

Spitronics ECU - Data Logger - Guide

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Introduction

The Cosmos software includes a built-in Data Logger that records ECU operating data while the engine is running. This allows the tuner to analyse engine behaviour after an event instead of trying to interpret large amounts of data in real time.

The data logger is an important diagnostic and tuning tool and is especially useful when assisting customers remotely.

The recorded log can be:

- analysed directly inside the Cosmos software
- saved together with the applicable Tune / Map file
- sent to a remote tuner for further analysis

The Android mobile application also allows the user to record and send data logs directly from a phone.

Because the logging is handled by the software or mobile device, recording is not limited by the memory size of the ECU hardware.

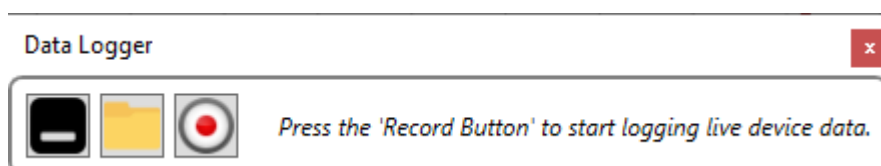
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Opening the Data Logger

Open the data logger from the **top menu bar** of the Cosmos ECU software.



The data logger opens in a **separate window**. This is particularly useful when using a dual-monitor setup, allowing the tuner to view the data logger and the ECU tuning software at the same time.



From this window the tuner can:

- start recording a new data log
- open a previously recorded log
- analyse or replay recorded data

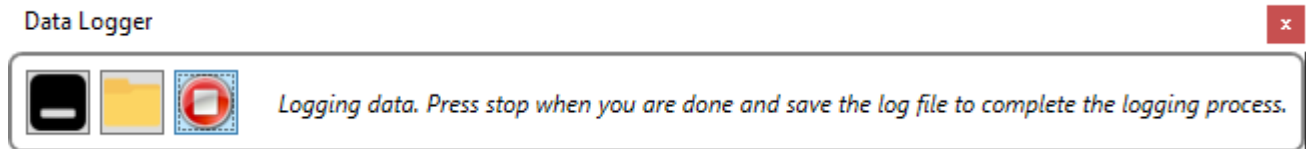
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Recording a Data Log

To begin recording, click the **Record** button.



The data logger will now record all relevant signals and parameters generated by the ECU.



These typically include:

- RPM
- MAP
- TPS
- Altitude / Barometric Pressure (Barro)
- Coolant / Water Temperature
- Air Temperature
- Battery Voltage
- Lambda
- POT
- Injector Time
- Injector Duty
- Timing Degrees
- Error / DTC Codes

The tuner will usually perform a driving run to capture the behaviour of the engine during a specific event.

Examples include:

- Injector Time
- Ignition Timing
- Temperatures
- MAP TPS and RPM values
- DTC Codes

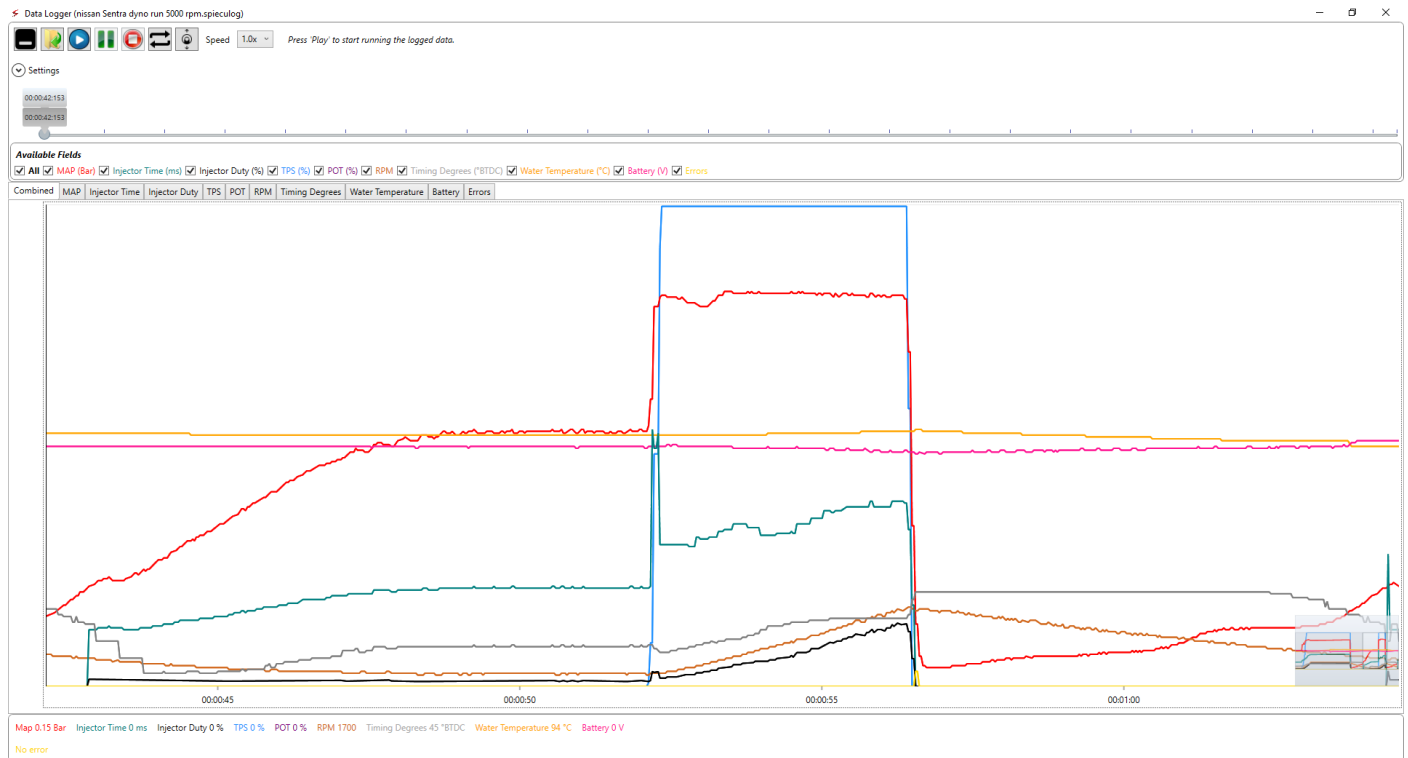
Once the event has been captured, click **Stop** to end the recording.



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Viewing the Recorded Log

When recording stops, the logger automatically opens the **Data Logger Dashboard**, where the recorded data is displayed as graphs.



The tuner can now analyse the recorded signals and determine what occurred during the driving event.

The graph allows the tuner to:

- zoom into specific sections of the recording
- move through the event timeline
- inspect signal values at any point in time

A **crossbar marker** shows the exact moment being analysed. At that point the software displays the real-time values of all recorded signals.

This makes it possible to identify the exact ECU operating condition at any moment during the drive.

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Analysing an Event

To analyse a specific event:

1. Select the section of the graph containing the event.
2. Place the crossbar at the point of interest.
3. Observe the signal values at that instant.

The tuner can then return to the applicable ECU Graphs, Matrix or settings and adjust the Tune accordingly.

Typical adjustments include:

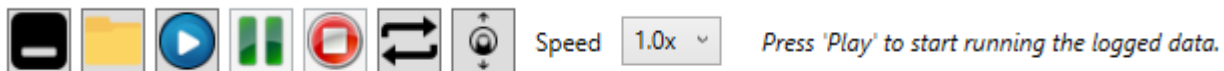
- · Fuel tuning.
- · Ignition timing.
- · Acceleration enrichment.
- · Engine-limit or protection settings.
- Sensor or input-related diagnosis.

After adjustments are made, the updated Tune can be downloaded to the ECU and tested again. This process can be repeated until the desired engine behaviour is achieved.

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Navigating the Data Logger

Top Menu Bar



The top menu bar provides access to the main data logger controls.

Functions include:

- Minimize the data logger window
- Open an existing data log file
- Start and stop recording
- Control playback of logged data

Open a Logged Data File



To open a previously recorded log:

1. Load the Tune / Map file used during the recording.
2. Open the corresponding **data log file**.

The serial number of the Tune / Map file must match the serial number of the Data Log file. If the files do not match, the log cannot be opened.

Always ensure the correct Tune / Map file is loaded before analysing a log. Using the wrong file may result in incorrect tuning adjustments.

Playback Controls

Play



Replays the recorded data between the selected start and stop points.

Pause



Pauses playback at the current position.

Stop



Stops playback.

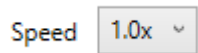
Loop On/Off



Repeats playback between the start and stop points.

This is useful when repeatedly analysing a specific engine event.

Playback Speed



Adjust Playback Speed

The playback speed control adjusts how fast the recorded data is replayed inside the ECU software.

Slower playback speeds make it easier to analyse rapid engine events such as:

- Acceleration enrichment.
- RPM or limiter events.
- Rapid sensor or load changes.

Increasing the playback speed allows the tuner to quickly review long recordings.

Crossbar Marker



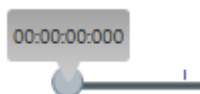
When the crossbar is moved across the graph, the value bar displays the signal values at that exact time. This allows the tuner to see the precise operating condition of the ECU during the recorded event.

This is extremely useful when diagnosing events such as:

- Lean or rich mixture changes.
- Ignition-timing behaviour.
- Sensor, RPM or DTC events.

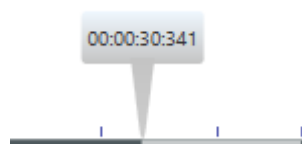
Crossbar Limits can be placed around an area of interest. This allows only the selected section to be replayed repeatedly through the ECU software.

Select Start Point



Set this point at the beginning of the event you want to analyse. Playback starts from this point.

Select Stop Point



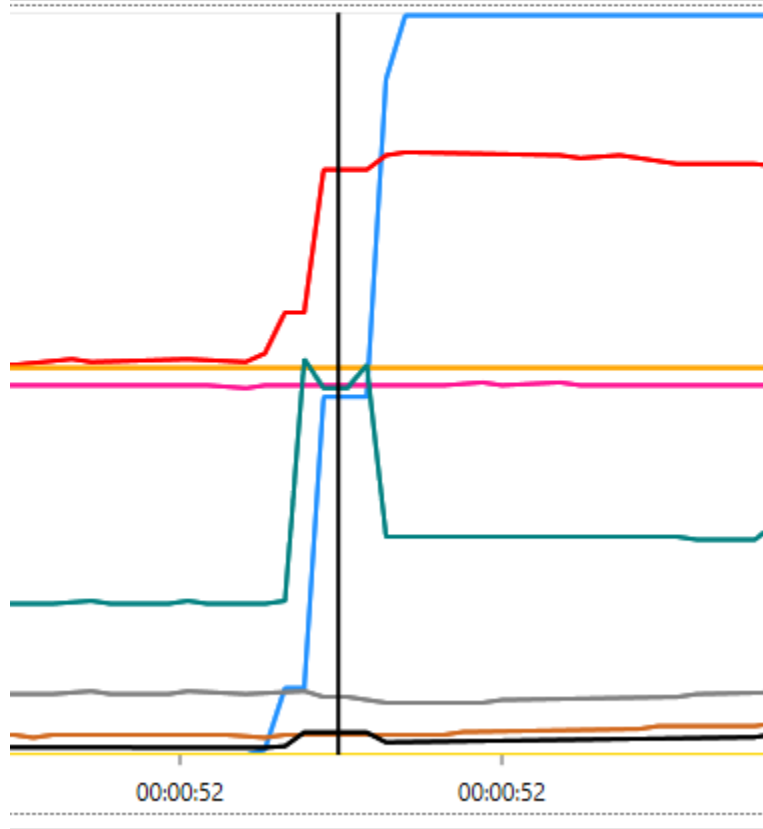
Set this point at the end of the event you want to analyse. Playback stops at this point.

Example: (Area selected to replay)



'M ☒ Timing Degrees (°BTDC) ☒ Water Temperature (°C) ☒ Battery

Temperature Battery Errors



Timing Degrees 20 °BTDC Water Temperature 93 °C Battery 0 V

Middle Menu Bar

Available Fields

Available Fields
☒ All ☒ MAP (Bar) ☒ Injector Time (ms) ☒ Injector Duty (%) ☒ TPS (%) ☒ POT (%) ☒ RPM ☒ Timing Degrees (°BTDC) ☒ Water Temperature (°C) ☒ Battery (V) ☒ Errors

The tuner can select which signals are displayed in the graph.

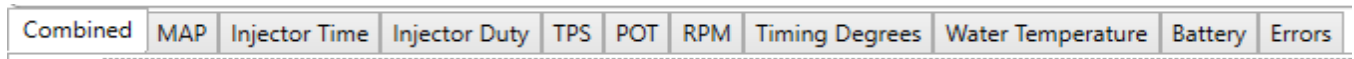
Reducing the number of displayed signals makes it easier to focus on the relevant data.

☒ All

The **Select All / Deselect All** button allows quick selection or removal of signals.

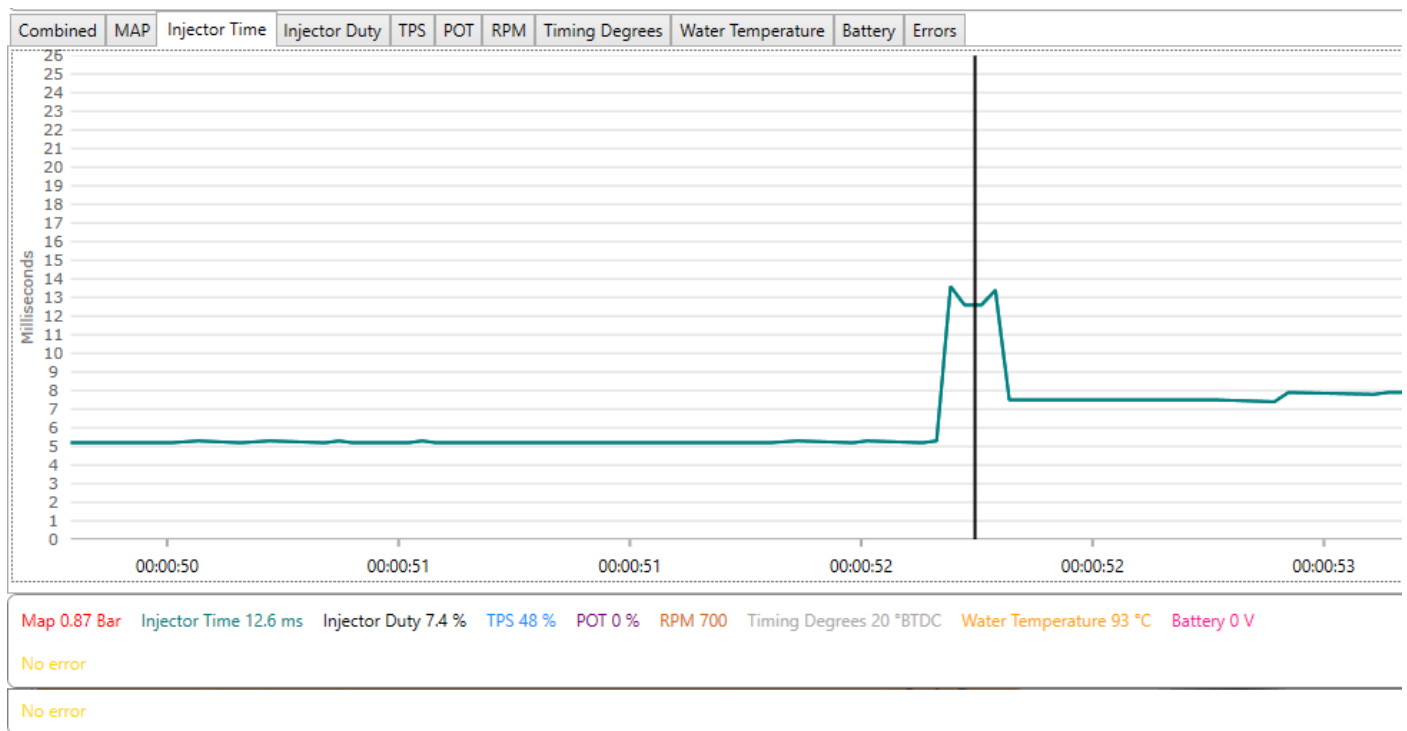
This button selects or deselects all displayed signals with one click.

Single Signal View



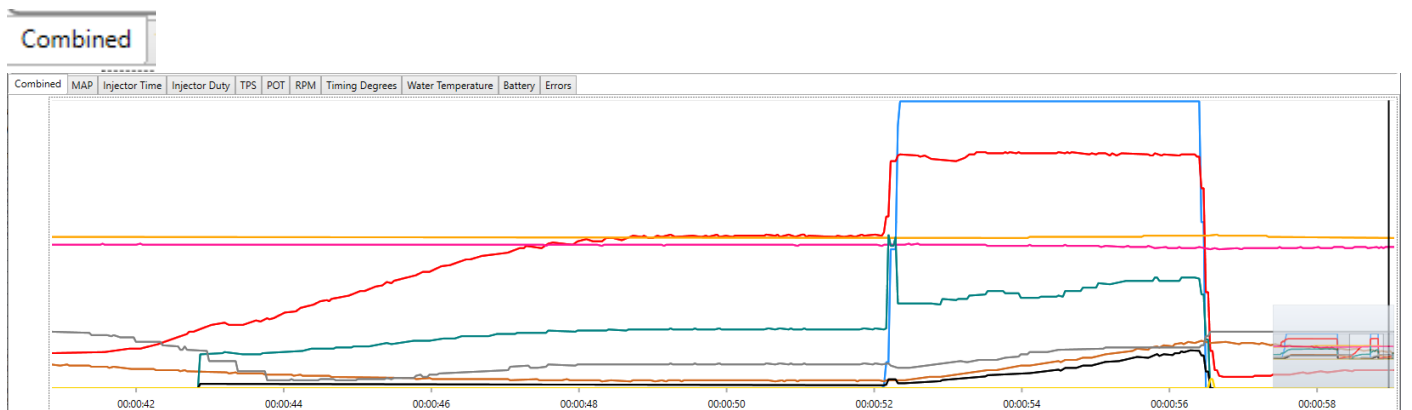
Because different signals use different Y-axis scales, it is sometimes easier to view a single signal at a time.

Selecting a single signal will display it using its full-scale range, making it easier to analyse its behaviour.





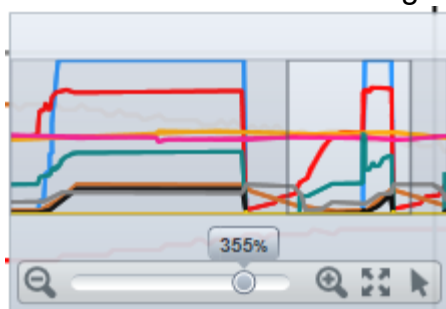
Selecting **Combined View** restores the multi-signal display.



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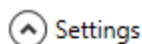
Navigation Window Controls

The Navigation Window assists the tuner in moving through the Data Log. The zoom controls allow small sections of a long recording to be examined in detail.



Navigation Window Location

These settings move the Navigation Window to different positions on the graph so that it does not cover the area being analysed.



☒ Show Navigation Window

Navigation Panel Options

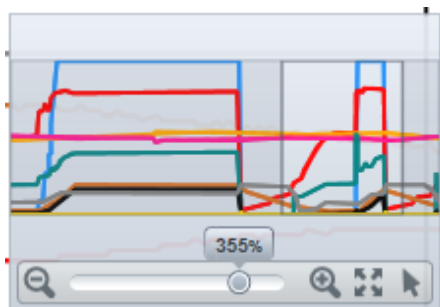
Horizontal Alignment

Right

Vertical Alignment

Top

Navigation Window Explanation



The highlighted block inside the navigation window represents the section of the log currently displayed in the main graph.

You can drag this block left or right to move quickly to another part of the whole data log. This feature is especially useful when analysing long data logs.

Reset



This button will restore zoom to 100% of the data log.

Mouse Navigation Modes



Pan Mode (Top Hand)

In **Pan Mode**, the graph can be moved left or right by dragging it with the mouse.

This allows the tuner to scroll through the recording while maintaining the current zoom level.

When the graph is moved, the active block in the navigation window will also move across the total log view.

Alternatively, you can drag the active block directly inside the navigation window to reposition the view.

Zoom Mode (Bottom Hand)

In **Zoom Mode**, the mouse can be used to zoom into a specific section of the graph.

To zoom in:

1. Click and hold the left mouse button.
2. Drag across the area of the graph you want to analyse.
3. Release the mouse button.

The selected area will expand to fill the graph window.

You can also adjust the zoom level using the mouse scroll wheel.

The navigation window will show the new zoom position relative to the full recording.

Arrow Key Control



Enable / Disable current position adjustment with arrow keys

This option enables or disables Crossbar movement with the keyboard arrow keys.

Option OFF

The **zoom window** will move left or right using the keyboard arrow keys.

Option ON

The **crossbar position** will move left or right using the keyboard arrow keys.

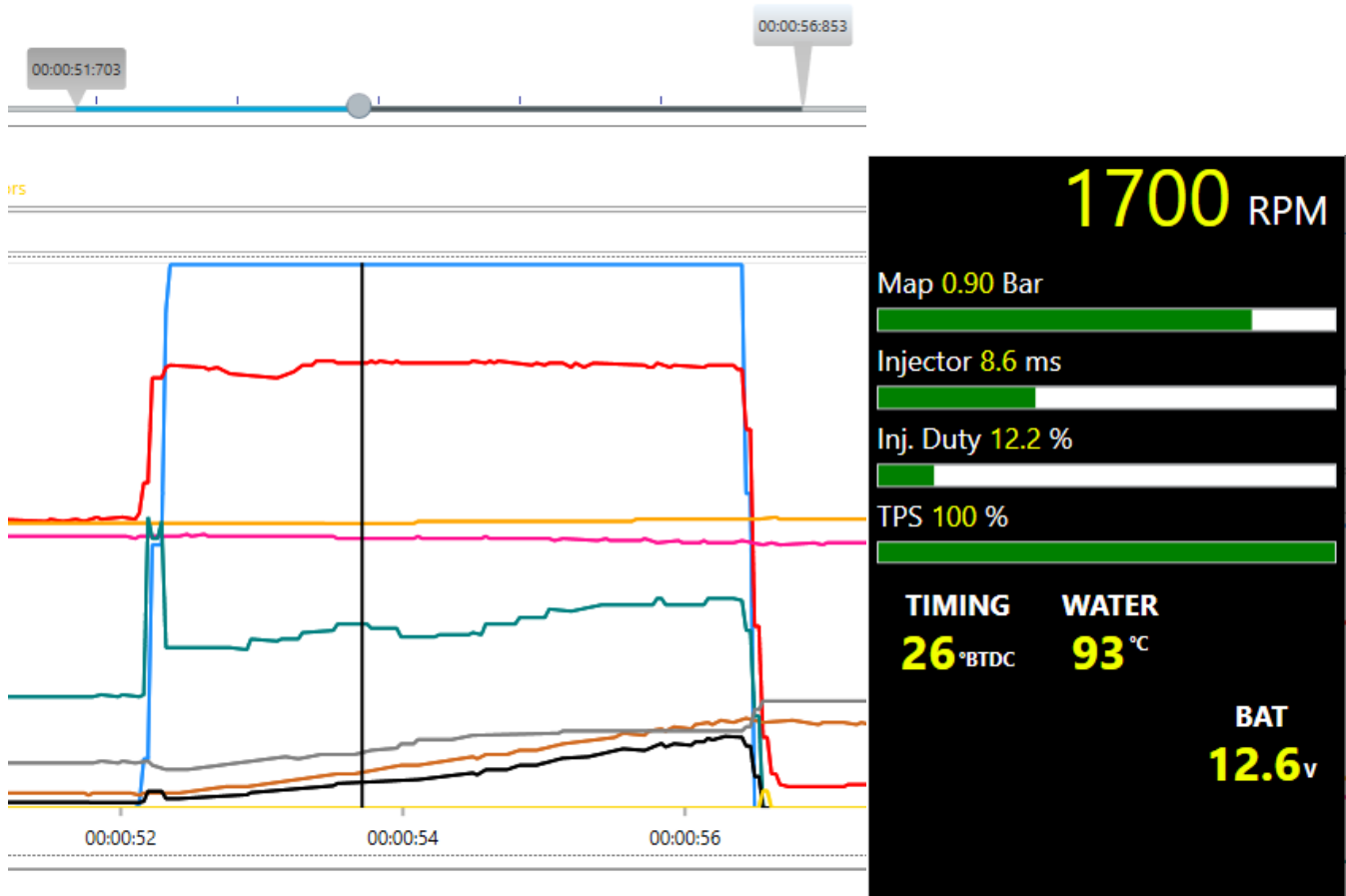
This allows precise navigation without using a mouse.



The time scale at the bottom of the graph shows the recording time and the position of the displayed data within the log.

TPS 0 % RPM 0 Speed In 0 Kph Speed Out 0 Kph Gear 0 Shifter D Shifter D Map 1 Oil Temperature 1 0 °C Oil Temperature 2 0 °C Battery 0 V Lockup Off Down Shift Off Low Range Off Over Drive Off Second Gear Start Off Brake Switch Off Sport Switch Off

The bottom value bar shows the Realtime values at the Crossbar position. This makes it easy to compare several signals at exactly the same point in an event.



Place the Crossbar on a specific point to view the exact recorded Realtime values. The tuner can then open the applicable Graph, Matrix or setting and identify the operating area that requires attention. When Play is selected, the recorded data is replayed through the ECU software so the tuner can watch the operating point move through the tuning screens as the event occurred. After making adjustments, save the modified Tune or connect to the ECU and download the changes, then record another test for comparison.

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Data Log Examples

Example - Analysing a Lean or Rich Area

1. Record the engine through the operating area where the mixture problem occurs.
2. Display the most useful signals, typically MAP or TPS, RPM, Injector Time, Injector Duty and Lambda where available.
3. Use the Crossbar to locate the exact point where the mixture changes.
4. Replay the selected area through the ECU software and identify the corresponding Graph or Matrix tuning area.
5. Adjust the Tune, record another test and compare the result.

Example - Analysing Acceleration Enrichment

1. Record a throttle-opening event where the engine hesitates, bogs or becomes excessively rich.
2. Display TPS, MAP, RPM, Injector Time and Lambda where available.
3. Compare the throttle or MAP movement with the fuel response.
4. Use the recorded event to adjust the applicable Prime and Accel settings, then repeat the test.

Example - Analysing an RPM or Misfire Event

1. Record the engine through the RPM range where the problem occurs.
2. Display RPM, Timing, Battery Voltage, Injector Duty and Errors together with the relevant load signal.
3. Check whether the fault occurs at a repeatable RPM or operating condition.
4. Use the recorded Errors and supporting signals to determine whether the problem is related to tuning, electrical supply, triggering or another engine-control condition.

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