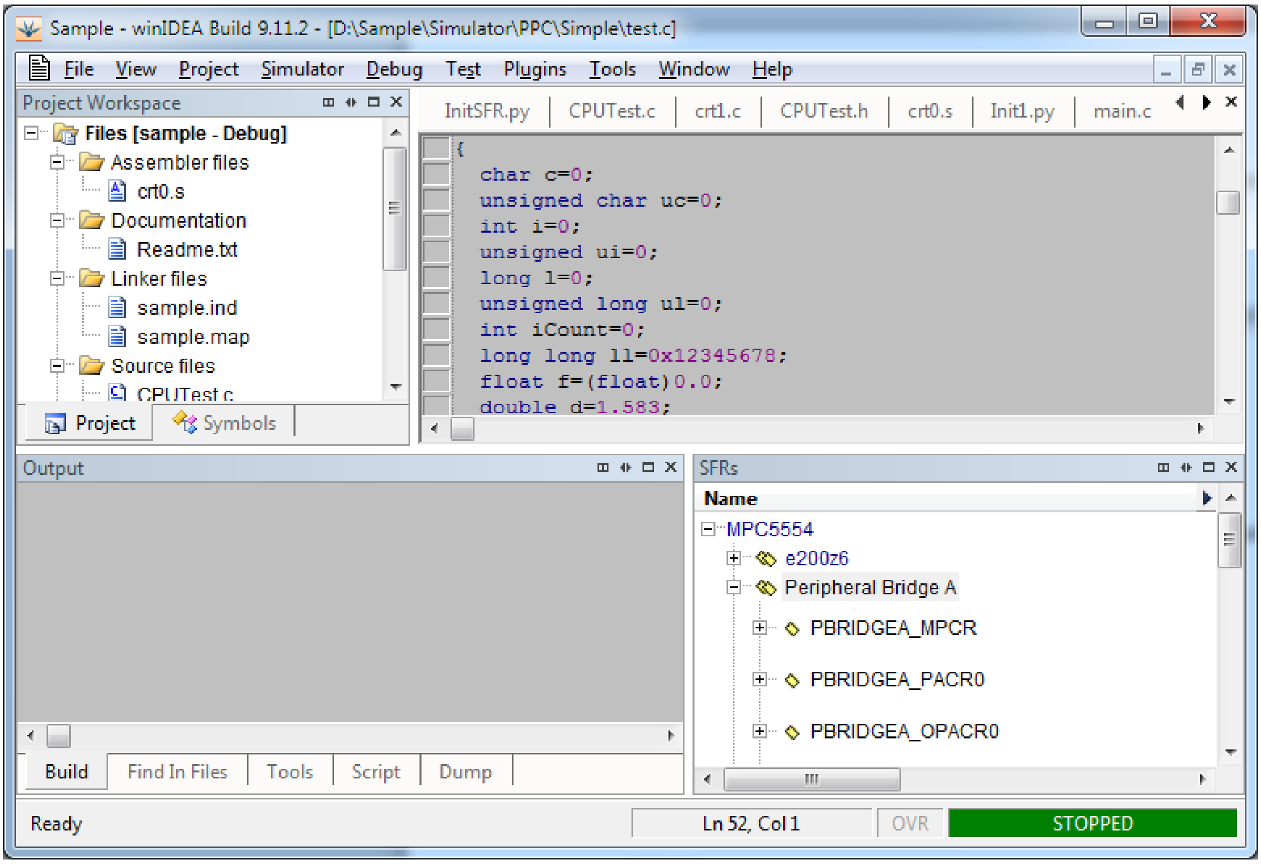
winIDEA 2011 9.11

9.11.2 (14.1.2011)

winIDEA

Facelift

The docking and toolbar elements introduce a new flatter design, bringing a fresh look to winIDEA.

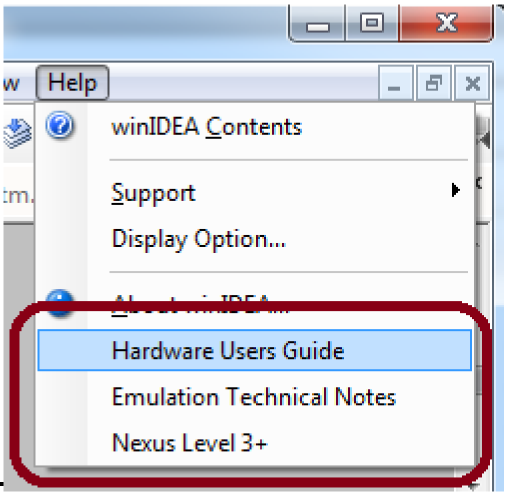


```
{
  char c=0;
  unsigned char uc=0;
  int i=0;
  unsigned ui=0;
  long l=0;
  unsigned long ul=0;
  int iCount=0;
  long long ll=0x12345678;
  float f=(float)0.0;
  double d=1.583;
```

Help

Hardware Technical notes are now accessible via global Help menu.

The applicable documents are linked according to current configuration.



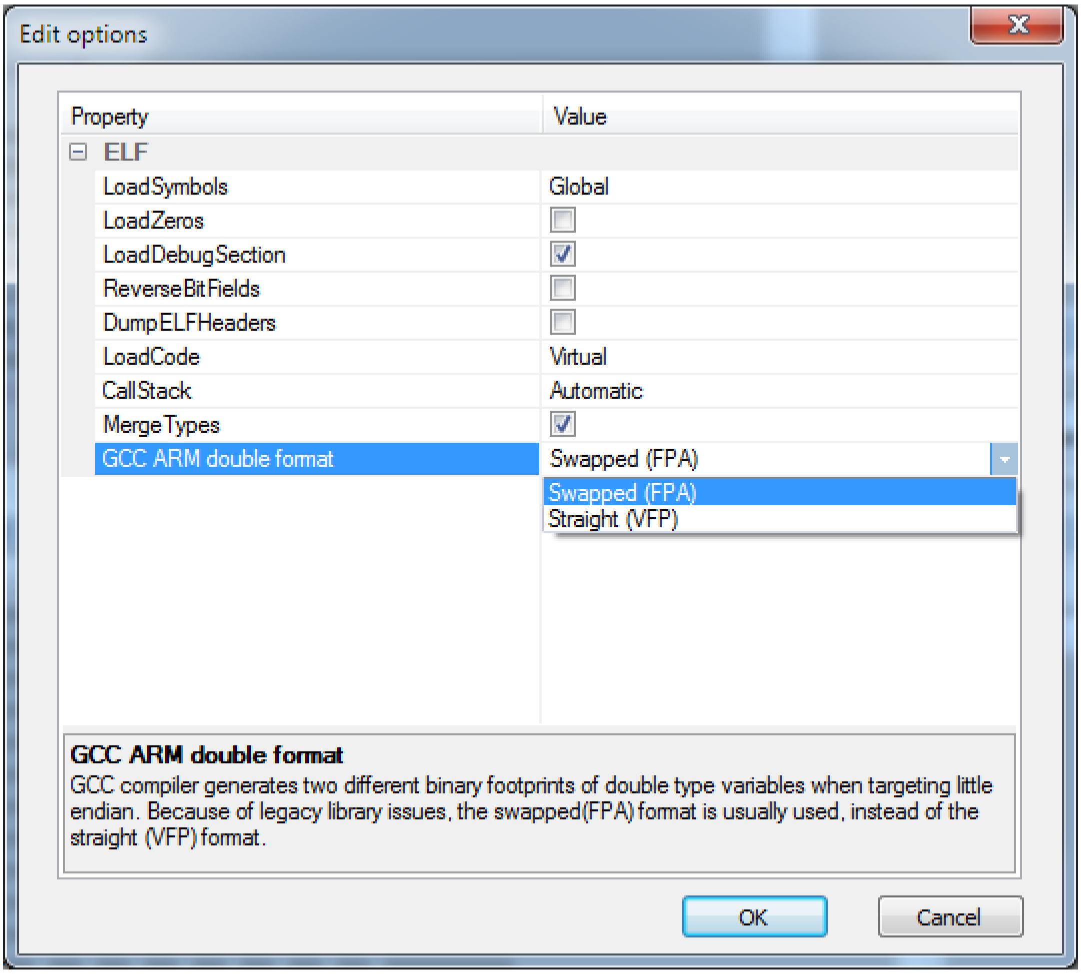
GCC ARM double Type support

GCC compiler generates two different binary footprints of ***double*** type variables when targeting little endian platform. Because of legacy library issues, the swapped(FPA) format is usually used by the application, instead of the straight (VFP) which is used by all other commercial compilers.

To support both implementations a configuration option is intrduced.

Location: ***Debug/Files for Download/Properties/Advanced/GCC ARM double format***

Default: **Swapped (FPA)**



Property	Value
⊟ ELF	
LoadSymbols	Global
LoadZeros	☐
LoadDebugSection	☑
ReverseBitFields	☐
DumpELFHeaders	☐
LoadCode	Virtual
CallStack	Automatic
MergeTypes	☑
GCC ARM double format	Swapped (FPA)

Swapped (FPA)
Straight (VFP)

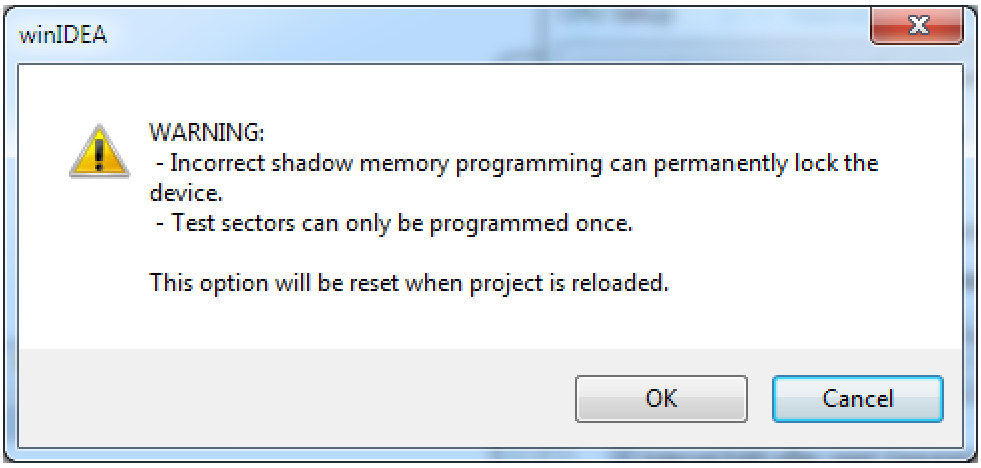
GCC ARM double format
GCC compiler generates two different binary footprints of double type variables when targeting little endian. Because of legacy library issues, the swapped(FPA) format is usually used, instead of the straight (VFP) format.

CPU Support

MPC 5xxx

Shadow Memory Programming

Shadow memory programming is released to all derivatives, however the user is warned to possible side effects:



WARNING:
- Incorrect shadow memory programming can permanently lock the device.
- Test sectors can only be programmed once.

This option will be reset when project is reloaded.

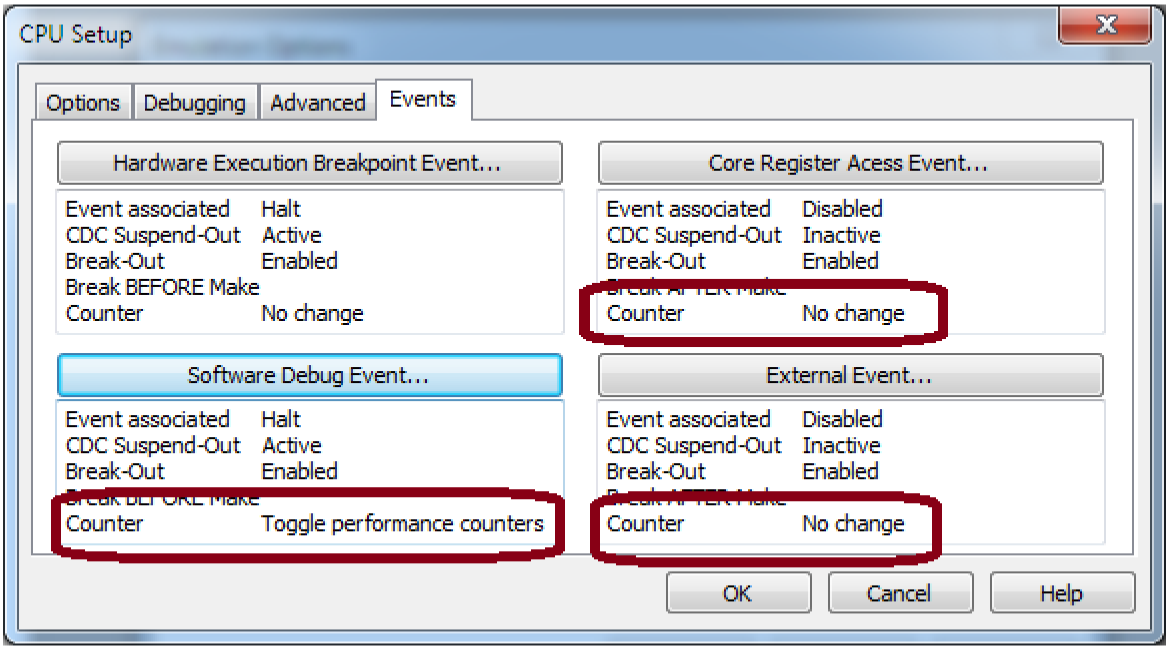
TriCore 1.6

Hardware Breakpoint Support

Compared to TriCore 1.3.x TriCore 1.6 changes the on-chip breakpoint module operation.

EXEVT, CREVT and SWEVT allow CNT toggle action

These events are accessible from ***Hardware/Emulation Options/CPU/Setup/Events*** dialog



Hardware Execution Breakpoint Event...

Event associated Halt
CDC Suspend-Out Active
Break-Out Enabled
Break BEFORE Make
Counter No change

Core Register Acess Event...

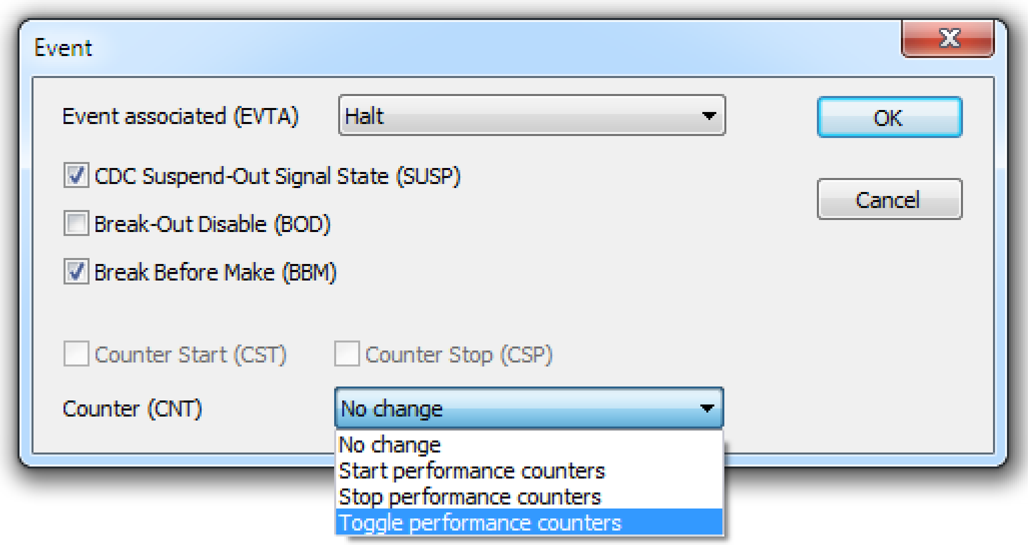
Event associated Disabled
CDC Suspend-Out Inactive
Break-Out Enabled
Break AFTER Make
Counter No change

Software Debug Event...

Event associated Halt
CDC Suspend-Out Active
Break-Out Enabled
Break BEFORE Make
Counter Toggle performance counters

External Event...

Event associated Disabled
CDC Suspend-Out Inactive
Break-Out Enabled
Break AFTER Make
Counter No change



Event associated (EVTA): Halt

☑ CDC Suspend-Out Signal State (SUSP)

□ Break-Out Disable (BOD)

☑ Break Before Make (BBM)

□ Counter Start (CST) □ Counter Stop (CSP)

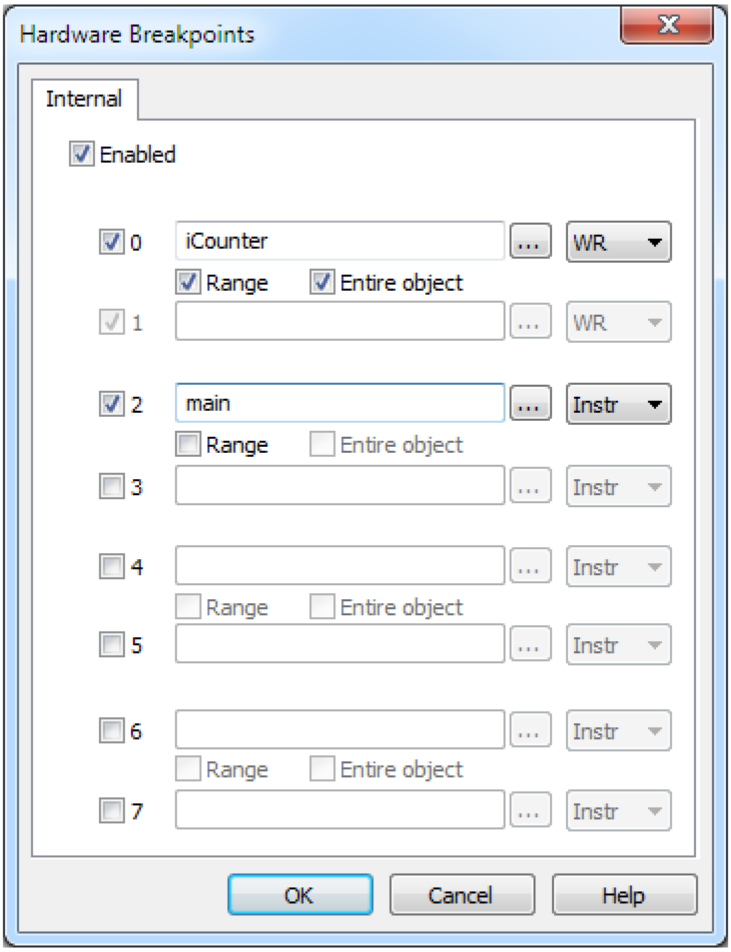
Counter (CNT): No change

- No change
- Start performance counters
- Stop performance counters
- Toggle performance counters

Hardware Breakpoints

TriCore 1.6 uses 8 execution/access breakpoint resources. The TriCore 1.3 *Memory Protection Module* is no longer used.

The breakpoints are accessible from ***Debug/Hardware Breakpoints*** dialog.



☑ Enabled

☑ 0 iCounter WR
☑ Range ☑ Entire object

☑ 1 WR

☑ 2 main Instr
□ Range □ Entire object

□ 3 Instr

□ 4 Instr
□ Range □ Entire object

□ 5 Instr

□ 6 Instr
□ Range □ Entire object

□ 7 Instr

9.11.3 (24.1.2011)

isystem.connect

OCD Register Access

On-chip debug registers on some CPUs are accessible only via on-chip debug protocol (JTAG, SDI,…).

Access to such registers is provided on per OCD architecture basis via isystem.connect ***SERVICE_OCD_Access*** service.

Since OCD registers can be of arbitrary size, the access is provided as a BYTE vector with little-endian ordering (the first BYTE will be scanned in first, starting with bit 0).

Python code example:

```
import isystem.connect as ic


cmgr = ic.ConnectionMgr()
cmgr.connectMRU('')
dataCtrl = ic.CDataController(cmgr)

wrData = ic.VectorBYTE([0x12, 0x34, 0x56, 0x79])
dataCtrl.writeOCDRegister(0x20, 32, wrData)

rdData = ic.VectorBYTE()
dataCtrl.readOCDRegister(0x20, 32, rdData)

for byte in rdData:
     print hex(byte),
```

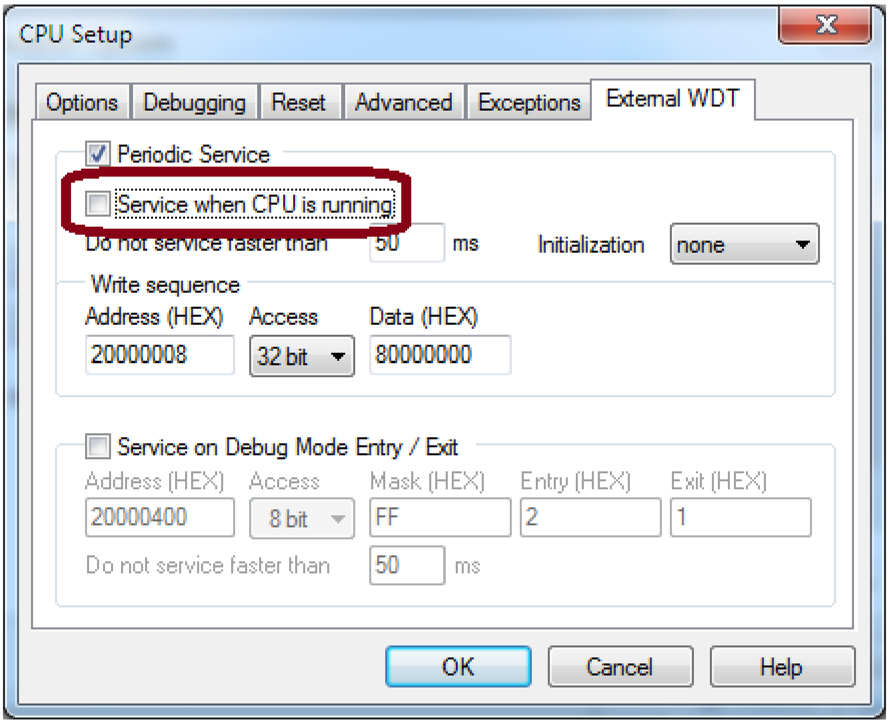
CPU Support

External Watchdog Service

Periodic watchdog service can handle the watchdog depending on CPU state.

Location: ***Hardware/Emulation Options/CPU/CPU Setup/External WDT***

Default: **OFF**



☑ Periodic Service

□ Service when CPU is running

Do not service faster than 50 ms

Initialization none

Write sequence

Address (HEX)	Access	Data (HEX)
20000008	32 bit	80000000

□ Service on Debug Mode Entry / Exit

Address (HEX)	Access	Mask (HEX)	Entry (HEX)	Exit (HEX)
20000400	8 bit	FF	2	1

Do not service faster than 50 ms

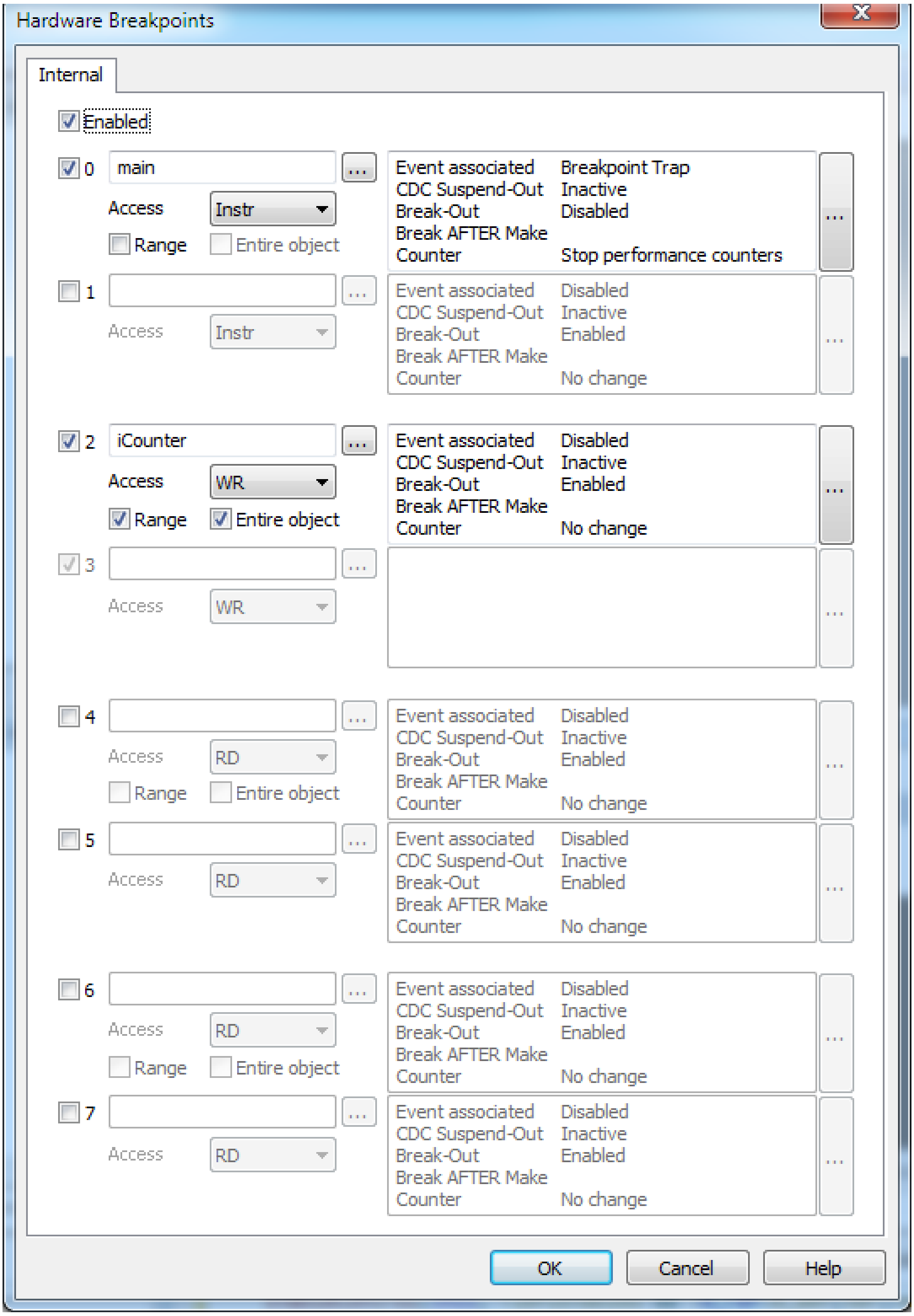
Note: watchdog service is currently available only on ARM architecture.

TriCore 1.6

Hardware Breakpoints

Event configuration is available with every breakpoint resource.

The breakpoints are accessible from ***Debug/Hardware Breakpoints*** dialog.



Hardware Breakpoints

Internal

☑ Enabled

☑ 0 main ...
Access Instr
□ Range □ Entire object
Event associated Breakpoint Trap
CDC Suspend-Out Inactive
Break-Out Disabled
Break AFTER Make
Counter Stop performance counters

□ 1 ...
Access Instr
Event associated Disabled
CDC Suspend-Out Inactive
Break-Out Enabled
Break AFTER Make
Counter No change

☑ 2 iCounter ...
Access WR
☑ Range ☑ Entire object
Event associated Disabled
CDC Suspend-Out Inactive
Break-Out Enabled
Break AFTER Make
Counter No change

☑ 3 ...
Access WR

□ 4 ...
Access RD
□ Range □ Entire object
Event associated Disabled
CDC Suspend-Out Inactive
Break-Out Enabled
Break AFTER Make
Counter No change

□ 5 ...
Access RD
Event associated Disabled
CDC Suspend-Out Inactive
Break-Out Enabled
Break AFTER Make
Counter No change

□ 6 ...
Access RD
□ Range □ Entire object
Event associated Disabled
CDC Suspend-Out Inactive
Break-Out Enabled
Break AFTER Make
Counter No change

□ 7 ...
Access RD
Event associated Disabled
CDC Suspend-Out Inactive
Break-Out Enabled
Break AFTER Make
Counter No change

Execution Coverage

If four ranges or less are configured for execution coverage, the on-chip trigger/buffer system is configured to record execution from those ranges only.

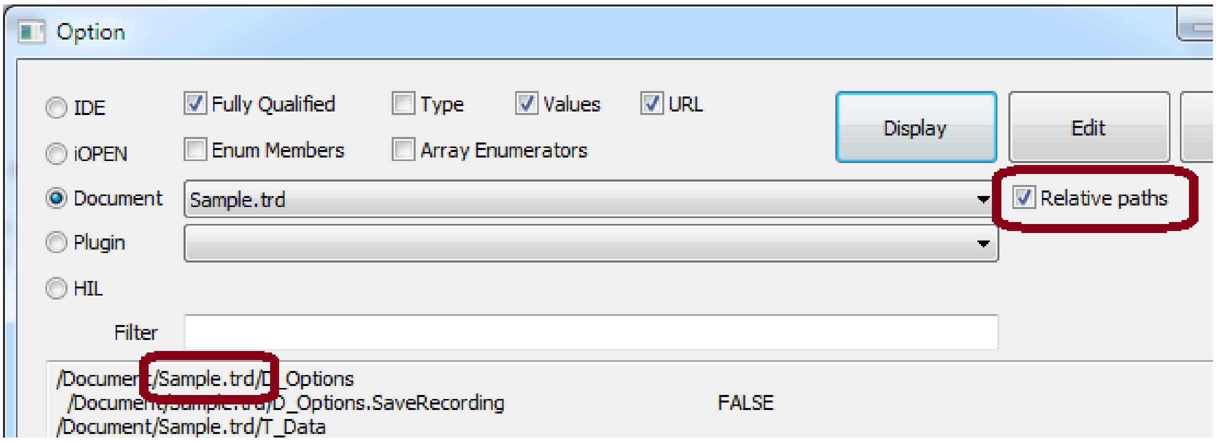
This increases the recording time period.

9.11.4 (26.1.2011)

isystem.connect

Option Display

Options accessible via ***isystem.connect*** which are stored inside documents can be accessed using relative paths. The ***Help/Display Option*** dialog always showed full path, which could yield a very long URL.



Option

○ IDE ☑ Fully Qualified □ Type ☑ Values ☑ URL

○ iOPEN □ Enum Members □ Array Enumerators

● Document Sample.trd ☑ Relative paths

○ Plugin

○ HIL

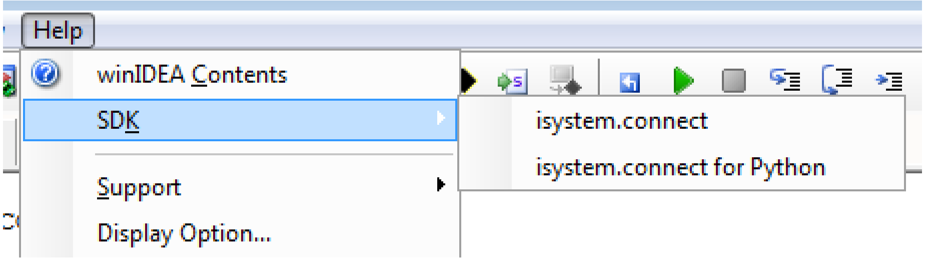
Filter

```
/Document/Sample.trd/D_Options
 /Document/Sample.trd/D_Options.SaveRecording                    FALSE
/Document/Sample.trd/T_Data
```

winIDEA

Help

Direct access to installed SDK help is provided from the Help menu.



SDK documentation is provided in HTML format. Selecting an item opens the default HTML browser.

9.11.8 (11.2.2011)

winIDEA

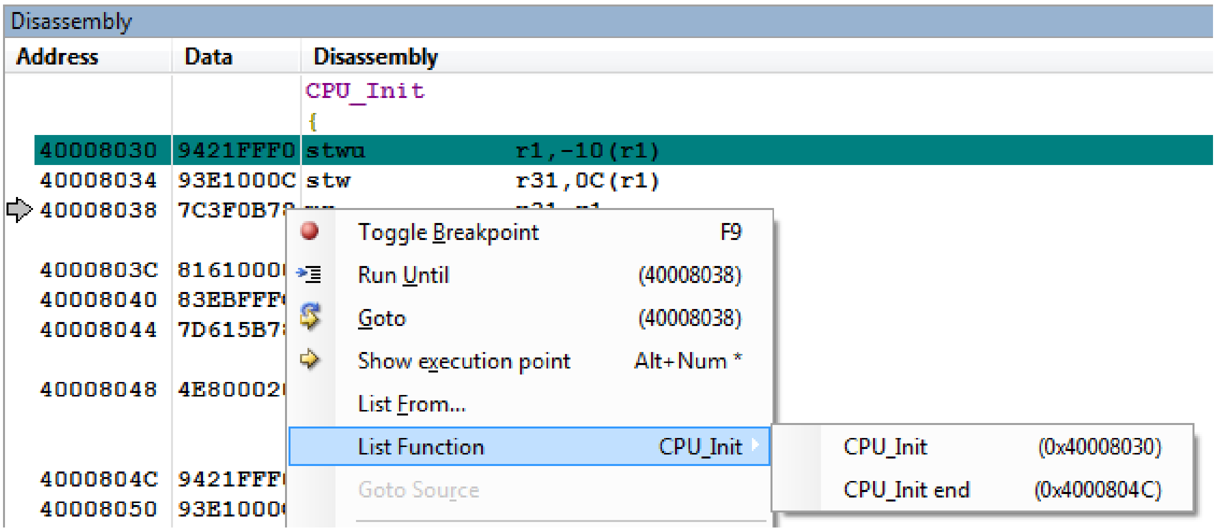
Disassembly Window

Listing from beginning of code range (e.g. start of current function)

Context menu provides list commands:

- ***List Function*** - available when inside a function body. List from function start and beyond function end are provided

- ***List Label*** – available when outside function body. Lists from first preceding code label and first subsequent code label are provided.



```
Disassembly
Address    Data      Disassembly
                     CPU_Init
                     {
40008030   9421FFF0  stwu          r1,-10(r1)
40008034   93E1000C  stw           r31,0C(r1)
40008038   7C3F0B7
4000803C   8161000
40008040   83EBFFF
40008044   7D615B7
40008048   4E80002
4000804C   9421FFF
40008050   93E1000
```

List History

Points before and after ***List*** command are memorized. Reversing the path is possible using the *Backspace* key.

9.11.12 (24.2.2011)

isystem.connect

Download symbols only functionality is available via **IConnectDebug::RunControl(rDownloadNoCode)** call.

CPU Support

MPC 5xxx

MPC560x Shadow Memory Programming

Flash mass erase erases also user area in shadow block.

9.11.14 (8.3.2011)

CPU Support

MPC 5xxx

Low Power Debug

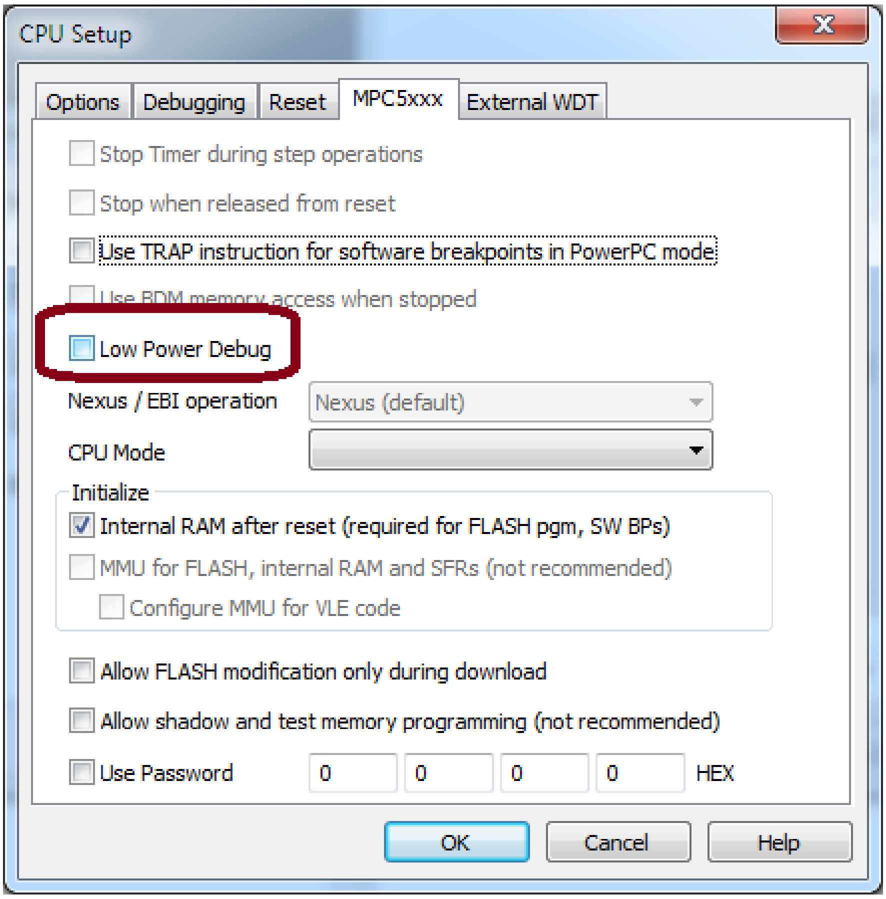
Transition into low-power state and return to normal power is supported on

- MPC551x
- MPC560x

Low power handling is enabled optionally as not all CPU masks implement debugger support internally.
If such a CPU is used with this option enabled, emulation will not start.

Location: ***Hardware/Emulation Options/CPU/CPU Setup/MPC5xxx***

Default: **OFF**



☐ Stop Timer during step operations

☐ Stop when released from reset

☐ Use TRAP instruction for software breakpoints in PowerPC mode

☐ Use BDM memory access when stopped

☐ Low Power Debug

Nexus / EBI operation: Nexus (default)

CPU Mode:

Initialize

☑ Internal RAM after reset (required for FLASH pgm, SW BPs)

☐ MMU for FLASH, internal RAM and SFRs (not recommended)

☐ Configure MMU for VLE code

☐ Allow FLASH modification only during download

☐ Allow shadow and test memory programming (not recommended)

☐ Use Password 0 0 0 0 HEX

ARM

iMX25 Support

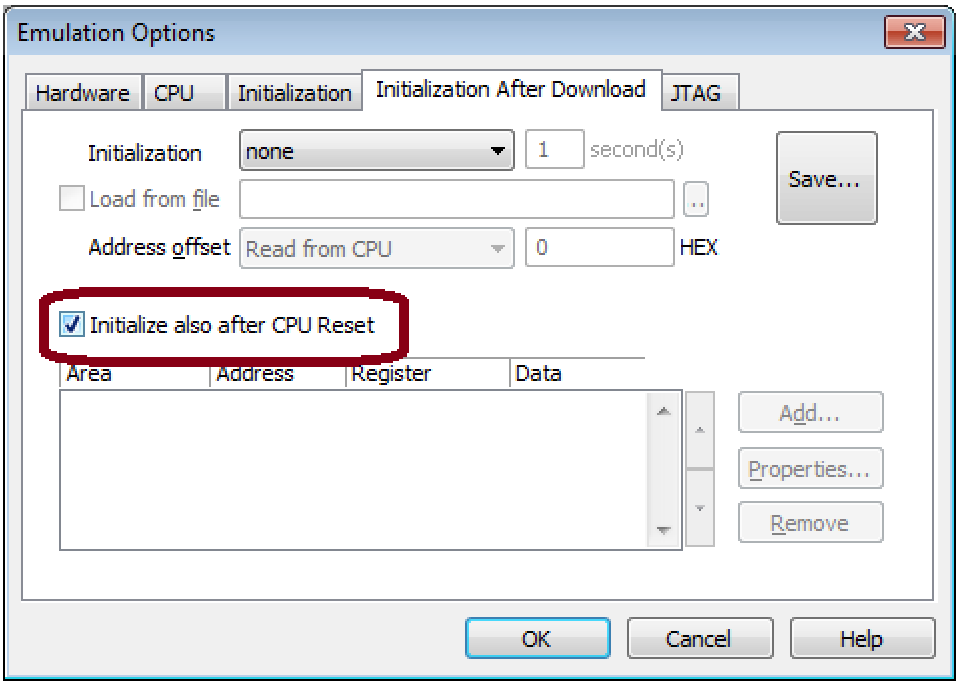
iMX25 Debug and ETB trace is supported.

Initialization after Download

Initialization after download can be optionally performed also on CPU Reset command.

Location: ***Hardware/Emulation Options/Initialization After Download***

Default: **ON**



Initialization: none — 1 second(s)

□ Load from file

Address offset: Read from CPU — 0 HEX

☑ Initialize also after CPU Reset

Area	Address	Register	Data

winIDEA

Profiler Range Mode

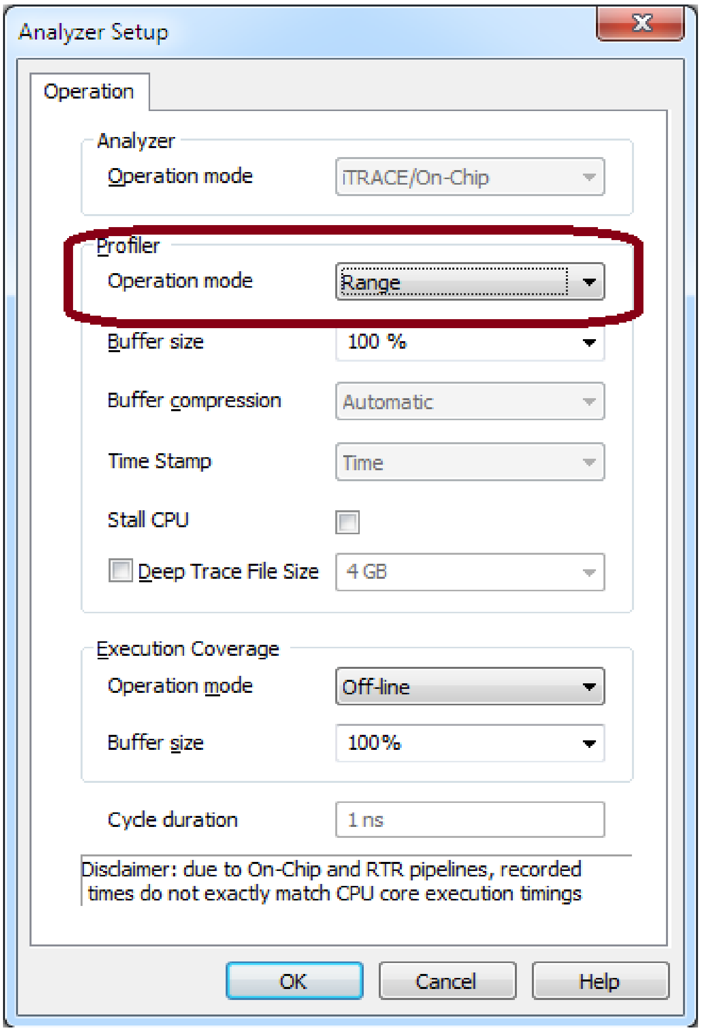
Range mode is a stateless analysis method and is not susceptible to:

- weak debug information
- compiler optimizations
- RTOS stack manipulations

Execution profiling under RTOS is possible even if task switches are not traceable.

Refer to ***ProfilerConcepts.pdf*** for further information.

Note: Range mode is currently supported only on MPC e200 architecture.



Analyzer

Operation mode: iTRACE/On-Chip

Profiler

Operation mode: Range

Buffer size: 100 %

Buffer compression: Automatic

Time Stamp: Time

Stall CPU □

□ Deep Trace File Size: 4 GB

Execution Coverage

Operation mode: Off-line

Buffer size: 100%

Cycle duration: 1 ns

Disclaimer: due to On-Chip and RTR pipelines, recorded times do not exactly match CPU core execution timings

9.11.17 (15.3.2011)

CPU Support

MPC 5xxx

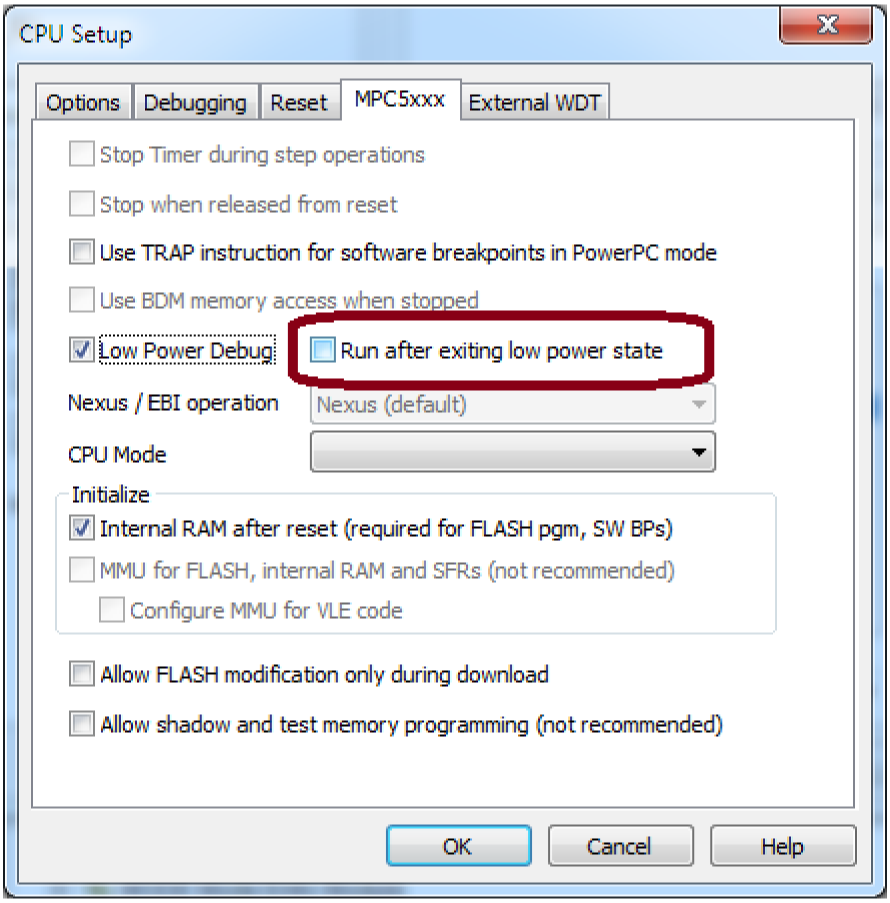
Low Power Debug

When CPU exits low power state, the emulator stops it and reinitializes the on-chip debug module. This ensures that breakpoints and trace do not miss any code execution.

After the OCD initialization the CPU remains stopped. If the CPU should resume running, check the ***Run after exiting low power state*** option.

Location: ***Hardware/Emulation Options/CPU/CPU Setup/MPC5xxx***

Default: **OFF**



□ Stop Timer during step operations

□ Stop when released from reset

□ Use TRAP instruction for software breakpoints in PowerPC mode

□ Use BDM memory access when stopped

☑ Low Power Debug □ Run after exiting low power state

Nexus / EBI operation: Nexus (default)

CPU Mode:

Initialize

☑ Internal RAM after reset (required for FLASH pgm, SW BPs)

□ MMU for FLASH, internal RAM and SFRs (not recommended)

□ Configure MMU for VLE code

□ Allow FLASH modification only during download

□ Allow shadow and test memory programming (not recommended)

ARM

Cortex M4 Core Support

Cortex M4 core debug is supported.

winIDEA

Watch Window

Display format for expanded elements of aggregate types (arrays, structures) is configurable. The format is selected via context menu on the specific element.

Variables Window

Display format of local variables is configurable. The format is selectable via context menu on the local variable.

9.11.19 (18.3.2011)

CPU Support

MPC 5xxx

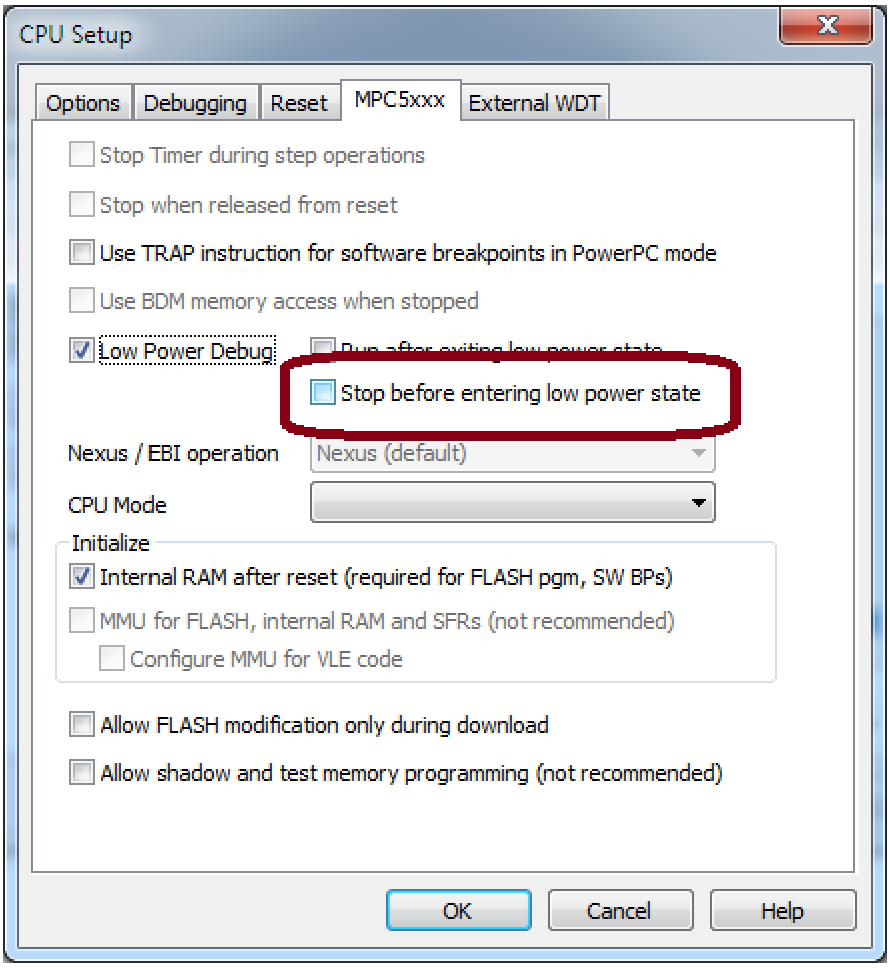
Low Power Debug

When CPU is about to enter low power mode, the emulator can stop it. This allows review of the application context. The CPU status indicates that the CPU is stopped before entering low power mode.

When the user subsequently runs the CPU, it will enter low power state.

Location: ***Hardware/Emulation Options/CPU/CPU Setup/MPC5xxx***

Default: **OFF**



□ Stop Timer during step operations

□ Stop when released from reset

□ Use TRAP instruction for software breakpoints in PowerPC mode

□ Use BDM memory access when stopped

☑ Low Power Debug □ Run after exiting low power state

□ Stop before entering low power state

Nexus / EBI operation: Nexus (default)

CPU Mode:

Initialize

☑ Internal RAM after reset (required for FLASH pgm, SW BPs)

□ MMU for FLASH, internal RAM and SFRs (not recommended)

□ Configure MMU for VLE code

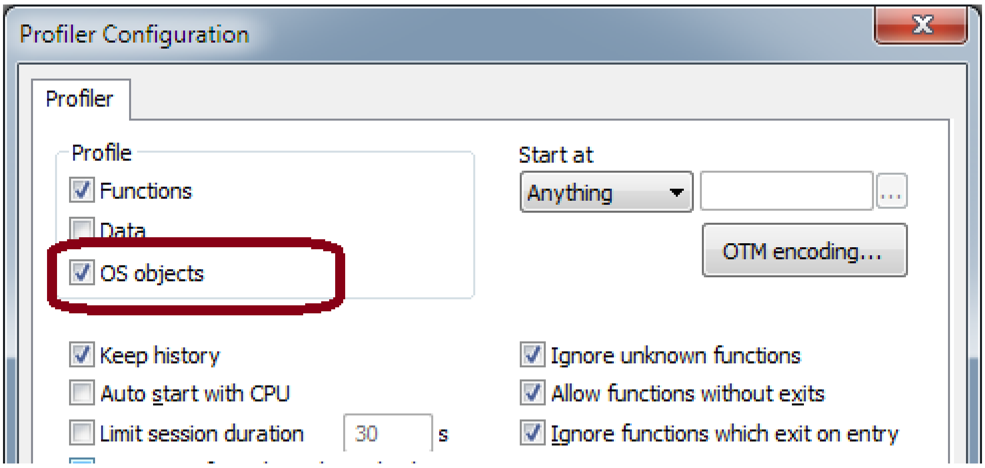
□ Allow FLASH modification only during download

□ Allow shadow and test memory programming (not recommended)

winIDEA

Profiler

Configuration of OS object profiling is now independent of data profiling configuration.



Profile

☑ Functions

□ Data

☑ OS objects

Start at: Anything

☑ Keep history

□ Auto start with CPU

□ Limit session duration 30 s

☑ Ignore unknown functions

☑ Allow functions without exits

☑ Ignore functions which exit on entry

Changes in operation

Earlier winIDEA versions:

- Task ID object was profiled if
    - ***Data*** and ***Include OS objects*** were selected, or
    - ***Function*** was selected and an operating system was configured in the ***OS Setup…***
- Other OS objects were profiled if
    - ***Data*** and ***Include OS objects*** were selected

Since 9.11.18:

- Task ID object and other OS objects are profiled if
    - ***OS objects*** is selected

9.11.22 (4.4.2011)

CPU Support

HC12

- MM912G634
- MM912H634

ARM

- Freescale Kinetis family

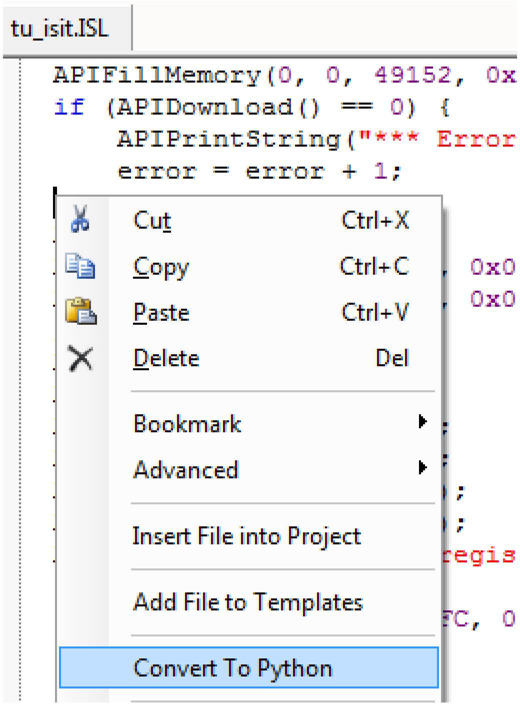
winIDEA

ISL to Python converter

iSYSTEM Script Language is deprecated. To provide an easy upgrade to Python, winIDEA can convert an existing ISL script to a Python script.

If an ISL file is open in winIDEA editor, a ***Convert To Python*** command is provided in the context menu.

After conversion the Python file is opened in winIDEA.



```
APIFillMemory(0, 0, 49152, 0x
if (APIDownload() == 0) {
    APIPrintString("*** Error
    error = error + 1;
```

9.11.24 (13.4.2011)

CPU Support

PowerPC

- Bolero3M family ActiveGT POD.

- MPC e300 (MPC83xx, MobileGT) JTAG Burst+ download. Download speeds in range of 1MB/s.

winIDEA

Symbol Table Dump

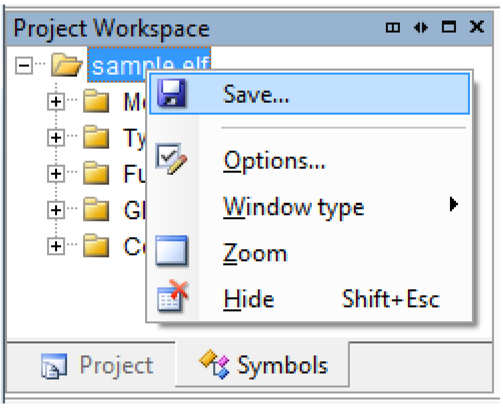
winIDEA internal symbol table can be dumped to a text file. This is used for diagnostic purposes when symbolic information is not yielding results expected from the source code.

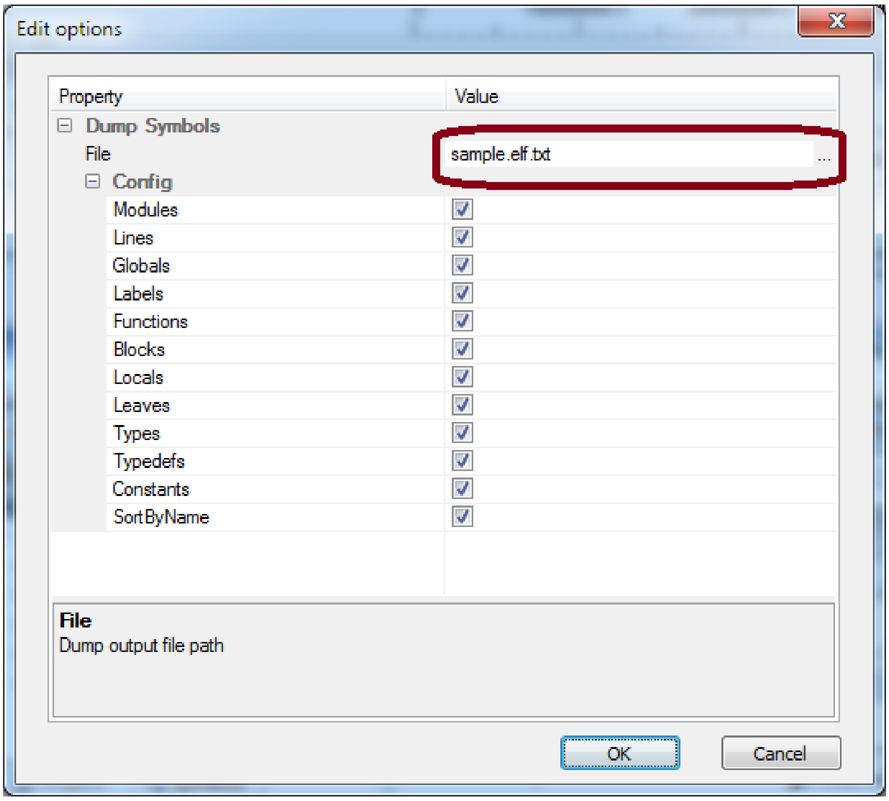
To dump the symbols:

- Select the ***Symbols*** pane in the ***Workspace*** window

- Right click the download file to be dumped

- Select the file and information to dump





Property	Value
⊟ Dump Symbols	
File	sample.elf.txt
⊟ Config	
Modules	☑
Lines	☑
Globals	☑
Labels	☑
Functions	☑
Blocks	☑
Locals	☑
Leaves	☑
Types	☑
Typedefs	☑
Constants	☑
SortByName	☑

File
Dump output file path

9.11.26 (25.4.2011)

CPU Support

V850

- Fx4-L FLASH support.

winIDEA

Parser

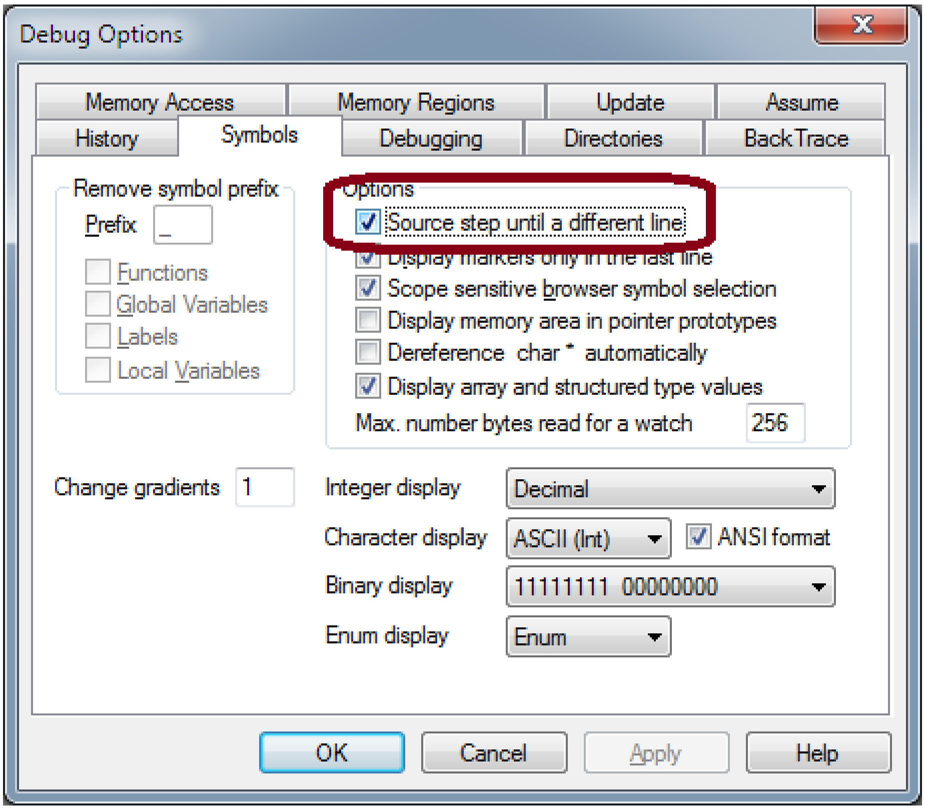
- C++ reference variables can be modified
- ***decltype*** operator can be used to extract type information from an object
- function parameter or return value can be accessed via ***sizeof***, ***typeof*** and ***decltype*** operators

Run Control

If the compiler generates debug information where multiple source line symbols are generated for the same source line (e.g. **for** statements, multiple statements in one line), winIDEA can step over all these statements in a single Source Step operation.

Location: ***Debug/Options /Symbols/Source step until a different line***

Default: **OFF**



Remove symbol prefix

Prefix _

□ Functions
□ Global Variables
□ Labels
□ Local Variables

Options

☑ Source step until a different line
☑ Display markers only in the last line
☑ Scope sensitive browser symbol selection
□ Display memory area in pointer prototypes
□ Dereference char * automatically
☑ Display array and structured type values

Max. number bytes read for a watch 256

Change gradients 1

Integer display Decimal

Character display ASCII (Int) ☑ ANSI format

Binary display 11111111 00000000

Enum display Enum

9.11.27 (5.5.2011)

CPU Support

MPC 5xxx

Internal RAM initialization

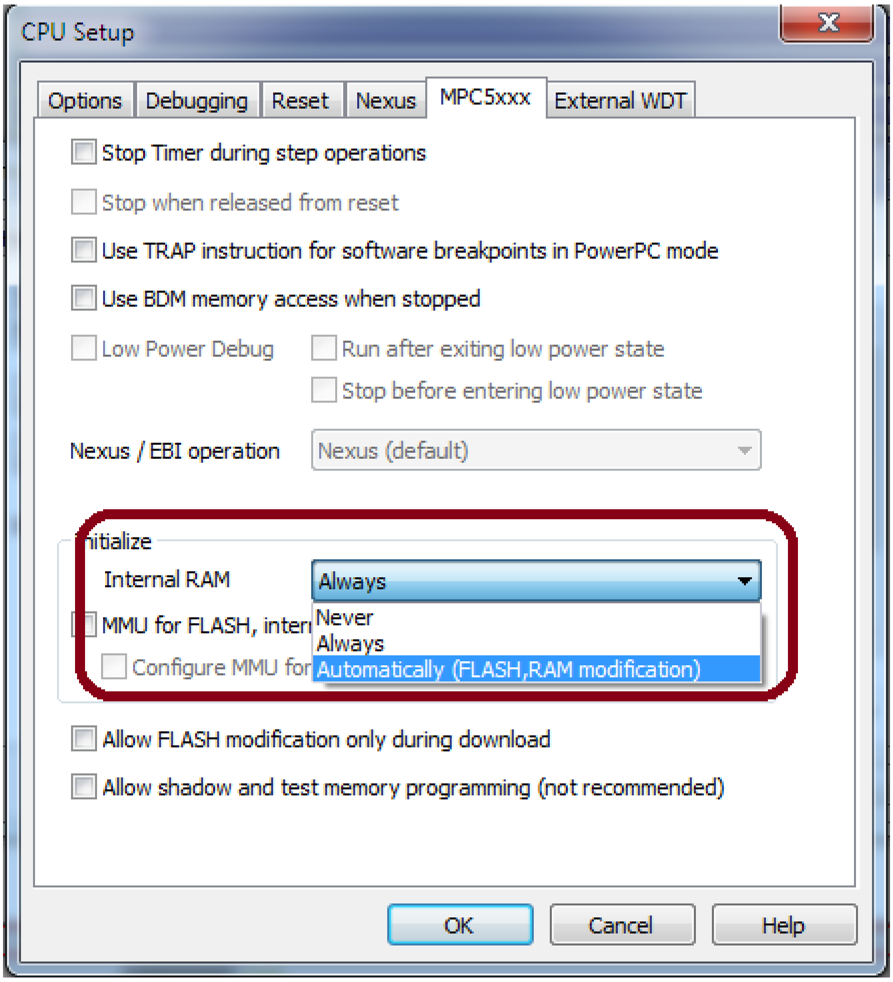
Internal RAM initialization is required to program the internal FLASH and to perform unaligned access to RAM.

Initialization can be performed:

- Never
- Always
- Automatically – in this case the initialization is performed if during download FLASH or internal RAM must be written

Location: ***Hardware/Emulation Options/CPU/CPU Setup/MPC5xxx***

Default: **Automatically**



□ Stop Timer during step operations

□ Stop when released from reset

□ Use TRAP instruction for software breakpoints in PowerPC mode

□ Use BDM memory access when stopped

□ Low Power Debug □ Run after exiting low power state

□ Stop before entering low power state

Nexus / EBI operation: Nexus (default)

nitialize

Internal RAM: Always

Never
Always
Automatically (FLASH,RAM modification)

□ MMU for FLASH, interi

□ Configure MMU for

□ Allow FLASH modification only during download

□ Allow shadow and test memory programming (not recommended)

winIDEA

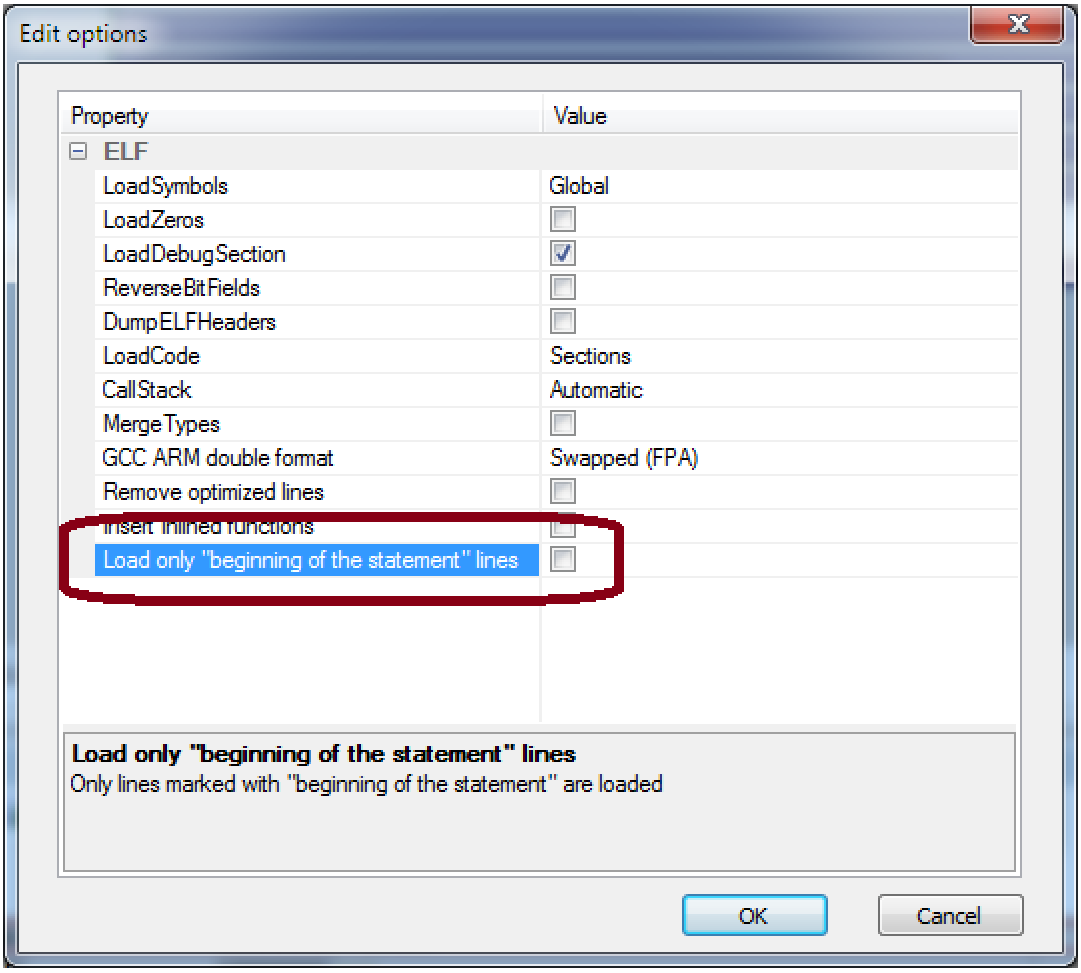
Elf/Dwarf

Some compilers generate 'hint' source line debug info, which can create several source line symbols for a single actual source line. This can cause confusing results in trace and in coverage and can have impact on source code debugging.

Per default such lines are discarded, but if necessary they can be loaded by clearing the ***Load only »beginning of the statement« lines*** option.

Location: ***Debug/Files for download/Properties/Advanced***

Default: **ON**



Property	Value
⊟ ELF	
LoadSymbols	Global
LoadZeros	☐
LoadDebugSection	☑
ReverseBitFields	☐
DumpELFHeaders	☐
LoadCode	Sections
CallStack	Automatic
MergeTypes	☐
GCC ARM double format	Swapped (FPA)
Remove optimized lines	☐
Insert inlined functions	☐
Load only "beginning of the statement" lines	☐

Load only "beginning of the statement" lines
Only lines marked with "beginning of the statement" are loaded

9.11.28 (10.5.2011)

CPU Support

Sitel SCxxx

SC14443 MMU supported

SC14443 can remap virtual addresses to physical, loading into physical memory and display in memory windows is provided.

winIDEA

Analyzer

The ***Analyzer*** window unifies Trace and Profiler analysis functionality. Both analyses can run in parallel on a single recording session.

The configuration and recorded data is saved in a ***.trd*** file. trd files created by older winIDEA versions are backward compatible.

In addition to existing ***View/Analyzer*** command shortcut, which opens the ***<workspace>.trd*** file, the ***View/Profiler*** provides a shortcut to the ***<workspace>_profiler.trd*** file. This file is created automatically when an older winIDEA workspace is opened and the legacy Profiler configuration is imported to it.

Note: A separate **Analyzer.pdf** user manual document is provided.

isystem.connect implications

The existing ***IConnectProfiler*** interface interfaces the **active** analyzer window.

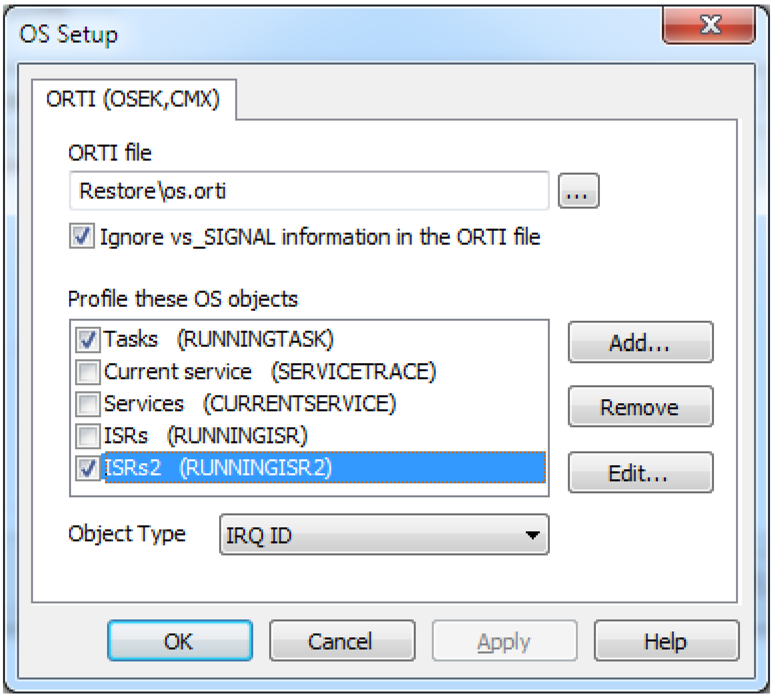
Profiler configuration is now available via ***IConnectIDE::Option*** interface.

OSEK

IRQ Object definition allows subtraction of IRQ context activity from the task activity which it interrupted.

An OSEK object is defined to be IRQ object by setting its ***Object Type*** to **IRQ ID**.

Per default, this is attributed to the **RUNNINGISR2** OSEK object.



ORTI file: Restore\os.orti

☑ Ignore vs_SIGNAL information in the ORTI file

Profile these OS objects

☑ Tasks (RUNNINGTASK)
☐ Current service (SERVICETRACE)
☐ Services (CURRENTSERVICE)
☐ ISRs (RUNNINGISR)
☑ ISRs2 (RUNNINGISR2)

Object Type: IRQ ID

Depending on how OSEK signals IRQ state, profiler can manage IRQ context switches as:

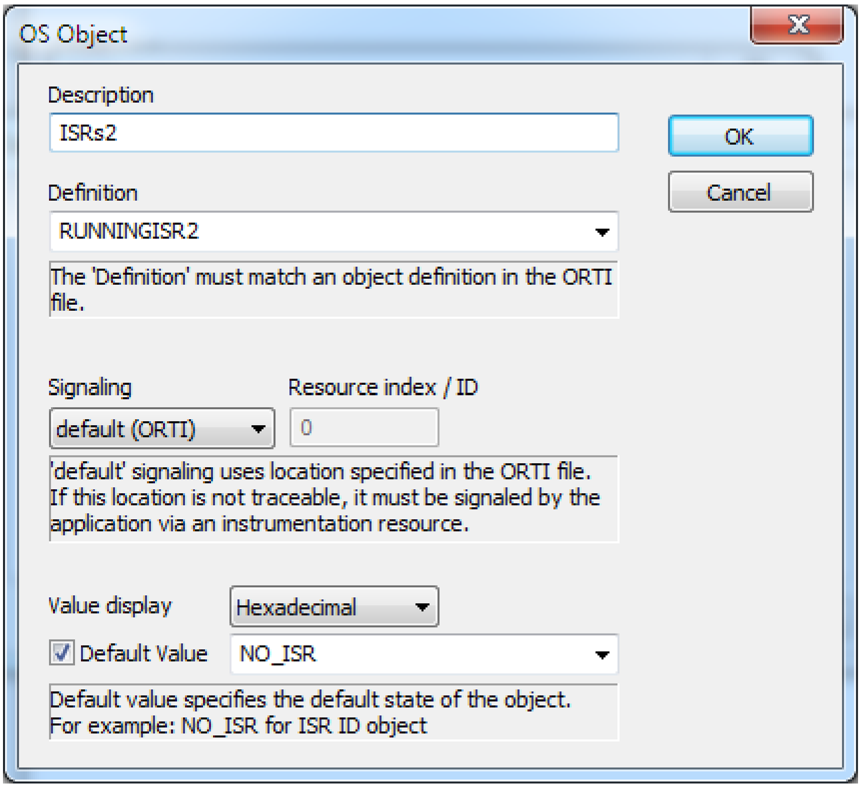
Single IRQ context

Usually the OS signals no IRQ activity, with a value like NO_ISR.

In this case it is assumed that last active task is reactivated.

If a value other than this **Default** value is signaled, a separate **IRQ** context is used.

For such scenario enable the ***Default Value*** option in the Object properties and select the value which is considered neutral.



Description: ISRs2

Definition: RUNNINGISR2

The 'Definition' must match an object definition in the ORTI file.

Signaling: default (ORTI)

Resource index / ID: 0

'default' signaling uses location specified in the ORTI file. If this location is not traceable, it must be signaled by the application via an instrumentation resource.

Value display: Hexadecimal

☑ Default Value: NO_ISR

Default value specifies the default state of the object. For example: NO_ISR for ISR ID object

Per default the **RUNNINGISR2** object is set to **have a default value** of **NO_ISR**.

Multiple IRQ contexts

If the OS (re)signals the active task after IRQ was serviced, then the default value should be disabled.

9.11.30 (17.5.2011)

CPU Support

Cortex M

SoC Reset Method

SoC reset is available on all Cortex M devices.

winIDEA

Analyzer

Legacy Profiler configuration is imported automaticaly into ***Profiler.trd*** file.

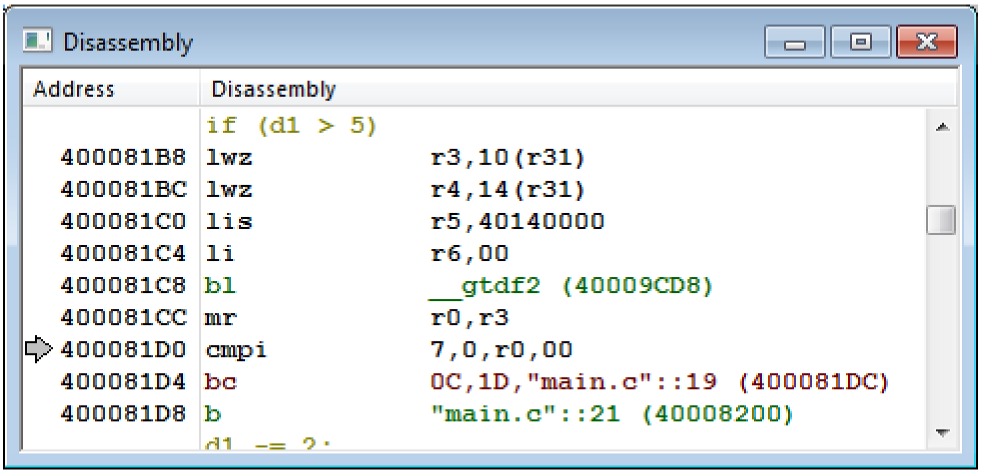
View/Profiler menu opens the ***Profiler.trd*** file.

IConnectProfiler interface interfaces the active analyzer window.

Profiler configuration is accessible via script interface.

Disassembly

Conditional (dark red) and change-of-flow (dark green) instructions are coloured differently to regular instructions.



```
Address    Disassembly
           if (d1 > 5)
  400081B8 lwz           r3,10(r31)
  400081BC lwz           r4,14(r31)
  400081C0 lis           r5,40140000
  400081C4 li            r6,00
  400081C8 bl            __gtdf2 (40009CD8)
  400081CC mr            r0,r3
⇨ 400081D0 cmpi          7,0,r0,00
  400081D4 bc            0C,1D,"main.c"::19 (400081DC)
  400081D8 b             "main.c"::21 (40008200)
           d1 -= 2;
```

9.11.31 (24.5.2011)

winIDEA

Analyzer

Zoom in/out using ***Ctrl + mouse wheel*** is implemented.

Editor

Default custom color syntax (additional keywords) for Assembler, C and C++ now use standard CCS syntax, instead of just a list of keywords.

9.11.32 (27.5.2011)

FLASH Programming

UMI Double Buffering

FLASH devices using UMI2 monitors with double buffering support are now supported.

Double buffering can double programming performance. In this mode, the CPU is programming one sector while the data for the next sector is being delivered via on-chip debug interface.

Currently available on:

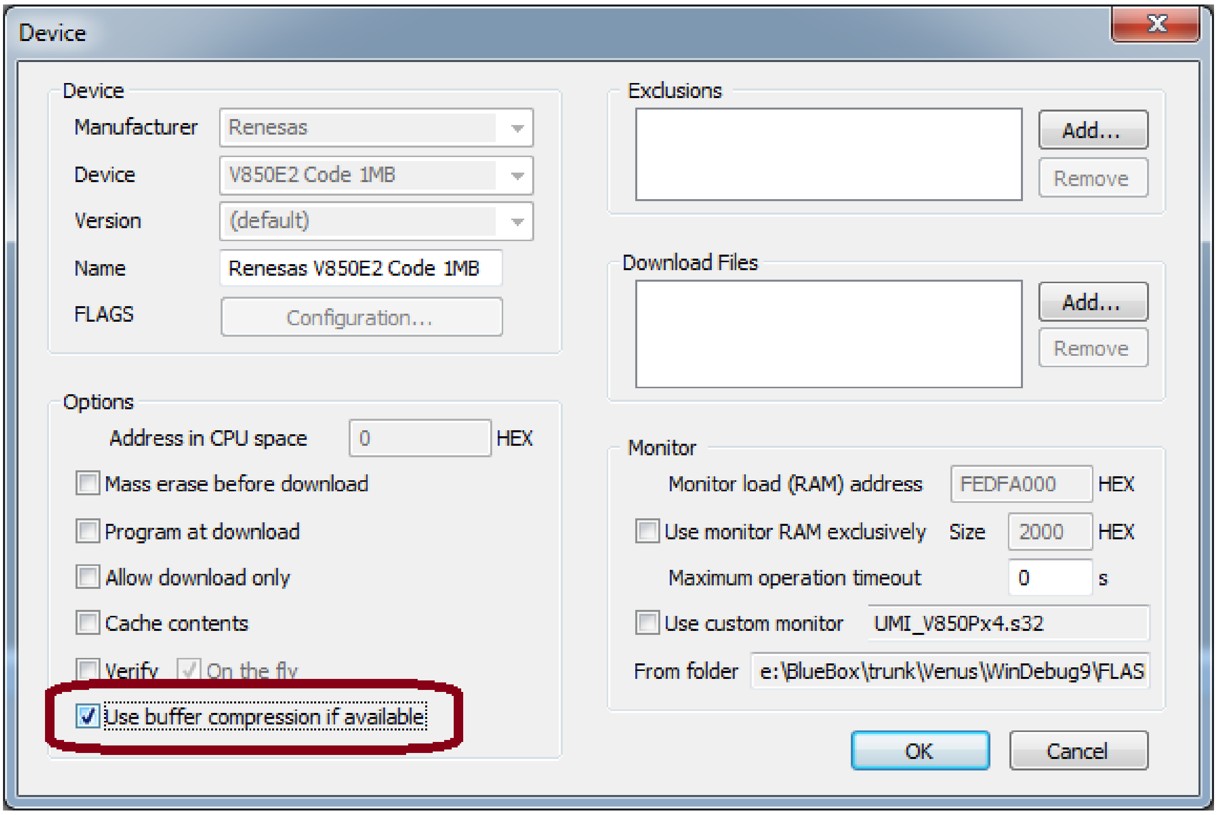
- STM32

UMI Buffer Compression

FLASH devices using UMI2 monitors with buffer compression capabilities are now supported.

If the FLASH monitor supports compression, it is used when better than 60% compression can be achieved. This can increase programming performance on devices with a slow memory write debug interface.

If using compression decreases FLASH programming performance (e.g. when writing memory via on-chip debug interface is fast, but CPU itself is slow), it can be explicitly disabled in FLASH device configuration dialog.



Device

Device
Manufacturer: Renesas
Device: V850E2 Code 1MB
Version: (default)
Name: Renesas V850E2 Code 1MB
FLAGS: Configuration...

Options
Address in CPU space: 0 HEX
□ Mass erase before download
□ Program at download
□ Allow download only
□ Cache contents
□ Verify ☑ On the fly
☑ Use buffer compression if available

Exclusions
Add... Remove

Download Files
Add... Remove

Monitor
Monitor load (RAM) address: FEDFA000 HEX
□ Use monitor RAM exclusively Size: 2000 HEX
Maximum operation timeout: 0 s
□ Use custom monitor: UMI_V850Px4.s32
From folder: e:\BlueBox\trunk\Venus\WinDebug9\FLAS

OK Cancel

Currently available on:

- STM32

winIDEA

Build Manager

Build manager is disabled on workspace load, if project is not configured (no targets or no project files).

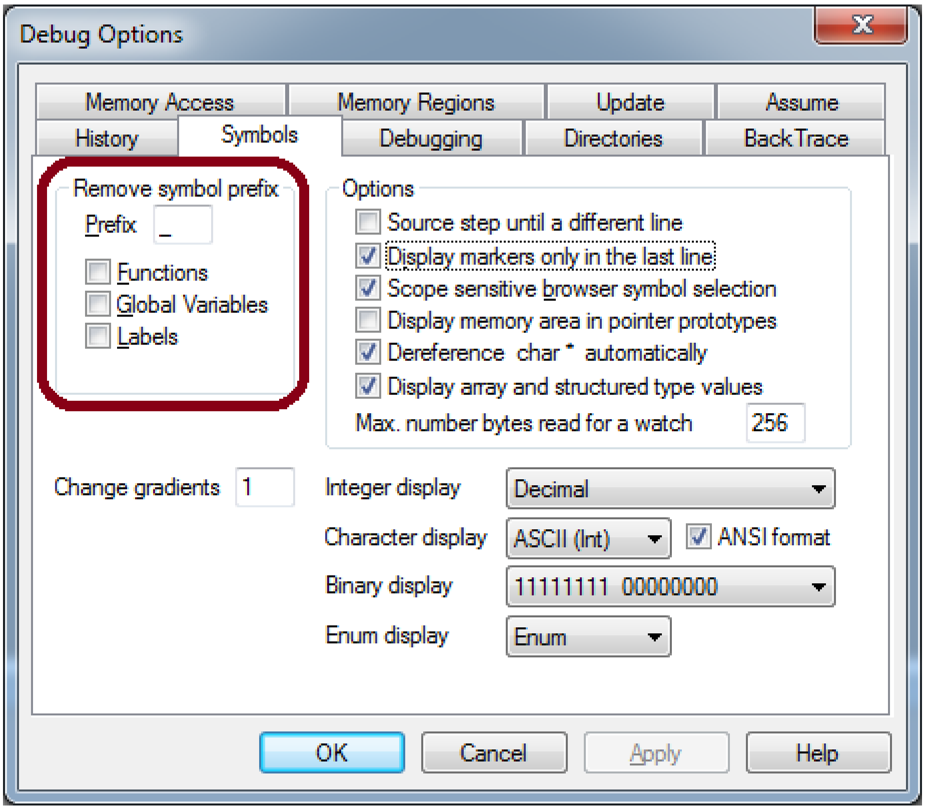
Symbol prefix removal

Prefix on symbol names can be optionally removed on these symbol classes:

- Global Variables
- Functions
- Code Labels

Location: ***Debug/Options/Symbols***

Default: **disabled**



Remove symbol prefix

Prefix _

☐ Functions

☐ Global Variables

☐ Labels

Options

☐ Source step until a different line

☑ Display markers only in the last line

☑ Scope sensitive browser symbol selection

☐ Display memory area in pointer prototypes

☑ Dereference char * automatically

☑ Display array and structured type values

Max. number bytes read for a watch 256

Change gradients 1

Integer display Decimal

Character display ASCII (Int) ☑ ANSI format

Binary display 11111111 00000000

Enum display Enum

9.11.33 (2.6.2011)

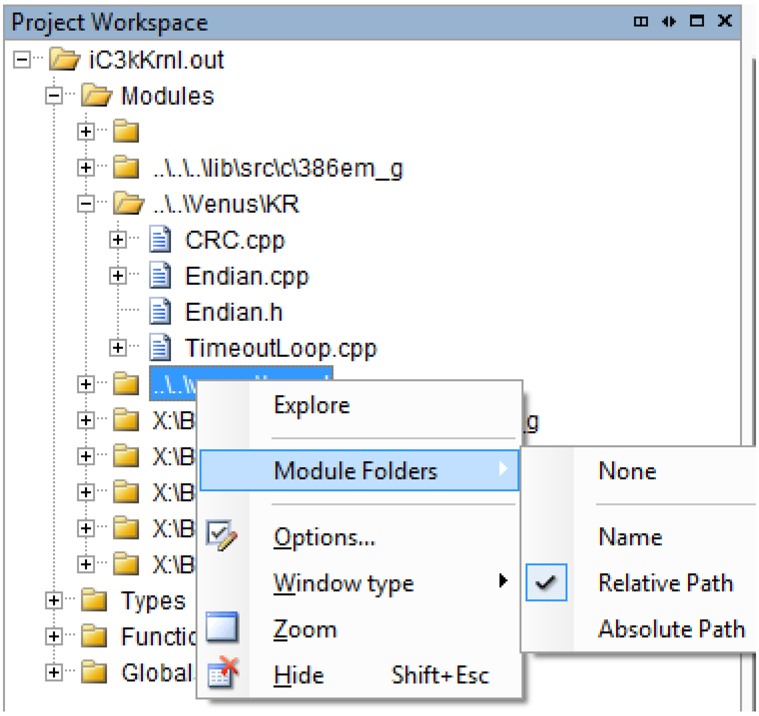
winIDEA

Project / Symbols Window

The ***Symbols*** pane of the project window can show modules used in the download file, organized in folder groups.

The ***Module Folders*** context menu allows selection of folder diplay:

- **None** - no folder hierarchy is shown
- **Name** - only folder names are shown
- **Relative path**- folder relative path to workspace folder is shown
- **Absolute path**- full folder path is shown



Context menu operations on module folder:

- **Explore** - opens system explorer on the selected folder

Context menu operations on module:

- **Goto Source** - opens the module file in winIDEA editor
- **Open File Location** – opens system explorer and selects the module file

9.11.34 (10.6.2011)

isystem.connect

Symbol Retrieval

A symbol name can be retrieved using an address, even if the symbol does not begin at that address. This can be used to determine to which function a certain code location belongs.

The ***ESymbolFlags*** to ***IConnectDebug::GetSymbol*** function have been extended with:

- ***sScopeExact*** symbol whose starting address matches ***aAddress*** exactly

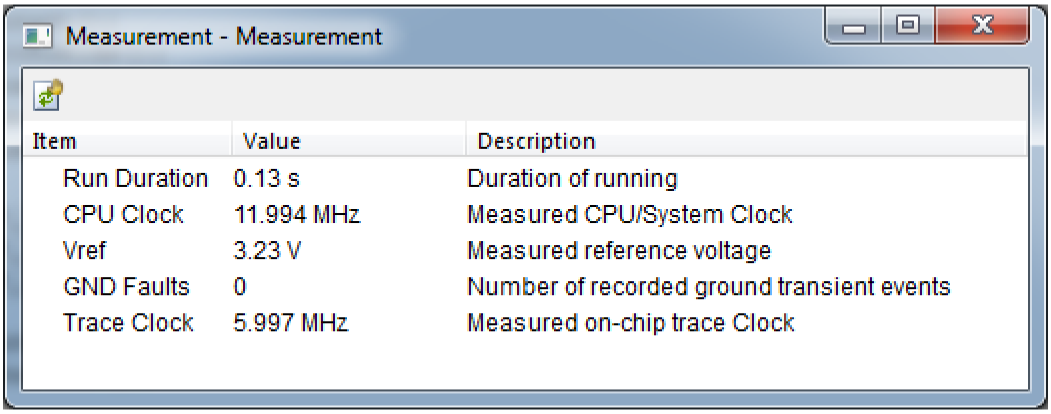
- ***sScopeNarrow*** symbol which spans over ***aAddress***. For composite types the *narrow* scope is returned, e.g. A.B[3].C

- ***sScopeWide*** symbol which spans over ***aAddress***. For composite types the *wide* scope is returned, e.g. A

winIDEA

Measurement plugin

Location: ***Plugin/Measurement***



Item	Value	Description
Run Duration	0.13 s	Duration of running
CPU Clock	11.994 MHz	Measured CPU/System Clock
Vref	3.23 V	Measured reference voltage
GND Faults	0	Number of recorded ground transient events
Trace Clock	5.997 MHz	Measured on-chip trace Clock

Run Duration

This value shows the time CPU was running since the last time the user set it into running.

The accuracy of this value is approximately 20ms.

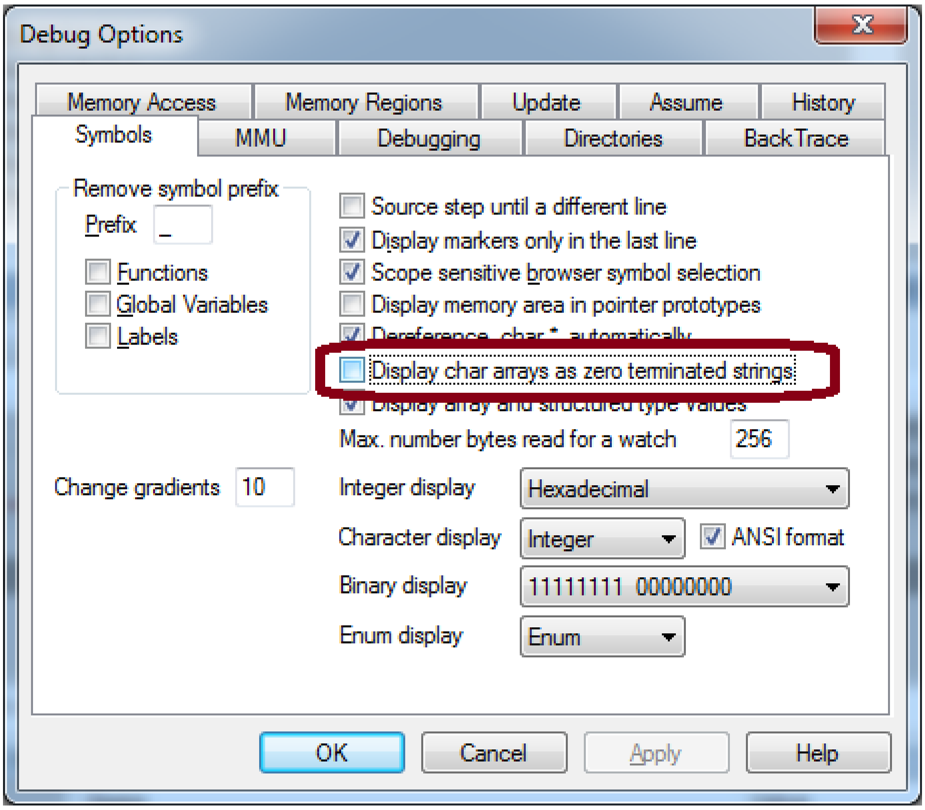
GND Faults

This value is the number of observed ground transient events. An event is registered when debugger and target GND potentials differ by more than 250 mV. The GND potentials are sampled at 500ns intervals.

If this value is non zero, verify that the debugger and target GND have a good contact.

Note that switching target on or off, normally causes a few transient events.

Display of char type arrays



Remove symbol prefix

Prefix _

□ Functions
□ Global Variables
□ Labels

□ Source step until a different line
☑ Display markers only in the last line
☑ Scope sensitive browser symbol selection
□ Display memory area in pointer prototypes
☑ Dereference char * automatically
□ Display char arrays as zero terminated strings
☑ Display array and structured type values

Max. number bytes read for a watch 256

Change gradients 10

Integer display Hexadecimal

Character display Integer ☑ ANSI format

Binary display 11111111 00000000

Enum display Enum

Arrays of type char can be displayed in watch window as zero terminated strings.

If the option is not checked, the string is displayed as a array of 8-bit characters. Individual elements are displayed according to ***Character display*** configuration in the same dialog.

Location: ***Debug/Options/Symbols***

Default: **ON**

Expression override modifiers

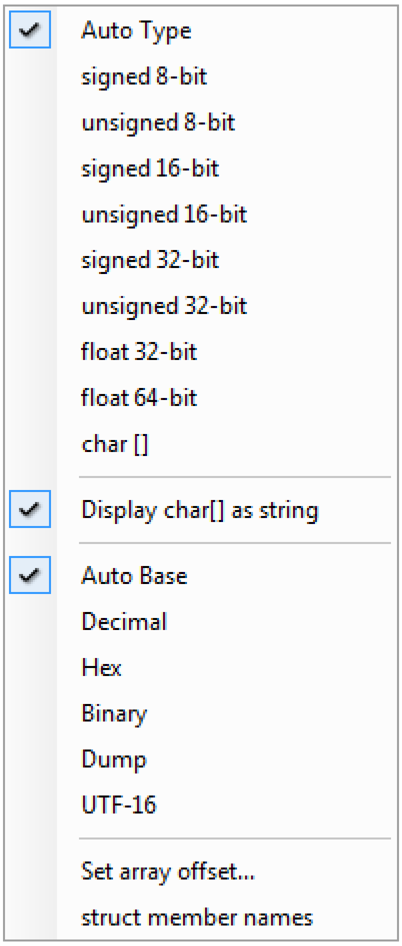
The above global setting can be explicitly overriden for individual watches with watch modifiers.

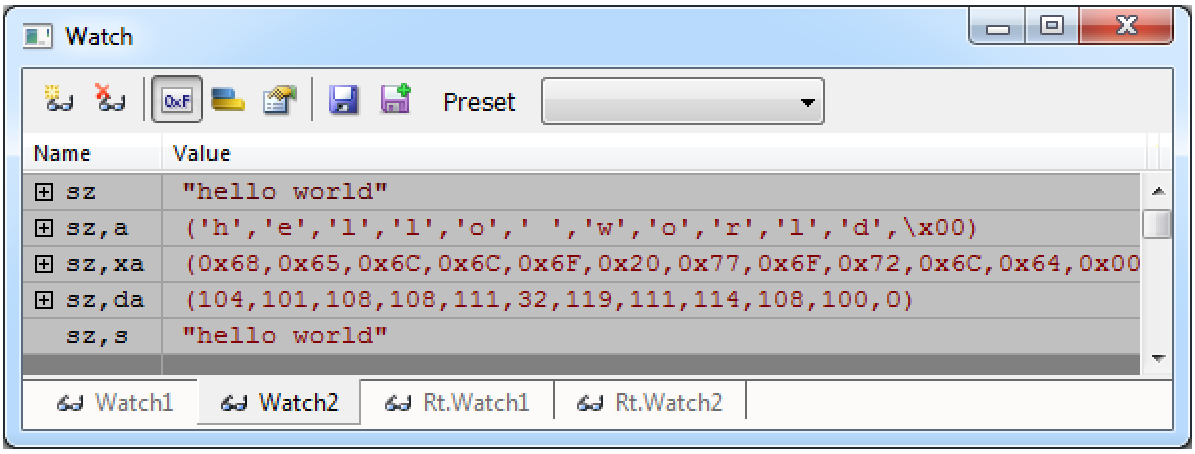
- To force string interpretation, use the **,s** modifier.
  From context menu select: ***char[]***

- To force array interpretation, use the **,a** modifier.
  From context menu select: ***Display char[] as string***

Example:

```
char sz[] = “Hello World”;
```





Name	Value
⊞ sz	"hello world"
⊞ sz,a	('h','e','l','l','o',' ','w','o','r','l','d',\x00)
⊞ sz,xa	(0x68,0x65,0x6C,0x6C,0x6F,0x20,0x77,0x6F,0x72,0x6C,0x64,0x00
⊞ sz,da	(104,101,108,108,111,32,119,111,114,108,100,0)
sz,s	"hello world"

Array offset and number of elements displayed

To allow viewing elements of large arrays, watch modifiers can be used to set the first displayed element and number of displayed elements.

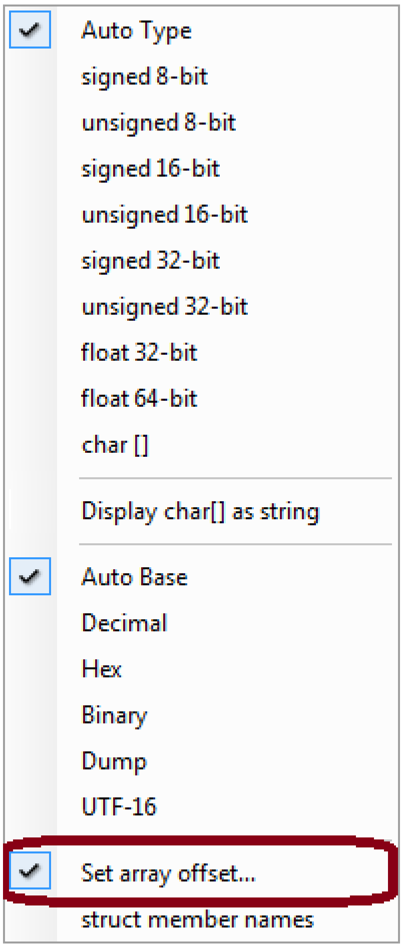
Format:

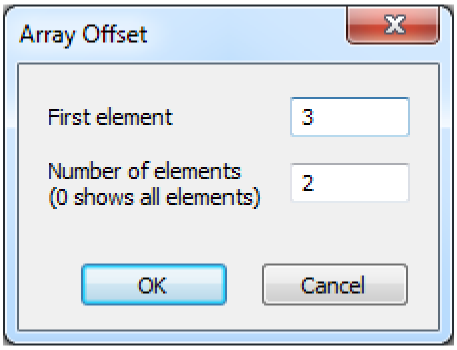
```
<watch expression>,a[<first element][.<number of elements>]
```

Example:

```
sz,a3   // display array elements starting from sz[3]
sz,a3.2 // display 2 array elements, starting at sz[3]
sz,a.2  // display first 2 array elements
```

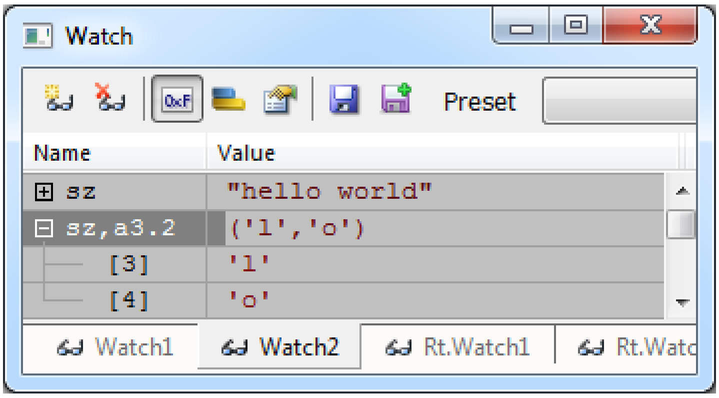
This modifier can also be set by selecting ***Set array offset…*** from the context menu.





First element: 3

Number of elements (0 shows all elements): 2

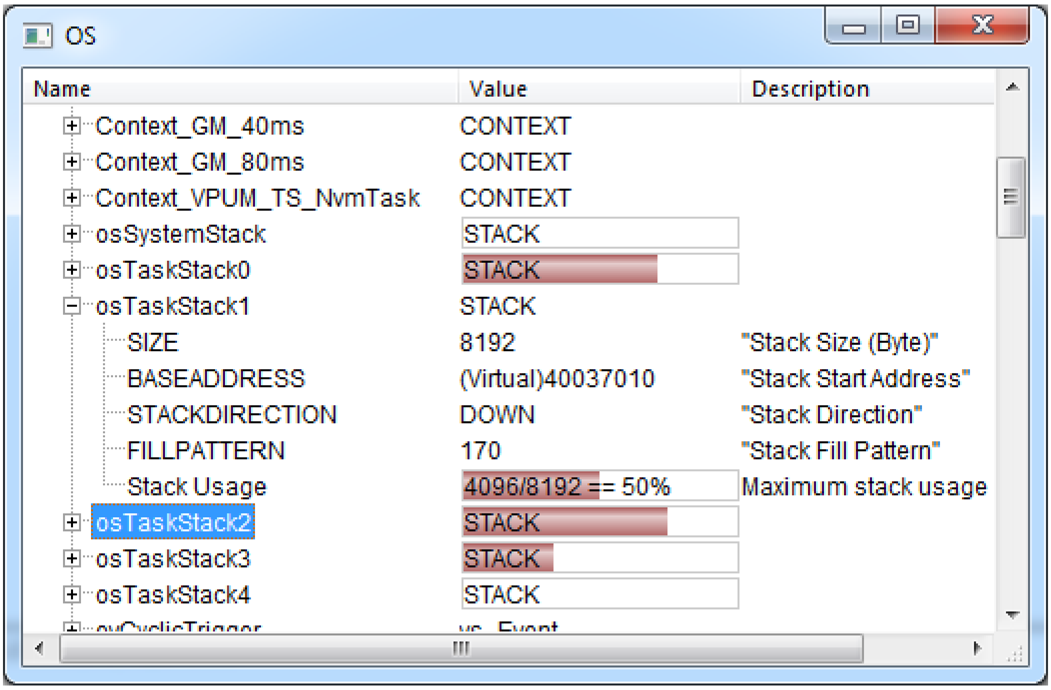


Name	Value
⊞ sz	"hello world"
⊟ sz,a3.2	('l','o')
[3]	'l'
[4]	'o'

Graphical OS resource display

The OS window provides graphical representation of resource consumption (if such information is available).

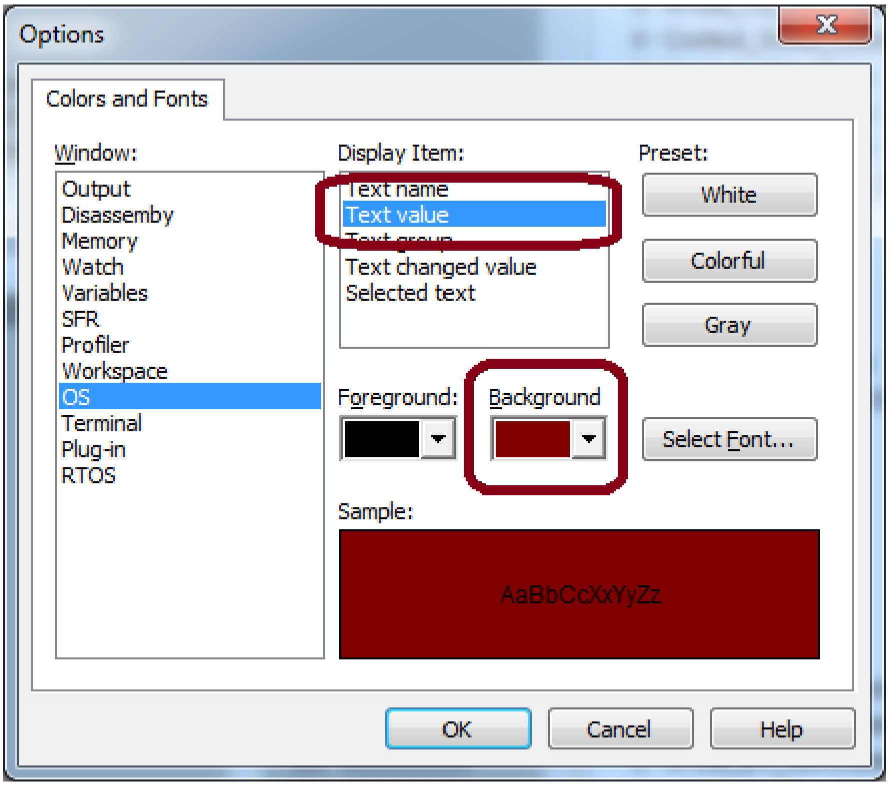
In this screenshot stack usage for an OSEK OS is shown.



OS

Name	Value	Description
Context_GM_40ms	CONTEXT	
Context_GM_80ms	CONTEXT	
Context_VPUM_TS_NvmTask	CONTEXT	
osSystemStack	STACK	
osTaskStack0	STACK	
osTaskStack1	STACK	
SIZE	8192	"Stack Size (Byte)"
BASEADDRESS	(Virtual)40037010	"Stack Start Address"
STACKDIRECTION	DOWN	"Stack Direction"
FILLPATTERN	170	"Stack Fill Pattern"
Stack Usage	4096/8192 == 50%	Maximum stack usage
osTaskStack2	STACK	
osTaskStack3	STACK	
osTaskStack4	STACK	

Note: the bar color is defined by the ***Background*** color of the ***OS/Text value*** item.



Options

Colors and Fonts

Window: Output, Disassemby, Memory, Watch, Variables, SFR, Profiler, Workspace, OS (selected), Terminal, Plug-in, RTOS

Display Item: Text name, Text value (selected), Text group, Text changed value, Selected text

Preset: White, Colorful, Gray

Foreground: ■

Background: ■

Select Font...

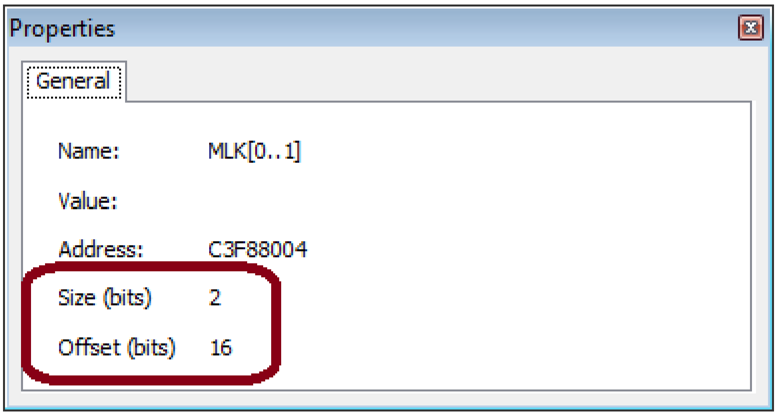
Sample: AaBbCcXxYyZz

OK Cancel Help

SFR Properties displays register details

In SFR window, displaying Properties of an SFR now displays also:

- Size of the register or sub-register in bits
- Sub-register offset from the register in bits



Name: MLK[0..1]

Value:

Address: C3F88004

Size (bits) 2

Offset (bits) 16

CPU Support

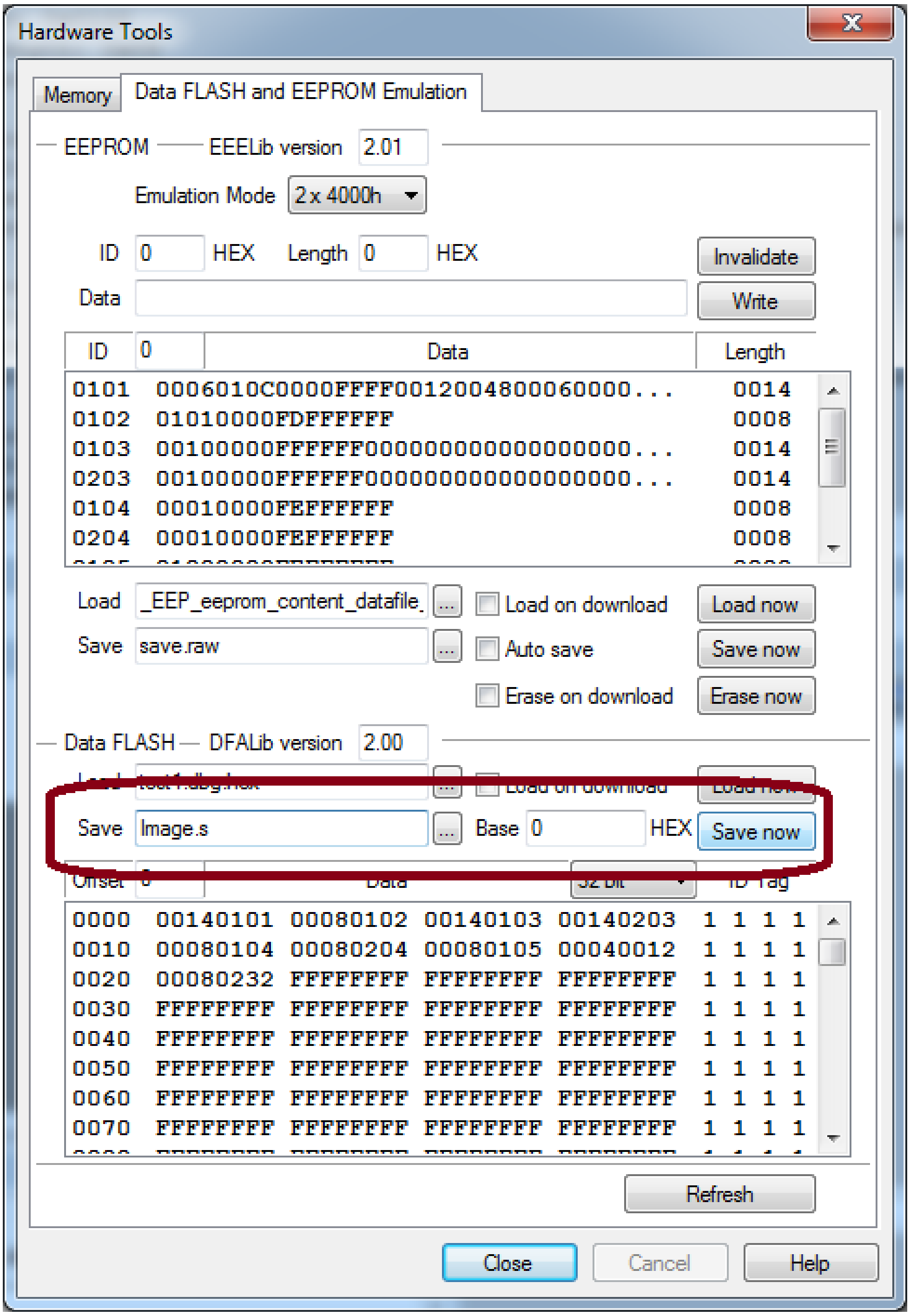
V850

Data FLASH contents save

Data FLASH contents with ID tags can be saved in NEC interleaved hex format.

The **Base** configuration specifies the offset to add to the addresses in the output file.

Location: ***Hardware/Tools/Data FLASH and EEPROM Emulation***



Hardware Tools

Memory | Data FLASH and EEPROM Emulation

EEPROM — EEELib version 2.01

Emulation Mode 2x 4000h

ID 0 HEX Length 0 HEX

Data

ID	Data	Length
0101	0006010C0000FFFF0012004800060000...	0014
0102	01010000FDFFFFFF	0008
0103	00100000FFFFFF0000000000000000000...	0014
0203	00100000FFFFFF0000000000000000000...	0014
0104	00010000FEFFFFFF	0008
0204	00010000FEFFFFFF	0008

Load _EEP_eeprom_content_datafile

Save save.raw

□ Load on download

□ Auto save

□ Erase on download

Data FLASH — DFALib version 2.00

Save Image.s Base 0 HEX

Offset	Data				ID Tag			
0000	00140101	00080102	00140103	00140203	1	1	1	1
0010	00080104	00080204	00080105	00040012	1	1	1	1
0020	00080232	FFFFFFFF	FFFFFFFF	FFFFFFFF	1	1	1	1
0030	FFFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFFF	1	1	1	1
0040	FFFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFFF	1	1	1	1
0050	FFFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFFF	1	1	1	1
0060	FFFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFFF	1	1	1	1
0070	FFFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFFF	1	1	1	1

9.11.35 (17.6.2011)

CPU Support

CR16B

SC14443 MMU supported

SC14443 can remap virtual addresses to physical, loading into physical memory and display in memory windows is provided.

winIDEA

Editor block macros

A block comment interprets certain key combinations as a block modify operation.

All file types

• TAB	indent selection
• SHIFT+TAB	unindent selection

C

• /	adds or removes double slash // comment

Python

• #	adds or removes # comment

9.11.36 (26.6.2011)

isystem.connect

CodeStore container

CodeStore is a container which can keep any amount of code. The purpose of the container is to keep track of all e.g. all dowloaded code, all code in a single file, read-back code in a verification process etc.

The container consists of a collection of ***CodeStoreItems***. Each item keeps address, size and data stored at that address.

Operations:

- Add, exclude and retrieve code
- Compare two containers and create a difference container
- Report contents to a file

Creation:

- Return from one of the ***DataController*** functions
- Explicitly

```
csEmpty = ic.CCodeStore(cmgr)
```

CodeStore operations

The ***isystem.connect DataController*** provides these operations:

csGetDownloaded

Returns a CodeStore with downloaded code (from a single or all files).

csReadMemory

Uses an existing CodeStore as reference and returns a new CodeStore with reference memory regions read.

csDif

Performs a difference operation between two CodeStores and creates a new CodeStore with the difference information.

This Python example shows how a verify operation can be performed:

```
dataCtrl = ic.CDataController(cmgr)
memArea = 0
# get downloaded,
#   all files
#   include data
csDownloaded = dataCtrl.csGetDownloaded(memArea, '', True)
# read back the memory.
#   Use csDownloaded as address reference
csRead = dataCtrl.csReadMemory(memArea, csDownloaded)
# create a dif
csDif = dataCtrl.csDif(csDownloaded, csRead)
# report differences,
#   don't append
#   use default report format
#   contiguous regions
#   references are csDownloaded and csRead
csDif.reportDif('VerifyReport.txt', False, '', 0, csDownloaded, csRead)
```

csVerifyDownloaded

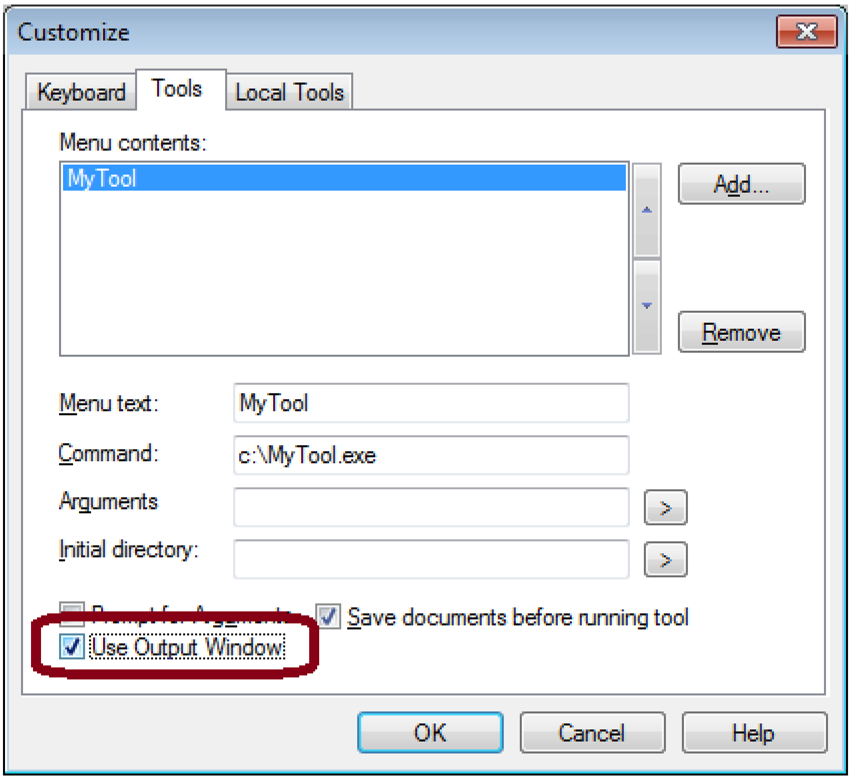
This function performs all above steps in a single operation.

```
dataCtrl = ic.CDataController(cmgr)
memArea = 0
# verify and report
#   all files
#   write a report to VerifyReport.txt
dataCtrl.csVerifyDownloaded(memArea, '', 'VerifyReport.txt')
```

winIDEA

Custom tools can use Output window

Tools/Customize/Tools configuration allows setting of the ***Use Output window*** option.



Menu contents: MyTool

Menu text: MyTool

Command: c:\MyTool.exe

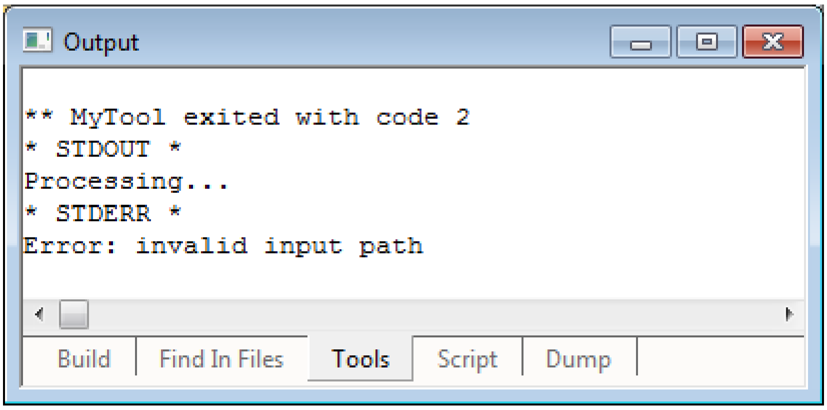
Arguments

Initial directory:

☐ Prompt for Arguments ☑ Save documents before running tool

☑ Use Output Window

If this option is checked, the tool will start hidden and STDOUT/STDERR streams will be shown in the Output window's ***Tools*** pane.



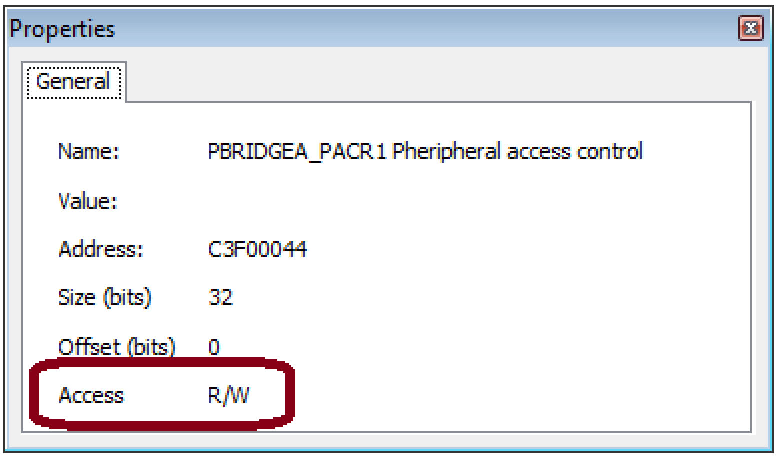
```
** MyTool exited with code 2
* STDOUT *
Processing...
* STDERR *
Error: invalid input path
```

Disassembly Register / Memory list

Drag & drop a register from disassembly into memory window lists memory from register value.

SFR Register properties

SFR properties dialog displays read/write property of a register.



Name: PBRIDGEA_PACR1 Pheripheral access control

Value:

Address: C3F00044

Size (bits) 32

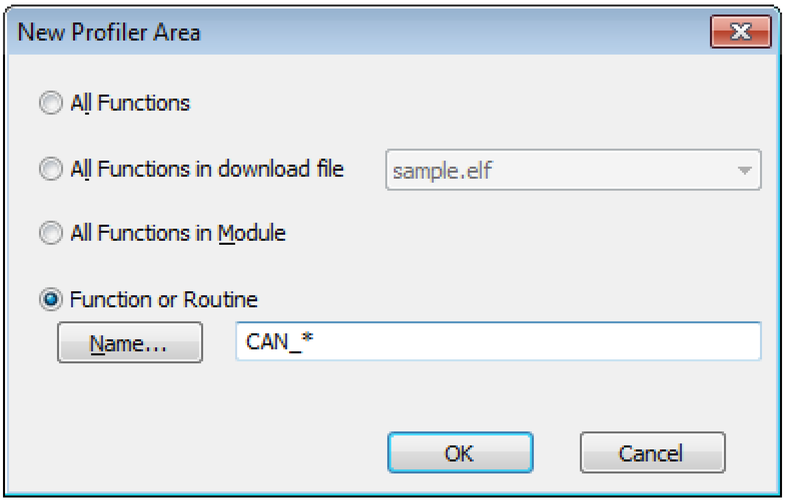
Offset (bits) 0

Access R/W

Analyzer / Profiler

Function execution areas can be specified with a wildcard.

In this example all functions which start with *CAN_* are profiled.



○ All Functions

○ All Functions in download file sample.elf

○ All Functions in Module

● Function or Routine

CAN_*

Wildcard format

- *		any sequence of characters
- ?		any single character
- #		any single digit
- [*set*]		any of the characters in the specified set
- [!*set*]		none of the characters in the specified set

A ***set*** is defined as a sequence of characters. If a dash is used, all characters within the range qualify, e.g. [a-z] defines all characters in range *a* though *z*.

9.11.37 (4.7.2011)

CPU Support

ARM

OMAP4 OCD

Basic single core debug support.

PowerPC

xPC5643L Leopard Active GT POD

Full feature set.

PPC440EPx OCD

Full debug feature set.

9.11.38 (8.7.2011)

Verified Build

- V850
- HCS12/S12X
- MPC5xxx
- ARM7/ARM9
- ColdFire
- CPU32
- TMSx70
- Cortex-M0/M1/M3/A8
- 78K
- CR16
- MPC56x
- TriCore
- XC2xxxx
- STM8
- HCS08
- R8C
- CoolRISC

CPU Support

ARM

AM3517 OCD

Basic single core debug support. Implemented as derivative of OMAP35xx.

HCS12

MC9S12VRx Tomar OCD

Full debug feature set.

9.11.39 (9.7.2011)

CPU Support

V850

V850Fx4-L

Program and Data FLASH programming.

TriCore

PCP Channel Enable

If a channel is disabled, winidea can optionally enable R7.CEN bit before step/run.

ARM

TMS570 Reset initialization

nSRST is released for 500 microseconds before debug init to allow AJSM to unlock debug resources.

9.11.40 (13.7.2011)

CPU Support

78k0R

Data Profiler

When more than 2 data items are defined, trace is configured to the union of all items. This allows profiling of an arbitrary number of data variables, but reduces the trace buffer depth.

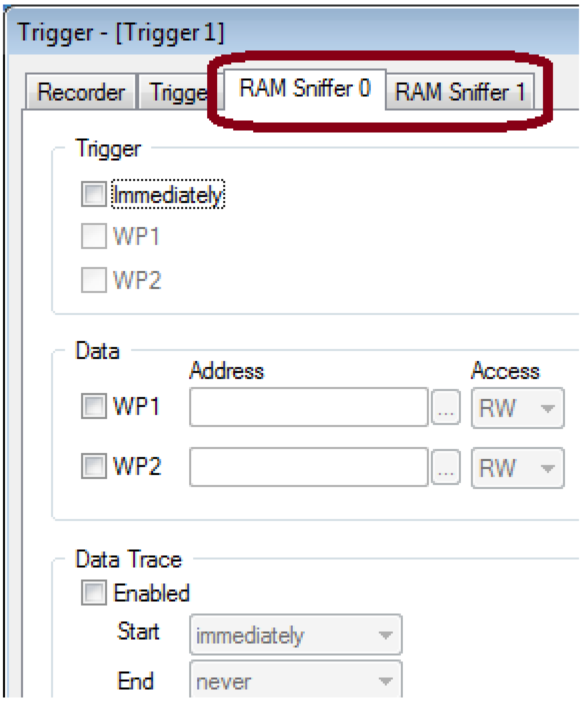
9.11.42 (21.7.2011)

CPU Support

PowerPC

Pictus 1M RAM Sniffer support

The two RAM Sniffer modules on the Pictus1M can be used to trace memory accesses to the internal RAM.



Trigger: □ Immediately, □ WP1, □ WP2

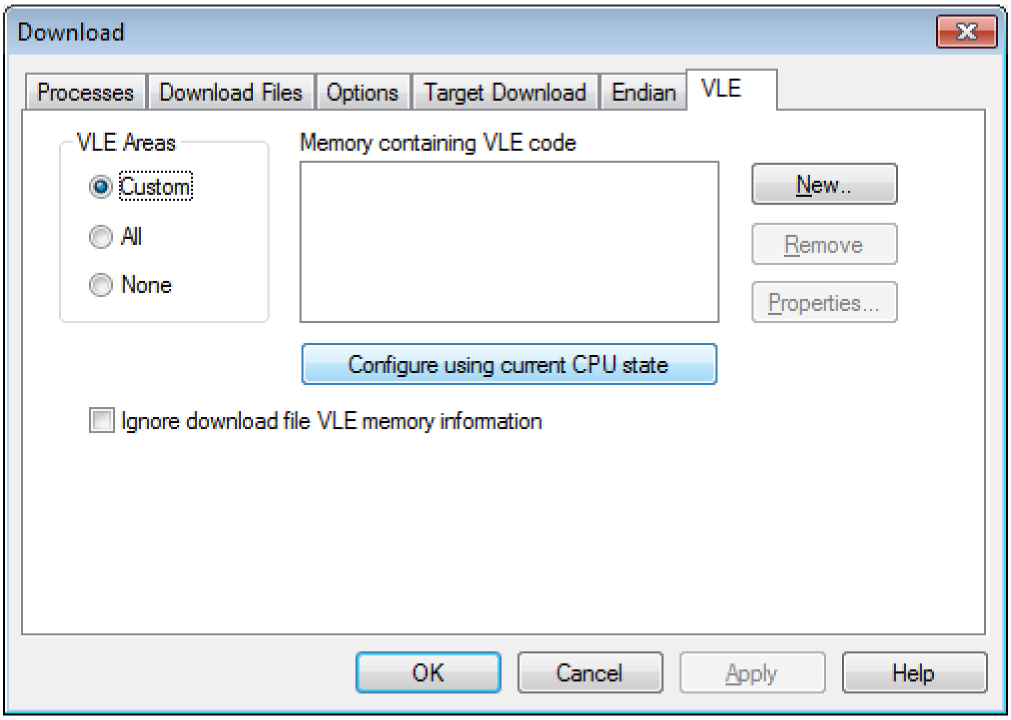
Data: □ WP1, Access RW; □ WP2, Access RW

Data Trace: □ Enabled, Start: immediately, End: never

VLE area auto configuration

VLE areas can be configured using current MMU configuration.

When CPU is stopped, the ***Configure using current CPU state*** button in the ***Debug/Files for Download/VLE*** dialog can be used to configure VLE regions to all MMU TLBs currently configured for VLE code.



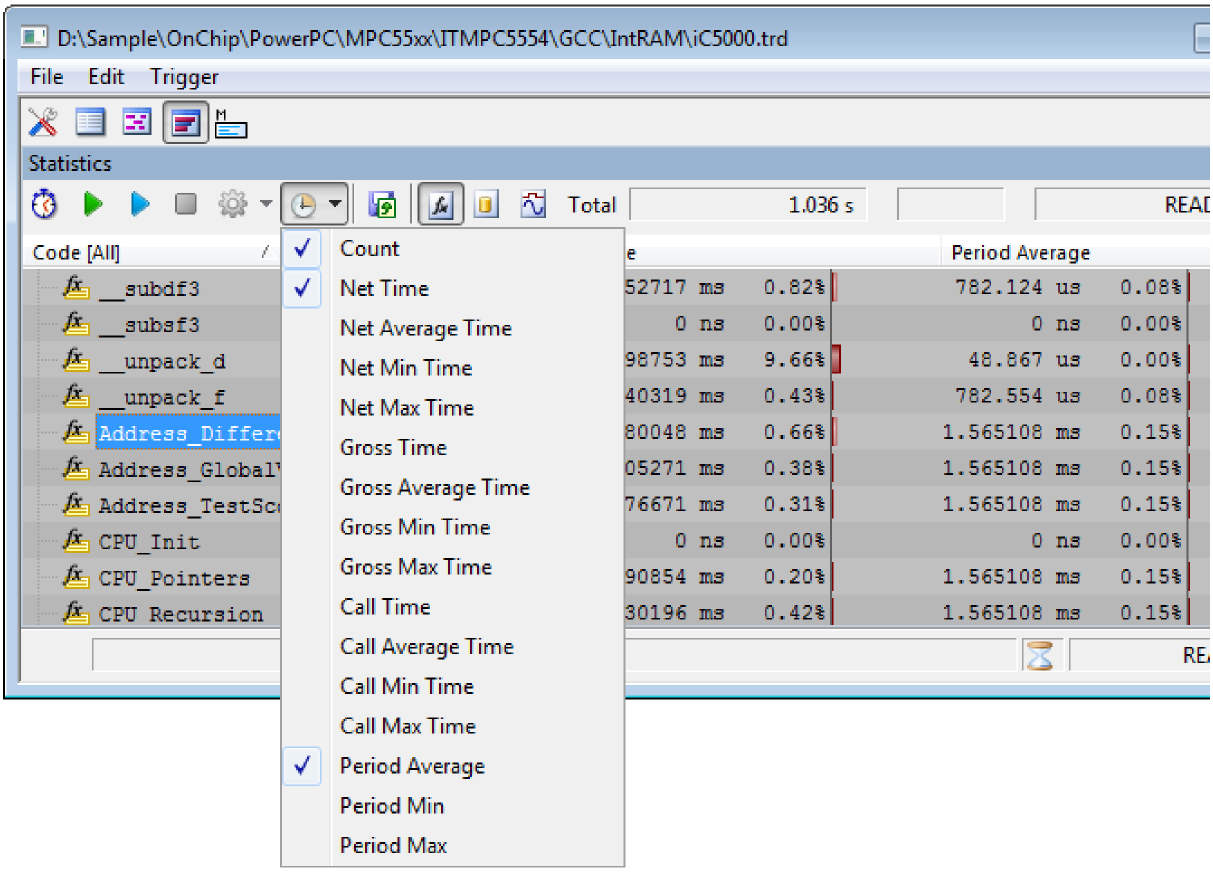
VLE Areas: ● Custom, ○ All, ○ None

□ Ignore download file VLE memory information

winIDEA

Customizable columns in Analyzer Profiler Statistics View

Any statistical aspect of the profiler session can be displayed as a column in the statistics view. Column selection is available via button or by right-clicking the header line (below the toolbar).



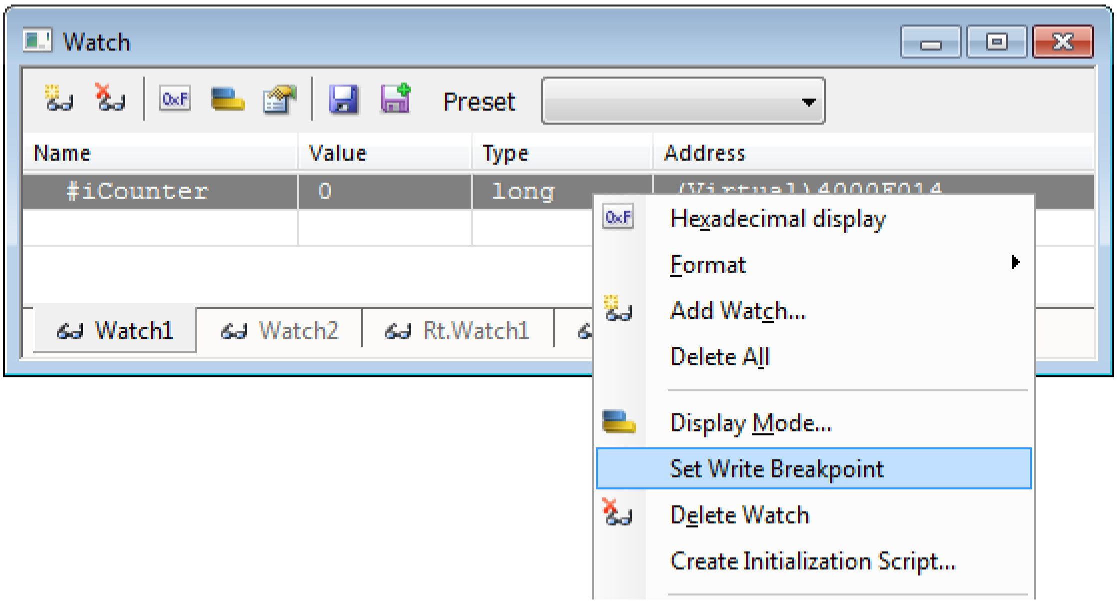
Code [All]	e		Period Average	
__subdf3	52717 ms	0.82%	782.124 us	0.08%
__subsf3	0 ns	0.00%	0 ns	0.00%
__unpack_d	98753 ms	9.66%	48.867 us	0.00%
__unpack_f	40319 ms	0.43%	782.554 us	0.08%
Address_Differe	80048 ms	0.66%	1.565108 ms	0.15%
Address_Global	05271 ms	0.38%	1.565108 ms	0.15%
Address_TestSc	76671 ms	0.31%	1.565108 ms	0.15%
CPU_Init	0 ns	0.00%	0 ns	0.00%
CPU_Pointers	90854 ms	0.20%	1.565108 ms	0.15%
CPU_Recursion	30196 ms	0.42%	1.565108 ms	0.15%

To sort the contents by a specific statistic criteria, click the respective column header.

Write access breakpoints can be set directly from watch window

Variables configured in the ***Watch*** window can be used to directly set a hardware Write access breakpoint.

When a single variable whose address is linear in memory space (i.e. not in a register, or using a register offset), the context menu ***Set Write Breakpoint*** command configures the hardware access breakpoint logic (if available on the current platform).



Name	Value	Type	Address
#iCounter	0	long	(Virtual)4000F014

To modify or clear the breakpoint, use ***Debug/Hardware Breakpoint*** command.

9.11.43 (25.7.2011)

CPU Support

ARM

Floating point instructions support

Cortex VFPv2 and VFPv3 instruction set extension is supported.

PowerPC

MPC560xE support

Full debug and trace feature set.

9.11.44 (27.7.2011)

CPU Support

PowerPC

MPC5xxx / PX Industrial Line support

Industrial line of e200 core based CPUs is using this naming convention:

Prefix	Domain
PXD	Display
PXN	Networking (Ethernet)
PXS	Safety
PXR	Real-time Performance

This table links industrial, automotive and code names. Apart from different marketing names, the devices are identical.

Industrial	Automotive	Code Name
PXR40xx	MPC5674F	Mamba
PXS20xx	MPC5643L	Leopard
PXS30xx	MPC5675K	Komodo
PXD10xx	MPC5606S	Spectrum
PXD20xx	MPC5645S	Rainbow
PXN2xxx	MPC5668G	Fado

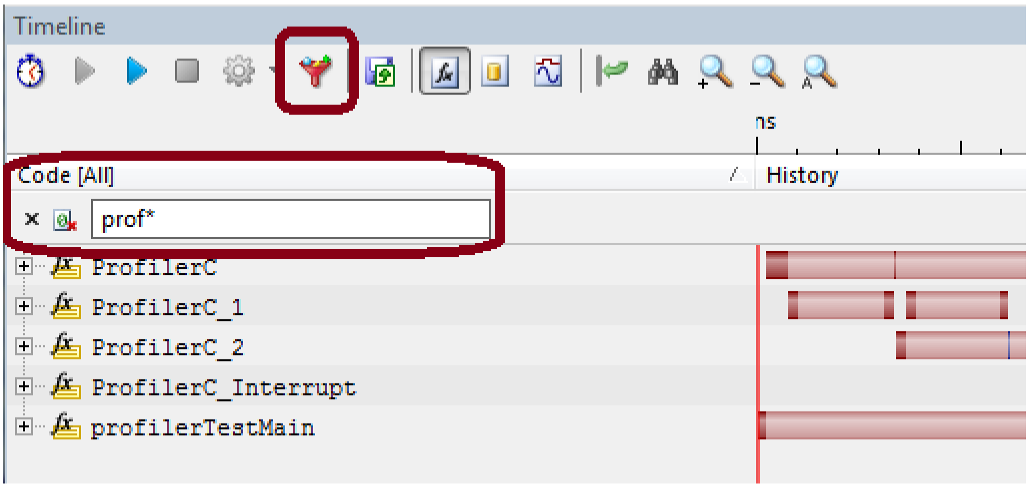
9.11.46 (11.8.2011)

winIDEA

Analyzer

Profiler Filter

Code items displayed in the timeline and statistics view can be filtered using wildcard expressions in the ***Filter*** bar.



To open the filter bar, click the icon in the toolbar, or ***Filter*** command from the context menu.

Filter expression uses case insensitive wildcard format.

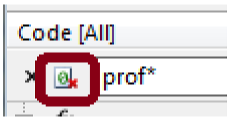
Several expressions can be specified by delimiting them with space characters; e.g. to display only functions starting with OS or CAN, specify the filter: **OS* CAN***

Filtering is applied until the filter bar is open. When closed, all areas are displayed again.

Note: filter expressions are synchronized between profiler timeline and statistic views.

Hide items with no activity

Press the Filter bar's button:



Profiler / Trace Synchronization

Trace view can be synchronized to the position of the caret in the Profiler timeline view.

To synchronize manually, hold down the Shift key when placing the caret pointer.

To synchronize automatically on every caret move, press the toolbar button.

Profiler Line Profiling

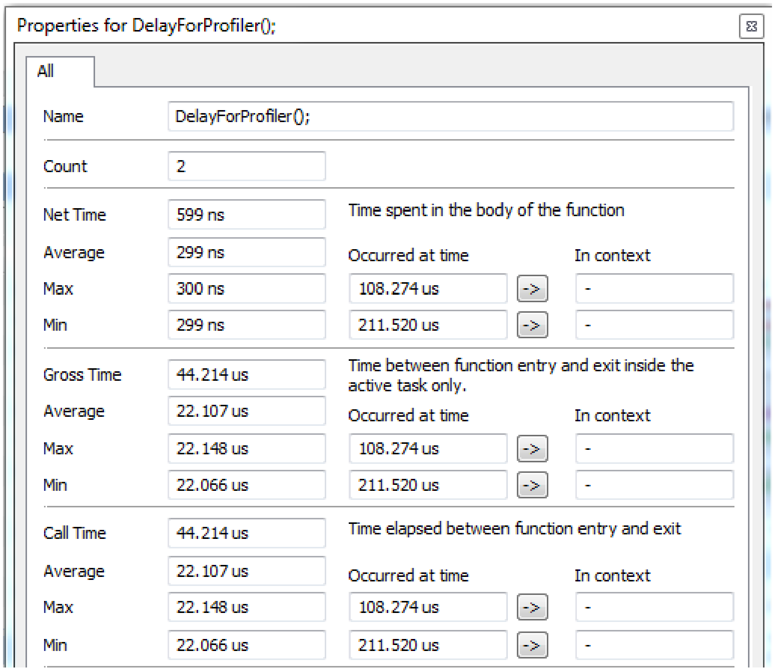
Line profiling is available in Entry/Exit and Range mode.

Statistic criteria:

- Count
- Net time
- Gross time
- Call time

Timeline:

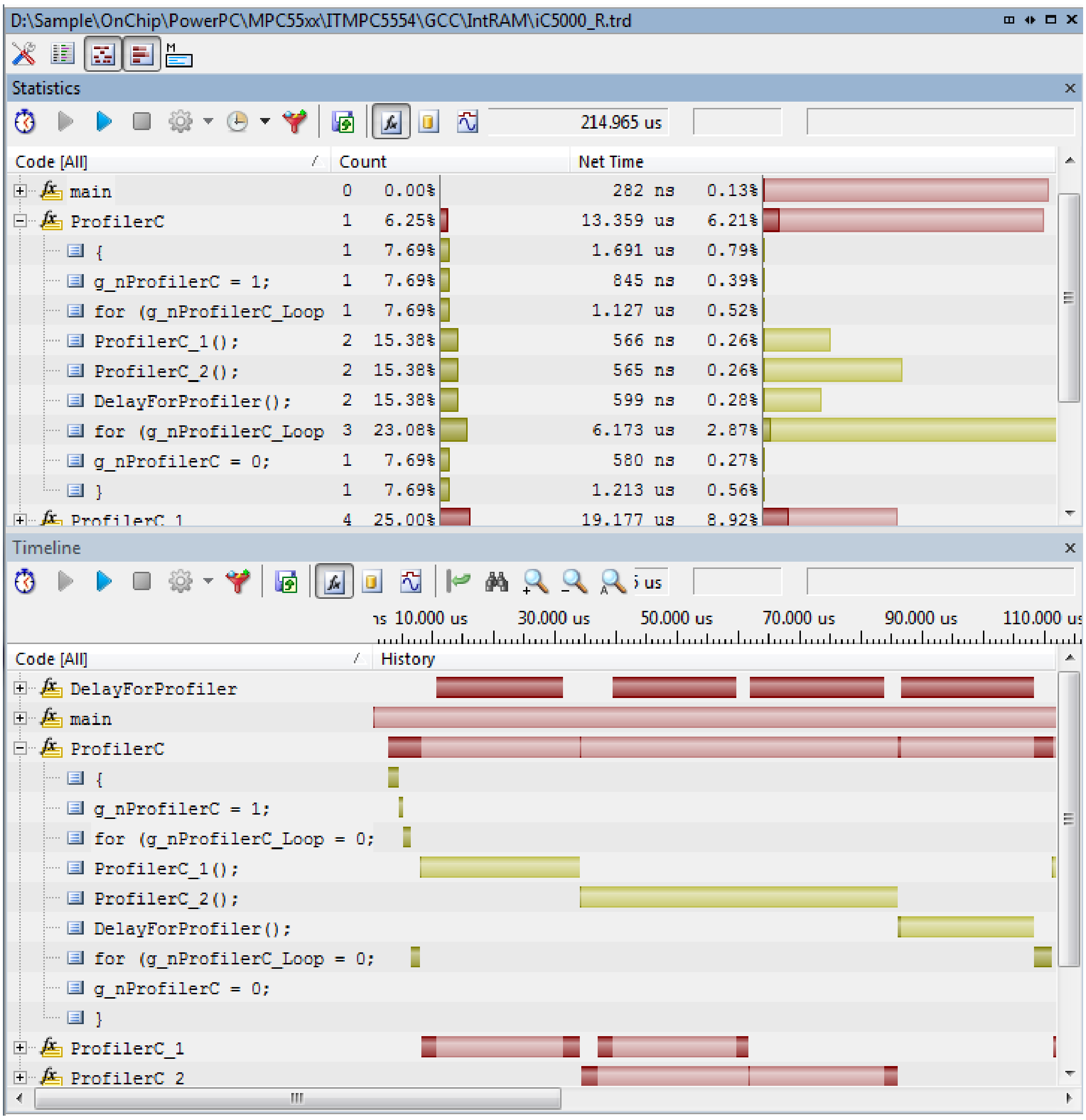
Net and gross activity is shown in Range mode only.



Properties for DelayForProfiler();

All

Name	DelayForProfiler();				
Count	2				
Net Time	599 ns	Time spent in the body of the function			
Average	299 ns	Occurred at time		In context	
Max	300 ns	108.274 us	->	-	
Min	299 ns	211.520 us	->	-	
Gross Time	44.214 us	Time between function entry and exit inside the active task only.			
Average	22.107 us	Occurred at time		In context	
Max	22.148 us	108.274 us	->	-	
Min	22.066 us	211.520 us	->	-	
Call Time	44.214 us	Time elapsed between function entry and exit			
Average	22.107 us	Occurred at time		In context	
Max	22.148 us	108.274 us	->	-	
Min	22.066 us	211.520 us	->	-	



D:\Sample\OnChip\PowerPC\MPC55xx\ITMPC5554\GCC\IntRAM\iC5000_R.trd

Statistics

214.965 us

Code [All]	Count		Net Time	
main	0	0.00%	282 ns	0.13%
ProfilerC	1	6.25%	13.359 us	6.21%
{	1	7.69%	1.691 us	0.79%
g_nProfilerC = 1;	1	7.69%	845 ns	0.39%
for (g_nProfilerC_Loop	1	7.69%	1.127 us	0.52%
ProfilerC_1();	2	15.38%	566 ns	0.26%
ProfilerC_2();	2	15.38%	565 ns	0.26%
DelayForProfiler();	2	15.38%	599 ns	0.28%
for (g_nProfilerC_Loop	3	23.08%	6.173 us	2.87%
g_nProfilerC = 0;	1	7.69%	580 ns	0.27%
}	1	7.69%	1.213 us	0.56%
ProfilerC_1	4	25.00%	19.177 us	8.92%

Timeline

Code [All]

- DelayForProfiler
- main
- ProfilerC
  - {
  - g_nProfilerC = 1;
  - for (g_nProfilerC_Loop = 0;
  - ProfilerC_1();
  - ProfilerC_2();
  - DelayForProfiler();
  - for (g_nProfilerC_Loop = 0;
  - g_nProfilerC = 0;
  - }
- ProfilerC_1
- ProfilerC_2

9.11.47 (18.8.2011)

CPU Support

V850

V850 Fx4 FLASH Programming

Before FLASH programming operation is attempted, winIDEA presets OPTION byte to disable watchdog during programming. After the operation, the OPTION byte is restored.

V850 Fx4 64k FLASH Support

New parts with larger FLASH are now supported, using new Renesas FLASH library.

PowerPC

SPACE2 CPU support

Preliminary device support. Verification pending silicon.

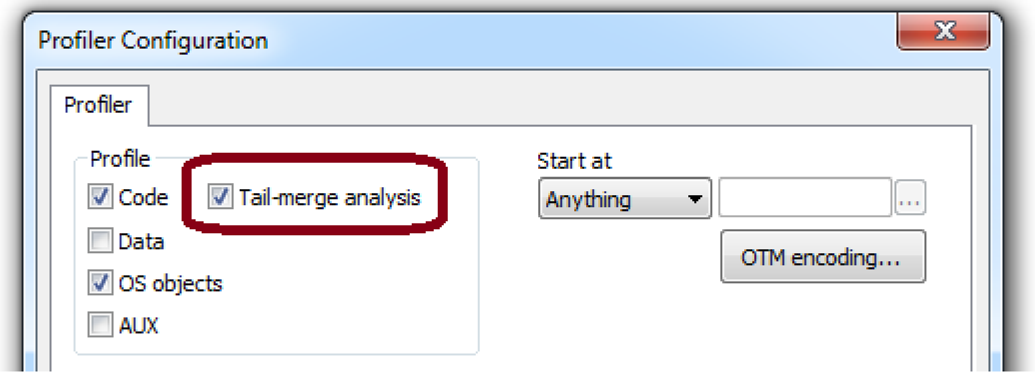
winIDEA

Analyzer

Profiler Tail Merge Analysis

Compiler’s tail merge optimization effectively moves part of function (A) code body into another function (B). In range mode, execution in function B would be attributed to function B, instead of the optimized function A.

If this option is enabled, profiler performs analysis of tail-merge optimization on the fly. This analysis requires a higher level of debug information quality and it relies on object code analysis. If the analysis algorithm fails, profiler session aborts. In such case the tail-merge analysis can be disabled to revert to regular range mode.



Profiler Configuration

Profiler

Profile

☑ Code ☑ Tail-merge analysis

□ Data

☑ OS objects

□ AUX

Start at: Anything

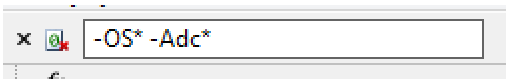
Location: ***Analyzer/ /Profiler/Tail-merge analysis***

Default: **OFF**

Profiler Filter

Negative wildcards are supported by using the - prefix.

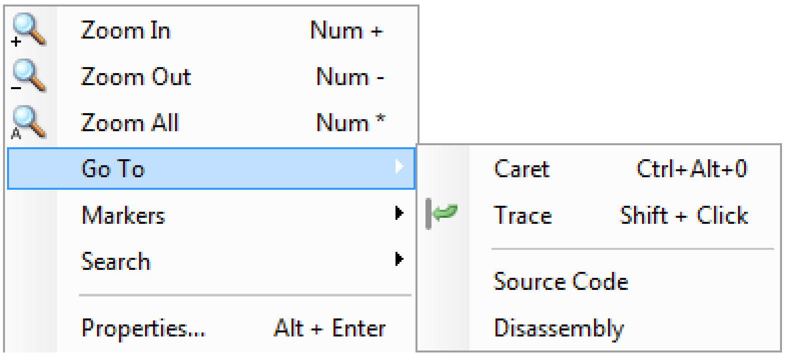
In this example all functions are shown except functions starting with *OS* or *Adc*.



-OS* -Adc*

Profiler Goto Disassembly

Tracking disassembly from timeline and statistics views is available via ***Context menu/GoTo/Disassembly.***



Help

Release notes link is now provided from ***Help/Release notes…*** menu.

The link points to the online version of the release notes PDF file.

9.11.48 (26.8.2011)

CPU Support

XC2000

XC22xxM (MR+) devices support

Full feature set.

PowerPC

PowerPC PPC405D5 support

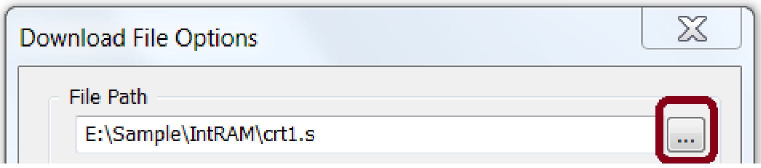
Full debug feature set. PowerPC PPC405D5 is a soft-core found in Xilinx FPGAs

winIDEA

Debug

Download File Configuration

Download file path can be modified, while all other file options remain unchanged.



File Path: E:\Sample\IntRAM\crt1.s

Note: path for the ***Project Output File*** cannot be changed.

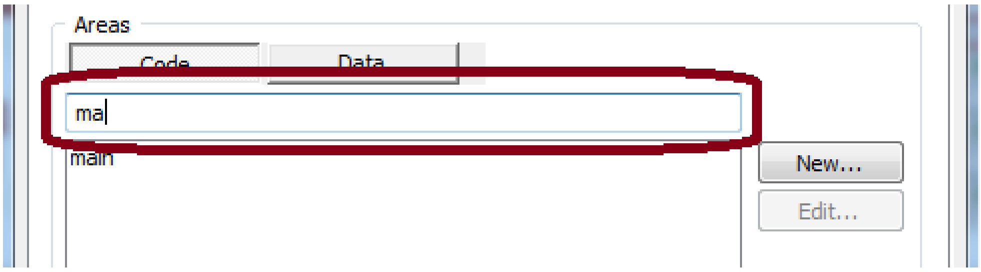
9.11.49 (30.8.2011)

winIDEA

Analyzer

Profiler function configuration filter

To find a specific function easier, the function configuration list now provides a filter field, with same functionality as symbol browser.



Profiler function lines timeline in Entry/Exit mode

Line execution timeline is available in Entry/Exit mode too.

9.11.50 (7.9.2011)

CPU Support

STM8

STM8L15xR6, STM8L15xR8, STM8L15xM8, STM8L15xC8 devices support

Full feature set.

winIDEA

Analyzer

Marker auto-sync from Trace view

If Auto-sync is enabled, Profiler Timeline view synchronizes markers if they are moved in the Trace view.

Debug

Group Breakpoint Setting

Setting breakpoints at emulation start and ***Enable All/Disable All/Remove All***, is performed in a single operation. For software breakpoints set in FLASH this yields only a single FLASH erase/program operation and a considerable improvement in speed.

Eclipse

Eclipse Debug plug-in verified with Eclipse 3.7.0 (Indigo).

Existing plug-in works fine without changes, installation document is updated.

iSystem Reg-Ex parser plug-in is no longer needed, because similar functionality is built-in.

9.11.51 (14.9.2011)

CPU Support

CR16C

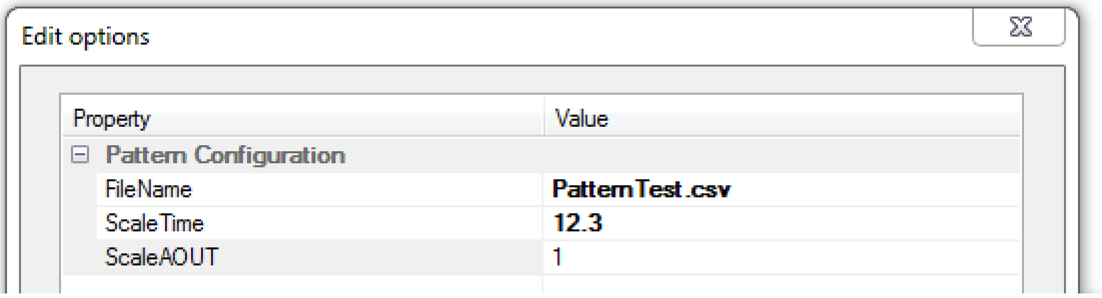
SC14444A SC14445A devices support

Full feature set.

I/O Module

I/O module Pattern program can be scaled in time and voltage at load time.

This allows definition of a generic waveform (e.g. sine wave) which can be scaled to custom frequency and amplitude.



Property	Value
⊟ Pattern Configuration	
FileName	PatternTest.csv
ScaleTime	12.3
ScaleAOUT	1

9.11.52 (15.9.2011)

CPU Support

CR16C

QSPI monitor new device support

Winbond W25Q64BV is supported.

9.11.53 (21.9.2011)

CPU Support

ARM

Energy Micro EFM32 support

Full feature set.

winIDEA

SDKs

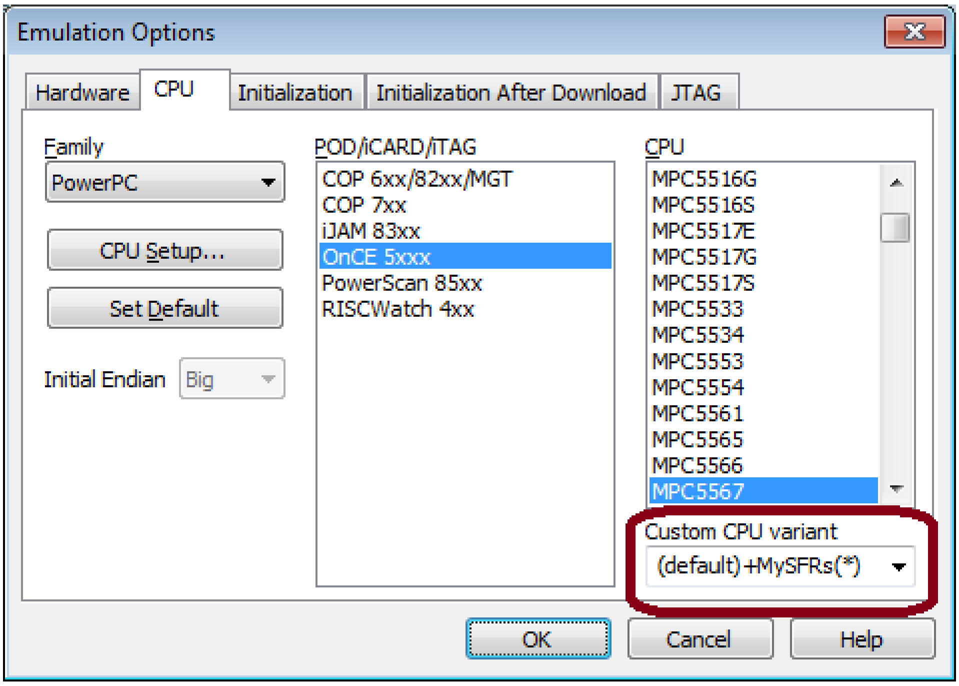
The SDK file locations have been moved to be in the same folder, as when the SDK is installed standalone.

The ***Help/SDKs/*** menu opens the documentation files from the new location.

SFRs

Multiple special function registers can be defined for a CPU

In the CPU specification, names of multiple CPUs or modules can be combined with the + sign.



Emulation Options

Family: PowerPC

POD/iCARD/iTAG: OnCE 5xxx

CPU: MPC5567

Custom CPU variant: (default)+MySFRs(*)

Initial Endian: Big

This allows adding a few SFRs for a CPU. In the above example the default registers for MPC5567 are used with addition of SFRs specified in external definition ***MySFRs***.

Structure for external SFR definitions provided in the setup

The folder structure, top-level definition file and CPU family specific description files are provided in winIDEA setup. The folder structure is placed in ***SFR*** subfolder of winIDEA installation.

Custom SFRs (.SFR file and .SFG files) can be placed in this structure and will be available on next winIDEA start.

For more information see ***External SFR.pdf***.

isystem.connect

ISYSTEM_APPDATA environment variable can be set to specify root folder of winIDEA permanent files.

This is necessary on some Windows platforms when *isystem.connect* operation is performed under a service account.

If the system environment doesn't provide the **APPDATA** environment variable, ISYSTEM_APPDATA should be defined, pointing to a directory which is accessible from the service account.

9.11.54 (23.9.2011)

CPU Support

V850

V850Fx3 Range mode profiler

Range mode is supported.

I/O Module

Power Measurement

I/O module now supports power measurement.

The optional ***Power Probe*** can be used between the power source and target.

For more information refer to ***IOModule.pdf***

This allows definition of a generic waveform (e.g. sine wave) which can be scaled to custom frequency and amplitude.

winIDEA

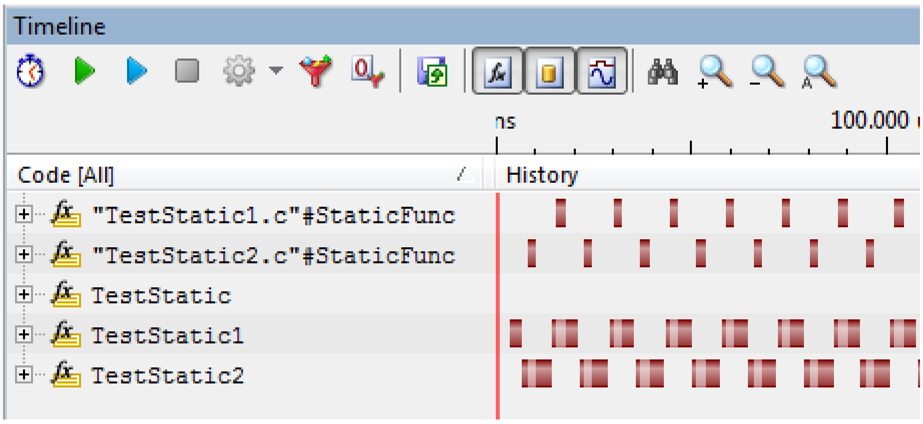
Analyzer

Functions with identical names can be profiled. If multiple functions with the same name are detected, the fully qualified name is used:

- File static functions: **“<file name>”#<function name>**
- Class methods: **<class name>::<method name>**

Example:

Record functions: ***Static***



"TestStatic1.c"#StaticFunc
"TestStatic2.c"#StaticFunc
TestStatic
TestStatic1
TestStatic2

9.11.55 (26.9.2011)

CPU Support

ARM

STM32 GPIO initialization for trace operation

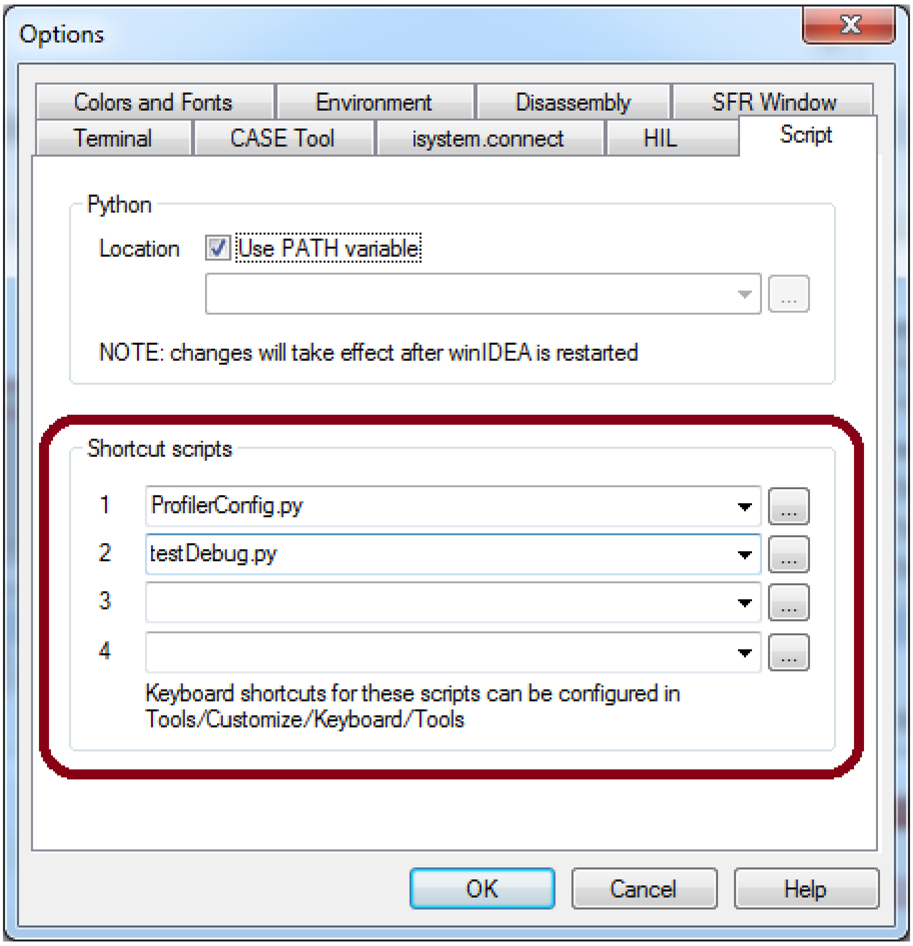
New STM32 devices require additional initialization of GPIO if Trace operation is required.

winIDEA

Script

Keyboard shortcuts can be configured for external scripts.

The shortcut scripts are configured in the ***Options/Script*** dialog.



Python

Location ☑ Use PATH variable

NOTE: changes will take effect after winIDEA is restarted

Shortcut scripts

1 ProfilerConfig.py

2 testDebug.py

3

4

Keyboard shortcuts for these scripts can be configured in Tools/Customize/Keyboard/Tools

To define keyboard shortcuts, open ***Tools/Customize/Keyboard*** dialog and set ***Script shortcut*** in the ***Tools*** category.

Note: this setting is specific to winIDEA workspace.

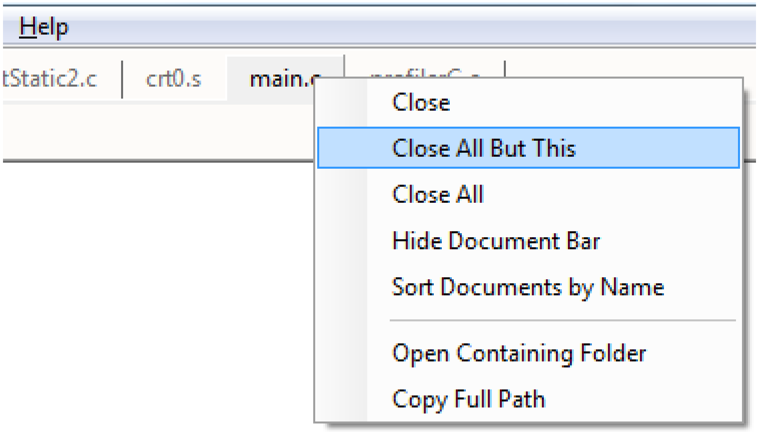
9.11.57 (28.9.2011)

winIDEA

Document handling

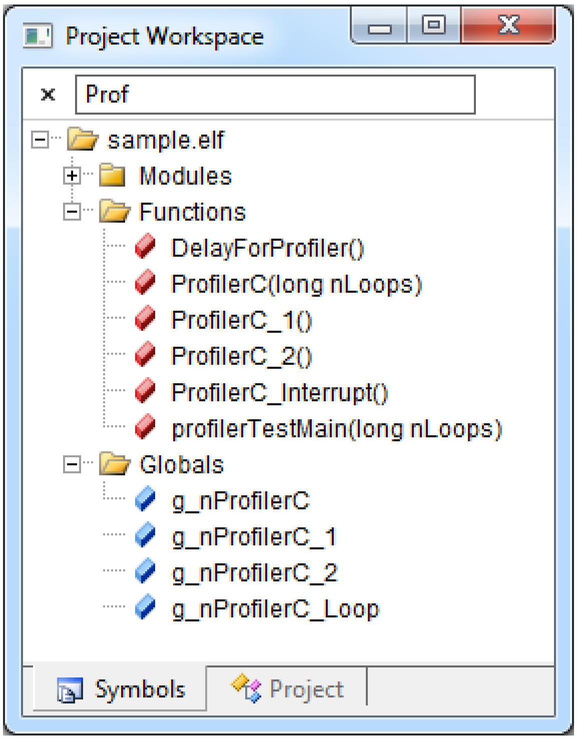
Document selector provides these commands (available from context menu)

- Open Containing folder
- Close All
- Close All But This
- Copy Full Path



Symbol navigation

Workspace/Symbols window now provides filtering for quick location of a symbol. Filter format is same as in symbol browser.



9.11.60 (7.10.2011)

CPU Support

ARM

STM32F series FLASH support

STM32F2xxxB/C/E/F/G devices FLASH programming is supported.

isystem.connect

CExecutionController::call interface

The ***call*** method of the ***CExecutionController*** class allows calling target functions via ***isystem.connect***. The call mechanism makes use of isystem.test technology. It requires that the application is loaded and the stack has been initialized.

Note: this functionality is available only on platforms where ***isystem.test*** is implemented.

These functions are provided:

```
string call(const string &functionName);
string call(const string &functionName, const string &param1);
string call(const string &functionName, const string &param1, const string &param2);
string call(const string &functionName, const string &param1, const string &param2,
const string &param3);
string call(const string &functionName, const StrVector &params);
```

Example

```
import isystem.connect as ic

from isystem.connect import IConnectDebug


cmgr = ic.ConnectionMgr()

cmgr.connectMRU('')

execCtrl = ic.CExecutionController(cmgr)

print execCtrl.call('Factorial', '7')
```

Note: the target application must be stopped at the time of the call.

Source line symbol size information

IConnectDebug::GetSourceAddress function can return size of source line along with its address.

SDK implements this functionality in

- ***CAddressController::getAddressOfSourceLine***
- ***CDebugFacade::getAddressOfSourceLine***

For more information refer to obnline SDK documentation.

9.11.62 (17.10.2011)

CPU Support

PowerPC

PPC44x Trace support on iC5000

RISCWatch trace protocol is supported.

MPC5xxx e200z4/z7 MMU support

TLB layout differences (TSIZE) to older e200 CPUs are supported.

winIDEA

Symbols

Type names of struct, union and enum types are accessible with the type prefix.

Example

```
struct S
{
  char c;
}
```

This type is accessible with ***struct S*** too.

Analyzer

Profiler Export Format Text1

New configurable text export format ***Text1*** is implemented.

For further information refer to ***Analyzer.pdf***

Profiler Stack Killer functionality

Profiler supports OS killing a complete task, without all functions on stack exiting properly.

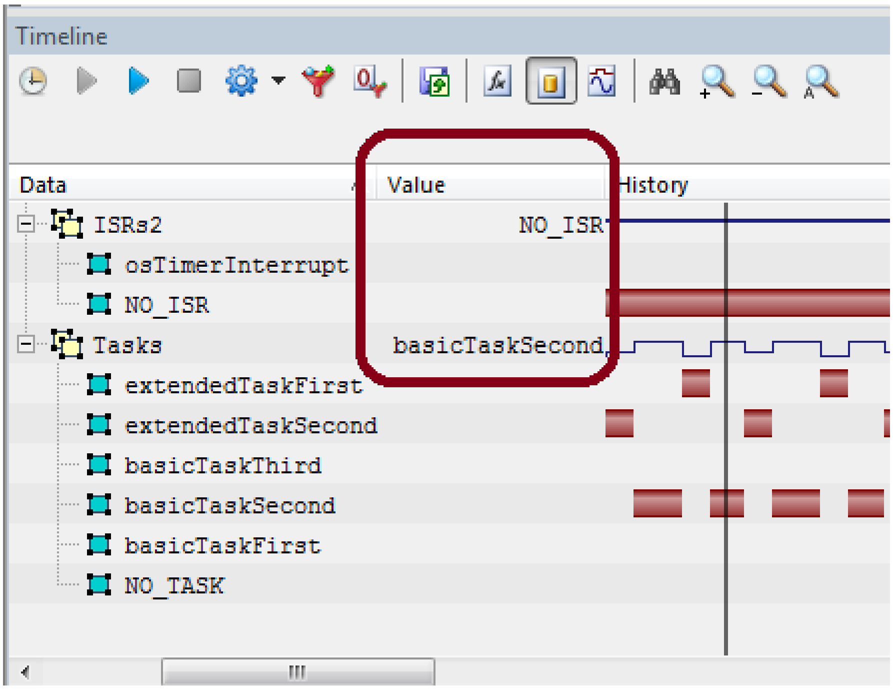
Configuration is available via ***Profiler Configuration/Advanced*** dialog.

Functions configured as stack killers must be determined empirically, or by OS vendor specification.

For further information refer to ***Analyzer.pdf*** and ***ProfilerConcepts.pdf***

Profiler Timeline state variable display

Symbolic values for state variables are shown in timeline view. The value is shown for the *caret* pointer time.



isystem.connect

Global symbol retrieval

`CDataController:getSymbols()`

can be used to get all functions and global variables. The returned list is a string vector.

Example

```
import isystem.connect as ic
cmgr = ic.ConnectionMgr()
cmgr.connectMRU('')
data = ic.CDataController(cmgr)
# allocate string vector to receive function list
functions = ic.StrVector()
# For other types of global symbols use other flags as the first parameter.
data.getSymbols(ic.CDataController.estFunctions, functions)
# Iterate the returned vector and print every function name.
for funcName in functions:
    print funcName
```

9.11.63 (25.10.2011)

CPU Support

PowerPC

MPC5xxx TLB write access

TLB entries can be written via ***MemoryWrite*** functions (e.g. ***isystem.connect***).

To access a specific part of a specific TLB entry, the **access address** encodes the TLB index in bits 16-31 and the MAS register number in bits 0-15.

Example

To access MAS3 of TLB 4, use address 0x00040003

isystem.connect

MPC 5xxx controller

MMU TLB manipulation functions are provided via ***CMPC5xxxController*** class.

Example:

```
import isystem.connect as ic
cmgr = ic.ConnectionMgr()
cmgr.connectMRU('')
# get MPC5xxx controller
MPCCtrl = ic.CMPC5xxxController(cmgr)
# get TLB 3
TLB = MPCCtrl.getTLB(3)
# change RPN to 0x40800000 physical
TLB.m_dwMAS3 = 0x40800000 | (TLB.m_dwMAS3 & 0xFFF)
# set TLB 3
MPCCtrl.setTLB(3, TLB)
```

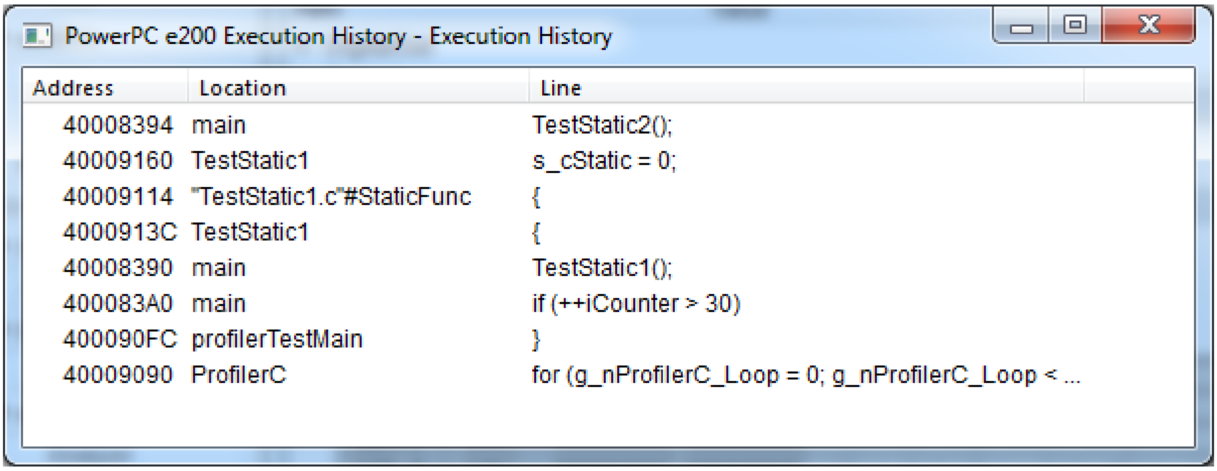
9.11.64 (4.11.2011)

CPU Support

PowerPC

MPC5xxx Instruction Address FIFO Buffer (PC FIFO) display

Last eight change-of-flow PC locations are displayed in ***Plugin/e200 Execution History*** window.



Address	Location	Line
40008394	main	TestStatic2();
40009160	TestStatic1	s_cStatic = 0;
40009114	"TestStatic1.c"#StaticFunc	{
4000913C	TestStatic1	{
40008390	main	TestStatic1();
400083A0	main	if (++iCounter > 30)
400090FC	profilerTestMain	}
40009090	ProfilerC	for (g_nProfilerC_Loop = 0; g_nProfilerC_Loop < ...

Double-click actions:

- on the address – shows disassembly
- on Location or Source – shows source code

winIDEA

Technical Notes

The ***Help/Technical Notes*** menu provides links to technical notes documents installed in the winIDEA folder.

9.11.66 (11.11.2011)

CPU Support

PowerPC

Leopard 2M support

Full feature set on iC5000 and iTraceGT.

Leopard Active GT Double data rate Nexus support

On the active POD, double data rate Nexus streaming can be used to attain maximum bandwidth.

9.11.67 (16.11.2011)

CPU Support

PowerPC

Leopard Active GT Nexus configuration

Only applicable options are shown in the Nexus configuration dialog.

V850

V850 Fx4 trace recording

Maximum session duration extended using compression. Up to 1 minute session recording is possible.

I/O Module

Values for power measurement probe preset JB1/JB2 positions are available as drop-down shortcuts in ***Hardware/Options/IO Module*** dialog.

If current measurement is used, Multiply factor is forced to 1.

winIDEA

Analyzer

Profiler Export Filter

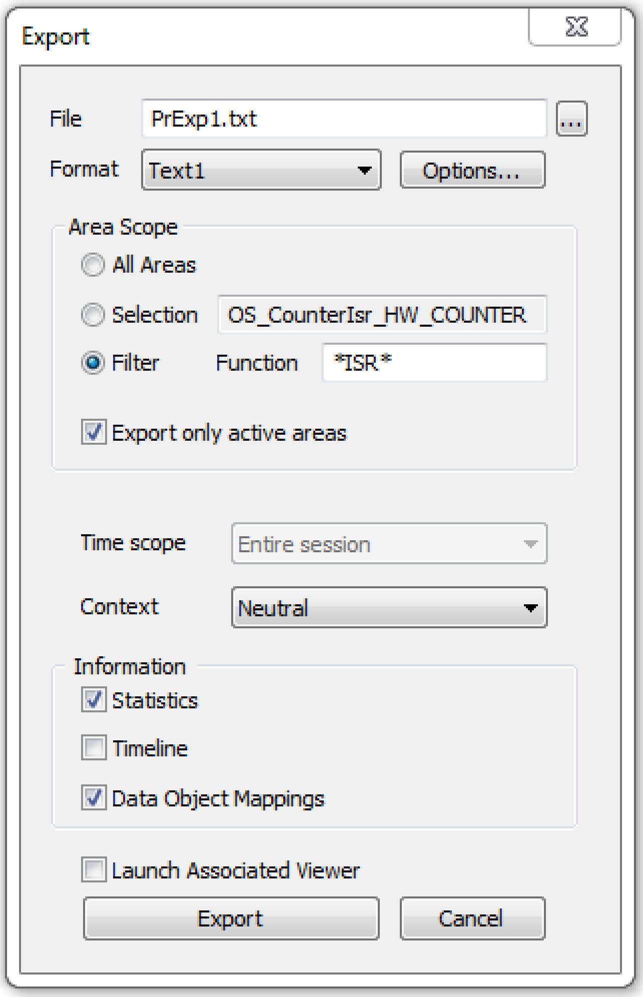
Profiler export can be limited to items matching the specified filter.

Filter

Same wildcard format as the Analyzer window filter.

Export only active areas

Only areas with recorded activity will be exported.



Export

File: PrExp1.txt

Format: Text1

Area Scope

○ All Areas

○ Selection: OS_CounterIsr_HW_COUNTER

● Filter — Function: *ISR*

☑ Export only active areas

Time scope: Entire session

Context: Neutral

Information

☑ Statistics

□ Timeline

☑ Data Object Mappings

□ Launch Associated Viewer

9.11.68 (18.11.2011)

CPU Support

PowerPC

Leopard unlock with password

Standard MPC5xxx password unlock supported.

ARM

TMS570 trace support on iC5000

ETM trace on iC5000 is supported.

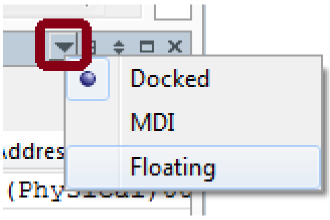
winIDEA

IDE

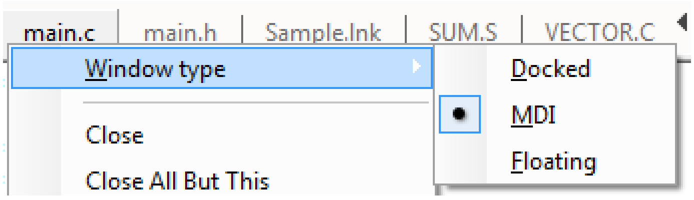
Unified window type switching

Switching between MDI, floating and dockable window type is unified.

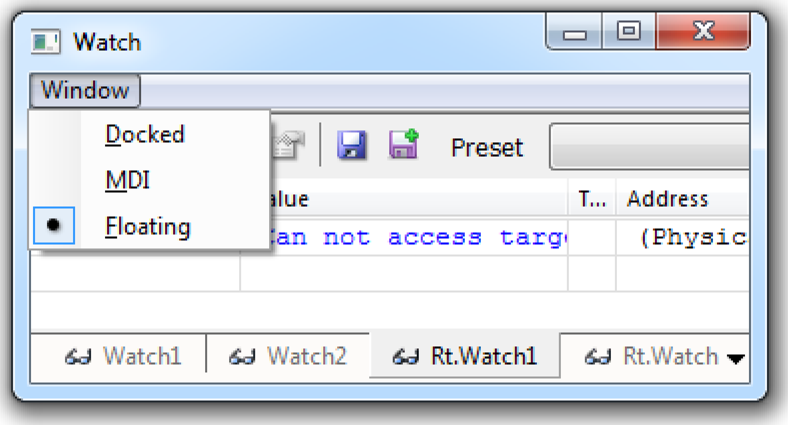
- **Docked state**: right click on window title bar or the document tab, and open the ***Window type*** menu



- **MDI state**: right click on window title bar or the document tab, and open the ***Window type*** menu



- **Floating state**: open the ***Window*** menu



9.11.69 (28.11.2011)

CPU Support

ARM

STM32L15x support

Full feature set.

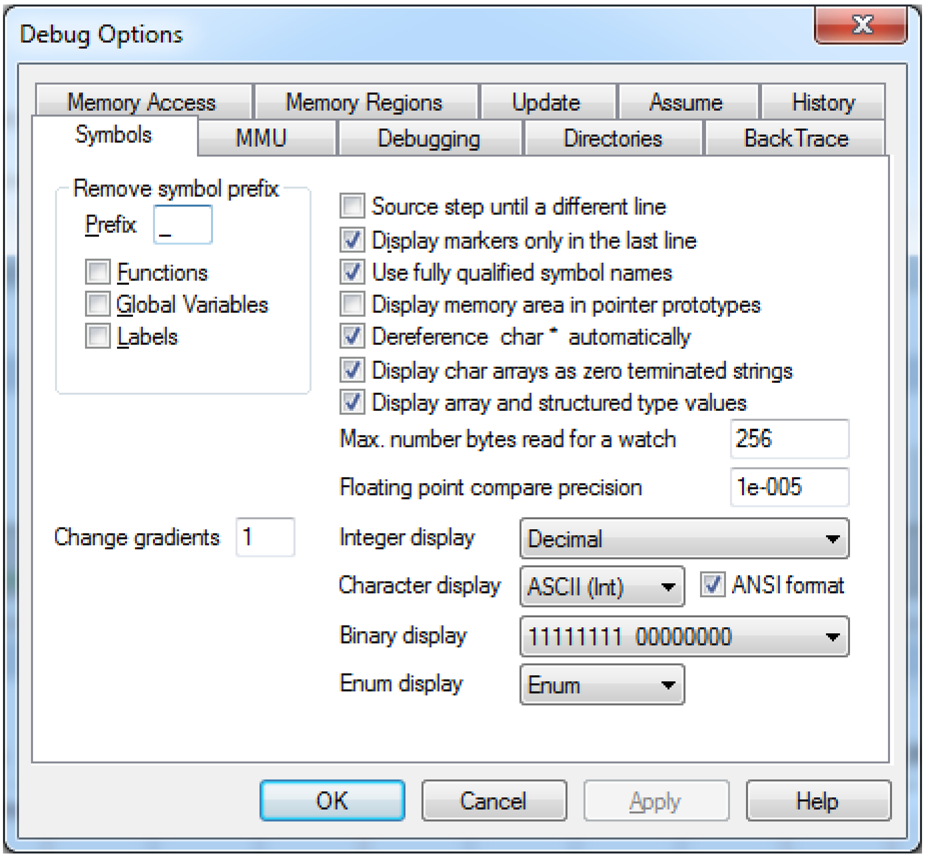
winIDEA

Floating point compare precision

When comparing floating point numbers using vague precision, the precision can be specified.

Location: ***Debug/Debug Options/Symbols***

Default: **1E-5**



Remove symbol prefix

Prefix _

□ Functions

□ Global Variables

□ Labels

Change gradients 1

□ Source step until a different line

☑ Display markers only in the last line

☑ Use fully qualified symbol names

□ Display memory area in pointer prototypes

☑ Dereference char * automatically

☑ Display char arrays as zero terminated strings

☑ Display array and structured type values

Max. number bytes read for a watch 256

Floating point compare precision 1e-005

Integer display Decimal

Character display ASCII (Int) ☑ ANSI format

Binary display 11111111 00000000

Enum display Enum

9.11.71 (2.12.2011)

CPU Support

Sitel SCxxxx

SC14446A, SC14447A, SC14448A support

Standard SCxxxx CPU feature set is supported.

winIDEA

Analyzer

Profiler XML Export

Profiler XML export is available.

9.11.72 (8.12.2011)

CPU Support

Tricore

TC1724, TC1728

Full debug feature support.

ARM

VFP registers support

VFP register set can be accessed via SFR window, watch expressions and isystem.connect.

winIDEA

Debug

SFR window

Floating point SFRs are displayed in floating point format per default. Hexadecimal display can be selected via context menu.

FLASH operations

Explicitly issued FLASH operations (verify, blank check, erase,…) retain the progress report open after successful completion.

Analyzer

Profiler XML Export

Parent area information for data states and function lines is available in the export.

9.11.73 (13.12.2011)

CPU Support

ARM

STM32Lxxx automatic trace port initialization

On STM32L CPUs, the TPIU does not automatically configure GPIO ports for trace operation when activated. This initialization is now performed by winIDEA when trace is activated.

winIDEA

IDE

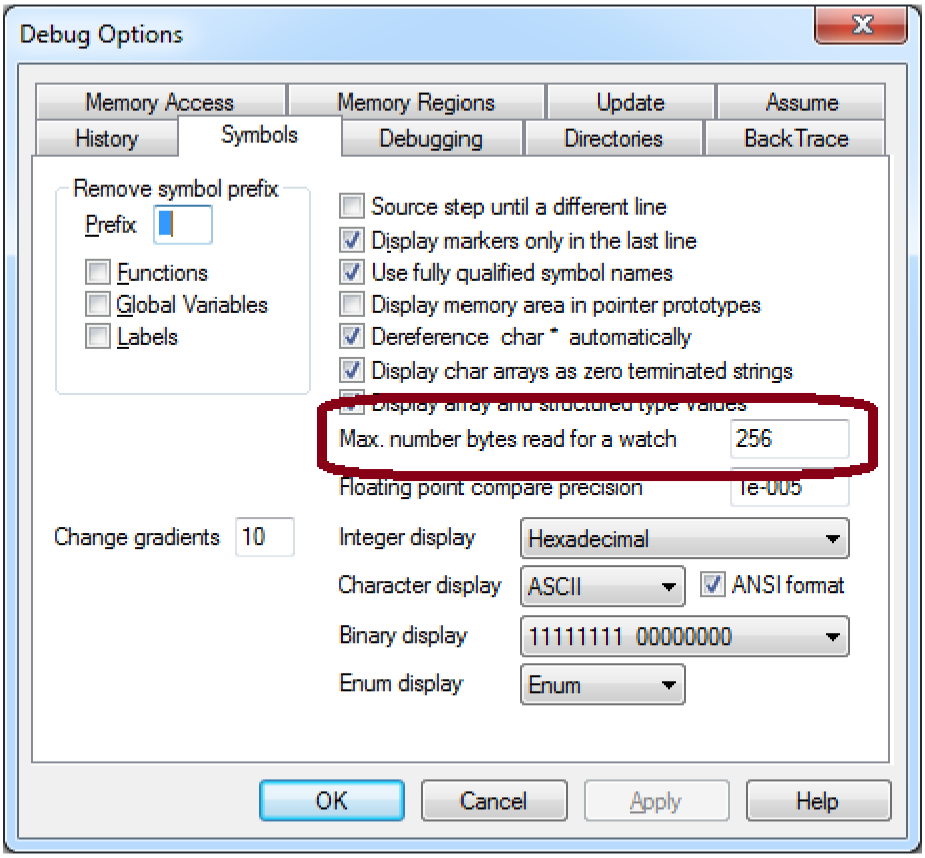
Release notes

Online ***Help/Release Notes*** now include full change-log for official release and development version.

Debug

Expression evaluation

Maximum evaluation upload extended to 64kB. Old limit was 256 Bytes. Default remains at 256.



Remove symbol prefix

Prefix

□ Functions

□ Global Variables

□ Labels

□ Source step until a different line

☑ Display markers only in the last line

☑ Use fully qualified symbol names

□ Display memory area in pointer prototypes

☑ Dereference char * automatically

☑ Display char arrays as zero terminated strings

☑ Display array and structured type values

Max. number bytes read for a watch 256

Floating point compare precision 1e-005

Change gradients 10

Integer display Hexadecimal

Character display ASCII ☑ ANSI format

Binary display 11111111 00000000

Enum display Enum

Watch window

Watch arrays can be expanded up to 4096 elements. Previous limit was set to 256 elements.

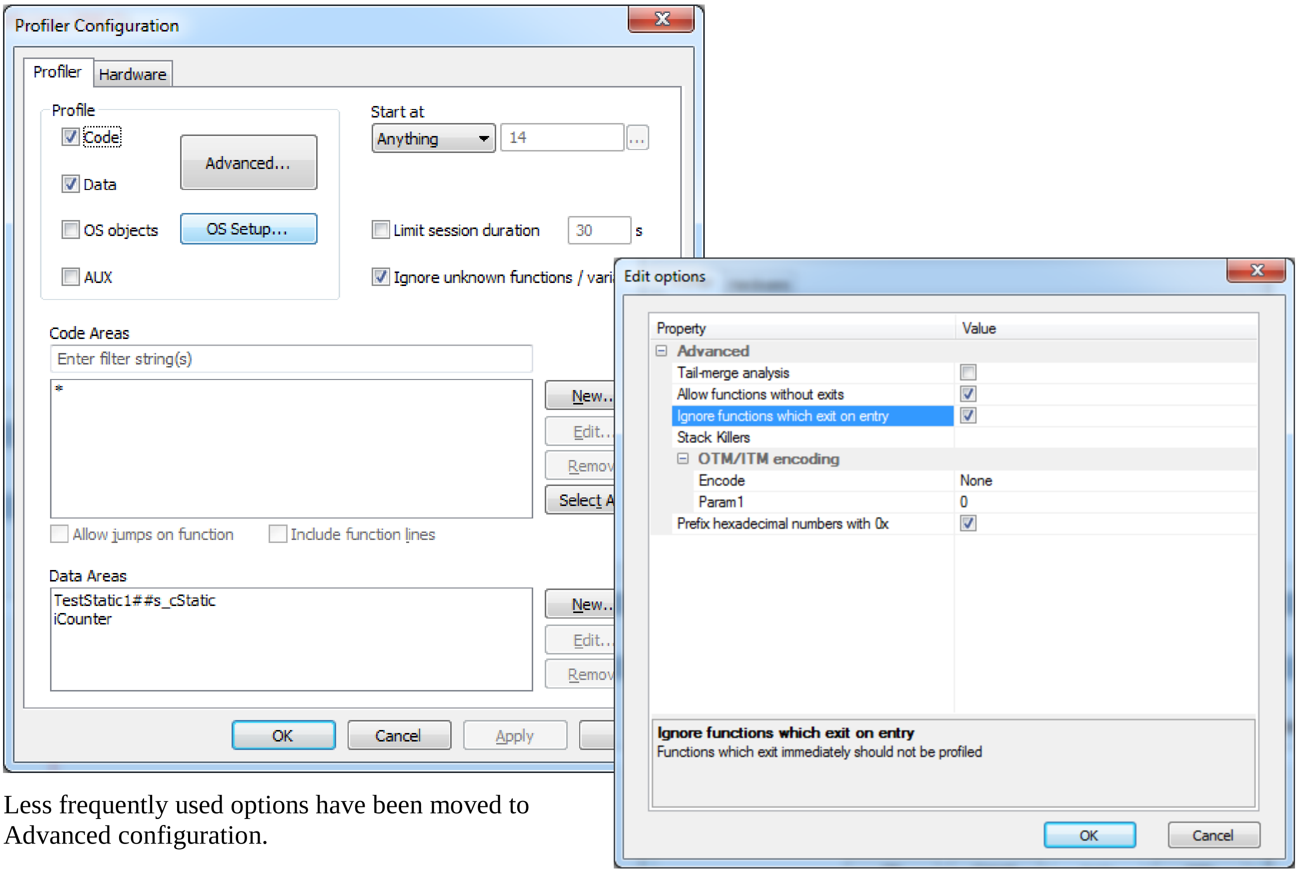
Download verify

The standard progress dialog is now used for verification. This allows copying the report to clipboard.

Analyzer

Profiler configuration cleaned-up

Code and data areas are displayed in parallel.



Profiler Configuration

Profiler | Hardware

Profile
☑ Code
☑ Data
□ OS objects
□ AUX

Start at: Anything, 14
□ Limit session duration 30 s
☑ Ignore unknown functions / vari

Code Areas
Enter filter string(s)
*
□ Allow jumps on function
□ Include function lines

Data Areas
TestStatic1##s_cStatic
iCounter

Edit options

Property	Value
⊟ Advanced	
Tail-merge analysis	□
Allow functions without exits	☑
Ignore functions which exit on entry	☑
Stack Killers	
⊟ OTM/ITM encoding	
Encode	None
Param1	0
Prefix hexadecimal numbers with 0x	☑

Ignore functions which exit on entry
Functions which exit immediately should not be profiled

Less frequently used options have been moved to Advanced configuration.

9.11.74 (19.12.2011)

CPU Support

Sitel SCxxxx

SC14446A, SC14447A, SC14448A support

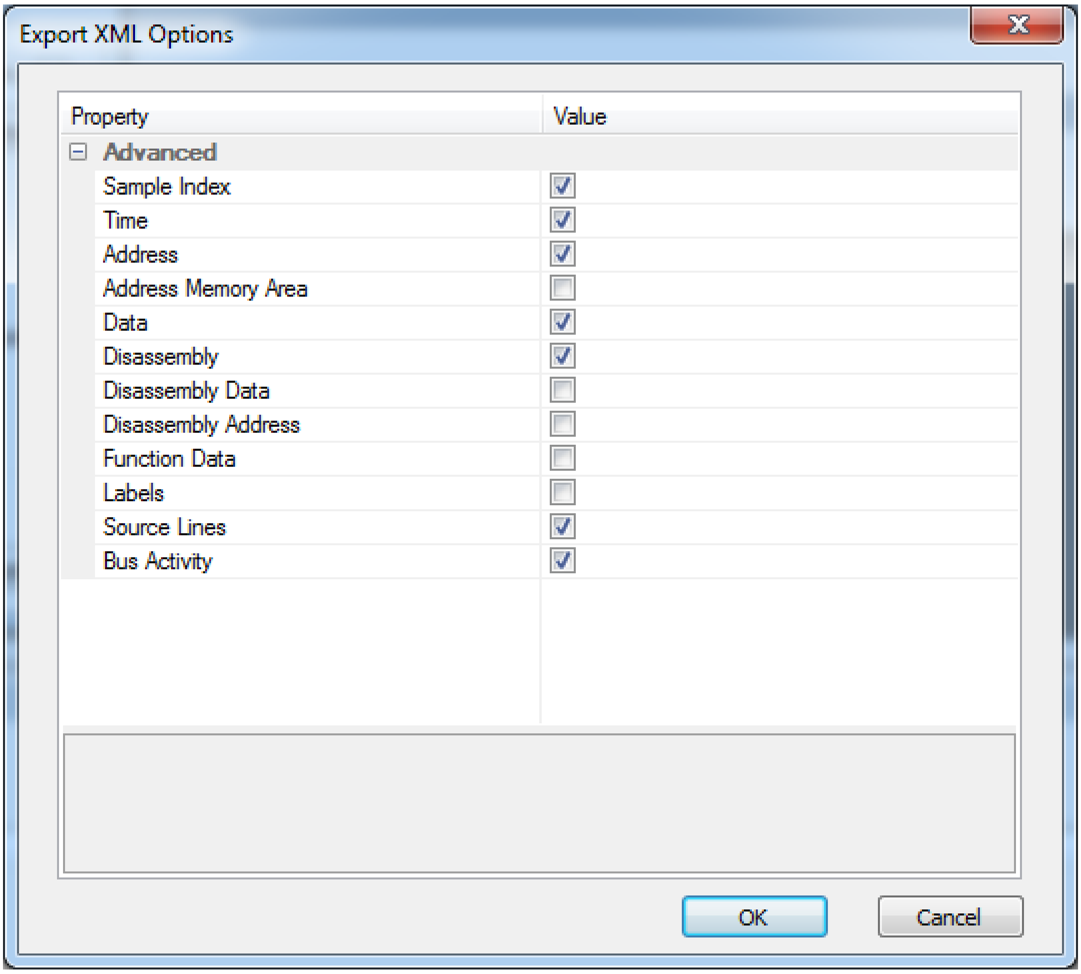
Special function register database is up to date.

winIDEA

Analyzer

Trace XML export

XML export is available. Exported information detail is configurable.



Property	Value
⊟ **Advanced**	
Sample Index	☑
Time	☑
Address	☑
Address Memory Area	☐
Data	☑
Disassembly	☑
Disassembly Data	☐
Disassembly Address	☐
Function Data	☐
Labels	☐
Source Lines	☑
Bus Activity	☑

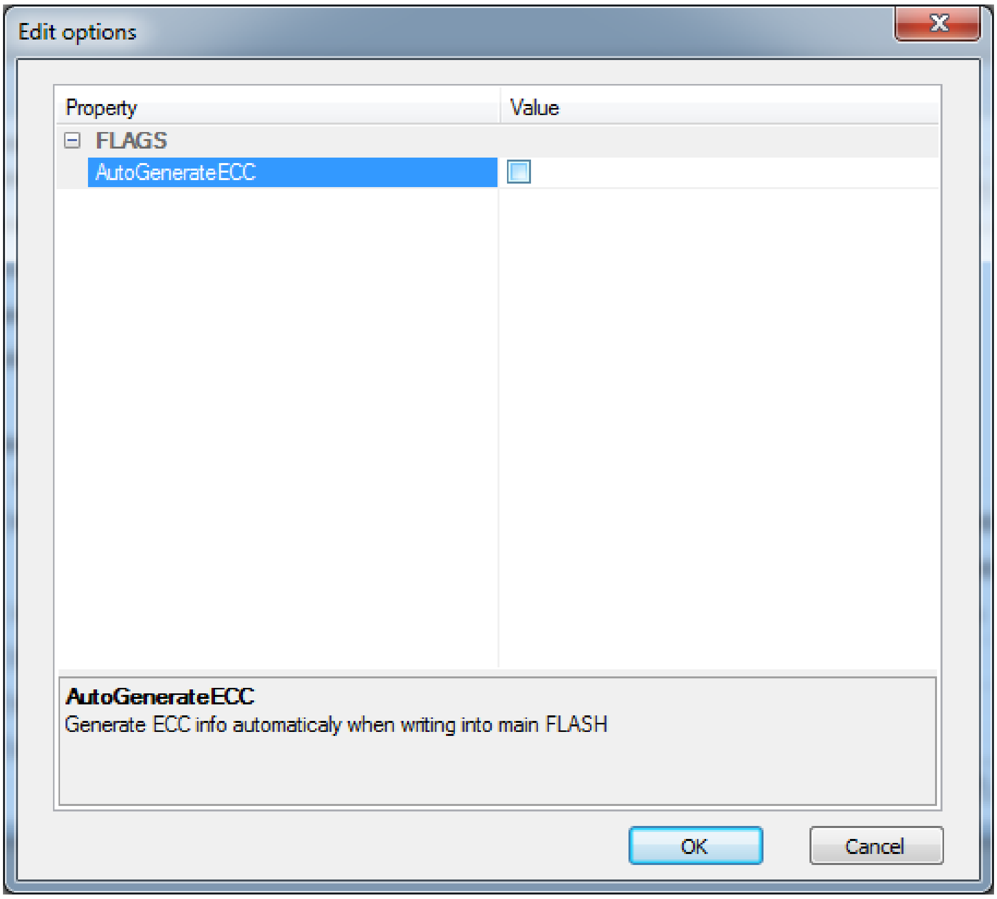
9.11.75 (22.12.2011)

CPU Support

ARM

TMSx70 ECC FLASH programming

Flash ECC data can be programmed separately when automatic ECC generation is disabled (Hardware/FLASH device Configure/Configuration).



Property	Value
⊟ FLAGS	
AutoGenerateECC	□

AutoGenerateECC
Generate ECC info automaticaly when writing into main FLASH

winIDEA

IDE

Inconsistent text file line endings tolerance

winIDEA now detects the 'prevailing' line ending convention. Inconsistencies like sequences of CR CR LF are treated as a single new line.

Text files using such mixture of line endings are non-standard and are considered as file error. The effect occurs when content from differently encoded sources is merged via file transfer, copy/paste or explicit merging.

To avoid confusion, it is advised that the error is eliminated at the source.

9.11.76 (4.1.2012)

CPU Support

HC11

Range mode profiler support

Range mode analysis is supported.

V850

V850Fx4 Nexus width selection

Nexus width is now limited to 16, 24 and 48 bits. Due to implementation specifics, narrower widths yield no benefit in session duration (due to trace buffer compression).

winIDEA

Analyzer

Profiler tail-merge analysis

Functions which are tail-merge optimization destinations are now included implicitly if any of the explicitly specified functions use them.

Implicitly added functions are not shown in the Analyzer window.

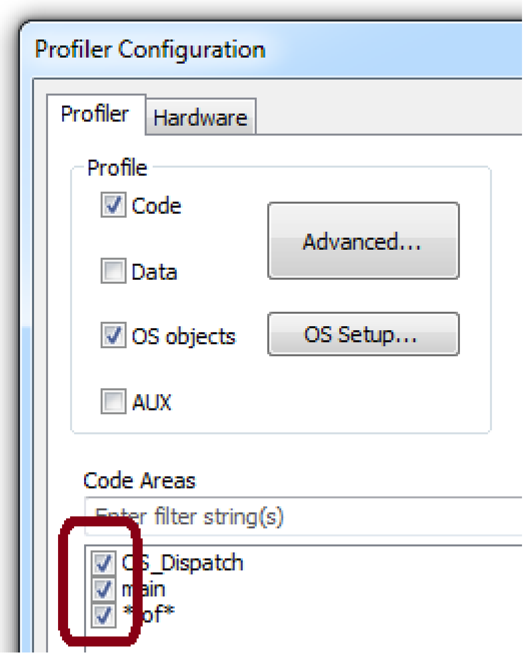
Profiler function configuration update

If Code Areas list is empty, but Code profiling is checked, all functions will be profiled.

Profiler areas enable/disable

Already configured profiler areas can be temporarily disabled by clearing the leading check-box.

The new configuration will take effect in the next profiler session (live or off-line)



Profile

☑ Code

☐ Data

☑ OS objects

☐ AUX

Code Areas

☑ OS_Dispatch

☑ main

☑ *of*

Snap to area

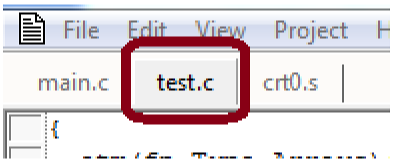
If timeline toolbar's button is checked, the located area will be scrolled into view when find next or find previous is executed.

9.11.77 (12.1.2012)

winIDEA

Desktop

Double click on document tab maximizes the window.

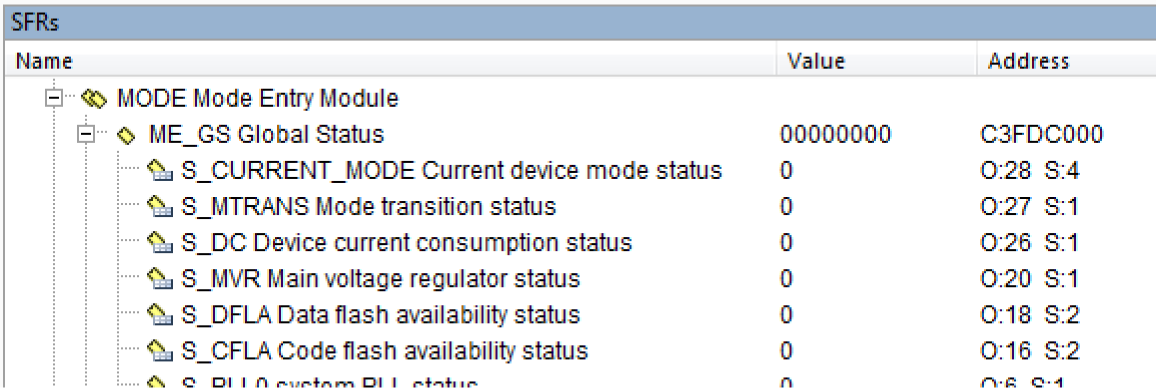


SFR Window

Address column

The Address column displays:

- address for SFRs
- bit position and size for sub-SFRs



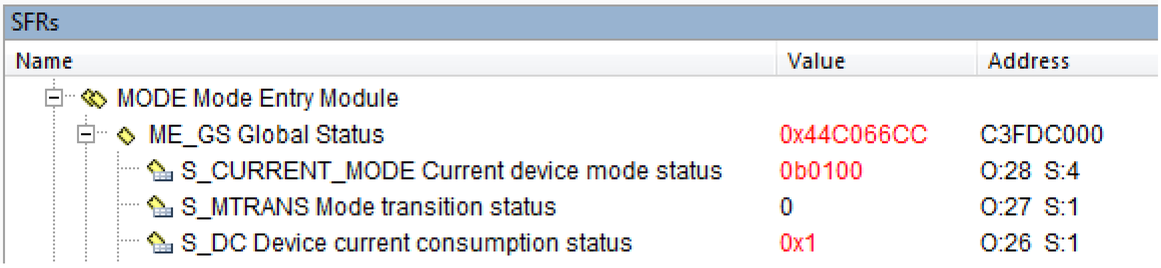
SFRs

Name	Value	Address
MODE Mode Entry Module		
ME_GS Global Status	00000000	C3FDC000
S_CURRENT_MODE Current device mode status	0	O:28 S:4
S_MTRANS Mode transition status	0	O:27 S:1
S_DC Device current consumption status	0	O:26 S:1
S_MVR Main voltage regulator status	0	O:20 S:1
S_DFLA Data flash availability status	0	O:18 S:2
S_CFLA Code flash availability status	0	O:16 S:2
S_PLL0 system PLL status	0	O:6 S:1

Value radix

SFR value can include radix prefix:

- 0x for hexadecimal values
- 0b for binary values

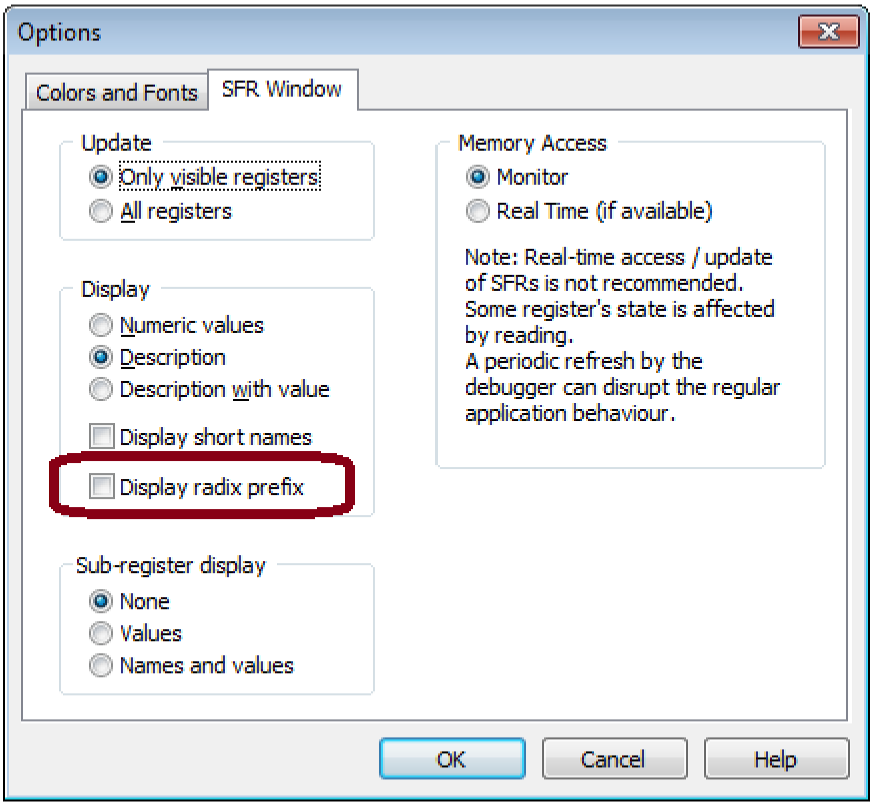


SFRs

Name	Value	Address
MODE Mode Entry Module		
ME_GS Global Status	0x44C066CC	C3FDC000
S_CURRENT_MODE Current device mode status	0b0100	O:28 S:4
S_MTRANS Mode transition status	0	O:27 S:1
S_DC Device current consumption status	0x1	O:26 S:1

Location: ***Tools/Options/SFR Window/Display radix prefix***

Default: **Off**



Update
● Only visible registers
○ All registers

Display
○ Numeric values
● Description
○ Description with value

□ Display short names

□ Display radix prefix

Sub-register display
● None
○ Values
○ Names and values

Memory Access
● Monitor
○ Real Time (if available)

Note: Real-time access / update of SFRs is not recommended. Some register's state is affected by reading.
A periodic refresh by the debugger can disrupt the regular application behaviour.

Analyzer

Non regular functions properties display is limited to Net display only.

Count and Count derived information as well as Context specific statistics are not shown.

I/O Module

HIL Access to Pattern Engine

HIL Write method accepts these parameters:

- Pattern.FileName Path to the pattern definition file
- Pattern.ScaleTime Multiply the times by this factor.
- Pattern.ScaleAOUT Multiply the Analog Out values by this factor.
- Pattern.UseConfig Use configuration part.
- Pattern.UseTableA Use Table A part.
- Pattern.UseTableB Use Table B part.
- PatternSet Set to TRUE/1 to apply the pattern configuration.

CPU Support

HC11

Data profiling considers all write sources

Write from any SoC source (not just CPU core)) is considered as a profiler event.

ARM

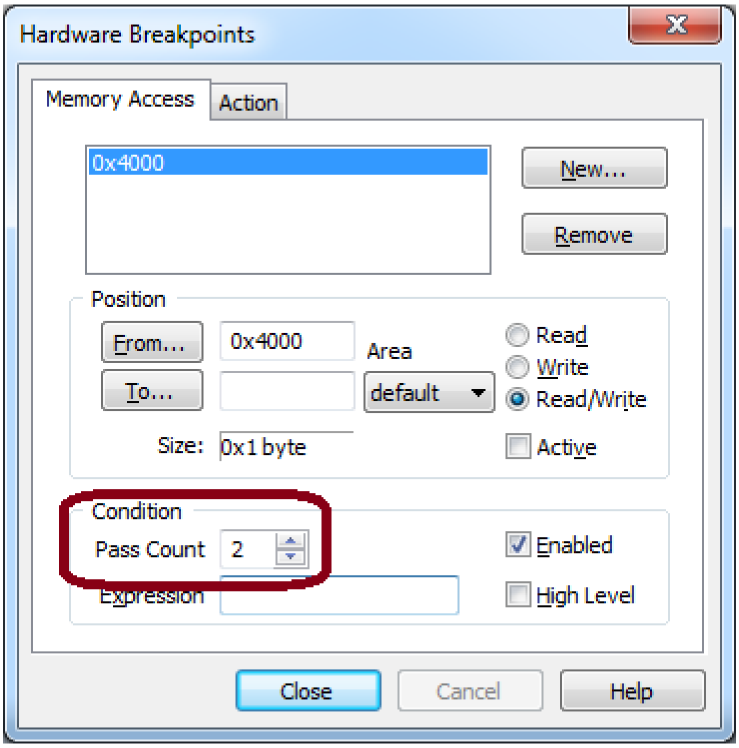
TMSx70 EEPROM programming

EEPROM programming for F021 devices is supported.

Note that EEPROM is erased during mass erase.

In-Circuit emulation access breakpoints

Breakpoint Count is now interpreted as **pass count** – the number of hits to skip before a breakpoint stops execution.



From...: 0x4000

Area: default

○ Read
○ Write
● Read/Write

Size: 0x1 byte

□ Active

Pass Count: 2

☑ Enabled

□ High Level

This behavior is now identical to execution breakpoint pass count.

9.11.78 (17.1.2012)

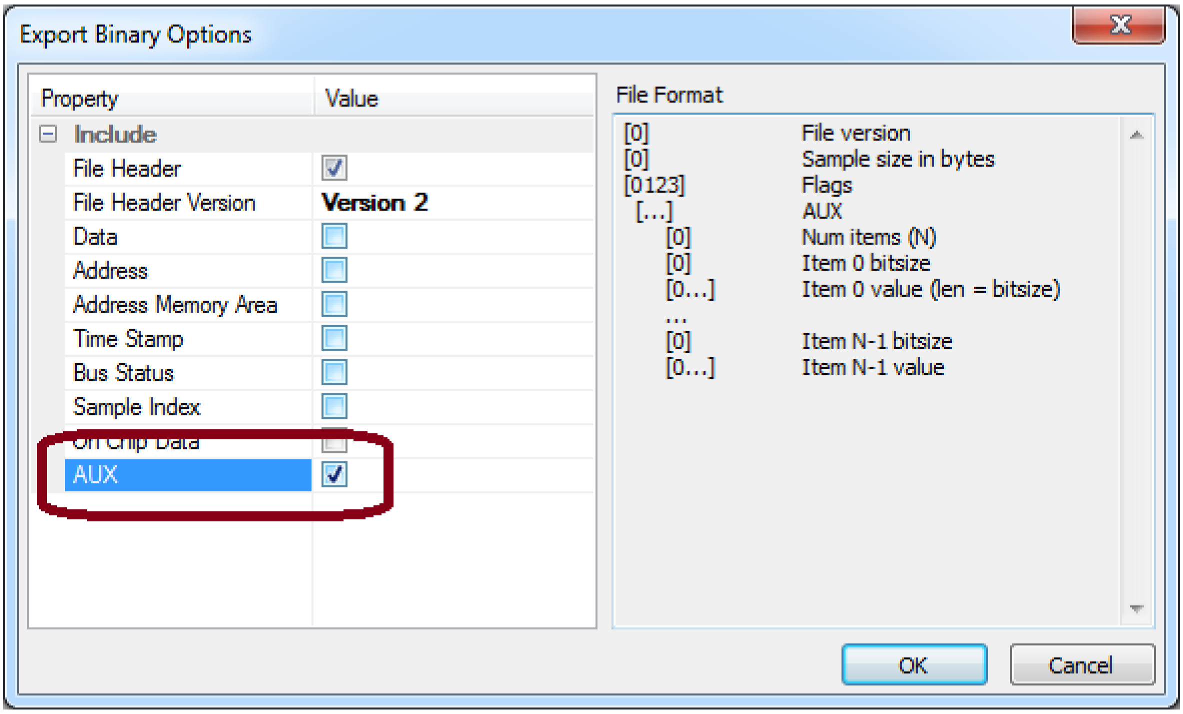
winIDEA

Help

Help/Release notes now links to isystem.com/downloads/sw-updates

Analyzer

Binary export provides AUX/IOM data export option.



Property	Value
⊟ Include	
File Header	☑
File Header Version	**Version 2**
Data	□
Address	□
Address Memory Area	□
Time Stamp	□
Bus Status	□
Sample Index	□
On Chip Data	□
AUX	☑

File Format

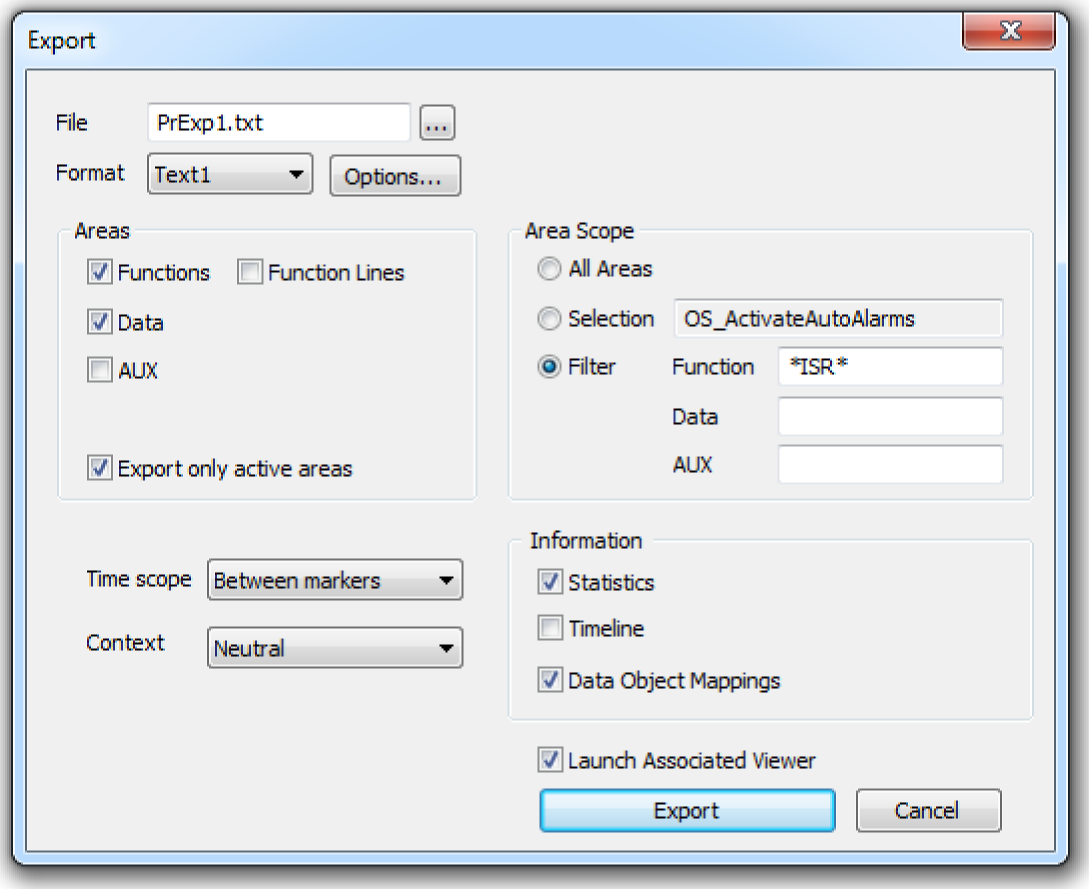
```
[0]                 File version
[0]                 Sample size in bytes
[0123]              Flags
 [...]              AUX
    [0]             Num items (N)
    [0]             Item 0 bitsize
    [0...]          Item 0 value (len = bitsize)
    ...
    [0]             Item N-1 bitsize
    [0...]          Item N-1 value
```

9.11.79 (24.1.2012)

winIDEA

Analyzer

Profiler export adds Area type selection and Data and AUX filters.



Export

File PrExp1.txt

Format Text1

Areas

☑ Functions ☐ Function Lines

☑ Data

☐ AUX

☑ Export only active areas

Area Scope

○ All Areas

○ Selection OS_ActivateAutoAlarms

● Filter Function *ISR*

Data

AUX

Time scope Between markers

Context Neutral

Information

☑ Statistics

☐ Timeline

☑ Data Object Mappings

☑ Launch Associated Viewer

Areas

Defines which area types will be exported.

Note: function lines are exported only if functions are also exported.

9.11.80 (3.2.2012)

winIDEA

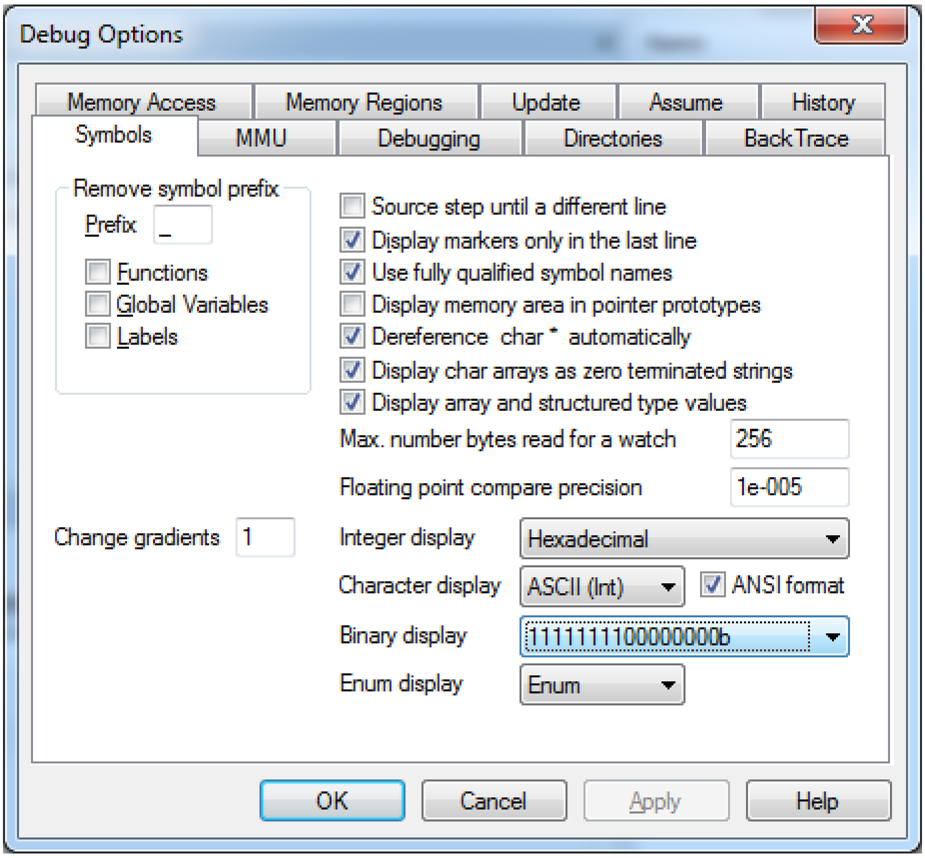
Watch window

Binary constants

Binary constants of the form <***digits***>***b*** are recognized.

e.g. 1000b == 4

This format should be used if one intends to modify binary values in the watch window. Other binary display formats cannot be used to modify the value.



Remove symbol prefix

Prefix _

□ Functions

□ Global Variables

□ Labels

Change gradients 1

□ Source step until a different line

☑ Display markers only in the last line

☑ Use fully qualified symbol names

□ Display memory area in pointer prototypes

☑ Dereference char * automatically

☑ Display char arrays as zero terminated strings

☑ Display array and structured type values

Max. number bytes read for a watch 256

Floating point compare precision 1e-005

Integer display Hexadecimal

Character display ASCII (Int) ☑ ANSI format

Binary display 1111111100000000b

Enum display Enum