

# 03 ANALYZER – TRACE





# Analyzer – Trace

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# 01 Starting with the Trace Wizard 1/2

iSYSTEM provides simple to use Trace Wizard to ease configuring complex and often hard to understand CPU on-chip trace resources.

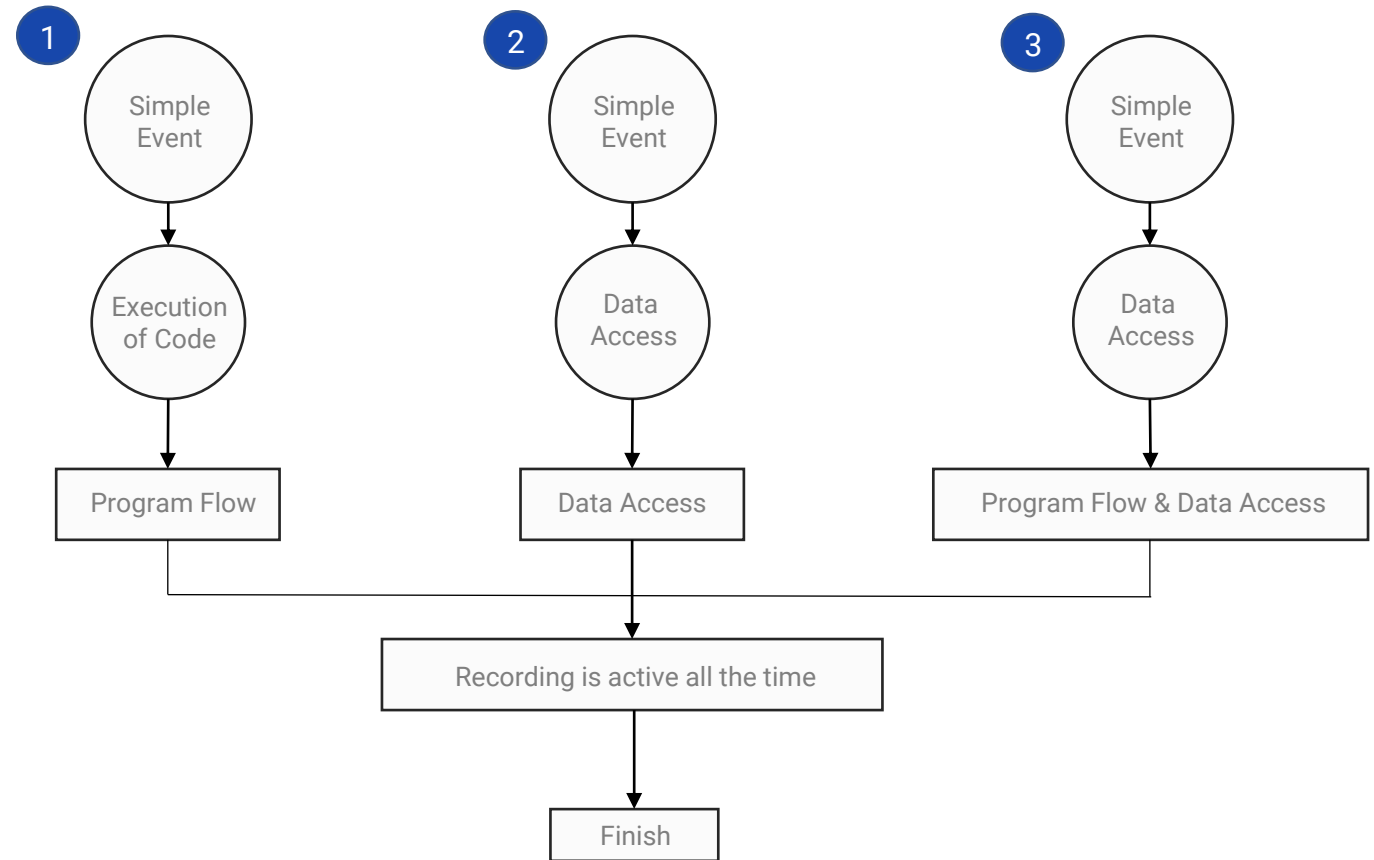
Trace Wizard is a simple tool which allows configuring popular trace scenarios in just a few clicks.

This tutorial will guide you through three simple uses cases:

**Scenario 1:** Trigger on a specific function and record code

**Scenario 2:** Trigger on a specific data value and record data

**Scenario 3:** Trigger on a specific data and record code and data



# 01 Starting with the Trace Wizard 2/2

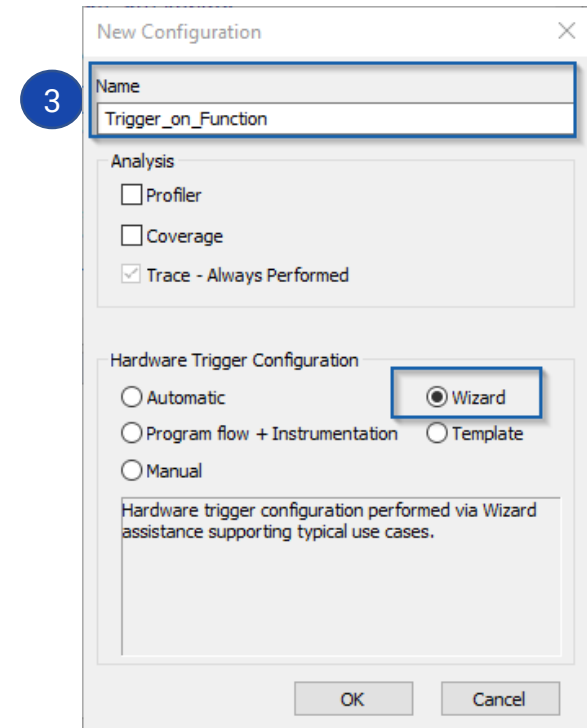
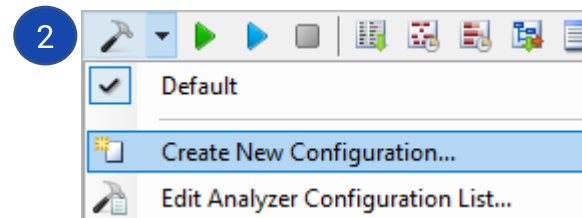
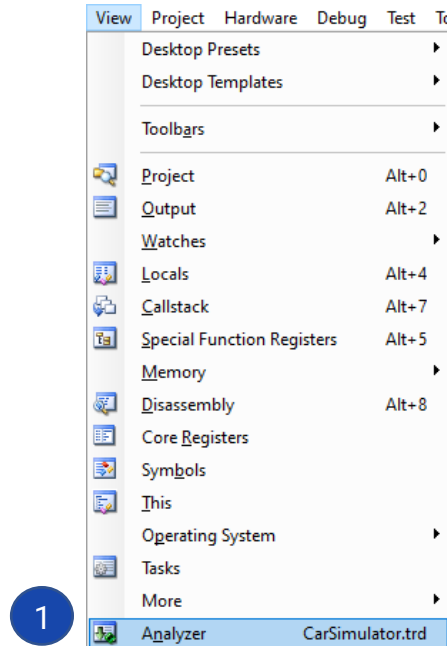
1. Click *View menu / Analyzer*.

2. Click the arrow button in the Analyzer toolbar and select *Create New Configuration...*

3. Give the New Configuration a meaningful name, select *Wizard* under *Hardware Trigger Configuration* and confirm by clicking OK.

When not required, Profiler and Coverage analysis should be unchecked to speed up the trace display.

**NOTE:** Leave the Profiler checked in case you wish to view the results in the Profiler Timeline view.

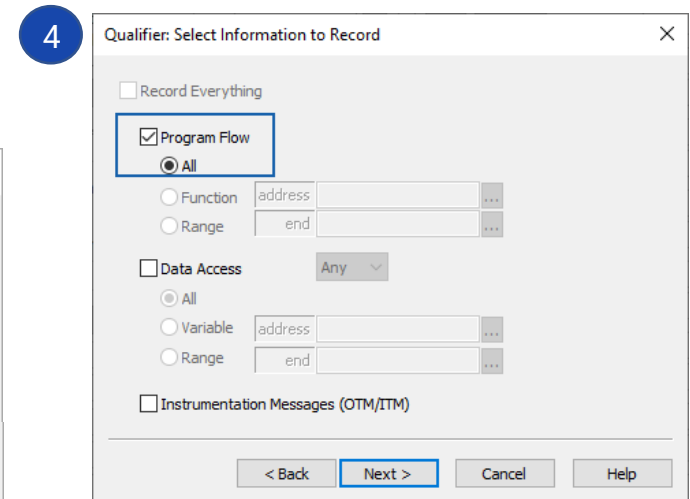
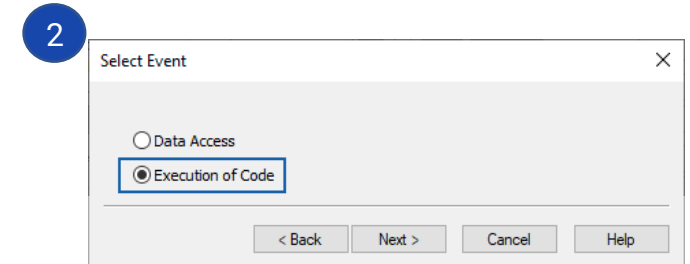
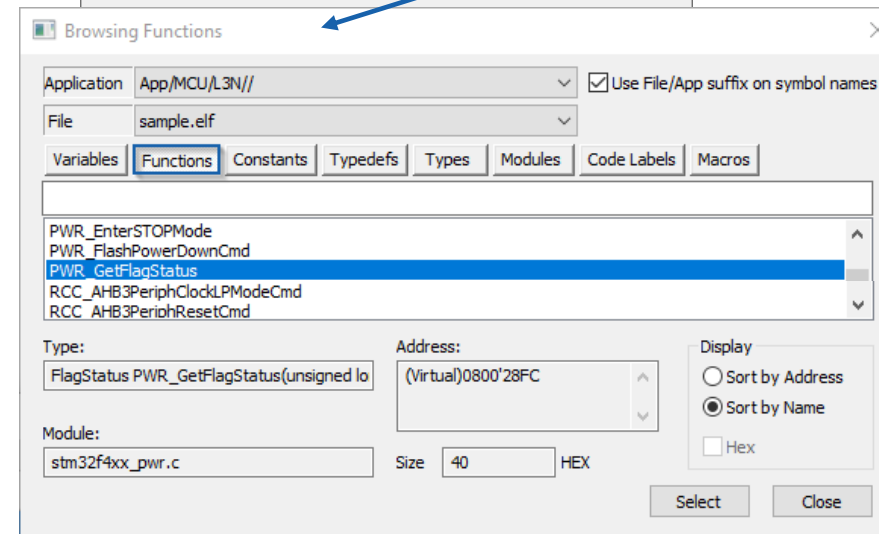
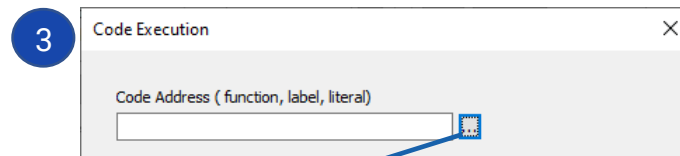
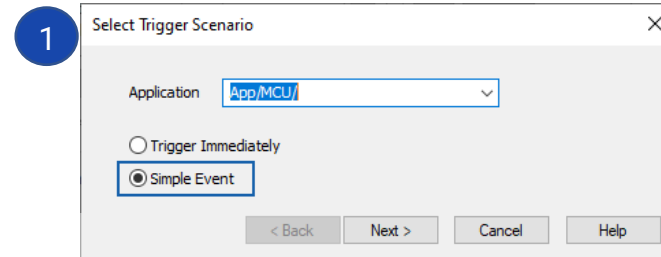


## 02 Trigger on a function and record code 1/2

### Trigger Scenario & Recording Information

Once the Wizard is opened, configure following settings:

1. Select **Simple Event** for the Trigger Scenario and click Next.
2. Select **Execution of Code** for the Event and click Next.
3. Select a **function** from the *Symbol Browser / Functions tab* for the Code Address and click Next.
4. Make sure **Program Flow / All** is selected and click Next.



## 02 Trigger on a function and record code 2/2

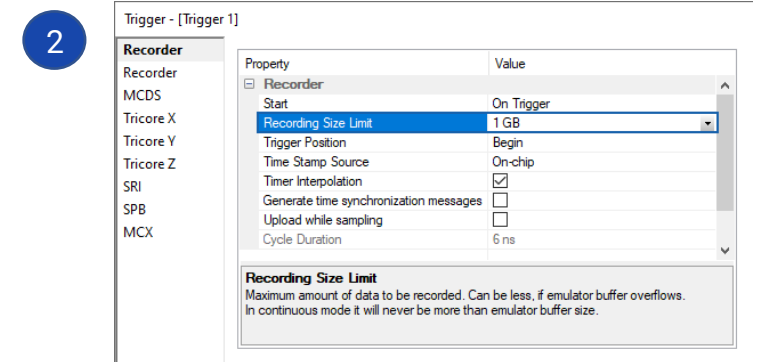
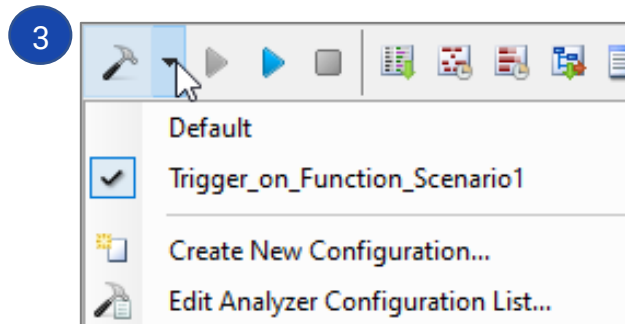
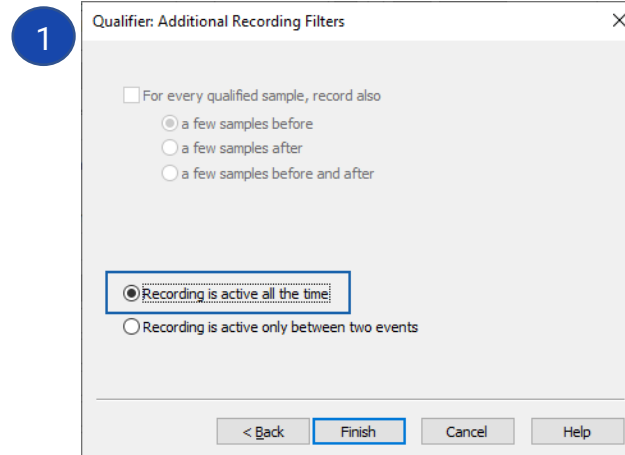
1. Keep default **Recording is active all the time** selected for the Additional Recording Filter and click Finish.

2. **Recording Size Limit:** It is recommended to reduce the amount of data to be recorded (e.g. 1M can be a good starting point) to your specific needs since this directly impacts trace upload time and trace window responsiveness.

It makes no sense to record big amount of code around the trigger event if your interest is only a small part of the code in the trigger vicinity. The bigger the trace recording is, the longer will take the trace upload and processing the recorded information.

3. Make sure the New Configuration Trigger is selected in the drop-down menu (e.g. *Trigger\_on\_Function\_Scenario1*).

→ Begin Analyzer recording session. [Skip to page 11.](#)



# 03 Trigger on a data and record data 1/2

## Trigger Scenario

Once the Wizard is opened, configure following settings:

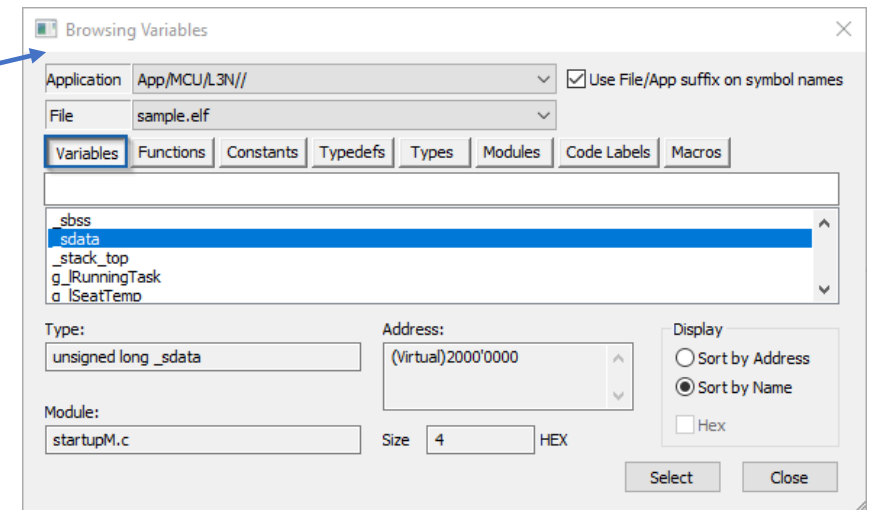
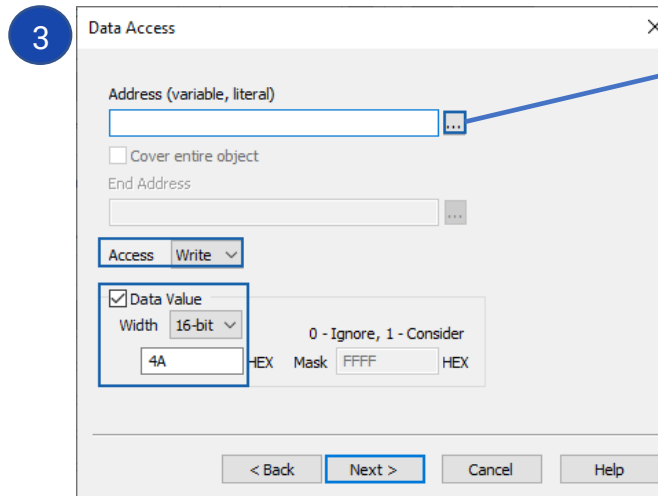
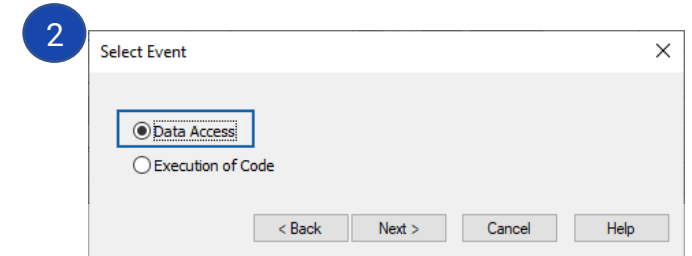
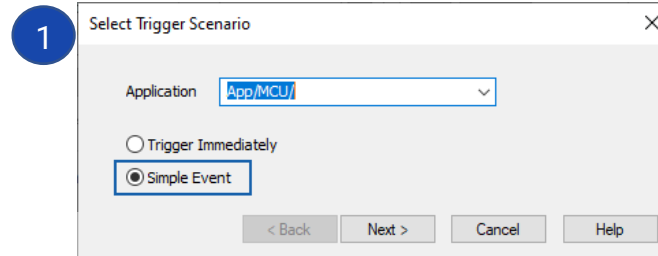
1. Select **Simple Event** for the Trigger Scenario and click Next.
2. Select **Data Access** for the Event and click Next.
3. Select a **variable** from the *Symbol Browser / Variables* tab for the variable Address.

**Access:** Select **Write** since typically write accesses are relevant only. Omitting read data accesses saves trace port bandwidth for other important trace information.

If trace should trigger on any write access to this variable, skip configuring specific data value by pressing Next at the bottom of the dialog.

**Data Value Width:** For specific data value entry set Width to 8, 16 or 32-bit based on the variable size (or object data).

**Data Value Value:** Finally enter the Value in a hexadecimal format and press Next at the bottom of the dialog.



# 03 Trigger on a data and record data 2/2

## Recording Information

1. Select **Data Access** and **Write** from the drop-down menu. Make sure **Program Flow / All** is deselected.

Select **the variable** from the *Symbol Browser / Variables tab* for the variable Address and click Next.

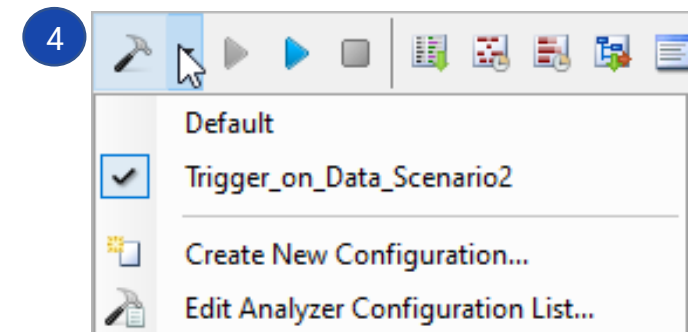
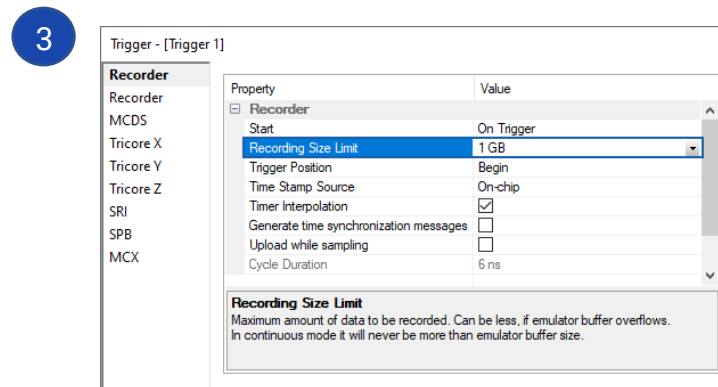
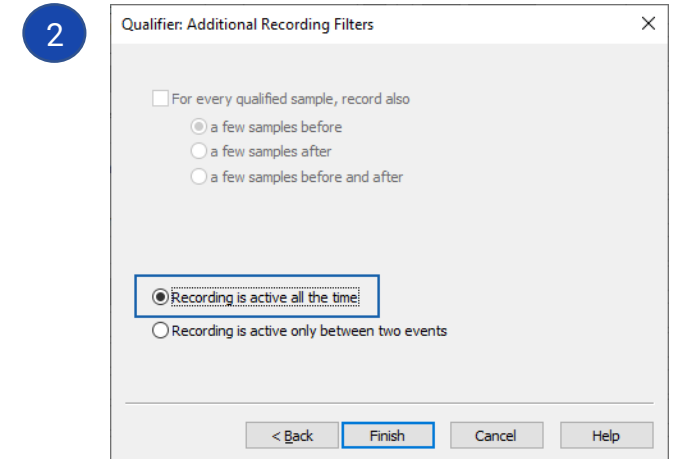
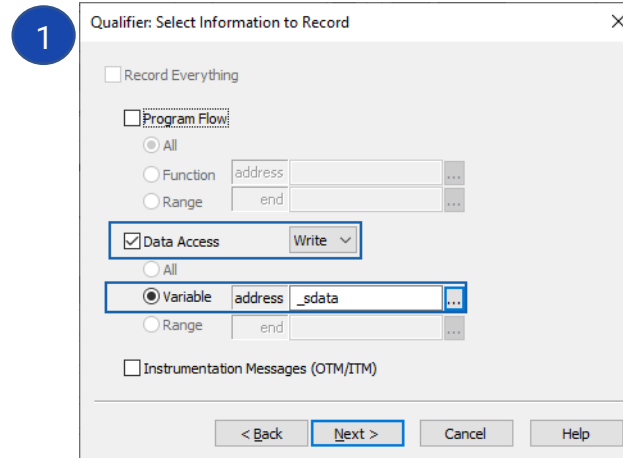
2. Keep default **Recording is active all the time** selected for the Additional Recording Filter and click Finish.

3. **Recording Size Limit:** It is recommended to reduce the amount of data to be recorded (e.g. 1M can be a good starting point) to your specific needs since this directly impacts trace upload time and trace window responsiveness.

It makes no sense to record big amount of data around the trigger event if your interest is only a small part of the data in the trigger vicinity. The bigger the trace recording is, the longer will take the trace upload and processing the recorded information.

4. Make sure the New Configuration Trigger is selected in the drop-down menu (e.g. *Trigger\_on\_Data\_Scenario2*).

→ Begin Analyzer recording session. [Skip to page 11.](#)





# 04 Trigger on a data and record code and data 1/2

## Trigger Scenario

Once the Wizard is opened, configure following settings:

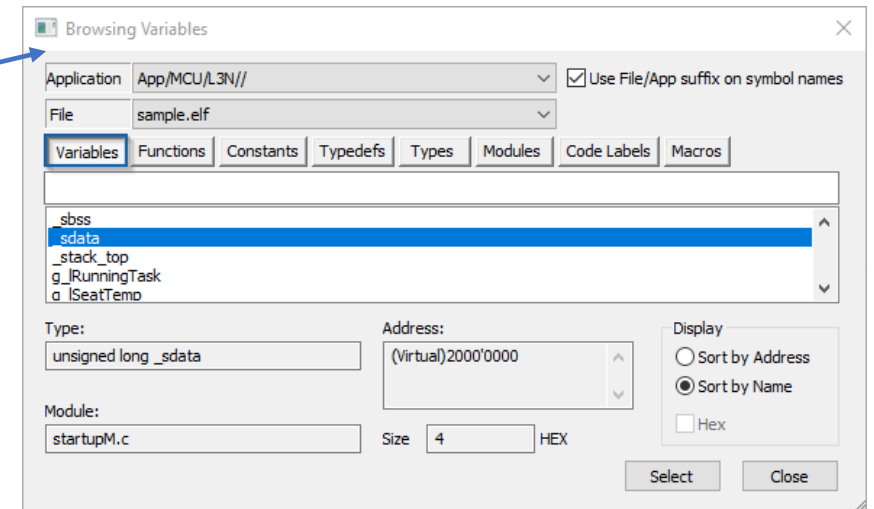
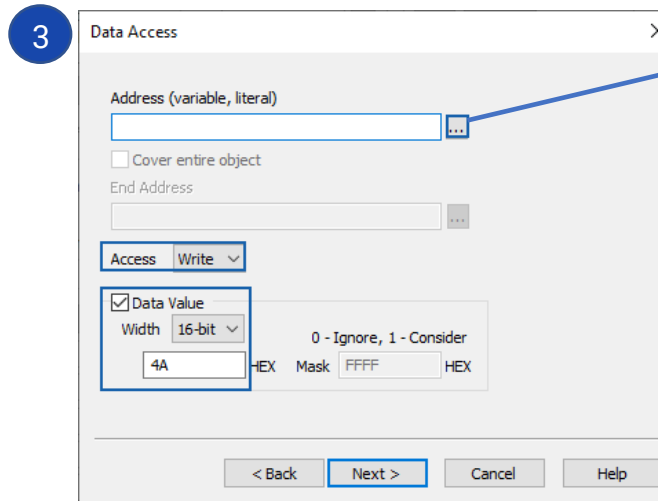
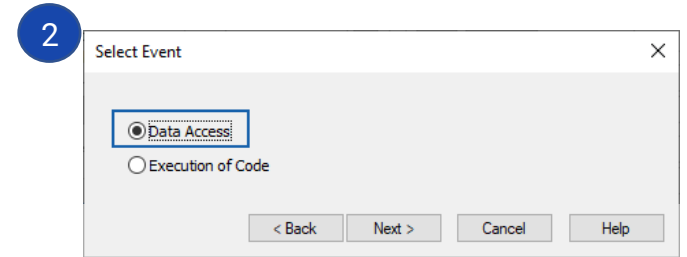
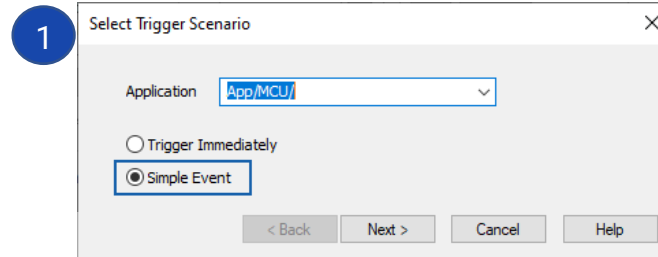
1. Select **Simple Event** for the Trigger Scenario and click Next.
2. Select **Data Access** for the Event and click Next.
3. Select a **variable** from the *Symbol Browser / Variables tab* for the variable Address.

**Access:** Select **Write** since typically write accesses are relevant only. Omitting read data accesses saves trace port bandwidth for other important trace information.

If trace should trigger on any write access to this variable, skip configuring specific data value by pressing Next at the bottom of the dialog.

**Data Value Width:** For specific data value entry set Width to 8, 16 or 32-bit based on the variable size (or object data).

**Data Value Value:** Finally enter the Value in a hexadecimal format and press Next at the bottom of the dialog.



# 04 Trigger on a data and record code and data 2/2

## Recording Information

1. Select **Data Access** and **Write** from the drop-down menu. Select **the variable** from the *Symbol Browser / Variables tab* for the variable Address and click Next.

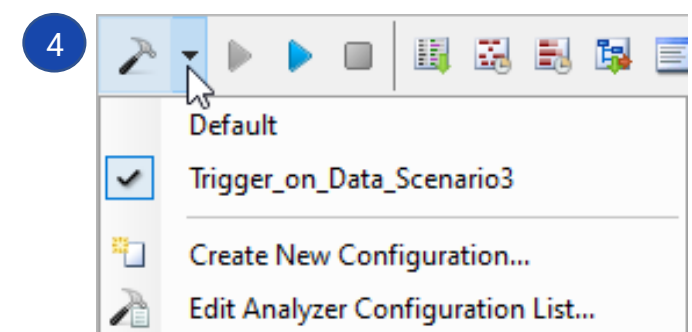
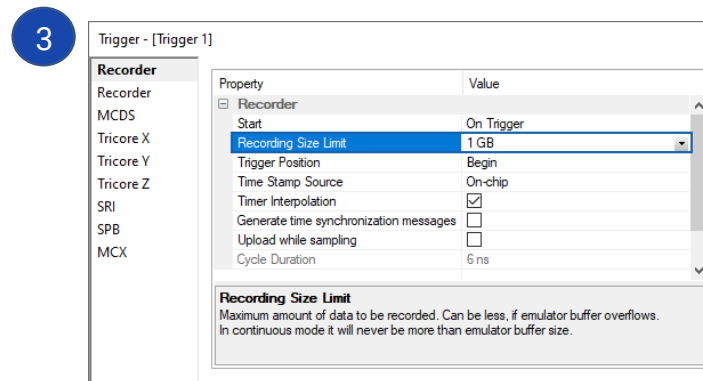
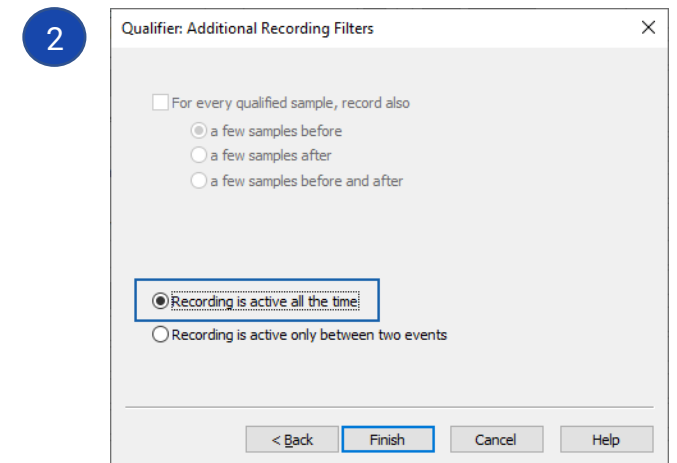
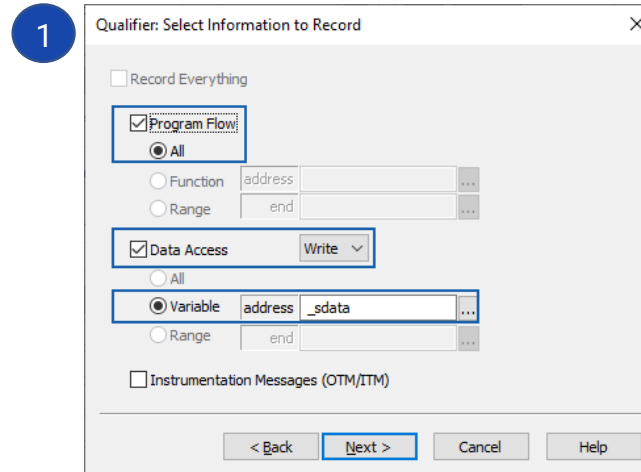
Make sure **Program Flow / All** is selected as well in order to record code along the specific data access.

2. Keep default **Recording is active all the time** selected for the Additional Recording Filter and click Finish.

3. **Recording Size Limit:** It is recommended to reduce the amount of data to be recorded (e.g. 1M can be a good starting point) to your specific needs since this directly impacts trace upload time and trace window responsiveness. It makes no sense to record big amount of data around the trigger event if your interest is only a small part of the data in the trigger vicinity. The bigger the trace recording is, the longer will take the trace upload and processing the recorded information.

4. Make sure the New Configuration Trigger is selected in the drop-down menu (e.g. *Trigger\_on\_Data\_Scenario3*).

→ Begin Analyzer recording 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:

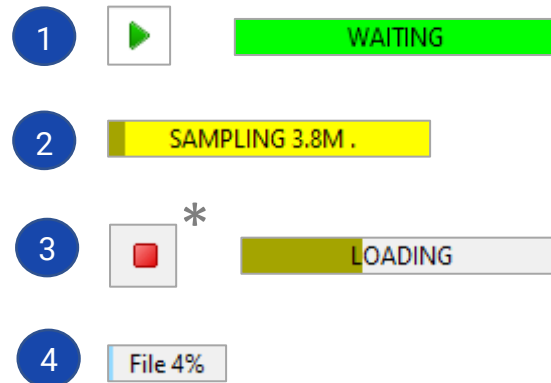
1. Click **Begin New Session** button or press Ctrl+B. WAITING status will be displayed:

- 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 trace information processing, the results are displayed.

You should see now trace data in the Trace View.

sample\_gcc\_ic5k\_SWD.trd\* [Trigger\_on\_Function\_Scenario1]

Trace

Number	Address	Data	Content	Time
0.35	0800'05DE	000000007B04F85D	SDF8047B ldr r7,[sp],#+0x04	65.893162 ms
0.36	0800'05E2	0000000000004770	TestStatic_EXIT_7047 bx lr	65.893976 ms
0.37	0800'05FE	000000000000BF00	00BF nop	65.894790 ms
0.38	0800'0600	000000000000BD80	Address_GlobalVariables_EXIT_80BD pop {r7,r15}	65.894913 ms
0.39	2000'0010	0000000000005D55	iCounter [IIM] Data Write	65.902849 ms
3.0	0800'087A	00000000FEC5F7FF	Address_TestScopes(); FFF7C5FE bl Address_TestScopes (0x08000608)	65.895036 ms
3.1	0000'0000	0000000000000001	[EIM4] Event	65.895100 ms
3.2	0800'0608	000000000000B480	{ Address_TestScopes 80B4 push {r7}	65.895101 ms
3.3	0800'060A	000000000000B087	87B0 sub sp,sp,#0x001C	65.895102 ms
3.4	0800'060C	000000000000AF00	00AF add r7,sp,#0x0000	65.895103 ms
3.5	0800'060E	0000000000002300	int i=0,j=0; 0023 movs r3,#0x00	65.895104 ms
3.6	0800'0610	000000000000617B	7B61 str r3,[r7,#0x14]	65.895105 ms
3.7	0800'0612	0000000000002300	0023 movs r3,#0x00	65.895106 ms
3.8	0800'0614	000000000000613B	3B61 str r3,[r7,#0x10]	65.895107 ms
3.9	0800'0616	0000000000002377	X.m_l=0x77; 7723 movs r3,#0x77	65.895108 ms
3.10	0800'0618	000000000000607B	7B60 str r3,[r7,#0x04]	65.895109 ms
3.11	0800'061A	0000000000002300	for (i=0;i<2;++i) 0023 movs r3,#0x00	65.895110 ms
3.12	0800'061C	000000000000617B	7B61 str r3,[r7,#0x14]	65.895111 ms
3.13	0800'061E	000000000000E01F	1FE0 b 0x08000660	65.895112 ms
3.14	0800'0660	000000000000697B	7B69 ldr r3,[r7,#0x14]	65.895113 ms
3.15	0800'0662	0000000000002B01	012B cmp r3,#0x01	65.895114 ms
3.16	0800'0664	000000000000DDDC	DCDD ble "test.c":216 (0x08000620)	65.895115 ms
3.17	0800'0620	0000000000002304	char c=4; 0423 movs r3,#0x04	65.895116 ms
3.18	0800'0622	00000000000073FB	FB73 strb r3,[r7,#0x0F]	65.895117 ms
3.19	0800'0624	000000000000687B	X.m l++;	65.895118 ms



# Further Reading

For more information refer to our online resources:

- Hardware Solutions:
  - On-Chip Analyzer BlueBox [iC5700](#)
  - [Debug Adapters](#)
  - Active Probes
- winIDEA Online Help:
  - [Analyzer](#)
- [Knowledge Base](#)