



ECU model 600

Quickstart and Wiring Manual



Revised 2026-05-02

If you found this manual through an internet search - please visit axiomefi.com to download the current manual.

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1: Introduction and warnings

This product is designed for off-highway applications in non-pollution controlled vehicles. It is the operator's responsibility to adhere to local laws.

Installers are expected to have general electrical, mechanical and computer skills.

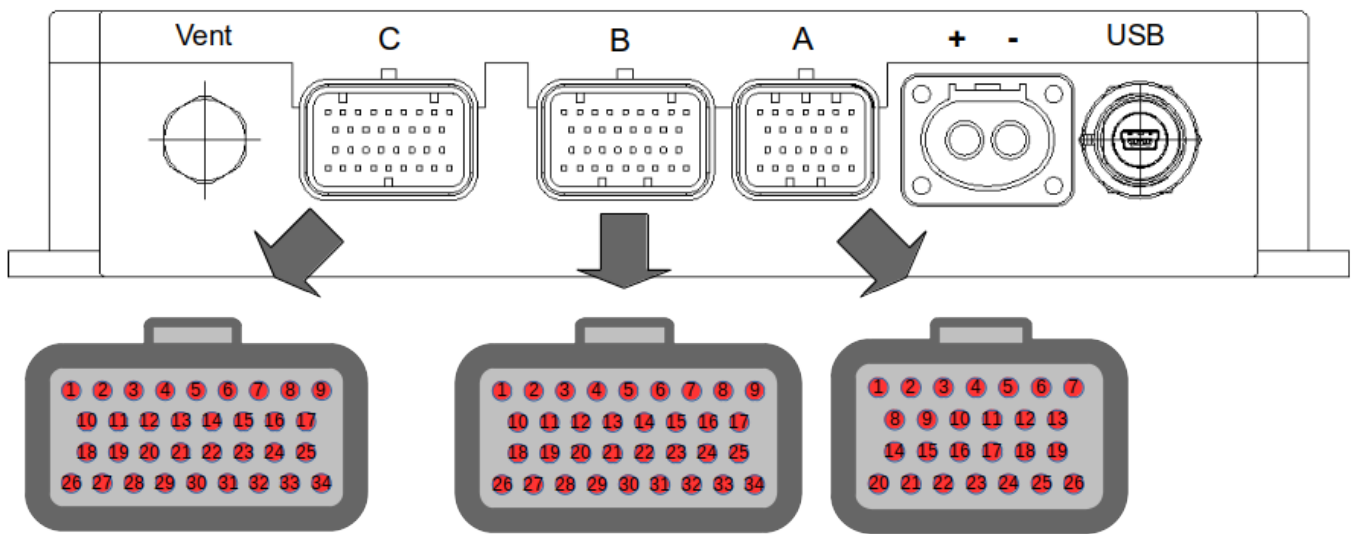
For correct operation, see the following sections for required power and ground wiring.

Please read all of this quickstart manual.

2: Absolute Basics

- Configure Features.
- Configure wiring and wire it up.
- Test all inputs and outputs.
- Test injectors and coils.
- Test crank and cam signals (with injector fuses removed.)
- Rough check ignition timing during cranking. Finalize with engine running.

3: ECU connectors



USB - sealed mini USB for connection to tuning computer. Install sealing cap when not in use.

Power plug - this provides the main ground and switched power to the ECU. See diagrams for correct connection.

Connector A - Superseal 1.0 plug

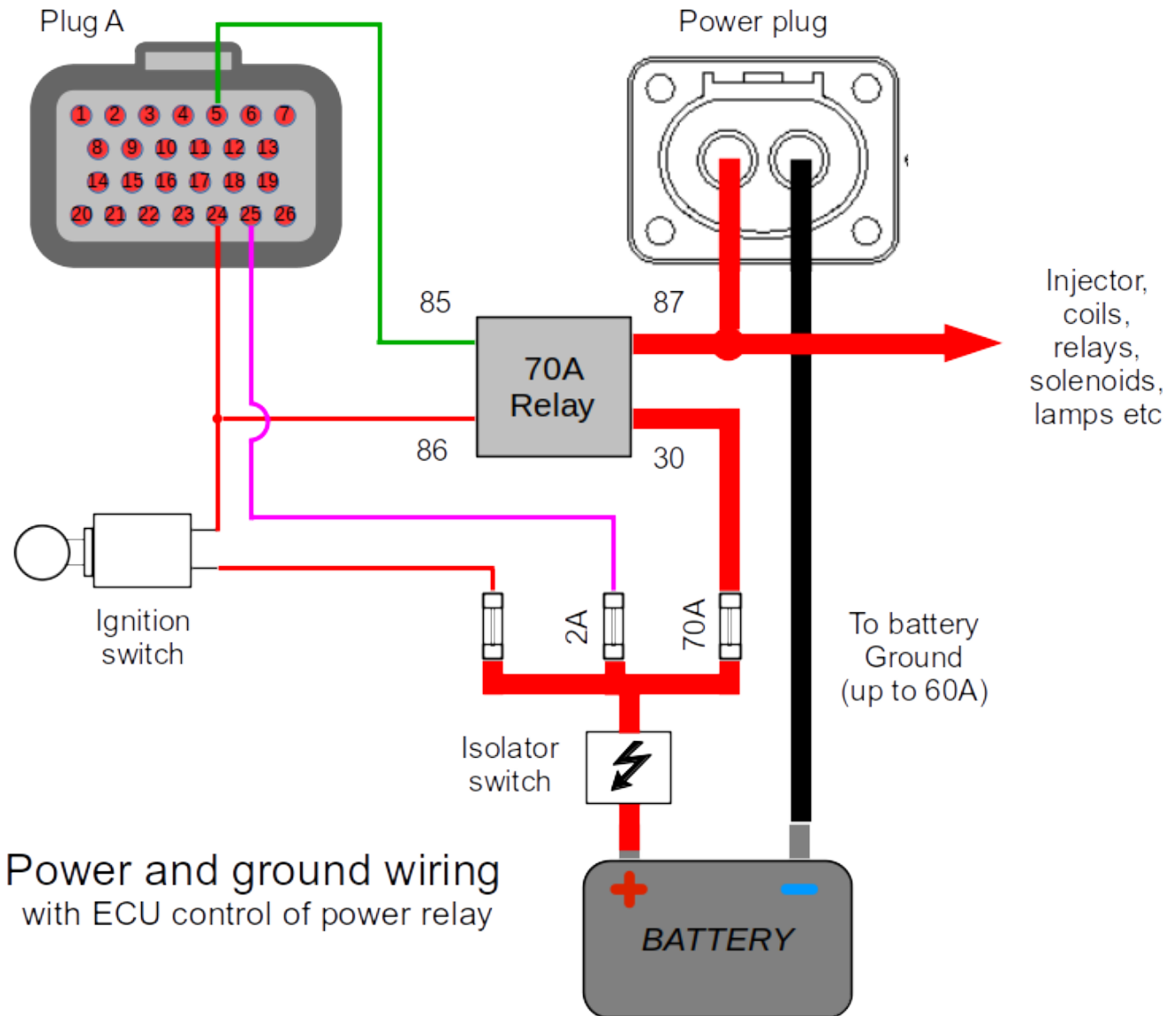
Connector B - Superseal 1.0 plug

Connector C - Superseal 1.0 plug

SuperSeal 1.0 crimp pins.

Vent allows pressure inside case to equalize.

4: Power and ground wiring



Functions

A25 - provides power to the electronics inside the ECU and keep alive power for learn tables and internal clock. Typical current draw when on is <1A and negligible when off.

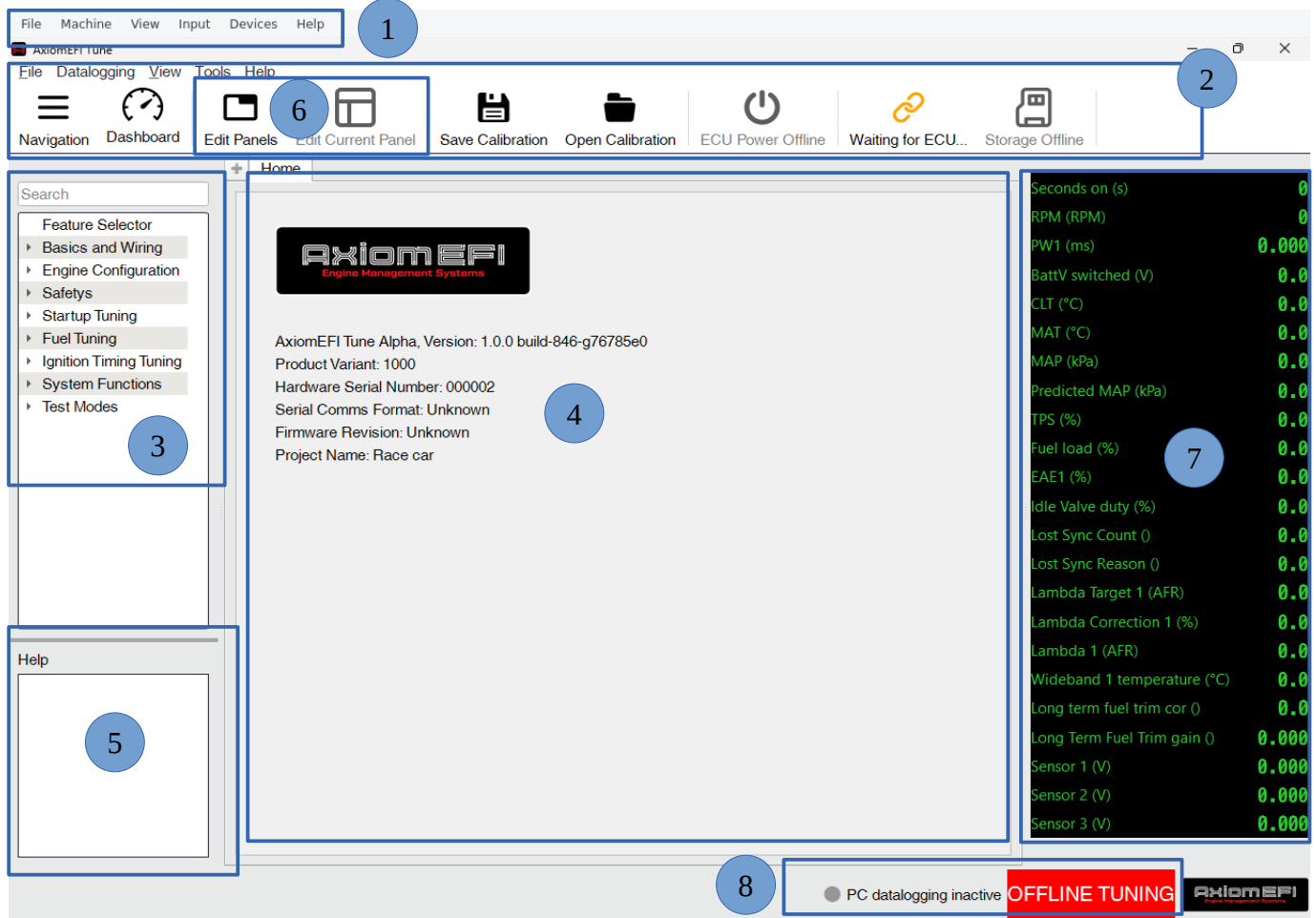
A24 - provides a "turn on" signal to the internal power supply. Current draw is negligible.

Power plug black wire - the main ground for the ECU. Up to 60A.

Power plug red wire - high-side power to half-bridges, recirculation for solenoids and recirculation for low-z injectors. This must be 'live' when the ECU is on and must be off when the ECU is off. It is preferred to use the ECU's power relay control, but it is permissible to run without. Do not connect it permanent live.

To avoid backfeeding, any devices controlled by the ECU should share the same +12V that connects to the power plug. Fuse as required.

5: Software Screen Basics



5.1 1-Menu Bar

The Menu bar allows control over the tuning software, loading/saving calibration files, preferences and datalog download.

5.2 2-Button Bar

Quick buttons for menu items.

Navigation - enables or hides the settings tree.

Dashboard - enables or hides the basic dashboard.

Edit Panels / Edit Current panel - allow tuning panels to be created and edited.

Save Calibration - saves the current tuning calibration to disc.

Open Calibration - opens a saved calibration from disc.

Power button - allows ECU to be reset for settings that require it.

Connect button - establishes/breaks communications with ECU. 'Online' = connected to ECU.

Store settings button - stores changes settings into ECU memory.

5.3 3-Settings Navigation Tree

The main navigation for accessing settings and tuning pages.

Only active features are displayed, use the Feature Selector to enable/disable features.

The Search bar can be used to find items.

5.4 4-Main pane

This is where the tuning pages or customized panels are displayed.

5.5 5-Help area

For settings within tuning pages, tips or notes are shown in the help area.

5.6 6-Panels selection

Tuning panels can be created using 'Edit Panels' and then selected here.

5.7 7-Basic dashboard

The basic dashboard is available when custom panels are not in use.

To add/remove or re-arrange items, right-click in the dashboard area.

5.8 8-Status bar

Shows the ECU status, whether PC datalogging is active and whether offline tuning is active.

6: Connectors pinout

C1	OUT_HB3+
C2	OUT_HB3-
C3	OUT_HB4+
C4	OUT_HB4-
C5	LAMBDA B HTR- (white)
C6	OUT_LSH_D
C7	OUT_LSH_D
C8	OUT_LSH_D
C9	OUT_LSH_D
C10	LAMBDA 2 RE (black)
C11	LAMBDA 2 APE (red)
C12	LAMBDA 2 RT (green)
C13	LAMBDA 2 IPN (yellow)
C14	IN_CAM 3
C15	IN_CAM 4
C16	IN_SS
C17	IN_SS
C18	OUT_LS_D
C19	IN_AN_P
C20	IN_AN_P
C21	IN_AN_P
C22	IN_AN_P
C23	IN_AN_P
C24	IN_AN_P
C25	IN_KNOCK2+
C26	OUT_LS_D
C27	CAN#2 H
C28	CAN#2 L
C29	IN_DIGI_GND12
C30	IN_DIGI_GND
C31	EGT A+
C32	EGT A-
C33	EGT B+
C34	EGT B-

B1	OUT_LS_P_D
B2	LAMBDA A HTR- (white)
B3	SENSOR 5V #1
B4	SENSOR 5V #2 (DBW)
B5	INJ E
B6	INJ F
B7	INJ G
B8	INJ H
B9	3V BATTERY IN
B10	SPK A
B11	SPK B
B12	SPK C
B13	SPK D
B14	SPK E
B15	SPK F
B16	SPK G
B17	SPK H
B18	OUT_LS_P_D
B19	IN_CAM 2
B20	LAMBDA 1 IPN (yellow)
B21	IN_DIGI_GND12
B22	IN_DIGI_GND12
B23	IN_DIGI_GND12
B24	CAN#1 H
B25	CAN#1 L
B26	LAMBDA 1 APE (red)
B27	LAMBDA 1 RT (green)
B28	LAMBDA 1 RE (black)
B29	GND (HALL/VR/SHIELD)
B30	SENSOR GND
B31	IN_AN_P
B32	IN_AN_P
B33	IN_AN_P
B34	IN_AN_P

A1	INJ A
A2	INJ B
A3	INJ C
A4	INJ D
A5	POWER RELAY OUT
A6	OUT_LS_P_D
A7	OUT_HB2+
A8	IN_AN (MAP)
A9	IN_TEMP (CLT)
A10	IN_TEMP (MAT)
A11	IN_CAM1+
A12	IN_CRANK+
A13	OUT_HB2-
A14	OUT_LS_P_D
A15	IN_KNOCK1+
A16	RS232 GND
A17	IN_CAM1-
A18	IN_CRANK-
A19	OUT_HB1+
A20	OUT_LS_P_D
A21	IN_AN_P
A22	RS232 TX
A23	RS232 RX
A24	12V IGN SW IN
A25	12V PERM IN
A26	OUT_HB1-

Legend

INJ	Injector outputs. Controls the negative side of the injector with low-impedance capability.	8A
SPK	5V Ignition outputs for logic/smart coils or ignition modules. Do not connect directly to high-current 'dumb' coils.	30mA
OUT_LS_P_D	Output, low-side. Optional pullup to 5V or 12V. Optional diode recirculation.	1A
OUT_LS_D	Output, low-side. Optional diode recirculation.	1A
OUT_LSH_D	Output, low-side, high current. Optional diode recirculation.	10A
OUT_HBxx	Half-bridge push/pull outputs. Typically used in pairs for servo motor control.	15A
POWER RELAY OUT	Low-side output to control power relay.	1A
IN_AN	Analog (0-5V) inputs.	
IN_TEMP	Analog inputs for temperature sensors.	
IN_AN_P	Analog (0-5V) inputs with optional pullup (bias) for temperature sensors.	
IN_DIGI_GND12	Digital/switch/frequency input for ground or 12V.	

IN_DIGI_GND	Digital/switch/frequency input for ground.
IN_KNOCKx	Input from knock sensor. Connect other wire to a spare ECU GND.
IN_CRANK+/-	Differential input from crank sensor for VR/magnetic. For Hall/Logic/Optical connect to CRANK+ only and use B29 ground.
IN_CAM 1+/-	Differential input from cam sensor for VR/magnetic. For Hall/Logic/Optical connect to CRANK+ only and use B29 ground.
IN_CAM2,3,4	One wire input from cam sensor for all types. Use B29 ground.
IN_SS	One wire input from (wheel) speed sensor. Use B29 ground.
RS232	RS232 serial connection can be used with an external Bluetooth adapter or GPS module.
12V IGN SW IN	12V input from ignition switch to enable ECU. (Low current.)
12V PERM IN	12V permanent input to ECU, provides operating current and maintains learn tables and clock. See also power plug connections.
LAMBDA x	Connections to LSU4.9 lambda sensor. Sensors also require a switched 12V supply (gray) for the heater.
SENSOR 5V #1	Main 5V sensor reference voltage out.
SENSOR 5V #2	Secondary 5V sensor reference voltage out. Can be used for DBW pedal and throttle.
SENSOR GND	Common ground point for all sensors. DO NOT connect this wire to chassis or battery ground.
GND (HALL/VR/SHIELD)	Common ground point for hall, VR, shielding. DO NOT connect this wire to chassis or battery ground.
3V BATTERY IN	Optional 3V supply to maintain learn tables and clock when power is off. Typically 2xAAA batteries in an external holder. Useful on vehicles with a battery isolator.
CANx	Two CAN buses #1 and #2 use H and L wires as a paired signal.
EGTx	Two inputs for K-type thermocouples.

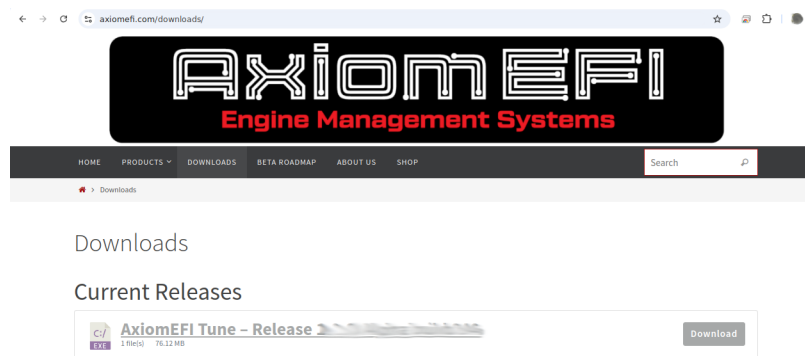
7: Installing and Setting Up Tuning Software

A tuning computer (laptop) is required to configure and tune your ECU. These instructions cover Windows only.

7.1 Downloading and installing

Open a web browser on your computer and go to <https://www.axiomefi.com>

Go to the Downloads page and download the latest software release.



You will need to read and accept the license terms.

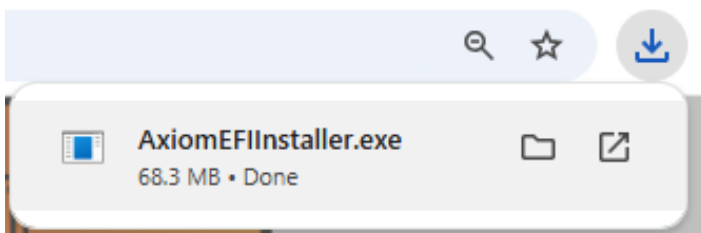


When you click the Download button, the file should start downloading - check your web browser's downloads notification area.

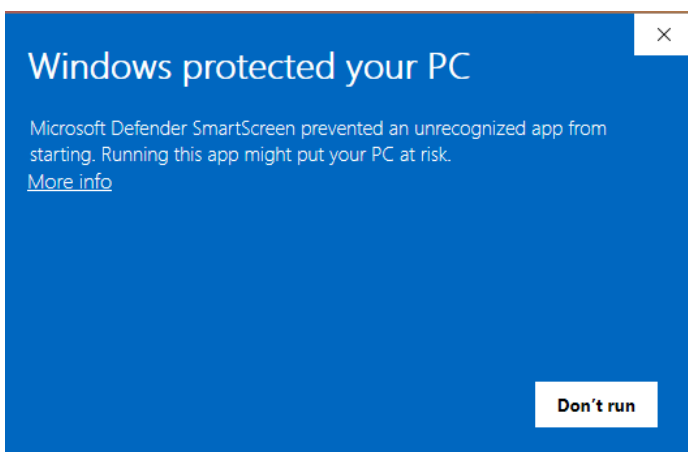
Also download the latest firmware.



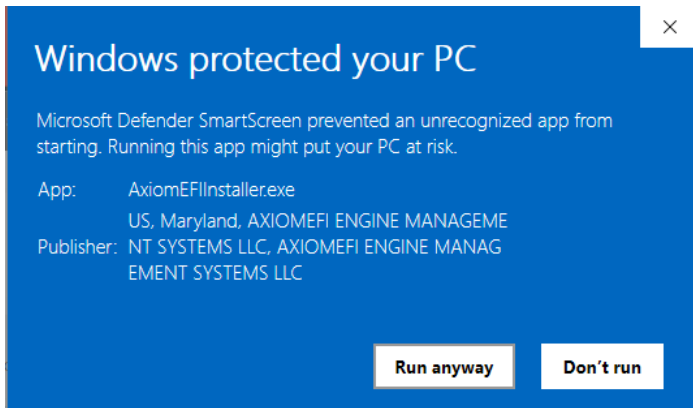
From the web browser's downloads area, run the software installer



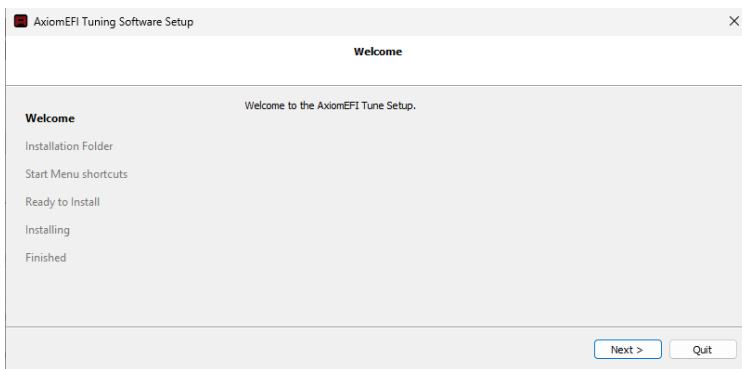
Windows might popup a security warning



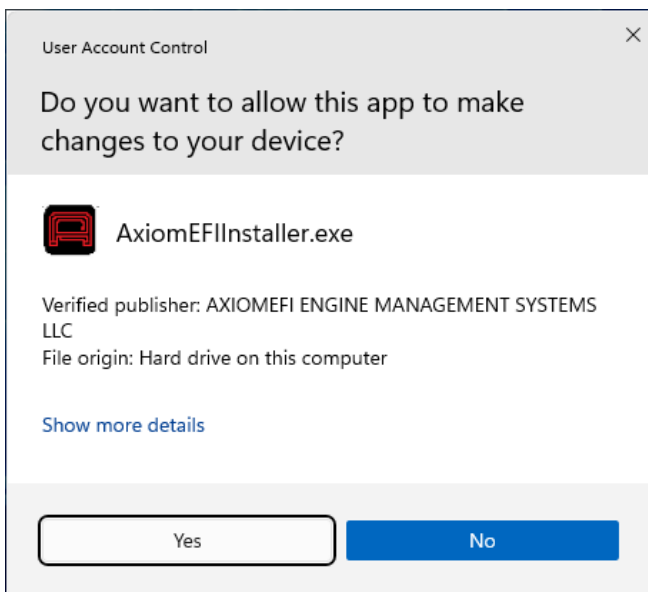
Click on 'More info'



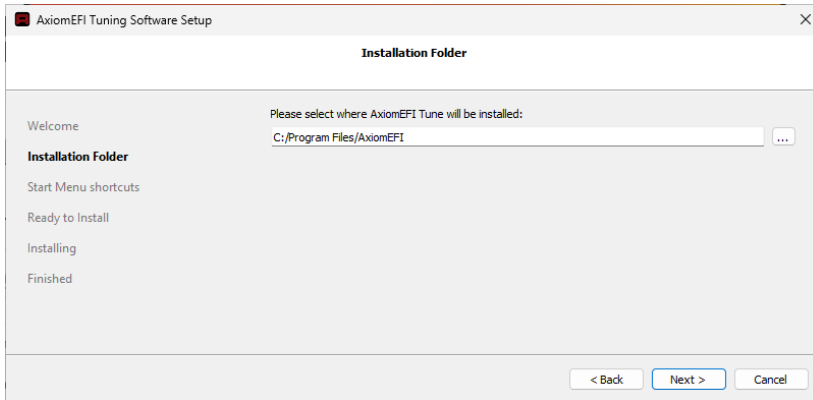
Check that the Publisher matches with above and then click 'Run anyway'



Click Next

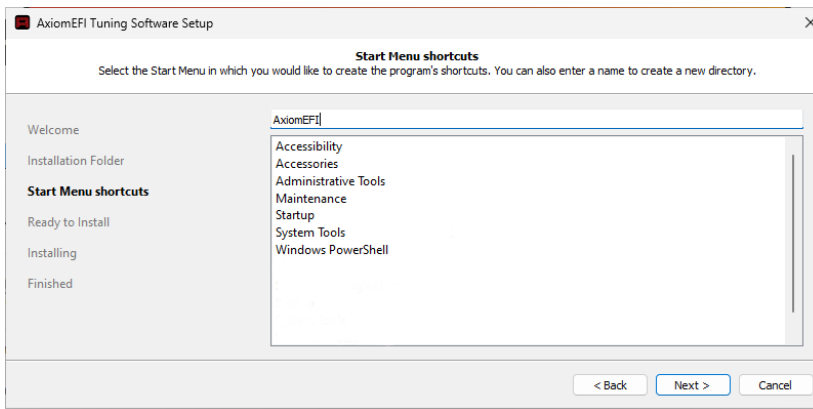


Click Yes

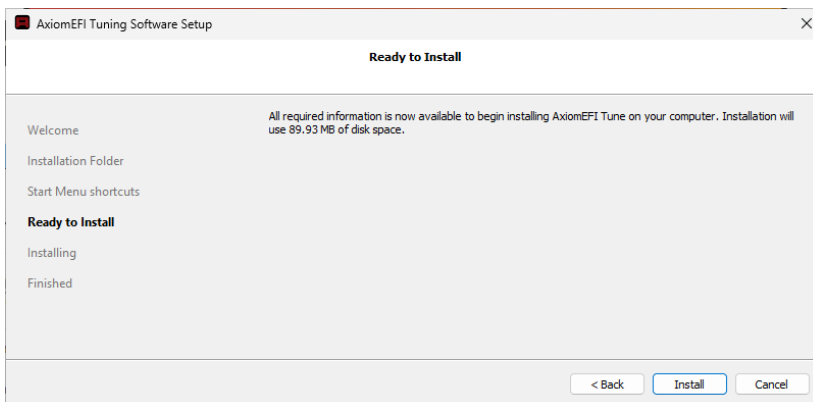


Leave the installation folder at the default unless you have a very good reason to change it. Click Next.

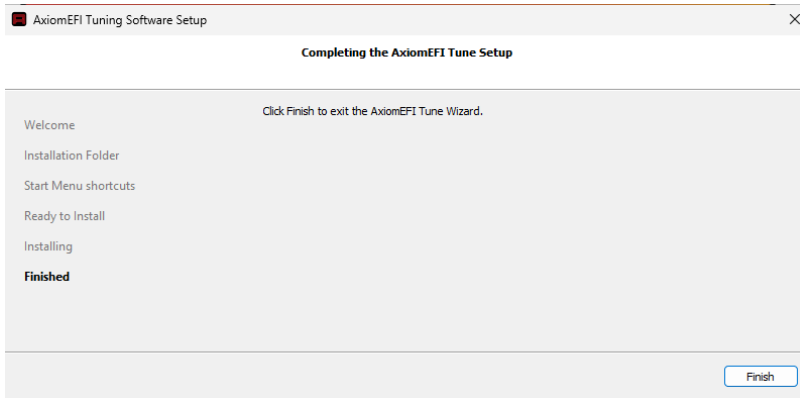
(If you are upgrading or re-installing, wait until the de-installation has completed.)



Click Next



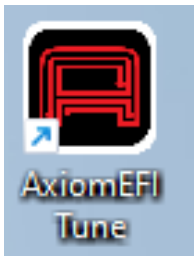
Click Next



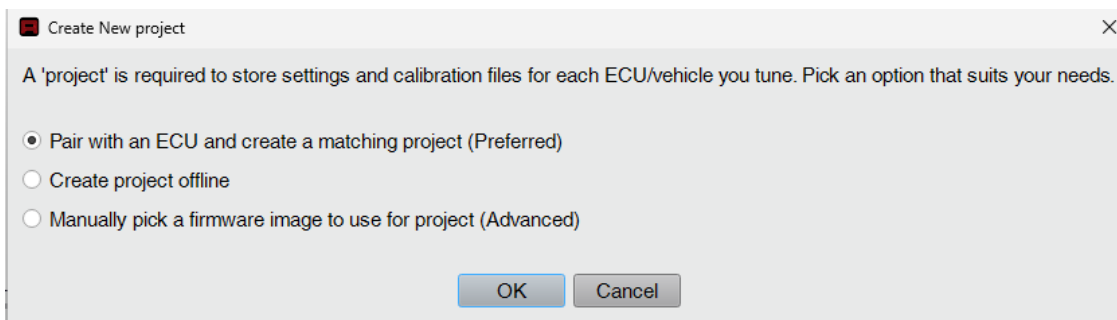
Click Finish

7.2 Starting the tuning software

Find the AxiomEFI Tune icon on your desktop and double-click it.



Before using the software, you need to create a 'project' to hold the configuration for each ECU/engine you will tune.

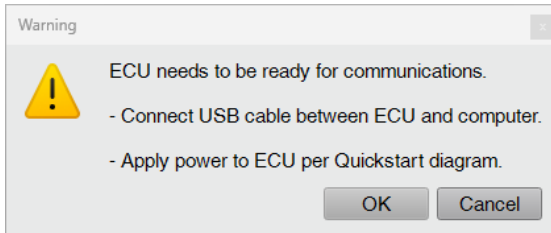


The preferred process to create a new project is to connect the USB cable and 12V power to your ECU and have the software pair with it. This will get you set up ready to tune.

For customers wanting to evaluate the software or get started before your ECU has arrived, you can create a project offline. This will allow you to start with a base calibration. The project can later be paired to an ECU.

7.2.1 Pair with an ECU

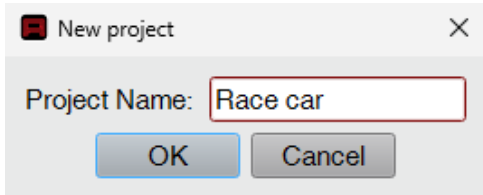
Before pairing, ensure that your ECU has 12V power per section 4 and that the USB cable is connected between the ECU and your computer.



After clicking OK, the software will try to make a connection with the ECU. If there are any problems, you will see a message describing the problem.

Once there is a successful connection, you will be prompted for a project name.

Enter a name for your project e.g. engine name, vehicle or customer name etc.

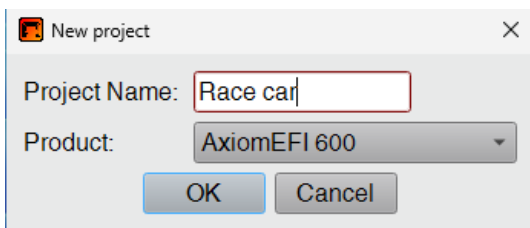


Click OK and the software should then go online with the ECU and allow live tuning.

7.2.2 Create Project Offline

When choosing to create a project offline, the software automatically creates a project using the firmware that was bundled in the installer. This is likely fine to get you started.

As this is offline, no ECU is required to be connected.



Enter a name for your project e.g. engine name, vehicle or customer name etc.

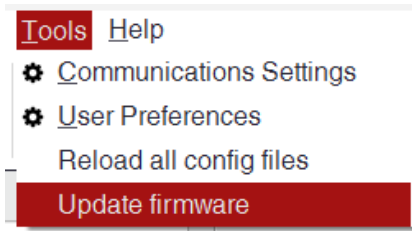
Select the Product you will be using.

Click OK and the software should then be ready for offline tuning.

8: Firmware upgrade

For a new install it is highly recommended that the ECU is upgraded to the latest release firmware version.

From the Tools menu, select Update firmware and follow the prompts.



Use a firmware image downloaded from the website.

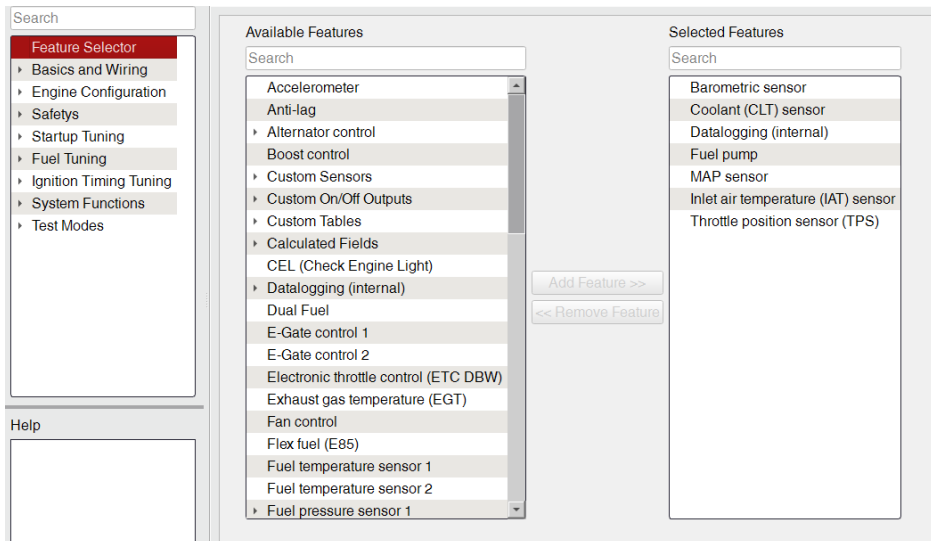


9: Software Usage Basics

The settings navigation tree is intended so you start at the top configuring fundamental settings and wiring options, then work down the list to tuning the engine.

9.1 Feature Selector

The top level item in the navigation tree is the 'Feature Selector'. Here you choose which ECU features and functions you wish to use.



Some features have sub-options, click on the triangle to expand them. (e.g. Custom Sensors.)

9.2 Basics and Wiring > Engine Basics

The core settings relating to your engine are defined here.

Search

Feature Selector

Basics and Wiring

Engine basics

Wiring Overview

Measurement units

Basic Sensors

Firing order

Injector wiring

Ignition wiring

Crank/cam inputs

Outputs

CAN bus

Engine Configuration

Safety

Startup Tuning

Fuel Tuning

Help

Engine basics

Engine stroke type

Four-stroke

Engine Type

Even Fire

Number of Cylinders/Rotors

4

Engine Size (cc)

2000

No. Primary injectors

4

Effective Injector Size Each (cc)

180

Fuel type (internal)

Gasoline/petrol

Stoichiometric air:fuel ratio (AFR)

14.70

Fuel density (g/ml)

0.755

Fuel evaporation (kJ/kg)

300

Units

Lambda/O2

AFR gasoline scale (14.7)

Minimum allowed pulsewidth (ms)

1.000

9.3 Basics and Wiring > Wiring Overview

The Wiring Overview allows you to review your current wiring, test inputs and outputs, set wire colors and confirm wire locations.

Filter: Show All Search (Pin/Wire) Print

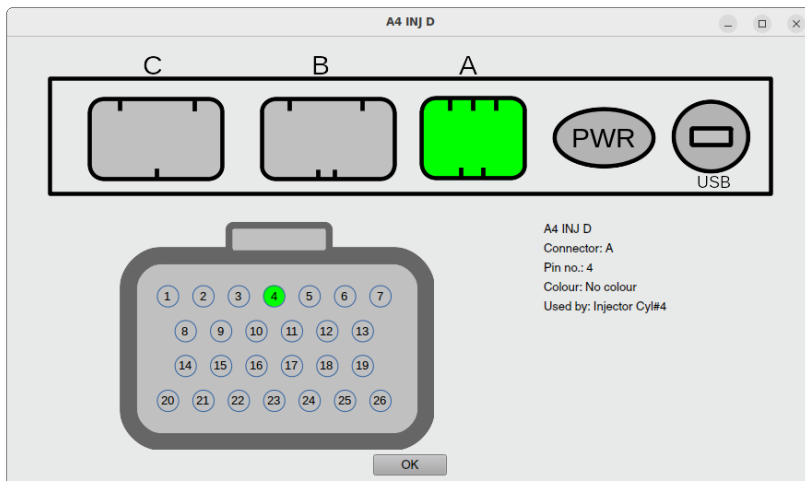
Disable test mode

Enable test mode

Pin/Wire	Pin location	Colour	Colour Name	Options	Status	Test	Used by
A1 INJ A	Location		No colour		Off		Injector Cyl#1
A2 INJ B	Location		No colour		Off		Injector Cyl#2
A3 INJ C	Location		No colour		Off		Injector Cyl#3
A4 INJ D	Location		No colour		Off		Injector Cyl#4
A5 POWER RELAY	Location		No colour		Off	Test	Power relay
A6 OUT_LS_P_D	Location		No colour	None	Off	Test	Unused
A7 OUT_HB2+	Location		No colour		Off	Test	Unused
A8 IN_AN (MAP)	Location		No colour		0.00V		MAP voltage in 1
A9 IN_TEMP (CLT)	Location		No colour		0.00V		CLT sensor input
A10 IN_TEMP (MAT)	Location		No colour		0.00V		MAT sensor input
A11/A17 IN_CAM 1	Location		No colour		GND		Cam 1 (home) tach input
A12/A18 IN_CRANK	Location		No colour		GND		Crank (primary) tach input
A13 OUT_HB2-	Location		No colour		Off	Test	Unused
A14 OUT_LS_P_D	Location		No colour	None	Off	Test	Unused
A19 OUT_HB1+	Location		No colour		Off	Test	Unused
A20 OUT_LS_P_D	Location		No colour	None	Off	Test	Unused
A21 IN_AN_P	Location		No colour	None	0.00V		Unused
A22 OUT_HB1-	Location		No colour		Off	Test	Unused

The Filter can be used to display certain categories of input/output.

The 'Location' button shows where to find this pin/wire in the connectors.



The Color button allows you to set a color/stripe for each wire. This is optional but is intended to help with trackside fault finding.



For most inputs/outputs, when the ECU is connected (online) you can see the on/off status or input analog voltage for each pin.



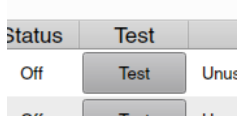
The wiring overview includes a basic test for outputs. This is intended to be used mainly for

lamps or relays to confirm it is wired correctly.

Note - injectors, coils and idle valves should be tested using the specific test mode pages.



With the ECU online but the engine not running (key-on, engine off) click on 'Enable test mode'. Then a 'Test' button will appear against available outputs. Click on the 'Test' button to temporarily activate the output.



9.4 Basics and Wiring > Measurement Units

The software allows you to select your preferred measurement units for each commodity. Adjust as required.

Internally the ECU mostly works in SI units, but the display and datalogging operate in your preference.

Note that where 'psi' is selected for pressure this is referenced to sea level

i.e. 0 psi = sea level pressure = 101.35 kPa absolute.

9.5 Continuing configuration

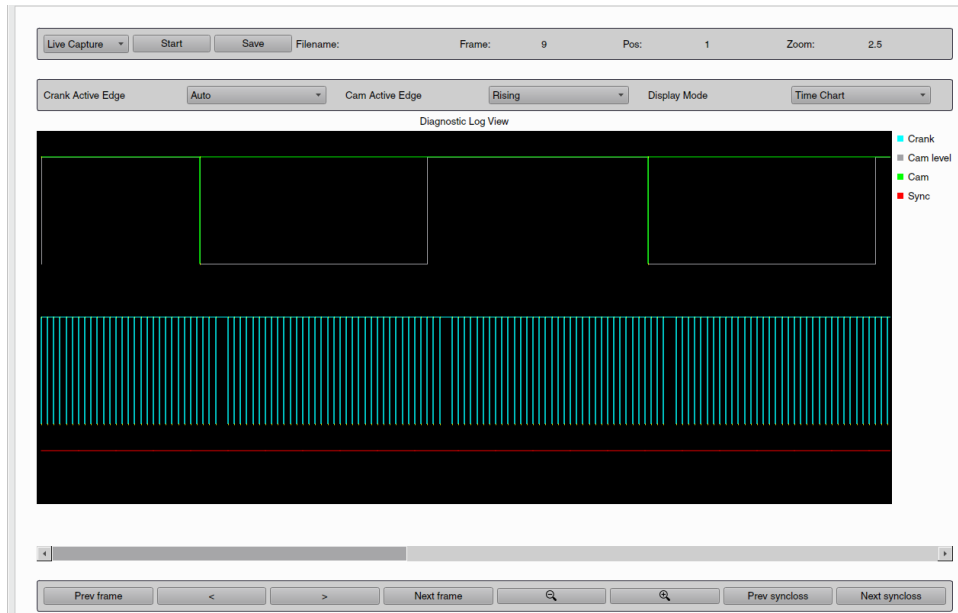
Work down the list through the other pages, configuring necessary settings and building your wiring.

9.6 System Function > Diagnostics

Within the diagnostics menus are three main diagnostic tools.

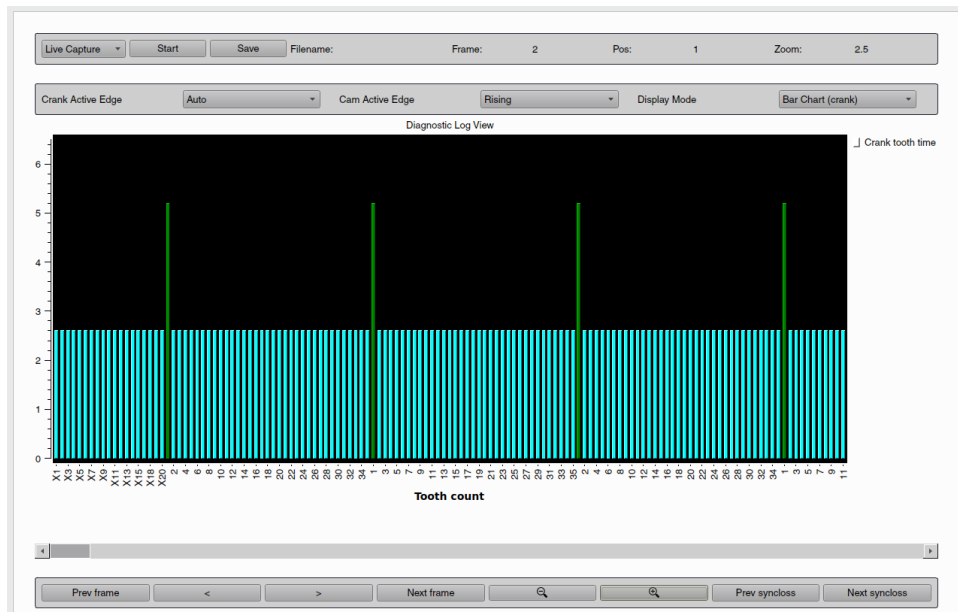
9.6.1 Crank/cam log viewer

This enables viewing the crank and cam inputs in the most basic manner and shows the decoded signals received internally at the engine processor.



The above shows the typical 'Time Chart' view. The X-axis is time and the vertical lines represent decoded pulses on the crank on cam. On the cam signal, the green vertical line shows the active 'trigger' edge of the signal and the gray lines show the inactive parts of the signal. The crank input is set to 'Falling Edge' - only that active edge is captured in this log, so no gray inactive portions are displayed.

The crank/cam log viewer also allows a 'Bar Chart' view where the height of each bar represents time. This can be useful for visualizing missing tooth wheel patterns.

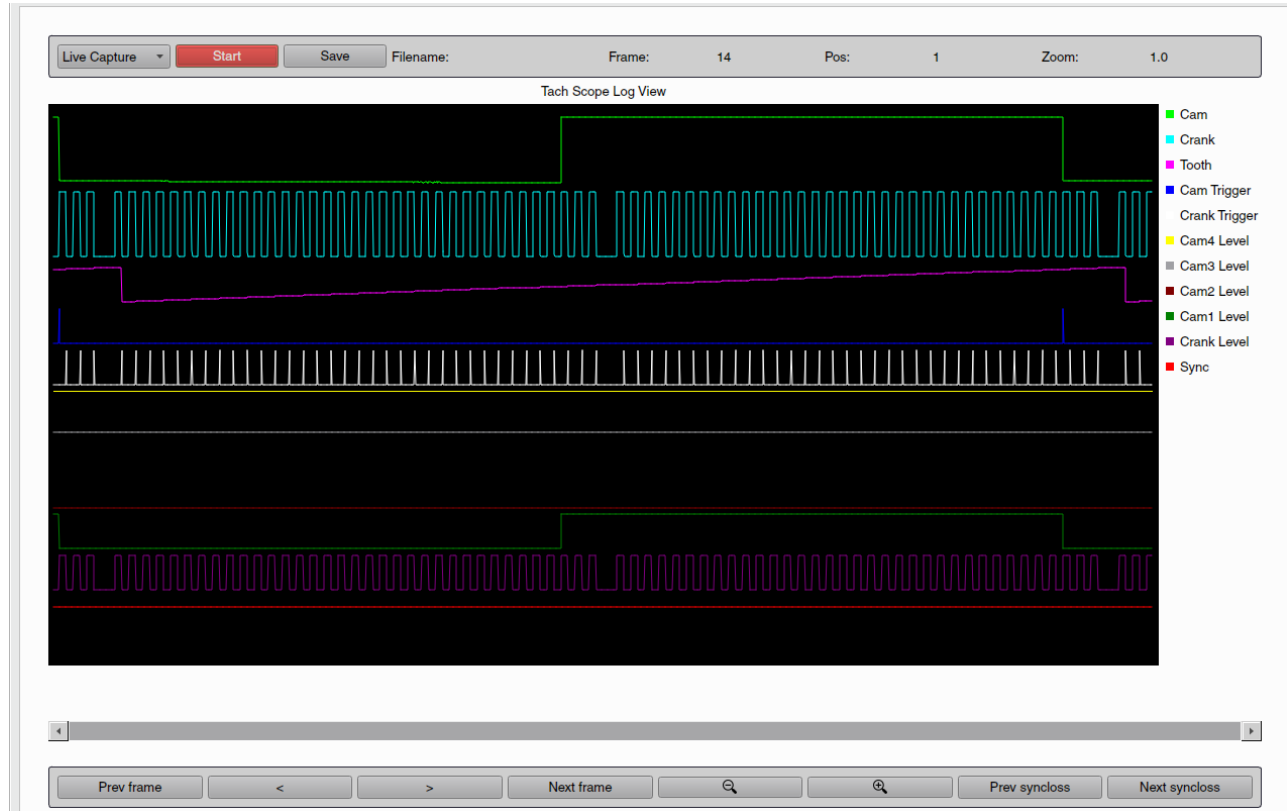


9.6.2 Analog Scope log viewer

Allows analog inputs and some internal channels to be scoped. It is more specialized.

9.6.3 Tach Scope log viewer

This gives a view of external signals received into the ECU and how these 'look' when decoded by the ECU. (This screenshot shows a 36-1 + cam signal on the testbench.)



'Crank' and 'Cam' traces show the analog voltage signal received at the ECU.

'Crank trigger' and 'Cam trigger' show a pulse that represents the active trigger edge of the input signal.

'Crank Level' and 'Cam* Level' show the crank and cam signals after they have been decoded into a digital signal inside the ECU.

'Tooth' is the internal tooth count.

'Sync' shows whether the ECU is synchronized to the crank and cam.
1 = ECU is synced to crank and cam. 0 = ECU is not synced.

In the data area, left-click and hold to see all the data for that point.

9.7 Test Modes

Use the injector and ignition test modes to confirm operation of the injectors and coils and validate wiring.

Output Test Mode - Inj/Spk

Enable test mode

Fuel Pump Control

Fuel pump on

Fuel pump off

Output Interval (ms) 199.9

Ignition Coil Testing

Coil Testing Mode Off

Coil Output To Test Cyl#1

Dwell (ms) 3.0

Coil Test Start

Stop

Injector Testing

Injector Testing Mode Off

Injector Channel To Test Cyl#1

Pulsewidth (ms) 0.000

Total Number Of Injections 0

Injector Test Start

Stop

Be careful when testing ignition coils - excessive dwell can cause permanent damage.

For testing injectors, a pulsewidth of 2ms is likely sufficient to hear them click and feel that with your hand.

10: Datalogging

There are two datalogging methods available: 'Internal logging' and 'PC logging'.

The internal logging allows the ECU to record data channels to internal storage without a tuning PC connected. This is what you will use when racing. It has the highest data rate, but you are required to select which channels you want to record.

The PC logging allows all data channels to be recorded onto the PC for immediate viewing but typically has a slower data rate. This may be more useful for logging dyno pulls and other tuning.

Note ! Datalogging is FREE - the only cost is storage space. Always datalog when tuning !

10.1 Internal Datalogging - setup

Before use, you need to configure the logging and select the data channels.

Search

TPS-based MAP Prediction

Table Choices

Individual Throttle Bodies (ITB)

Safetys

Startup Tuning

Fuel Tuning

Ignition Timing Tuning

Custom Tables

System Functions

Datalogging

Internal Datalogging Setup

Internal Datalogging Field Selection

Diagnostics

About Current Device Firmware

Internal Datalogging Setup

SD Card Logging:

Trigger

RPM

RPM > (RPM)

2000

Log Data Block Size

64 byte

Interleave GPS Data

Off

Sampling

Timed

Frames/Second

250

Log File Max Duration (mins)

10

Action after log completed

Start new log

Search

TPS-based MAP Prediction

Table Choices

Individual Throttle Bodies (ITB)

Safetys

Startup Tuning

Fuel Tuning

Ignition Timing Tuning

Custom Tables

System Functions

Datalogging

Internal Datalogging Setup

Internal Datalogging Field Selection

Diagnostics

About Current Device Firmware

Available Fields

Search

Accel X

Accel Y

Accel Z

Alternator control duty

Alternator control period

Alternator load

Alternator target voltage

APP

APP A

APP B

Average Lambda

Barometer

Battery current

Battery Voltage

Boost duty

Boost duty 2

Boost Target 1

Boost Target 2

Calculated field 1 (Calc 1)

Calculated field 2 (Calc 2)

Calculated field 3 (Calc 3)

Calculated field 4 (Calc 4)

Calculated field 5 (Calc 5)

Calculated field 6 (Calc 6)

Calculated field 7 (Calc 7)

Calculated field 8 (Calc 8)

can_error

can_error_cnt

CANpwmmin0

CANpwmmin1

CANpwmmin2

CANpwmmin3

CEL errorcode

CEL status

CEL status2

Closed-loop idle target RPM

Cold Advance

Current Speed Load (duty)

Add Field >>

<< Remove Field

Selected Fields

Search

BattV switched

CLT

EAE1

Est. Intake Air Temp

Estimated air flow

Fuel load

Fuel Pressure 1

Fuel Temp1

Fuel temperature cor

Lambda 1

Lambda cor 1

Lambda Target 1

Lambda Transport Delay

Long term fuel trim cor

MAP

MAP rate of change

MAT

Predicted MAP

Predicted MAP rate of change

PW1

RPM

RPM rate of change

TPS

TPS rate of change

VE1

VVT duty 1

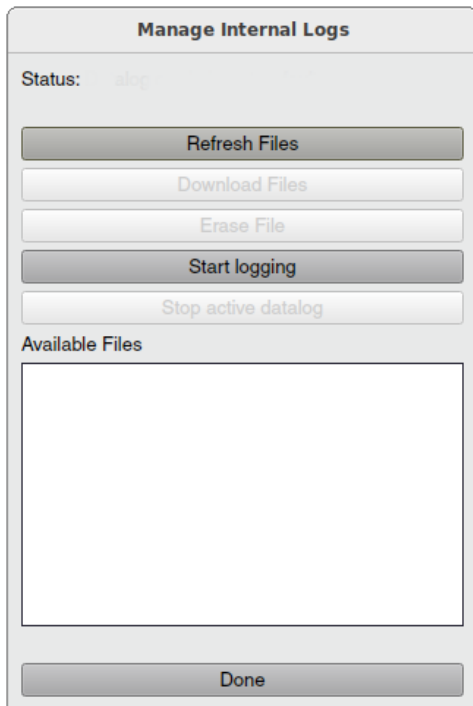
Wall fuel 1

Help

Total Data Amount: 63 bytes

10.2 Internal Datalogging - Manage Internal Logs

From the top level Datalogging menu, select Manage Internal Logs



This window allows internal logs to be downloaded. Files use a binary format on the internal storage. During download they are converted into a readable text CSV.

10.3 PC datalogging

PC datalogging records a readable text CSV to your tuning computer disc.

Logs are started and stopped from the top level Datalogging menu.

10.4 Viewing datalogs

To view datalogs we recommend using 3rd party software 'MegaLogViewer' from EFI Analytics.

The basic version can be sufficient for most tuning, but registration is recommended to enable more advanced features such as scatter plots and histograms.

Download from: <http://www.tunerstudio.com/index.php/products/megalogviewer>

It is planned to including basic log viewing in a future version of the AxiomEFI tune software.