



# HOW-TO

## How-to Prepare Files in EMU Black

Document version: 1.0

Software version: 2.169 or later

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# 1. Introduction

Project, log, and scope files are essential when diagnosing issues or tracking changes made to an ECU setup. A project file stores all ECU settings, while log and scope files capture engine behavior during operation. These files can help compare configurations, identify issues, and share data for support or analysis. This guide applies to EMU Black V2 and V3 software.

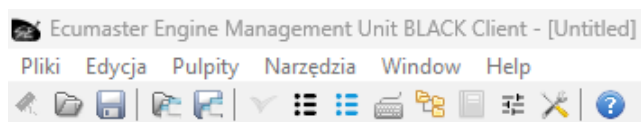
## 2. ECU project file

ECU project files contain the current configuration of the ECU and are saved with the extension **.emub** or **.emub3** (for EMU Black V3).

To save the ECU project file (the current ECU configuration):

1. Click **File** in the main window toolbar or press **Ctrl + S**.

Alternatively, click the Save icon in the toolbar.



2. Choose the folder where you want to save the file and enter a project name.

## 3. Log file

A log file contains recorded channel data over time and is saved with the extension **.emublog** or **.emublog3** (for EMU Black V3). Although the *Graph Log* window displays only selected channels, all available data is recorded during logging and can be saved for future analysis.



### Note:

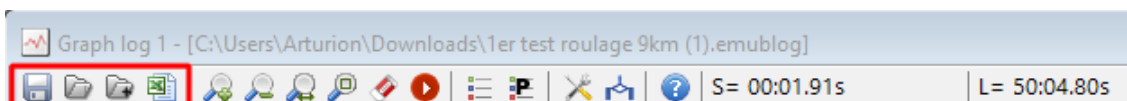
Data is temporarily stored during logging. If the file is not saved manually, the data will be lost.

## Opening the Graph Log window

You can open the *Graph Log* window using one of the following methods:

- Via **Treeview: Log / Graph 1**
- By clicking the **Log graph icon** in the main toolbar
- From the menu: select **Tools** → **Loggraph** (or shortcut: **F6**) - available only in **EMU Black V3**

## Graph Log toolbar icons

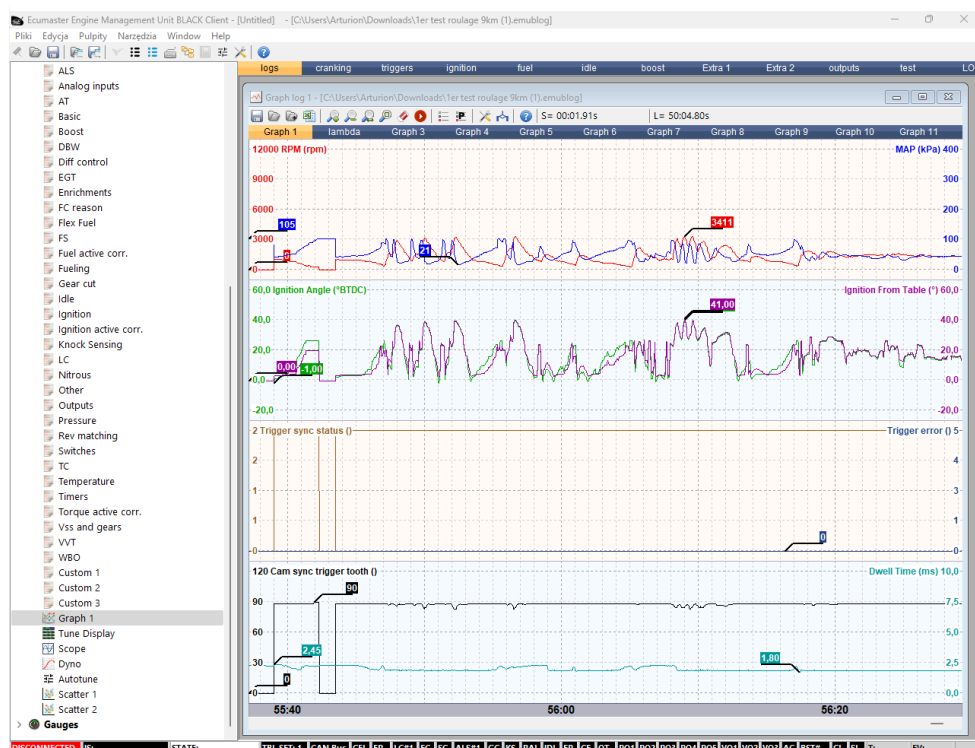


The toolbar in the Graph Log window includes the following icons:

- **Save log** – saves the currently recorded log data to a `.emublog` or `.emublog3` file
- **Open log** – opens a previously saved log file
- **Append log** – appends new data from an additional logging session to an existing log file
- **Export to CSV** – exports the log data to a `.csv` file for further analysis (e.g. in Excel)

## To save a log file:

1. After logging the desired data, click the **Save icon** (floppy disk symbol) in the toolbar of the *Graph log* window.



2. Select the folder where you want to save the file and enter a file name.

## 4. Scope file

The scope file contains the decoded signals from the crankshaft, cam sync, and cam #2 sensors, which are displayed as lines in the **Scope** window. These files are saved with the extension **.emubscp** or **.emubscp3** (for EMU Black V3).

### 1. Enabling Scope data capture

In the *Treeview: Ignition / Triggers / Primary trigger* parameters window, enable the 'Enable scope' option.



#### Note:

In **EMU Black V3**, the 'Enable scope' option is not available because Scope is always enabled.

### 2. Opening the Scope window

There are several ways to open the *Scope* window:

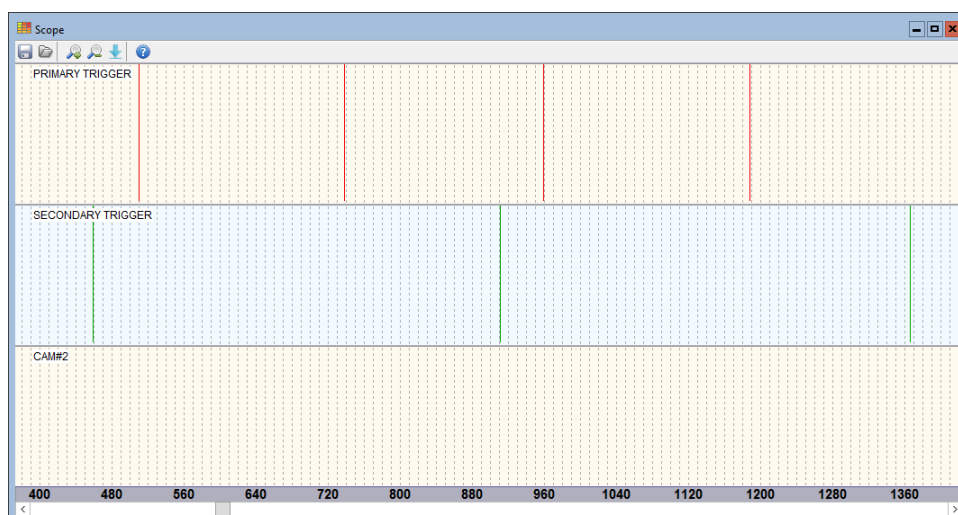
- Via **Treeview: Log / Scope**
- By clicking the **Scope icon** in the main toolbar
- From the menu: **Tools** → **Scope** (shortcut: **F5**) - available only in **EMU Black V3**

### 3. Using the Scope window

Using the *Scope* window

The *Scope* window is divided into three parts, each displaying the decoded signal from a specific sensor:

- PRIMARY TRIGGER – crankshaft sensor signal
- SECONDARY TRIGGER – cam sync sensor signal
- CAM#2 – secondary camshaft sensor signal

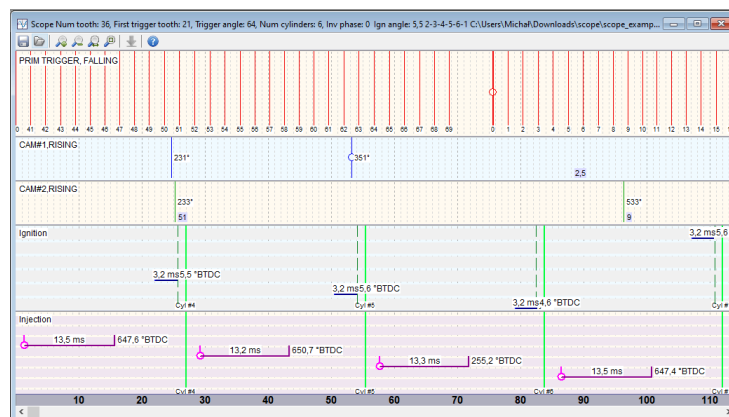


### In EMU Black V3

Scope in EMU Black V3 additionally shows the signals from ignition and injection outputs.

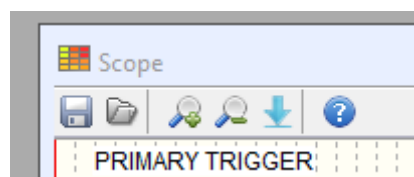
The title bar contains the following information:

- Number of defined teeth
- First trigger tooth
- Trigger angle
- Number of cylinders
- Phase inversion
- Defined firing order
- Ignition angle (ignition angle at the moment the data was captured)
- File path (if the data was opened from a saved file)



The toolbar in the *Scope* window includes the following icons:

- Save scope – saving the current scope data
- Open scope – loading a previously saved scope file
- Zoom In/Out – zooming in/out on the signal graph
- Get scope data (blue arrow icon)
- Help – opening help documentation



## 4. Collecting data

Signals will not appear automatically. To collect data:

1. Preconfigure the trigger system, including sensor types, trigger settings, etc.
2. Click the blue arrow located on the toolbar of the Scope window.
3. Start cranking the engine.

When the setup is correct, signals will appear in the graph.

### Troubleshooting Scope data

If signals do not appear in the *Scope* window:

- Ensure that the sensors are wired correctly.
- Verify sensor type and polarity in the trigger settings.
- Check pull-up or pull-down resistor configurations.
- Confirm that 'Enable scope' is selected in the *Primary Trigger* parameters. (*only in EMU Black V2*)



#### Note:

Note: Without a valid *Primary trigger* (crankshaft) signal, the other sensors will not function (the cam sync and cam #2 signals will not be displayed).

## 5. Document history

| Revision | Date       | Changes         |
|----------|------------|-----------------|
| 1.0      | 2025.07.03 | Initial release |