DAWN OBD Inspector™
Clean Truck Check - User's Guide
CARB Approved Version
HEM Data Corporation
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Table of Contents

1. The California Heavy-Duty Inspection and Maintenance Program

The California Air Resources Board (CARB) has developed an inspection and maintenance program (Clean Truck Check) to ensure that heavy-duty vehicle emission control systems function properly and that emissions remain low throughout their operating life. The Clean Truck Check (CTC) program applies to nearly all diesel and alternative fuel vehicles with a gross vehicle weight rating (GVWR) of over 14,000 pounds (Class 4-8), including all out-of-state and out-of-country vehicles. Vehicles that are model year 2013 and newer diesel engines, and model year 2018 and newer alternative fuel engines, are required to submit On-Board Diagnostic (OBD) data.

Data is acquired using the vehicle's OBD system to determine whether a vehicle's emission control systems are functioning properly. HEM Data Corporation has developed DAWN OBD Inspector™ for use with the CARB Clean Truck Check. The test is typically completed in 2 minutes.

The data is sent to HEM Data's server where it is processed into the format required by CARB, encrypted, and transmitted to CARB. An email should come from CARB with pass/fail results within 5 minutes after submitting the test.

Interested Clean Truck Check personnel must successfully complete a free online training session from CARB. An approved tester will receive a Tester ID that is valid for 2 years. A Tester ID is required to use DAWN Inspector. See details of the Clean Truck Check program at https://ww2.arb.ca.gov/our-work/programs/heavy-duty-inspection-and-maintenance-program.

2. DAWN OBD Inspector™ Components

The DAWN OBD Inspector consists of three components
- **CAN Mini Streamer™** hardware (dongle)
- **DAWN Inspector™ - CARB Approved** software
- **iPad or iPhone** (provided by the user)

3. CAN Mini Streamer Hardware

HEM Data's CAN Mini Streamer™ sends the vehicle data to the DAWN Inspector app. The Mini Streamer hardware conveniently fits directly on the vehicle's 9-pin J1939 connector. If the vehicle has the 16-pin J1962 connector (light-duty automobile style trapezoidal connector), then an adapter is used. Protocol speeds CAN250, CAN500, and CAN1000 are automatically detected.
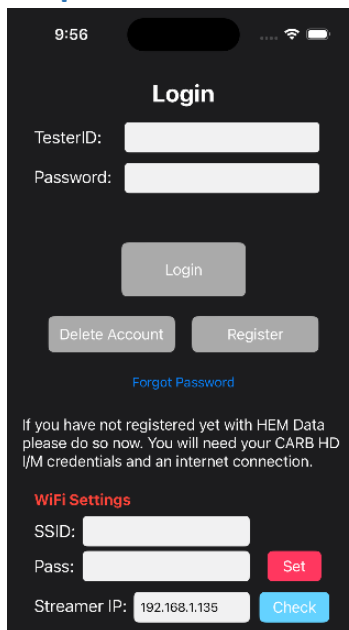

CAN Mini Streamer™

4. DAWN Inspector™ Software

The DAWN Inspector™ app runs on iOS devices, specifically an iPhone/iPad (iOS version 12.5 or newer), or Mac (with the M1 processor or newer). The app is available on the Apple App Store as a free app (the icon will be show as "DAWN CTC" after downloading). The app receives the data from the Mini Streamer hardware using WiFi. (WiFi is faster and more reliable than Bluetooth). The app displays real-time information to the user as the test is progressing. CARB requires that the app has an internet connection throughout the test. Link to Apple App Store: https://apps.apple.com/us/app/dawn-inspector-carb-approved/id6449002686.

The following is an overview for the required steps to acquire CTC data

- Register in DAWN OBD Inspector – Section 5

- Connect the Mini Streamer hardware to your iOS device – Section 6

- Connect to your WiFi hotspot (only if you don't have a cellular iOS device) – Section 7

- Start the test – Section 8

- Troubleshooting – Section 9
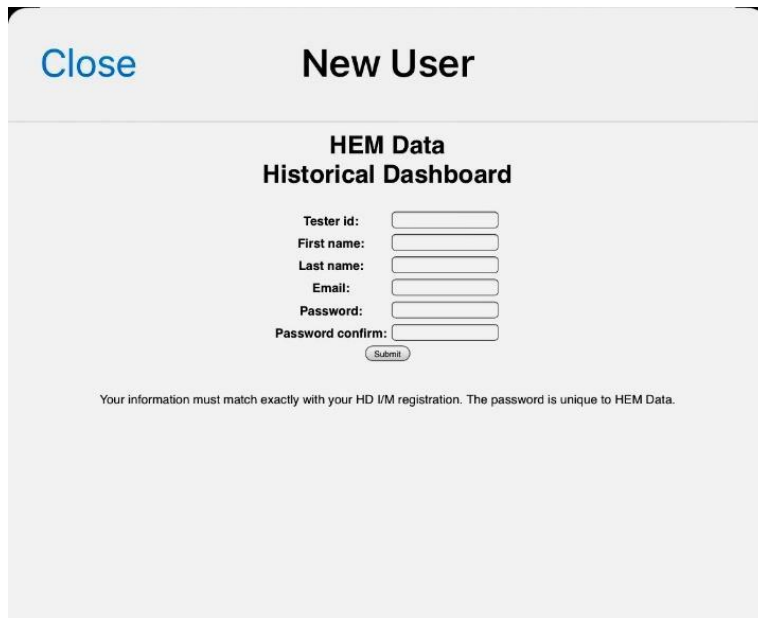
5. Registering in DAWN OBD Inspector™

Home Screen

When first using the app, you need to register. After clicking the Register button on the login screen, enter the same information you provided CARB:

- CARB Tester ID
- First and Last name
- Email address

**** It is critical that this information match what you provided to CARB when you received your Tester ID. *****

Registration Screen

Then enter a password that is unique to the DAWN OBD Inspector app. CARB has the following password requirements:

- At least 6 characters long
- Must contain at least one digit
- Must contain at least one lowercase letter
- Must contain at least one uppercase letter
- Must contain at least one special symbol

**** Please save your password in a place that is easy to recall.. *****
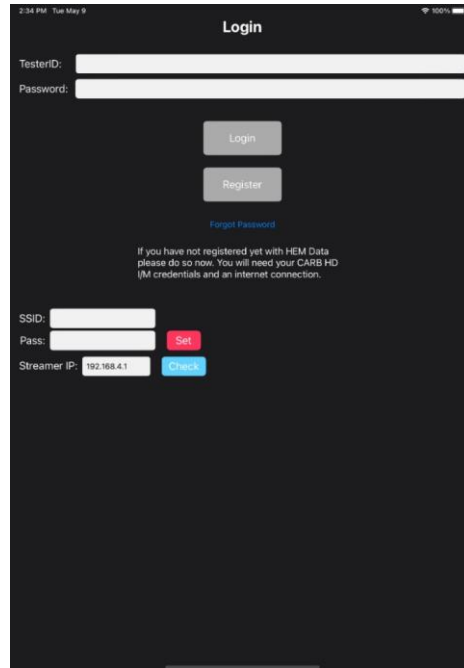
6. Setting Up the Mini Streamer Hardware

The following connects the Mini Streamer hardware to your iOS device using WiFi.

1) First plug the Streamer into the vehicle diagnostic port to power it. This will allow your iOS device to discover the Mini Streamer. If you are connecting to a 9-pin round vehicle connector, you may use the Y-cable or connect the Mini Streamer directly to the vehicle.
2) Go to Settings, WiFi on the iOS device. Select the SSID IOSiX ELD: XXXXXXXXXXXX where the 'X's will be some combination of hex characters.
3) Enter the password in all lowercase: deadbeef77

7. Connecting to a Hotspot (if needed)

CARB requires that there be internet access throughout the test. If you need to use a hotspot for internet access then keep reading this section. If your iOS device has built-in cellular service then continue to Section 8.

Login Screen

The following steps are necessary to connect both the Mini Streamer and iOS device to the router/hotspot simultaneously as a local network.

1) The WiFi router/hotspot you will be using must broadcast at 2.4GHz. The Mini Streamer is not compatible with the 5GHz signal. If the steps below do not work that is the most likely cause. If you are using a newer model Android hotspot, you can configure this in the phone settings.

2) Enter the **SSID** and **Password of your WiFi router/hotspot** as shown on the lower portion of the Login screen above. *This is the same information you would enter in the WiFi settings on your iOS device to connect to your internet hotspot. This SSID and password are unique to your hotspot and is <u>not related</u> to the connection made to the Mini Streamer in Section 6. The SSID or password may be long so be careful typing.*

3) Press the Set button. If the Streamer joined correctly, a new **Streamer IP** address will appear (that was assigned by your hotspot*). If the default IP address remains at 192.168.4.1, you know it was not updated. When the IP address is updated the text will change to a green color*.

4) If the Streamer IP disappears, try pressing the Check button. A response may take up to 10 seconds. If that does not work, double-check the SSID and password to your hotspot and try the Set button again.

5) Once the Streamer has joined the hotspot, **switch the iOS device to the WiFi hotspot** (to now have internet access). If you don't do this step you will receive an error message when you start the test that there is no internet connection.

8. Acquiring Clean Truck Check Data

8.1 Connecting to the vehicle

1) Turn the engine on. Plug the Mini Streamer into the vehicle diagnostics port if not already plugged in.
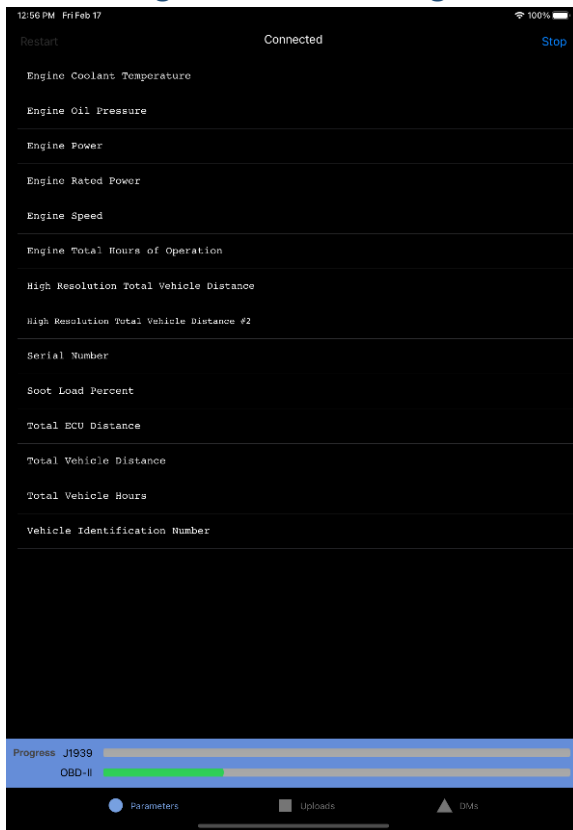
Using a <u>Cellular</u> iPhone/iPad with a direct connection to the Mini Logger:

2) Make sure the iPad/iPhone is connected to the Mini Streamer WiFi (Section 6).
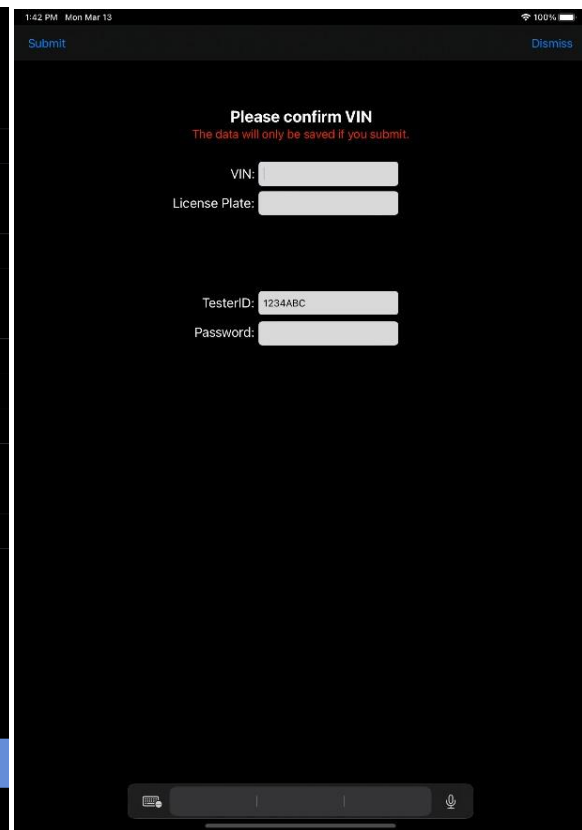
Using a <u>WiFi hotspot</u> for iPad/iPhone without cellular by creating a local network:

2) Make sure the iPad/iPhone is connected to the WiFi hotspot (Section 7.4).

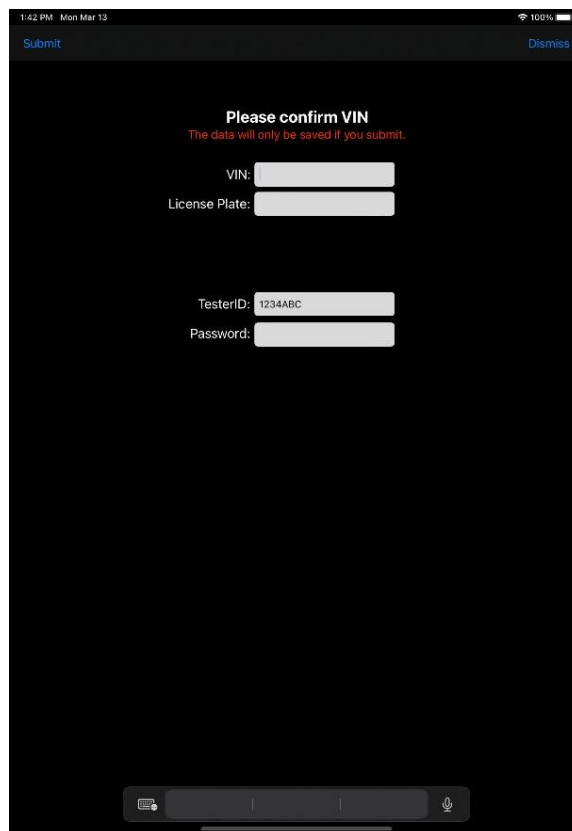### 8.2 Starting the test and taking the data

Parameters/Logging Screen　　　　　*VIN confirmation screen*

3) Open the app and log in using the Login screen. Use the Tester ID provided by CARB. *Don't use your name or email address. The password is the one you used to register when first using this app described in Section 5* (If you don't have an account with HEM Data, choose the Register button to create a new account as shown in Section 5.)

4) Make sure the engine is on. After clicking the Login button, and the app should automatically connect to the Mini Streamer. If it doesn't, see Section 9 for troubleshooting.

5) Once connected, a progress bar at the bottom will start to fill up. In general, only one progress bar will show up. Some vehicles contain both J1939 and OBD-II (J1979) data, so both progress bars will show. Once the required data is acquired, the test will stop automatically. The test is typically completed within 2 minutes. *The app must stay connected during the entire test to both the Mini Streamer and the internet.* The VIN confirmation screen will then appear.

VIN confirmation screen

The parameters are displayed to provide user feedback that data is being acquired. If you are having difficulty completing a test, refer to Section 9.

8.3 Finishing the test and uploading the data

6) You will be prompted to enter the VIN, License plate number and your login password. You may use a barcode reader app to scan the vehicle's VIN, and copy it into the DAWN app. You may want to do this prior to the test or when you are prompted for the VIN (do not leave the DAWN app while the data is being collected).

7) Press Submit on the upper left to save the results. The test will then be automatically uploaded. If the upload fails, you will have to run the test again as the data is not stored to the iOS device. CARB does not allow the user access to the acquired test data.

8) The app automatically switches to the **Uploads Tab** to show whether or not the test successfully made it to the CARB server. If successfully uploaded, the testing is now completed. The **Uploads Tab** selection is located at the bottom-center of the screen if you wish to display it manually. It will show all of the uploads done during the current session. Older uploads are not stored.

9) You should receive an email from CARB regarding test results within 5 minutes after submitting the test.

8.4 Buttons

The following buttons on the upper right and left are now described

1) **Restart** starts another test
2) **Stop** stops a test. Use this when you want to abort a test.
3) **Back** moves from the Parameters screen to the Login screen.
4) **Submit (test complete screen)** uploads the data to HEM Data's server to process the data and forward it to CARB's server. The test is now complete. You should receive an email from CARB within 5 minutes.
5) **Dismiss (test complete screen)** will abort the test and CARB will not receive any data.

9. Troubleshooting

9.1 For Cellular Devices

If the app is not connecting to the Mini Streamer, verify that the WiFi between the iOS device and Streamer is properly configured as outlined in Section 6. If there is still an issue, unplug the Streamer for a few seconds and then plug it back in while the vehicle ignition is on. Wait 20 seconds for the Mini Streamer to initialize.

9.2 For WiFi Hotspot Devices

If you have unpowered the Mini Streamer since a previous test, its IP may have changed. If the test does not start, connect back to the Streamer WiFi. Find the new IP address with the Check button, and then reconnect to the hotspot.

If you changed to a different hotspot, then enter its SSID and password as explained in Section 7.

9.3 Error message: No OBD data

Some vehicles have more than one diagnostic connector, for example Ford 650/750 models. Prior to 2016 they used Cummins engines and the 9-pin round connector. Starting in 2016, they used their own engine and the rectangular 16-pin connector. If you use the wrong connector, you will receive the error message: *No OBD data*.

9.4 DM24 Message

Test not complete *DM24 data is missing for an OBD compliant controller*. Consider trying the test again before submitting. There are four possible causes for this message:

1) The vehicle may be equipped with an engine that is too old for OBD testing in Clean Truck Check. The vehicles required to undergo OBD testing in Clean Truck Check are 2013 and newer model year diesel and diesel hybrid engines, and vehicles with 2018 and newer model year alternative fuel and alternative fuel hybrid engines.
2) There may be some communication interference that is preventing the data from being collected. Ensure that there are no other GPS/ELD/telematics devices installed with y-cable splitters during the test.
3) The wrong port was used. If the vehicle has both a 9-pin and a 16-pin connector, you may have chosen the wrong connector. If the engine is made by a car (Ford, GM) company, try the 16-pin connector first. If the engine is made by a heavy-duty engine manufacturer, such as Cummins or Detroit Diesel, try the 9-pin connector first.
4) The test did not finish properly. In this case, try the test again before submitting.

9.5 PACCAR Vehicles (No data gathered)

2017 PACCAR vehicles (Kenworth and Peterbilt) have the required data on the wrong pins, and a specific cable is needed to take the data. The problem was propagated into some 2018 and 2019 model year vehicles. There are several options when searching for a *PACCAR crossover cable* as shown with this link: https://www.amazon.com/Crossover-Diagnostic-Adapter-Connection-Replacement/dp/B0C6872KHV . The customer will need to purchase this cable if needed since HEM Data does not sell this cable.

9.6 Progress Bar Does Not Complete

If the J1979 progress bar stops near the end for more than 20 seconds, stop the test manually. All necessary data should be gathered. Submit the test normally.

10. Warranty

The warranty for the hardware and software support is one year. There is an annual renewal fee.

HEM Data warrants that the device is designed and built free from defects in materials and workmanship and remains functional for the warranty period. This applies to the purchaser and each subsequent purchaser during the warranty period. HEM Data ensures that the device is in compliance with Clean Truck Check and is functionally equivalent in all material respects to the product approved for device certification. HEM Data is liable only and up to the price paid for the product. Thank you for purchasing DAWN OBD Inspector™.

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