Service Bulletin

Bulletin No.: 24-NA-239
Date: October, 2024

INFORMATION

Subject: Information on Use of PicoScope for Noise Isolation and Diagnosis

Brand:	Model:	Model Year:		Build Date:		Engine:	Transmission:
		from	to	from	to		
Buick	Enclave	2020	2025				
	Encore		2022				
	Encore GX		2025				
	Envision						
	Envista	2024					
Cadillac	CT4	2020	2025				
	CT5						
	CT6		2020				
	Escalade Models		2025				
	XT4						
	XT5						
	XT6						
Chevrolet	Blazer	2020	2025				
	Camaro		2024				
	Colorado		2025				
	Corvette						
	Equinox						
	Express						
	Silverado 1500		2021				
	Silverado 1500 LTD (RPO J21, VIN Digit 5 = W/Y)	2022	2022				
	Chevrolet Silverado 1500 - New (RPO J22, VIN Digit 5 = A/D)						
	Silverado 1500	2023	2025				
	Silverado 2500HD/ 3500HD	2020	2025				
	Suburban						
	Tahoe						
	Traverse						
GMC	Acadia	2020	2025				
	Canyon						
	Savanna						

Brand:	Model:	Model Year:		Build Date:		Engine:	Transmission:
		from	to	from	to		
	Sierra 1500		2021				
	Sierra 1500 - Limited (RPO J21, VIN Digit 5 = 8/9)	2022	2022				
	Sierra 1500 - New (RPO J22, VIN Digit 5 = H/U)						
	Sierra 1500	2023	2025				
	Sierra 2500HD/ 3500HD	2020					
	Terrain						
	Yukon Models						

Involved Region or Country	North America, Israel, Argentina (Mercosur), Brazil (Mercosur), Bolivia (West), Chile (West), Colombia (West), Ecuador (West), Paraguay (West), Peru (West), Uruguay (West), Venezuela (West), Japan, Cadillac Korea (South Korea), GM Korea Company
Condition	Some customers may comment on noise from vehicle.
Information	Some vehicle noises are difficult to pinpoint or locate, the PicoScope can be used to help narrow down the sources of noise. Use the PicoScope to help isolate noises using the accelerometer as a microphone for structure-borne noise and the use of the microphone for airborne noise. Demonstrate to the dealer how to diagnose noises using the PicoScope accelerometer configured as a microphone. This device will pick up almost any structure-borne noise or vibration and will allow it to be closely analyzed in a recording. The PowerPoint shows the process where we set up the PicoScope for noise recording rather than vibration using an accelerometer as a microphone for structure-borne noise. When we are trying to isolate airborne noise, we will be using the Pico TA144 microphone and using the same setup procedure. The document attached also has guidelines for when and how to record sounds using a smartphone for review by Engineering and gives tips to get a higher-quality recording.
Correction	Use PicoScope and the PicoLog application to help identify and isolate intermittent draws.

Important: Service agents must comply with all International, Federal, State, Provincial, and/or Local laws applicable to the activities it performs under this bulletin, including but not limited to handling, deploying, preparing, classifying, packaging, marking, labeling, and shipping dangerous goods. In the event of a conflict between the procedures set forth in this bulletin and the laws that apply to your dealership, you must follow those applicable laws.

Determine where the noise/vibration is coming from.

1. Get in the driver's seat and start the vehicle.
2. Determine if the complaint can be heard or felt from inside the vehicle. If not, determine if it can be heard or felt from under the hood.
   - Heard from driver's seat: Take a phone/audio recording from the driver's seat, along with engine speed (RPM), and vehicle speed. Send the recording to the assigned TAC representative or FSE.
   - Felt through steering wheel or seat: Proceed with using a PicoScope accelerometer to collect data. AS AN ACCEL NOT A MIC (used on seat track).
   - Heard from under the hood or outside the vehicle: Take a phone/audio recording where the noise is the loudest.

Note: If accelerometer is setup as a microphone, only channel B on PicoScope will be actively collecting data.

- Felt under the hood: Proceed with using a PicoScope accelerometer to collect data. AS A MIC.

Note: For best results using cell phone video/audio recordings, please refer to helpful guidelines outlined and the end of the guide or click HERE to be taken directly there.

Verify and if needed download the latest PicoScope NVH software.

- Type in “GM Tools and Equipment” into your web browser and go to the respective website link.
- Click on “Software Downloads” and scroll to the PicoScope NV Tool section.
- If a download is required, click on the latest software update link, and follow the onscreen instructions to download the software

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Note: Two versions of PicoScope will download automatically; GM NVH will be most commonly used.

- (1) GM NVH
- (2) PicoScope for GM

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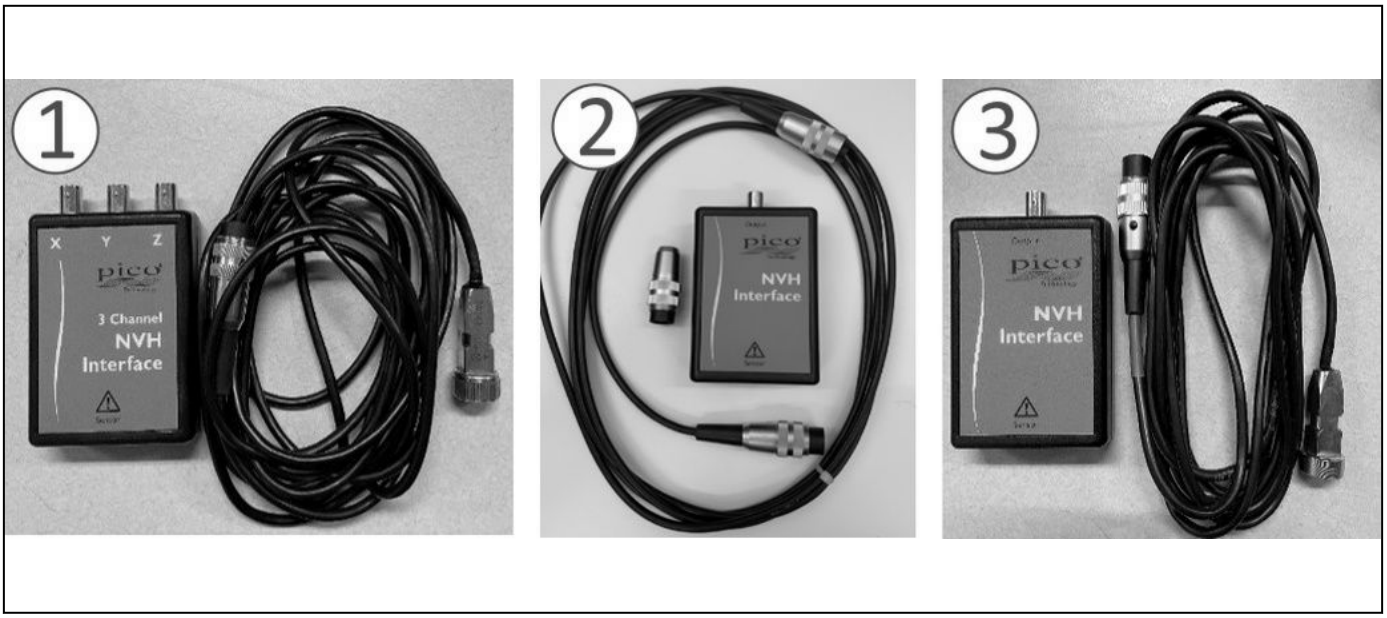
Set-Up for Vibration and/or Microphone Pico Readings

1. Accelerometer Setup:
   - Screw the accelerometer connector into the sensor interface. The red LED will start to blink when it senses the connection. If the sensor interface doesn't show a red light, the 3V battery in it may need to be replaced.
     - If you are using a tri-axis, three output accelerometer, attach a blue, red, and green BNC cable to X, Y, and Z ports respectively. Then attach the blue, red, and green cables to channels A, B, and C on the backside of the PicoScope.
     - If you are using a single axis, single output, accelerometer attach the output to the X port using any colored cable.
   - Common Locations for Accelerometers:
     - Interior- Drivers Front Outboard Seat Track Bolt (Large Hex)
     - Engine- Valve/Cam Cover Bolt, Oil Pan Bolt, Engine Block (Iron Block), Main Bearing Cross Bolt
     - Transmission- Transmission Mount Bolt, Transmission Bellhousing Bolt (Lower)
2. Microphone Setup:
   - Screw the microphone into the female end of the sensor extension cable and the male end into the NVH interface box. The red LED on the sensor interface box will start to blink when it senses the connection. If the sensor interface doesn't show a red light, the 3V battery in it may need to be replaced.
     - Connect the single axis NVH interface box to channel "B" on the PicoScope using any colored BNC cable.
   - Common Locations for Microphone:
     - Interior- Pico TA144 Microphone not recommended for interior sound measurements.
     - Engine- 0.5m or more away from noise source on engine, same relative location as ear.
     - Transmission- 0.5m away from bellhousing/exhaust (if stationary)



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- 1) Tri-Axis Accelerometer (TA-143)
- 2) Microphone (TA-144)
- 3) Single Axis Accelerometer (TA-183)

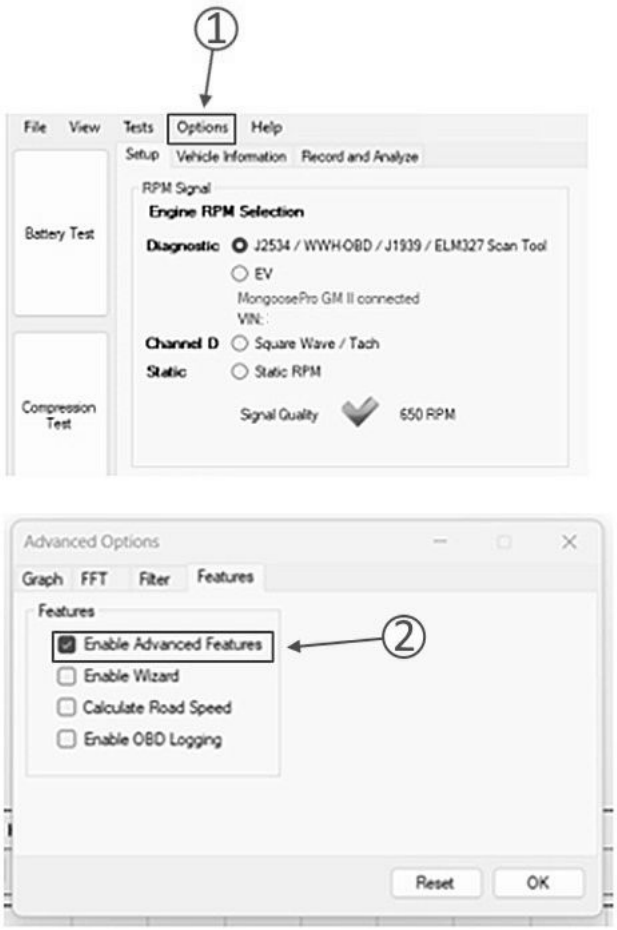
Software Setup

1. Setup the software to collect data:
   - Plug the PicoScope USB cable into the computer that's going to be used for recording.
   - Open the GM NVH software and click on the **NVH button**.
   - Start a new test with the setup wizard and follow steps.
   - For Using Vehicle CAN Data (Engine and Vehicle Speed).
     - Key on vehicle and connect either an MDI or J2534 (Mongoose) to the vehicle's OBD-II port.
     - Attach the MDI or a J2534 USB cable into the second USB port on the computer and wait for PicoScope to recognize/connect to vehicle. Vehicle VIN will appear once connected.

Note: If using a J2534 interface you may have a window open with a red "X" through a picture of a blue MDI box. Hit "Cancel" and continue to wait for the driver to connect. It may take several minutes to connect to the vehicle.

   - For Static/Stationary Testing Only (idle speed), the static rpm option can be used.
     - Continue through the setup wizard and configure the vehicle appropriately.
     - Select the interface that was plugged in and then the correct sensor type. Make sure the accelerometer and/or microphone is setup as the correct model and note location.
   - Go to the setup screen to finalize the wizard setup:

Note: For vibration, the device J2534 interface is required, so it must be set up and working before continuing to the Tri-Axis Accelerometer Setup section.



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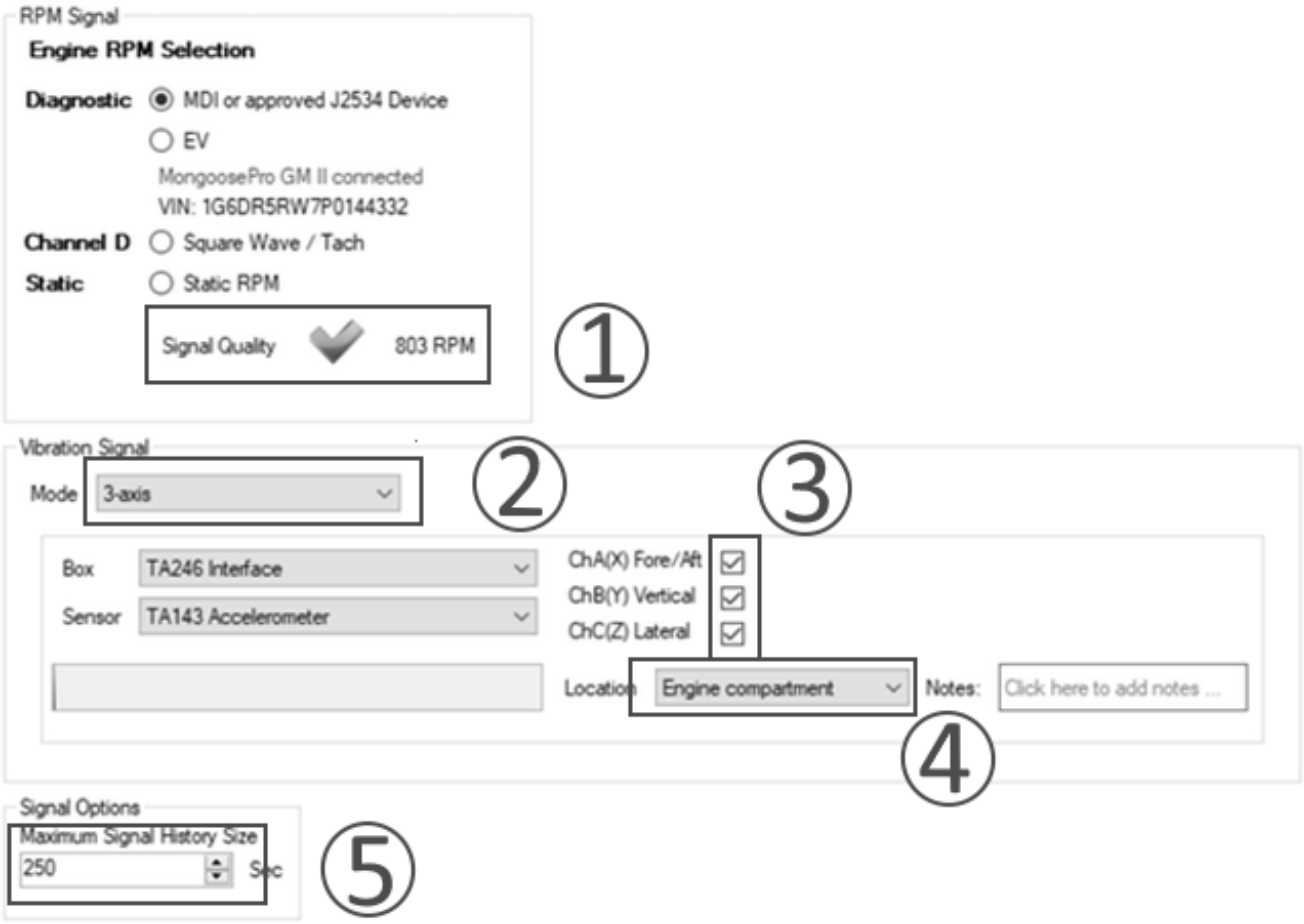
1. Select the Options tab.
2. Select the Enable Advanced Features box.



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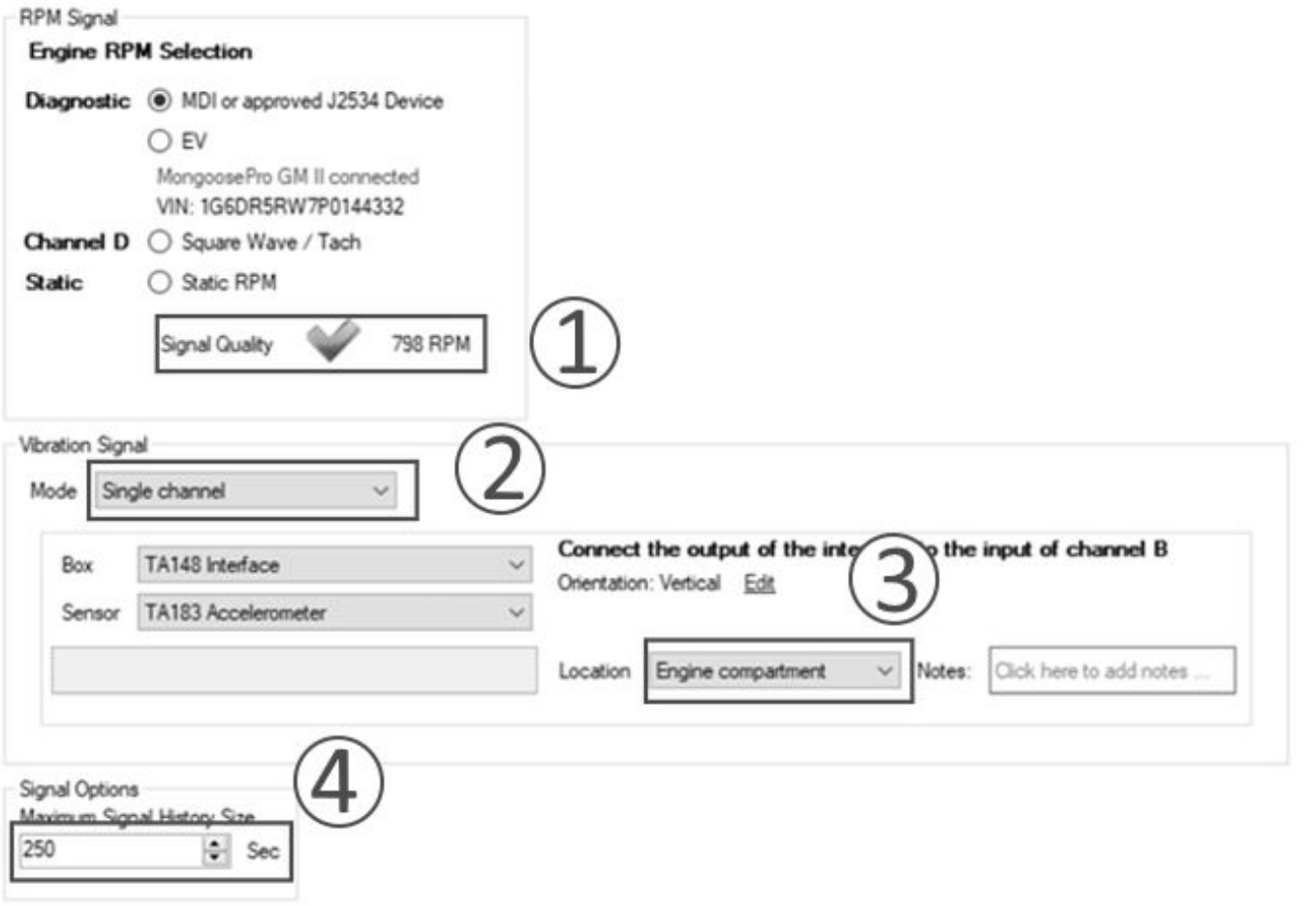
Tri-Axis Accelerometer Setup:

1. Verify that the RPM signal is displaying the correct value.
2. Verify the mode is set to 3-axis.
3. Verify that all the channels are selected
4. Verify that the location is set to where the accelerometer was placed:
   - If it is in the vehicle, set as passenger compartment.
   - If it is under the hood, set as engine compartment.
5. Set the signal history to 250 seconds (Default is 50 seconds).



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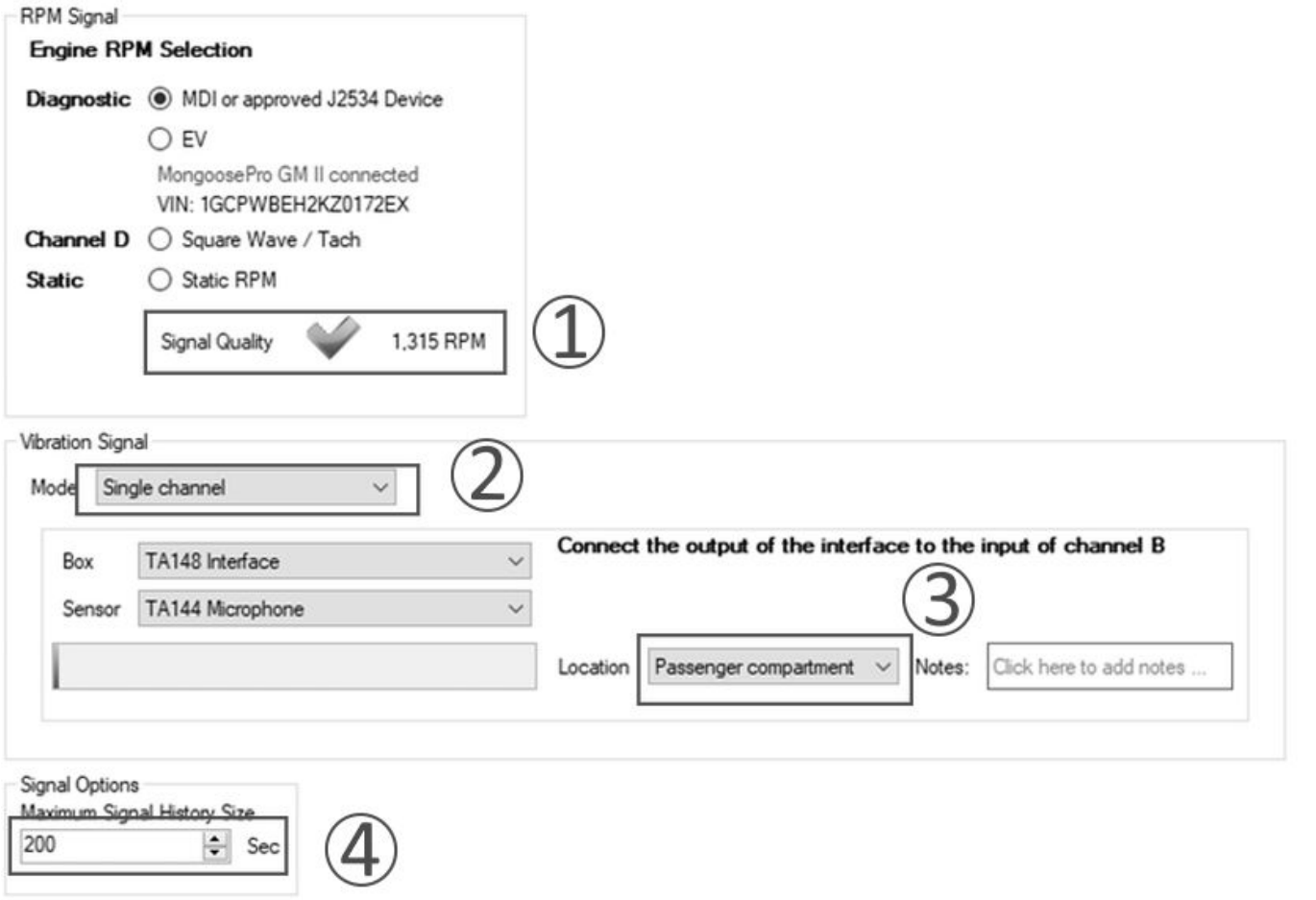
Single-Axis Accelerometer Setup:

1. Verify that the RPM signal is displaying the correct value.
2. Verify that the mode is set to Single channel.
3. Change the orientation to match the placement of the accelerometer if needed.
4. Verify that the location is set to where the accelerometer was placed:
   - If it is in the vehicle, set as passenger compartment.
   - If it is under the hood, set as engine compartment.

Signal Quality Check:

- The **Vibration Signal** on the Setup tab includes a **Signal Quality** bar. The green signal quality bar is a visual indication the software is receiving a signal from the accelerometer. Verify the accelerometer has a response by tapping on (or next to) the accelerometer, the green bar should move respectively.



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Microphone Setup:

1. Verify that the RPM signal is displaying the correct value.
2. Verify that the mode is set to Single channel.
3. Check that the location is set to where the microphone was placed.
4. Set the signal history to 250 seconds (Default is 50 seconds).

Signal Quality Check:

- The **Microphone Signal** on the Setup tab includes a **Signal Quality** bar. The green signal quality bar is a visual indication the software is receiving a signal from the microphone. Verify the microphone has a response by speaking into or clapping next to the microphone, the green bar should move respectively.

Note: After completing the set-up wizard, it will redirect to the Record and Analyze tab. In the middle right of the Record and Analyze tab, there will be a **Details** button. Clicking on the **Details** button will bring up a new window where notes can be recorded. Enter specific details regarding accelerometer/microphone location along with any other important details regarding the test set-up.

Recording Data:

- Verify noise/vibration can be reproduce before recording.
- To Start recording, click on the **Start Recording** button in the lower left of the Record and Analyze Tab.
- Once finished testing, click on the **Stop Recording** button in the lower left of the Record and Analyze Tab.

Note: To reset current capture and clear any previously unsaved recorded data, click on the **Reset Current Capture** arrow that's to the right of the recording button.

- After finishing the recording, click file and select save. Click OK on the details box as this input is optional and save as a .pddata.
- Create an e-mail to TACSNAPSHOT@gm.com in the U.S. and TACSNAPSHOTCANADA@gm.com in Canada and in the subject line Put Vibration, your BAC, and last 8 of the VIN.

Helpful Guidelines for Audio/Video Recordings
Note: The Following Applies to Smart Phones Only.

Important Notes:

- Microphones are typically located at the bottom of the phone, where you speak, and by the cameras. It's important to try and keep the microphones free and clear of any obstructions such as fingers/hands while making the recording(s).
- Unless specified that noise is only heard with windows down only, ensure windows are rolled up, HVAC blower is off along with radio volume turned down to zero or off completely.
- *For Audio Recordings*, make note of location of phone and speed of engine at time of recording.
- For Video Recordings, capture engine speed, vehicle speed along, and current gear (if possible).

Maximizing Sound Quality for Audio Recordings (Settings):

- **Android Users:** Recommend downloading Wav.Editor in the Google Play Store since default phone audio settings vary by phone manufacture (.WAV is ideal).
- **Apple/iOS Users:** Go to Settings > Voice Memos > Audio Quality > Select Lossless.

Maximizing Sound Quality for Video Recordings (Settings):

- **Android Users:** Default newer phones will record video in high quality .MP4 format. Some older model phones that predate 5G phones (3G and 4G) may have default to lower quality compressed video format (.3GP). Verify video settings are correct first open camera app > switch to video mode > tap on recording settings > video size/ resolution > Full HD (1920x1080).
- **Apple/iOS Users:** By default, videos recorded by iPhones are high quality .MOV format (H.264).

Version	1
Modified	Released October 28, 2024