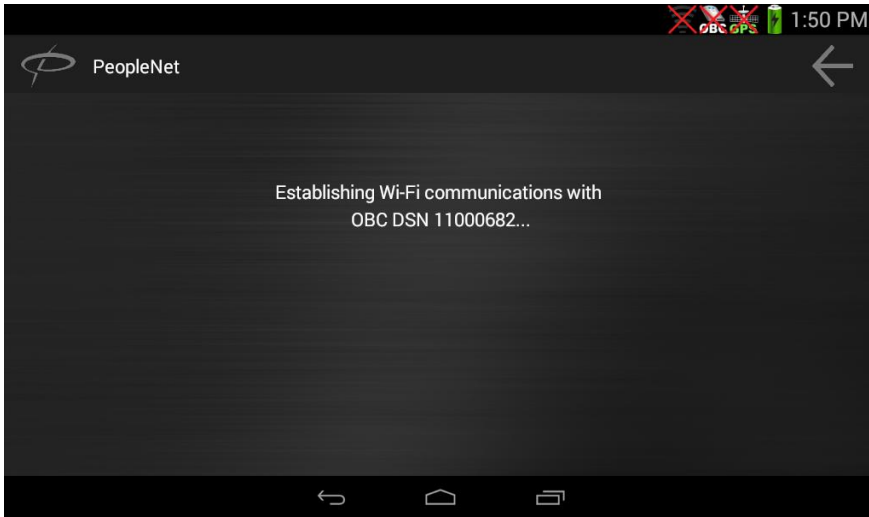
- The DUO will attempt to connect to the Wi-Fi network of the DSN you entered.
    - If establishing the connection fails, verify the OBC is on and that the correct DSN was entered.
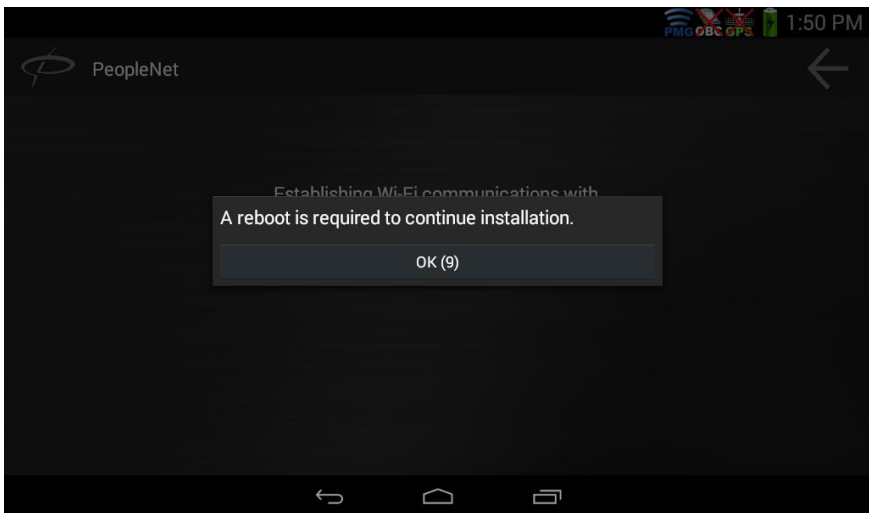
- If this is the first time your DUO has connected to a OBC, it will need to modify a setting.
    - This setting allows the the DUO to communicate with the OBC properly
- Click "OK" or let the timer expire.
- This will cause your PMobile software to reboot and use the new setting.

- Due to the reboot and the install not being complete yet, you will be prompted to complete an installation again.
- Re-enter your OBC's DSN and click "OK"

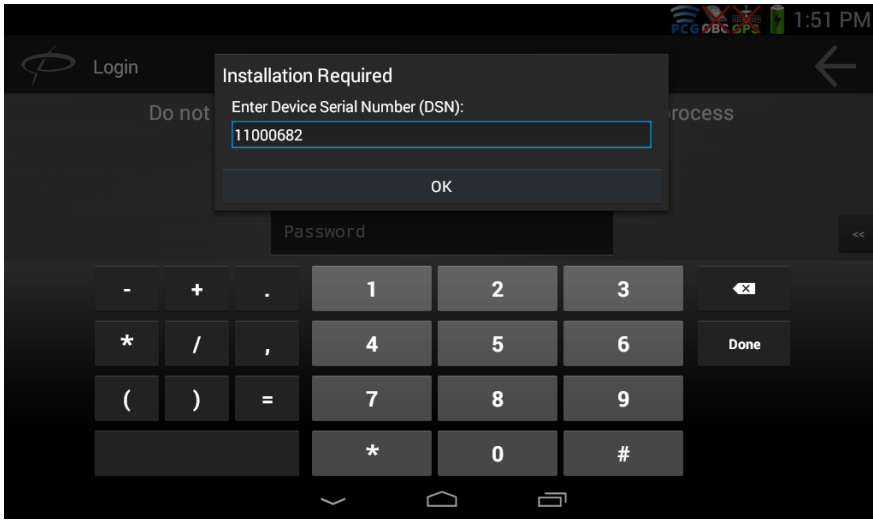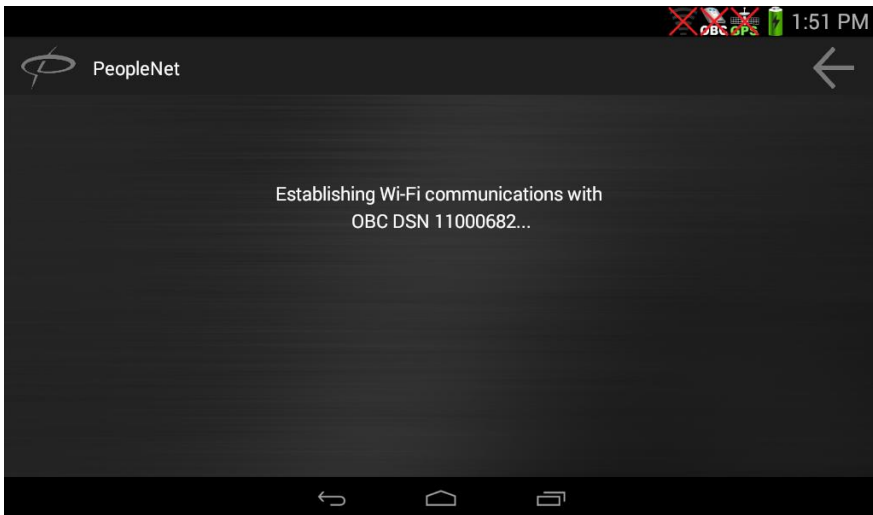- The DUO will attempt to do the same process as before; and attempt to connect to the Wi-Fi network of the DSN you entered.
  - If it fails, verify the OBC is on and that the correct DSN was entered.

DUO Installation Only
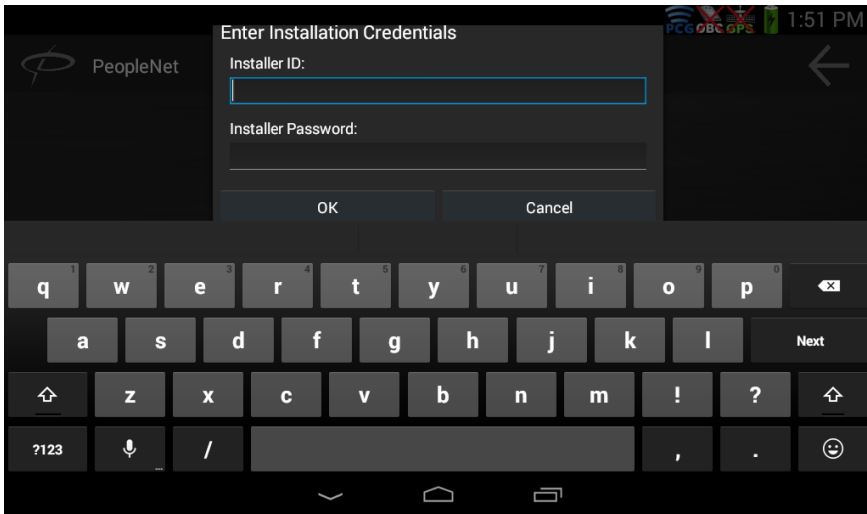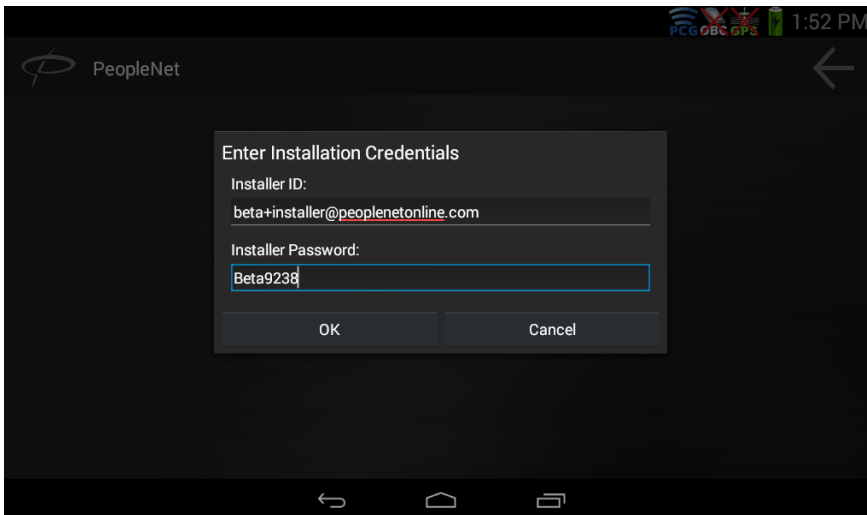- Once the wifi network is established, you will be prompted to enter your "Installation Credentials".
  - This is a new prompt unique to the DUO/DUO pairing process.
  - The installation credentials are on the next screen.

DUO Installation Only
- In the Installer ID field enter: Your Installer ID
- In the Installer Password enter: Your Installer Password
- **If you do not have an installer ID/Password please reach out to your system administrator**
- Click "OK"
- The step is very important, as it allows the DUO to talk to the DUO and Enterprise (back-end). It creates a trust relationship and a certificate held by the DUO.
- There are a number of potential error messages depending on how far the DUO gets into the process
  - If you encounter an error message, verify that the installation credentials were typed correctly
  - If the installation credentials are correct, try rebooting the DUO and the DUO. The most common issue is the DUO or DUO is unable to talk to the back-end, and rebooting will cause the DUO to reinitialize its modem and re-register with the cellular network.
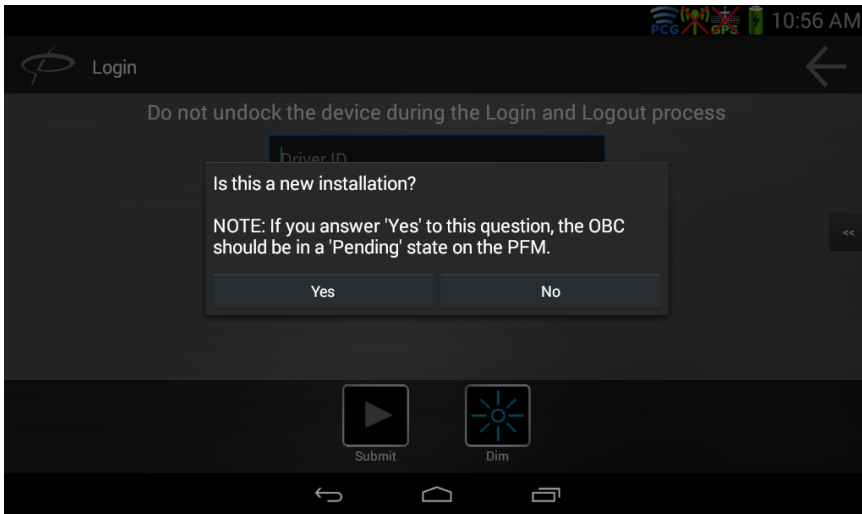
- After getting past the installer credentials, the installation process is identical to how it used to be
- You will be asked if this is a "new installation"
  - If the OBC is in a pending state (the OBCs will be shipped in this state) in the PFM (PeopleNet Fleet Manager) and you are going to give it a new truck number, then click "yes" this is a new installation
  - If the OBC is already in an activated state or you want to give a pending OBC an already existing truck number, then click "no" this is not a new installation

- If you selected "yes" this is a new installation, you will be prompted with InstallerID and Vehicle ID fields (you will not see the Old DSN field like you see in the screenshot).
  - Enter your Installer ID. This installer ID will not be the same as the installation credentials, and only digits are allowed in this field. If you do not have an installer ID, enter a number that will differentiate you from other installers in your fleet (the Installer ID used at this screen is recorded in the PFM, it has no impact on your ability to complete an install).
  - Enter the Vehicle Number you would like assigned to this device (it will be the vehicle number you use in the PFM to lookup this device)
  - Click "Submit"
- If you selected, "no", this is not a new installation, you will be prompted with InstallerID, Vehicle ID, and Old DSN fields (same as the screenshot).
  - Enter the Installer ID and Vehicle ID as noted above
  - Enter "Old DSN" only if you are swapping the PMG/DUO module in this vehicle
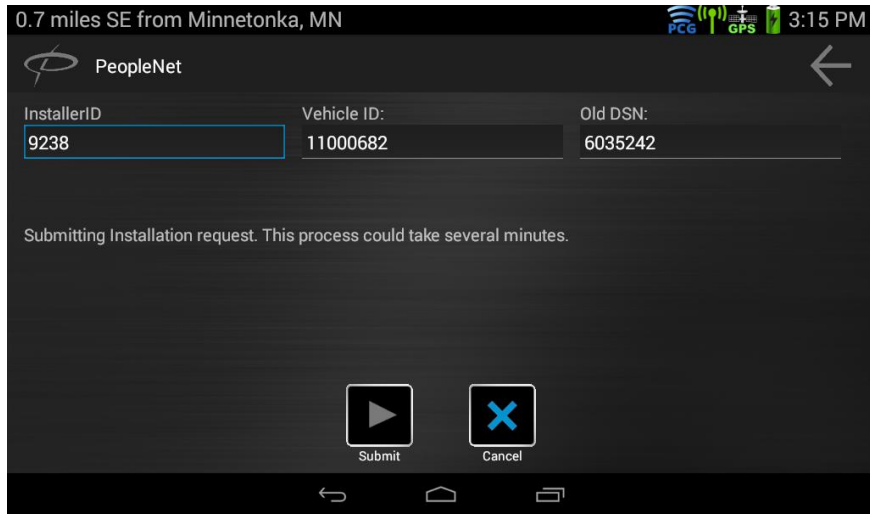
- After clicking "Submit" you will see "Submitting Installation request. This process could take several minutes" and the Submit button will be grayed out.
  - If you get an error code at this part and you clicked "yes, this is a new installation", verify that the truck number you're trying to use is not already in use, and you should have selected "no, this is not a new installation".
  - If you get an error code at this part and you clicked "no, this is not a new installation", verify that the truck number used does already exist, and the correct DSN was entered into the Old DSN field.

- Once you see "Installing Data Store, Activation nearly complete," your installation request was accepted by the PFM and has gone through.

- You will then be prompted with "Activating Device". This means that the DUO is loading settings from the PFM.
  - Event Journal Service and Mail Message Manager will start off as "Activating"
  - Once all the settings have been received, they will go from "Activating" to "Activated".
- PMobile software will then reboot and load to the Driver Login screen. At this point, your installation is complete.

Testing

Once the DUO boots, a full test is recommended. Follow the steps below to confirm function.

First, login to the device. If you do not have a Driver ID/Password, contact your system administrator for a test ID.

Once logged in, verify the following:

- ☐ Go to System✧OBC Diagnostic✧Diagnostic Basic and verify:
  - o GPS=**3D**   Indicates the GPS is currently reading. This may not show if the vehicle is indoors.
  - o Cell Strength is **>2**   Indicates relative cell signal strength on a scale of 0-7.
- ☐ Go to System✧OBC Diagnostic✧Diagnostic Device and verify:
  - o Ignition reads **ON** when the vehicle key is on and **OFF** when the key is off and **OFF** in accessory.
- ☐ With the key ON, go to System✧OBC Diagnostic✧Diagnostic PerformX and verify:
  - o **RPM** matches engine
  - o **Odometer Type: ECM** and **Odo:** matches dash
  - o **FUEL TYPE = ECM** and **FUEL: >0 gallons**
- ☐ Confirm the Display Power button LED is green, indicating charging
  - o Disconnect the DUO from the cable and verify the LED turns to Blue and the display remains powered up
- ☐ NOTE: A fully charged battery will supply power for roughly 15 minutes, though a new unit may not have a full charge

Hard Reboot Button

A hard reboot button is available under the top access panel on the display's right side. Press the button to reset the internal power management controller IF depressing the power button for ~5 seconds doesn't power down the DUO.

Reset Button
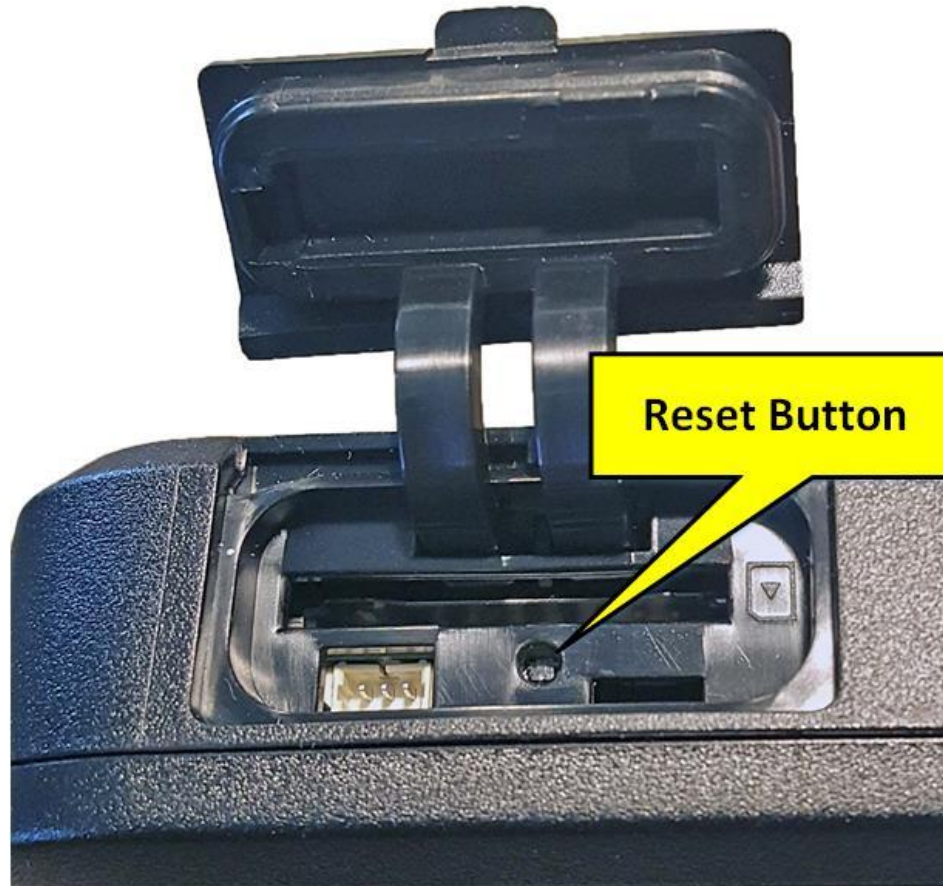
Cable Pin-Out

This DB-26 pin-out can aid in troubleshooting if the display fails to boot

Pin #	Signal	Type	Description
1	CAN2_LO	TP I/O	CAN2 Interface Low (future)
2	J1939_LO	TP I/O	J1939 Interface Low
3	CH_GND	Ground	Vehicle Ground Return (1A)
4	Reserve	-	-
5	VIDEO_IN	Input	Video in, "CVBS"
6	VIDEO_GND	Ground	Video "CVBS Ground

CONNECTOR A
VIEW FROM MATING SIDE OF D-SUB
26 WITH SOCKET CONTACTS
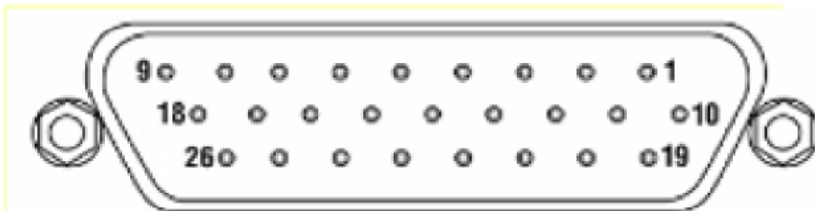
7	IGNITION	Power_in	Ignition
8	CH_GND	Ground	Vehicle Ground Return (1A)
9	BATT+	Power_in	Unswitched power input
10	CAN2_HI	TP I/O	CAN2 Interface High (future)
11	J1939_HI	TP I/O	J1939 Interface High
12	Reserve	-	-
13	Reserve	-	-
14	Reserve	-	-

15	Reserve	-	-
16	Reserve	-	-
17	Reserve	-	-
18	CH_GND	Ground	Vehicle Ground Return (1A)
19	J1939_GND	Ground	Shield Ground for J1939-11
20	Reserve	-	-
21	DBG_RX	Receive -	Debug Receive -
22	DBG_TX	Transmit +	Debug Transmit +
23	Reserve (DGND)	Ground	Debug port &Digital Ground
24	AUDIO_GND	Ground	Audio Ground
25	AUDIO_OUT_R	Audio	Audio output
26	AUDIO_OUT_L	Audio	Audio output

Federal Communication Commission Interference Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that
- to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution:

- Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
- This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.