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## VDI Live Tuner

Revision 1.2

### **Parts Included, VDI Live Tuner:**

- VDI Live Tuner USB Interface (1)
- Male A to Mini A USB cable (1)



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**Time Required:**

- Less than an hour.

**Difficulty:**

- 1/10

**Supported Machines:**

- All Copperhead CDI/ECU's with compatible firmware

**Introduction:**

The Live Tuner is the most advanced engine tuning device available. In addition of allowing fuel and timing adjustments in real time, it also has the ability to log the actual EFI parameters used at the same time as the ECU is using them. This data can also be logged in conjunction with two analog inputs (O<sub>2</sub>, EGT, etc.) for ease of tuning. When used in conjunction with our free CopperheadEFI application, you have access to the most comprehensive tuning setup available today.

Several of the key features are:

- Upgrade maps in seconds.
- Firmware upgrades in approximately 30 seconds.
- Stores one map and one firmware file to allow updates without a computer at the machine.
- Reports ECU machine type as well as loaded firmware version.
- Reports current error codes in the ECU.
- Logs EFI data as well as two 0-5 Volt analog inputs (O<sub>2</sub>, EGT, etc.) to internal storage.
- Logged data is synchronized to the ECU operation to allow for easy map adjustments.
- Two storage modes. Standard and extended diagnostic mode.
- Stores approximately an hour of logged data during normal riding (storage dependant on log detail as well as engine RPM).
- Logging, firmware and map updates can be initiated via the pushbutton on the device.
- Log data can be downloaded and played back using the CopperheadEFI application.
- Log utilization shown in a convenient graphical bar on the CopperheadEFI application.
- Log data can be exported to CSV format to be displayed in spreadsheets like Excel.
- Live Tuner firmware upgrades via the CopperheadEFI application.

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### **Warranty and Limited Liability:**

**Velocity Devices Inc. warrants that any device sold by Velocity Devices Inc, or by a distributor, are free from defects resulting from the manufacture, materials, or workmanship for a period of one (1) year from the date of sale to the customer, subject to and on the terms and conditions set forth in this Limited Warranty. Velocity Devices Inc. is not responsible for damages caused by misuse or improper installation of the products, and for incidental costs which are associated with the removal and return of products. Velocity Devices Inc. reserves the right to refund the entire purchase price, or replace the device at Velocity Devices Inc. discretion.**

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**IF YOU DO NOT AGREE TO THE ABOVE TERMS AND CONDITIONS, RETURN THIS PRODUCT IN UNUSED FORM TO THE PLACE OF PURCHASE FOR A FULL REFUND.**

***Third Party License Agreement:  
The Live Tuner utilizes the LUFA USB Driver  
Copyright 2012 Dean Camera  
[www.lufa-lib.org](http://www.lufa-lib.org)***

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## Overview:

The Live Tuner has contains the following items:

- 1) DB9 Connector: Plugs into the Copperhead® CDI/ECU to allow for map updates, firmware updates and live tuning.
- 2) Status LED: Serves as a system status and error indicator. It indicates operation with a combination of Red/Orange/Green colors/pulses. See the table in the **Operation** section for all the possible combinations.
- 3) USB connector: Standard Male mini-A USB cable to connect to the computer.
- 4) Pushbutton Switch: Used to initiate different functionality (log start/stop, log erase, firmware update, format unit). See the table in the **Operation** section for the different operations.
- 5) 1/8" Jack: Allows for two *optional* 0-5 Volt analog inputs to be connected to the Live Tuner. The "Ring" is Analog 1, the "Tip" is Analog 2, and the barrel is the common ground.

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## **Installation:**

### **Step 1:**

**BEFORE CONNECTING THE LIVE TUNER, navigate to:**

**<http://www.velocitydevices.com>**

**Click on the “SUPPORT” tab. Scroll to the bottom of the page, and select:**

**[ECU Software and Documentation - For fuel injected machines](#)**

Download and install the CopperheadEFI application. This will install the application in a start menu time called “Velocity Devices Inc.”, as well as install the necessary files for the Live Tuner driver.

If the error “This program is blocked because of compatibility issues”:

- Right click on the CopperheadEFI install
- Select “Properties”
- Select “Unblock”

The application should now install properly.

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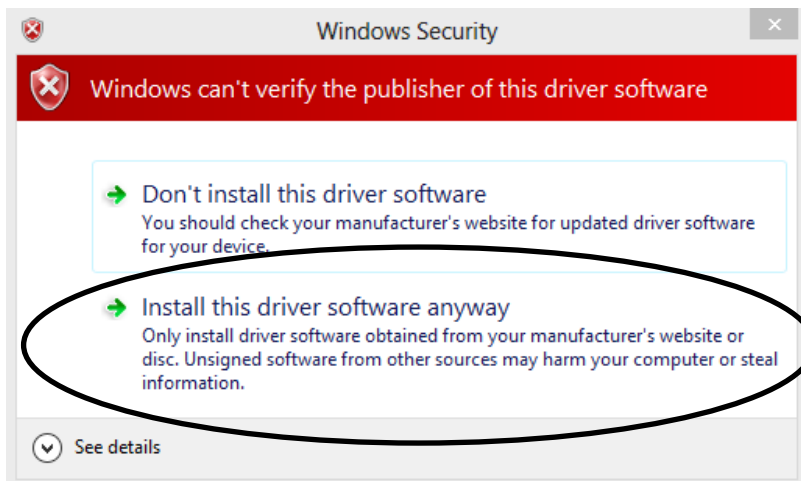
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### Step 2:

Connect the Live Tuner to the USB port. Windows should automatically detect and install the appropriate driver.

**NOTE: The Live Tuner uses the standard Windows virtual serial port driver. Should the warning message, below, occur indicating the software cannot be verified; click “Install this driver software anyway”. The driver is safe for installation.**



### Windows 8:

**If the driver fails to install due to increased driver security measures, you will need to “disable driver signature enforcement”. Follow the directions in the appendix.**

### Step 3:

Navigate to your “Start Menu->All Programs->Velocity Devices Inc.” folder. Click on the “CopperheadEFI” program. The program should start, and display a spreadsheet type environment.

**NOTE: Should the program fail to start with a “Side by Side Configuration Error”, your computer is missing the necessary Windows library files. Click on the “Install vcredinst\_x86” in the “Start Menu->All Programs->Velocity Devices Inc.” to install the necessary files.**

### Step 4:

If the Live Tuner properly installed, selecting the “Live Tuner” button on the toolbar will pop down a list of operations that are all enabled. If the device is not connected, then most of the items will be disabled.

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## Operation:

Connect the Live Tuner to the ECU to synchronize the devices. If the ECU is powered on, it will synchronize to the Live Tuner, and download the map. **NOTE:** *The Live Tuner can be connected "hot" (while the ECU is running), but it will force the ECU to reset, shut down the engine and then download the map.* This convenient feature allows you to keep the Live Tuner connected, and continuously change/download maps into the ECU without disconnecting anything.

The 1/8" jack is used to connect *optional* external analog inputs (such as the Innovate LM1 O2 meter) to be displayed on the CopperheadEFI application or to be logged with the EFI data. Consult the owner's manual of the specific device to configure it for a 0-5V analog output.

Holding the button down will toggle through the following four (4) functions. When the status light flashes, the function will be active when the button is released. If you continue to hold for over two (seconds) after the status light stopped blinking, the status light will turn orange to indicate that the function will not be selected when the button is released. If you wish to abort the button press, release the button after the status turns orange and before it flashes off again. Consult the following table for explanation:

Time (seconds)	Status LED	Function When button is Released
>1	Solid	Nothing
1	1 Flash	Start/stop logging
3	Orange	Start/stop logging will <b>NOT</b> be selected
5	2 Flashes	Erase logs
7	Orange	Erase logs will <b>NOT</b> be selected
10	3 Flashes	Download firmware to ECU
12	Orange	Download firmware to ECU will <b>NOT</b> be selected
30	4 Flashes	Erase logs, map and ECU firmware
32	Orange	Erase logs, map and ECU firmware will <b>NOT</b> be selected

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The status light is used to indicate the current operation of the Live Tuner. The current operation can also be displayed with the CopperheadEFI application

Status LED Color	Function
Solid Green	Idle, data storage healthy
Solid Red	<i>After power on, no ECU connected:</i> Data storage defective. <i>After power on, ECU connected:</i> ECU connected to the Live Tuner has non-Live Tuner compatible firmware. Upgrade ECU firmware. <i>After ECU firmware update:</i> Upgrade failed, press the button once to acknowledge the failure.
Solid Orange	Offline/Booting/Map being loaded into ECU
Red/Green alternating on 1/4 second intervals	ECU firmware update.
Red/Green alternating on 1 second intervals	Logging data.
Red flashing on 1/4 second intervals	Erasing logs
Red flashing on 1 second intervals.	Erasing logs, map and ECU firmware.
Orange with red flashing on 1/4 second intervals.	Live Tuner firmware issue. Upgrade the Live Tuner firmware.
Orange with red flashing on 1 second intervals.	Live Tuner firmware upgrade in progress.

**NOTE: ECU FIRMWARE UPDATE**

If the ECU does not contain a Live Tuner compatible firmware version, the update cannot occur with the Live Tuner connected to the computer and ECU.

Follow the directions below to update the ECU to Live Tuner capable:

- 1) Using the CopperheadEFI application, load the map and new ECU firmware into the Live Tuner.
- 2) Disconnect the Live Tuner from the computer, and connect to the ECU port.
- 3) Turn on the key of the machine.
- 4) Hold the button on the Live Tuner until it flashes 3 times (to initiate the firmware update), and release the button.
- 5) Wait until the status light on the Live Tuner returns to solid, and the ECU status light turns on solid.

Any new ECU updates can occur with the ECU connected to the Live Tuner and computer.



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## 6) Appendix:

To disable Windows 8 driver enforcement:

- 1) Unplug the Live Tuner from the USB port.
- 2) Press the **Windows button + I** to launch the charm bar.
- 3) Click **Change PC Settings** at the bottom.

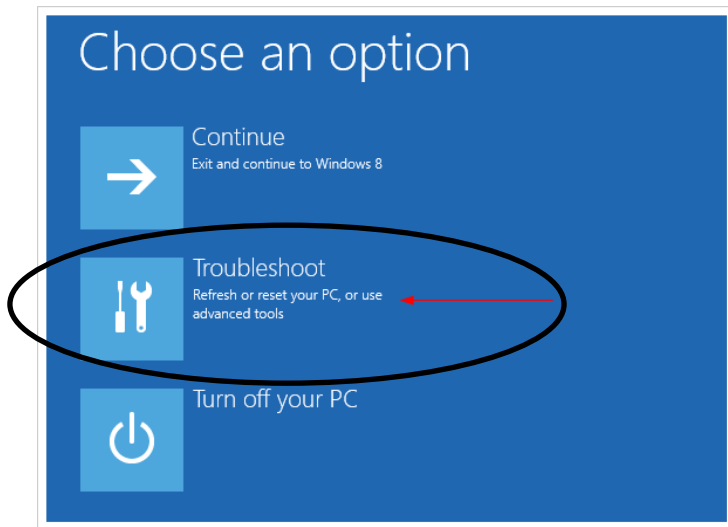


- 4) Windows 8: Select **General**, scroll to the bottom of the page, select **Restart Now** under the **Advanced Startup** section.

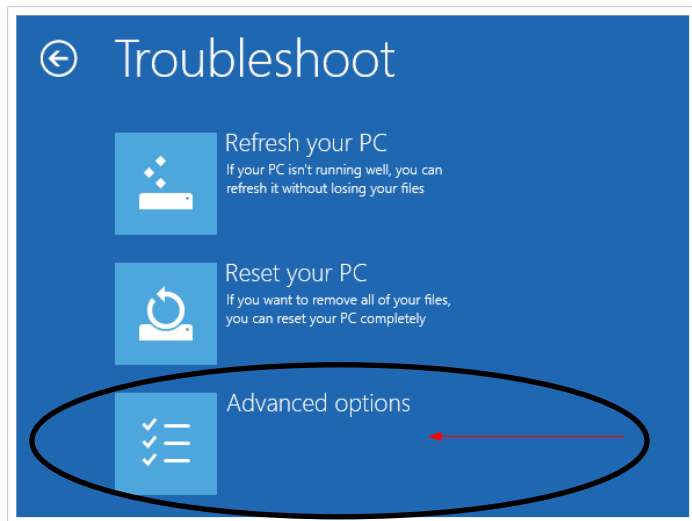
Windows 8.1: Select **Update & Recovery**, scroll to the bottom of the page, select **Restart Now** under the **Advanced Startup** section.

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- 5) The computer will reboot to a startup menu. Select **Troubleshoot**.

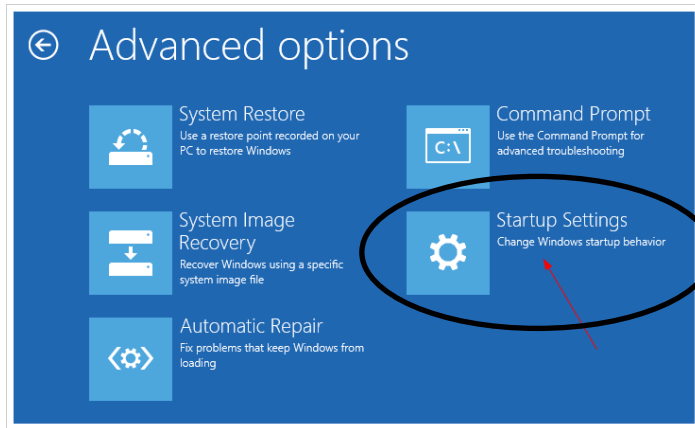


- 6) Select **Advanced Options**.

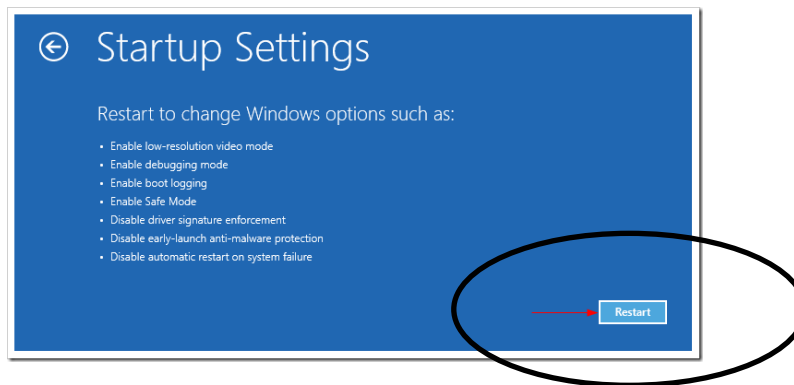


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7) Select **Startup Settings**.



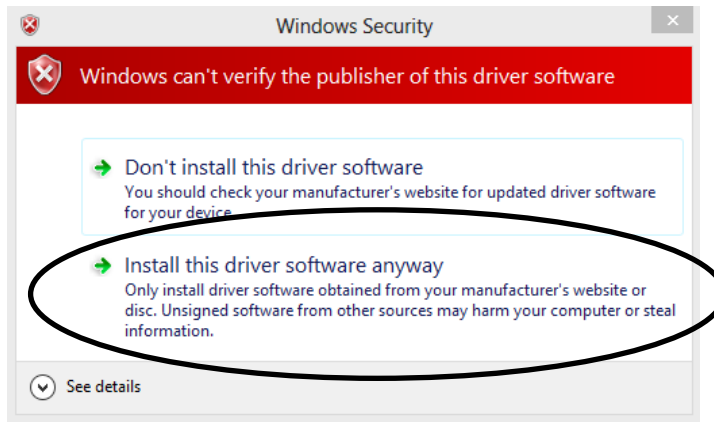
8) Select **Restart**.



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- 9) Select **Disable driver signature enforcement** from the next screen.
- 10) Connect the Live Tuner to the USB port. If the device does not automatically install, browse to the “**C:\Program Files (x86)\Velocity Devices Inc**” folder. Right click on the **VDI\_VirtualSerial.inf**, and choose **Install**. The Live Tuner uses the standard windows serial port driver. When prompted, select “Install this driver software anyway” to install the driver. This driver is safe to install.





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The maple leaf found on the bottom of your Copperhead® CDI is a symbol of the pride we take in each and every unit we manufacture.

Every unit is assembled, tested and packaged locally by one of our trained technicians, or approved ISO9001 registered manufacturing firms.

Should have any questions or concerns with this product, contact us immediately, and one of our courteous representatives will deal with your concerns in a prompt fashion.

We appreciate your business, and hope you enjoy your purchase.

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