

04 ANALYZER - PROFILER



Analyzer - Profiler

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01 Analyzer – Profiler Configuration

Complete Profiler analysis is performed on the captured trace record after its data is uploaded to the PC where winIDEA runs.

This unit covers profiling:

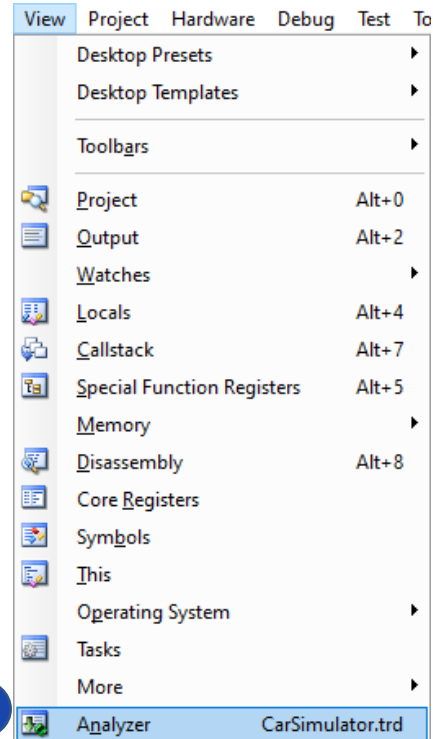
- Executed Code
- Recorded data accesses
- Operating System (OS) events and objects

Profiler configuration starts in the Analyzer Configuration dialog:

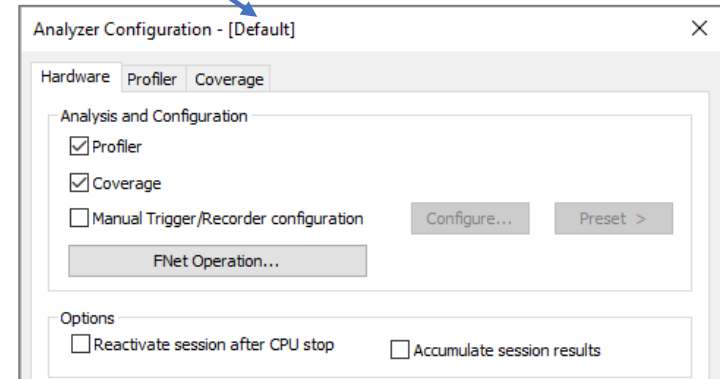
1. Open View menu / Analyzer

When new Analyzer file (.trd) is created, Profiler Timeline view and Coverage Statistics view are visible. For this particular session close Coverage Statistics view and open Profiler Statistics view and Trace view using according Analyzer toolbar buttons. All views within the Analyzer window can be freely repositioned by drag-and-drop.

2. Click Analyzer Configuration button in the Analyzer menu.



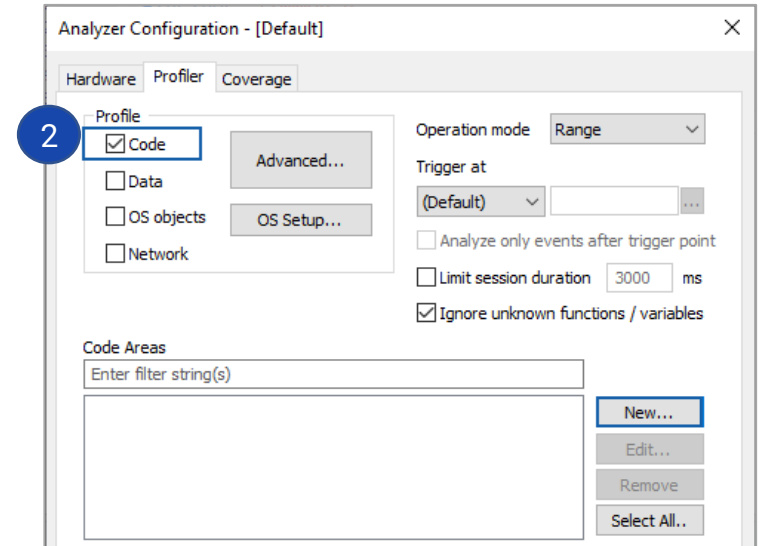
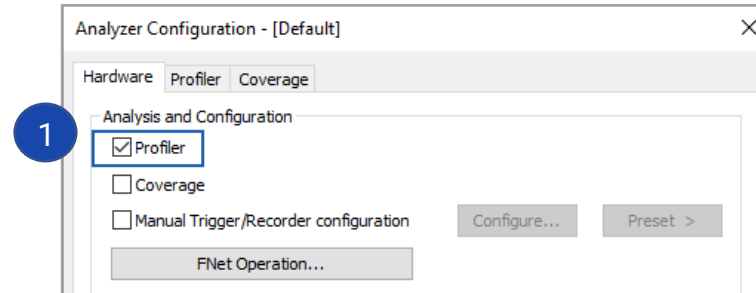
2



02 Profiling Code 1/2

To enable profiling the Code:

1. Check **Profiler** in the *Hardware* tab.
2. Check **Code** in the *Profiler* tab.



To optimize the settings *Manual Trigger/Recorder configuration* needs to be enabled, followed by clicking **Configure** button to open Specific trace configuration dialog.

02 Profiling Code 2/2

If Code Areas section is left empty, all functions listed (reported) in the debug download file(s) are recorded.

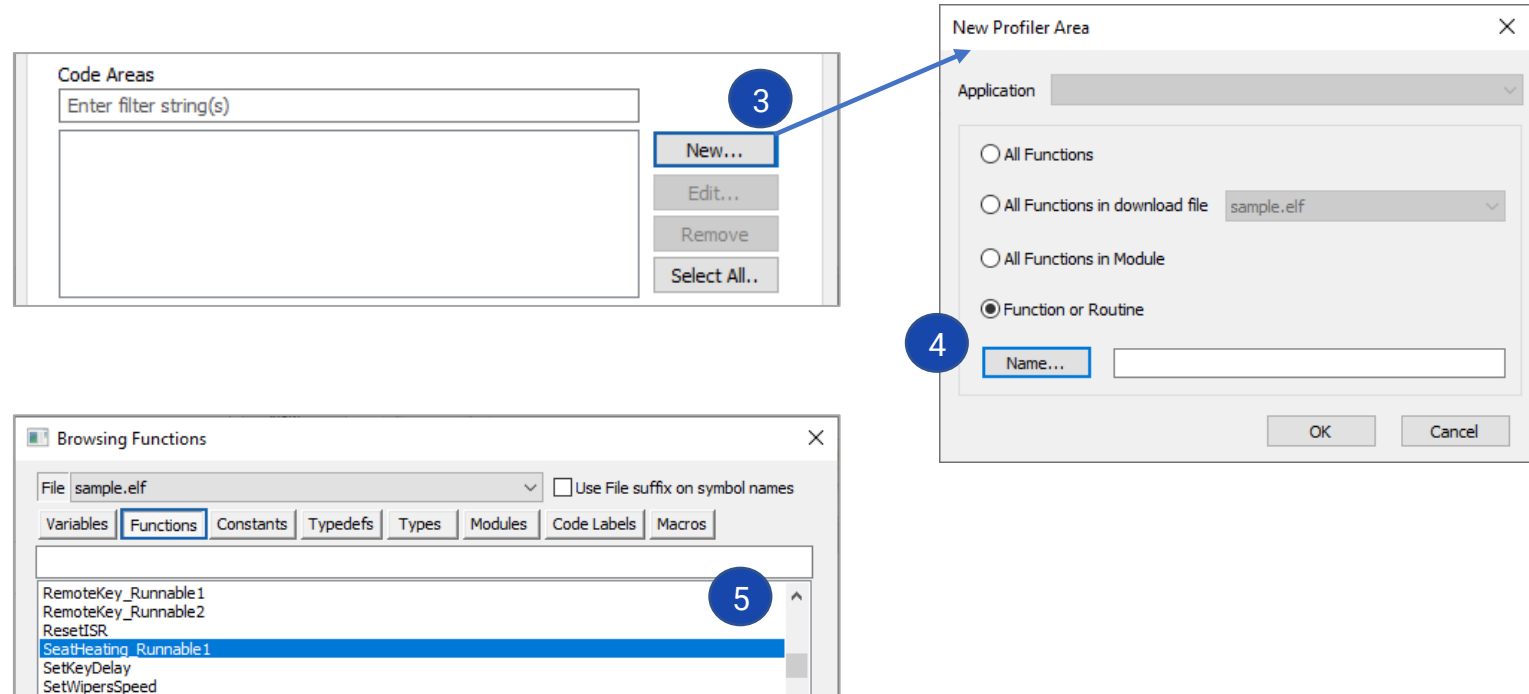
In general, it is recommended to profile only functions of interest since this yields faster Profiler analysis. Define functions of interest in Code Areas section.

3. In Code Areas section click **New** button to open New Profiler Area dialog.

4. Select *Function or Routine* and click **Name...** button to open Browsing Functions dialog.

5. Select individually each function of interest from the **Functions** list.

If you want to profile only Code, **skip to page 9**, to start the Analyzer session.



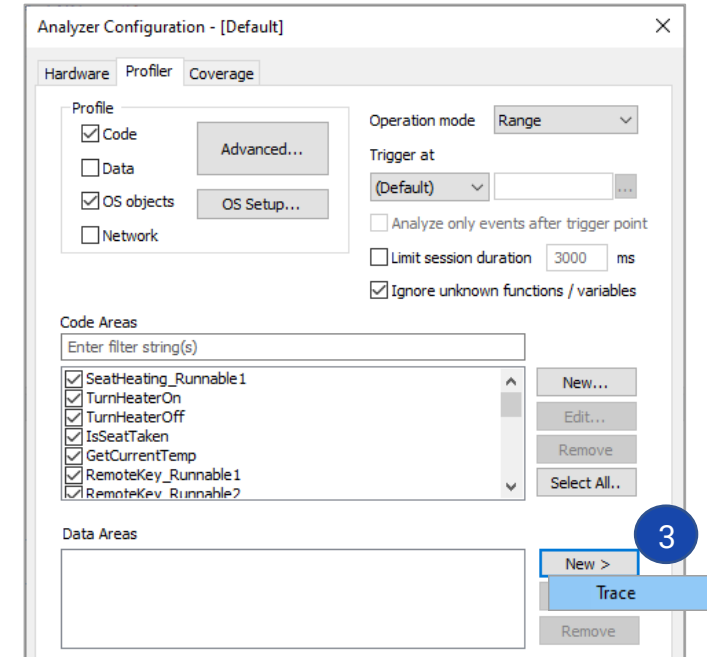
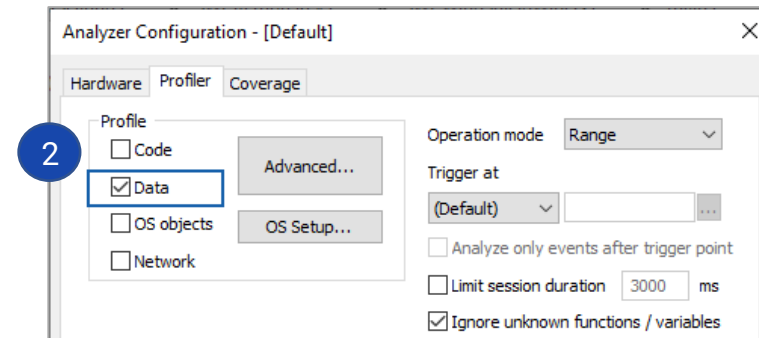
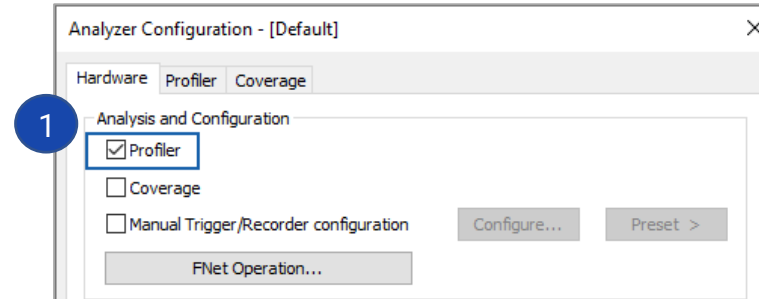
03 Profiling Data 1/2

Through the Analyzer tracing the CPU data accesses, the Profiler obtains the necessary data to track data changes over time and calculate the statistics for data objects.

To profile data accesses:

1. Check **Profiler** in the *Hardware* tab.
2. Check **Data** in the *Profiler* tab.
3. Click **New / Trace** in the *Data Areas* section.

NOTE: Number of Data Areas, which can be configured is limited, typically by number of on-chip data address comparators, which depends on the CPU architecture.



03 Profiling Data 2/2

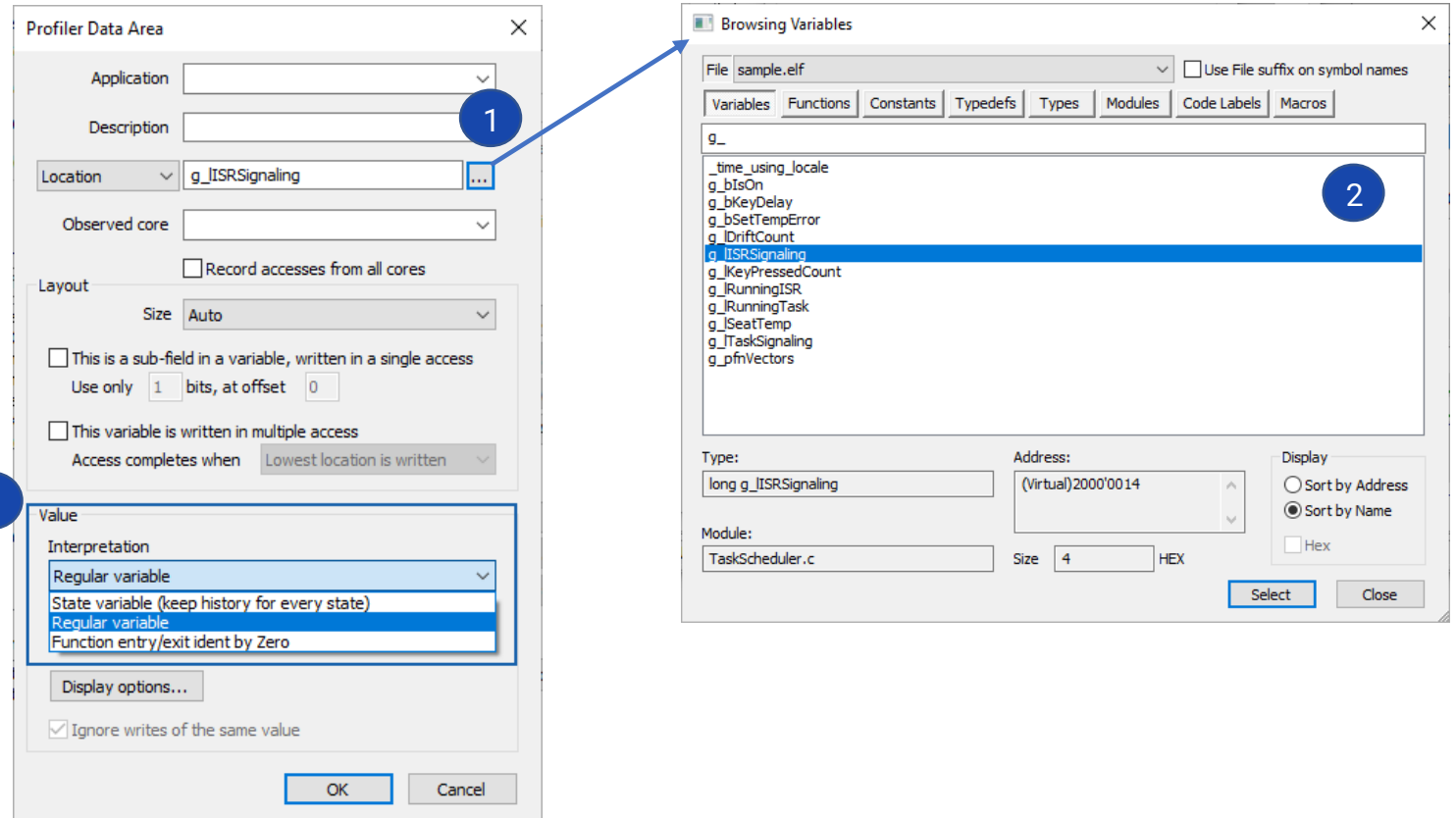
Profiler Data Area dialog offers various settings. In this case configure only the following:

1. Click "..." button in the *Location* section.
2. Select **Variables** you would like to profile in the *Browsing Variables* dialog.
3. Select **Interpretation** in the *Value* section and confirm by clicking OK.

* Value Interpretation options:

- **State variable** displays finite number of states and keeps history for every state.
- **Regular variable** displays recorded data as a waveform (e.g. measuring temperature).

→ If you want to profile only Data and Code, [skip to page 9](#), to start the Analyzer session.



The image shows two dialog boxes from a profiler tool. The first is the 'Profiler Data Area' dialog, and the second is the 'Browsing Variables' dialog. Red circles and arrows indicate the steps described in the text.

Profiler Data Area Dialog:

- 1:** Points to the '...' button next to the 'Location' field, which is set to 'g_ISRSignaling'.
- 2:** Points to the 'Value' section, specifically the 'Interpretation' dropdown menu.
- 3:** Points to the 'Regular variable' option in the 'Interpretation' dropdown menu.

Browsing Variables Dialog:

- 2:** Points to the 'Variables' tab, where 'g_ISRSignaling' is selected in the list of variables.

04 Profiling OS objects

1. To profile OS objects, specific OS awareness (e.g. OSEK AUTOSAR, PikeOS,..) needs to be configured before. For more information refer to [Online Help](#).

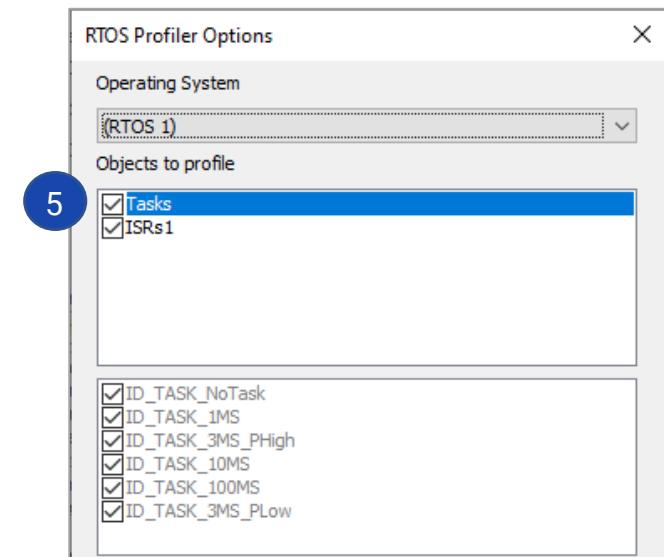
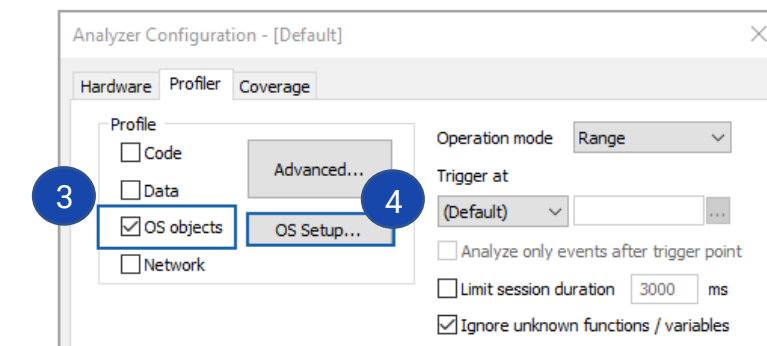
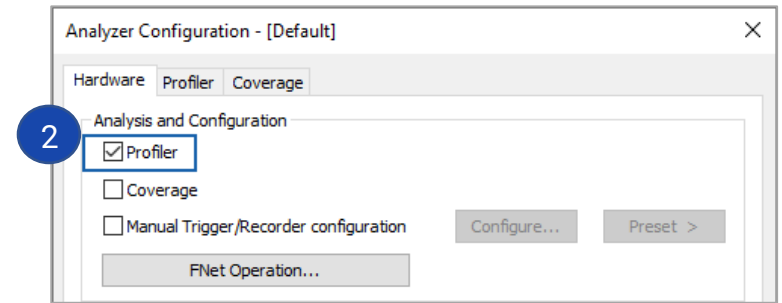
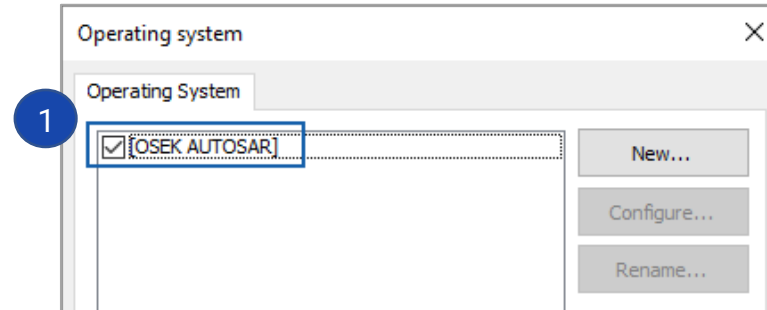
2. Check **Profiler** in the *Hardware tab*.

3. Check **OS objects** in the *Profiler tab*.

4. Click **OS Setup** button.

5. Select **Objects to profile** (e.g. Context ID, Tasks, ISRs1, Interrupt ID) in the *RTOS Profiler Options* dialog. Available objects for specific OS are listed only.

→ Start the Analyzer session



05 Begin Analyzer Session

To begin a new Analyzer session, first establish the Debug session and then run the application until e.g. Main function.

Following commands are available in the Analyzer window toolbar:

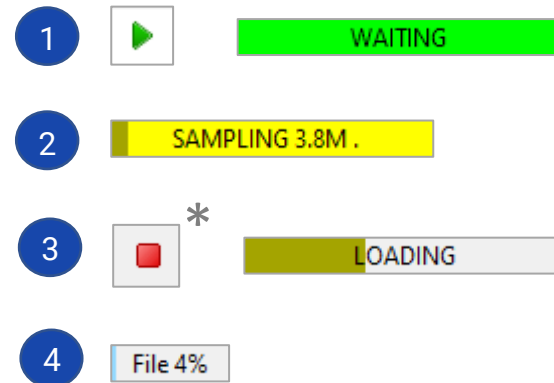
1. Click **Begin New Session** button or press Ctrl+B. WAITING status will be displayed:

- if the application is still stopped
- if the application is running already but optionally configured Analyzer trace trigger didn't hit yet

2. Run the application. While BlueBox is recording, Analyzer status bar shows SAMPLING. Dark yellow bar displays the amount of the trace buffer being filled already.

3. Once the Analyzer stops recording, it will continue LOADING the trace data. The dark yellow bar indicates the amount of trace data transferred to the PC already.

4. Analyzer file status bar indicates relative size of the Analyzer recording file on the PC against its maximum (configurable) file size. In case the file reaches 100% of its limit, the upload stops.







06 Results

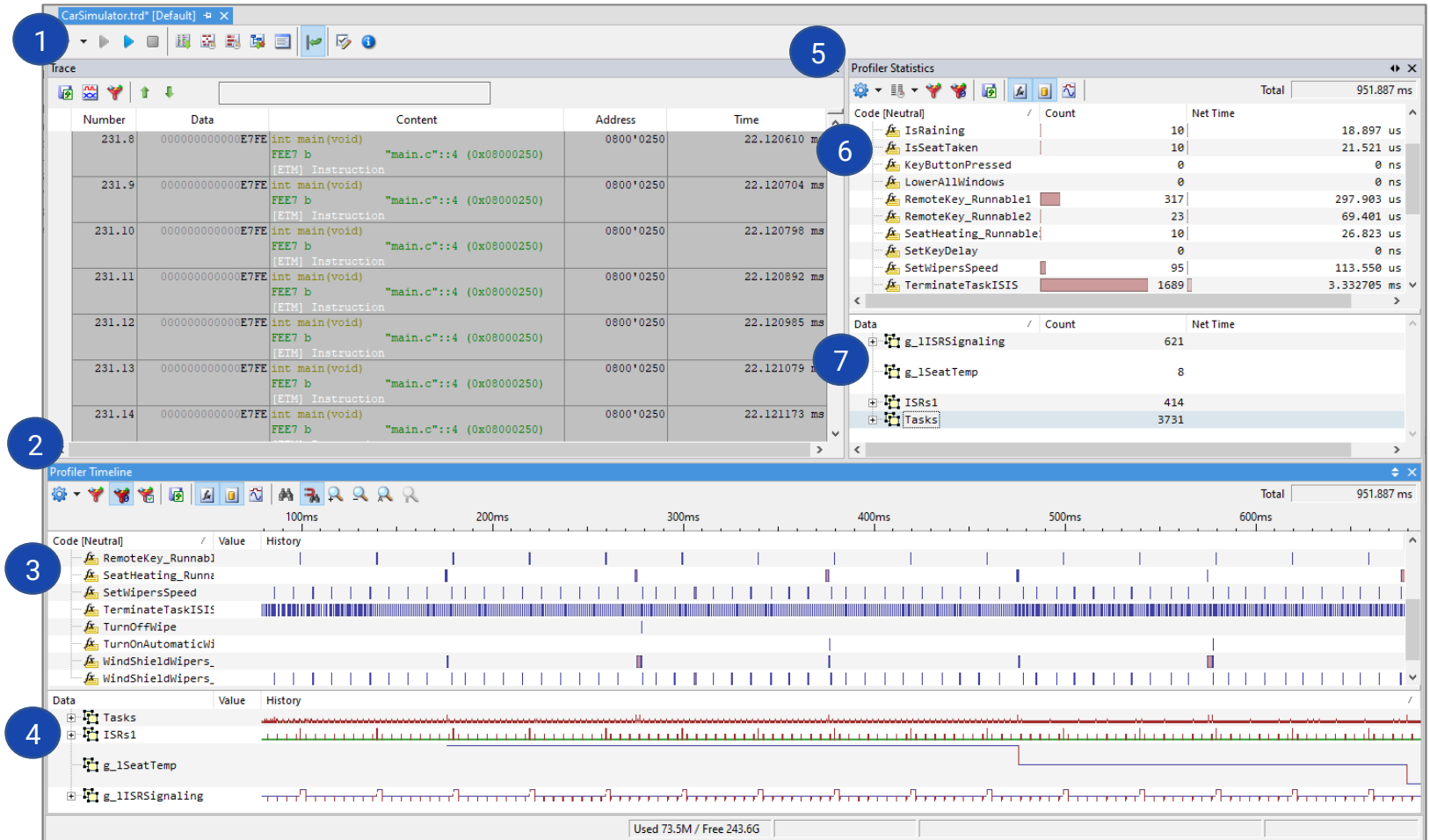
After the Analyzer completes the upload and the Profiler analysis, the results are displayed. If Data and OS objects information is not displayed, find and press Show Data button in the Profiler Timeline and Profiler Statistics toolbar to display this.

You should see now:

1. Raw trace data in Trace View
2. Profiler Timeline View
3. Code execution over time
4. Data Areas and OS events over time
5. Profiler Statistics View
6. Code execution statistics
7. Data Areas and OS events statistics

Among other features Trace and Profiler toolbars allow to:

-  Export data
-  Toggle Data events
-  Toggle Code / Function events
-  Zoom in / out



The screenshot displays the Profiler tool interface with the following components and callouts:

- 1**: Trace View toolbar (Play, Stop, Refresh, etc.)
- 2**: Profiler Timeline toolbar (Zoom, Pan, etc.)
- 3**: Profiler Timeline view showing code execution over time.
- 4**: Data Areas view showing OS events over time.
- 5**: Profiler Statistics toolbar (Settings, Filter, etc.)
- 6**: Profiler Statistics view showing code execution statistics.
- 7**: Data Areas view showing Data Areas and OS events statistics.

Code [Neutral]	Count	Net Time
IsRaining	10	18.897 us
IsSeatTaken	10	21.521 us
KeyButtonPressed	0	0 ns
LowerAllWindows	0	0 ns
RemoteKey_Runnable1	317	297.903 us
RemoteKey_Runnable2	23	69.401 us
SeatHeating_Runnable1	10	26.823 us
SetKeyDelay	0	0 ns
SetWipersSpeed	95	113.550 us
TerminateTaskISIS	1689	3.332705 ms

Data	Count	Net Time
g_lISRSignaling	621	
g_lSeatTemp	8	
ISRs1	414	
Tasks	3731	



Further Reading

For more information refer to our online resources:

Hardware Solutions:

- On-Chip Analyzer BlueBox [iC5700](#)
- [Active Probes](#)
- [Debug Adapters](#)

winIDEA Online Help:

- [Analyzer](#)

[Knowledge Base](#)