

02.1.2 ARM CORTEX-M winIDEA CONFIGURATION



ARM Cortex-M winIDEA Configuration

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01 CPU Options

Specific CPU Options need to be configured prior to using Trace.

First you need to determine:

- Does the CPU support trace?
- Are CPU trace pins available on target debug connector?
- Does the Debug Adapter and target debug connector match?
- Is the trace license programmed in the BlueBox?

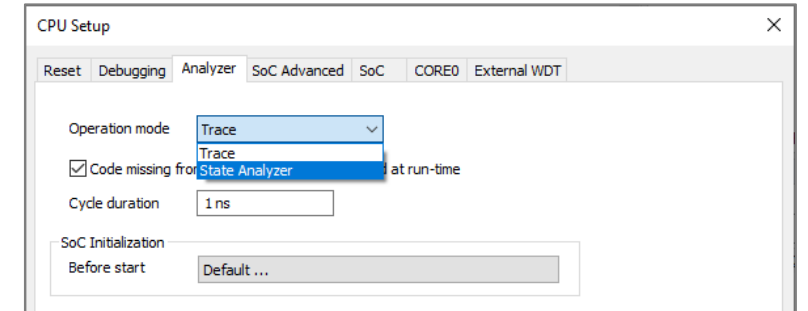
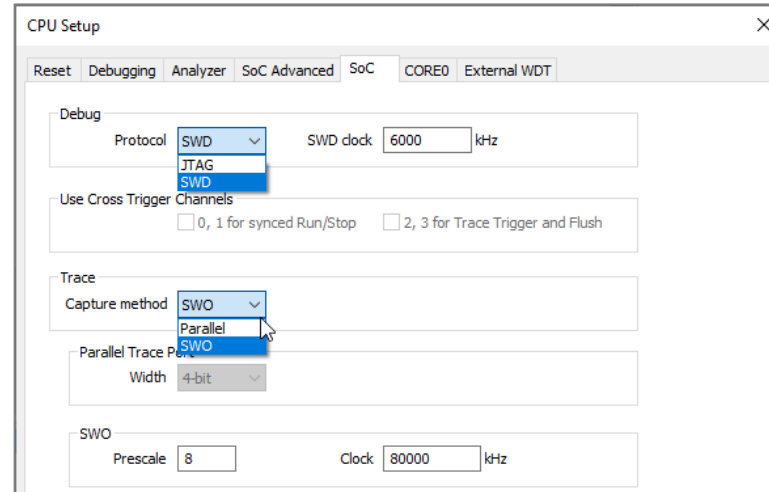
winIDEA Trace Configuration is mainly done in *Hardware menu / CPU Options* dialog in

- SoC tab
- Analyzer tab

This unit describes settings in the CPU Options dialog.

Analyzer Configurations dialog settings are explained in detail in:

- [Analyzer – Trace](#) unit
- [Analyzer – Profiler](#) unit



02 Debug Protocol Setup

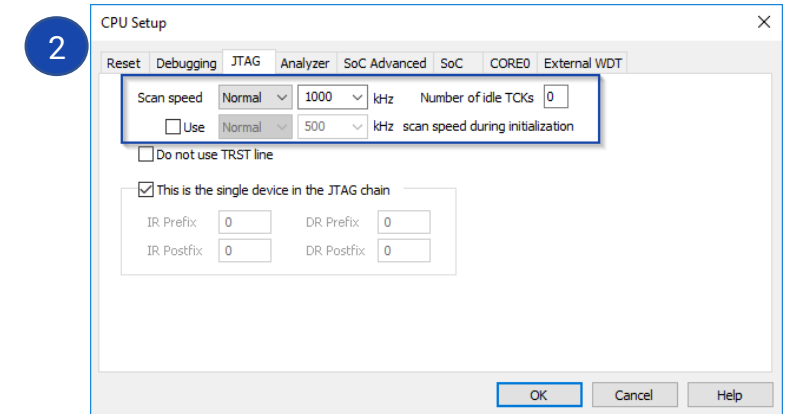
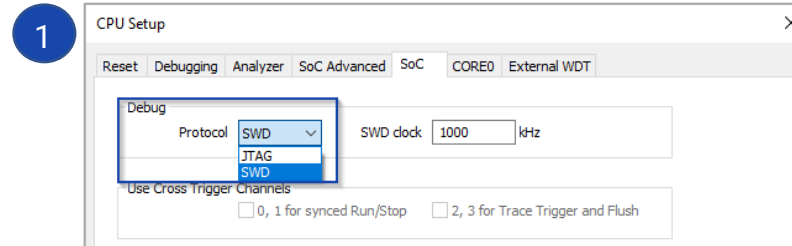
Debug session needs to be established prior to using Trace. First step is to select correct Debug Protocol:


1. Select **SWD** or **JTAG** Debug Protocol according to the Debug connector on the Target in *Hardware menu / CPU Options / SoC tab*.

If SWD Debug Protocol is selected, the default **SWD clock** setting should work in most cases.

2. If JTAG Debug Protocol is selected, set the JTAG Scan Speed in the JTAG tab of the same dialog.

Default Scan Speed should work in most cases.



 Read more about this setting in the online Tutorial [CPU Specific Architecture Settings](#).

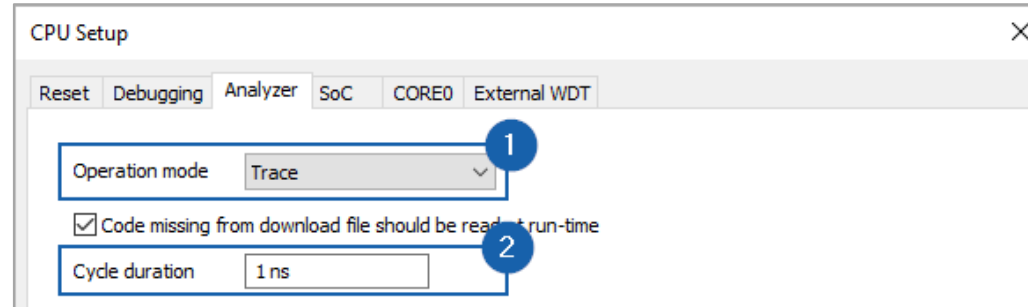
03 Operation mode

Open *Hardware menu / CPU Options / Analyzer tab*:

1. Make sure **Trace** is selected in the **Operation mode** section.

2. **Cycle duration** – Parameter is relevant for ETB On-Chip Trace Capture methods and time-stamp calculation.

Cycle duration is calculated based on the CPU clock.



04 Trace Capture method

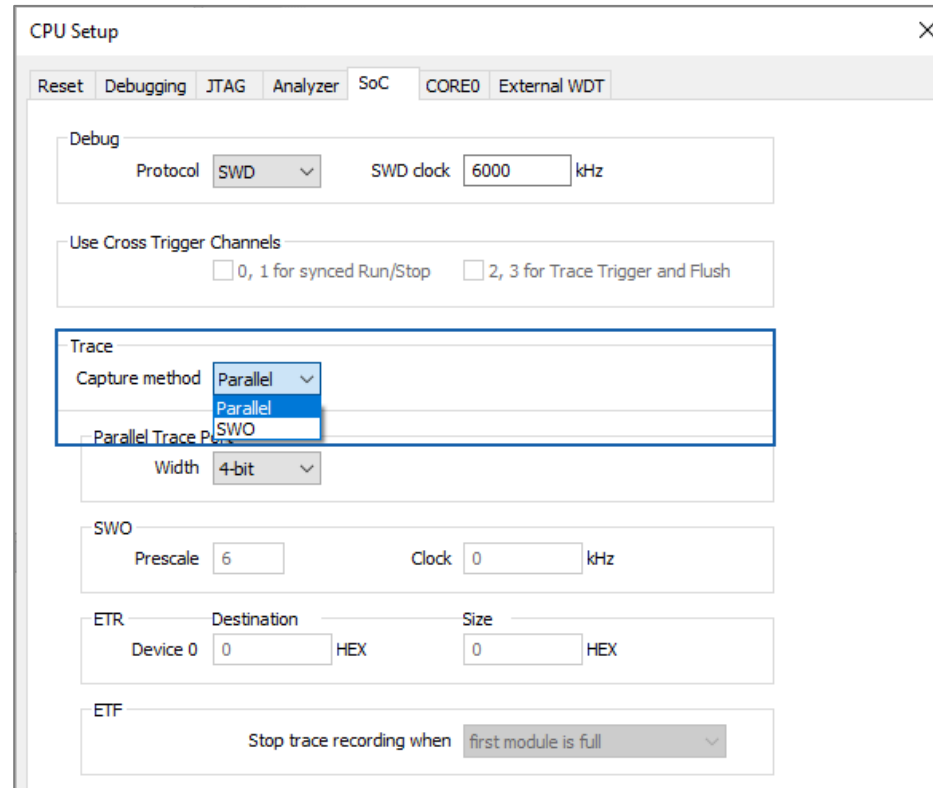
Trace Capture method is configured in *Hardware menu / CPU Options / SoC tab / Trace section / Capture method*.

winIDEA displays available Trace Capture methods in the drop-down menu:

- **Parallel**
- **SWO**
- Other (optional): MTB, ETB

Depending on the chosen Trace Capture method additional settings are available (Parallel Trace Port Width, SWO Prescale, SWO Clock etc.).

Details about supported trace capture method are available in the microcontroller documentation.



04.1 Trace Capture method - SWO

This asynchronous trace is available **only in combination with the SWD Debug Protocol** as SWO signal is shared with the JTAG TDO pin.

Settings in winIDEA are:

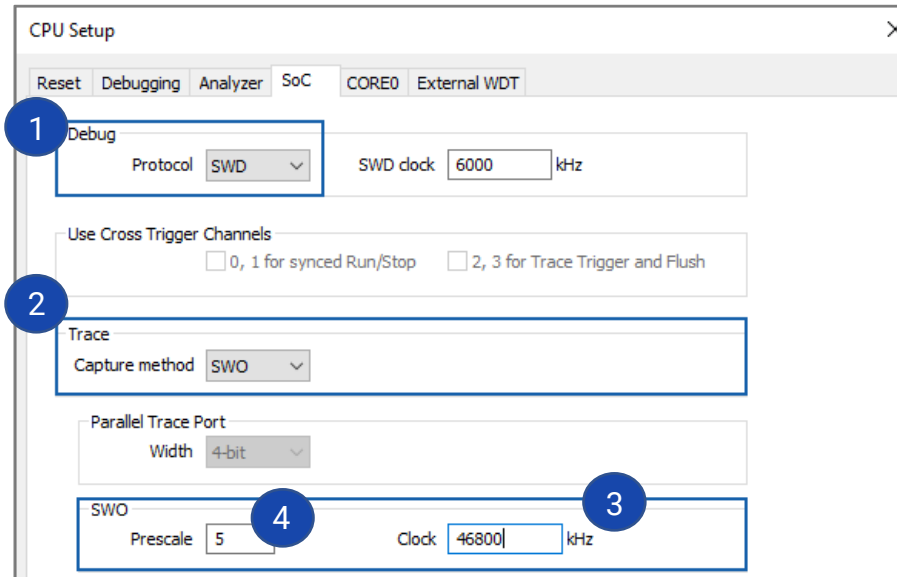
1. Select **SWD Debug Protocol**.

2. Select **SWO** Trace Capture method.

3. **SWO Clock** – The clock value corresponds to the clock of the SWO trace source, which in most cases represents the CPU clock.

4. **SWO Prescale** – Additionally decreases SWO Clock frequency and must be specified in such a way that the value of $\text{Clock}/(\text{Prescale} + 1) < 10000$ kHz.

TIP: Once a working trace is established, the Prescale can be lowered to get a higher bandwidth.



04.2 Trace Capture method - Parallel

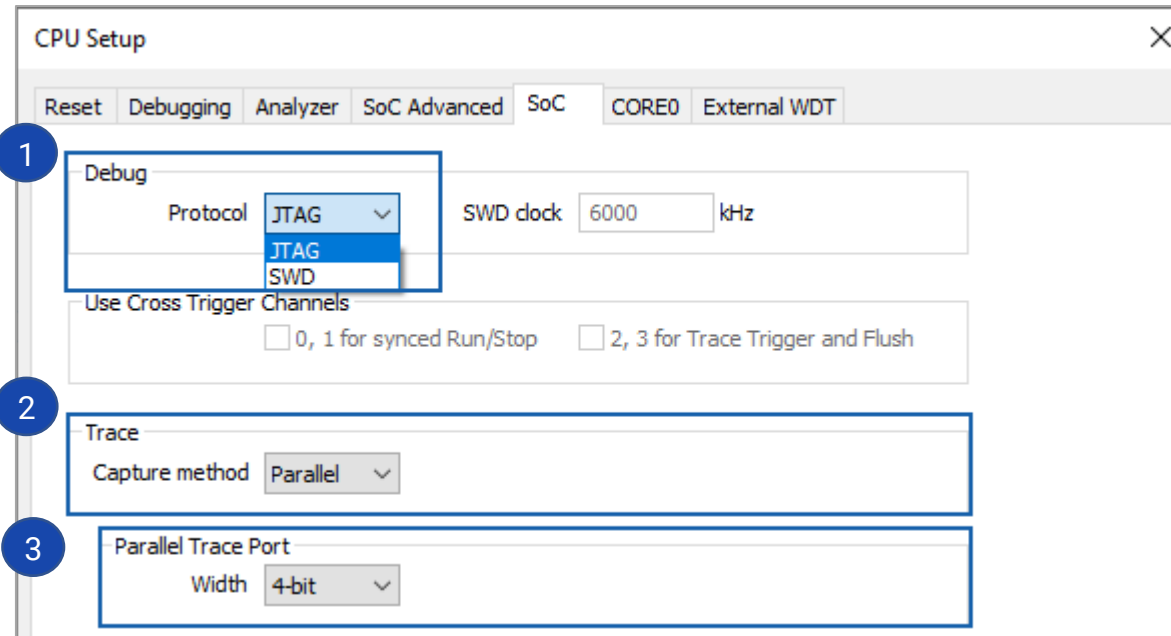
Parallel (synchronous) trace is available in conjunction with both debug protocols, JTAG and SWD, and requires from 2 to 5 extra pins depending on the data trace size. Typical implementation is one clock line + 4 data lines.

It features significantly higher trace output bandwidth comparing to the SWO trace, exact time information for recorded events and ETM (when available) support.

Settings in winIDEA are:

1. Select **JTAG** or **SWD Debug Protocol**.
2. Select **Parallel** Trace Capture method.
3. Select Parallel Trace Port **Width** depending on the Target microcontroller.

TIP: It is recommended to use Parallel Capture method with all (4 data) available pins for trace.



05 Trace Line Calibration test



Note that Trace Line Calibration test is available only with Parallel Trace Capture method.

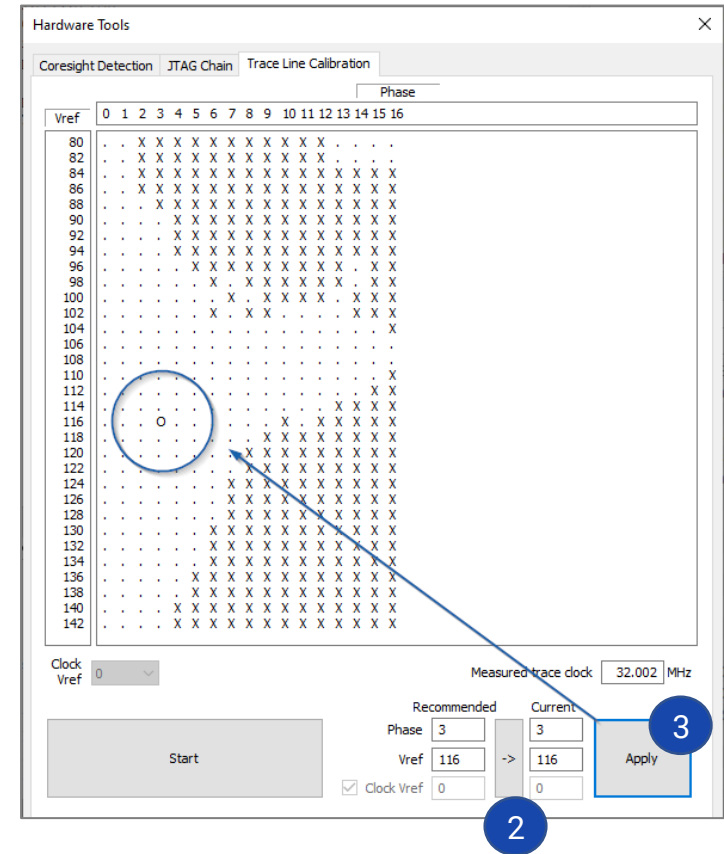
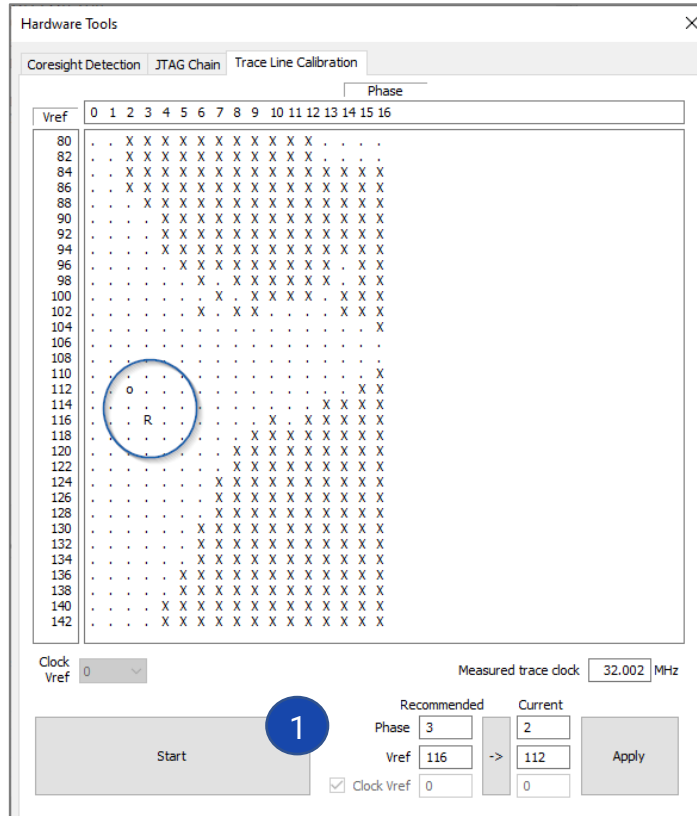
Trace Line Calibration test is required due to different Trace line lengths.

Open *Hardware menu / Tools / Trace Line Calibration* and establish Debug session by clicking F5 or pressing *Run* button in the Debug toolbar.

1. Click **Start** button. Indicators "o" and "R" show current and recommended settings.
2. Click the **Arrow** button to copy Recommended values to the Current values.
3. Click **Apply** button. Indicator "O" shows optimized setting.

TIP: It is recommended to perform Trace Line Calibration test to measure the clock at which the trace is running.

See also [Trace Line Calibration](#) topic in Online Help for more information.





Further Reading

For more information refer to our online resources:

- Hardware Solutions:
 - On-Chip Analyzer BlueBox [lc5700](#)
 - [Active Probes](#)
- winIDEA Online help:
 - ARM Cortex [Analyzer](#)
 - Trace Line [Calibration](#)
- [Knowledge Base](#)